Preface

First of all, thank you for purchasing KM1000 series AC Drives (also called frequency inverters or Variable frequency drive).

KM1000 series is a high-performance, high-reliability and multi-functional general-purpose using inverter.
Equipped with a 32-bit DSP motor-specific processor, using advanced vector control algorithms to ensure high precision and high torque output, it has good torque dynamic response and super overload capacity. It can match a variety of motor types, (IM, IPM, SPM) all have good driving performance. Considering the complexity of user usage scenarios, it fully embodies the product features of easy installation, easy debugging, easy maintenance, and high reliability
KM1000 inverters has strong versatility and is widely used in petroleum, chemical, textile, building materials, medicine, food, papermaking, plastics, printing and dyeing, lifting, cables, water supply, machine tools, HVAC, packaging, sewage treatment and various mixers and extruders. Winding machinery, compressors, fans, grinders, conveyor belts, centrifuges, elevators, etc. have mature applications.

There are kinds of optional expansion cards (PG card, communication card, I/0 card, special application cases using card) for KM1000 inverters can better meet the application requirements of various occasions.

This manual introduces the functional characteristics and usage methods of KM1000 series inverters. Including product selection, parameter setting, function explanation, operation debugging, maintenance inspection, application cases, etc. Please read this manual carefully before installing the machine, and please keep it properly for future use.

The following are the matters that need special attention:
1. Before wiring, be sure to turn off the power.
2. After the power supply is cut off, before the indicator light of the inverter goes out, it means that there is still high voltage inside, and the internal circuit and components must not be touched.
3. Never connect the power supply to the output terminal U V W of the inverter, otherwise it will cause serious damage.
4. Never modify the internal parts and circuits of the inverter by yourself.
5. If there are still some problems in use, please contact the customer service of our company.

Subject to changes due to continuous product improvement

Content

Chapter 1. Safety Information and Precautions

In this manual, the notices are graded based on the degree of danger:

- **DANGER** indicates that failure to comply with the notice will result in severe personal injury or even death.
- **WARNING** indicates that failure to comply with the notice will result in personal injury or property damage.

Read this manual carefully so that you have a thorough understanding. Installation, commissioning or maintenance may be performed in conjunction with this chapter vendor will assume no liability or responsibility for any injury or loss caused by improper operation.

1.1. Safety Information

1. Before installation:

⚠DANGER
• Do not install the equipment if you find water seepage, component missing or damage upon unpacking. • Do not install the equipment if the packing list does not conform to the product you received
⚠ **Warning**
• Handle the equipment with care during transportation to prevent damage to the equipment. • Do not use the equipment if any component is damaged or missing. Failure to comply will result in personal injury. • Do not touch the components with your hands. Failure to comply will result in static electricity damage.

2. During installation

⚠DANGER
• Install the equipment on incombustible objects such as metal, and keep it away from combustible materials. Failure to comply may result in a fire. • Do not loosen the fixed screws of the components, especially the screws with red mark
⚠ **Warning**

• Do not drop wire end or screw into the AC drive. Failure to comply will result in damage to the AC drive. • Install the AC drive in places free of vibration and direct sunlight. • When two AC drives are laid in the same cabinet, arrange the installation positions properly to ensure the cooling effect.

3. At wiring

⚠DANGER
• Wiring must be performed only by qualified personnel under instructions described in this manual. Failure to comply may result in unexpected accidents. • A circuit breaker must be used to isolate the power supply and the AC drive. Failure to comply may result in a fire. • Ensure that the power supply is cut off before wiring. Failure to comply may result in electric shock. • Tie the AC drive to ground properly by standard. Failure to comply may result in electric shock

⚠ Warning
•Never connect the power cables to the output terminals (U, V, W) of the AC drive. Pay attention to the marks of the wiring terminals and ensure correct wiring. Failure to comply will result in damage to the AC drive. • Never connect the braking resistor between the DC bus terminals (+) and (-). Failure to comply may result in a fire. • Use wire sizes recommended in the manual. Failure to comply may result in accidents. • Use a shielded cable for the encoder, and ensure that the shielding layer is reliably grounded.

4. Before power on

⚠DANGER
• Check that the following requirements are met: – The voltage class of the power supply is consistent with the rated voltage class of the AC drive. – The input terminals (R, S, T) and output terminals (U, V, W) are properly connected. – No short-circuit exists in the peripheral circuit. – The wiring is secured. Failure to comply will result in damage to the AC drive • Do not perform the voltage resistance test on any part of the AC drive because such test has been done in the factory. Failure to comply will result in accidents.
⚠ **Warning**
• Cover the AC drive properly before power-on to prevent electric shock. • All peripheral devices must be connected properly under the instructions described in this manual. Failure to comply will result in accidents

5. After power on

⚠DANGER
• Do not open the AC drive's cover after power-on. Failure to comply may result in electric shock. • Do not touch any I/O terminal of the AC drive. Failure to comply may result in electric shock

⚠ Warning
• Do not touch the rotating part of the motor during the motor auto-tuning or running. Failure to comply will result in accidents. • Do not change the default settings of the AC drive. Failure to comply will result in damage to the AC drive

6. During operation:

⚠DANGER
• Do not touch the fan or the discharging resistor to check the temperature. Failure to comply will result in personal burnt. • Signal detection must be performed only by qualified personnel during operation. Failure to comply will result in personal injury or damage to the AC drive.

⚠ Warning
• Avoid objects falling into the AC drive when it is running. Failure to comply will result in damage to the AC drive. • Do not start/stop the AC drive by turning the contactor ON/OFF. Failure to comply will result in damage to the AC drive.

7. During operation

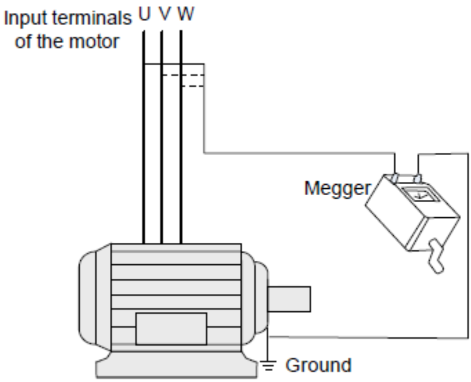
⚠DANGER
• Repair or maintenance of the AC drive may be performed only by qualified personnel. Failure to comply will result in personal injury or damage to the AC drive. • Do not repair or maintain the AC drive at power-on. Failure to comply will result in electric shock. • Repair or maintain the AC drive only ten minutes after the AC drive is powered off. This allows for the residual voltage in the capacitor to discharge to a safe value. Failure to comply will result in personal injury. • Ensure that the AC drive is disconnected from all power supplies before starting repair or maintenance on the AC drive. • Set and check the parameters again after the AC drive is replaced. • All the pluggable components must be plugged or removed only after power-off. • The rotating motor generally feeds back power to the AC drive. As a result, the AC drive is still charged even if the motor stops, and the power supply is cut off. Thus ensure that the AC drive is disconnected from the motor before starting repair or maintenance on the AC drive.

⚠ Warning
• During AC drive running to avoid any parts drop into it and cause equip damaged. Don't start and stop AC drive by contactors ON and OFF to void equip damaged.

1.2. General Precautions

1. Motor insulation test

Perform the insulation test when the motor is used for the first time, or when it is reused after being stored for a long time, or in a regular check-up, in order to prevent the poor insulation of motor windings from damaging the AC drive. The motor must be disconnected from the AC drive during the insulation test. A 500-V mega-Ohm meter is recommended for the test. The insulation resistance must not be less than 5 MΩ.



2. Thermal protection of motor

If the rated capacity of the motor selected does not match that of the AC drive, especially when the AC drive's rated power is greater than the motor's, adjust the motor protection parameters on the operation panel of the AC drive or install a thermal relay in the motor circuit for protection.

3. Running at over 50 Hz

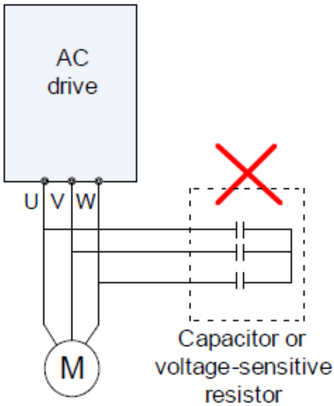
The AC drive provides frequency output of 0 to 3200 Hz (Up to 400 Hz is supported if the AC drive runs in CLVC and SFVC mode). If the AC drive is required to run at over 50 Hz, consider the capacity of the machine.

4. Motor heat and noise

The output of the AC drive is pulse width modulation (PWM) wave with certain harmonic frequencies, and therefore, the motor temperature, noise, and vibration are slightly greater than those when the AC drive runs at power frequency (50 Hz).

5. Voltage-sensitive device or capacitor on output side of the AC drive

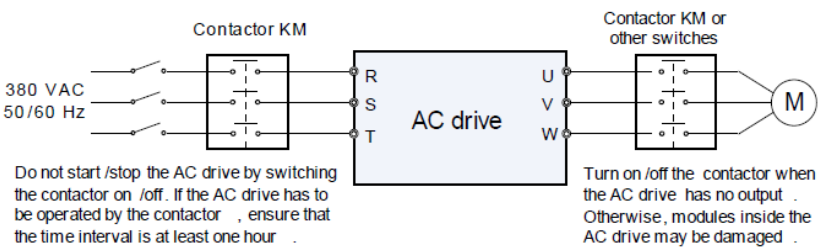
Do not install the capacitor for improving power factor or lightning protection voltage sensitive resistor on the output side of the AC drive because the output of the AC drive is PWM wave. Otherwise, the AC drive may suffer transient over current or even be damaged.



6. Contactor at the I/O terminal of the AC drive

When a contactor is installed between the input side of the AC drive and the power supply, the AC drive must not be started or stopped by switching the contactor on or off. If the AC drive has to be operated by the contactor, ensure that the time interval between switching is at least one hour since frequent charge and discharge will shorten the service life of the capacitor inside the AC drive.

When a contactor is installed between the output side of the AC drive and the motor, do not turn off the contactor when the AC drive is active. Otherwise, modules inside the AC drive may be damaged.



7. When external voltage is out of rated voltage range

The AC drive must not be used outside the allowable voltage range specified in this manual. Otherwise, the AC drive's components may be damaged. If required, use a corresponding voltage step-up or step-down device.

8. Prohibition of three-phase input changed into two-phase input

Do not change the three-phase input of the AC drive into two-phase input. Otherwise, a fault will result or the AC drive will be damaged

8. Surge suppressor

The AC drive has a built-in voltage dependent resistor (VDR) for suppressing the surge voltage generated when the inductive loads (electromagnetic contactor, electromagnetic relay, solenoid valve, electromagnetic coil and electromagnetic brake) around the AC drive are switched on or off. If the inductive loads generate a very high surge voltage, use a surge suppressor for the inductive load or also use a diode

Note: Do not connect the surge suppressor on the output side of the AC.

10. Altitude and de-rating

In places where the altitude is above 1000 m and the cooling effect reduces due to thin air, it is necessary to de-rate the AC drive. Contact vendor for technical support.

11. Some special usages

If wiring that is not described in this manual such as common DC bus is applied, contact the agent or vendor for technical support.

12. Disposal

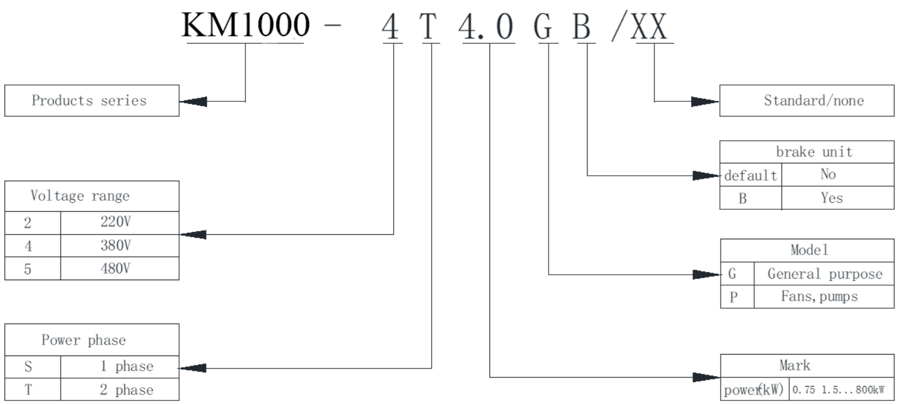
The electrolytic capacitors on the main circuits and PCB may explode when they are burnt. Poisonous gas is generated when the plastic parts are burnt. Treat them as ordinary industrial waste

Adaptable Motor

- The standard adaptable motor is adaptable four-pole squirrel-cage asynchronous induction motor or PMSM. For other types of motor, select a proper AC drive according to the rated motor current.
- The cooling fan and rotor shaft of non-variable-frequency motor are coaxial, which results in reduced cooling effect when the rotational speed declines. If variable speed is required, add a more powerful fan or replace it with variable-frequency motor in applications where the motor overheats easily.
- The standard parameters of the adaptable motor have been configured inside the AC drive. It is still necessary to perform motor auto-tuning or modify the default values based on actual conditions. Otherwise, the running result and protection performance will be affected.
- The AC drive may alarm or even be damaged when short-circuit exists on cables or inside the motor. Therefore, perform insulation short-circuit test when the motor and cables are newly installed or during routine maintenance. During the test, make sure that the AC drive is disconnected from the tested parts.

Chapter 2. Product Information Introduction

2.1. Models



2.2. Name plate

2.3. Production Technical

Items		Specification		
Control mode	Control mode	SVC in open loop	V/F control	Close loop vector control
	Starting torque	0.5Hz 180%	0.5Hz 150%	0.00Hz 180%
	Speed adjust range	1:100	1:100	1:1000
	Speed stabilizing precision			±0.02%
	Torque precision	NO	NO	±5%
	Motor type	General induction motor， permanent magnet synchronous motor (PMSM)*		
Function design	Highest frequency	General vector control :400Hz V/f control： 4000Hz		
	frequency resolution	Digital setting: 0.01Hz analog setting:maximum×0.025%		
	Carrier frequency	0.5K ~ 16KHz, the carrier frequency can be adjusted by temperature automatically		
	Frequency reference setting method	Digital of Control panel, analog AI1, AI2, potentiometer of control panel, UP/DN control, communication, PLC pulse frequency		
	Acceleration./deceleration characteristic	Linear curve and S curve accel. /decel. mode, range of time: 0.0 to 65000S.		
	V/F curve	3 mode: linear, multiple points, N Power		
	V/F separation	2 times separation: totally separation, half separation		
	DC braking	DC braking frequency: 0.0 to 300Hz, DC braking current: 0.0% to 100%		
	Braking unit	Standard built in for up to 4T22G (22kw), optional built it for 4T30G ~ 4T75G (30kw to 75kw), external built for above 4T93G (95kw).		
	Jog function	Job frequency range: 0.0 to 50.0Hz, the acceleration and deceleration time of Jog		
	Configure PID function	Easy to perform pressure, flow, temperature close loop control.		
	PLC multiple speed	To achieve 16 segment speed running through built in PLC or terminal control		
	Common Dc bus	Multiple drives use one DC bus for energy balance.		
	Auto voltage regulation (AVR)	Enable to keep output voltage constant when grid fluctuation		
	Over load tolerance capability	G type model: 150% rated current for 60s, 180% rated current for 3s, P type Model: 120% rated current for 60s, 150% rated current for 3s.		

Items		Specification
	Stall protection control when over current, over voltage	Carry out limiting automation for running current, voltage to prevent over current, over voltage frequently
	Rapid current limit function	Minimize the IGBT module broken to protect the AC Drive, maximum reduce the over current fault.
	Torque limit and torque control	"Excavator" characteristic , torque limit automatically during motor running. Torque control is available in close loop vector control mode.
Features	Friendly interface	Display "Hello" when power on.
	Multiple function key JOG button	It can set for Forward Jog, reverse Jog, forward/reverse switch
	Timing control function	A total running time and total running time calculating
	2 group motor parameters	To achieve two motor switchover freely, control mode is selectable
	Motor over heat protection	Accepting motor temperature sensor signal input via AI1 terminals.
	Multiple kinds encoder *	Compatible collector PG, differential PG, and rotary transformer Encoder(resolver).
	Command source	Control panel, control terminals, series communication, switch freely.
	Frequency source	Digital setting, analog current/voltage, pulse setting, serial communication, main and auxiliary combination.
	Protection function	Short circuit detect when power on, input/output phase loss, over voltage, over current, under voltage, over heat, over load protection.
Environment	Application site	Indoor, free of exposure to sunlight, no dusty, no corrosive, no inflammable gas, no oil and water vapor, and water dipping
	Altitude	Lower 1000m
	environment temperature	-10℃ ~ +40℃, power derated for 40 ~ 50℃, rated current derated 1% for 1℃ increasing.
	humidity	Less than 95%, no water condense.
	storage	-40 ~ +70℃
	Ip rating	IP20

2.4. Outline overall and installing dimensions

2.4． 1. Outline overall and installing dimensions： KM1000 series

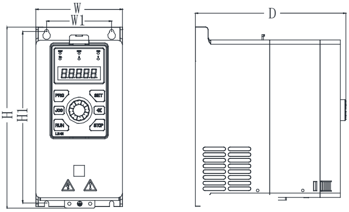


Fig.1 （Floor stand)

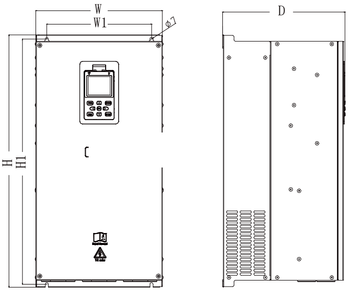


Fig.2 （Floor stand)

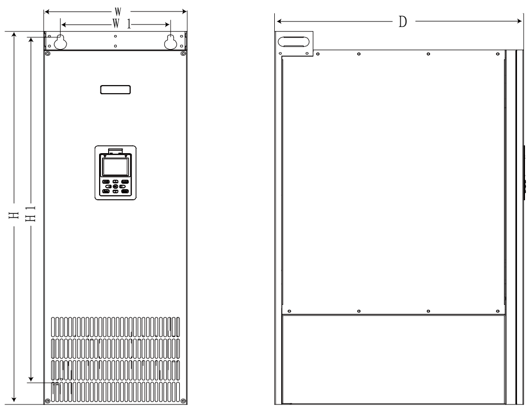


Fig.3 （Floor stand)

AC drive model	Install the hole mm		outline dimension mm			construction bolt mm	net weight /kg	Legend / Structure dimensions
	W1	H1	W	H	D			
KM1000 Series single-phase 220V								
KM1000-2S0.75GB	75	196	100	207	164	M4	1.9	Fig 1
KM1000-2S1.5GB	75	196	100	207	164	M4	1.9	Fig 1
KM1000-2S2.2GB	75	196	100	207	176	M4	2.1	Fig 1
KM1000-2S4.0GB	96	268	126	279	183	M5	3.4	Fig 1
KM1000-2S5.5GB	96	268	126	279	183	M5	3.4	Fig 1
KM1000 Series of three-phase 220V								
KM1000-2T0.75GB	75	196	100	207	164	M4	1.9	Fig 1
KM1000-2T1.5GB	75	196	100	207	164	M4	1.9	Fig 1
KM1000-2T2.2GB	75	196	100	207	164	M4	2.1	Fig 1
KM1000-2T3.7GB	75	196	100	207	176	M4	3.4	Fig 1
KM1000-2T5.5GB	75	196	100	207	176	M4	3.4	Fig 1
KM1000-2T7.5GB	96	268	126	279	183	M5	6.3	Fig 1
KM1000-2T11GB	96	268	126	279	183	M5	6.3	Fig 1
KM1000-2T15G	140	334	170	352	184	M5	6.3	Fig 1
KM1000-2T18.5G	140	334	170	352	184	M5	13.4	Fig 1
KM1000-2T22G	140	334	170	352	184	M5	23.7	Fig 1
KM1000-2T30G	200	414	235	429	215	M6	23.7	Fig 2
KM1000-2T37G	200	414	235	429	215	M6	23.7	Fig 2
KM1000-2T45G	230	538	278	553	269	M6	33.8	Fig 2
KM1000-2T55G	230	538	278	553	269	M6	33.8	Fig 2
KM1000-2T75G	230	538	278	553	269	M6	54	Fig 2
KM1000-2T93G	225	581	265	600	1000	M8	54	Fig 2
KM1000-2T110G	225	581	265	600	1000	M8	91.9	Fig 2

AC drive model	Install the hole mm		outline dimension mm			construction bolt mm	net weight /kg	Legend / Structure dimensions
	W1	H1	W	H	D			
KM1000-2T132G	265	632	325	650	424	M8	91.9	Fig 3
KM1000-2T160G	265	632	325	650	424	M8	91.9	Fig 3
KM1000 Series of three-phase 380V								
KM1000-4T0.7GB KM1000-4T1.5GB KM1000-4T2.2GB KM1000-4T3.0GB	75	196	100	207	164	M4	1.9	Fig 1
KM1000-4T4.0GB KM1000-4T5.5GB	75	196	100	207	176	M4	2.1	Fig 1
KM1000-4T7.5GB KM1000-4T11GB	96	268	126	279	183	M5	3.4	Fig 1
KM1000-4T15GB KM1000-4T18.5GB KM1000-4T22GB	140	334	170	352	184	M5	6.3	Fig 1
KM1000-4T30G KM1000-4T37G	200	414	235	429	215	M6	13.4	Fig 2
KM1000-4T45G KM1000-4T55G KM1000-4T75G	230	538	278	553	269	M6	23.7	Fig 2
KM1000-4T93G KM1000-4T110G	225	581	265	600	1000	M8	33.8	Fig 2
KM1000-4T132G KM1000-4T160G	265	632	325	650	424	M8	54	Fig 2
KM1000-4T185G KM1000-4T200G KM1000-4T220G KM1000-4T250G	230	875	300	950	520	M12	91.9	Fig 3

AC drive model	Install the hole mm		outline dimension mm			construction bolt mm	net weight /kg	Legend / Structure dimensions
	W1	H1	W	H	D			
KM1000-4T280G KM1000-4T315G KM1000-4T355G KM1000-4T400G	230	1175	300	1250	520	M12	125	Fig 3

AC drive model	Install the hole mm		outline dimension mm			construction bolt mm	net weight /kg	Legend / Structure dimensions
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KM1000 Series single-phase 220V								
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KM1000-2T110G	225	581	265	600	1000	M8	91.9	Fig 2
KM1000-2T132G	265	632	325	650	424	M8	91.9	Fig 3
KM1000-2T160G	265	632	325	650	424	M8	91.9	Fig 3
KM1000 Series of three-phase 380V								
KM1000-4T0.7GB KM1000-4T1.5GB KM1000-4T2.2GB KM1000-4T3.0GB	75	196	100	207	164	M4	1.9	Fig 1
KM1000-4T4.0GB KM1000-4T5.5GB	75	196	100	207	176	M4	2.1	Fig 1
KM1000-4T7.5GB KM1000-4T11GB	96	268	126	279	183	M5	3.4	Fig 1
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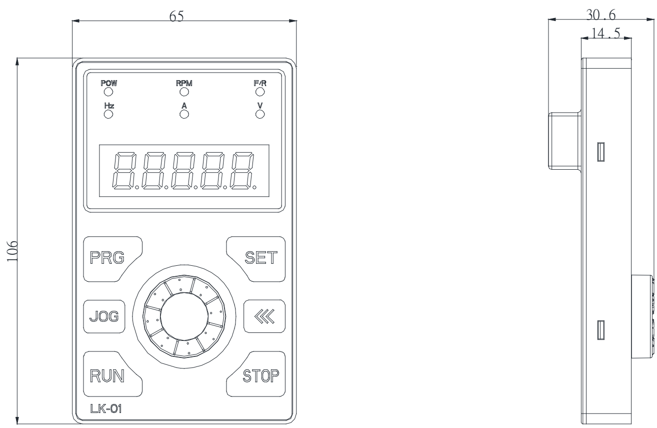
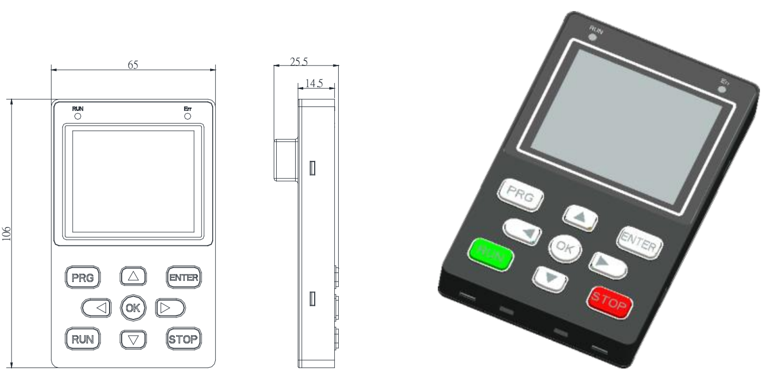
KM1000-4T280G KM1000-4T315G KM1000-4T355G KM1000-4T400G	230	1175	300	1250	520	M12	125	Fig 3

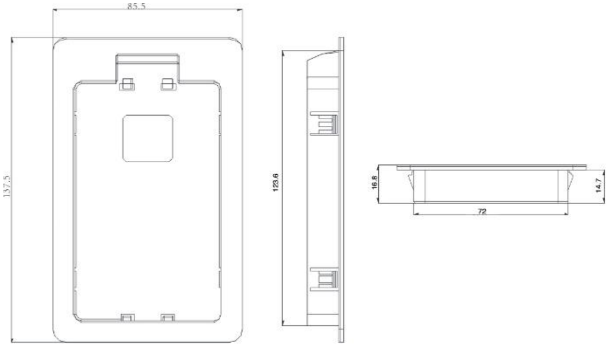
2.5. Dimension of standard built keypad and optional keypad



Stadard built keypad model: LK-01



LCD panel (optional)



Opening size of panel bracket: 123.6mm * 72mm

Chapter 3. Production installation

3.1. Installation Environment Requirements

1. Ambient temperature, the surrounding environment temperature take great effect for service life span of Ac drive, don't allow surrounding temperature over than allowable temperature above (-10°C to +50°C)
2. Heat dissipation, Install the AC drive on the surface of an incombustible object, and ensure that there is sufficient space around for heat dissipation. Install the AC drive vertically on the support using screws.
3. Vibration, it should be less than 0.6G, far away from the punching machine or the like.
4.Free from direct sunlight, high humidity and condensation
5.Free from corrosive, explosive and combustible gas
6.Free from oil dirt, dust and metal powder

Installation position remind.

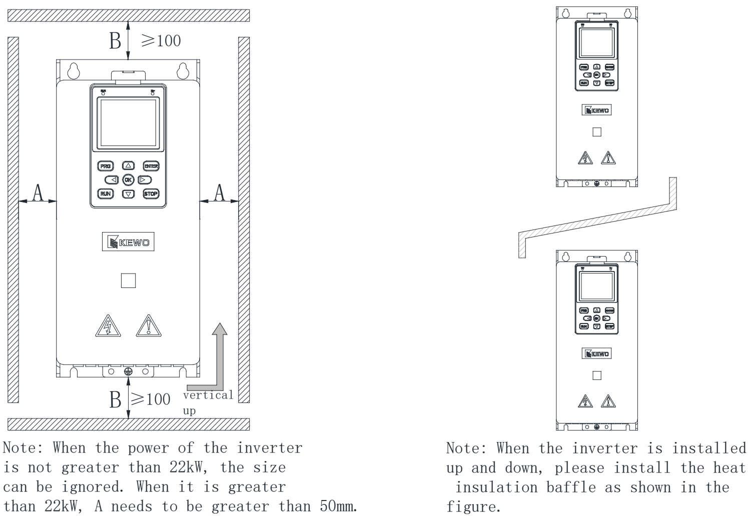


Fig 3-1 KM series AC drive installation

when AC drive installation in up and down, should install insulation guide plate to avoid upper AC drive heating.

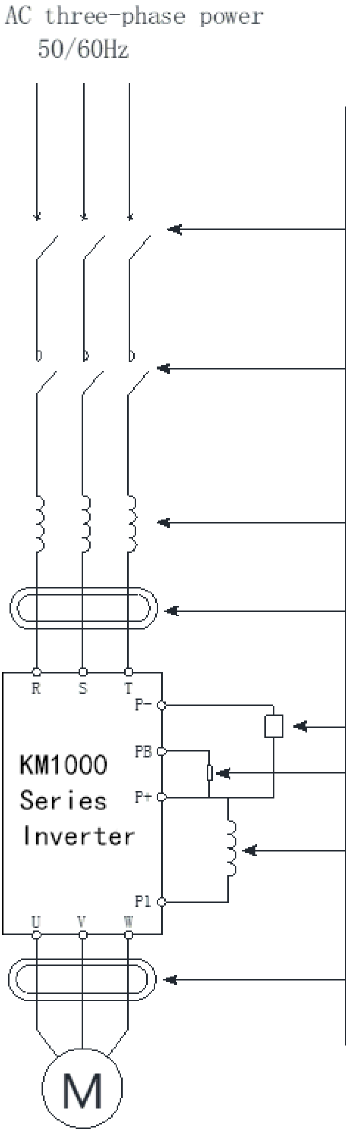
Note: when the power of AC drive less than 22kW, no need consider the A dimension, When the power large than 22kW, A should large than 50mm.

Installation Precautions

1) Reserve the installation clearances as specified in Fig 3-1 to ensure sufficient space for heat dissipation. Take heat dissipation of other parts in the cabinet into consideration.
2) Install the AC drives upright to facilitate heat dissipation. If multiple AC drives are installed in the cabinet, install them side by side. If one row of AC drives need to be installed above another row, install an insulation guide plate, as shown in Fig 3-1.

3) Use incombustible hanging bracket.
4) In scenarios with heavy metal powder, install the heat sink outside the cabinet, and ensure that the room inside the fully-sealed cabinet is as large as possible.

3.2. Peripheral Electrical Devices and System Configuration



Peripherals and any options	illustrate:
* Fuseless circuit breakers MCCB	Used to quickly cut off the faulty power supply of the inverter and prevent the inverter and line faults from causing power failure
* AC contactor MC	Cut off mains supply in case of inverter failure and prevent power failure and restart after failure
* AC reactor DCL	Used to improve input power factor, reduce high-order harmonics and suppress power surges
* radio noise filter NF	To reduce radio interference from frequency converters
* brake unit B	It is selected when the braking torque cannot meet the requirements. It is suitable for the occasions of large inertia load and frequency braking or quick stop.
Braking resistor RB	
* DC reactor DCL	Used to improve power factor and suppress current spikes
* radio noise filter NF	To reduce radio interference from frequency converters

3.3. Peripheral Electrical Devices selection.

AC drive model	(MCCB) A	Recommend contactor	recommend input side main loop cable mm2	recommend output side main loop cable mm²	Recommend Control circle cable mm²
Single 220V					
KM1000-2S0.7GB	16	10	1.5	1.5	0.5
KM1000-2S1.5GB	20	16	1.5	1.5	0.5
KM1000-2S2.2GB	32	20	2.5	2.5	0.5
Three-phase 220V					
KM1000-2T0.4GB	10	10	1.5	1.5	0.5
KM1000-2T0.75GB	16	10	1.5	1.5	0.5
KM1000-2T1.5GB	16	10	1.5	1.5	0.75
KM1000-2T2.2GB	25	16	1.5	1.5	0.75
KM1000-2T3.7GB	32	25	2.5	2.5	0.75
KM1000-2T5.5GB	63	40	6.0	6.0	0.75
KM1000-2T7.5GB	63	40	10	10	0.75
KM1000-2T11GB	100	63	16	16	1.0
KM1000-2T15G	125	100	16	16	1.5
KM1000-2T18.5G	160	100	25	25	1.5
KM1000-2T22G	200	125	35	35	1.5
KM1000-2T30G	200	125	50	50	1.5
KM1000-2T37G	250	160	70	70	1.5
KM1000-2T45G	250	160	95	95	1.5
KM1000-2T55G	1000	1000	120	120	1.5
KM1000-2T75G	500	400	150	150	1.5
KM1000-2T90G	500	400	185	185	1.5
KM1000-2T110G	600	600	95*2	95*2	1.5
KM1000-2T132G	600	600	120*2	120*2	1.5

AC drive model	(MCCB) A	Recommend contactor	recommend input side main loop cable mm2	recommend output side main loop cable mm²	Recommend Control circle cable mm²
KM1000-2T160G	1000	600	120*2	120*2	1. 5
Three phase 380V					
KM1000-4T0. 7GB	10	10	1. 5	1. 5	1. 0
KM1000-4T1. 5GB	16	10	1. 5	1. 5	0. 5
KM1000-4T2. 2GB	16	10	1. 5	1. 5	0. 5
KM1000-4T3. 0GB	25	16	1. 5	1. 5	0. 5
KM1000-4T4. 0GB	25	16	1. 5	1. 5	0. 5
KM1000-4T5. 5GB	32	25	2. 5	2. 5	0. 5
KM1000-4T7. 5GB	40	32	4. 0	4. 0	0. 5
KM1000-4T11GB	63	40	6. 0	6. 0	0. 75
KM1000-4T15GB	63	40	10	10	0. 75
KM1000-4T18. 5GB	100	63	10	10	0. 75
KM1000-4T22GB	100	63	16	16	0. 75
KM1000-4T30G	125	100	16	16	1. 0
KM1000-4T37G	160	100	25	25	1. 0
KM1000-4T45G	200	125	35	35	1. 0
KM1000-4T55G	200	125	50	50	1. 0
KM1000-4T75G	250	160	70	70	1. 0
KM1000-4T93G	250	205	95	95	1. 0
KM1000-4T110G	315	245	120	120	1. 0
KM1000-4T132G	1000	300	120	120	1. 0
KM1000-4T160G	400	300	150	150	1. 0
KM1000-4T185G	500	410	185	185	1. 0
KM1000-4T200G	500	410	185	185	1. 0
KM1000-4T220G	630	475	240	240	1. 0
KM1000-4T250G	630	475	120*2	120*2	1. 0
KM1000-4T280G	700	620	120*2	120*2	1. 0

AC drive model	(MCCB) A	Recommend contactor	recommend input side main loop cable mm2	recommend output side main loop cable mm^2	Recommend Control circle cable mm^2
KM1000-4T315G	1000	620	150*2	150*2	1.0
KM1000-4T355G	1000	1000	185*2	185*2	1.0
KM1000-4T400G	1250	1000	240*2	240*2	1.0

3.4. Reactor description and selection.

An AC input reactor is installed to eliminate the harmonics of the input current. As an optional device, the reactor can be installed externally to meet strict requirements of an application environment for harmonics.

When the cable of motor connecting from AC drive longer than 50m, electrical resonance will be generated due to the impact of distributed capacitance. This will damage the motor insulation or generate higher leakage current, causing the AC drive to trip in over current protection. If the motor cable is greater than 100 m long, an AC output reactor must be installed close to the AC drive.

Built in external DC reactor for above 18.5kw AC drive is available, configuration DC reactor standard for above 160kw AC drive. The DC reactor can improve the power factor and avoid too big current rush to AC drive to cause rectifier damage, and also can avoid grid suddenly change.

AC input reactor, output reactor and DC reactor selection table.

AC drive models	Input AC contactor		Output AC contactor		DC reactor	
	current (A)	inductance (mH)	Current (A)	Inductance (mH)	current (A)	inductance (mH)
KM-4T1.5G	5	3.8	5	1.5	6	11
KM-4T2.2G	7	2.5	7	1	6	11
KM-4T3.7G	10	1.5	10	0.6	12	6.3
KM-4T5.5G	15	1.0	15	0.25	23	3.6
KM-4T7.5G	20	0.75	20	0.13	23	3.6
KM-4T11G	30	0.60	30	0.087	33	2
KM-4T15G	40	0.42	40	0.066	33	2
KM-4T18.5G	50	0.35	50	0.052	40	1.3
KM-4T22G	60	0.28	60	0.045	50	1.08
KM-4T30G	80	0.19	80	0.032	65	0.80
KM-4T37G	90	0.16	90	0.030	78	0.70
KM-4T45G	120	0.13	120	0.023	95	0.54
KM-4T55G	150	0.10	150	0.019	115	0.45
KM-4T75G	200	0.12	200	0.014	160	0.36

KM-4T93G	250	0.06	250	0.011	180	0.33
KM-4T110G	250	0.06	250	0.011	250	0.26
KM-4T132G	290	0.04	290	0.008	250	0.26
KM-4T160G	330	0.04	330	0.008	Standard built	
KM-4T185G	400	0.04	400	0.005		
KM-4T200G	490	0.03	490	0.004		
KM-4T220G	490	0.03	490	0.004		
KM-4T250G	530	0.03	530	0.003		
KM-4T280G	600	0.02	600	0.003		
KM-4T315G	660	0.02	660	0.002		
KM-4T355G	660	0.02	660	0.002		
KM-4T400G	400*2	0.03	400*2	0.005		

3.5. Main loop circuit terminals description

R	S	T	PB	P+	P–	U	V	W

⏚

Applicable to KM1000 - 2S0.75GB ~ 2S5.5GB / 2T0.75GB ~ 2T11GB / 4T0.75GB ~ 4T75G

R	S	T	U	V	W

⏚

4T90GB ~ 4T400G

3.6. Control loop circuit and connections

1. Single phase 220V input AC drive main loop terminal description

Terminal mark	Name	Description
R T	Single phase power input terminal	Connecting 220V power supply
U V W	AC drive output terminal	Connecting 3 phase motor
P+ P-	DC bus positive/negative terminal	DC bus common input terminal
P+ PB	Braking resistor connecting terminal	Connecting braking resistor
PE (⏚)	Grounding terminal	AC drive grounding terminal

2.Three phase AC drive main loop terminal description

Terminal mark	Name	Description
R S T	3 phase power input terminal	Connect 3 phase power supply
U V W	AC drive output terminal	Connect 3 phase motor
P+ P1	Short circuit after factory leaving	Connect DC reactor dismantle
P+ P-	DC bus positive/negative terminal	DC bus input terminal/ external braking unit connecting point
P+ PB	Braking resistor connecting terminal	Connecting braking resistor
PE (⏚)	Grounding terminal	AC drive grounding terminal

Wring precaution:

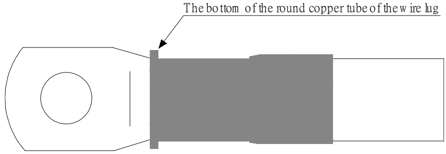
1. Input R, T or R, ST
AC drive input power supply connection side, no phase order request.
2. DC bus P+ P- , Take attention there are still exist residual voltage between P+, P- after power off. If need touch must need wait LED off and measuring voltage less than 36V. Otherwise it will be shock.
3. The braking unit wiring can't over than 10m, and need to using twisted-pair and diploma cable. Don't allow connect braking resistor to P+ and P-, otherwise it will cause AC drive damaged and fire.
4. Braking resistor should be connect to P+ and PB.
Built it braking unit up to 4T22(22Kw) for standard, only connect braking resistor is OK.
Please select braking resistor according to recommend list and wring should less than 5M, otherwise it will cause AC drive damaged.
5. Connecting external DC reactor terminal. Built it DC reactor for above 4T160G. if need connect DC reactor for 4T18.5G ~ 4T132G range of AC drive, please remove P+ and P1 short circuit copper bar first, and connect to reactor.
6. AC drive output side U V W of terminals.
Don't allow connect capacitor and surge after there terminals, otherwise will cause AC drive damage. If the motor cable is too long, electrical resonance will be generated due to the impact of distributed capacitance. This will damage the motor insulation or generate higher leakage current, causing the AC drive to trip in over current protection. If the motor cable is greater than 100 m long, an AC output reactor must be installed close to the AC drive.
7. Ground PE
7.1 The inverter must be grounded reliably, and the grounding resistance is less than10 ohms, otherwise the equipment will work abnormally or eve be damaged.
7.2 The ground terminal must be shared with the neutral terminal of the power supply.
7.3 The protective grounding conductor must be a yellow-green cable.
7.4 Grounding position of the shielding layer of the main circuit.

7.5 The inverter is recommended to be installed o a conductive metal mounting surface, to ensure that the entire conductive bottom of the inverter is well overlapped with the mounting surface.

7.6 The filter should be installed o the same installation surface as the inverter to ensure the filtering effect of the filter.

8. Mai circuit cable protection requirements

The copper tube of the wire lug and the core wire of the main circuit cable should be heated and shrink, and ensure that the sleeve completely covers the conductor part of the cable, as show i the following figure:

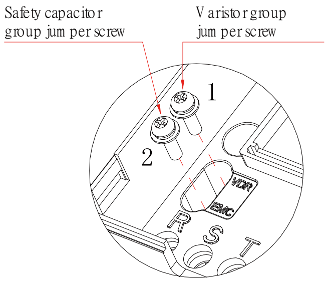


Schematic diagram of the heat shrinkable tube of the cable conductor exposed to the conductor sleeve

9. Grid system requirements

9.1. This product is suitable for the power grid system with grounded neutral point. If it is used i IT power grid system (power grid system with grounded neutral point), it is necessary to connect the varistors (VDR) to the ground jumper and the safety capacitor (EMC) The ground jumper is removed, and the o. 1 and o. 2 screws are show i the figure, and the filter cannot be installed, otherwise it may cause injury or damage to the inverter.

9.2. I the case where the leakage circuit breaker is configured, if there is a diplonema of tripping and leakage protection during startup, the safety capacitor (EMC) to ground jumper ca be removed, as show i the o. 2 screw.

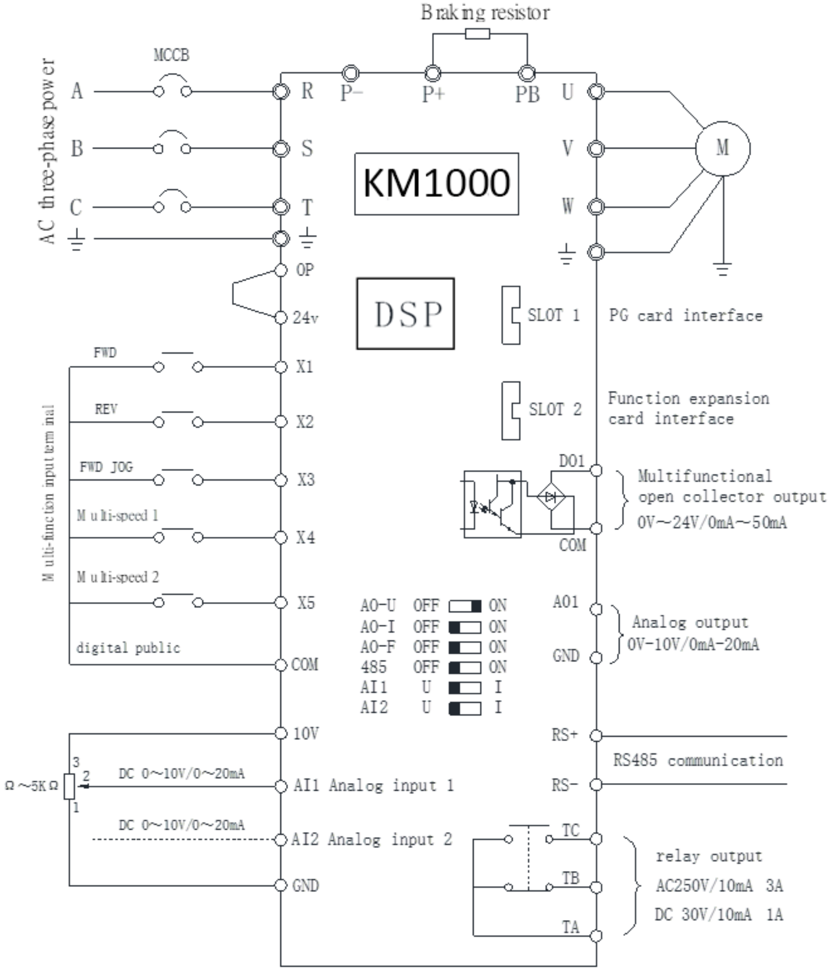


Schematic diagram of the location of the ground jumper for varistor (VDR) and safety capacitor (EMC)

3.7. Control terminal and wiring

3.7.1 Control terminal and wiring： KM1000 AC Drive for example

AI1	AI2	AO1	X1	X2	X3	X4	COM	OP	24V
10V	GND	RS+	RS−	X5	COM	DO1	TA	TB	TC



3.7.2 Control terminals function description

Terminal symbol	Terminal name	Function declaration
X1 COM	Multi-function input terminal 1	1. Input specification: 24V DC, 5 mA 2. Frequency range: 0-200 Hz 3. Voltage range: 10V~30V Standard with 5 DI, can be expanded to 10 DI
X2 COM	Multi-function input terminal 2	
X3 COM	Multi-function input terminal 3	
X4 COM	Multi-function input terminal 4	
X5 COM	Multi-function input terminal 5 High-speed pulse input terminal	In addition to the function of X1-X4, it can also be used as a high-speed pulse input channel. Pulse frequency: 0-100 KHz
10V GND	External 10V power supply	Provide 10V power supply to the outside, and the maximum output current: 10 mA Generally used as both ends of the potentiometer, the resistance range of the potentiometer: 1-5 KΩ
24V COM	External connection with a 24V power supply	Provide 24V power supply to the maximum output current: 200 mA Generally used as an external sensor power supply or micro-small relay power supply
OP	External power supply input terminal	The 24V terminal is connected to the terminal (H bit) When driving X 1 to X 5 with external signal, OP is connected to external power supply and S7 is disconnected (L bit)
AI1 GND	Analog quantity input terminal 1	1. Input signal: DC 0~10V / 4 ~ 20 mA is determined by the control board dial switch P5 2. Input impedance: voltage signal 22 KΩ Current signal: 500 Ω
AI2 GND	Analog quantity input terminal 2	1. Input signal: DC 0~10V / 4 ~ 20 mA, which is determined by the control board dial switch P6 2. Input impedance: voltage signal 22 KΩ Current signal: 500 Ω
AO1 GND	Analog quantity output terminal 1	Decided by the dial switch AO bit of the control board (P1 / P2 / P3) Voltage signal or current signal or frequency signal Voltage signal range: 0-10 V Current signal range: 0 ~ 20 mA Frequency and signal range: 0-100 KHz

Terminal symbol	Terminal name	Function declaration
DO1 COM	Open-circuit collector electrode output	Optical coupling isolation, open circuit collector output Allowable output voltage range: 0-24 V Allowable output current range: 0-50 mA
TA TB TC	Relay output	Multi-function relay output: TA and TC normally open TA and TB normally closed Contact point drive capability: AC250V 3A / DC 30V 1A Standard 1-way relay output, which can be expanded to 2-way relay output
RS+ RS-	485 Communication interface	Standard with RS485 communication interface
SLOT 1	PG card interface	External multi-function extension card
SLOT 2	Function extension card interface	External multi-function extension card
Definition of pull switch: P1: AI1 input, Left side: voltage, Right side: Current P2: AO analog output: Left side: voltage, Right side: Current P3: External;/local keypad selection UP: external DOWN: local P4: RS485 terminal resistor UP: Enable DOWN: disable P5: AI1 Analog Input Left: U/ Voltage Right: I/ Current P6: AI2 Analog Input Left: U/ Voltage Right: I/ Current		

3.8. Description of Wiring of control loop Signal Terminals

3.8.1 Analog input terminals

1) Wiring of AI terminals

Weak analog voltage signals are easy to suffer external interference, and therefore the shielded cable must be used and the cable length must be less than 20 m, as shown in following Fig.

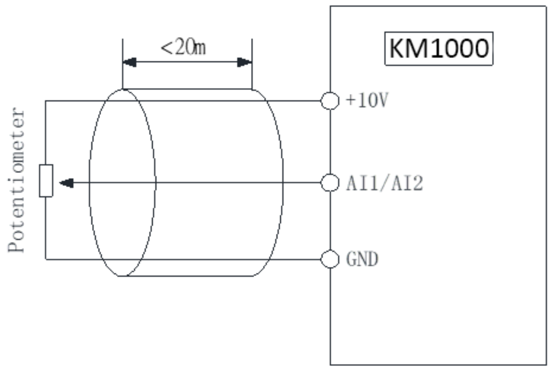


Fig 3-2 Wiring mode of AI terminals

In applications where the analog signal suffers severe interference, install filter capacitor or ferrite magnetic core at the analog signal source as below fig.

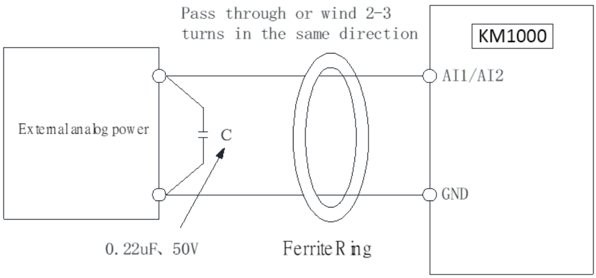


Fig 3-3 Install filter capacitor or ferrite magnetic core

3.8.2. Wiring of XI input terminals

Generally, select shielded cable no longer than 20 m. When active driving is adopted, necessary filtering measures shall be taken to prevent the interference to the power supply. It is recommended to use the contact control mode.

a. SINK wiring

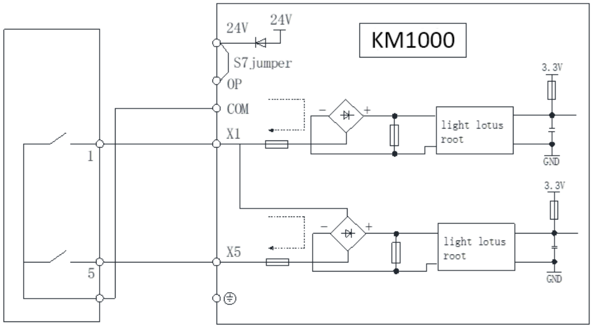


Figure 3-4 Using internal power dry contact mode, S7 terminal H is shorted.

This is the most commonly used wiring mode. To apply external power supply, remove jumpers between +24 V and OP and between COM and CME, and connect the positive ole of external power supply to OP and negative pole to CME. In such wiring mode, the XI terminals of different AC drives cannot be connected in parallel. Otherwise, DI mal-function may result. If parallel connection (different AC drives) is required, connect a diode in series at the DI and the diode needs to satisfy the requirement: IF > 10 mA, UF < 1 V.

b. SOURCE wiring

In such wiring mode, remove the jumper between +24 V and OP. Connect +24 V to the common port of external controller and meanwhile connect OP to COM. If external power supply is applied, remove the jumper between CME and COM.

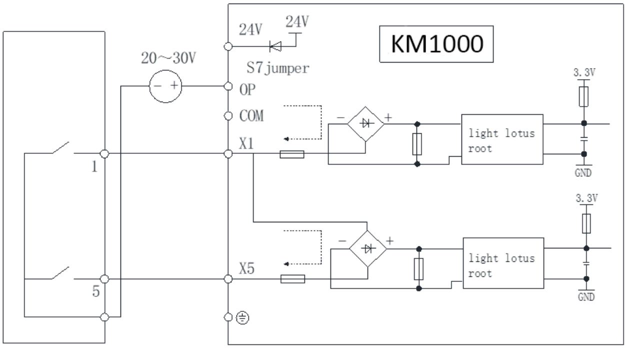


Fig 3-5 Using external power supply connected mode, remove 9 terminals short circuit bar.

Note: when using the external power supply, it must remove short circuit bar between 24V and OP, otherwise it will cause Ac drive damage, the external power supply voltage range is DC20 to 30V, otherwise it can't make sure AC drive works well our cause AC drive damage.

3.8.3. Wiring of DO terminal

When the digital output terminal needs to drive the relay, an absorption diode shall be installed between two sides of the relay coil. Otherwise, it may cause damage to the 24 VDC power supply. The driving capacity is not more than 50 mA.

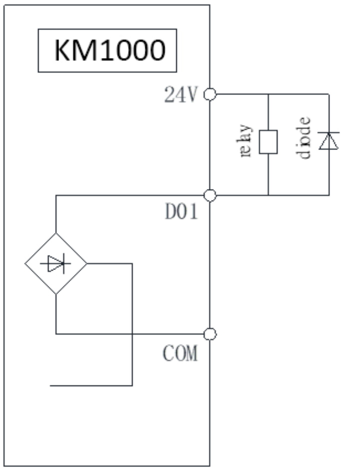


Fig 3-6 Using the inside power supply to drive external relay diagram, P8 terminals short circuit.

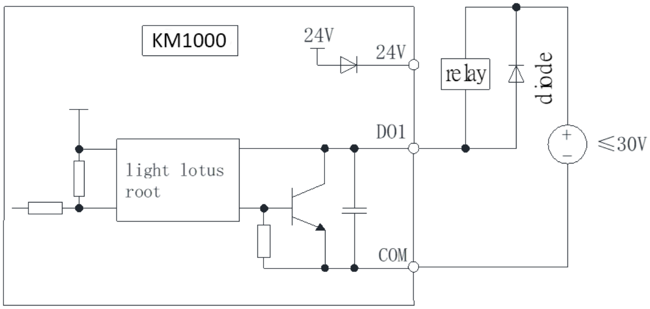


Fig 3-7, Using the external to drive relay diagram

3.9. EMC (Electromagnetic Compatibility)

3.9.1 Definition

Electromagnetic compatibility refers to the ability that the electric equipment runs in an electromagnetic interference environment and implements its function stably without interference on the electromagnetic environment.

3.9.2. EMC Standard

In accordance with the requirements of the Chinese national standard GB/T12668.3, the AC Drive must comply with the requirements of electromagnetic interference and anti- electromagnetic interference.

Our existing products adopt the latest international standards: IEC/EN611000-3: 2004),which is equivalent to the Chinese national standards GB/T12668.3. EC/EN611000-3 assesses the AC Drive in terms of electromagnetic interference and anti-electronic interference. Electromagnetic interference mainly tests the radiation interference, conduction interference and harmonics interference on the AC Drive (necessary for civil AC Drive)

Anti-electromagnetic interference mainly tests the conduction immunity, radiation immunity, surge immunity, EFTB (Electrical Fast Transient Burs) immunity, ESD immunity and power low frequency end immunity (the specific test items includes: 1. Immunity tests of input voltage sag, interrupt and change; 2 communication notch immunity; 3. harmonic input immunity ; 4. input frequency change; 5. input voltage unbalance; 6. input voltage fluctuation). The tests shall be conducted strictly in accordance with the above requirements of IEC/EN611000-3, and our products are installed and used according to the guideline of the Section 7.3 and can provide good electromagnetic compatibility in general industry environment.

3.9.3. Directive

1. Harmonic Effect:

The higher harmonics of power supply may damage the AC Drive. Thus, at some places where the quality of power system is relatively poor, it is recommended to install AC input reactor.

2. Electromagnetic Interference and Installation Precautions:

There are two kinds of electromagnetic interference, one is the interference from electromagnetic noise in the surrounding environment to the AC Drive, and the other is the interference from the AC Drive to the surrounding equipment.

Installation Precautions:

1) The earth wires of the AC Drive and other electric products ca shall be well grounded;

2) The power cables of the AC Drive power input and output and the cable of weak current signal (e.g. control line) shall not be arranged in parallel but in vertical if possible.

3) It is recommended that the output power cables of the AC Drive shall use shield cables or steel pipe shielded cables and that the shielding layer shall be grounded reliably, the lead cables of the

equipment suffering interferences shall use twisted-pair shielded control cables, and the shielding layer shall be grounded reliably.

4) When the length of motor cable is longer than 100 meters, it needs to install output filter or reactor.

3. Remedies for the interferences from the surrounding electromagnetic equipment to the AC Drive:

Generally the electromagnetic interference on the AC Drive is generated by plenty of relays, contactors and electromagnetic brakes installed near the AC Drive. When the AC Drive has error action due to the interferences, the following measures is recommended:

1) Install surge suppressor on the devices generating interference;

2) Install filter at the input end of the AC Drive, please refer to Section 7.3.6 for the specific operations.

3) The lead cables of the control signal cable of the AC Drive and the detection line shall use the shielded cable and the shielding layer shall be grounded reliably.

4. Remedies for the interferences from the AC Drive to the surrounding electromagnetic equipment:

These noise interferences are classified into two types: one is the radiation interference of the AC Drive, and the other is the conduction interference of the AC Drive. These two types of interferences cause that the surrounding electric equipment suffer from the affect of electromagnetic or electrostatic induction. Further the surrounding equipment produces error action. For different interferences, please refer to the following remedies:

1) Generally the meters, receivers and sensors for measuring and testing have more weak signals. If they are placed nearby the AC Drive or together with the AC Drive in the same control cabinet, they easily suffer from interference and thus generate error actions. It is recommended to handle with the following methods: away from the interference source as far as possible; do not arrange the signal cables with the power cables in parallel and never bind them together; both the signal cables and power cables shall use shielded cables and shall be well grounded; install ferrite magnetic ring (with suppressing frequency of 30 to 1,000MHz) at the output side of the AC Drive and wind it 2 to 3 turns; install EMC output filter in more severe conditions.

2) When the interfered equipment and the AC Drive use the same power supply, it may cause conduction interference. If the above methods cannot remove the interference, it shall install EMC filter between the AC Drive and the power supply (refer to Section 7.3.6 for the selection operation);

3) The surrounding equipment shall be separately grounded, which can avoid the interference caused by the leakage current of the AC Drive's grounding wire when common grounding mode is adopted.

5. Remedies for leakage current

There are two forms of leakage current when using the AC Drive. One is leakage current to the earth, and the other is leakage current between the cables.

1) Factors of affecting leakage current to the earth and its solutions:

There are the distributed capacitance between the lead cables and the earth. The larger the distributed capacitance, the larger the leakage current; the distributed capacitance can be reduced by effectively reducing the distance

between the AC Drive and the motor. The higher the carrier frequency, the larger the leakage current. The leakage current can be reduced by reducing the carrier frequency. However, the carrier frequency reduced may result in the increase of motor noise. Please note that additional installation of reactor is also an effective method to solve leakage current problem.

The leakage current may increase with the increase of circuit current. Therefore, when the motor power is higher, the corresponding leakage current will be higher too.

2) Factors of producing leakage current between the cables and its solutions:

There is the distributed capacitance between the output cables of the AC Drive. If the current passing lines has higher harmonic, it may cause resonance and thus result in leakage current. If the thermal relay is used, it may generate error action.

The solution is to reduce the carrier frequency or install output reactor. It is recommended that the thermal relay shall not be installed in the front of the motor when using the AC Drive, and that electronic over current protection function of the AC Drive shall be used instead.

6. Precautions on Installing EMC input filter at the input end of power supply

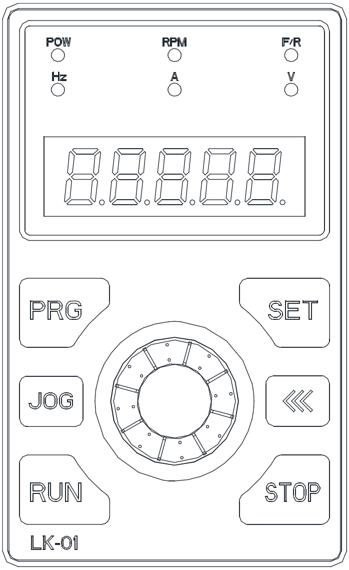
1) Note: when using the AC Drive, please follow its rated values strictly. Since the filter belongs to Classification I electric appliances, the metal enclosure of the filter and the metal ground of the installing cabinet shall be well earthed in a large area, and have good conduction continuity, otherwise there may be danger of electric shock and the EMC effect may be greatly affected. Through the EMC test, it is found that the filter ground end and the PE end of the AC Drive must be connected to the same public earth end, otherwise the EMC effect may be greatly affected.

2) The filter shall be installed at a place close to the input end of the power supply as much as possible.

Chapter 4. Operation and display

4.1. Operation display introduction

User can modify the parameters, monitor the working status and start or stop the KM series AC drive by operating the operation panel, as shown in the following



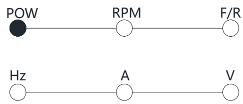
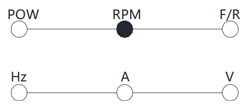
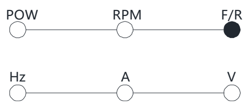
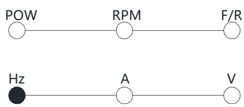
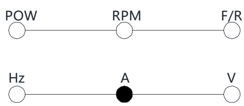
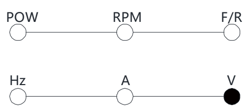
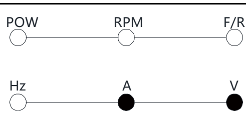
4.2. Press function description

	Programming key	Access to first level menu, or exit
	Shift key	Press this key to display the parameters cyclically in the stopped or running state. When modifying a parameter, you can select the modification bit (blinking bit) of the parameter.
	Confirm key	Enter the menu screen successively, confirm and save the parameters
	Multi-function key	This function code determined by P7.04.
	Run the key	In the keyboard operation mode, start the AC drive
	Stop / reset key	Stop AC drive i keypad operation mode, reset fault when fault occurs and trouble clearing.

	The Digital Knob encoder	1. Increment of frequency, data or function code 2. Decrement of frequency, data or function code 3. Knob LED backlight color definition: Yellow: Power-o status Blue: Ready status Green: Running status Red: Fault status Purple: Torque mode

Description of Indicators：

（○extinguish； ●illumine）

Indicator lamp status	Indicate meaning
	POW power light
	The RPM rotational speed unit
	F / R forward and reverse indicator
	Hz frequency indication
	A current indication
	V voltage indication
	% percentage

4.3. Monitor status list

Through the shit key “” of keypad can display kinds of state parameters in stop or running mode. Selecting parameters display by function binary bit of code P7.06 （running parameters 1），P7.07 （running parameters 2. P7.08 （stop parameters）

In stop state, there are 11 stop state parameters can be selected to display, show as following respectively.

P7.0 8	LED Stop display parameter	Unit’s digit： Bit0: frequency reference Bit1: DC bus voltage Bit2: AI1 voltage Bit3: AI2 voltage Ten’s digit： Bit0: reserve	Bit1: counting value Bit2: length value Bit3: load speed Hundred’s unit： Bit0: PID reference Bit1： X terminals status Bit2： D0 status	3 3	☆

In running state, 4 running status parameters running frequency, frequency reference, DC bus voltage and output current are displayed by default, and you can set whether other parameters are displayed by setting

P7.06 and P7.07, as listed in the following table.

P7.06	LED running display parameters 1	Unit’s digit： Bit0: running reference Bit1: Output current Bit2: Output voltage Bit3: Machine speed Ten ‘s digit： Bit0: DC bus voltage Bit1: frequency reference Bit2: Count value Bit3: length value	Hundred’ digit： Bit0： X input terminals state Bit1： DO output terminals state Bit2： AI1 voltage Bit3： AI2 voltage Thousand’s digit： Bit0: Reserve Bit1： PID reference Bit2: Output current Bit3: Output torque	33	☆

P7.07	LED running display parameters 1	Unit's digit: Bit0: linear speed Bit1: PID feedback Bit2: PLC stage Bit3: PLUSE input frequency Ten's digit: Bit0: current power on time Bit1: current running time Bit2: The rest running time Bit3: main frequency display Hundred's unit: Bit0: Auxiliary frequency Y Bit1: encoder feedback Bit2: actual feedback Bit3: before AI1 revise voltage Thousand 's unit: Bit0: before AI2 revise voltage Bit1: Torque reference Bit2: PLUSE input frequency Bit3: communication value	0	☆

When the AC drive is powered on again after power failure, the parameters that are selected before power failure are displayed.

Take P7.08 for example (stop display parameter), if you need to display frequency reference, DC bus voltage, machine speed, PID reference. Due to each parameter is independently, should be set unit's digit, then 's digit, hundred's unit. Should set it with binary, and then translate into hexadecimal.

Binary and hexadecimal transformed compare table

Binary				hexadecimal (LED bit display value)
BIT3	BIT2	BIT1	BIT0	
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7

1	0	0	0	8
1	0	0	1	9
1	0	1	0	A
1	0	1	1	B
1	1	0	0	C
1	1	0	1	D
1	1	1	0	E
1	1	1	1	F

Table 4.1: Binary and hexadecimal translation compare table

Refer to below list

Unit' digit setting: The frequency reference and DC bus voltage is determined by BIT0, BIT1 of P7.08 parameters. for example, if BIT0=1, means set for frequency reference, other bit set for 0 if no need display. So the unit digit is 0011, and the translate it for 3 of hexadecimal. So the unit's digit is 3.

Unit' digit setting: If need display machine speed, so the binary of ten' digit is 1000, and then translate 8 of hexadecimal, so the ten unit should set it for 8.

Hundred's unit setting: If need to display PID setting, so the binary of hundred digit is 00001, then translate it to 1 of hexadecimal.

In conclusion, the P7.08 should set for 0183.

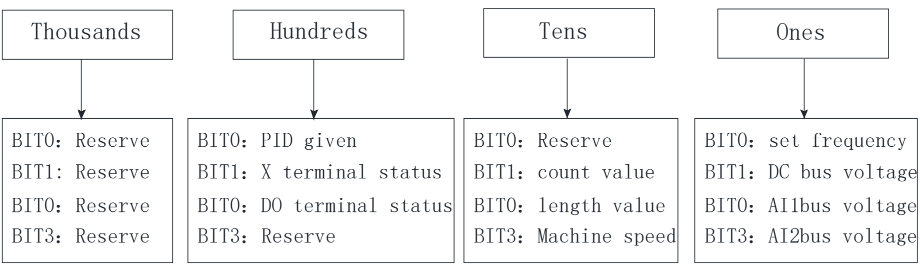
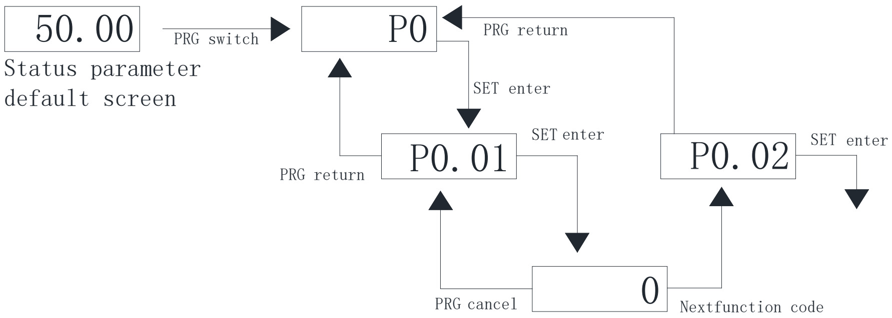


Table 4.2 Hexadecimal parameters setting chat

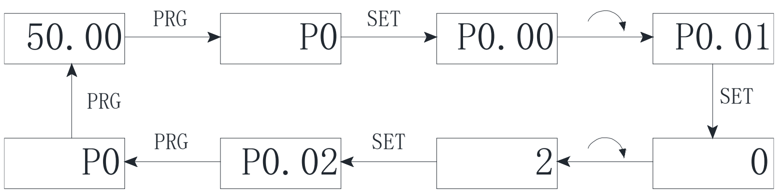
4.4. Function code review and modify method

KM series AC drive keypad adopts 3 level menu design to operate parameters setting.



Note: During the third level menu operation, press PRG or SET key can return to second level menu. The difference is that, press SET key can save the set parameters and return to second menu, and automatically switch to next function code, and press PRG key means cancel the current parameters modifying and return to current function code of second menu directly.

For example: Change the 0 value to2 of P0.01 function/



In the third menu state, if the parameters no blinking, means this function code can't modify. The possibility reason as following list:

1. This function code don't allow modify, such as AC drive type, actually detect parameters, running record parameters.
2. this function code can't be modified in running state. Only change in stop mode.

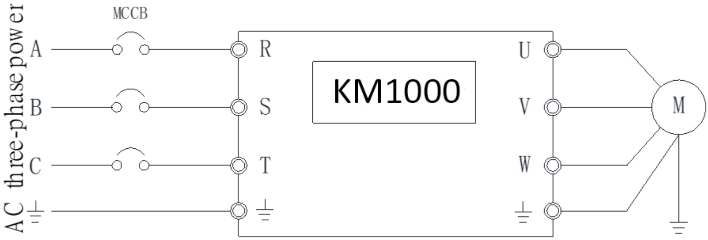
4.5. Password setting

KM series AC dive provide user password protection. If the P7.00 is none 0 value, means it is user password. The password protection function is activated once exit function code edit mode. It will display "-----" if press the PRG key. Need input correct password to enter general menu. Otherwise it is forbidden enter.

If it need cancel the password, should enter to P7.00 with password first and then set it to 0.

4.6. Motor trial running (first time power on)

1. Correct wiring as following connection diagram.



Above Fig, Simple wiring connection for trail running.

2. Confirm the wiring is correct and power on, the AC drive will display HELLO first and then display 50.00.

3. Check the main frequency source (X) if by digit setting (P0.03=0/1).

4. Confirm the running command channel if by keypad control (P0.01=0)

5. Press the RUN key to start AC drive. RUN indicator is ON, and motor start to running.

6. Press ,  key to increase or reduce frequency to check motor if runs well in difference frequency range.

7. Press the STOP key to AC drive, and cut off power supply.

Note: It is forbidden to connect power supply to output terminals U, V, W of AC drive, otherwise it will damage AC drive seriously. Please disconnect motor from driving machine in the first time running to ensure safety.

Confirm the running direction of motor if correct. If not correct, please change the any two phase order of U, V, W.

Make sure the power (capability) of motor and AC drive if matching

Chapter 5. Function parameters list

The function code describes as following:

"☆" : Stands for parameters can be modify during frequency running and stop status.

"★" : Stands for parameters can't be modify on running status.

"●" : Stands for parameters can't modify in any conditions, only for reference.

Function code	Name	Set the scope	Factory value	Modbus address	Change
The P0 basic function group					
P0.00	Control mode selection	0: No speed sensor and no vector control 1: V / F control 2: Speed sensor with vector control	1	0x F 000	★
P0.01	Run command selection	0: Operating panel 1: External terminals 2: RS485 communication	0	0x F 001	☆
P0.02	Digital setting frequency shutdown memory selection	0: No memory; 1: memory	1	0x F 002	☆
P0.03	Primary frequency selection	0: panel digital frequency setting, the frequency is not remembered after power loss 1: panel digital frequency setting, frequency memory after power loss 2: Analog volume AI1 (-10v-10v)	1	0x F 003	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
		3: Analog volume of AI2 (0-10v / 4-20 mA) 4: The panel potentiometer 5: PULSE setting 6: Simple PLC 7: Multiple instructions 8: Process PID 9: RS485 communication			
P0.04	Maximum output frequency	50.00Hz ~ 400.00Hz	50.00Hz	0x F 004	★
P0.05	Upper limit running frequency	P0.06 ~ P0.04	50.00Hz	0x F 005	★
P0.06	Lower limit running frequency	0.00Hz ~ P0.05	0.00Hz	0x F 006	☆
P0.07	Digital frequency setting	0.00Hz ~ P0.04	50.00Hz	0x F 007	☆
P0.08	Acceleration time 1	0.00s ~ 65000s	Model determination	0x F 008	☆
P0.09	Slow down time 1	0.00s ~ 65000s	Model determination	0x F 009	☆
P0.10	Run direction selection	0: forward; 1: reverse	0	0x F 00A	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P0.11	carrier frequency	0.5KHz ~ 16.0KHz	Model determination	0x F 00B	☆
P0.12	Carrier frequency automatic adjustment selection	0: No automatic adjustment; 1: Automatic adjustment	1	0x F 00C	☆
P0.13	Parameter initialization	0: No operation 1: restore the factory parameters, the motor parameters P2 group does not recover 12: Clear the record information	0	0x F 00D	★
P0.14	Auxiliary frequency source selection	With P0.03 (primary frequency source selection)	0	0x F 00E	★
P0.15	Auxiliary frequency source range selection when superposition	0: relative to the maximum frequency 1: Relative to the primary frequency source	0	0x F 00F	☆
P0.16	Range of auxiliary frequency sources during stacking	0% ~ 150%	100%	0x F 010	☆
P0.17	Primary and secondary	Individual bit: frequency source selection	00	0x F 011	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
	frequency superposition selection	0: Primary frequency source 1: Main and auxiliary operation results (operation relationship is determined by ten digits) 2: Main frequency source and auxiliary frequency source switch 3: Switch between the main frequency source and the main and auxiliary operation results 4: Switch between the auxiliary frequency source and the main and auxiliary operation results Ten place: frequency source main and auxiliary operation relationship 0: Main + auxiliary 1: Master-auxiliary 2: Maximum value of both cases 3: Minimum value of both cases			
P0.18	Run the command terminal	0: Two-line 1 1: Two lines 2 2: Three-line 1 3: Three-line 2	0	0x F 012	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
	combination mode				
The P1 start-stop control group					
P1.00	Starting mode	0: Direct start 1: First, the DC brake and then start from the start frequency 2: Speed tracking start	0	0x F100	☆
P1.01	Start frequency	0.00Hz ~ 10.00Hz	0.00Hz	0x F101	☆
P1.02	Start the frequency hold time	0.0s ~ 100.0s	0.0s	0x F102	★
P1.03	Start the DC brake current	0% ~ 100%	0%	0x F103	★
P1.04	Start the DC brake time	0.0s ~ 100.0s	0.0s	0x F104	★
P1.05	Downtime method	0: Slow down parking; 1: Free parking	0	0x F105	☆
P1.06	Stop time DC brake starting frequency	0.00Hz ~ the maximum frequency P0.04	0.00Hz	0x F106	☆
P1.07	Shutdown time for the DC brake waiting time	0.0s ~ 100.0s	0.0s	0x F107	☆
P1.08	Shutdown DC brake current	0% ~ 100%	0%	0x F108	☆
P1.09	Stop the DC brake time	0.0s ~ 100.0s	0.0s	0x F109	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P1.10	Energy consumption and brake utilization rate	0% ~ 100%	100%	0x F10A	☆
P1.11	Reverse control	0: allow reversal; 1: prohibit reversal	0	0x F10B	★
P1.12	Point movement operation frequency	At 0.00Hz ~ the maximum frequency	5.00Hz	0x F10C	☆
P1.13	Speed tracking method	0: Start from the shutdown frequency 1: Start from the power frequency 2: Start at the maximum frequency	0	0x F10D	★
P1.14	Speed tracking speed	1 ~ 100	20	0x F10E	☆
P1.15	Speed tracking current size	50% ~ 200%	100%	0x F10F	☆
P1.16	Speed-tracking closed-loop current KP	0 ~ 100	20	0xF110	☆
P1.17	Speed-tracking closed-loop current KI	0 ~ 100	20	0xF111	☆
P1.18	Speed tracking closed-loop current lower limit	0 ~ 100	20	0xF112	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P1.19	Speed tracking voltage rise time	0 ~ 10.0s	0.5s	0xF113	★
P1.20	Demagnetic time	0 ~ 10.0s	0.5s	0xF114	★
The P2 motor parameter group					
P2.00	GP type is shown	0: G machine 1: P machine	Model determination	0x F200	●
P2.01	Motor type selection	0: Ordinary Asynchronous motor 1: variable frequency induction motor 2: Permanent magnet synchronous motor	0 2	0x F201	★
Description: P2.01 asynchronous machine defaults to 0 and 2.					
P2.02	The motor is rated power	0.1kW ~ 1000.0kW	Model determination	0x F202	★
P2.03	Rated frequency of motor	At 0.00Hz ~ the maximum frequency	50.00Hz	0x F203	★
P2.04	Motor rated speed	0rpm ~ 65535rpm	1460rpm	0x F204	★
P2.05	The motor is rated voltage	0V ~ 2000V	Model determination	0x F205	★
P2.06	Rated current of motor	0.1A ~ 2000A	Model determination	0x F206	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
P2.07	Motor stator resistance	0.001Ω ~65.535Ω	Model determination	0x F207	★
P2.08	Motor rotor resistance	0.001Ω ~65.535Ω	Model determination	0x F208	★
P2.09	Motor leakage resistance	0.01mH ~ 655.35mH	Model determination	0x F209	★
P2.10	Motor mutual resistance	0.1mH ~ 6553.5mH	Model determination	0x F20A	★
P2.11	No-load current of motor	0.01A ~ P2.06	Model determination	0x F20B	★
P2.12	Synchronizer stator resistance	0.001Ω ~65.535Ω	Model determination	0x F20C	★
P2.13	Synchronizer D-axis inductor	0.01mH ~ 655.35mH	Model determination	0x F20D	★
P2.14	Synchronizer Q-axis inductor	0.01mH ~ 655.35mH	Model determination	0x F20E	★
P2.16	Synchronizer anti-EMF	0.1V ~6553.5V	Model determination	0x F210	★
P2.18	Number of encoder pulses	1 ~ 65535	1024	0x F212	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
P2.19	Encoder type	0: The ABZ incremental encoder 4: Rotary transformer	0	0x F213	★
P2.21	The ABZ encoder phase sequence	0: forward 1: reverse	0	0x F215	★
P2.22	Encoder installation angle	0 ~ 359.9°	0	0x F216	★
P2.23	UVW sense	0 ~ 1	0	0x F217	★
P2.24	UVW signal zero position angle	0 ~ 359.9°	0	0x F218	★
P2.25	The log of the variable pole	1 ~ 65535	1	0x F219	★
P2.26	PG broken line enabling	0 ~ 100	0	0x F21A	★
P2.27	Motor self-learning selection	1: Still self-learning 2: Rotate for self-learning 3: Static learning with the load 11: synchronization machine with load static tuning 12: synchronous machine no-load dynamic tuning	0	0x F21B	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
1: Still self-learning Suitable for asynchronous motor and load is not easy to remove, and cannot be complete self-learning occasions. The motor type and motor nameplate parameters P2.02~P2.06 must be set correctly before performing stationary self-learning. Stationary self-learning, the frequency converter can obtain three parameters: P2.07~P2.09. **2: Rotate for self-learning** In order to ensure the dynamic control performance of the inverter, please choose rotary self-learning. At this time, the motor must be removed from the load and keep the motor in the no-load state. In the process of rotating self-learning, the frequency converter first learns still and then accelerates to 80% of the rated frequency of the motor according to the acceleration time P0.08. After a period of time, stop down according to the deceleration time P0.09 and finish the learning. **3: Static with a load of self-learning** Applicable to cases where the load cannot be removed. **After rotating since the study is completed, view the parameter values of P2.11. This value shall be 1 / 3~1 / 2 of the motor rated current (P2.06). If it is greater than this value, please set the value of P2.11 manually.** **11: Synchronization machine with load self-learning** When the synchronous motor and the load cannot be removed, the synchronous motor has to choose with load learning, and the motor runs at 10 rmp. Before learning the synchronous motor on load, correctly set the motor type and motor nameplate parameters P2.02~P2.06. Synchronous motor with on-load learning, the frequency converter can obtain the initial position Angle of the synchronous motor, which is the necessary condition for the normal operation of the synchronous motor, so the synchronous motor is installed before the first use, we must learn. Action description: set the function code to 11, and then press the RUN key, the frequency converter will be on-load learning. **12: Synchronized machine no-load self-learning**					

Function code	Name	Set the scope	Factory value	Modbus address	Change

If the motor and load can be removed, it is recommended to choose the no-load learning of the synchronous motor, which can obtain better operation performance than the on-load learning of the synchronous motor.

In the process of no-load learning, the frequency converter first completes the on-load learning, and then accelerates to P0.07 motor rated frequency according to the acceleration time P0.08. After a period of time, stop according to the deceleration time P0.09 and finish the learning.

Before no-load learning of synchronous motor, in addition to the motor type and parameters P2.02~P2.06, the encoder pulse number P2.18, P2.19, encoder type and logarithm P2.25.

No-load learning of synchronous motor, the frequency converter can obtain P 2.12 ~ P 2.12, the information P2.21, and the encoder P2.22, P 2.22, P2.24, and the vector control current ring PI parameters P3.11~P3.14.

Note: Motor self-learning can only be performed in the keyboard operation mode (P0.01=0), but not in the terminal operation and communication operation mode. After setting the five parameters (P2.01~P2.05), when the inverter is down, enter the (P2.27) menu, select the corresponding self-learning mode, press the confirmation button, then the panel displays "LEARN", and then press the RUN button to do the motor self-learning. After the learning, stop automatically.

Function code	Name	Set the scope	Factory value	Modbus address	Change
The P3 motor vector control parameter group					
P3.00	The velocity-ring proportional gain of 1	1 ~ 100	30	0x F300	☆
P3.01	The velocity loop integration time 1	0.01s ~ 10.00s	0.50s	0x F301	☆
P3.02	Switch frequency 1	0.00 ~ P3.05	5.00Hz	0x F302	☆
P3.03	The velocity-loop proportional gain of 2	1 ~ 100	20	0x F303	☆
P3.04	The velocity loop integration time 2	0.01s ~ 10.00s	1.00s	0x F304	☆
P3.05	Switch frequency 2	P3.02 ~ P0.04	10.00Hz	0x F305	☆
P3.06	Transfer difference compensation coefficient	50% ~ 200%	100%	0x F306	☆
P3.07	The velocity loop filtering time constant	0.000s ~ 0.100s	0.000s	0x F307	☆
P3.08	Vector-controlled overexcitation gain	0 ~ 200	64	0x F308	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P3.09	Torque upper limit source selection during speed control	0: Set the function code P3.10 1: AI1 setting 2: AI2 setting 3: The panel potentiometer setting 4: PULSE pulse setting 5: Communication given	0	0x F309	☆
P3.10	The torque limit is set during speed control	0.0% ~ 200.0%	150.0%	0x F30A	☆
P3.11	The M-axis current ring, Kp	0 ~ 60000	2000	0x F30B	☆
P3.12	M-axis current ring Ki	0 ~ 60000	1300	0x F30C	☆
P3.13	The T-axis current ring, Kp	0 ~ 60000	2000	0x F30D	☆
P3.14	The T-axis current ring, Ki	0 ~ 60000	1300	0x F30E	☆
P3.15	Speed ring integral separation (bits)	0 ~ 1	0	0x F30F	☆
The P4 V / F control parameter group					
P4.00	VF curve setting	0: Line V / F curve 1: Multipoint V / F curve 2: Square V / F curve 3: VF separation mode 1 4: VF separation mode 2	0	0x F400	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
P4.01	Recurrent ascension	0.0%: (Automatic torque lift) 0.1% ~ 30.0%	Model determination	0x F401	☆
P4.02	Torque lift cutoff frequency	At 0.00Hz ~ the maximum frequency	50.00Hz	0x F402	★
P4.03	The VF transition compensation gain coefficient	0.0% ~ 200.0%	0.0%	0x F403	☆
P4.04	VF overexcitation gain	0 ~ 200	64	0x F404	☆
P4.05	The VF break-point 1 output frequency	0.00Hz ~ P4.07	0.00Hz	0x F405	★
P4.06	The VF break-point 1 output voltage ratio	0.0% ~ 100.0%	0.0%	0x F406	★
P4.07	VF point 2 output frequency	P4.05 ~ P4.09	0.00Hz	0x F407	★
P4.08	The VF break-point 2 output voltage ratio	0.0% ~ 100.0%	0.0%	0x F408	★
P4.09	VF point 3 output frequency	P 4.07 to motor rated frequency	0.00Hz	0x F409	★
P4.10	The VF break-point 3 output voltage ratio	0.0% ~ 100.0%	0.0%	0x F40A	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
P4.11	Voltage source separated by the VF	0: Number setting (P4.12) 1: AI1 given 2: AI2 given 3: Panel potentiometer is given 4: PULSE Pulse Setting (X5)	0	0x F40B	☆
P4.12	VF separate voltage source number setting	0 V to motor rated voltage	0V	0x F40C	☆
P4.13	Voltage rise time for the VF separation	0.0s ~ 1000.0s	0.0s	0x F40D	☆
P4.14	Voltage drop time for the VF separation	0.0s ~ 1000.0s	0.0s	0x F40E	☆
P4.15	Vector 0-speed current setting	0:0 speed with current 1: no current	0	0x F40F	★
P4.16	The VF oscillations suppress the gain	0 ~ 100	40	0x F410	☆
P4.17	The VF oscillatory inhibition mode	0 ~ 4	3	0x F411	★
P4.18	Excessive loss speed enabling	0: Don't make it 1: Enable	1	0x F412	★
P 4.19	Over-drain speed protection current	100% ~ 200%	150%	0x F413	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P4.20	Over loss speed gain	0 ~ 100	20	0x F414	☆
P4.21	VF double loss of speed action current compensation coefficient	50% ~ 200%	50	0x F415	☆
P4.22	Overpressure stall enabling	0: Don't make it 1: Enable	1	0x F416	★
P4.23	Over-voltage stall protection voltage	200 ~ 2000	Model determination	0x F417	☆
P4.24	Overvoltage frequency gain	0 ~ 100	30	0x F418	☆
P4.25	Over-voltage stall-suppressed voltage gain	0 ~ 100	30	0x F419	☆
P4.26	Maximum increase limit frequency of overvoltage stall	0 ~ 50.00Hz	5.00Hz	0x F41A	☆
P4.27	Under voltage stall suppression mode	0: Not enable 1: enable 2: Slow down at P8.09 after power failure	0	0x F41B	★
P4.28	Under-pressure stall KP	0 ~ 100	40	0x F41C	☆
P4.29	Under pressure stall KI	0 ~ 100	30	0x F41D	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P4.30	VF under voltage stall recovery judgment voltage	80.0% ~ 100.0%	85.0%	0x F41E	★
P4.31	The VF under voltage stall recovery determines the voltage time	0.0s ~ 10.0s	0.5	0x F41F	★
P4.32	The VF undervoltage stall point	60.0%~100.0% (standard bus bar voltage)	80.0%	0x F420	★
P4.33	The VF transition-compensation response time	0 ~ 100	5	0x F421	☆
P4.34	continue to have				
P4.36	The VF online torque compensation	0.00 ~ 1.50	1.00	0x F424	☆
The P5 Input terminal group					
P5.00	X1 terminal function selection	0: No function 1: Forward Run (FWD) 2: Reverse Run (REV)	1	0x F500	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
P5.01	The X2 terminal function selection	3: Three-line operation control 4: Forward movement (FJOG) 5: Reverse point movement (RJOG) 6: Free parking 7: Fault reset (RESET) 8: External fault often open input 9: Terminal UP 10: Terminal DOWN 11: UP / DOWN set reset (terminal, keyboard) 12: Multiple segment command terminal 1 13: Multiple segment command terminal 2 14: Multiple segment command terminal 3 15: Multiple segment command terminal 4 16: the acceleration and deceleration selection terminal 1 17: Select terminal 2 for acceleration and deceleration	2	0x F501	★
P5.02	X3 terminal function selection		4	0x F502	★
P5.03	X4 terminal function selection		12	0x F503	★
P5.04	The X5 terminal function selection		13	0x F504	★
P5.05	Expand the X6 terminal function selection		0	0x F505	★
P5.06	Expand the X7 terminal function selection		0	0x F506	★
P5.07	Expand the X8 terminal function selection		0	0x F507	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
P5.08	Expand the X9 terminal function selection	18: External fault is frequently closed for input	0	0x F508	★
P5.09	Extend the X10 terminal function selection	19: External parking terminal (only valid for operation panel running command channel) 20: frequency source switching 21: X5 pulse frequency input 22: Switch between the main frequency and the preset frequency 23: Switch between auxiliary frequency and preset frequency 24: Run the command switch terminal 25: The PID is paused 26: Take the reverse terminal of the PID 27: PID integral pause terminal 28: PID parameter switching terminal 29: Counter input 30: Counter is reset 31: Length count input 32: Length is reset 33: The timer is valid	0	0x F509	★

Function code	Name	Set the scope	Factory value	Modbus address	Cha nge
		34: swing frequency pause 36: acceleration and deceleration prohibition 37: DC brake command 38: Run the command to switch to the terminal 2 39: Frequency set start-up terminal 40: Motor selection terminal 1 41: Motor selection terminal 2 42: Speed control / torque control switch 43: Operation is suspended 44: User-defined fault 1 45: User-custom fault 2 46: Simple PLC state reset 47: Torque control is prohibited 48: Emergency stop 49: External terminal stop (deceleration time 4 stop, external terminal stop) 50: Reduce the DC brake 52: No reversal is allowed 53: No positive turn			

Function code	Name	Set the scope	Factory value	Modbus address	Change
		54: Simple PLC procedure is suspended			
P5.10	X-terminal filter time	0.000s ~ 10.00s	0.010s	0x F50A	☆
P5.11	Line AI1 minimum given	-10.00V ~ P5.13	0.20V	0x F50B	☆
P5.12	Line AI1 minimum given the corresponding value	-100.0% ~ +100.0%	0.0%	0x F50C	☆
P5.13	Line AI1 maximum given	P5.11 ~ +10.00V	10.00V	0x F50D	☆
P5.14	Line AI1 maximum given the corresponding value	-100.0% ~ +100.0%	100.0%	0x F50E	☆
P5.15	The AI1 filtering time	0.00s ~ 10.00s	0.10s	0x F50F	☆
P5.16	Line AI2 minimum given	0.00V ~ P5.18	0.20V	0x F510	☆
P5.17	Line AI2 minimum given the corresponding value	-100.0% ~ +100.0%	0.0%	0x F511	☆
P5.18	Line AI2 maximum given	P5.16 ~ +10.00V	10.00V	0x F512	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P5.19	Line AI2 maximum given the corresponding value	-100.0% ~ +100.0%	100.0%	0x F513	☆
P5.20	The AI2 filtering time	0.00s ~ 10.00s	0.10s	0x F514	☆
P5.21	AI3 minimum given	0.00V ~ P5.23	0.20V	0x F515	☆
P5.22	AI3 minimum given the corresponding value	0.0% ~ +100.0%	0.0%	0x F516	☆
P5.23	AI3 is the maximum given	P5.21 ~ +10.00V	10.00V	0x F517	☆
P5.24	Panel potentiometer maximum given the corresponding value	-100.0% ~ +100.0%	100.0%	0x F518	☆
P5.25	The AI3 filtering time	0.00s ~ 10.00s	0.10s	0x F519	☆
P5.26	PULSE minimum input	0.00KHz ~ P5.28	0.00KHz	0x F51A	☆
P5.27	The PULSE minimum input corresponds to the setting	-100.0% ~ 100.0%	0.0%	0x F51B	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P5.28	PULSE maximum input	P5.26 ~ 100.00KHz	50.00KHz	0x F51C	☆
P5.29	PULSE maximum input corresponding setting	-100.0% ~ 100.0%	100.0%	0x F51D	☆
P5.30	The PULSE filtering time	0.00s ~ 10.00s	0.10s	0x F51E	☆
P5.31	AI curve selection	Individual bit: AI1 curve selection 1: Curve 1 (2 points, see P5.11~P5.14) 2: Curve 2 (2 points, see P5.16~P5.19) 3: Curve 3 (2 points, see P5.21~P5.24) 4: Curve 4 (4 points, see H3.00~H3.07) 5: Curve 5 (4 points, see H3.08~H3.15) Ten place: AI2 curve selection, identical to above Hundred bits: AI3 curve selection, identical to above	H.321	0x F51F	☆
P5.32	The AI is below the minimum input setting selection	the unit: The AI1 is below the minimum input setting selection	000	0x F520	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
		0: minimum input 1： 0.0% Ten place: AI2 is below the minimum input setting selection, i. s. above Hundred bits: AI3 is below the minimum input setting selection, III. above			
P5.33	X1 terminal response delay time	0.0s ~ 3600.0s	0.0s	0x F521	★
P5.34	X2 terminal response delay time	0.0s ~ 3600.0s	0.0s	0x F522	★
P5.35	The X3 terminal response delay time	0.0s ~ 3600.0s	0.0s	0x F523	★
P5.36	Enter the terminal positive and negative logic setting 1	0: Positive logic 1: Anti-logic Position: X1 Ten: X2 Hundred positions: X3 Thousand position: X4 Ten thousand positions: X5	00000	0x F524	★
P5.37	Enter the terminal positive and negative logic setting 2	0: Positive logic 1: Anti-logic Position: X1 Ten: X2 Hundred positions: X3	00000	0x F525	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
		Thousand position: X4 Ten thousand positions: X5			
P5.38	Pulse potentiometer minimum sampling pulse	0 ~ 65535	0	0x F526	☆
P5.39	Minimum input of pulse potentiometer (percentage)	0.00 ~ 200.00	0.00	0x F527	☆
P5.40	Maximum number of sampled pulses of the pulse potentiometer	0 ~ 65535	500	0x F528	☆
P5.41	Maximum input of pulse potentiometer (percentage)	-200.0 ~ 200.00	100.01	0x F529	☆
The P6 output terminal group					
P6.00	The A0 terminal output selection	Individual bit: AO1 output selection: 0: Pulse output 1: switching output 2: analog output Ten-place: AO2 output selection: 0: Pulse output 2: analog output	22	0x F600	☆

<table>
<tr><th>Function code</th><th>Name</th><th>Set the scope</th><th>Factory value</th><th>Modbus address</th><th>Cha nge</th></tr>
<tr><td>P6.01</td><td>AO1 terminal switch quantity output selection</td><td rowspan="5">0: No output
1: Frequency converter is in operation
2: Frequency arrives
3: Fault output (free shutdown fault)
4: Frequency level detection of FDT 1 output
5: Frequency level detection of FDT 2 output
6: During zero-speed operation (no output during shutdown)
7: Zero-speed operation 2 (also output during shutdown)
8: Upper limit frequency reaches
9: Lower limit frequency reaches
10: Frequency reaches 1 output
11: Frequency reaches 2 for output
12: Power-up time arrives
13: Run time arrives
14: Timing time arrives
15: Set the count value
16: The specified count value arrives</td><td>0</td><td>0x F601</td><td>☆</td></tr>
<tr><td>P6.02</td><td>Local relay output selection</td><td>3</td><td>0x F602</td><td>☆</td></tr>
<tr><td>P6.03</td><td>Extended relay output selection</td><td>0</td><td>0x F603</td><td>☆</td></tr>
<tr><td>P6.04</td><td>The DO 1 output selection</td><td>1</td><td>0x F604</td><td>☆</td></tr>
<tr><td>P6.05</td><td>DO 2 output selection</td><td>4</td><td>0x F605</td><td>☆</td></tr>
</table>

Function code	Name	Set the scope	Factory value	Modbus address	Change
		17: Length arrives 18: Under voltage state output 19: Motor overload forecast alarm 20: frequency converter overload forecast alarm 21: In the frequency limit 22: Torque limit 23: Ready to run 24： AI1>AI2 25: The AI1 input exceeds the upper and lower limit 26: Lower limit frequency reached (shutdown also output) 27: The run time has arrived 28: Alarm output (all faults) 29: Fault output (free shutdown fault and under output) 30: Current reaches 1 output 31: Current reaches 2 output 32: In the load Zero current output			

Function code	Name	Set the scope	Factory value	Modbus address	Change
		34: The module temperature arrives 35: The software overflow output 36: Running direction 37: Motor over temperature forecast alarm 38: The PLC cycle is complete 39: Communication control			
P6.07	AO1 analog volume / pulse output selection	0: Run frequency 1: Set the frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: PULSE input (100% corresponds to 100.0KHz) 7: AI1 value 8: AI2 value 9: Keep 10: Length value 11: Count the value 12: Communication settings 13: Motor rotation speed	0	0x F607	☆
P6.08	Expansion card AO2 analog volume / pulse output selection		1	0x F608	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
		14: Output current (100.0% corresponds to 1000.0A) 15: Output voltage (100.0% corresponds to 1000.0V) 16: Output torque (torque rating)			
P6.09	AO1 / AO2 pulse output maximum frequency	0.01KHz ～100.00KHz	50.00KHz	0x F609	☆
P6.10	The AO1 zero-bias coefficient	-100.0% ~ 100.0%	0.0%	0x F60A	☆
P6.11	AO1 gain	-10.00 ~ 10.00	1.00	0x F60B	☆
P6.12	Expansion card AO2 zero bias coefficient	-100.0% ~ 100.0%	0.0%	0x F60C	☆
P6.13	Expansion card AO2 gain	-10.00 ~ 10.00	1.00	0x F60D	☆
P6.14	AO1 switch volume output ON delay time	0.0s ~ 3600.0s	0.0s	0x F60E	☆
P6.15	Local relay output ON delay time	0.0s ~ 3600.0s	0.0s	0x F60F	☆
P6.16	Extension relay output ON delay time	0.0s ~ 3600.0s	0.0s	0x F610	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P6.17	DO 1 output ON delay time	0.0s ~ 3600.0s	0.0s	0x F611	☆
P6.18	DO 2 output ON delay time	0.0s ~ 3600.0s	0.0s	0x F612	☆
P6.19	DO output terminal valid state selection	0: Positive logic; 1: reverse logic Individual bit: AO1 terminal Ten place: local relay Hundred bits: extension relay Thousand position: DO1 Ten thousand positions: DO2	00000	0x F613	☆
P6.20	AO1 switch volume output OFF delay time	0.0s ~ 3600.0s	0.0s	0x F614	☆
P6.21	Local relay output OFF delay time	0.0s ~ 3600.0s	0.0s	0x F615	☆
P6.22	Extension relay output OFF delay time	0.0s ~ 3600.0s	0.0s	0x F616	☆
P6.23	The DO 1 outputs the OFF delay time	0.0s ~ 3600.0s	0.0s	0x F617	☆
P6.24	The DO 2 outputs the OFF delay time	0.0s ~ 3600.0s	0.0s	0x F618	☆

Function code	Name	Set the scope	Factory value	Modbus address	Cha nge
The P7 Keyboard and display group					
P7.00	User password	0 ~ 65535	0	0x F700	☆
P7.01	Functional parameter group display selection	Individual bit: Group C monitoring display selection 0: Not displayed; 1: Display Ten-place: Group H function display selection 0: Not displayed; 1: Display	01	0x F701	☆
P7.03	Parameter write protection	0: parameter allows modification 1: parameter modification is not allowed	0	0x F703	☆
P7.04	The JOG key function selection	0: The JOG key is invalid 1: switch between operation panel command channel and remote command channel (terminal command channel or serial port communication command channel) 2: Forward and reverse switch 3: Positive point movement 4: Reverse point movement 5: Reverse operation	3	0x F704	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
P7.05	The STOP key function	0: STOP shutdown is valid only under keyboard control 1: The STOP key shutdown function is valid in any control mode	1	0x F705	☆
P7.06	LED run display parameter 1	the unit: Bit 0: Running frequency Bit 1: the output current Bit 2: Output voltage Bit 3: Load speed display decade: Bit 0: bus bar voltage Bit 1: Set the frequency Bit 2: Count value Bit 3: the length value hundreds place: Bit 0: X terminal input state Bit 1: DO terminal output state Bit 2: AI1 voltage Bit 3: AI2 voltage kilobit: Bit 0: reserved Bit 1: PID given Bit 2: Output power Bit 3: Output torque	003b	0x F706	☆
P7.07	LED run display parameter 2	the unit: Bit 0: Line speed	0000	0x F707	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
		Bit1: PID feedback Bit 2: the PLC stage Bit 3: PLUSE Input Pulse frequency (KHz) decade: Bit 0: Current power-on time Bit 1: Current running time Bit 2: the remaining running time Bit 3: Main frequency display hundreds place: Bit 0: auxiliary frequency display Bit 1: Encoder feedback speed Bit 2: Actual feedback speed Bit 3: AI1 correction front voltage kilobit: Bit 0: AI2 pre-correction voltage Bit 1: Torque given the setpoint Bit 2: PLUSE input frequency Bit 3: Communication settings			

Function code	Name	Set the scope	Factory value	Modbus address	Change
P7.08	LED shutdown to display the parameters	the unit: Bit 0: Set the frequency Bit 1: bus bar voltage Bit 2: AI1 voltage Bit 3: AI2 voltage decade: Bit 0: Torque-given value Bit 1: Count value Bit 2: the length value Bit 3: Load speed hundreds place: Bit 0: PID given Bit 1: X terminal state Bit2:DO state	0003	0x F708	☆
P7.09	Load speed display coefficient	0.0001 ~ 6.5000	0.300	0x F709	●
P7.10	Inverter module, the radiator temperature	0.0°C ~ 100°C	-	0x F70A	●
P7.12	Cumulative running time	0h ~ 65535h	-	0x F70C	●
P7.15	Load speed shows the decimal number	The 0:0 decimal point 1:1 decimal point 2:2 decimal points At 3:3 decimal places	0	0x F70F	●
P7.16	Cumulative power time	From 00000 to 65535 hours	-	0x F710	●

Function code	Name	Set the scope	Factory value	Modbus address	Change
P7.17	Accumulated power consumption	00000~65535 degrees	-	0x F711	●
The P8 auxiliary function group					
P8.00	Time unit of acceleration and deceleration	0:1 Seconds 1:0.1 Seconds 2:0.01 sec	1	0x F1000	★
P8.01	Point motion acceleration time	0.0s ~ 6500.0s	20.0s	0x F801	☆
P8.02	Point motion deceleration time	0.0s ~ 6500.0s	20.0s	0x F802	☆
P8.03	Acceleration time 2	0.0s ~ 6500.0s	20.0s	0x F803	☆
P8.04	Slow down time 2	0.0s ~ 6500.0s	20.0s	0x F804	☆
P8.05	Acceleration time 3	0.0s ~ 6500.0s	20.0s	0x F805	☆
P8.06	Slow down time 3	0.0s ~ 6500.0s	20.0s	0x F806	☆
P8.07	Acceleration time 4	0.0s ~ 6500.0s	20.0s	0x F807	☆
P8.08	Slow down time 4	0.0s ~ 6500.0s	20.0s	0x F808	☆
P 8.09	Under voltage suppresses the effective	0.0s ~ 6500.0s	5.0s	0x F809	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
	deceleration time				
P8.10	Acceleration of deceleration time reference frequency	0: Maximum frequency (P0.04) 1: Set the frequency 2： 100Hz	0	0x F80A	★
P8.11	Jump frequency 1	At 0.00Hz ~ the maximum frequency	0.00Hz	0x F80B	☆
P8.12	Jump frequency 2	At 0.00Hz ~ the maximum frequency	0.00Hz	0x F80C	☆
P8.13	Jump frequency amplitude	At 0.00Hz ~ the maximum frequency	0.01Hz	0x F80D	☆
P8.14	Frequency selection is prohibited during the acceleration and deceleration process	0: Invalid; 1: valid	0	0x F80E	☆
P8.15	Acceleration time: 1 / 2 of the switching frequency point	At 0.00Hz ~ the maximum frequency	0.00Hz	0x F80F	☆
P8.16	Reduction time 1 / 2 switching frequency point	At 0.00Hz ~ the maximum frequency	0.00Hz	0x F810	☆
P8.17	The terminal point movement function is preferred	0: No priority; 1: priority	0	0x F811	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P8.18	Upper limit frequency source given mode	0: P0.05 setting 1: AI1 given 2: AI2 given 3: Panel potentiometer is given 4: PULSE pulse setting 5: Communication given	0	0x F812	★
P8.19	Upper limit frequency bias	0.00Hz ~ the maximum frequency P0.04	0.00Hz	0x F813	☆
P8.20	Auxiliary frequency source bias frequency upon superposition	0.00Hz ~ the maximum frequency P0.04	0.00Hz	0x F814	☆
P8.21	Runtime frequency instruction UP / DOWN baseline	0: Operating frequency; 1: Set the frequency	0	0x F815	★
P8.22	Command source bundle frequency source selection	Individual bit: operation panel command, binding frequency source selection 0: No binding 1: Number setting frequency 2： AI1 3： AI2 4: The panel potentiometer	0000	0x F816	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
		5: PULSE Pulse setting (X5) 6: Multi-section speed 7: Simple PLC 8： PID 9: Communication given Ten place: terminal command, binding frequency source selection Hundred bits: 485 communication command, binding frequency source selection Thousand bits: automatic operation, binding frequency source selection			
P8.23	The terminal UP / DOWN modification rate	0.001Hz ~ 65.535Hz	1.00Hz	0x F817	☆
P8.24	Add deceleration mode	0: Straight-line acceleration and deceleration; 1: S-curve acceleration and deceleration A	0	0x F818	★
P8.25	S curve start period time scale	0.0% ~ (100.0%-P8.26)	30.0%	0x F819	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
P8.26	S curve end period time scale	0.0% ~ (100.0%-P8.25)	30.0%	0x F81A	★
P8.27	Forward and reverse dead zone time	0.0s ~ 3000.0s	0.0s	0x F81B	☆
P8.28	The frequency is below the lower limit frequency	0.0 ~ 600.0S	0.0S	0x F81C	☆
P8.29	The frequency is lower than the lower limit frequency running action	0: Run at the lower limit frequency 1: Downtime 2: Zero speed operation	0	0x F81D	☆
P8.30	The upper power terminal initiates the protection selection	0: no protection; 1: protection	0	0x F81E	☆
P8.31	Drop control	0.00Hz ~ 10.00Hz	0.00Hz	0x F81F	☆
P8.32	FDT1 level	At 0.00Hz ~ the maximum frequency	50.00Hz	0x F820	☆
P8.33	The FDT 1 lag ratio	0.0% ~ 100.0%	5.0%	0x F821	☆
P8.34	Frequency reaches the detected width	0.0%~100.0% (maximum frequency)	0.0%	0x F822	☆
P8.35	FDT2 level	At 0.00Hz ~ the maximum frequency	50.00Hz	0x F823	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P8.36	The FDT 2 lag ratio	0.0% ~ 100.0%	5.0%	0x F824	☆
P8.37	Arbitrary arrival frequency detection value of 1	At 0.00Hz ~ the maximum frequency	50.00Hz	0x F825	☆
P8.38	Arbitrary arrival frequency detection amplitude of 1	0.0%~100.0% (maximum frequency)	0.0%	0x F826	☆
P8.39	Arbitrary arrival frequency detection value of 2	At 0.00Hz ~ the maximum frequency	50.00Hz	0x F827	☆
P8.40	Arbitrary arrival frequency detection amplitude of 2	0.0%~100.0% (maximum frequency)	0.0%	0x F828	☆
P8.41	continue to have			0x F829	
P8.42	Timer time setting mode	0: P8.43 The number setting 1: AI1 given 2: AI2 given 3: Panel potentiometer is given The simulated input range corresponds to P8.43	0	0x F82A	☆
P8.43	Timer time value	0.0min ~ 6500.0min	0.0min	0x F82B	☆
P8.44	Zero-current detection level	0.0%~300.0%; (100.0% corresponds to rated	5.0%	0x F82C	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
		current of motor, no output during shutdown)			
P8.45	Zero-current detection delay time	0.01s ~ 600.00s	0.10s	0x F82D	☆
P8.46	Software over-flow point	0.0% (not tested) 0.1% to 300.0% (rated current of the motor)	200.0%	0x F82E	☆
P8.47	Software overcurrent detection delay time	0.00s ~ 600.00s	0.00s	0x F82F	☆
P8.48	Arbitrary arrival current of 1	0.0%~300.0% (rated current of the motor)	100.0%	0x F830	☆
P8.49	Any reach current 1 width	0.0%~300.0% (rated current of the motor)	0.0%	0x F831	☆
P8.50	Arbitrary arrival current 2	0.0%~300.0% (rated current of the motor)	100.0%	0x F832	☆
P8.51	Any reach current 2 width	0.0%~300.0% (rated current of the motor)	0.0%	0x F833	☆
P8.52	Lower AI1 input voltage protection value limit	0.00V ~ P8.53	3.00V	0x F834	☆
P8.53	AI1 input voltage protection limit	P8.52 ~ 11.00V	7.00V	0x F835	☆
P8.54	Heat dissipation fan control selection	0: The cooling fan operates during operation	0	0x F836	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
		1: The cooling fan keeps running after power-on			
P8.55	Module temperature arrives	0°C ~ 100°C	75°C	0x F837	☆
P8.56	Current run arrival time	0 ~ 65000	0	0xF8378	★
The P9 PID Functional group					
P9.00	PID given the channel selection	0: Set quantitative number (function code P9.01) 1: AI1 given 2: AI2 given 3: Panel potentiometer is given 4: PULSE Pulse Setting (X5) 5: Communication given 6: Multiple speed given	0	0x F900	☆
P9.01	The PID sets the quantitative number	0.0% ~ 100.0%	50.0%	0x F901	☆
P9.02	The PID feedback channel selection	0: analog quantity AI1 1: analog quantity AI2 2: Keep 3： AI1-AI2 4: PULSE Pulse Setting (X5) 5: Communication given 6： AI1+AI2 7： MAX (|AI1|, |AI2|)	0	0x F902	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
		8： MIN(|AI1|, |AI2|)			
P9.03	PID characteristic	0: Positive feature; 1: reverse feature	0	0x F903	☆
P9.04	PID given the feedback range	0 ~ 65535	1000	0x F904	☆
P9.05	Proportion gain P1	0.0 ~ 100.0	20.0	0x F905	☆
P9.06	Integral time I1	0.01s ~ 10.00s	2.00s	0x F906	☆
P9.07	Differential time D1	0.000s ~ 10.000s	0.000s	0x F907	☆
P9.08	The PID reversal cutoff frequency	From 0.00 to the maximum frequency	0.00Hz	0x F908	☆
P9.09	The PID deviation limit	0.0% ~ 100.0%	0.0%	0x F909	☆
P9.10	PID differential limit amplitude	0.00% ~ 100.00%	0.10%	0x F90A	☆
P9.11	PID given the time of change	0.00 ~ 650.00s	0.00s	0x F90B	☆
P9.12	The PID feedback filtering time	0.00 ~ 60.00s	0.00s	0x F90C	☆
P9.13	The PID output filter time	0.00 ~ 60.00s	0.00s	0x F90D	☆
P9.15	Proportion gain P2	0.0 ~ 100.0	20.0	0x F90F	☆
P9.16	Integral time I2	0.01s ~ 10.00s	2.00s	0x F910	☆
P9.17	Differential time D2	0.000s ~ 10.000s	0.000s	0x F911	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P9.18	The PID parameter switching condition	0: Don't switch 1: Terminal 2: Automatic switch according to the deviation	0	0x F912	☆
P9.19	PID parameter switching deviation 1	0.0% ~ P9.20	20.0%	0x F913	☆
P9.20	PID parameter switching deviation 2	P9.19 ~ 100.0%	80.0%	0x F914	☆
P9.21	PID starter	0.0% ~ 100.0%	0.0%	0x F915	☆
P9.22	PID initial value holding time	0.00 ~ 650.00s	0.00s	0x F916	☆
P9.23	Two output deviation positive maximum value	0.00% ~ 100.00%	1.00%	0x F917	☆
P9.24	Two output deviation reverse maximum	0.00% ~ 100.00%	1.00%	0x F918	☆
P9.25	The PID integration attribute	Individual bit: integral separation 0: Invalid; 1: valid Ten place: output to the limit value, whether to stop the integration 0: Continue integral; 1: stop integral	00	0x F919	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
P9.26	PID feedback loss detection value	0.0%: not judging the feedback loss 0.1% ~ 100.0%	0.0%	0x F91A	☆
P9.27	PID feedback loss detection time	0.0s ~ 20.0s	0.0s	0x F91B	☆
P9.28	The PID shutdown operation	0: shutdown does not calculate; 1: shutdown operation	1	0x F91C	☆
P9.29	Wake up frequency	Dormant frequency (P9.31) ~ Maximum frequency (P0.04)	0.00Hz	0x F91D	☆
P9.30	Wake up delay time	0.0s ~ 6500.0s	0.0s	0x F91E	☆
P9.31	The dormancy frequency	0.00Hz ~ Wake-Up Frequency (P9.29)	0.00Hz	0x F91F	☆
P9.32	Sleep delay time	0.0s ~ 6500.0s	0.0s	0x F920	☆
P9.33	Wake-up definition function selection	0: Definition by frequency value (P9.29) 1: Definition by percentage (P9.34)	0	0x F921	☆
P9.34	Wake up valve value	0.0% ~ 100.0%	0.0%	0x F922	☆
P9.35	Dormant defines the function selection	0: Definition by frequency value (P9.31) 1: Definition by percentage (P9.36)	0	0x F923	☆
P9.36	The value of dormant valve	0.0 ~ 200.0%	101%	0x F924	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
The PA multi-section, PLC operation group					
PA.00	Multi-segment speed frequency 1	-100.0% ~ 100.0% (100.0% corresponds to the maximum frequency P0.04)	5.0%	0x FA00	☆
PA.01	Multi-segment speed frequency 2	-100.0% ~ 100.0%	10.0%	0x FA01	☆
PA.02	Multi-frequency rate segment 3	-100.0% ~ 100.0%	15.0%	0x FA02	☆
PA.03	Multi-segment speed frequency 4	-100.0% ~ 100.0%	20.0%	0x FA03	☆
PA.04	Multi-segment speed frequency 5	-100.0% ~ 100.0%	25.0%	0x FA04	☆
PA.05	Multi-segment speed frequency 6	-100.0% ~ 100.0%	30.0%	0x FA05	☆
PA.06	Multi-segment speed frequency 7	-100.0% ~ 100.0%	35.0%	0x FA06	☆
PA.07	Multi-segment speed frequency 8	-100.0% ~ 100.0%	40.0%	0x FA07	☆
PA.08	Multi-segment speed frequency 9	-100.0% ~ 100.0%	45.0%	0x FA08	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
PA.09	Multistage speed frequency of 10	-100.0% ~ 100.0%	50.0%	0x FA09	☆
PA.10	Multistage speed frequency of 11	-100.0% ~ 100.0%	55.0%	0x FA0A	☆
PA.11	Multistage speed frequency of 12	-100.0% ~ 100.0%	60.0%	0x FA0B	☆
PA.12	Multistage speed frequency of 13	-100.0% ~ 100.0%	65.0%	0x FA0C	☆
PA.13	Multistage speed frequency of 14	-100.0% ~ 100.0%	70.0%	0x FA0D	☆
PA.14	Multistage speed frequency of 15	-100.0% ~ 100.0%	75.0%	0x FA0E	☆
PA.15	Multistage speed frequency of 16	-100.0% ~ 100.0%	80.0%	0x FA0F	☆
PA.16	PLC run mode	0: Stop after a single operation 1: Maintain the final value at the end of a single run 2: Always cycle	0	0x FA10	☆
PA.17	PLC runs drop memory selection	the unit: 0: Power loss not memory; 1: Power memory	00	0x FA11	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
		decade: 0: shutdown does not remember; 1: shutdown memory			
PA.18	PLC paragraph 1 run time	0.0s(h) ~ 6500.0s(h)	0.0s(h)	0x FA12	☆
PA.19	acceleration and deceleration time selection of PLC paragraph 1	0 ~ 3	0	0x FA13	☆
PA.20	PLC paragraph 2 run time	0.0s(h) ~ 6500.0s(h)	0.0s(h)	0x FA14	☆
PA.21	Paragraph 2 acceleration and deceleration time selection of PLC	0 ~ 3	0	0x FA15	☆
PA.22	PLC paragraph 3 run time	0.0s(h) ~ 6500.0s(h)	0.0s(h)	0x FA16	☆
PA.23	Paragraph 3 of acceleration and deceleration time selection of PLC	0 ~ 3	0	0x FA17	☆
PA.24	PLC paragraph 4 run time	0.0s(h) ~ 6500.0s(h)	0.0s(h)	0x FA18	☆
PA.25	Paragraph 4 of acceleration and deceleration	0 ~ 3	0	0x FA19	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
	time selection of PLC				
PA.26	PLC paragraph 5 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA1A	☆
PA.27	acceleration and deceleration time selection of PLC paragraph 5	0 ~ 3	0	0x FA1B	☆
PA.28	PLC paragraph 6 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA1C	☆
PA.29	Selection of the acceleration and deceleration time of the PLC in paragraph 6	0 ~ 3	0	0x FA1D	☆
PA.30	PLC paragraph 7 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA1E	☆
PA.31	acceleration and deceleration time selection of PLC paragraph 7	0 ~ 3	0	0x FA1F	☆
PA.32	PLC paragraph 8 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA20	☆
PA.33	Paragraph 8 acceleration and deceleration time of PLC	0 ~ 3	0	0x FA21	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
PA.34	PLC paragraph 9 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA22	☆
PA.35	Paragraph 9 of acceleration and deceleration time selection of PLC	0 ~ 3	0	0x FA23	☆
PA.36	PLC paragraph 10 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA24	☆
PA.37	Selection of the acceleration and deceleration time of the PLC paragraph 10	0 ~ 3	0	0x FA25	☆
PA.38	PLC paragraph 11 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA26	☆
PA.39	Selection of acceleration and deceleration time in PLC paragraph 11	0 ~ 3	0	0x FA27	☆
PA.40	PLC paragraph 12 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA28	☆
PA.41	Selection of the acceleration and deceleration time of the PLC paragraph 12	0 ~ 3	0	0x FA29	☆
PA.42	PLC paragraph 13 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA2A	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
PA.43	Selection of the acceleration and deceleration time of the PLC paragraph 13	0 ~ 3	0	0x FA2B	☆
PA.44	PLC paragraph 14 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA2C	☆
PA.45	Selection of the acceleration and deceleration time of the PLC paragraph 14	0 ~ 3	0	0x FA2D	☆
PA.46	PLC paragraph 15 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA2E	☆
PA.47	Selection of acceleration and deceleration time in PLC paragraph 15	0 ~ 3	0	0x FA2F	☆
PA.48	PLC paragraph 16 run time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	0x FA30	☆
PA.49	Selection of acceleration and deceleration time in PLC paragraph 16	0 ~ 3	0	0x FA31	☆
PA.50	PLC running time units	0: s (sec); 1: h (hours)	0	0x FA32	☆
PA.51	Given frequency selection for	0: Function code PA.00 Given	0	0x FA33	☆

Function code	Name	Set the scope	Factory value	Modbus address	Cha nge
	multiple period instruction 1	1: AI1 given 2: AI2 given 3: Panel potentiometer is given 4: The PULSE pulse is given 5: The PID is given 6: The number setting frequency is given, and the UP / DOWN can be modified			
PA.52	Power drop Up / Down save selection	0: Do Not Save 1: Save	1	0x FA34	☆
P A.53	Terminal Up / Down shutdown at a given frequency enables	0: Invalid 1: valid	0	0x FA35	☆
The Pb pendulum frequency and counting array					
Pb.00	Setting mode of pendulum frequency	0: relative to the center frequency 1: Relative to the maximum frequency	0	0x FB00	☆
Pb.01	The frequency amplitude	0.0% ~ 100.0%	0.0%	0x FB01	☆
Pb.02	The amplitude of the jump frequency	0.0% ~ 50.0%	0.0%	0x FB02	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
Pb.03	Pop frequency cycle	0.1s ~ 3000.0s	10.0s	0x FB03	☆
Pb.04	Triangle-wave rise time of the swing frequency	0.1% ~ 100.0%	50.0%	0x FB04	☆
Pb.05	Set the length	0m ~ 65535m	1000m	0x FB05	☆
Pb.06	physical length	0m ~ 65535m	0m	0x FB06	☆
Pb.07	Number of pulses per meter in 0.1	0.1 ~ 6553.5	100.0	0x FB07	☆
Pb.08	Set the gauge value	1 ~ 65535	1000	0x FB08	☆
Pb.09	Specify the count value	1 ~ 65535	1000	0x FB09	☆
The PC Fault and Protection group					
PC.00	Motor overload protection selection	0: prohibit; 1: allow	1	0x FC00	☆
PC.01	Motor overload protection gain	0.20 ~ 10.00	1.00	0x FC01	☆
PC.02	Motor overload warning factor	50% ~ 100%	80%	0x FC02	☆
PC.03	The brake unit turns on the voltage threshold	200 ~ 2000	Model determination	0x FC03	☆
PC.04	continue to have	0	0	0	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
PC.05	User-defined overload threshold value	0.0% ~ 200.0%	200.0%	0x FC05	☆
PC.06	User custom overload detection time	0.0s ~ 1000.0s	60.0s	0x FC06	☆
PC.07	Selection of short-circuit to ground function when power-up	0: No action 1: action	1	0x FC07	☆
PC.08	Number of automatic reset	0 ~ 200	0	0x FC08	☆
PC.09	Fault DO action selection during fault automatic reset	0: Do not move 1: Action	0	0x FC09	☆
PC.10	Automatic fault reset interval time	0.1s ~ 100.0s	1.0s	0x FC0A	☆
PC.11	Input phase-deficiency protection	0: Ban 1: allow	1	0x FC0B	★
PC.12	Output phase-deficiency protection	0: Ban 1: allow	1	0x FC0C	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
PC.13	First-time fault type	0: No fault 1: accelerated overcurrent (E001) 2: deceleration overcurrent (E002) 3: constant speed over-current (E003) 4: accelerated overvoltage (E004) 5: deceleration overvoltage (E005) 6: constant speed overvoltage (E006) 7: Control power supply failure (E007) 8: Under voltage fault (E008) 9: Inverter unit fault (E009) 10: Input the missing phase (E010) 11: Output phase absence (E011) 12: Motor short circuit to ground fault (E012) 13: Keep 14: Inverter overload (E01l4) 15: Motor overload (E015)	-	0x FC0D	●
PC.14	The second failure type		-	0x FC0E	●
PC.15	Third (most recent) failure type		-	0x FC0F	●

Function code	Name	Set the scope	Factory value	Modbus address	Change
		16: Module overheating (E016) 17: abnormal parameter reading and writing (E017) 18: External fault (E018) 19: Hold (E019) 20: Hold (E020) 21: Current detection fault (E021) 22: Motor over temperature (E022) 23: Contactor abnormal (E023) 24: communication abnormal (E024) 25: Encoder / PG card fault (E025) 26: Motor learning fault (E026) 27: Initial position error (E027) 28: Hardware overcurrent protection (E028) 29: Motor over speed (E029) 30: Excessive speed deviation (E030) 31: Switching motor fault during operation (E031)			

Function code	Name	Set the scope	Factory value	Modbus address	Change
		32: load fault (E032) 33: PID Feedback Loss (EO 33) 34: User-defined fault 1 (EO 35) 35: User-defined fault 2 (E036) 36: User-defined overload fault (E065)			
PC.16	Operating frequency during the third failure	-	-	0x FC10	●
PC.17	Current at the third failure	-	-	0x FC11	●
PC.18	Bus voltage at the third failure	-	-	0x FC12	●
PC.19	Enter the terminal status for the third failure	-	-	0x FC13	●
PC.20	Output terminal status at the third failure	-	-	0x FC14	●
PC.21	Inverter status during the third failure	-	-	0x FC15	●
PC.22	Time of the third failure (starting from this time)	-	-	0x FC16	●

Function code	Name	Set the scope	Factory value	Modbus address	Change
PC.23	Time at the third failure (timing from runtime)	-	-	0x FC17	●
PC.24	Operating frequency during the second failure	-	-	0x FC18	●
PC.25	Current at the second fault	-	-	0x FC19	●
PC.26	Bus voltage during the second failure	-	-	0x FC1A	●
PC.27	Enter the terminal status for the second fault	-	-	0x FC1B	●
PC.28	Output terminal status at the second failure	-	-	0x FC1C	●
PC.29	Frequency converter status during the second failure	-	-	0x FC1D	●
PC.30	Time during the second failure (starting from this time)	-	-	0x FC1E	●
PC.31	Second failure time (timing from runtime)	-	-	0x FC1F	●

Function code	Name	Set the scope	Factory value	Modbus address	Change
PC.32	Operating frequency during the first failure	-	-	0x FC20	●
PC.33	Current at the first fault	-	-	0x FC21	●
PC.34	Bus voltage at the first failure	-	-	0x FC22	●
PC.35	Enter the terminal status at the first failure	-	-	0x FC23	●
PC.36	Output terminal status at the first failure	-	-	0x FC24	●
PC.37	Inverter status at the first failure	-	-	0x FC25	●
PC.38	Time of the first failure (starting from this time)	-	-	0x FC26	●
PC.39	Time at first failure (timing from runtime)	-	-	0x FC27	
PC.49	Loading protection options	0 ~ 1	0	0x FC31	☆
PC.50	Load loss detection level	0 ~ 100.0	10.0%	0x FC32	☆
PC.51	Load loss detection time	0 ~ 60.0s	1.0s	0x FC33	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
PC.52	Over speed detection value	0 ~ 50.0%	20.0%	0x FC34	☆
PC.53	Over speed detection time	0 ~ 60.0s	1.0s	0x FC35	☆
PC.54	Excessive velocity deviation and the detection value	0 ~ 50.0%	20.0%	0x FC36	☆
PC.55	Speed deviation is too large for the detection time	0 ~ 60.0s	5.0s	0x FC37	☆
PC.56	Abnormal standby frequency setting	0 ~ 100.0%	100.0%	0x FC38	☆
PC.57	Motor temperature sensor type	0: No 1: PT100 2: PT1000	0	0x FC39	★
PC.58	Motor overheat protection valve value	0 ~ 200°C	110°C	0x FC3A	★
PC.59	Motor overheating pre-alarm valve value	0 ~ 200°C	90°C	0x FC3B	★
PC.60	Continue running frequency	0: Run at the current operating frequency 1: Run at a set frequency	0	0x FC3C	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
	selection when failure	2: Above limit frequency operation 3: Run at the lower limit frequency 4: Run at an abnormal standby frequency			
PC.61	Wave-by-wave flow limiting enabling	0: Not enable 1: enable	1	0x FC3D	★
PC.62	Underpressure point setting	100.0 ~ 400.0V	Model determination	0x FC3E	☆
PC.63	Overpressure point setting	200.0 ~ 1200.0V	Model determination	0x FC3F	☆
The Pd communication parameter group					
Pd.01	Communication Baud rate selection	1： 600BPS 2： 1200BPS 3： 2400BPS 4： 41000BPS 5： 9600BPS 6： 19200BPS 7： 38400BPS 8： 57600BPS 9： 115200BPS	5	0x FD01	☆
Pd.02	data format	0: No check (8.N-2) 1: even check (8.E-1) 2: odd check (8.O-1) 3: No check (8.N-1)	0	0x FD02	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
Pd.03	This machine address	1~247; 0 For the broadcast address	1	0x FD03	☆
Pd.04	answering delay	0ms ~ 20ms	2	0x FD04	☆
Pd.05	Communication timeout time	0.0 (invalid); 0.1s~60.0s	0.0	0x FD05	☆
Pd.06	Data transfer format selection	0: Non-standard MODBUS protocol 1: Standard MODBUS protocol	1	0x FD06	☆
Pd.07	Communication to read the current resolution	0:0.01A (Power is less than 55KW) 1： 0.1A	0	0x FD07	☆
The H0 Torque control parameter group					
H0.00	Torque control mode	0: Torque control is invalid; 1: Torque control is valid	0	0x A000	★
H0.01	Selection of the torque setting mode	0: keyboard number given torque 1 (H0.03) The following maximum range corresponds to the upper limit of the driving torque (H0.03) 1: analog quantity AI1 given 2: analog quantity AI2 given 3: Panel potentiometer is given	0	0x A001	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
		4: The PULSE pulse is given 5: Communication given 6: Both are small (AI1, AI2) 7: both measures are large (AI1, AI2)			
H0.03	Keypad number torque settings	-200.0% ~ 200.0%	150.0%	0x A003	☆
H0.04	Recurrent filtering time	0 ~ 10.00s	0.00s	0xA004	☆
H0.05	The torque control positive the maximum frequency	At 0.00Hz ~ the maximum frequency	50.00Hz	0x A005	☆
H0.06	Torque control reversal maximum frequency	At 0.00Hz ~ the maximum frequency	50.00Hz	0x A006	☆
H0.07	Torque to control the acceleration time	0.00s ~ 65000s	0.00s	0x A007	☆
H0.08	Torque-controlled deceleration time	0.00s ~ 65000s	0.00s	0x A008	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
The H1 virtual DI, virtual DO parameter group					
H1.00	The VDI 1 terminal function selection	0 ~ 55	0	0x A100	★
H1.01	The VDI 2 terminal function selection	0 ~ 55	0	0x A101	★
H1.02	The VDI 3 terminal function selection	0 ~ 55	0	0x A102	★
H1.03	The VDI 4 terminal function selection	0 ~ 55	0	0x A103	★
H1.04	The VDI 5 terminal function selection	0 ~ 55	0	0x A104	★
H1.05	The VDI terminal active state source	0 ~ 22222	0	0x A105	★
H1.06	The VDI terminal function code sets the valid status	0 ~ 11111	0	0x A106	☆
H1.07	AI1 terminal function selection (as a DI)	0 ~ 55	0	0x A107	★
H1.08	AI2 terminal function	0 ~ 55	0	0x A108	★

Function code	Name	Set the scope	Factory value	Modbus address	Change
	selection (as a DI)				
H1.09	AI3 terminal function selection (as a DI)	0 ~ 55	0	0x A109	★
H1.10	The AI is selected as the DI valid state	0 ~ 111	0	0x A10A	☆
H1.11	Virtual VDO 1 output selection	0 ~ 42	0	0x A10B	☆
H1.12	Virtual VDO 2 output selection	0 ~ 42	0	0x A10C	☆
H1.13	Virtual VDO 3 output selection	0 ~ 42	0	0x A10D	☆
H1.14	Virtual VDO 4 output selection	0 ~ 42	0	0x A10E	☆
H1.15	Virtual VDO 5 output selection	0 ~ 42	0	0x A10F	☆
H1.16	The VDO 1 delay time	0 ~ 3600.0s	0	0x A110	☆
H1.17	The VDO 2 delay time	0 ~ 3600.0s	0	0x A111	☆
H1.18	The VDO 3 delay time	0 ~ 3600.0s	0	0x A112	☆
H1.19	The VDO 4 delay time	0 ~ 3600.0s	0	0x A113	☆
H1.20	The VDO 5 delay time	0 ~ 3600.0s	0	0x A114	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
H1.21	The VDO output terminal has a valid state selection	0 ~ 11111	0	0x A115	☆
The H3 multipoint AI curve parameter group					
H3.00	AI curve 4 minimum input	-10.00V ~ H3.02	0.00V	0x A300	☆
H3.01	AI curve The minimum input of 4 corresponds to the setting	-100.0% ~ +100.0%	0.0%	0x A301	☆
H3.02	AI curve 4 point 1 input	H3.00 ~ H3.04	3.00V	0x A302	☆
H3.03	AI curve 4 point 1 input the corresponding setting	-100.0% ~ +100.0%	30.00%	0x A303	☆
H3.04	AI curve 4 point 2 input	H3.02 ~ H3.06	6.00V	0x A304	☆
H3.05	AI curve 4 fold point 2 input to the corresponding setting	-100.0% ~ +100.0%	60.00%	0x A305	☆
H3.06	AI curve 4 maximum input	H3.04 ~ +10.00V	10.00V	0x A306	☆
H3.07	The maximum input of the AI	-100.0% ~ +100.0%	100.0%	0x A307	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
	curve 4 corresponds to the setting				
H3.08	AI curve 5 minimum input	-10.00V ~ H3.10	0.00V	0x A308	☆
H3.09	The AI curve 5 minimum input corresponds to the setting	-100.0% ~ +100.0%	0.0%	0x A309	☆
H3.10	AI curve 5 fold point 1 input	H3.08 ~ H3.12	3.00V	0x A30A	☆
H3.11	AI curve 5 fold point 1 input to the corresponding setting	-100.0% ~ +100.0%	30.00%	0x A30B	☆
H3.12	AI curve 5 point 2 input	H3.10 ~ H3.14	6.00V	0x A30C	☆
H3.13	AI curve 5 fold point 2 input to the corresponding setting	-100.0% ~ +100.0%	60.00%	0x A30D	☆
H3.14	AI curve 5 maximum input	H3.12 ~ +10.00V	10.00V	0x A30E	☆
H3.15	AI curve 5 maximum input corresponds to the setting	-100.0% ~ +100.0%	100.0%	0x A30F	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
The H7 AI, AO correction parameter group					
H7.00	AI1 measured voltage 1	-10.000 ~ 10.000V	Factory correction	0x A700	☆
H7.01	The AI1 shows the voltage of 1	-10.000 ~ 10.000V	Factory correction	0x A701	☆
H7.02	AI1 measured voltage of 2	-10.000 ~ 10.000V	Factory correction	0x A702	☆
H7.03	The AI1 shows the voltage of 2	-10.000 ~ 10.000V	Factory correction	0x A703	☆
H7.04	AI2 measured voltage 1	-10.000 ~ 10.000V	Factory correction	0x A704	☆
H7.05	The AI2 shows the voltage of 1	-10.000 ~ 10.000V	Factory correction	0x A705	☆
H7.06	AI2 measured voltage 2	-10.000 ~ 10.000V	Factory correction	0x A706	☆
H7.07	The AI2 shows the voltage of 2	-10.000 ~ 10.000V	Factory correction	0x A707	☆
H7.08	AI3 measured voltage 1	-10.000 ~ 10.000V	2.000V	0x A708	☆
H7.09	The AI3 shows the voltage of 1	-10.000 ~ 10.000V	2.000V	0x A709	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
H7.10	AI3 measured voltage of 2	-10.000 ~ 10.000V	8.000V	0x A70A	☆
H7.11	The AI3 shows the voltage of 2	-10.000 ~ 10.000V	8.000V	0x A70B	☆
H7.12	AO1 target voltage of 1	-10.000 ~ 10.000V	Factory correction	0x A70C	☆
H7.13	AO1 measured voltage 1	-10.000 ~ 10.000V	Factory correction	0x A70D	☆
H7.14	AO1 target voltage of 2	-10.000 ~ 10.000V	Factory correction	0x A70E	☆
H7.15	AO1 measured voltage 2	-10.000 ~ 10.000V	Factory correction	0x A70F	☆
H7.16	AO2 target voltage of 1	-10.000 ~ 10.000V	2.000V	0x A710	☆
H7.17	AO2 measured voltage 1	-10.000 ~ 10.000V	2.000V	0x A711	☆
H7.18	AO2 target voltage of 2	-10.000 ~ 10.000V	8.000V	0x A712	☆
H7.19	AO2 measured voltage 2	-10.000 ~ 10.000V	8.000V	0xA713	☆
The HC controls the optimized parameter group					
HC.00	DPWM switching upper limit frequency	0.00 hz ~ Maximum frequency (P0.04)	12.00hz	0x AC00	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
HC.01	modulation mode	0 ~ 1	0	0x AC01	☆
HC.02	Selection of dead zone compensation mode	0 ~ 2	1	0x AC02	☆
HC.03	stochastic PWM	0 ~ 10	0	0x AC03	☆
HC.04	Over modulation coefficient	0 ~ 120	100	0x AC04	☆
HC.05	Energy saving control enabling	0 ~ 1	0	0x AC05	★
The HF process card sets the parameter group					
HF.00	Temperature channel enabling	00000～11111	00011	0x AF00	☆
HF.01	PT 1 temperature channel overheating protection valve	0 ~ 200°C	110°C	0x AF01	☆
HF.02	PT 2 temperature channel overheating protection valve	0 ~ 200°C	110°C	0x AF02	☆
HF.03	PT 3 temperature channel	0 ~ 200°C	110°C	0x AF03	☆

Function code	Name	Set the scope	Factory value	Modbus address	Change
	overheating protection valve				
HF.04	PT 1 temperature channel overheating warning valve	0 ~ 200℃	90℃	0x AF04	☆
HF.05	PT 2 temperature channel overheating warning valve	0 ~ 200℃	90℃	0x AF05	☆
HF.06	PT 3 temperature channel overheating warning valve	0 ~ 200℃	90℃	0x AF06	☆

Function code	Name and description	Unit	Modbus address
The C0 Monitoring parameter group			
C0.00	Operating frequency (Hz)	0.01Hz	5000H
C0.01	Output current(A)	0.01A	5001H
C0.02	Output voltage(V)	1V	5002H
C0.03	Motor speed display	1	5003H
C0.04	Bus voltage (V)	0.1V	5004H
C0.05	Set frequency (Hz)	0.01Hz	5005H
C0.06	Count value	1	5006H
C0.07	length value	1	5007H
C0.08	X terminal status	1	5008H
C0.09	DO output status	1	5009H
C0.10	AI1 voltage (V)	0.01V	500AH
C0.11	AI2 voltage (V)	0.01V	500BH
C0.12	Panel potentiometer voltage	1℃	500CH
C0.13	PID setting	1	500DH
C0.14	Output power(Kw)	0.1Kw	500EH
C0.15	Output torque(%)	0.1%	500FH
C0.16	Line speed	1m/Min	5010H
C0.17	PID feedback	1	5011H
C0.18	PLC stage	1	5012H
C0.19	PULSE input pulse frequency (Hz)	0.01KHz	5013H
C0.20	Current power-on time	1Min	5014H
C0.21	Current running time	0.1Min	5015H
C0.22	remaining run time	0.1Min	5016H
C0.23	Main frequency display	0.01Hz	5017H
C0.24	Auxiliary frequency display	0.01Hz	5018H
C0.25	Feedback speed (unit 0.1Hz)	0.1Hz	5019H
C0.26	Encoder feedback speed	0.01Hz	501AH
C0.27	AI1 voltage before correction	0.001V	501BH

C0.28	AI2 voltage before correction	0.001V	501CH
C0.29	Torque given value	0.01%	501DH
C0.30	PULSE input pulse frequency	1Hz	501EH
C0.34	Motor temperature	1℃	5022H

C0.35	AI3 voltage before correction	0.001V	5023H
C0.36	Spin position	1	5024H
C0.37	Power factor angle	0.1°	5025H
C0.38	ABZ location	1	5026H
C0.39	VF separation target voltage	1V	5027H
C0.40	VF split output voltage	1V	5028H
C0.41	DI input intuitive display	1	5029H
C0.42	DO input intuitive display	1	502AH
C0.43	Intuitive display of DI function status	1	502BH
C0.44	Visual display of DO function status	1	502CH
C0.45	Accident details	1	502DH
C0.46	Inverter module radiator temperature	1℃	502EH
C0.49	Motor serial number	1	5031H
C0.55	Process card PT1 channel temperature value	1℃	5037H
CO.56	Process card PT2 channel temperature value	1℃	5038H
CO.57	Process card PT3 channel temperature value	1℃	5039H
C0.58	Z signal counter	1	503AH
C0.60	AI2 pressure feedback	0.1kPa	503CH

Charter 6. Function parameters description

P0. Basic parameters:

P0.00	The 1st motor control mode	Factory setting	0
	Setting range	0	Open loop sensorless vector control
		1	V/F control
		2	Close loop sensor vector control with PG card

0: Open loop sensorless vector control:

Open loop sensorless vector control mode suits for high performance general purpose application without encoder, such as machine, centrifugal machine, drawbench, injection mold machine, etc. one AC drive can only allow to service one motor.

1: V/F control

No need install encoder, good compatibility and stable running. Suits for the applications, which no high request for loads, and one drive for more than one motors, and motor auto-tuning cannot be performed or the motor's parameters can be acquired through other methods, such as fans, pumps load.

2: Close loop sensor vector control

That is vector control running mode with speed sensor, which is mainly used in the cases such as high accuracy speed control, torque control and simple servo control which have high requirements for control performance. When the control mode is selected, generally, PG should be installed on the motor's terminal, and the PG's parameters should be set up correctly. For the setup and adjustment of the PG's parameters, refer to the explanation of P2 parameters group.

Note:

1. Before running in the vector control mode for the first time, activate motor auto-tuning to get the correct motor parameters. After that, the motor parameters will be stored in the control panel for later use.
2. Correctly set the parameter of the speed regulator to ensure good static and dynamic control performance. See the description of P2 parameter group for related instructions.
3. When in the feedback vector control mode, one AC Drive can drive only one motor. Besides, the AC Drive and motor capacity should be close to each other. The AC Drive power can be two grades bigger or one grade smaller than the motor, otherwise its control performance may decrease, and the driving system may fail.
4. Using the vector control with PG requires the PG parameters in P2 group be set correctly.

P0.01	Running command reference		Factory setting	0
	Setting range	0	0： Keypad (operation panel)	
		1	1： External terminals	
		2	2： RS485 communication	

Selects AC Drive running command input channel,

The AC Drive control command includes starting, stop, forward, reverse, jog function.

0: Keypad (operation panel); the running command is controlled by RUN, STOP, JOG (through P7.04) by keypad.

1: External terminals The running command controlled by multiple function terminals. It can achieve to forward, reverse, Jog, reverse running with two lines or three lines control, see P0.18, P5.00 ~ 5.04 function code in detail.

2: communication command

The running command is given by communication, see the communication protocol Pd group description.

P0.02	Memory of digital setting frequency upon power failure		Factory setting	1
	Setting range	0	Not memorize	
		1	memorize	

This function only valid for the frequency source is selected by digital control. That is P0.03 set for 0 or 1.

No memorize means that the digital frequency reference will be restore to the value of P0.07, and frequency modification value , of keypad are rested (set to 0) after frequency stop power fail.

Memorize means that the digital frequency is kept on the setting of last time AC Drive on stop mode, and the frequency modification of , is keeping as well.

When using the external terminals to control frequency up and down, the terminals UP and DW function as same as , of keypad. (When two terminals of P5.00-P5.04 is setting for 9 UP and 10 DW).

P0.03	Main frequency source X		Factory setting	1
	Setting range	0	keypad digital frequency setting, not memorized after power failure	
		1	keypad digital frequency setting, memorized frequency after power failure.	
		2	Analog AI1 (-10v-10v)	

		3	Analog AI2 （0-10v/4-20mA ）
		4	Keypad potentiometer
		5	PULSE trains frequency reference
		6	simple PLC
		7	multi- step reference
		8	Process-PID
		9	communication

There are 10 kinds of main frequency reference source channel.

0: keypad digital frequency setting, not memorized after power failure

The frequency set by P0.07, and can be changed by , keys of keypad (or UP/DOWN of multi-function terminals.) But when the frequency setting will be restore to P0.07 preset frequency value after AC Drive stop power fail.

1: keypad digital frequency setting, memorized frequency after power failure.

The frequency set by P0.07, and can be changed by , keys of keypad (or UP/DOWN of multi-function terminals.) The frequency reference will be kept on the value of last time AC Drive stop mode, and it can be changed by , keys of keypad (or UP/DOWN of multi-function terminals.)

Note: P0.02 is used for the parameters memorizing selecting of digital frequency setting in stop mode. The frequency changed value if memorized or reset for 0 when AC Drive on stop mode.

2: Analog AI1, -10V to 10V voltage input, the direction of motor will be place on reverse when signal is negative. The default setting is 0-10V.

3: Analog AI2, 0 ~ 10V/4 ~ 20mA, if voltage signal or current signal are decided by PI slide switch of controller board. The default setting is voltage signal.

4: potentiometer of keypad. Used it to adjust the frequency directly.

Note: Because the potentiometer of keypad is easy damage parts, it will be damaged easily when it rotated frequently. Advice user don't used this potentiometer for a long term.

When connecting external potentiometer, too long cable will cause big voltage drop and cause speed accurate.

KM1000's keypad can't dismantle, if need external connecting should buy independent, and also need change the position of P3.

5: Pulse trains frequency (X5)

Frequency reference set by X5 high speed pulse trains.

The specification of this signal as following: 9V ~ 30V of voltage, frequency range is 0KHz ~ 100KHz, and only valid when connecting from X5 multiple input terminal. And the same time P5.04 should be set for 21.

6: simple PLC

When the frequency source set as simple PLC, the AC Drive can run with any frequency reference of 1-16 multi-step frequency, and the respective running time, acceleration, deceleration also can be set independently, see PA parameters group in detail.

7: Multi-step frequency

The difference corresponding frequency must be set by digital combination of X terminals when selecting multi-step frequency running. KM series AC Drive can set 16 multi-steps frequency through 4 digital

multi-step terminals. (terminals function 12 ~ 15).

The P5 group parameters should be set accordingly when digital input set as for multi-step frequency terminals function. see the P5 group associative function parameters description in detail.

8: Process PID

Select process PID control output as running frequency. in general, it used in process close loop control on site, such as constant pressure, constant temperature, constant tension control, which need make feedback value to fit target value in basically.

9: communication

The frequency set by communication, this series configure with standard Modbus RTU communication.

See the appendix of communication protocol A in detail, or contact vendor directly.

P0.04	Maximum frequency	Factory setting	50.00Hz
	Setting range	50.00Hz ~ 4000.00Hz	

Used to set frequency maximum output frequency. In general case, the value is set as rated of motor frequency. if this value is higher than rated motor frequency, please take consider to wearing of motor bearing, and mechanical vibration. For variable frequency motor, spindle motor case, the setting is set according to actual working conditions.

When analog input, pulse trains input, multi-step frequency is set for frequency source, the respective 100% is relative to P0.04.

In V/F control mode, the maximum frequency can be set up to 4000Hz.

P0.05	Upper limit frequency	Factory setting	50.00Hz
	Setting range	Lower limit frequency P0.06 ~ upper limit frequency	

The upper limit frequency of output frequency of AC Drive. This value setting is less than or equal to maximum frequency. Setting range P0.06 ~ P0.04

P0.06	Lower limit frequency	Factory setting	0.00Hz
	Setting range	0.00Hz ~ Upper limit frequency P0.05	

The lower limit frequency of AC Drive output frequency.

AC Drive can be stop, runs with less frequency or 0 speed when the running frequency less than this value.

Which running mode will be apply depends on P8.29 (running mode when frequency reference lower than lower limit frequency) setting.

P0.07	Digital frequency reference	Factory setting	50.00Hz
	Setting range	0.00 ~ maximum frequency P0.04	

When the frequency source set as digital reference or terminals UP/DOWN, this function code can be set as initial frequency of AC Drive by digital setting.

P0.08	Acceleration time 1	Factory setting	Per machine mode
	Setting range	0.0s ~ 6500.0s	
P0.09	Deceleration time 1	Factory setting	Per machine mode
	Setting range	0.0s ~ 6500.0s	

The acc time means the time during which the AC Drive output from zero frequency to the maximum output frequency (P0.04), shown in t1 of 6-1.

Dec time means the time during which the AC Drive outputs from the lowest output frequency to zero frequency shown in Figure 6-1 as T2.

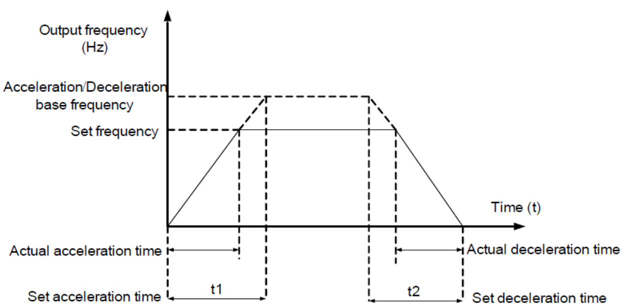


Figure 6-1 acceleration/ deceleration time

KM series provide 4 groups deceleration, acceleration time. user can use digit input terminals to select.

The 4 groups function code as following:

The first group： P0.08, P0.09；

The second group： P8.03, P8.04；

The third group： P8.05, P8.06；

The fourth group： P8.07, P8.08；

The difference acceleration, deceleration time if need, must set by multi-function terminals switching, to achieve 4 groups accel/ decel function, the default setting is the first accel/ decel. time.

In some case

In some cases, the actual acceleration, deceleration time is much larger than setting of acceleration, deceleration time, possibility the effect of over current stall, and over voltage stall function cause by too heavy load or too big inertia.

P0.10	Rotation direction	Factory setting	0
	Setting range	0	forward
		1	Reverse

Possible to change motor rotation direction via this parameters setting, no need change motor wiring. The function as same as changing the every two wires order of U, W, V to modify the director of motor.

But the director will be recover to the original status after AC Drive parameters initialization.

P0.11	Carrier frequency	Factory setting	per model
	Setting range	0.5kHz ~ 16.0kHz	

This function use to adjust carrier frequency. the motor noise can be adjust via carrier frequency changing, to avoid the point of resonance of mechanical system, and to reduce the interference generated by AC Drive, and reduce leakage current.

When the carrier frequency is low, the output ultraharmonics of current will be increase, and motor loss and temperature will be increase as well.

When the carrier frequency is high, the motor loss and temperature will be reduce, but the loss, temperature and interference of AC Drive will be increase.

It will generate following effect when carrier frequency adjusting.

carrier frequency value	low→ high
Motor noise	Large→ small
Output current waveform	Bad→ Good
Motor temperature rise	High→ Low
AC drive temperature rise	Low→ high
Leakage current	small→ large
External radiation interference	small→ large

The factory setting of carrier frequency varies with the AC drive power. If you need to modify the carrier frequency, note that if the set carrier frequency is higher than factory setting, it will lead to an increase in temperature rise of the AC drive's heatsink. In this case, you need to de-rate the AC drive. Otherwise, the AC drive may overheat and alarm. When the setting is above the factory setting, the AC Drive should derated using for 20% when carrier frequency increasing 1KHz.

P0.12	Carrier frequency adjust with temperature	Factory setting	0
	Setting range	0： no； 1： yes	

It is used to set whether the carrier frequency is adjusted based on the temperature. The AC Drive automatically reduces the carrier frequency when detecting that the heat sink temperature is high. The AC drive resumes the carrier frequency to the set value when the heat sink temperature becomes normal. This function reduces the overheat alarms.

P0.13	Parameters restore settings		Factory setting	0
	Setting range	0	0: No operation	
		1	1: Restore factory settings except motor parameters	
		12	12: Clear records	

1: Restore default settings except motor parameters

When P0.13 set for 1, most function codes are restored to the default settings except motor parameters, fault records.

12. Clear fault record If P0.13 set to 12, the fault records will be clear and then it will reset to 0 after setting.

P0.14	Auxiliary frequency source Y selection		Factory setting	0
	Setting range	0	keypad digital frequency setting, not memorize after power failure	
		1	keypad digital frequency setting, memorized frequency after power failure.	
		2	Analog AI1 (-10v-10v)	
		3	Analog AI2 (0-10v/4-20mA)	
		4	Keypad potentiometer	
		5	PULSE trains frequency reference (X5)	
		6	simple PLC	
		7	multi- step reference	
		8	Process-PID	
		9	9: communication	

When used as an independent frequency input channel, the auxiliary frequency source is used in the same way as the main frequency source (refer to P-03). The using method refer to P0.03 description.

When the auxiliary frequency source as for frequency combination reference. (it means frequency reference depend on combination of main and auxiliary frequency source).

Note： 1. When the auxiliary frequency source is selected by digital, the digital frequency (P0.07) is disable, the user can adjust frequency directly base on given frequency by UP and DOWN of keypad or UP and DOWN of multiple function terminals).

2. When auxiliary frequency is selected by AI1, AI2, potentiometer of keypad or pulse trains, 100% of the input corresponds to the range of the auxiliary frequency can be set by P0.15 and P0.16.

3. If the auxiliary frequency source is pulse setting, it is similar to analog input

4. The main frequency source and auxiliary frequency source must not use the same channel. That is, P0-03 and P0-14 cannot be set to the same value.

P0.15	Range of auxiliary frequency source selection when superimposed		Factory setting	0
	Setting range	0	0: Respect to the maximum frequency (P0.04)	
		1	Respect to main frequency source reference (P0.03)	
P0.16	Range of auxiliary frequency source selection when operation		Factory setting	0
	Setting range		0% ~ 150%	

When the frequency source is selected for frequency combination, both parameters used to define the range of auxiliary frequency source. P0.15 used to select the object of selection, it can be select maximum frequency or main frequency source. When select to main frequency, the range of auxiliary frequency will vary with main frequency changing.

P0.17	frequency source selection when operation		Factory setting.	0
	Setting range	Unit's digit	Frequency source selection	
		0	Main frequency source X	
		1	1: X and Y operation (operation relationship determined by ten's digit)	
		2	Switchover between X and Y	
		3	Switchover between X and "X and Y operation"	
		4	4: Switchover between Y and "X and Y operation"	
		Ten digits	Ten's digit (X and Y operation relationship)	

		0	X+Y
		1	X-Y
		2	Maximum (X, Y)
		3	Min (X, Y)

Select the frequency reference source through parameters setting. The frequency reference select by operation between main frequency source X and auxiliary frequency source Y.

Unit digit: frequency source selection

0: Main frequency source X, take the main frequency source X for target frequency

1:Operation result of main X and auxiliary Y frequency source.

Take the operation result as target frequency, the operation relationship decide by ten unit setting.

2: Switchover between main frequency source X and auxiliary frequency source Y.

When input multi-function terminals function 20 (frequency switchover) is disable, main frequency X will be take for target frequency.

When input multi-function terminals function 20 (frequency switchover) is enable, the auxiliary frequency Y will be take for target frequency.

3. Switchover between main frequency source X and operation of main frequency source X and auxiliary frequency Y.

When input multi-function terminals function 20 (frequency switchover) is disable, main frequency X will be take for target frequency.

When input multi-function terminals function 20 (frequency switchover) is enable, the operation of X and Y will be take for target frequency.

4. Switchover between auxiliary frequency source Y and operation of main frequency source X and auxiliary frequency Y.

When input multi-function terminals function 20 (frequency switchover) is disable, auxiliary frequency Y will be take for target frequency.

When input multi-function terminals function 20 (frequency switchover) is enable, the operation of X and Y will be take for target frequency.

Ten digit: the relationship of frequency source operation of X and Y

0: Main frequency source X+ Auxiliary frequency source Y

The addition of X and Y serve as for the target frequency to realize frequency superposition reference.

1: main frequency source X – auxiliary frequency source Y

Main frequency X minus the auxiliary frequency Y as the target frequency

2: MAX (main frequency source X, auxiliary frequency source Y)

Take the maximum absolute value of main frequency X and auxiliary frequency Y as the target frequency.

3. MIN (main frequency source X, auxiliary frequency source Y)

Take the minimum absolute value of main frequency X and auxiliary frequency Y as the target frequency.

In addition, when set the operation of main X and auxiliary Y frequency as for frequency source reference, user can set the offset frequency through P8.20 parameter, do superposition base on result operation of main X and auxiliary to meet various of requirement.

P0.18	Running terminals command mode		Factory setting	0
	Setting range	0	Two-line mode 1	
		1	Two-line mode 2	
		2	Three-line mode 1	
		3	Three-line mode 2	

This parameter defines 4 kinds difference control mode of AC Drive by external terminals.

Note: For convenience of explanation, takes any 3 terminals function of X1、X2、X3 from X1 ~ X5 multi-function terminals for showing. Refer to P5.00 ~ P5.04 to get description in detail.

0： Two-line mode 1：

This is most common using two lines control mode. The motor forward and reverse running decide by terminals X1 and X2. See function code setting as following:

Function code	Name	Setting value	Function description
P0.18	terminal command mode	0	Two line 1
P5.00	X1 terminals function selection	1	Forward run (FWD)
P5.01	X2 terminals function selection	2	Reverse run (REV)

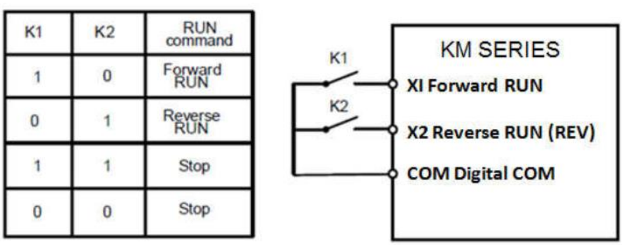


Fig. 602 tow line mode 1

As shown in the preceding figure, when only K1 is ON, the AC Drive instructs forward rotation. When only K2 is ON, the AC Drive instructs reverse rotation. When K1 and K2 are ON or OFF simultaneously, the AC Drive stop.

1: Two line mode 2:

In this mode, X1 is RUN enabled terminal, and X2 determines the running direction.

The parameters are set as below:

Function code	Name	Value	Function Description
P0.18	Terminal command mode	1	Two line 2
P5.00	X1 terminals function selection	1	RUN enabled
P5.01	X2 terminals function selection	2	Forward or reverse direction

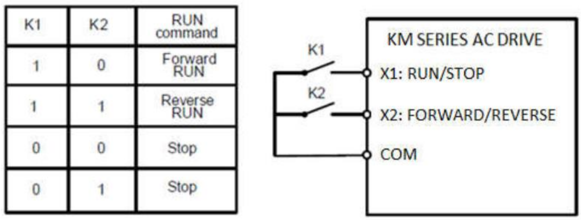


Fig. 6-3 two line mode 2

As shown in the preceding figure, if K1 is ON, the AC Drive instructs forward rotation when K2 is OFF, and instructs reverse rotation when K2 is ON. If K1 is OFF, the AC Drive stops.

2: 3 line control mode 1：

In this mode, X3 is RUN enabled terminal, and the direction is decided by X1 and X2.

The parameters are set as below:

Function code	Name	Value	Function description
P0.18	Terminal command mode	2	3 lines mode 1
P5.00	X1 terminals function selection	1	Forward run (FWD)
P5.01	X2 terminals function selection	2	Reverse run （REV)
P5.02	X3 terminals function selection	3	Three-line control

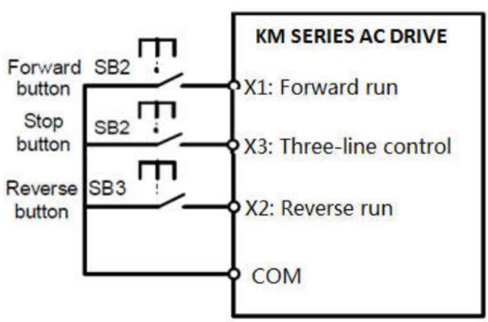


Fig 6-4 3 lines mode 1 (normal close for starting)

As shown in the preceding figure, if SB1 is ON, the AC drive instructs forward rotation when SB2 is pressed to be ON and instructs reverse rotation when SB3 is pressed to be ON. The AC drive stops immediately after SB1 becomes OFF. During normal startup and running, SB1 must remain ON. The AC drive's running state is determined by the final actions on SB1, SB2 and SB3. And SB2 and SB3 button take effect once on close action edge.

Note: the above description is 3 lines normal close mode. In some application case, especial start and stop control in multiple positions. If the stop button place on normal close state. It will bring some wiring trouble.

In this matter, through P5.36=00100 setting can achieve normal open start.

Press SB2 button AC Drive will run in forward, press SB2 the AC Drive runs in reverse, press SB1 AC Drive will stop.

Please see below picture.

Function code	Name	Value	Function description
P0.18	Terminal command mode	2	3 lines mode 1
P5.00	X1 terminals function selection	1	Forward run (FWD)
P5.01	X2 terminals function selection	2	Reverse run (REV)
P5.02	X3 terminals function selection	3	3 lines 1 control
P5.36	Input terminal Positive and negative logic	00100	X3 terminal normal open valid

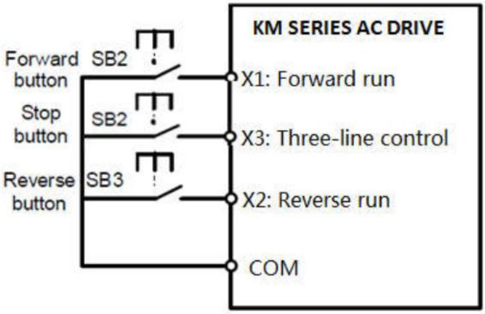


Fig. 65 3 line mode 1 (normal open for starting)

3: 3 lines control mode 2:

X3 is enable terminals in this mode, the running command given by X1, and rotate direction given by X2.

The function code setting as following:

Function code	Name	Value	Function description

P0.18	Terminal command mode	3	3 line mode 2
P5.00	X1 terminals function selection	1	Enable terminal
P5.01	X2 terminals function selection	2	Forward/reverse control
P5.02	X3 terminals function selection	3	3 line control

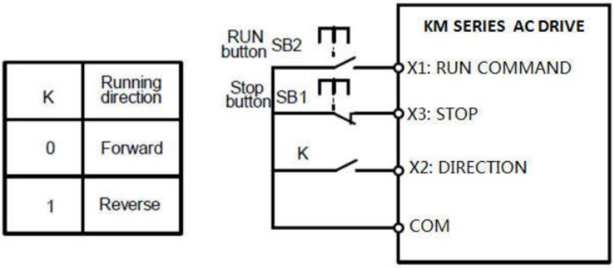


Fig 6-6: 3 line mode 2

As shown in the preceding figure, if SB1 is ON, the AC drive starts running when SB2 is pressed to be ON; the AC drive instructs forward rotation when K is OFF and instructs reverse rotation when K is ON. The AC drive stops immediately after SB1 becomes OFF. During normal startup and running, SB1 must remain ON, the SB1 button command take effect when close action edge.

P1. Startup and stop group

P1.00	Startup mode		Factory setting	0
	Setting range	0	Direct start	
		1	DC brake first and then start from starting frequency	
		2	reserve	

0： Direct start

If the DC braking time is set for 0, the AC Drive start from starting frequency.

If the DC braking time is not 0, it will performance DC braking first, and then start from starting frequency.

1: braking first, and then start.

Perform DC braking P1.03, P1.04, and then start motor from starting frequency. it is suits for application, which load is not big, and motor starting might occur in reverse.

P1.01	Starting frequency	Factory setting	0.00Hz
	Setting range	0.00Hz ~ 10.00Hz	

P1.02	Starting frequency holding time	Factory setting	0.0s
	Setting range	0.0s ~ 100.0s	

In order to get enough motor torque, please set a appropriate starting frequency. it need place starting frequency for a holding time to help motor generate sufficient flux.
The start frequency doesn't limit by lower limit frequency P0.06. but the frequency reference below than starting frequency, AC Drive will not start and place standby states.
When the frequency reference large than starting frequency, motor will start with starting frequency. The starting frequency is disable during switching between forward and reverse. The starting frequency also disable when carry out speed tracking.

P1.03	Startup DC braking current	factory set	0%
	Setting range	0% ~ 100%	
P1.04	Startup DC braking time	factory set	0.0s
	Setting range	0.0s ~ 100.0s	

In generally, DC braking performance will stop motor completely first and then start. Pre-excite used for building the magnetic filed before the motor runs, to improve the response speed.
Starting DC braking only valid when startup mode set for direct start. At that time, AC Drive will performance DC braking with pre-set DC braking current first, and then to motor motor after DC braking holding time.
If the DC braking time is 0, start directly no DC braking. The bigger DC braking current, the larger braking torque.
The DC braking current value setting is percent of rated current of AC Drive.

P1.05	Stop mode	Factory set	0
	Setting range	0	Deceleration to stop
		1	Free stop

0: Decelerate to stop
After the stop command is enabled, the AC drive decreases the output frequency according to the deceleration time and stops when the frequency decreases to zero.
1: Free stop.
After the stop command is enabled, the AC drive immediately stops the output. The motor will coast to stop (free stop) based on the mechanical inertia.

P1.06	Initial frequency of stop DC braking	Factory set	0.00Hz
	Setting range	0.0 ~ maximumP0.04	
P1.07	Waiting time of stop DC braking	Factory set	0.0s
	Setting range	0.0 ~ 100.0S	
P1.08	Stop DC braking current	Factory set	0%
	Setting range	0% ~ 100%	
P1.09	Stop DC braking time	Factory set	0.0s

	Setting range	0.0 ~ 100.0S

P1.06 (Initial frequency of stop DC braking)

During the process of decelerating to stop, the AC drive starts DC braking when the running frequency is lower than the value set in P1.06.

P1.07 (Waiting time of stop DC braking)

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

P1.08 (Stop DC braking current)

This parameter specifies the output current at DC braking and is a percentage relative to the base value.

The bigger setting of this value, it larger DC braking capability can get, but will cause motor and AC Drive generating more heat, temperature is higher.

P1.09 (Stop DC braking time)

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

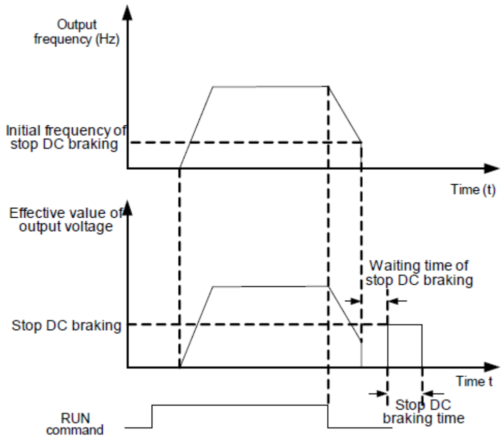


Fig 6-7 Stop DC braking process

P1.10	Brake use ratio	Factory set	100%
	Set range	0% ~ 100%	

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

P1.11	Inversion control		Factory setting	0
	Setting range	0	Reverse runs is allowable	
		1	reverse is forbidden	

Please set this parameter to 1 for some application, which motor runs in reverse is forbidden.

P1.12	Jog	Factory setting	5.00
	Setting range	0.00 ~ P0.04	

This parameter use to set frequency of AC Drive jog running. The acceleration and deceleration time of job can be set in P8.01 and P8.02.

P2. Motor parameters group

P2 parameters group is motor vector control parameters group. AC Drive is sensitive to motor parameters in vector control mode. For the first time using, user should set motor parameters group according to the nameplate of motor.

When the same AC Drive used to serve for another motor, must need to set another motor parameter to AC Drive, otherwise AC Drive won't work properly.

P2.00	G/P type indicator		Factory setting	Per model
	Setting range	0	G type (constant load)	
		1	P type (fan, pumps load variable torque load)	

0: For driving general purpose constant torque heavy load.

1: For driving fans pumps, etc variable torque light load

The power of P type mode for fans, pumps light load lower than G constant torque model one range.

Note: This value can't change after factory leaving.

For some fans pumps application, such as boost fans, deep well pump, which load is heavy. Select the AC Drive should according to the actual current.

P2.01	Motor type selection		Factory setting	0
	Setting range	0	general asynchronous motor	
		1	frequency AC Drive motor	

The difference between general asynchronous and frequency AC Drive motor is heating dissipation. The heat can't dissipated by external fans for asynchronous motor when low speed. When asynchronous motor runs in low speed in long timer, should derated power of AC drive.

P2.02	rated power	Factory setting	Per model
	Setting range	0.1kW ~ 1000.0kW	
P2.03	Rated frequency	Factory setting	Per model
	Setting range	0.01Hz ~ maximum frequency	

P2.04	Rated speed	Factory setting	Per model
	Setting range	1rpm ~ 65535rpm	
P2.05	Rated voltage	Factory setting	Per model
	Setting range	1V ~ 2000V	
P2.06	Rated current	Factory setting	Per model
	Setting range	0． 1 ~ 2000A	

Set the above mentioned parameters according to the motor nameplate no matter whether V/F control vector control is adopted.

To achieve better V/F or vector control performance, motor auto-tuning is required. The motor auto-tuning accuracy depends on the correct setting of motor nameplate parameters

P2.07	Stator resistance (asynchronous motor)	Factory setting	Per model
	Setting range	0.001Ω ~ 65.535Ω	
P2.08	Stator resistance (asynchronous motor)	Factory setting	Per model
	Setting range	0.001Ω ~ 65.535Ω	
P2.09	Leakage inductive reactance (asynchronous motor)	Factory setting	Per model
	Setting range	0.01mH ~ 655.35mH	
P2.10	Mutual inductive Reactance (asynchronous motor)	Factory setting	Per model
	Setting range	0.1mH ~ 6553.5mH	
P2.11	No-load current (asynchronous motor)	Factory setting	Per model
	Setting range	0.01A ~ P2.06	

P2.07 ~ P2.11 these parameters in generally can't find in nameplate of motor. Please perform motor auto tuning to get these parameters. only get P2.07 ~ P2.09 from static auto-tuning. Not only get these 5 parameters, but also can get encoder phase order, current loop PI parameters from performance motor rotating complete auto tuning.

The P2.07 ~ P2.11 parameters will be changed automatically when rated power of motor (P2.02) and rated voltage of motor (P2.05) changing,

If motor tuning can't performed well please consult motor manufacturer to get motor parameters correctly.

P2.12	Stator resistance of synchronous motor)	Factory setting	Per model
	Setting range	0.001Ω ~ 65.535Ω	

P2.13	Shaft D inductance of synchronous motor	Factory setting	Per model
	Setting range	0.01mH ~ 655.35mH	
P2.14	Shaft Q inductance of (synchronous motor	Factory setting	Per model
	Setting range	0.01mH ~ 655.35mH	
P2.16	Back EMF of synchronous motor of	Factory setting	Per model
	Setting range	0.1V ~ 6553.5V	

P2.12 ~ P2.16 are synchronous motor parameters. These parameters are unavailable on the nameplate of most synchronous motors and can be obtained by means of "Synchronous motor no-load auto-tuning". Through "Synchronous motor with-load auto-tuning", only the encoder phase sequence and installation angle can be obtained.

Each time "Rated motor power" (P2.02) or "Rated motor voltage" (P2.05) is changed, the AC drive automatically modifies the values of P2.12 ~ P2.16.

You can also directly set the parameters based on the data provided by the synchronous motor manufacturer.

P2.17	Encoder pulses per revolution	Factory setting	1024
	Setting range	1 ~ 65535	

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

P2.19	Encoder type		Factory setting	0
	Setting range	0	ABZ incremental encoder	
		1	Resolver	
		2	Reserve	

KM1000 can supports multiple types of encoder. Different PG cards are required for different types of encoder. Select the appropriate PG card for the encoder used. Any of the five encoder types is applicable to synchronous motor. Only ABZ incremental encoder and resolver are applicable to asynchronous motor.

After installation of the PG card is complete, set this parameter P2.19 and relative parameters properly based on the actual condition. Otherwise, the AC drive cannot run properly.

P2.21	A/B phase sequence of ABZ incremental encoder		Factory setting	0
	Setting range	0	Forward	
		1	Reserve	

This parameter is valid only for ABZ incremental encoder (P2.19 = 0) and is used to set the A/B phase sequence of the ABZ incremental encoder.

It is valid for both asynchronous motor and synchronous motor. The A/B phase sequence can be obtained through "Asynchronous motor complete auto-tuning" or "Synchronous motor no-load auto-tuning".

P2.22	Encoder installation angle	Factory setting	0.0°
	Setting range	0.0° ~ 359.9°	

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

It can be obtained through synchronous motor no-load auto-turning or with-load auto-tuning.

After installation of the synchronous motor is complete, the value of this parameter must be obtained

by motor auto-tuning. Otherwise, the motor cannot run properly.

P2.23	U, V, W phase sequence of UVW encoder		Factory setting	0
	Setting range	0	Forward	
		1	Reserve	
P2.24	UVW encoder angle offset		Factory setting	0.0°
	Setting range		0.0° ~ 359.9°	

These two parameters are valid only when the UVW encoder is applied to a synchronous motor. They can be obtained by synchronous motor no-load auto-tuning or with-load auto tuning.

After installation of the synchronous motor is complete, the values of these two parameters must be obtained by motor auto-tuning. Otherwise, the motor cannot run properly.

P2.25	Number of pole pairs of resolver	Factory setting	1
	Setting range	1 ~ 65535	

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

P2.26	Encoder wire-break fault detection time	Factory setting	0.0s
	Setting range	0.0s: operation 0.1s ~ 10.0s	

This parameter is used to set the time that a wire-break fault lasts. If it is set to 0.0s, the AC drive does not detect the encoder wire-break fault. If the duration of the encoder wire-break fault detected by the AC drive exceeds the time set in this parameter, the AC drive reports Err25.

P2.27	Auto-tuning selection		Factory setting	0
	Setting range	0	No auto-tuning	
		1	Asynchronous motor static auto-tuning	
		2	Asynchronous motor complete auto-tuning	
		11	Synchronous motor with-load auto-tuning	
		12	Synchronous motor no-load auto-tuning	

0: No auto-tuning Auto-tuning is prohibited.

1: Asynchronous motor static auto-tuning

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

Before performing static auto-tuning, properly set the motor type and motor nameplate parameters of P2.02 ~ P2.06 first. The AC drive will obtain parameters of P2.07 ~ P2.09 by static auto-tuning. Set this parameter to 1, and press RUN. Then, the AC drive starts static auto-tuning and display the frequency reference setting.

2: Asynchronous motor complete auto-tuning

To perform this type of auto-tuning, ensure that the motor is disconnected from the load. During the process of complete auto-tuning, the AC drive performs static auto-tuning first and then accelerates to 80% of the rated motor frequency within the acceleration time set in P0.08. The AC drive keeps running for a certain period and then decelerates to stop within deceleration time set in P0.09.

Before performing complete auto-tuning, properly set the motor type, motor nameplate parameters of P2.02 ~ P2.06, when P0.00 set for 2 performance close loop vector control mode, also need set "Encoder type" (P2.18) and "Encoder pulses per revolution" (P2.19) first.

The AC drive will obtain motor parameters of P2.07 ~ P2.11, "A/B phase sequence of ABZ incremental encoder" (P2.21) and vector control current loop PI parameters of P3.11 ~ P3.14 by complete auto-tuning.

Note: if set this function code for 2, (P0.01 must set for 0), when the AC Drive display LEATN and then press run button, AC Drive will performance auto tuning to stop .

It must check the P2.11 value after motor auto tuning, this value should be place within 1/3 ~ 1/2 of P2.06. if out of this range, please set it by manual.

11: Synchronous motor with-load auto-tuning

It is applicable to scenarios where the synchronous motor cannot be disconnected from the load. During with-load auto-tuning, the motor rotates at the speed of 10 PRM.

Before performing with-load auto-tuning, properly set the motor type and motor nameplate parameters of P2.02 ~ P2.06 first.

By with-load auto-tuning, the AC drive obtains the initial position angle of the synchronous motor, which is a necessary prerequisite of the motor's normal running.

Before the first use of the synchronous motor after installation, motor auto-tuning must be performed.

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

12: Synchronous motor no-load auto-tuning

If the synchronous motor can be disconnected from the load, no-load auto-tuning is recommended, which will achieve better running performance compared with with-load auto-tuning.

During the process of no-load auto-tuning, the AC drive performs with-load auto-tuning first and then accelerates to 80% of the rated motor frequency within the acceleration time set in P0.08. The AC drive keeps running for a certain period and then decelerates to stop within the deceleration time set in P0.09.

Before performing no-load auto-tuning, properly set the motor type, motor nameplate parameters of P2.12 ~ P2.16, "Encoder type" (P2.19) and "Encoder pulses per revolution" (P2.18) and "Number of pole pairs of resolver" (P2.25) first.

The AC drive will obtain motor parameters of P2.12 ~ P2.16 encoder related parameters of P2.21, P2.22, P2.23, P2.24 and vector control current loop PI parameters of P3.11 ~ P3.14 by no-load auto-tuning.

Note: when this code set for 12, press the RUN button, AC Drive will perform no-load auto tuning.

Note: Auto tuning performance only in keypad mode, that is P0.01 set for 0. It can't performance auto tuning in terminals mode.

During the AC Drive auto tuning process, it will display LETTN, and running indicator LED will be flash, and then the running indicator LED will be turn off.

P3. Motor Vector Control Parameters

Note: Group P3 is valid for vector control, and invalid for V/F control.

P3.00	Speed loop proportional gain 1	Factory setting	30
	Setting range	1 ~ 100	
P3.01	Speed loop integral time 1	Factory setting	0.50s
	Setting range	0.01s ~ 10.00s	
P3.02	Switchover frequency 1	Factory setting	5.00Hz
	Setting range	0.00 ~ P3.05	
P3.03	Speed loop proportional gain 2	Factory setting	15
	Setting range	0 ~ 100	
P3.04	Speed loop integral time 2	Factory setting	1.00s
	Setting range	0.01s ~ 10.00s	
P3.05	Switchover frequency 2	Factory setting	10.00Hz
	Setting range	P3.02 ~ maximum output frequency	

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

If the running frequency is less than or equal to "Switchover frequency 1" (P3.02), the speed loop PI parameters are P3. 00 and P3.01.

If the running frequency is equal to or greater than "Switchover frequency 2" (P3.05), the speed loop PI parameters are P3. 03 and P3. 04.

If the running frequency is between P3-02 and P3-05, the speed loop PI parameters are obtained from the linear switchover between the two groups of PI parameters, as shown in Figure 6-8.

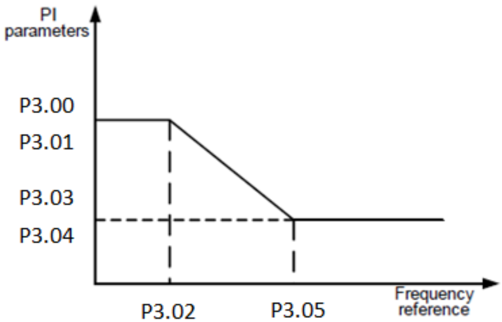


Figure 6-8 Relationship between running frequencies and PI parameters

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

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

The recommended adjustment method is as follows:

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

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

P3.06	Vector control slip gain	Factory setting	100%
	Setting range	50% ~ 200%	

In vector control mode, it is used to adjust speed stability accuracy of the motor. When the motor with load increasing, and runs at a very low speed, increase the value of this parameter; when load decrease, and runs at a very large speed, decrease the value of this parameter.

P3.07	Time constant of speed loop filter	Factory setting	0.000s
	Setting range	0.000s ~ 0.100s	

In the vector control mode, the output of the speed loop regulator is torque current reference. This parameter is used to filter the torque references. It need not be adjusted generally and can be increased in the case of large speed fluctuation. In the case of motor oscillation, decrease the value of this parameter properly.

If the value of this parameter is small, the output torque of the AC drive may fluctuate greatly, but the response is quick.

P3.08	Vector control over-excitation gain	Factory setting	64
	Setting range	0 ~ 200	

During deceleration of the AC drive, over-excitation control can restrain rise of the bus voltage to avoid the overvoltage fault. The larger the over-excitation gain is, the better the restraining effect is. Increase the over-excitation gain if the AC drive is liable to overvoltage error during deceleration. Too large over-excitation gain, however, may lead to an increase in output current. Therefore, set this parameter to a proper value in actual applications.

Set the over-excitation gain to 0 in applications of small inertia (the bus voltage will not rise during deceleration) or where there is a braking resistor.

P3.09	Torque upper limit source in speed control mode		Factory setting	0
	Setting range	0	P3.10 value	
		1	AI1	
		2	AI2	
		3	Potentiometer of keyad	
		4	PULSE trains （X5）	
		5	Communication	
		6	MIN(AI1,AI2)	
		7	MAX(AI1,AI2)	
P3.10	Digital setting of torque upper limit in speed control mode		Factory setting	150.0%
	Setting range		0.0% ～200.0%	

In the speed control mode, the maximum output torque of the AC drive is restricted by P3-.09. If the torque upper limit is analog, pulse or communication setting, 100% of the setting corresponds to the value of P3.10, and 100% of the value of P3.10 corresponds to the AC drive rated torque.

For details on the AI1, AI2, and potentiometer of keypad setting, see the description of the AI curves in group (see P5.31 curve selecting), the pulse trains setting see the P5.26 ~ P5.30 introduction.

P4. V/F Control Parameters

This group valid only for V/F control, disable for vector control.

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

P4.00	V/F curve setting		Factory setting	0
	Setting range	0	Linear V/F	
		1	Multi-point V/F	
		2	Square V/F	
		3	V/F separation mode 1	
		4	V/F separation mode 2	

0: Linear V/F

It is applicable to common constant torque load. Output voltage is zero, when frequency output is 0. The output voltage is rated motor voltage, when output rated frequency. it is able to get any VF curve through P4.06 ~ P4.11 parameters points setting, see Fig. 6-10.

1: Multi-point V/F

It is applicable to special load such as dehydrator and centrifuge. Output voltage is zero, when frequency output is 0. The output voltage is rated motor voltage, when output rated frequency.

2: Square V/F

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

3: V/F separation mode 1

The output frequency and output voltage is independent. The output frequency is programmed by frequency source, and output voltage is decide by P4.12 (VF separation voltage).

4: VF separation mode 2.

In this mode, the output voltage and frequency have a proportional relationship, but this relationship is set by voltage source P4.12, and this relationship also related to the rated motor voltage and rated motor frequency in Group P2.

Assume that the voltage source input is X (0 ~ 100%), the relationship between V and F is:

V/F=2*X* (Rated motor voltage)/(Rated motor frequency)

Note: this V/F separation is applicable for various of variable frequency power supply source, but user should pay more attention for this parameters adjusting. Because the improperly parameters setting might cause machine damage.

P4.01	Torque boost	Factory setting	0.0
	Setting range	0.0% ~ 30%	
P4.02	Cut-off frequency of torque boost	Factory setting	50.00Hz
	Setting range	0.00Hz ~ Maximum frequency	

To compensate the low frequency torque characteristics of V/F control, you can boost the output voltage of AC drive at low frequency by modifying F4-01. If the torque boost is set to too large, the motor may overheat, and the AC drive may suffer over current.

If the load is large and the motor startup torque is insufficient, increase the value of P4-01.

If the load is small, decrease the value of P4-01. If it is set to 0.0, the AC drive performs automatic torque boost. In this case, the AC drive automatically calculates the torque boost value based on motor parameters including the stator resistance. P4-02 specifies the frequency under which torque boost is valid. Torque boost becomes invalid when this frequency is exceeded, as shown in the following figure.

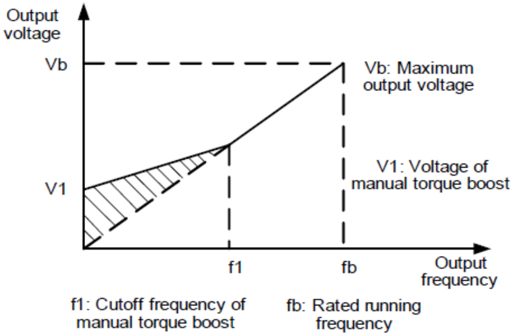


Figure 6-9 Manual torque boost

P4.03	V/F slip compensation gain	Factory setting	0.0%
	Setting range	0% ~ 200.0%	

This parameter is valid only for the asynchronous motor.

It can compensate the rotational speed slip of the asynchronous motor when the load of the motor increases, stabilizing the motor speed in case of load change. If this parameter is set to 100%, it indicates that the compensation when the motor bears rated load is the rated motor slip. The rated motor slip is automatically obtained by the AC drive through calculation based on the rated motor frequency and rated motor rotational speed in group P2.

Generally, if the motor rotational speed is different from the target speed, slightly adjust this parameter.

P4.04	V/F over-excitation gain	Factory setting	64
	Setting range	0 ~ 200	

During deceleration of the AC drive, over-excitation can restrain rise of the bus voltage, preventing the overvoltage fault. The larger the over-excitation is, the better the restraining result is.

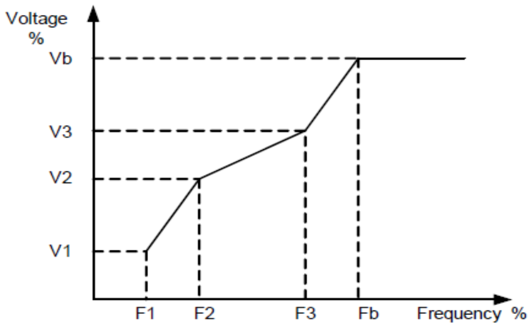
Increase the over-excitation gain if the AC drive is liable to overvoltage error during deceleration. However, too large over-excitation gain may lead to an increase in the output current.

Set P4-09 to a proper value in actual applications. For light load application, which will not occur over voltage alarm, set it for 0. Also in application which connect braking resistor, set it for 0.

P4.05	Multi-point V/F frequency 1 (F1)	Factory setting	0.00Hz
	Setting range	0.00Hz ~ P4.07	
P4.06	Multi-point V/F voltage 1 (V1)	Factory setting	0.0%
	Setting range	0.0% ~ 100.0%	
P4.07	Multi-point V/F frequency 2 (F2)	Factory setting	0.00Hz

	Setting range	P4.05 ~ P4.09	
P4.08	Multi-point V/F voltage 2 (V2)	Factory setting	0.0%
	Setting range	0.0% ~ 100.0%	
P4.9	Multi-point V/F frequency 3 (F3)	Factory setting	0.00Hz
	Setting range	P4.07 ~ motor rated frequency (P2.03)	
P4.10	Multi-point V/F voltage 3 (V3)	Factory setting	0.0%
	Setting range	0.0% ~ 100.0%	

P4.05 ~ P4.10, these 6 parameters are used to define the multi-point V/F curve.
The multi-point V/F curve is set based on the motor's load characteristic. The relationship between voltages and frequencies is: V1 < V2 < V3, F1 < F2 < F3
At low frequency, higher voltage may cause overheat or even burnt out of the motor and over current stall or over current protection of the AC drive.
Figure 6-10 Setting of multi-point V/F curve



V1-V3： V1-V3: 1st, 2nd and 3rd voltage percentages of multi -point V/F
F1-F3: 1st, 2nd and 3rd frequency percentages of multi -point V/F
Vb： motor rated voltage　　Fb: motor rated frequency
Fig 6-10 Setting of multi-point V/F curve

P4.11	Voltage source for V/F separation		Factory setting	0
	Setting range	0	Digital reference （P4.13）	
		1	AI1	
		2	AI2	
		3	Potentiometer of keypad	
		4	PULSE trains （X5）	
		5	Multiple step terminals	
		6	Simple LC	
		7	PID	
		8	Communication	
		100.0% corresponding to rated voltage of motor P2.05		
P4.12	Voltage digital reference		Factory setting	0V

	for V/F separation		
	Setting range	0V ~ motor rated voltage	

V/F separation is generally applicable to scenarios such as induction heating, inverse power supply and motor torque control.
If V/F separated control is enabled, the output voltage can be set in P4.12 or by means of analog, multi-reference, simple PLC, PID or communication. If you set the output voltage by means of non-digital setting, 100% of the setting corresponds to the rated motor voltage. If a negative percentage is set, its absolute value is used as the effective value.
0: digital reference (P4.12), the voltage is set by P4.12.
1: AI1reference, the voltage is set by analog signal.
2: AI2 reference, the voltage is set by analog signal.
3: Potentiometer of keypad,
4: PULSE trains （X5） , the voltage is set by pulse trains terminal. Range of voltage is 9V ~ 30V, frequency range is 0kHz ~ 100kHz.
5: Multiple step terminals.
When the voltage source is set by multiple step terminals, if need to set P5 ground and PA group to determine the relationship of signal reference to corresponding voltage reference. PA group parameters is present by percent, 100% is corresponding to motor rated voltage.
6: Simple PLC, when the voltage source is simple PLC, it need to set PA group parameters to determine the output voltage.
7: Process PID, voltage output determine by PID close loop, see P9 and PID description in deital.
8: Communication, the voltage is set by upper controller through communication.
The voltage source for V/F separation is set in the same way as the frequency source. For details, see P0-03. 100.0% of the setting in each mode corresponds to the rated motor voltage. If the corresponding value is negative, its absolute value is used.

P4.13	Voltage rise time of V/F separation	Factory setting	0.0s
	Setting range	0.0s ~ 1000.0s	

VF rise time of V/F separation used to limit the time requested from 0V to rated motor voltage.

P5. Input terminals group

The KM series provides 5 DI terminals (DI5 can be used for high-speed pulse input) and two analog input (AI) terminals. The optional extension card provides another 5 DI terminals (DI6 to DI10).

Function code	Name	Factory setting	Remark
P5.00	X1 terminals function define	1 （forward）	standard
P5.01	X2 terminals function define	2 （reverse）	standard
P5.02	X3 terminals function define	4 （Jog forward）	standard
P5.03	X4 terminals function define	1 （Multi-reference terminal 1）	standard
P5.04	X5 terminals function define	13 （Multi-reference terminal 2 ）	standard
P5.05	X6 terminals function define (extension)	0	extension

P5.06	X7 terminals function define (extension)	0	extension
P5.07	X 8 terminals function define (extension)	0	extension
P5.08	X 9 terminals function define (extension)	0	extension
P5.09	X 10 terminals function define (extension)	0	extension

The following table lists the functions available for the XI terminals.

Functions of XI terminals functions description.

Set code	Function	Description
0	No operation	Set 0 for reserved terminals to avoid malfunction.
1	Forward running (FWD)	The terminal is used to control forward or reverse RUN 2 Reverse RUN (REV) of the AC drive
2	Reverse running (REV)	
3	3 line control mode	The terminal determines three-line control of the AC drive. For details, see the description of F0.18.
4	Forward Jog (FJOG)	FJOG indicates forward JOG running, while RJOG indicates reverse JOG running. The JOG frequency, acceleration time and deceleration time are described respectively in P1.12, P8.01 and P8.02
5	Reverse Jog (RJOG)	
6	Cost to stop(free stop)	The AC drive blocks its output, the motor coasts to rest and is not controlled by the AC drive. It is the same as coast to stop described in P1.05
7	Fault reset (RESET)	The terminal is used for fault reset function, the same as the function of RESET key on the operation panel. Remote fault reset is implemented by this function.
8	Normally open (NO) input of external fault	If this terminal becomes ON, the AC drive reports Err18 and performs the fault protection action.
9	Frequency UP	If the frequency is determined by external terminals, the terminals with the two functions are used as increment and decrement commands for frequency modification. When the frequency source is set by digital reference, it using to adjust frequency. P0.03 set for 0 or 1.
10	Frequency DOWN	

Set code	Function	Description
11	UP/DOWN reset (terminals, and keypad)	When frequency set by digital reference, this terminal can use to clear UP/DOWN or UP/DOWN button of keypad changing value, make P0-07.
12	Multi-reference terminal 1	The setting of 16 speeds or 16 other references can be implemented through combinations of 16 states of these four terminals.
13	Multi-reference terminal 2	
14	Multi-reference terminal 3	
15	Multi-reference terminal 4	
16	Terminal 1 for acceleration/ deceleration time selection	Totally 4 groups of acceleration/deceleration time can be selected through combinations of 2 states of these 2 terminals. See tale2.
17	Terminal 2 for acceleration/ deceleration time selection	
18	Normally open (NC) input of external fault	If this terminal becomes ON with external fault input, the AC drive reports Err18 and performs the fault protection action.
19	External stop terminal	Can use this terminal to stop AC Drive when in keypad control mode, this function equipment to STOP button of keypad.
20	Frequency source switchover	Use to switchover difference frequency source according to frequency source selection code function (P0.17)
21	Pulse trains frequency input (only valid for X5).	X5 takes as for pulse trains input terminal function.
22	Switchover between main frequency source X and preset frequency	After this terminal becomes ON, the frequency source X is replaced by the preset frequency set in P0.08.
23	Switchover between auxiliary frequency source	After this terminal is enabled, the frequency source Y is replaced by the preset frequency set in P0.07 .

Set code	Function	Description
	Y and preset frequency	
24	Command source switchover terminal	If the command source is set to terminal control （P0.01=1） , this terminal is used to perform switchover between terminal control and keypad control. If the command source is set to communication control （P0.01=2, this terminal is used to perform switchover between communication control and keypad control
25	PID pause	PID is invalid temporarily. The AC drive maintains he current frequency output without supporting PID djustment of frequency source.
26	Reverse PID action direction	After this terminal becomes ON, the PID action direction is reversed to the direction set in P0.03..
27	PID integral pause	After this terminal becomes ON, the integral adjustment function pauses. However, the proportional and differentiation adjustment functions are still valid.
28	PID parameter switchover	If the PID parameters switchover performed by means of XI terminal (P9.18=1), the PID parameters are P9.05 ~ P9.07 when the terminal becomes OFF; the PID parameters are F P9.15 ~ P9.17. when this terminal becomes ON.
29	Counter input	This terminal is used to count pulses.
30	Counter reset	This terminal is used to clear the counter status.
31	Length count input	This terminal is used to count the length.
32	Length reset	This terminal is used to clear the length.
33	Timer is activate	inner timer start to timing
34	Swing frequency operation pause	The AC drive outputs the central frequency, and the swing frequency function pauses.
35	Reverse	
36	Acceleration /deceleration forbidden	To protection AC Drive don't effected by extern signal except the stop command, to maintain current frequency output.
37	DC braking immediately	When this terminal is enable, AC Drive will switch to DC braking state.
38	Command control terminals switchover	Use to switchover command control mode between terminals and communication control. If current control is terminal control, it will change to communication mode once this terminal is activate, Vise Versa.

Set code	Function	Description
39	Frequency changing enable	When this function is enable, the AC drive will not response to change when frequency has been modified, until this terminal is disable.
40	Motor selection terminal	Enable to 2 motor parameters group switching, see table 3 in detail.
41	Speed control/Torque control switchover	This terminal enables the AC drive to switch over between speed control and torque control. When this terminal becomes OFF, the AC drive runs in the mode set in H0.00. When this terminal becomes ON, the AC drive switches over to the other control mode.
42	Running pause.	AC drive decelerate to stop but all running status and parameters will be record, such as PLC parameters, swing frequency, PID parameters. Ac drive will restore to before stop running status once this terminal signal is disable.
43	Reverse	
44	Reverse	
45	Reverse	
46	Torque control is forbidden	Forbidden enter to torque control mode, only speed control mode is valid.
18	Normally closed (NC) input of external fault	After this terminal becomes ON, the AC drive reports Err18 and stops.
47	Emergency stop	When this terminal becomes ON, the AC drive stops within the shortest time. During the stop process, the current remains at the set current upper limit. This function is used to satisfy the requirement of stopping the AC drive in emergency state.
48	External STOP terminal 2	In any control mode (operation panel, terminal or communication), it can be used to make the AC drive decelerate to stop. In this case, the deceleration time is deceleration time 4.
49	Deceleration DC braking	When this terminal becomes ON, the AC drive decelerates to the starting frequency of stop DC braking and then switches over to DC braking state.
50	Clear the current running time	When this terminal becomes ON, the AC drive's current running time is cleared. This function must be supported by P8.41 and P8.56.

Set code	Function	Description
52	No reversal	When this terminal is valid, all reverse rotation commands are prohibited and zero-speed operation is maintained, and all forward rotation signals are unrestricted.
53	Forward rotation prohibited	When this terminal is valid, all forward rotation commands are prohibited and zero-speed operation is maintained, and all reverse rotation signals are unrestricted.
54	Simple PLC pause	During the execution of the PLC, when the terminal function is valid, the program is paused and runs at the current speed segment. After the function is cancelled, the simple PLC continues to run.

Attached table 1: Multi-reference terminal function description

The 4 multi-reference terminals have 16 state combinations, corresponding to 16 reference values, as listed in the following table. See below list in detail.

K4	K3	K2	K1	Command setting	Corresponding code
OFF	OFF	OFF	OFF	multi-reference 1	PA.00
OFF	OFF	OFF	ON	multi-reference 2	PA.01
OFF	OFF	ON	OFF	multi-reference 3	PA.02
OFF	OFF	ON	ON	multi-reference 4	PA.03
OFF	ON	OFF	OFF	multi-reference 5	PA.04
OFF	ON	OFF	ON	multi-reference 6	PA.05
OFF	ON	ON	OFF	multi-reference 7	PA.06
OFF	ON	ON	ON	multi-reference 8	PA.07
ON	OFF	OFF	OFF	multi-reference 9	PA.08
ON	OFF	OFF	ON	multi-reference 10	PA.09
ON	OFF	ON	OFF	multi-reference 11	PA.10
ON	OFF	ON	ON	multi-reference 12	PA.11
ON	ON	OFF	OFF	multi-reference 13	PA.12
ON	ON	OFF	ON	multi-reference 14	PA.13
ON	ON	ON	OFF	multi-reference 15	PA.14
ON	ON	ON	ON	multi-reference 16	PA.15

When frequency source set as Multi step reference. The 100% of function code PA.00 ~ PA.15 corresponding to P0.04.

Attached table 2. Acceleration, deceleration time selection by terminals.

Terminals 1	Terminals 2	Acceleration, / deceleration time selection	Corresponding parameters
OFF	OFF	Terminals 1	P0.08, P0.09
OFF	ON	Terminals 2	P8.03, P8.04
ON	OFF	Terminals 3	P8.05, P8.06
ON	ON	Terminals 4	P8.07, P8.08

Attached table 3: Applicable motor selection function.

terminals 2	terminals 2	Motor selection	Corresponding parameters
OFF	OFF	Motor 1	P2、P3 group
OFF	ON	Motor 2	H2 group

P5.10	X terminals filter time	Factory setting	0.010s
	Setting range	0.000s ~ 1.000s	

To set X terminals software filter time P5.10. In some application cases, which input terminals is easy to interference cause malfunction, user can increase this value to improve anti-interference capability. However, increase of the X filter time will slow the response of detection. Set this parameter properly based on actual conditions.

P5.11	AI curve 1 minimum input	Factory setting	0.20V
	Setting range	-10.00V ~ P5.13	
P5.12	Corresponding setting of AI curve 1 minimum input	Factory setting	0.0%
	Setting range	-100.00% ~ 100.0%	
P5.13	AI curve 1 maximum input	Factory setting	10.00V
	Setting range	P5.11 ~ 10.00V	
P5.14	Corresponding setting of AI curve 1 maximum input	Factory setting	100.0%
	Setting range	-100.00% ~ 100.0%	
P5.15	AI1 filter time	Factory setting	0.10s
	Setting range	0.00s ~ 10.00s	

These parameters are used to define the relationship between the analog input voltage and the corresponding setting. When the analog input voltage exceeds the maximum value (P5.13), the maximum value is used. When the analog input voltage is less than the minimum value (P5.11), the value set in P5.32 (Setting for AI less than minimum input) is used, or take it as for 0.0%.

When the analog input is current input, 1 mA current corresponds to 0.5 V voltage.

P5.15 (AI1 filter time) is used to set the software filter time of AI1. If the analog input is liable to interference, increase the value of this parameter to stabilize the detected analog input. However, increase of the AI filter time will slow the response of analog detection. Set this parameter properly based on actual conditions.

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

Two typical setting examples are shown in the following figure.

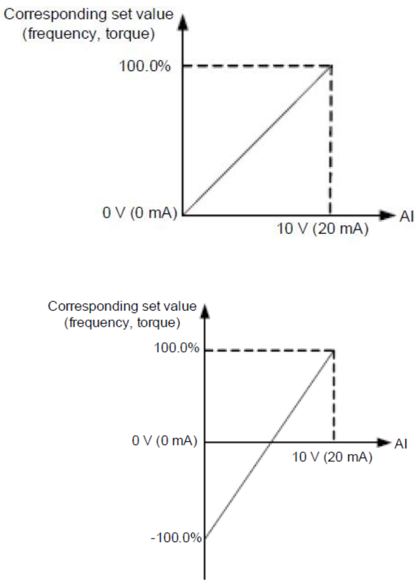


Fig. 6-11 Corresponding relationship between analog input and set values

P5.16	AI curve 2 minimum input	Factory setting	0.20V
	Setting range	0.00V ~ P5.18	
P5.17	Corresponding setting of AI curve 2 minimum input	Factory setting	0.0%
	Setting range	-100.00% ~ 100.0%	
P5.18	AI curve2 maximum input	Factory setting	10.00V
	Setting range	P5.16 ~ 10.00V	
P5.19	Corresponding setting of AI curve 2 maximum input	Factory setting	100.0%
	Setting range	-100.00% ~ 100.0%	
P5.20	AI curve 2 AI1 filter time	Factory setting	0.10s
	Setting range	0.00s ~ 10.00s	

The method of setting AI2 functions is similar to that of setting AI1 function.

P5.21	Potentiometer of keypad minimum input	Factory setting	0.20V

	Setting range	0.00V ~ P5.23	
P5.22	Corresponding setting of potentiometer of keypad minimum input	Factory setting	0.0%
	Setting range	-100.00% ~ 100.0%	
P5.23	Potentiometer of keypad maximum input	Factory setting	10.00V
	Setting range	P5.21 ~ 10.00V	
P5.24	Corresponding setting of potentiometer of keypad maximum input	Factory setting	100.0%
	Setting range	-100.00% ~ 100.0%	
P5.25	Potentiometer of keypad filter time	Factory setting	0.10s
	Setting range	0.00s ~ 10.00s	
P5.26	Pulse trains minimum input	Factory setting	0.00kHz
	Setting range	0.00kHz ~ P5.28	
P5.27	Corresponding setting of Pulse trains minimum input	Factory setting	0.0%
	Setting range	-100.00% ~ 100.0%	
P5.28	Pulse trains maximum input	Factory setting	50.00kHz
	Setting range	P5.26 ~ 10.00V	
P5.29	Corresponding setting of Pulse trains maximum input	Factory setting	100.0%
	Setting range	-100.00% ~ 100.0%	
P5.30	Pulse trains filter time	Factory setting	0.10s
	Setting range	0.00s ~ 10.00s	

P5.32	AI less than minimum input setting selection		Factory setting	000
	Setting range	Unit's digit	AI 1less than minimum input setting selection	
		0	AI less than minimum input setting selection	
		1	0.0%	
		Ten's digit	AI 2 less than minimum input setting selection(0 ~ 1, as same as above)	
		Hundred's digit	Potentiometer less than minimum input setting selection(0 ~ 1, as same as above)	

This parameter is used to determine the corresponding setting when the analog input voltage is less than the minimum value. The unit's digit, ten's digit and hundred's digit of this parameter respectively correspond to the setting for AI2, AI2 and potentiometer.

If the value of a certain digit is 0, when analog input voltage is less than the minimum input, the corresponding setting of the minimum input （P5.12、P5.17、P5.22）is used.

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

P5.33	X1 response delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	
P5.34	X2 response delay time time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	
P5.35	X2 response delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	

These parameters are used to set the response delay time of the AC drive when the status of XI terminals changes. Currently, only X1, X2 and X3 support the response delay time function.

P5.36	XI valid mode selection 1		Factory setting	00000
	Setting range	Unit's digit	X1 terminal valid state setting	
		0	High level valid	
		1	Low level valid	
		Ten's digit	X2 terminal valid state setting （0 ~ 1， as above)	
		hundred's digit	X3 terminal valid state setting （0 ~ 1， as above)	
		Thousand's digit	X4 terminal valid state setting （0 ~ 1， as above)	
		Ten thousand's digit	X5 terminal valid state setting （0 ~ 1， as above)	

These parameters are used to set the valid mode of XI terminals.

0: High level valid, The XI terminal is valid when being connected with COM, and invalid when being

disconnected from COM.

1: Low level valid The XI terminal is invalid when being connected with COM, and invalid when being

disconnected from COM.

P6. Output terminals group

The KM1000 series AC drive provides 1 analog output terminal, 1 multi-function digital relay output terminal, 1 FM terminal (used for high-speed pulse output or open-collector switch signal output) as standard.

KM1000 AC drive provides 1 multi-function analog output terminal. All the digital output terminal function can be defined by function code.

P6.00	FM terminal output mode		Factory setting	0
	Setting range	0	Pulse trains output (FMP)	
		1	digital output (FMR)	

The FM terminal is programmable multiplexing terminal. It can be used for high-speed pulse output (FMP), with maximum frequency of 100 kHz. Refer to F6-06 for relevant functions of FMP. It can also be used as open collector switch digital signal output (FMR).

P6.01	FMR function (open-collector output terminal)	Factory setting	0
P6.02	Relay function (T/A-T/B-T/C)	Factory setting	3
P6.03	Extension card relay function (TA1-TB1-TC1)	Factory setting	0
P6.04	DO1 function selection (open-collector output terminal)	Factory setting	1
P6.05	Reserve		

Multiple functions of output terminals description as following.

Setting value	**Function**	**description**
0	No output	The terminal has no function, set it for 0 to prevent malfunctoin
1	AC drive running	When the AC drive is running and has output frequency (can be zero), the terminal becomes ON.
2	Frequency reached	refer to function code P8.34 description
3	Fault output (fault and stop)	When the AC drive occurs fault and stop, the terminal becomes ON.
4	Frequency-level detection FDT1 output	Refer to function code P8.32, P8.33 description
5	Frequency-level detection FDT2 output	Refer to function code P8.35, P8.36 description
6	0 speed running (no output at stop)	If the AC drive is running with the output frequency of 0, the terminal becomes ON. If the AC drive is in the stop state, the terminal becomes OFF.

Setting value	Function	description
7	0 speed running 2(stop with output)	When Ac drive is running and output 0Hz, the terminals signal is ON. even in stop state, the terminal signal also is ON
8	upper limit frequency reached	When the running frequency reached to upper limit frequency, terminals sent out ON signal.
9	lower limit frequency reached (no output at stop)	When the running frequency reached to lower limit frequency, terminals signal is ON, in stop state, the signal is OFF.
10	Frequency 1 reached	Refer to the descriptions of P8.37,P8.38
11	Frequency 2 reached	Refer to the descriptions of P8.39, P8.40
12	Reserve	
13	Reserve	
14	Timing reached	If the timing function (P8.43) is valid, the terminal becomes ON after the current running time of the AC drive reaches the set time
15	Set count value reached	When the value reach to Pb.08 set value, sent out ON signal.
16	Designated count value reached	When the counter reached to Pb.09, sent out ON signal, refer to Pb group for counting function.
17	Length reached	The terminal becomes ON when the detected actual length exceeds the value set in Pb-05.
18	under voltage status output t	If the AC drive is in under voltage state, the terminal becomes ON.
19	motor overload pre-alarm	Sent out ON signal according to overload pre-warning setting value before motor over load protection, see the motor overload function code setting PC.00 ~ PC.02.
20	AC drive overload pre-warning	The terminal becomes ON 10s before the AC drive overload protection action is performed.
21	Frequency limited	If the set frequency exceeds the frequency upper limit or lower limit and the output frequency of the AC drive reaches the upper limit or lower limit, the terminal becomes ON.

Setting value	Function	description
22	Torque limited	In speed control mode, if the output torque reaches the torque limit, the AC drive enters the stall protection state and meanwhile the terminal becomes ON.
23	Ready for RUN	When the AC drive main circuit and control circuit become stable, and the AC drive detects no fault and is ready for RUN, the terminal becomes ON.
24	AI1>AI2	When the input of AI1 is larger than the input of AI2, the terminal becomes ON.
25	AI1input over range	When the analog input AI1 large than P8.53(AI1 input upper limit protection) or less than P8.52 (AI1 input lower limit protection), it will sent out ON signal.
26	lower frequency reached (stop also sent output)	When the running frequency reached lower limit frequency, sent out ON signal, still keep ON when stop status.
27	Current running time reach	AC Drive runs over P8.56 setting value from this time, the terminal sent out ON.
28	Reserve	
29	Alarm output	When a fault happens, and this alarm action allow to continue running, AC Drive sent out alarm.
30	current arrive 1 output	Refer to the descriptions of P8.48 and P8.49
31	current arrive 2 output	Refer to the descriptions of P8.50 and P8.51
32	missing load	When AC Drive missing load, sent ON signal.
33	Reverse	
34	Module temperature reached	If the heat sink temperature of the AC Drive module (P7.10) reaches the set module temperature threshold (P8.55), the terminal becomes ON
35	Software current limit exceeded	Refer to the descriptions of P8.46 and P8.47.
36	Reverse running	When AC Drive change to reverse running, sent out ON signal
37	Motor overheat warning	If the motor temperature reaches the temperature set in PC.59 (Motor overheat warning threshold), the terminal becomes ON. You can view the motor temperature by using C0-34.

<table>
<tr><th>Setting value</th><th>Function</th><th>description</th></tr>
<tr><td>38</td><td>PLC circle running finish</td><td>When PLC finished a circle running, sent out a pulse signal with 250ms width</td></tr>
<tr><td>39</td><td>Communication control</td><td>
<table>
<tr><td>BIT4</td><td>BIT3</td><td>BIT2</td><td>BIT1</td><td>BIT0</td></tr>
<tr><td>AO1 output</td><td>Relay 2</td><td>Relay 1</td><td>D02 output</td><td>D01 output</td></tr>
</table>
</td></tr>
</table>

P6.06	FMP output function selection (pulse trains output)	Factory setting	0
P6.07	AO1 output function selection	Factory setting	0
P6.08	AO2 output function selection	Factory setting	1

The output pulse frequency of the FMP terminal ranges from 0.01 kHz to "Maximum FMP utput frequency" (P6.09). The value of P6.09 is between 0.01 kHz and 100.00 kHz.
The output range of AO1 and AO2 is 0–10 V or 0–20 mA. The relationship between pulse and analog output ranges and corresponding functions is listed in the following table.

Setting value	Function	Range (Corresponding to Pulse or Analog output Range 0.0%–100.0%)
0	Running frequency	0 ~ maximum frequency
1	Frequency reference	0 ~ maximum frequency
2	Output current	0 ~ 2 times motor current
3	Output torque (absolute value)	0 ~ 2 times rated motor torque
4	Output power	0 ~ 2 times rated power
5	Output voltage	0 0 to 1.2 times of rated AC drive voltage
6	PULSE train input	0.01kHz ~ 100.00kHz
7	AI1	-10V ~ 10V
8	AI2	0V ~ 10V （ or0mA ~ 20mA）
9	Potentiometer of keypad	0V ~ 10V
10	Length	0 ~ maximum length
11	Count value	0 ~ maximum count
12	Communication setting	0.0% ~ 100.0%
13	Motor rotational speed	0 to rotational speed corresponding to maximum output frequency
14	Output current	0.0A ~ 1000.0A
15	Output voltage	0.0V ~ 1000.0V

16	Output torque (real value)	-2 times of rated motor torque to 2 times of rated motor torque

P6.09	FMP output maximum frequency	Factory setting	50.00
	Setting range	0.01kHz ~ 100.00kHz	

If the FM terminal is used for pulse output, this parameter is used to set the maximum frequency of pulse output.

P6.10	AO1 offset coefficient	Factory setting	0.0%
	Setting range	-100.0% ~ +100.0%	
P6.11	AO1 gain	Factory setting	1.00
	Setting range	-10 ~ +10	
P6.12	Extension card AO2 offset coefficient	Factory setting	0.0%
	Setting range	-100.0% ~ +100.0%	
P6.13	Extension card AO2 gain	Factory setting	1.00
	Setting range	-10 ~ +10	

Above parameters are used to correct the zero drift of analog output and the output amplitude deviation. They can also be used to define the desired AO curve.

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

The zero offset coefficient 100% of AO1 and AO2 corresponds to 10 V (or 20 mA). The standard output refers to the value corresponding to the analog output of 0 to 10 V (or 0 to 20 mA) with no zero offset or gain adjustment.

For example, if the analog output is used as the running frequency, and it is expected that the output is 0 V when 0 frequency, output maximum frequency when output 5V, should set gain for 0.5, and 0 offset set of 0.0%.

If analog output is running frequency, expect to output 0 frequency when 2V output, maximum frequency when output 8V, the gain should set for 1.5, and 0 offset shall be set to 75%.

P6.14	FMR digital output delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	
P6.15	Relay 1 output ON delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	
P6.16	(extension) Relay 1 output ON delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	
P6.17	DO1 output ON delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	

P6.18	(extension) DO2 output delay ON time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	

These parameters are used to set the delay time of output terminals FMR, relay 1, relay 2, DO1 and DO2 from status change to actual output.

P6.19	DO valid mode selection		Factory setting	00000
	Setting range	Unit's digit	FMR valid mode	
		0	Positive logic	
		1	Negative logic	
		Ten's digit	Relay 1 valid mode(0 ~ 1, as above)	
		Hundred's digit	Relay 2 valid mode(0 ~ 1, as above)	
		Thousand's digit	DO1 terminal valid mode （0 ~ 1， as above)	
		Ten thousand's digit	DO2 terminal valid mode （0 ~ 1， as above）	

It is used to set the logic of output terminals FMR, relay 1, relay 2, DO1 and DO2.

0: Positive logic

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

1: Positive logic

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

P6.20	FMR output OFF delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	
P6.21	Relay 1 output OFF delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	
P6.22	Extension Relay 2 output OFF delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	
P6.23	DO1 output OFF delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	
P6.24	Extension DO2 output OFF delay time	Factory setting	0.0s
	Setting range	0.0s ~ 3600.0s	

Use it set signal OFF relay time of output terminal FMR, relay 1, relay 2, DO1 and DO2.

P7. Keypad operation and Display

P7.00	User password	Factory setting	0
	Setting range	0 ~ 65535	

Set P7.00 with none zero number for password, it will activate password protection function. if press PRG, it will display "-----". The user need to input correct password to enter AC Drive, otherwise it can't access.

Set P7.00 for 00000to reset password to make it disable.

P7.01	Function parameters display selection	Factory setting	01
	Setting range	Unit digit	C group parameter select to display
		0	No display
		1	Display
		Ten digit	C group parameter select to display
		0	No display
		1	Display

If need to access to set H group parameters or review C group parameter, please set this parameter.

H is advanced applications group parameter C group is monitor parameters.

P7.03	Function code allow to modify	Factory setting	0
	Setting range	0	Allow to modify
		1	Forbidden modify

If set for 1, the parameter can't change to avoid malfunction. If need to modify parameters, please set it for 0 first.

P7.04	JOG key function selection	Factory setting	3
	Setting range	0	JOG invalid
		1	Switchover between keypad control and remote control (terminals or communication control mode)
		2	Forward/reverse switchover
		3	Forward JOG
		4	Reverse JOG

Jog is multiple function key, user can select function through JOG key. It is valid during stop and running state.

0: this key is invalid.

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

2: Switchover between forward rotation and reverse rotation

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

3: Forward JOG

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

4: Reverse JOG

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

P7.05	STOP/RESET key function		Factory setting	1
	Setting range	0	STOP/RESET key enabled only in keypad control	
		1	STOP/RESET key enabled in any operation mode	

P7.06	LED running display parameter 1	Unit digit： Bit0: Running frequency Bit1: Output current Bit2: Output voltage Bit3: Machine speed display Ten digit： Bit0: DC bus voltage Bit1: Frequency reference Bit2: counting value Bit3： Length value	Hundred digit： Bit0： X input terminals state Bit1： DO output terminals state Bit2： AI1 Voltage Bit3： AI2 Voltage Thousand digit： Bit0： Reverse Bit1： PID reference Bit2： Output power Bit3： Output torque	33	☆
		If need display above mention parameters, set the corresponding bit to 1, and set P0.06 to the hexadecimal equivalent of this binary number.			
P7.07	LED running display parameter 2	Unit digit： Bit0： linear velocity Bit1： PID feedback Bit2： PLC stage Bit3： PLUSE input frequency Ten digit： Bit0： current power on time Bit1： current running time	Hundred digit Bit0： auxiliary frequency Y Bit1： encoder feedback Bit2： actual feedback Bit3： AI1 before revise voltage Thousand digit： Bit0： AI1 before revise voltage Bit1： torque reference Bit2： PLUSE input frequency	0	☆

		Bit2： remain running time Bit3： main frequency ref. Bit3： communication		
		If need display above mention parameters, set the corresponding bit to 1, and set P0.07 to the hexadecimal equivalent of this binary number.		

These two parameters are used to set the parameters that can be viewed when the AC drive is in the running state. You can view a maximum of 32 running state parameters that are displayed from the lowest bit of F7-06.

P7.08	LED display parameters in stop	Unit digit： Bit0: frequency reference. Bit1: DC bus voltage Bit2: AI1 voltage Bit3: AI2 voltage Ten digit： Bit0: Reserve Bit1: Counting value Bit2: Length Bit3: machine speed Hundred digit： Bit0: PID reference Bit1: X terminal state Bit2： D0 state	33	☆
		If a parameter needs to be displayed in stop mode, set the corresponding bit to 1, and set P7.08 to the hexadecimal equivalent of this binary number.		

Setting method refer to 4.3 of chapter 4 description

P7.09	Machine speed display coefficient	Factory setting	1.0000
	Setting range	0.0001 ~ 6.5000	

This parameter is used to adjust the relationship between the output frequency of the AC drive and the machine speed. For details, see the description of P7.15.

P7.10	Heat sink temperature of AC Drive module	Factory setting	--

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

P7.12	Accumulative running time	Factory setting	Actual value

It is used to display the accumulative running time of the AC drive.

P7.15	Number of decimal places for load speed display		Factory setting	
	Setting range	0	0 decimal place	
		1	1 decimal place	
		2	2 decimal places	
		3	3 decimal places	

P7.15 is used to set the number of decimal places for machine speed display. The following gives an example to explain how to calculate the machine speed: Assume that P7.09 (Load speed display coefficient) is 2.000 and P7.15 is 2 (2 decimal places). When the running frequency of the AC drive is 40.00 Hz, the machine speed is 40.00 x2.000 = 80.00 (display of 2 decimal places).
If the AC drive is in the stop state, the load speed is the speed corresponding to the set frequency, namely, "set load speed". If the set frequency is 50.00 Hz, the load speed in the stop state is 50.00 x 2.000 = 100.00 (display of 2 decimal places).

P8. Auxiliary Functions

P8.00	Acceleration/deceleration time unit	Factory setting	1
	Setting range	0: 1s 1: 0.1s 2: 0.01s	
P8.01	JOG running frequency	Factory setting	20.0s
	Setting range	0.0s ~ 6500.0s	
P8.02	JOG acceleration/deceleration time	Factory setting	20.0s
	Setting range	0.0s ~ 6500.0s	

P8.03	Acceleration time 2	Factory setting	20.0s
	Setting range	0.0s ~ 6500s	
P8.04	Deceleration time 2	Factory setting	20.0s
	Setting range	0.0s ~ 6500s	
P8.05	Acceleration time 3	Factory setting	20.0s
	Setting range	0.0s ~ 6500s	
P8.06	Deceleration time 3	Factory setting	20.0s
	Setting range	0.0s ~ 6500s	
P8.07	Acceleration time 4	Factory setting	20.0s
	Setting range	0.0s ~ 6500s	
P8.08	Deceleration time 4	Factory setting	20.0s
	Setting range	0.0s ~ 6500s	

The KM series provides a total of 4 groups of acceleration/deceleration time, that is, the preceding 3 groups and the group defined by P0.08/P0.09. Definitions of 4 groups are completely the same. You can switch over between the four groups of acceleration/deceleration time through different state combinations of XI terminals. For more details, see the descriptions of P5.00 ~ P5.05.

The acceleration and deceleration time unit is set by P8.00.

P8.10	Acceleration/deceleration time frequency reference		Factory setting	0
	Setting range	0	Maximum frequency (P0.04)	
		1	Setting frequency	
		2	100Hz	

Acceleration/deceleration time is a request time that frequency from 0 to accelerate /decelerate to P8.10 frequency reference. See Fig. 6-1.

When P8.10 set for 1. the acceleration/deceleration time is vary with frequency reference. Please need to notice in application, If the frequency reference changes frequently, the acceleration/deceleration speed is also change.

P8.11	Jump frequency 1	Factory setting	0.00Hz
	Setting range	0.00Hz ~ maximum frequency	
P8.12	Jump frequency 2	Factory setting	0.00Hz
	Setting range	0.00Hz ~ maximum frequency	
P8.13	Frequency jump amplitude	Factory setting	0.00Hz
	Setting range	0.00Hz ~ maximum frequency	

If the set frequency is within the frequency jump range, the actual running frequency is the jump frequency close to the set frequency. Setting the jump frequency helps to avoid the mechanical resonance point of the load.

The KM series can set two jump frequencies. If both are set to 0, the frequency jump function is disabled. The principle of the jump frequencies and jump amplitude is shown in the following figure.

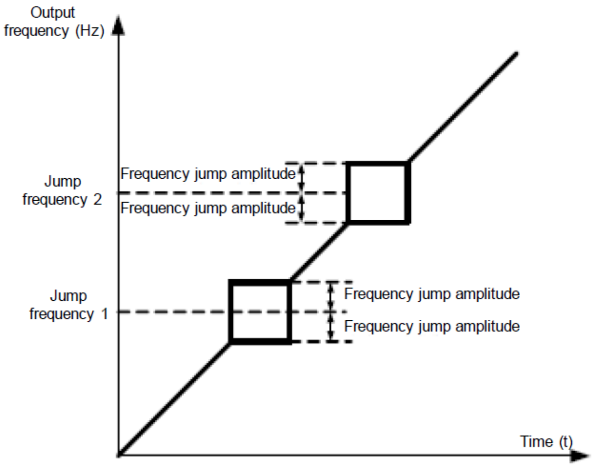


Figure 6-13 Principle of the jump frequencies and jump amplitude

P8.14	Jump frequency during acceleration/deceleration	Factory setting	0
	Setting range	0: disable 1: enable	

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

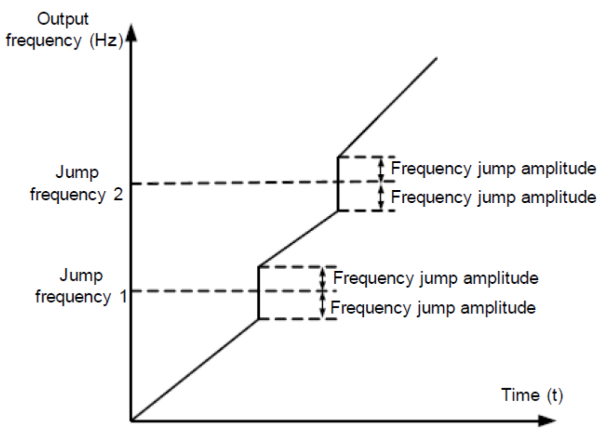


Figure 6-14 Diagram when the jump frequencies are valid during acceleration/deceleration

P8.17	Terminal JOG Priority	Factory setting	0
	Setting range	0: disable 1: enable	

It is used to set whether terminal JOG is priority

If terminal JOG is preferred, the AC drive switches to terminal JOG running state when there is a terminal JOG command during the running process of the AC drive.

P8.18	Source of frequency upper limit		Factory setting	0
	Setting range	0	Set by P0.05	
		1	AI1	
		2	AI2	
		3	Potentiometer	
		4	PULSE train	
		5	Communication	

It is used to set the source of the frequency upper limit, including digital setting (P0.05)), AI, pulse setting or communication setting. If the frequency upper limit is set by means of AI1, AI2, potentiometer of keypad, pulse train (X5) or communication, the setting is similar to that of the main frequency source X. For details, see the description of P0.03.

For example, to avoid runaway in torque control mode in winding application, you can set the frequency upper limit by means of analog input. When the AC drive reaches the upper limit, it will continue to run at this speed.

P8.19	upper limit frequency offset	Factory setting	0.00Hz
	Setting range	0.00Hz ~ maximum frequency P0.04	

If the source of the frequency upper limit is analog input or pulse setting, the final frequency upper limit is obtained by adding the offset in this parameterP8.19 to the frequency upper limit set in P8.18.

P8.20	Auxiliary frequency source offset frequency when operation	Factory setting	0.00Hz
	Setting range	0.00Hz ~ maximum frequency P0.04	

This function code is valid only the frequency source is select by operation between main and auxiliary.

When the frequency reference is operation of main frequency X and auxiliary frequency Y. The final frequency reference is operation of X and Y, added P8.20 offset frequency, which to make frequency setting more flexible to meet more requirement.

P8.21	Base frequency for UP/DOWN modification during running		Factory setting	0
	Setting range	0	Running frequency	

		1	Frequency reference

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

It is used to set the base frequency to be modified by using keys ∧, ∨ and or the terminal UP/DOWN function. If the running frequency and set frequency are different, there will be a large difference between the AC drive's performance during the acceleration/ deceleration process.

P8.22	Binding command source to frequency source	Factory setting	0000
	Setting range	Unit digit	Binding keypad command to frequency source
		0	No binding
		1	Frequency source by digital setting
		2	AI1
		3	AI2
		4	Potentiometer
		5	PULSE trains （X5）
		6	Multi-reference
		7	Simple PLC
		8	PID
		9	Communication reference
		Ten's digit	Binding terminal command to frequency source
		Hundred's digit	Binding communication command to frequency source
		Thousand digit	Auto running, binding to frequency source selection

It is used to bind the 3 running command sources with the 9 frequency sources, facilitating to implement synchronous switchover.

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

If a command source has a bound frequency source, the frequency source set in P0.03, P0.14, P0.15, P0.16, P0.17 no longer takes effect when the command source is effective

P8.23	Terminal UP/DOWN rate /s	Factory setting	1.00Hz
	Setting range	0.001Hz ~ 65.535Hz	

It is used to adjust the rate of change of frequency when the frequency is adjusted by means of terminal UP/DOWN

P8.24	Acceleration/ Deceleration mode	Factory setting	0
	Setting range	0	Linear acceleration/deceleration
		1	S-curve acceleration/deceleration A

		2	S-curve acceleration/deceleration B

It is used to set the frequency change mode during the AC drive start and stop process.

0: Linear acceleration/deceleration

The output frequency increases or decreases in linear mode. The KM series AC drive provides four group of acceleration/deceleration time, which can be selected by using P5.00 ~ P5.08.

1: S-curve acceleration/deceleration A

The output frequency increases or decreases along the S curve. This mode is generally used in the applications where start and stop processes are relatively smooth, such as elevator and conveyor belt. P8.25 and P8.26 respectively define the time proportions of the start segment and the end segment.

2: S-curve acceleration/deceleration B

In this curve, the rated motor frequency B, fb is always the inflexion point. This mode is usually used in applications where acceleration/deceleration is required at the speed higher than the rated frequency.

When the set frequency is higher than the rated frequency, the acceleration/deceleration time is:

In the formula, f is the set frequency, fb f is the rated motor frequency and T is the

acceleration time from 0 Hz to fb.

P8.25	Time proportion of S-curve start segment	Factory setting	30.0%
	Setting range	0.0% ~ (100.0%-P8.26)	
P8.26	Time proportion of S-curve end segment	Factory setting	30.0%
	Setting range	0.0% ~ (100.0%-P8.25)	

These 2 parameters respectively define the time proportions of the start segment and the end segment of S-curve acceleration/deceleration. They must satisfy the requirement: P8.25+P8.26≤100.0%.

In Figure 6-16, t1 is the time defined in F6-08, within which the slope of the output frequency change increases gradually. t2 is the time defined in 6-16, within which the slope of the output frequency change gradually decreases to 0. Within the time between t1 and t2,

the slope of the output frequency change remains unchanged, that is, linear acceleration/ deceleration.

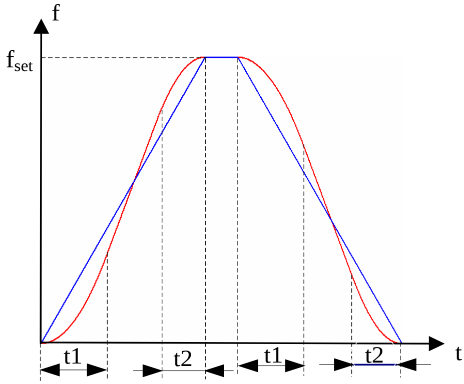


Figure 6-16 S-curve acceleration/deceleration A

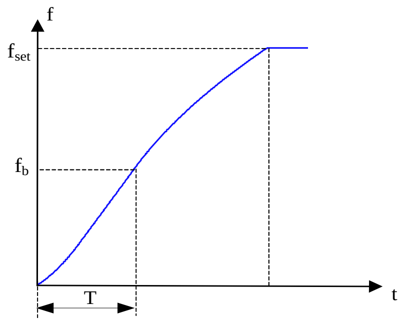


Figure 6-17 S-curve acceleration/deceleration B

P8.27	Forward/Reverse rotation dead-zone time	Factory setting	0.0s
	Setting range	0.0s ~ 3000.0s	

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

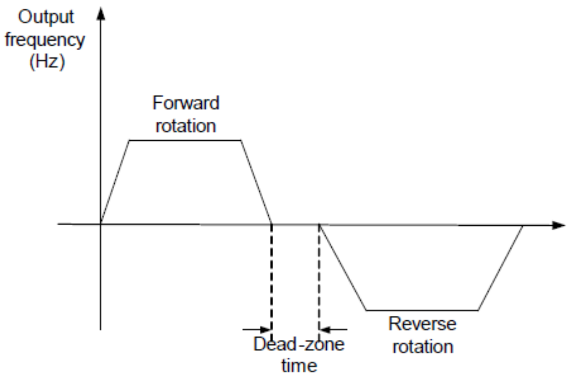


Fig 6-18 Forward/Reverse rotation dead-zone time

P8.28	Stop delay time when running frequency lower than lower limit frequency	Factory setting	0．0S
	Setting range	0.0 ~ 600.0S	

This parameter use to set stop delay time when performance f8.29 function.

P8.29	Running mode when set frequency lower than lower limit frequency		Factory setting	0
	Setting range	0	Running with lower limit frequency	
		1	Stop	
		2	0 speed	

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

P8.30	Terminals start up protection when power on		Factory setting	0
	Setting range	0	No protection	
		1	Protection	

This parameter is used to set whether to enable the safety protection. If it is set to 1, the AC drive does not respond to the run command valid upon AC drive power-on (for example, an input terminal is ON before power-on). The AC drive responds only after the run command is cancelled and becomes valid again.

In addition, the AC drive does not respond to the run command valid upon fault reset of the AC drive. The run protection can be disabled only after the run command is cancelled.

In this way, the motor can be protected from responding to run commands upon power-on or fault reset in unexpected conditions.

P8.31	Droop control	Factory setting	0.00Hz

	Setting range	0.00Hz ~ 10.00Hz

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

P8.32	Frequency detection value(FDT1)	Factory setting	50.00Hz
	Setting range	0.00Hz ~ maximum frequency	
P8.33	Frequency detection hysteresis (FDT hysteresis 1)	Factory setting	5.0%
	Setting range	0.0% ~ 100.0% （PDT1 voltage level）	

If the running frequency is higher than the value of F8-19, the corresponding DO terminal becomes ON. If the running frequency is lower than value of F8-19, the DO terminal goes OFF

Above 2 parameters are respectively used to set the detection value of output frequency and hysteresis value upon cancellation of the output. The value of P8.33 is a percentage of the hysteresis frequency to the frequency detection value (P8.32).

Fig 6-19 FDT function is shown in the following figure.

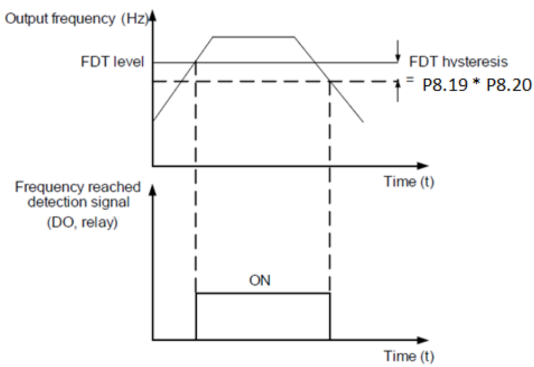


Fig 6-19 FDT showing

P8.34	Detection range of frequency reached	Factory setting	0.0%
	Setting range	0.0% ~ 100.0% （）	

If the AC drive running frequency is within the certain range of the set frequency, the corresponding DO terminal becomes ON.

This parameter is used to set the range within which the output frequency is detected to reach the set frequency. The value of this parameter is a percentage relative to the maximum frequency. The detection range of frequency reached is shown in the following figure.

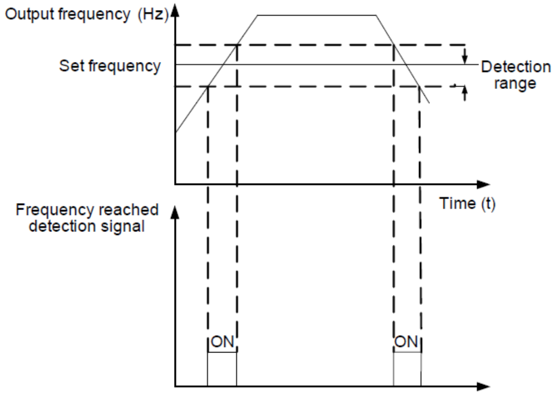


Figure 6-20 Detection range of frequency reached

P8.35	Frequency detection value(FDT1)	Factory setting	50.00Hz
	Setting range	0.00Hz ~ maximum frequency	
P8.36	Frequency detection hysteresis (FDT hysteresis 1)	Factory setting	5.0%
	Setting range	0.0% ~ 100.0% (PDT2 level)	

The frequency detection function is the same as FDT1 function. For details, refer to the descriptions of P8.32, P8.33.

P8.37	Any frequency reaching detection value 1	Factory setting	50.00Hz
	Setting range	0.00Hz ~ maximum frequency	
P8.38	Any frequency reaching detection amplitude 1	Factory setting	5.0%
	Setting range	0.0% ~ 100.0% (maximum frequency)	
P8.39	Any frequency reaching detection value 2	Factory setting	50.00Hz
	Setting range	0.00Hz ~ maximum frequency	
P8.40	Any frequency reaching detection amplitude 2	Factory setting	5.0%
	Setting range	0.0% ~ 100.0% (maximum frequency)	

If the output frequency of the AC drive is within the positive and negative amplitudes of the any frequency reaching detection value, the corresponding DO becomes ON.

The KM series AC drive provides two groups of any frequency reaching detection parameters, including frequency detection value and detection amplitude, as shown in the following figure.

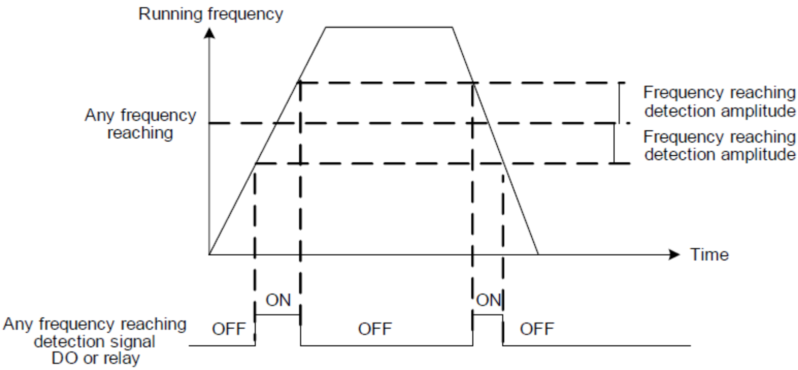


Figure 6-21 Any frequency reaching detection

P8.42	Timing of running time selection		Factory setting	0
	Setting range	0	P8.43 digital reference	
		1	AI1	
		2	AI2	
		3	Potentiometer	
			100% of analog corresponding to P8.43.	
P8.43	Timing of running time		Factory setting	0.0Min
	Setting range		0.0Min ~ 6500.0Min	

This group parameter use to set timing of AC drive running.

When the external programmable terminals timing selection is valid, the timing of AC Drive will activate, AC Drive will stop after a setting time, and the multiple output terminal DO will sent out ON signal as well.

Every time AC drive starting, the timing from 0 beginning, the rest running time can be check through C0.20.

The timing of running time set by P8.42、P8.43, the unit is minute.

P8.44	Zero current detection level	Factory setting	5.0%
	Setting range	0.0% ~ 300.0% (100% corresponding to rated motor current) stop without output	
P8.45	Zero current detection delay time	Factory setting	0.10s
	Setting range	00.01s ~ 600.00s	

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

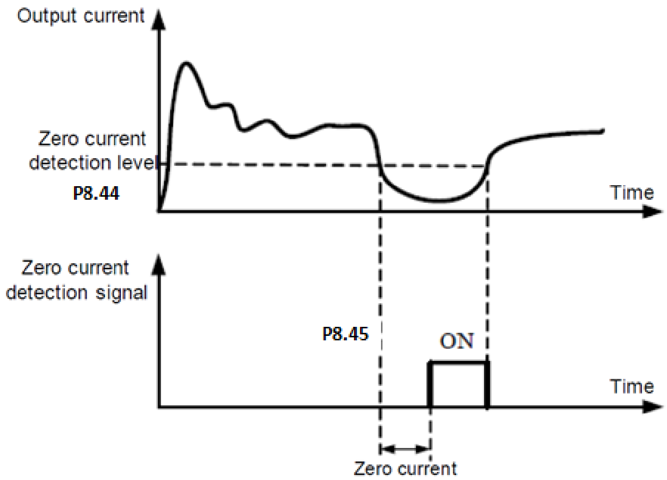


Figure 6-22 Zero current detection

P8.46	output over current threshold by software	Factory setting	200.0%
	setting range	0.0% （no detect） 0.1% ~ 300.0% （rated current of motor）	
P8.47	Output over current detection delay time	Factory setting	0.00s
	setting range	0.00s ~ 600.00s	

If the output current of the AC drive is equal to or higher than the over current threshold and the duration exceeds the detection delay time, the corresponding digital terminal DO becomes ON. The output over current detection function is shown in the following figure 6-23.

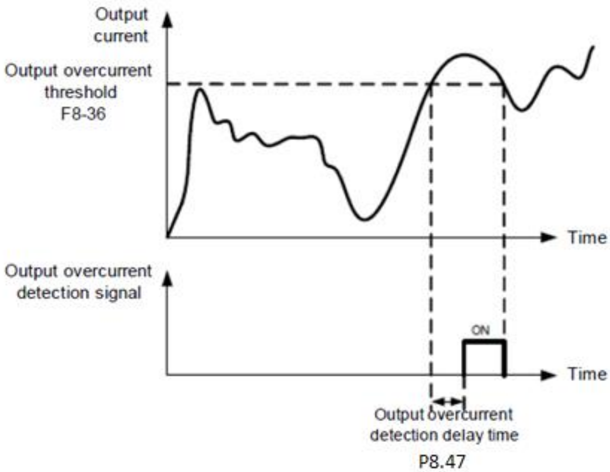


Fig. 6-23 output over current point by software setting

P8.48	Any current reaching 1	Factory setting	100.0%
	Setting range	0.0% ~ 300.0%(rated current of motor)	
P8.49	Any current reaching 1 amplitude	Factory setting	0.0%
	Setting range	0.0% ~ 300.0%(rated current of motor)	
P8.50	Any current reaching 2	Factory setting	100.0%
	Setting range	0.0% ~ 300.0%(rated current of motor)	
P8.51	Any current reaching 2 amplitude	Factory setting	0.0%
	Setting range	0.0% ~ 300.0%(rated current of motor)	

If the output current of the AC drive is within the positive and negative amplitudes of any current reaching detection value, the corresponding DO becomes ON.

The KM series drives provide two groups of any current reaching detection parameters, including current detection value and detection amplitudes, as shown in the 6-24 figure.

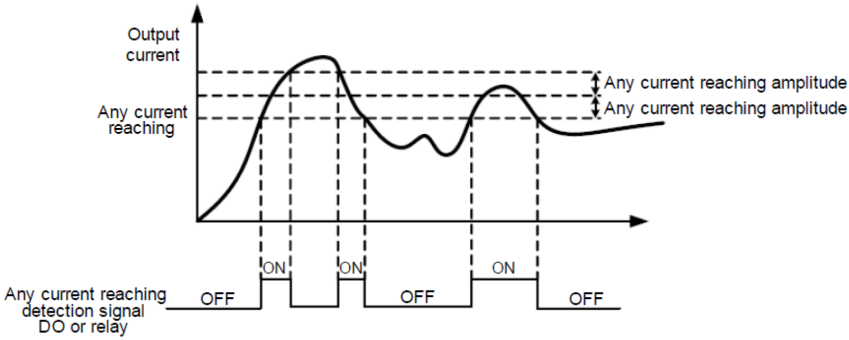


Fig 6-24 Any current reaching detection

P8.52	AI1 input voltage lower limit	Factory setting	3.00V
	Setting range	0.00V ~ P8.53	
P8.53	AI1 input voltage upper limit	Factory setting	7.00s
	Setting range	P8.52 ~ 11.00V	

These 2 parameters are used to set the limits of the input voltage to provide protection on the AC drive. When the AI1 input is larger than the value of P8.53or smaller than the value of P8.52, the corresponding DO becomes ON, indicating that AI1 input exceeds the limit

P8.54	Cooling fan control	Factory setting	0
	Setting range	0: Fan working during running 1: Fan working continuously after power on	

It is used to set the working mode of the cooling fan. If this parameter is set to 0, the fan works when the AC drive is in running state. When the AC drive stops, the cooling fan works if the heatsink temperature is higher than 40°C, and stops working if the heatsink temperature is lower than 40°C.

If this parameter is set to 1, the cooling fan keeps working after power-on.

P8.55	Module temperature threshold	Factory setting	75℃
	Setting range	0℃ ~ 100℃	

When the heat sink temperature of the AC drive reaches the value of this parameter, the corresponding DO becomes ON, indicating that the module temperature reaches the threshold.

P8.56	This time running time reached	Factory setting	0.0Min
	Setting range	0.0Min ~ 6500.0Min	

When current running time from reached, AC drive digital DO become ON.

P8.57	Motor select		Factory setting	0
	Setting range	0	Motor 1	

		1	Motor 2

KM1000 can support driving two motors at difference time for 1 AC Drive. It need configure motor nameplate, auto tuning, select difference control mode and ruining parameters.

Motor parameters group1 corresponding to parameters is P2 and P3. Motor parameters group 2 is H2.

KM1000 only can support one motor parameter setting.

P9. PID function group

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

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

Figure 6-25 Principle block diagram of PID control

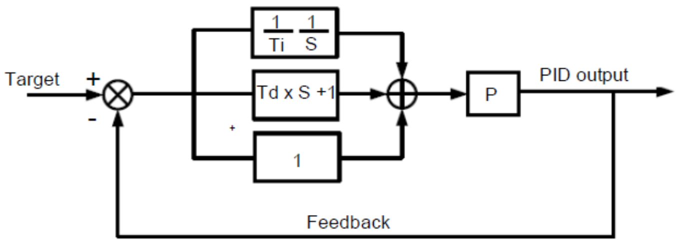


Fig 6-25 Process PID block diagram

P9.00	PID reference selection		Factory setting	0
	Setting range	0	Function code P9.01 reference	
		1	AI1	
		2	AI2	
		3	Potentiometer	
		4	PULSE train setting （X5）	
		5	Communication	
		6	Multiple step reference	
P9.01	PID reference digital setting		Factory setting	50.0%
	Setting range		0.0% ~ 100.0%	

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

P9.02	PID feedback source		Factory setting	0
	Setting range	0	AI1	
		1	AI2	

		2	Reserve
		3	AI1-AI2
		4	PULSE trains（X5）
		5	Communication
		6	AI1+AI2
		7	MAX(AI1, AI2)
		8	MIN(AI1, AI2)

This parameter is used to select the feedback signal channel of process PID.
The PID feedback is a relative value and ranges from 0.0% to 100.0%.

P9.03	PID action direction		Factory setting	0
	Setting range	0	Positive	
		1	Negative	

0: Positive action
When the feedback value is smaller than the PID setting, the AC drive's output frequency rises. For example, the winding tension control requires forward PID action.
1: Negative Reverse action
When the feedback value is smaller than the PID setting, the AC drive's output frequency reduces. For example, the unwinding tension control requires reverse PID action, water constant pressure system.
Note that this function is influenced by the DI function 35 "Negative PID action direction"

P9.04	PID setting feedback range	Factory setting	1000
	Setting range	0 ~ 65535	

This parameter is a non-dimensional unit. It is used for PID setting display (C0.13) and PID feedback display (C0.17).
Relative value 100% of PID setting feedback corresponds to the value of P9.04. If P9.04 is set to 3000 and PID setting is 100.0%, the PID setting display (C0.13) is 3000.

P9.05	Proportional gain Kp1	Factory setting	20.0
	Setting range	0.0 ~ 100.0	
P9.06	Integral time Ti1	Factory setting	2.00s
	Setting range	0.01s ~ 10.00s	
P9.07	Differential time Td1	Factory setting	0.000s
	Setting range	0.000s ~ 10.000s	

P9.05 (Proportional gain Kp1)
It decides the regulating intensity of the PID regulator. The higher the Kp1 is, the larger the regulating intensity is. The value 100.0 indicates when the deviation between PID feedback and PID setting is 100.0%, the adjustment amplitude of the PID regulator on the output frequency reference is the maximum frequency.
P9.06 (Integral time Ti1)

It decides the integral regulating intensity. The shorter the integral time is, the larger the regulating intensity is. When the deviation between PID feedback and PID setting is 100.0%, the integral regulator performs continuous adjustment for the time set in P9.06. Then the adjustment amplitude reaches the maximum frequency.

P9.07 (Differential time Td1)

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

P9.08	Cut-off frequency of PID reverse rotation	Factory setting	2.00Hz
	Setting range	0.00 ~ maximum frequency	

In some situations, only when the PID output frequency is a negative value (AC drive runs in reverse rotation), PID setting and PID feedback can be equal. However, too high reverse rotation frequency is prohibited in some applications, and P9.08 is used to determine the reverse rotation frequency upper limit.

P9.09	PID deviation limit	Factory setting	0.01%
	Setting range	0.0% ~ 100.0%	

If the deviation between PID feedback and PID setting is smaller than the value of P9.09, PID control stops. The small deviation between PID feedback and PID setting will make the output frequency stabilize, effective for some closed-loop control applications.

P9.10	PID differential limit	Factory setting	0.01%
	Setting range	0.0% ~ 100.0%	

It is used to set the PID differential output range. In PID control, the differential operation may easily cause system oscillation. Thus, the P9.10 PID differential regulation is restricted to a small range.

P9.11	PID setting change time	Factory setting	0.00s
	Setting range	0.00 ~ 650.00s	

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

P9.12	PID feedback filter time	Factory setting	0.00s
	Setting range	0.00 ~ 60.00s	
P9.13	PID output filter time	Factory setting	0.00s
	Setting range	0.00 ~ 60.00s	

P9.12 is used to filter the PID feedback, helping to reduce interference on the feedback but slowing the response of the process closed-loop system.

P9.13 is used to filter the PID output frequency, helping to weaken sudden change of the AC drive output frequency but slowing the response of the process closed-loop system

<table>
<tr><td rowspan="2">P9.15</td><td colspan="2">Proportional gain Kp2</td><td>Factory setting</td><td>20.0</td></tr>
<tr><td colspan="2">Setting range</td><td colspan="2">0.0 ~ 100.0</td></tr>
<tr><td rowspan="2">P9.16</td><td colspan="2">Integral time Ti2</td><td>Factory setting</td><td>2.00s</td></tr>
<tr><td colspan="2">Setting range</td><td colspan="2">0.01s ~ 10.00s</td></tr>
<tr><td rowspan="2">P9.17</td><td colspan="2">Differential time Td2</td><td>Factory setting</td><td>0.000s</td></tr>
<tr><td colspan="2">Setting range</td><td colspan="2">0.000s ~ 10.000s</td></tr>
<tr><td rowspan="4">P9.18</td><td colspan="2">PID parameter switchover condition</td><td>Factory setting</td><td>0</td></tr>
<tr><td rowspan="3">Setting range</td><td>0</td><td colspan="2">No switchover</td></tr>
<tr><td>1</td><td colspan="2">X terminal</td></tr>
<tr><td>2</td><td colspan="2">Automatic switchover based on deviation</td></tr>
<tr><td rowspan="2">P9.19</td><td colspan="2">PID parameter switchover deviation 1</td><td>Factory setting</td><td>20.0%</td></tr>
<tr><td colspan="2">Setting range</td><td colspan="2">0.0% ~ PA.20</td></tr>
<tr><td rowspan="2">P9.20</td><td colspan="2">PID parameter switchover deviation 2</td><td>Factory setting</td><td>80.0%</td></tr>
<tr><td colspan="2">Setting range</td><td colspan="2">PA.19 ~ 100.0%</td></tr>
</table>

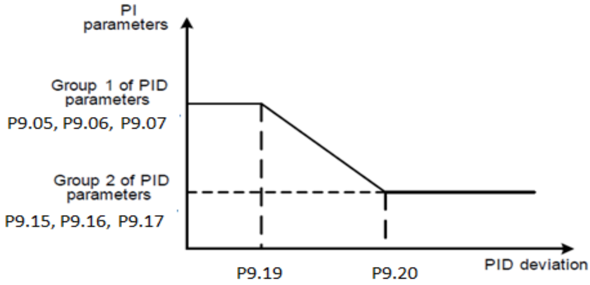
In some applications, PID parameters switchover is required when one group of PID parameters cannot satisfy the requirement of the whole running process.

These parameters are used for switchover between two groups of PID parameters. Regulator parameters P9.15 ~ P9.17 are set in the same way as P0.15 ~ P0.17.

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

If you select switchover via a XI terminal, the XI must be allocated with function 43 "PID parameter switchover". When the XI is OFF, group 1 (P0.15 ~ P0.17) will be selected. When the XI is ON, group 2 (P9.15 ~ P9.17) is selected.

If you select automatic switchover, when the absolute value of the deviation between PID feedback and PID setting is smaller than the value of P9.19, PID parameters will be selected group 1. When the absolute value of the deviation between PID feedback and PID setting is higher than the value of P9.20, group 2 is selected. For PID parameters. When the deviation is between P9.19 and P9.20, the PID parameters are the linear interpolated value of the two groups of parameter values. Please see Fig, 6-26 PID parameters switchover diagram.



6-26 PID parameters switchover

P9.21	PID initial value	Factory setting	0.0%
	Setting range	0.0% ~ 100.0%	
P9.22	PID initial value holding time	Factory setting	0.00s
	Setting range	0.00 ~ 650.00s	

When the AC drive starts. The PID output a constant PID initial value (P9.21), and will runs with a holding time (P9.22). Only after this, PID will carry out closed-loop algorithm

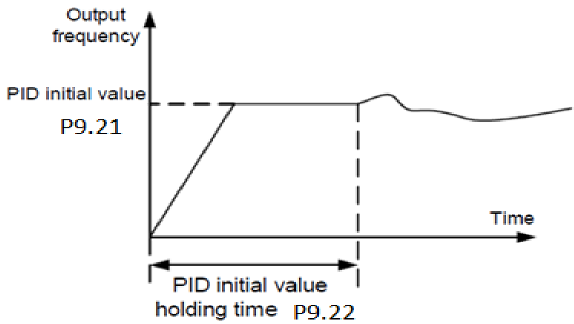


Figure 6-29 PID initial value function

P9.23	Maximum deviation between two PID outputs in forward direction	Factory setting	1.00%
	Setting range	0.00% ~ 100.00%	
P9.24	Maximum deviation between two PI D outputs in reverse direction	Factory setting	1.00%
	Setting range	0.00% ~ 100.00%	

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

P9.23 and P9.24 respectively correspond to the maximum absolute value of the output deviation in forward direction and in reverse direction.

P9.25	PID integral property	Factory setting	00

	Setting range	Unit's digit	Integral separated
		0	Disable
		1	Enable
		Ten's digit	Whether to stop integral operation when the output reaches the limit
		0	Continue integral operation
		1	Stop integral operation

Integral separated, If it is set to valid, the PID integral operation stops when the XI allocated with function
22 "PID integral pause" is ON In this case, only proportional and differential operations take effect.
If it is set to invalid, integral separated remains invalid no matter whether the XI allocated with function 22 "PID integral pause" is ON or not.
Whether to stop integral operation when the output reaches the limit, If "Stop integral operation" is selected, the PID integral operation stops, which may help to reduce the PID overshoot.

P9.26	Detection value of PID feedback loss	Factory setting	0.0%
	Setting range	0.0%： Not judging feedback loss； 0.1% ~ 100.0%	
P9.27	Detection time of PID feedback loss	Factory setting	0.0s
	Setting range	0.0s ~ 20.0s	

These parameters are used to judge whether PID feedback is lost.
If the PID feedback is smaller than the value of P9.26 and the lasting time exceeds the value of P9.27, the AC drive reports Err33 and acts according to the selected fault protection action

P9.28	PID operation at stop		Factory setting	0
	Setting range	0	No PID operation at stop	
		1	PID operation at stop	

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

P9.29	Wakeup frequency	Factory setting	0.0%
	Setting range	Sleeping frequency (P9.31) ~ max. frequency (P0.04)	
P9.30	Wakeup delay time	Factory setting	0.0s
	Setting range	Factory	
P9.31	Sleeping frequency	Factory	setting
	Setting range	0.00Hz ~ Wakeup frequency (P9.29)	
P9.32	Sleeping delay time	Factory setting	0.0s
	Setting range	0.0s ~ 6500.0s	

P9.33	Wake up function selection	Factory setting	0
	Setting range	0	Set by frequency (P9.29)
		1	Set by percentage (P9.34)
P9.34	Wake up threshold value	Factory setting	0.0%
	Setting range	0.0% ~ 100%	
P9.35	Hibernation definition function selection	Factory setting	0
	Setting range	0：	Defined by frequency value (P9.31 value)
		1：	Defined in percentage (P9.36 value)
P9.36	Sleep threshold	Factory setting	101.0%
	Setting range	0.0 ~ 200.0%	

These parameters are used to implement the dormant and wakeup functions in the water supply application.
When the AC drive is in running state, the AC drive enters the sleeping state and stops automatically after the sleeping delay time (P9.32) if the set frequency is lower than or equal to the sleeping frequency (P9.31).
When the AC drive is in sleeping state and the current running command is effective, the AC drives starts up after the wakeup delay time (P9.30) if the set frequency is higher than or equal to the wakeup frequency (P9.29).

Generally, set the wakeup frequency equal to or higher than the sleeping frequency. If the wakeup frequency and sleeping frequency are set to 0, the dormant and wakeup functions are disabled.
When the sleeping function is enabled, if the frequency source is PID, whether PID operation is performed in the sleeping state is determined by P9.28. In this case, select PID operation enabled in the stop state (P9.28=1).
The Wake up threshold value is corresponding to percentage of PID reference P9.01. In the sleeping mode, AC drive will restart after a delay time P9.30, once it meet conditions, which the PID feedback value is not larger than （P9.01） *P9.34 setting.
In the sleeping mode, the RUN indicator of keypad will be flash slowly.

PA. Multi-Reference and Simple PLC Function

The KM series AC drive multi-reference has many functions. Besides multi-speed, it can be used as the setting source of the V/F separated voltage source and setting source of process PID. In addition, the multi-reference is relative value.

Function code	Name	Setting range	Factory value
PA.00	Multi-step frequency 1	-100% ~ 100%	5.0%
PA.01	Multi-step frequency 2	-100% ~ 100%	10.0%

PA.02	Multi-step frequency 3	-100% ~ 100%	15.0%
PA.03	Multi-step frequency 4	-100% ~ 100%	20.0%
PA.04	Multi-step frequency 5	-100% ~ 100%	25.0%
PA.05	Multi-step frequency 6	-100% ~ 100%	30.0%
PA.06	Multi-step frequency 7	-100% ~ 100%	35.0%
PA.07	Multi-step frequency 8	-100% ~ 100%	40.0%
PA.08	Multi-step frequency 9	-100% ~ 100%	45.0%
PA.09	Multi-step frequency 10	-100% ~ 100%	50.0%
PA.10	Multi-step frequency 11	-100% ~ 100%	55.0%
PA.11	Multi-step frequency 12	-100% ~ 100%	60.0%
PA.12	Multi-step frequency 13	-100% ~ 100%	65.0%
PA.13	Multi-step frequency 14	-100% ~ 100%	70.0%
PA.14	Multi-step frequency 15	-100% ~ 100%	75.0%
PA.15	Multi-step frequency 16	-100% ~ 100%	80.0%

Multi- step frequency can be the setting source of frequency, V/F separated voltage and process PID. The multi- step frequency is relative value and ranges from -100.0% to 100.0%. As frequency source, it is a percentage relative to the maximum frequency. when value is negative, stands for motor runs in reverse.

As V/F separated voltage source, it is a percentage relative to the rated motor voltage. As process PID setting source, it does not require conversion.

Multi-reference can be switched over based on different states of XI terminals. For details, see the descriptions of group P5.

Take example, when the main frequency is set by external potentiometer, the speed adjusting is available. Press the switch 1, frequency will be run with 45hz, press switch 2, AC Drive runs with 45hz, if release switch 2, restore to frequency reference setting by potentiometer.

Parameters setting as following:

Function code	Setting value	Description
P0.03	7	Select control by multi-step frequency reference
P0.04	60.0	Set maximum frequency
P0.05	60.0	Set upper limit frequency
P5.03	12 (default)	switch 1 connect to X4
P5.04	13 (default)	switch 2 connect to X5
PA.00	100	Maximum range of potentiometer adjusting (relative to percentage of P0.04)
PA.01	30	20Hz corresponding to 30% of 60Hz.
PA.02	75	45Hz corresponding to 75% of 60Hz.
PA.51	1	Potentiometer signal connect to AI1

PA.16	Simple PLC running mode		Factory setting	0
	Setting range	0	Stop after the AC drive runs one cycle	
		1	Keep final values after the AC drive runs one cycle	
		2	Repeat after the AC drive runs one cycle	

Simple PLC can be either the frequency source or V/F separated voltage source.
When it used for frequency source, it has 3 running mode. It is disable when used for VF separation VF voltage source.
0: Stop after the AC drive runs one cycle
The AC drive stops after running one cycle, and will not start up until receiving another command.
1: Keep final values after the AC drive runs one cycle
The AC drive keeps the final running frequency and direction after running one cycle.
2: Repeat after the AC drive runs one cycle
The AC drive automatically starts another cycle after running one cycle, and will not stop until receiving the stop command.
When simple PLC is used as the frequency source, whether parameter values of PA.00 to PA.15 are positive or negative determines the running direction. If the parameter values are negative, it indicates that the AC drive runs in reverse direction.
Bellow Fig illustrates simple PLC when used as frequency source

PA.17	Simple PLC memorized power down selection		Factory setting	00
	Setting range	Unit's digit	Retentive upon power failure	
		0	No	
		1	Yes	
		Ten's digit	Retentive upon stop	
		0	No	
		1	Yes	

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

PA.18	Simple PLC 1st step running time	factory setting	0.0s(h)
	Setting range	0.0s(h) ~ 6553.5s(h)	
PA.19	Acceleration/deceleration time of simple PLC step 1st	factory setting	0

	Setting range	0 ~ 3	
PA.20	Simple PLC 2nd step running time	factory setting	0.0s(h)
	Setting range	0.0s(h) ~ 6553.5s(h)	
PA.21	Acceleration/deceleration time of simple PLC step 2nd	factory setting	0
	Setting range	0 ~ 3	
PA.22	Simple PLC 3rd step running time	factory setting	0.0s(h)
	Setting range	0.0s(h) ~ 6553.5s(h)	
PA.23	Acceleration/deceleration time of simple PLC step 3rd	factory setting	0
	Setting range	0 ~ 3	
PA.24	Simple PLC 4th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.25	Acceleration/deceleration time of simple PLC step 4th	factory setting	0
	setting range	0 ~ 3	
PA.26	Simple PLC 5th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.27	Acceleration/deceleration time of simple PLC step 5th	factory setting	0
	setting range	0 ~ 3	
PA.28	Simple PLC 6th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.29	Acceleration/deceleration time of simple PLC step 6th	factory setting	0
	setting range	0 ~ 3	
PA.30	Simple PLC 7th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.31	Acceleration/deceleration time of simple PLC step 7th	factory setting	0
	setting range	0 ~ 3	
PA.32	Simple PLC 8th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.33	Acceleration/deceleration time of simple PLC step 8th	factory setting	0
	setting range	0 ~ 3	
PA.34	Simple PLC 9th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	

PA.35	Acceleration/deceleration time of simple PLC step 9th	factory setting	0
	setting range	0 ~ 3	
PA.36	Simple PLC 10th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.37	Acceleration/deceleration time of simple PLC step 10th	factory setting	0
	setting range	0 ~ 3	
PA.38	Simple PLC 11th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.39	Acceleration/deceleration time of simple PLC step 11th	factory setting	0
	setting range	0 ~ 3	
PA.40	Simple PLC 12th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.41	Acceleration/deceleration time of simple PLC step 12th	factory setting	0
	setting range	0 ~ 3	
PA.42	Simple PLC 13th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.43	Acceleration/deceleration time of simple PLC step 13th	factory setting	0
	setting range	0 ~ 3	
PA.44	Simple PLC 14th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.45	Acceleration/deceleration time of simple PLC step 14th	factory setting	0
	setting range	0 ~ 3	
PA.46	Simple PLC 15th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.47	Acceleration/deceleration time of simple PLC step 15th	factory setting	0
	setting range	0 ~ 3	
PA.48	Simple PLC 16th step running time	factory setting	0.0s(h)
	setting range	0.0s(h) ~ 6553.5s(h)	
PA.49	Acceleration/deceleration time of simple PLC step 16th	factory setting	0
	setting range	0 ~ 3	
PA.50	Simple PLC running time unit	factory setting	0

	setting range	0	S（s）	
		1	h（H）	
PA.51	The 1st step frequency reference	Factory setting		0
	Setting range	0	Digital PA.00	
		1	AI1	
		2	AI2	
		3	Potentiometer	
		4	PULSE trains	
		5	PID	
		6	Pre-set frequency by P0.07， and changed by UP/DOWN.	

It determines the setting channel of multi-step frequency 1. You can perform convenient switchover between the setting channels. When multi-step frequency or simple PLC is used as frequency source, the switchover between two frequency sources can be realized easily.

PA.52	Up/Down save selection after power off	Factory setting	0.0%
	Setting range	0	NO save
		1	Save
PA.53	Terminal Up/Down shutdown given frequency enable	Factory setting	0.0%
	Setting range	0	Invalid
		1	Valid

Pb. Swing Frequency, Fixed Length and Count Group

The swing frequency function is applied to the textile and chemical fiber fields and the applications where traversing and winding functions are required.

The swing frequency function indicates that the output frequency of the AC drive swings up and down with the set frequency as the center. The trace of running frequency at the time axis is shown in the 6-28 figure.

The swing amplitude is set in Pb-00 and P-01. When Pb-01 is set to 0, the swing amplitude is 0 and the swing frequency does not take effect.

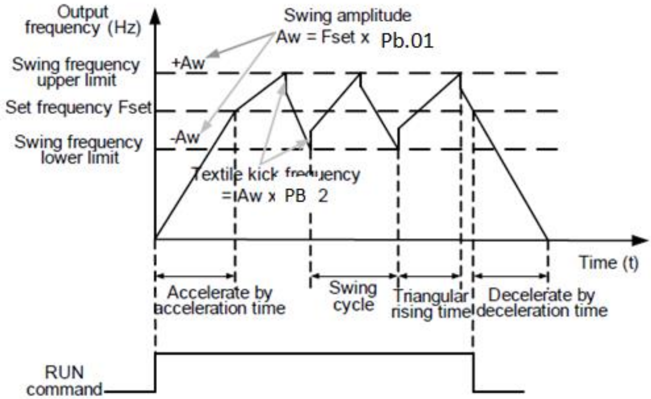


Figure 6-28 Swing frequency control

Pb.00	Swing frequency setting mode		factory setting	0
	setting range	0	Relative to the central frequency	
		1	Relative to the maximum frequency	

This parameter is used to select the base value of the swing amplitude.

0: Relative to the central frequency (P0-07 frequency source selection)

It is variable swing amplitude system. The swing amplitude varies with the central frequency (set frequency).

1: Relative to the maximum frequency (P0-10 maximum output frequency)

It is fixed swing amplitude system. The swing amplitude is fixed.

Pb.01	Swing frequency amplitude	factory setting	0.0%
	setting range	0.0% ~ 100.0%	
Pb.02	Jump frequency amplitude	factory setting	0.0%
	setting range	0.0% ~ 50.0%	

This parameter is used to determine the swing amplitude and jump frequency amplitude.

The swing frequency is limited by the frequency upper limit and frequency lower limit.

If relative to the central frequency (Pb.00 = 0), the actual swing amplitude AW is the calculation result of P0.17 (Frequency source selection) multiplied by Pb.00=1.

If relative to the maximum frequency (Pb.00 = 1), the actual swing amplitude AW is the calculation result of Pb.00=1 (Maximum frequency) multiplied by Pb.01.

Jump frequency = Swing amplitude AW x PB-02 (Jump frequency amplitude).

If relative to the central frequency (Pb.00 = 0), the jump frequency is a variable value.

If relative to the maximum frequency (Pb.00 = 1), the jump frequency is a fixed value.

The swing frequency is limited by the frequency upper limit and frequency lower limit.

Pb.03	Swing frequency cycle	factory setting	10.0s
	setting range	0.0s ~ 3000.0s	
Pb.04	Triangular wave rising time coefficient	factory setting	50.0%
	setting range	50.0% ~ 100.0%	

Pb. 03 specifies the time of a complete swing frequency cycle.

Pb. 04 specifies the time percentage of triangular wave rising time to Pb. 03 (Swing frequency cycle).

Triangular wave rising time = Pb.03 (Swing frequency cycle) x Pb.04 (Triangular wave rising time coefficient, unit: s)

Triangular wave falling time = Pb.03 (Swing frequency cycle) x (1 – Pb.04 Triangular wave rising time coefficient, unit: s)

Pb.05	Set length	factory setting	1000m
	setting range	0m ~ 65535m	
Pb.06	Actual length	factory setting	0m
	setting range	0m ~ 65535m	
Pb.07	Number of pulses per meter	factory setting	100.0
	setting range	0.1 ~ 6553.5	

The preceding parameters are used for fixed length control.

The length information is collected by XI terminals. Pb.06 (Actual length) is calculated by dividing the number of pulses collected by the XI terminal by Pb.07 (Number of pulses each meter).

When the actual length PB-06 exceeds the set length in Pb.05, the DO terminal allocated with function 10 (Length reached) becomes ON.

During the fixed length control, the length reset operation can be performed via the XI terminal allocated with function 30. For details, see the descriptions of P5.00 ~ P5.09.

Allocate corresponding XI terminal with function 31 (Length count input) in applications. If the pulse frequency is high, X5 must be used.

Pb.08	Set count value	factory setting	1000
	setting range	1 ~ 65535	
Pb.09	Designated count value	factory setting	1000
	setting range	1 ~ 65535	

The count value needs to be collected by XI terminal. Allocate the corresponding XI terminal with function 25 (Counter input) in applications. If the pulse frequency is high speed, X5 must be used. When the count value reaches the set count value (Pb.08), the DO terminal allocated with function 15 (Set count value reached) becomes ON. Then the counter stops counting.

When the counting value reaches the designated counting value (Pb.09), the DO terminal allocated with function 16 (Designated count value reached) becomes ON. Then the counter continues to count until the set count value is reached.

Pb.09 should be equal to or smaller than Pb.08.

Pb.09 should be equal to or smaller than Pb.08.

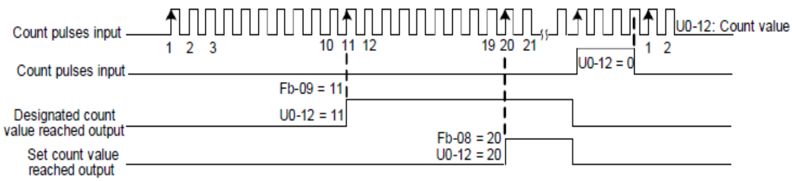


Fig 6-29 Reaching the set count value and designated count value

PC. Fault and Protection

PC.00	Motor overload protection selection		factory setting	1
	Setting range	0	Disabled	
		1	Enable	
PC.01	Motor overload protection gain		factory setting	1
	Setting range		0.20 ~ 10.0	

PC.00=0： The motor overload protective function is disabled. The motor is exposed to potential damage due to overheating. A thermal relay is suggested to be installed between the AC drive and the motor.

PC.01=1： The AC drive judges whether the motor is overloaded according to the inverse time-lag curve of the motor overload protection.

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

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

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

PC.02	Motor overload warning coefficient	factory setting	80%
	setting range	50% ~ 100%	

This function is used to give a warning signal to the control system via DO before motor overload protection. This parameter is used to determine the percentage, at which pre-warning is performed before motor overload. The larger the value is, the less advanced the pre-warning will be.
When the accumulative output current of the AC drive is greater than the value of the overload inverse time-lag curve multiplied by PC.02, the DO terminal on the AC drive allocated with function 6 (Motor overload pre-warning) becomes ON.

PC.03	Overvoltage stall gain	factory setting	0
	setting range	0 ~ 100	
PC.04	Overvoltage stall protective voltage	factory setting	130%
	setting range	120% ~ 150%	

When the DC bus voltage exceeds the value of PC.04 (Overvoltage stall protective voltage) during deceleration of the AC drive, the AC drive stops deceleration and keeps the present running frequency. After the bus voltage declines, the AC drive continues to decelerate.
PC.03 (Overvoltage stall gain) is used to adjust the overvoltage suppression capacity of the AC drive. The larger the value is, the greater the overvoltage suppression capacity will be
In the prerequisite of no overvoltage occurrence, set PC.03 to a small value.
For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow.
For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and an overvoltage fault may occur.
If the overvoltage stall gain is set to 0, the overvoltage stall function is disabled. The overvoltage stall protective voltage setting 100% corresponds to the base values in the following table:
below Overvoltage stall protective voltage setting 100% corresponds to base values

Voltage Class	Corresponding Base Value
1 phase 220V	290V
3 phase 220V	290V
3 phase 380V	530V
3 phase 480V	620V
3 phase 690V	880V

PC.05	Over current stall gain	factory setting	20
	setting range	0 ~ 100	

PC.06	Over current stall protective current	factory setting	150%
	setting range	100% ~ 200%	

When the output current exceeds the over current stall protective current during acceleration/ deceleration of the AC drive, the AC drive stops acceleration/deceleration and keeps the present running frequency. After the output current declines, the AC drive continues to accelerate/decelerate.

PC.06 (Over current stall gain) is used to adjust the over current suppression capacity of the AC drive. The larger the value is, the greater the over current suppression capacity will be. In the prerequisite of no over current occurrence, set PC.06 to a small value.

For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the value should be large. Otherwise, the suppression result will be poor and over current fault may occur.

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

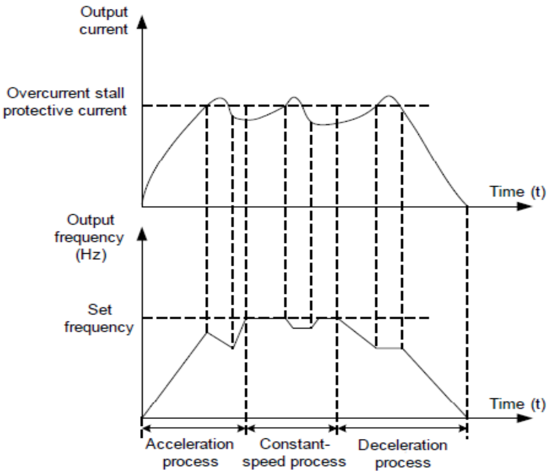


Diagram of the over current stall protection function

PC.08	Fault auto reset times	factory setting	0
	setting range	0 ~ 20	

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

PC.09	DO action during fault auto reset	factory setting	1
	setting range	0：NO 1：Yes	

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

PC.10	Time interval of fault auto reset	factory setting	1.0s
	setting range	0.1s ~ 100.0s	

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

PC.11	Input phase missing protection	factory setting	1
	setting range	0: forbidden 1: Allow	

It is used to determine whether to perform input phase missing.

PC.12	output phase missing.	factory setting	1
	setting range	0: forbidden 1: Allow	

It is used to determine whether to perform output phase missing.

PC.13	The first fault type	0： No fault 1: Over current upon accel. (E001) 2: Over current upon decel. (E002) 3: over current upon constant speed (E003) 4: over voltage upon accel. (E004) 5: over voltage upon decel. (E005) 6： over voltage upon constant speed (E006) 7: control power fault E007) 8: under voltage fault (E008) 9: AC Drive parts fault （E009） 10: input phase missing (E010) 11: output phase missing (E011) 12: motor to ground short circuit fault(E012) 13: hardware of AC Drive fault （E013） 14: AC Drive overload (E014) 15: motor overload (E015) 16: Igbt module overheat (E016) 17: parameters read/write abnormal （E017） 18: external fault (E018) 19: running time reached （E019） 20:: power on time reached （E020） 21: current detect fault (E021) 22: motor overheat （E022） 23: contactor abnormal (E023)
PC.14	The second fault type	
PC.15	The third fault type(latest one)	

		24: communication fault (E024) 25: Encoder/PG fault （E025） 26: motor auto tuning fault (E026) 27: initial position fault （E027） 28: quick current limit timeout （E028） 29: motor over speed （E029） 30: speed deviation too big （E030） 31： motor switchover fault during running （E031） 32: load missing （E032） 33: PID feedback missing during running （E033）
PC.16	Frequency upon 3rd fault	It displays the frequency when the latest fault occurs.
PC.17	Current upon 3rd fault	It displays the current when the latest fault occurs.
PC.18	Bus voltage upon 3rd fault	It displays the bus voltage when the latest fault occurs.

PC.19	XI status upon 3rd fault	It shows the latest fault occurs of input XI terminals： BIT9 | BIT8 | BIT7 | BIT6 | BIT5 X10 | X9 | X8 | X7 | X6 BIT4 | BIT3 | BIT2 | BIT1 | BIT0 X5 | X4 | X3 | X2 | X1 When input terminals is ON, the corresponding bit is 1, when OFF the corresponding bit is OFF, The value is the equivalent decimal number converted from the XI status..
PC.20	Output terminal status upon 3rd fault	BIT4 | BIT3 | BIT2 | BIT1 | BIT0 DO2 | DO1 | REL2 | REL1 | FMP When input terminals is ON, the corresponding bit is 1, when OFF the corresponding bit is OFF, The value is the

		equivalent decimal number converted from the XI status.. It shows the latest fault occurs of DO output terminals :
PC.21	AC drive status upon 3rd fault	Reserve
PC.22	Power-on time upon 3rd fault	It displays the present power-on time when the latest fault occurs
PC.23	Running time upon 3rd fault	It displays the present running time when the latest fault occurs
PC.24	Frequency upon 2nd fault	Same above as PC.16 ~ PC.23
PC.25	Current upon 2nd fault	
PC.26	Bus voltage upon 2nd fault	
PC.27	DI status upon 2nd fault	
PC.28	Output terminal status upon 2nd fault	
PC.29	AC drive status upon 2nd fault	
PC.30	Power-on time upon 2nd fault	
PC.31	Running time upon 2nd fault	
PC.32	Frequency upon 1st fault	Same above as PC.16 ~ PC.23
PC.33	Current upon 2st fault	
PC.34	Bus voltage upon 1st fault	
PC.35	DI status upon 1st fault	
PC.36	Output terminal status upon 1st fault	
PC.37	AC drive status upon 1st fault	
PC.38	Power-on time upon 1st fault	

PC.39	Running time upon 1st fault	

It can record latest 3 fault type. If display 0, it means no fault.
The possibility fault occurs and trouble shooting, refer to fault diagnosis

PC.45	Action selection at instantaneous power failure		Factory setting	0
	Setting range	0	Disable	
		1	Decelerate	
		2	Decelerate to stop	
PC.46	Action pause judging voltage at instantaneous power failure		Factory setting	100.0
	Setting range	0.0% ~ 100.0%		
PC.47	Voltage rise again judging time at instantaneous power failure		Factory setting	0.50s
	Setting range	0.00s ~ 100.00s		
PC.48	Action judging voltage at instantaneous power failure		Factory setting	80.0%
	Setting range	60.0% ~ 100.0% (Standard Dc voltage)		

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

• If PC.45=1,, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates. Once the bus voltage resumes to normal, the AC drive accelerates to the set frequency. If the bus voltage remains normal for the time exceeding the value set in
F9-61, it is considered that the bus voltage resumes to normal.

• If PC.45=2, upon instantaneous power failure or sudden voltage dip, the AC drive decelerates to stop.

PC.49	Protection upon load loss		Factory setting	0
	Setting range	0	Disable	
		1	Enable	
PC.50	Detection level of load loss		Factory setting	10.0%
	Setting range	0.0% ~ 100.0% (Rated current of motor)		
PC.51	Detection level of load loss		Factory setting	0.50s
	Setting range	0.0s ~ 60.0		

If protection upon load becoming 0 (load loss) is enabled, when the output current of the AC drive is lower than the detection level (PC.50) and the lasting time exceeds the detection time (PC.51), the output frequency of the AC drive automatically declines to 7% of the rated frequency. During the protection, the AC drive automatically accelerates to the set frequency if the load resumes to normal.

PC.52	Over-speed detection value	Factory setting	15.0%
	Setting range	0.0% ~ 50.0% (maximum frequency)	
PC.53	Over-speed detection time	Factory setting	2.0s
	Setting range	0.0s ~ 60.0	

This function is valid only when the AC drive runs in the CLVC mode P0.00=2.
If the actual motor rotational speed detected by the AC drive exceeds the maximum frequency and the excessive value is greater than the value of PC.52 and the lasting time exceeds the value of PC.53, the AC drive reports Err43 and acts according to the selected fault protection action.
If the over-speed detection time is 0.0s, the over-speed detection function is disabled.

PC.54	Detection value of too large speed deviation	Factory setting	20%
	Setting range	(0.0% ~ 50.0% maximum frequency)	
PC.55	Detection time of too large speed deviation	Factory setting	2.0s
	Setting range	0.0s ~ 60.0	
PC.56	Reserve		

This function is valid only when the AC drive runs in the CLVC mode (P.00=2).
If the AC drive detects the deviation between the actual motor rotational speed detected by the AC drive and the set frequency is greater than the value of PC.54 and the lasting time exceeds the value of PC.55, the AC drive reports Err30 and according to the selected fault protection action.
PC.55 (Detection time of too large speed deviation) is 0.0s, this function is disabled.

PC.57	Motor temperature sensor	Factory setting	0
	Setting range	0	No sensor
		1	PT100
		2	PT1000
PC.58	Motor overheat protection value	Factory setting	100℃
	Setting range	0℃ ~ 200℃	
PC.59	Motor overheat pre-alarm value	Factory setting	90℃

	Setting range	0℃ ~ 200℃

Use this function use to detect motor temperature. It need the optional expansion card to assist to use. Provide two kinds temperature model. PC.59 can use to overheat pre-alarm protection.

PC.61	rapid current limit		Factory setting	1
	Setting range	0	Disable	
		1	Enable	

The rapid current limit function can reduce the AC drive's over current faults at maximum, guaranteeing uninterrupted running of the AC drive.
However, long-time rapid current limit may cause the AC drive to overheat, which is not allowed. In this case, the AC drive will report Err28, indicating the AC drive is overloaded and needs to stop

PC.62	Under voltage point setting	Factory setting	100.0%
	Setting range	60.0% ~ 140.0%	

Use to set AC drive under voltage E008 voltage setting, difference rated voltage 100% value corresponding to difference voltage point.

Voltage level	Factory default (DC bus voltage)
Single phase 220V	200V
3 phase 220V	200V
3 phase 380V	1000V
3 phase 480V	450V

PC.63	Over voltage setting	Factory setting	Per models
	Setting range	100V ~ 1200V	

Used to set the voltage values of the inverter overvoltage fault E004, E005, and E006. The factory values for different voltage levels are:

Voltage level	Factory default (DC bus voltage)
Single phase 220V	400V
3 phase 220V	400V
3 phase 380V	810V
3 phase 480V	890V

Pd RS485 communication parameter group

Pd.00	Serial communication protocol selection		Factory setting	0
	Setting range	0	MODBUS protocol	
		1	Reserve	
		2	Reserve	
Pd.01	Baud rate		Factory setting	5
	Setting range	Ones digit	MODBUS	
		0	300BPS	
		1	600BPS	
		2	1200BPS	
		3	2400BPS	
		4	41000BPS	
		5	9600BPS	
		6	19200BPS	
		7	38400BPS	
		8	57600BPS	
		9	115200BPS	

This parameter is used to set the data transmission rate between the host computer and the inverter. Note that the baud rate set by the host computer and the inverter must be consistent, otherwise, communication cannot be carried out. The larger the baud rate, the faster the communication speed.

Pd.02	Data Format		Factory default	0
	Setting range	0	No verification (8-N-2)	
		1	Even parity (8-E-1)	
		2	Odd parity (8-O-1)	
		3	No verification (8-N-1)	

The data format set by the host computer and the inverter must be consistent, otherwise, communication cannot be carried out.

Pd.03	Local address	Factory default	1
	Setting range	1～247， 0 is broadcast address	

When the local address is set to 0, it is the broadcast address, realizing the broadcast function of the host computer.

The local address is unique (except the broadcast address), which is the basis for realizing point-to-point communication between the host computer and the inverter.

Pd.04	Response delay	Factory default	2ms

	Setting range	0 ~ 20ms

Response delay: refers to the interval between the end of data reception by the frequency converter and the sending of data to the upper computer. If the response delay is less than the system processing time, the response delay shall be based on the system processing time. If the response delay is longer than the system processing time, then after the system has processed the data, it will wait until the response delay time expires before sending the data to the host computer.

Pd.05	Communication timeout	Factory default	0.0s
	Setting range	0.0s (Invalid)； 0.1 ~ 60.0s	

When this function code is set to 0.0s, the communication timeout time parameter is invalid. When this function code is set to a valid value, if the interval between one communication and the next communication exceeds the communication timeout time, the system will report a communication failure error (E024). Normally, it is set to invalid. If during continuous communication System, set this parameter to monitor the communication status.

Pd.06	Data transfer format selection		Factory default	01
	Setting range	Ones digit	Modbus	
		0	Non-standard Modbus protocol	
		1	Standard Modbus protocol	
		Tenth place	reserve	

Pd.07	Communication reading current resolution		Factory default	0
	Setting range	0	0.01A(less than 55KW rated power inverter)	
		1	0.1A	

H0 torque control parameter group:

H0.00	Torque control mode		Factory default	0
	Setting range	0	Torque control disable	
		1	Torque control enable	

KM series inverters support two control methods: speed control and torque control. Speed control means that the entire control process takes stable speed as the core to ensure that the set frequency is consistent with the actual operating frequency. At the same time, the maximum load capacity is limited by the torque limiter. The core of torque control means that the entire control process takes stable torque as the core to ensure that the set torque is consistent with the actual output torque. The output frequency of the inverter is limited by the upper and lower frequency limits.

0: Torque control is invalid, the frequency converter is in speed control mode.

1: The frequency converter is in torque control mode.

Switching between these two modes can also be achieved through the setting of programmable terminals.

In any case, when the torque control prohibition terminal is valid, the inverter is fixed to the speed control mode.

H0.01	Torque control select mode		Factory default	0
	Setting range	0	Keyboard digital torque given (H0.03)	
		1	Analog quantity AI1 given	
		2	Analog quantity AI2 given	
		3	Panel potentiometer	
		4	PULSE pulse given	
		5	communication given	
		6	MIN(AI1,AI2)	
		7	MAX(AI1,AI2)	
H0.03	Keyboard digital torque setting value		Factory default	150.0%
	Setting range		-200.0% ~ 200.0%	

H0.01 is used to select the torque setting source. There are 8 torque setting methods in total.
The torque setting uses relative values, 100.0% corresponds to the rated torque of the inverter.
Setting range-200.0% ~ 200.0%, indicating that the maximum torque of the inverter is 2 times the rated torque of the inverter.
When the torque given is positive, the frequency converter runs forward.
When the torque given is negative, the frequency converter runs in reverse.
Each torque setting source is described as follows:
0: Keyboard number given (H0.03)
Refers to the target torque directly using the H0.03 setting value.
1: Analog quantity AI1 given
2: Analog quantity AI2 given
3: Panel potentiometer
It means that the target torque is determined by the analog input terminal. The KM1000 control board provides 2 analog input terminals (AI1AI2).
in:
AI1 is -10V~10V voltage input
AI2 can be a 0V~10V voltage input or a 4mA~20mA input, selected by the P1 jumper on the control board.
The input voltage value of AI1 and AI2 and the corresponding relationship curve with the target frequency can be freely selected by the user through P5.31.
4: PULSE pulse (X5)
The target torque is given through the high-speed pulse of terminal X5.

Pulse given signal specifications: voltage range 9V ~ 30V, frequency range 0KHz ~ 100KHz. Pulse given can only be input from multi-function terminal X5.
The relationship between the X5 terminal input pulse frequency and the corresponding setting is set through P5.26~P5.29. The corresponding relationship is a straight line corresponding relationship between 2 points. 100.0% of the corresponding setting of the pulse input refers to the torque The number sets the percentage of H0.03.
5: Communication given
It means that the target torque is given by communication method.
The data format is -100.0%~100.0%, 100.00% refers to the percentage relative to the torque digital setting H0.03.
Otherwise, the host computer gives data through the communication address OX1000. The data format is -100.0%~100.0%. 100.00% refers to the percentage relative to the torque digital setting H0.03.

H0.05	Torque control forward maximum frequency	Factory default	50.00Hz
	Setting range	0.00Hz ~ Max frequency	
H0.06	Torque control reverse maximum frequency	Factory default	50.00Hz
	Setting range	0.00Hz ~ Max frequency	

Used to set the forward or reverse maximum operating frequency of the inverter in torque control mode.
When the inverter torque is controlled, if the load torque is less than the motor output torque, the motor speed will continue to rise. In order to prevent accidents such as overspeed in the mechanical system, the maximum motor speed during torque control must be limited.
If it is necessary to dynamically and continuously change the maximum frequency of torque control, it can be achieved by controlling the upper limit frequency.

H0.07	Torque control acceleration time	Factory default	0.00s
	Setting range	0.00s ~ 65000s	
H0.08	Torque control deceleration time	Factory default	0.00s
	Setting range	0.00s ~ 65000s	

In the torque control mode, the difference between the motor output torque and the load torque determines the speed change rate of the motor and the load. Therefore, the motor speed may change rapidly, causing problems such as noise or excessive mechanical stress. By setting the torque Controlling the acceleration and deceleration time can make the motor speed change smoothly. However, for occasions that require quick torque response, the torque control acceleration and deceleration time needs to be set to 0.00s.
Example: Two motors are hard-connected to pull the same load. In order to ensure even load distribution, one frequency converter is set as the master machine and adopts speed control mode. The other frequency converter is set as the slave machine and adopts torque control. The actual

output of the host machine The torque is used as the torque command of the slave machine. At this time, the torque of the slave machine needs to follow the master machine quickly, so the torque control acceleration and deceleration time of the slave machine is 0.00s.

H1 virtual DI, virtual DO parameter group

H1.00	Virtual VDI1 terminal function selection	Factory default	0
	Setting range	0 ~ 59	
H1.01	Virtual VDI2 terminal function selection	Factory default	0
	Setting range	0 ~ 59	
H1.02	Virtual VDI3 terminal function selection	Factory default	0
	Setting range	0 ~ 59	
H1.03	Virtual VDI4 terminal function selection	Factory default	0
	Setting range	0 ~ 59	
H1.04	Virtual VDI5 terminal function selection	Factory default	0
	Setting range	0 ~ 59	

Virtual VDI1~VDI5 are functionally identical to the control panel DI and can be used as multi-functional digital inputs. For detailed settings, please refer to the introduction of P5.00~P5.09.

H1.05	DPWM Switch upper limit frequency		Factory default	00000
	Setting range	Ones digit	VirtualVDI1	
		0	Whether the VDI is valid is determined by the status of the virtual VDOx	
		1	Whether VDI is valid is set by function H0.06	
		Tenth place	Virtual VDI2 (0~1, same as above)	
		Hundreds	Virtual VDI3 (0~1, same as above)	
		Thousands	Virtual VDI4 (0~1, same as above)	
		Ten thousands	Virtual VDI5 (0~1, same as above)	
H1.06	DPWM switching upper limit frequency		Factory default	00000
	Setting range	Ones digit	VirtualVDI1	
		0	invalid	
		1	efficient	
		Tenth place	Virtual VDI2 (0~1, same as above)	
		Hundreds	Virtual VDI3 (0~1, same as above)	
		Thousands	Virtual VDI4 (0~1, same as above)	
		Ten thousands	Virtual VDI5 (0~1, same as above)	

Different from ordinary digital input terminals, the status of virtual VDI can be set in two ways and selected through H0.05. When the selected VDI state is determined by the state of the corresponding virtual VDO, whether VDI is in a valid state depends on whether the VDO output is valid or invalid, and VDIx is uniquely bound to VDOx (x is 1 to 5).

When the VDI status is selected to be set by function code, the status of the virtual input terminal is determined through the binary bits of function code H1.06.

The following examples illustrate how to use virtual VDI.

Example 1: When selecting the VDO state to determine the VDI state, if you want to complete the following function: "When the AI1 input exceeds the upper and lower limits, the inverter will alarm and stop due to fault", you can use the following setting method:

Set the function of VDI1 to "User-defined fault 1" (H1.00=44);

Set the effective status mode of VDI1 terminal to be determined by VDO1 (H1.05=xxx0);

Set the VDO1 output function to "AI1 input exceeds the upper and lower limits" (H1.11=25);

When the AI1 input exceeds the upper and lower limits, the VDO1 output is in the ON state. At this time, the VDI input terminal status is valid. When the inverter VDI1 receives user-defined fault 1, the inverter will alarm E035 and shut down.

Example 2: When selecting function code H1.06 to set the VDI state, if you want to complete the following function: "After the inverter is powered on, it automatically enters the running state", you can use the following setting method:

Set the function of VDI1 to "forward rotation" (H1.00=1);

Set the VDI1 terminal effective status mode to be set by function code (H1.05=xxx1);

Set the command source to "terminal control" (P0.01=1);

After the inverter is powered on and initialized, it is detected that VDI1 is valid, and this terminal corresponds to forward operation, which is equivalent to the inverter receiving a terminal forward operation command, and the inverter immediately starts forward operation.

<table>
<tr><td rowspan="2">H1.07</td><td colspan="2">Function selection when AI1 terminal is used as DI</td><td>Factory default</td><td>0</td></tr>
<tr><td colspan="2">Setting range</td><td colspan="2">0 ~ 59</td></tr>
<tr><td rowspan="2">H1.08</td><td colspan="2">Function selection when AI2 terminal is used as DI</td><td>Factory default</td><td>0</td></tr>
<tr><td colspan="2">Setting range</td><td colspan="2">0 ~ 59</td></tr>
<tr><td rowspan="2">H1.09</td><td colspan="2">Function selection when AI3 terminal is used as DI</td><td>Factory default</td><td>0</td></tr>
<tr><td colspan="2">Setting range</td><td colspan="2">0 ~ 59</td></tr>
<tr><td rowspan="6">H1.10</td><td colspan="2">Valid mode selection when AI is used as DI</td><td>Factory default</td><td>000</td></tr>
<tr><td rowspan="5">Setting range</td><td>ones digit</td><td colspan="2">AI1</td></tr>
<tr><td>0</td><td colspan="2">Active high level</td></tr>
<tr><td>1</td><td colspan="2">Active low</td></tr>
<tr><td>tenth place</td><td colspan="2">AI2 (0~1, same one bit)</td></tr>
<tr><td>hundreds</td><td colspan="2">AI3 (0~1, same one bit)</td></tr>
</table>

This group of function codes is used to use AI as DI. When AI is used as DI, when the AI voltage is greater than 7V, the AI terminal status is high level. When the AI input voltage is lower than 3V, the AI terminal status is low level. There is a hysteresis loop between 3V and 7V.
H1.10 is used to determine when AI is used as DI, AI high level or low level is the valid state. As for the function settings when AI is used as DI, it is the same as ordinary DI settings. Please refer to the relevant DI setting instructions of group P5.

H1.11	Virtual VD01 output function selection	Factory default	0
	Setting range	0: Internally shorted to physical DIx 1 ~ 40: P6 group physical DO output selection	
H1.12	Virtual VD02 output function selection	Factory default	0
	Setting range	0: Internally shorted to physical DIx 1 ~ 40: P6 group physical DO output selection	
H1.13	Virtual VD03 output function selection	Factory default	0
	Setting range	0: Internally shorted to physical DIx 1 ~ 40: P6 group physical DO output selection	
H1.14	Virtual VD04 output function selection	Factory default	0
	Setting range	0: Internally shorted to physical DIx 1 ~ 40: P6 group physical DO output selection	
H1.15	Virtual VD05 output function selection	Factory default	0
	Setting range	0: Internally shorted to physical DIx 1 ~ 40: P6 group physical DO output selection	
H1.16	VD01 output delay time	Factory default	0.0s
	Setting range	0.0s ~ 3600.0s	
H1.17	VD02 output delay time	Factory default	0.0s
	Setting range	0.0s ~ 3600.0s	
H1.18	VD03 output delay time	Factory default	0.0s
	Setting range	0.0s ~ 3600.0s	
H1.19	VD04 output delay time	Factory default	0.0s
	Setting range	0.0s ~ 3600.0s	
H1.20	VD05 output delay time	Factory default	0.0s
	Setting range	0.0s ~ 3600.0s	

H1.21	VD0 Output terminal valid status selection	Factory default	00000
	Setting range	ones digit	VD01
		0	positive logic
		1	Counter logic
		Tenth place	VDO2 (0~1, same one digit)
		Hundreds	VDO3 (0~1, same one one digit)
		Thousands	VDO4 (0~1, same one digit)
		Ten thousands	VDO5 (0~1, same one digit)

The virtual digital output function is similar to the DO output function of the control board and can be used to cooperate with the virtual digital input VDIx to achieve some simple logic control.
When the virtual VDOx output function is selected as 0, the output status of VDO1 ~ VDO5 is determined by the input status of DI1 ~ DI5 on the control board. At this time, VDOx and DIx correspond one to one.
When the virtual VDOx output function is selected as non-0, the function settings and usage of VDOx are the same as the DO output related parameters of group P6. Please refer to the related parameter description of group P6.
The output valid state of the same VDOx can be selected as positive logic or negative logic and is set through H1.21.
The application examples of VDIx include the use of VDOx, please refer to them.

H3 Multi-point AI curve parameter group：

H3.00	AI curve 4 minimum input	Factory default	0.00V
	Setting range	-10.00V ~ H3.02	
H3.01	AI curve 4 minimum input corresponding setting	Factory default	0.0%
	Setting range	-100.0% ~ 100.0%	
H3.02	AI curve 4 inflection point 1 input	Factory default	3.00V
	Setting range	H3.00 ~ H3.04	
H3.03	AI curve 4 inflection point 1 input corresponding setting	Factory default	30.0%
	Setting range	-100.0% ~ 100.0%	
H3.04	AI curve 4 inflection point 2 input	Factory default	6.00V
	Setting range	H3.02 ~ H3.06	

H3.05	AI curve 4 inflection point 2 input corresponding setting	Factory default	60.0%
	Setting range	-100.0% ~ 100.0%	
H3.06	AI curve 4 maximum input	Factory default	10.00V
	Setting range	H3.04 ~ +10.00V	
H3.07	AI curve 4 maximum input corresponding setting	Factory default	100.0%
	Setting range	-100.0% ~ 100.0%	
H3.08	AI curve 5 minimum input	Factory default	0.00V
	Setting range	-10.00V ~ H3.10	
H3.09	AI curve 5 minimum input corresponding setting	Factory default	0.0%
	Setting range	-100.0% ~ 100.0%	
H3.10	AI curve 5 inflection point 1 input	Factory default	3.00V
	Setting range	H3.08 ~ H3.12	
H3.11	AI curve 5 inflection point 1 input corresponding setting	Factory default	30.0%
	Setting range	-100.0% ~ 100.0%	
H3.12	AI curve 5 inflection point 2 input	Factory default	6.00V
	Setting range	H3.10 ~ H3.14	
H3.13	AI curve 5 inflection point 2 input corresponding setting	Factory default	60.0%
	Setting range	-100.0% ~ 100.0%	
H3.14	AI curve 5 maximum input	Factory default	10.00V
	Setting range	H3.12 ~ +10.00V	
H3.15	AI curve 5 maximum input corresponding setting	Factory default	100.0%
	Setting range	-100.0% ~ 100.0%	

The functions of Curve 4 and Curve 5 are similar to Curve 1 to Curve 3, but Curve 1 to Curve 3 are straight lines, while Curve 4 and Curve 5 are four-point curves, which can achieve a more flexible correspondence.

When setting Curve 4 and Curve 5, please note that the minimum input voltage, inflection point 1 voltage, inflection point 2 voltage, and maximum voltage of the curve must be increased at once.

AI curve selection P5.31 is used to determine how analog inputs AI1~AI3 are selected among the five curves.

H3.24	AI1 sets jump point	Factory default	0.0%
	Setting range	-100.0% ~ 100.0%	

H3.25	AI1 sets jump amplitude	Factory default	0.5%
	Setting range	0.0% ~ 100.0%	
H3.26	AI2 sets jump point	Factory default	0.0%
	Setting range	-100.0% ~ 100.0%	
H3.27	AI2 sets jump amplitude	Factory default	0.5%
	Setting range	0.0% ~ 100.0%	
H3.28	AI3 sets jump point	Factory default	0.0%
	Setting range	-100.0% ~ 100.0%	
H3.29	AI3 sets jump amplitude	Factory default	0.5%
	Setting range	0.0% ~ 100.0%	

The analog inputs AI1~AI3 of KM1000 all have the set value jump function.
The jump function means that when the analog corresponding setting changes between the upper and lower jump points, the analog corresponding setting value is fixed to the value of the jumping point.
For example: the voltage of analog input AI1 fluctuates around 5.00V, and the fluctuation range is 4.9V ~ 5.1V. The minimum input of AI1 is 0V corresponding to 0.0%, and the maximum input of 10V corresponds to 100%. Then the detected AI1 is set to 49%. fluctuates between ~51%. Set the jump point H3.24 of AI1 to 50%, and set the jump amplitude H3.25 of AI1 to 1.0%. Then when the above AI1 input is processed by the jump function, the corresponding setting of the AI1 input is fixed to 50.0%, and AI1 is Transformed into a stable input, eliminating fluctuations.

H7 AI/A0 correction parameter group

H7.00	AI1 measured voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	
H7.01	AI1 displays voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	
H7.02	AI1 measured voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	
H7.03	AI1 displays voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	
H7.04	AI2 measured voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	
H7.05	AI2 displays voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	
H7.06	AI2 measured voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	
H7.07	AI2 displays voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	

H7.08	AI3 measured voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	
H7.09	AI3 displays voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	
H7.10	AI3 measured voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	
H7.11	AI3 displays voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	

This group of function codes is used to correct the analog input AI to eliminate the influence of AI input zero bias and gain.

This group of functional parameters has been calibrated before leaving the factory. When restoring Factory default, this group of parameters will not change.

The actual measured voltage refers to the actual voltage measured by measuring instruments such as a multimeter, and the displayed voltage refers to the voltage display value sampled by the inverter. See the CO group AI pre-correction voltage (C0.27, C0.28, C0.29) display.

When calibrating, input two voltage peaks into each AI input port, and accurately input the value measured by the multimeter and the value read by the C0 group into the above function code, then the inverter will automatically perform AI zero-bias and gain calibration. Correction.

For situations where the user's given voltage does not match the actual sampling voltage of the inverter, on-site correction can be used to make the inverter's sampling value consistent with the expected given value. Taking AI1 as an example, the on-site correction method is as follows.

Given the AI1 voltage signal (about 2V), actually measure the AI1 voltage value and store it in function parameter H7.00. Check the C0.27 display value and store it in function code H7.01. Given the AI1 voltage signal (about 8V), actually measure the AI1 voltage value and store it in function parameter H7.02. Check the C0.27 display value and store it in function code H7.03.

When calibrating AI2 and AI3, the actual sampling voltage viewing positions are C0.28 and C0.29 respectively. For AI1 and AI2, it is recommended to use 2V and 8V as calibration points.

H7.12	AO1 target voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	
H7.13	AO1 measured voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	
H7.14	AO1 target voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	
H7.15	AO1 measured voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	
H7.16	AO2 target voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	
H7.17	AO2 measured voltage 1	Factory default	Factory calibration
	Setting range	0.500V ~ 4.000V	

H7.18	AO2 target voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	
H7.19	AO2 measured voltage 2	Factory default	Factory calibration
	Setting range	6.000V ~ 9.999V	
H7.20	AI2 measured current 1	Factory default	Factory calibration
	Setting range	0.000mA ~ 20.000mA	
H7.21	AI2 sampling current 1	Factory default	Factory calibration
	Setting range	0.000mA ~ 20.000mA	
H7.22	AI2 measured current 2	Factory default	Factory calibration
	Setting range	0.000mA ~ 20.000mA	
H7.23	AI2 sampling current 2	Factory default	Factory calibration
	Setting range	0.000mA ~ 20.000mA	
H7.24	AO1 ideal current 1	Factory default	Factory calibration
	Setting range	0.000mA ~ 20.000mA	
H7.25	A01 measured current 1	Factory default	Factory calibration
	Setting range	0.000mA ~ 20.000mA	
H7.26	AO1 ideal current 2	Factory default	Factory calibration
	Setting range	0.000mA ~ 20.000mA	
H7.27	A01 measured current 2	Factory default	Factory calibration
	Setting range	0.000mA ~ 20.000mA	

This group of function codes is used to correct the analog output AO. This set of functional parameters has been corrected before leaving the factory and will not be restored when restoring Factory default. The target voltage refers to the theoretical output voltage value of the inverter. The actual measured voltage refers to the actual output voltage value measured by a multimeter and other instruments.

HC Control optimization parameter group

HC.00	DPWM Switch upper limit frequency	Factory default	0.0s
	Setting range	0 ~ Max frequency	

Adjust parameter HC.00 to the maximum frequency to reduce motor noise

HC.01	PWM Modulation		Factory default	0
	Setting range	0	Asynchronous modulation	
		1	synchronous modulation	

When the carrier frequency divided by the operating frequency is less than 10, it will cause output current oscillation or large current harmonics. At this time, it can be adjusted to "synchronous modulation" to reduce the current harmonics.

HC.02	Dead zone compensation mode selection		Factory default	1
	Setting range	0	No compensation	
		1	Compensation mode 1	
		2	Compensation mode 2	

This parameter generally does not need to be modified. Only when there are special requirements for the quality of the output voltage waveform or the motor has oscillation or other abnormalities, you need to try to switch to different compensation modes. It is recommended to use compensation mode 2 for high power.

HC.03	PWM modulation method		Factory default	0
	Setting range	0	Random PWM is invalid	
		1 ~ 10	PWM carrier frequency random depth	

Setting random PWM can make the monotonous and harsh motor sound softer. And can help reduce external electromagnetic interference. When the random PWM is set to 0, the random PWM is invalid. Adjusting random PWM to different depths will result in different effects.

HC.04	Energy saving control enable		Factory default	0
	Setting range	0	Invalid	
		1	Efficient	

When the energy-saving control is effective, the output voltage is automatically adjusted to minimize the load current and reduce the loss of the motor when the motor speed remains unchanged. This function is especially effective for fans and pumps with torque-reducing characteristics. Automatic energy-saving operation is only effective for V/F control mode and is only suitable for situations where the load is stable. The automatic torque boost and slip compensation functions need to be used simultaneously during automatic energy-saving operation under V/F control.

HC.05	Dead time adjustment	Factory default	150%
	Setting range	100% ~ 200%	

HC.06	Current correction coefficient	Factory default	100%
	Setting range	0.0% ~ 200%	

When the output current (C0.01) does not correspond to the expected value, this value can be used to linearly correct the output current.

HF Expansion card card setting parameter group:

HF.00	Temperature channel enable		Factory default	00000
	Setting range	ones digit	PT1 temperature channel	
		0	PT1 is invalid	
		1	PT1 is valid	
		tenth place	PT2 temperature channel	

		0	PT2 is invalid
		1	PT2 is valid
		hundreds	PT3 temperature channel
		0	PT3 is invalid
		1	PT3 is valid

The KM1000IO1-01A expansion card needs to be configured to support three-channel PT100 or PT1000 temperature sensors. When using it, the sensor channel must be correctly set and the direction of the sensor type DIP switch of the expansion card must be correctly turned.

HF.01	PT1 temperature channel overheat protection threshold	Factory default	110℃
	Setting range	0℃ ~ 200℃	
HF.02	PT2 temperature channel overheat protection threshold	Factory default	110℃
	Setting range	0℃ ~ 200℃	
HF.03	PT3 temperature channel overheat protection threshold	Factory default	110℃
	Setting range	0℃ ~ 200℃	

When the driver detects that the temperature of the PT1 channel reaches the set value, the driver reports an E066 fault and shuts down. The actual temperature of the channel can be viewed through C0.55.

When the driver detects that the temperature of the PT2 channel reaches the set value, the driver reports E067 fault and stops. The actual temperature of the channel can be viewed through C0.56.

When the driver detects that the temperature of the PT3 channel reaches the set value, the driver reports an E068 fault and shuts down. The actual temperature of the channel can be viewed through C0.57.

HF.04	PT1 temperature channel overheating warning threshold	Factory default	90℃
	Setting range	0℃ ~ 200℃	
HF.05	PT2 temperature channel overheating warning threshold	Factory default	90℃
	Setting range	0℃ ~ 200℃	
HF.06	PT3 temperature channel overheating warning threshold	Factory default	90℃
	Setting range	0℃ ~ 200℃	

When the driver detects that the temperature of the PT1 channel reaches the set value, the driver's multi-function DO outputs an ON signal.

When the driver detects that the temperature of the PT2 channel reaches the set value, the driver's multi-function DO outputs an ON signal.
When the driver detects that the PT3 channel temperature reaches the set value, the driver multi-function DO output.

Chapter 7 : Fault diagnosis and treatment methods

KM series inverters have complete protection functions and can implement effective protectin while givg full play to product performance. Once a fault occurs, the inverter stops output and displays a fault code on the panel. Users can refer to the following table based on the displayed code. Analyze and self-check to determine the cause and eliminate faults. You can also view past faults and relevant data content at the time of the fault through P2.13~PC.39. To make it easier to find and solve problems.

6.1. Fault code description and solution

SN	Fault code	Fault name	Possible Causes	Solutions
1	E001	Over current during acceleration	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The acceleration time is too short. 4: Manual torque boost or V/F curve is not appropriate. 5: The voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during acceleration. 8: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto tuning. 3: Increase the acceleration time. 4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select an AC drive of higher power class.

SN	Fault code	Fault name	Possible Causes	Solutions
2	E002	Over current During deceleration	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The acceleration time is too short. 4: Manual torque boost or V/F curve is not appropriate. 5: The voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during acceleration. 8: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto tuning. 3: Increase the acceleration time. 4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select an AC drive of higher power class.
3	E003	over current at constant speed	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The voltage is too low. 4: A sudden load is added during operation. 5: The AC drive model is of too small power class	1: Eliminate external faults. 2: Perform the motor auto tuning. 3: Adjust the voltage to normal range. 4: Remove the added load. 5: Select an AC drive of higher power class.
4	E004	Over voltage during	1: The input voltage is too high.	1: Adjust the voltage to normal range.

SN	Fault code	Fault name	Possible Causes	Solutions
		acceleration	2: An external force drives the motor during acceleration. 3: The acceleration time is too short. 4: The braking unit and braking resistor are not installed.	2: Cancel the external force or install a braking resistor. 3: Increase the acceleration time. 4: Install the braking unit and braking resistor.
5	E005	Over voltage during deceleration	1: The input voltage is too high. 2: An external force drives the motor during deceleration. 3: The deceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor. 3: Increase the deceleration time. 4: Install the braking unit and braking resistor.
6	E006	Over-voltage at constant speed	1: The input voltage is too high. 2: An external force drives the motor during deceleration	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor.
7	E007	Control power supply fault	The input voltage is not within the allowable range.	Adjust the input voltage to the allowable range.
8	E008	Under voltage	1: Instantaneous power failure occurs on the input power supply. 2: The AC drive's input voltage is not within the allowable range. 3: The bus voltage is abnormal.	1: Reset the fault. 2: Adjust the voltage to normal range. 3: Contact the agent or vendor

SN	Fault code	Fault name	Possible Causes	Solutions
			4: The rectifier bridge and buffer resistor are faulty. 5: The drive board is faulty. 6: The main control board is faulty.	
9	E009	AC Drive parts fault	1.AC drive output short circuit 2. cable from AC drive to motor too long 3. IGBT module over heat 4. IGBT module damaged 5. driving abnormal	1.Too check the cable insulation, to check with disconnect motor cable 2. add AC reactor 3. to contact vendor
10	E010	Input phase missing	1: The three-phase power input is-abnormal. 2: The drive board is faulty. 3: The lightening board is faulty. 4: The main control board is faulty	1: Eliminate external faults. 2: Contact the agent or vendor
11	E011	Power output phase missing	1: The cable connecting the AC drive and the motor is faulty. 2: The AC drive's three-phase outputs are unbalanced when the motor is running. 3: The drive board is faulty. 4: The module is faulty.	1: Eliminate external faults. 2: Check whether the motor three-phase winding is normal. 3: Contact the agent or vendor
12	E012	Short circuit to ground	The motor is short circuited to the	Replace the cable or motor.

SN	Fault code	Fault name	Possible Causes	Solutions
			ground.	
13	Reserve			
14	E014	AC drive overload	1. Boost torque is too big under VF control 2. accel and decel. time is too short 3.motor parameters setting is improperly 4.Restart motor which in counter rotate 5． The grid voltage is too lower 6. load is too big or motor block load 7. AC drive selected is too load	1.Reduce boost torque 2. increase the accel /decel. time 3.reset motor parameters 4.Reduce current limit and adopt speed tracking 5. Too check grid voltage 6.Too check load 7.change bigger power AC drive
15	E015	Motor load	1. Motor have wrong parameters setting 2. Input voltage of grid is too low 3. Load is too big or motor is blocked	1, Reset the motor parameters 2, check the input source of grid 3, Check the motor load if in good condition
16	E016	Module overheat	1: The ambient temperature is too high. 2: The air filter is blocked. 3: The fan is damaged. 4: The thermally sensitive resistor of the module is damaged. 5: The AC Drive module is damaged.	1: Lower the ambient temperature. 2: Clean the air filter. 3: Replace the damaged fan. 4: Replace the damaged thermally sensitive resistor. 5: Replace the AC Drive module.
17	E017	EEPROM read/ write fault	The EEPROM chip is damaged.	Replace the main control board.

SN	Fault code	Fault name	Possible Causes	Solutions
18	E018	External equipment fault	Through multiple terminals X input external fault signal 2.Terminals error operation	1.running reset 2.Contact vendor
19	E019	Accumulative running time reached	The accumulative running time reaches the setting value.	Clear the record through the parameter initialization function
20	E020	Accumulative power-on time reached	The accumulative power-on time reaches the setting value	Clear the record through the parameter initialization function
21	E021	Current detect fault	1. Current hall detect damaged 2.Driving board fault	1. check the hall and plug if loose 2. contact to vendor
22	E022	Overheat fault of motor	1.Motor temperature 2. motor temperature sensor fault	1.motor heat dissipation is not good 2.check the connecting of halls and sensor
23	E023	Contactor fault	1.Cont actor is abnormal 2.driving board and power supply is not good	1.change the cont actor 2.contact vendor
24	E024	Communication fault	1.Upper control abnormal 2.communication cable is not good 3.communicator parameters setting is correct	1. Check the connection of upper controller 2. Check communication cable 3.To set correct parameters
25	E025	Encoder fault	1.Encoder type is not matching 2.wrong wiring of encoder 3.encoder is damaged 4.PG card abnormal	1.Set encoder parameters correct 2. Check wiring 3.To check encoder 4. Check PG card
26	E026	Motor auto-tuning fault	1: The motor parameters are not	1: Set the motor parameters according to the nameplate

SN	Fault code	Fault name	Possible Causes	Solutions
			set according to the nameplate. 2: The motor auto-tuning times out.	properly. 2: Check the cable connecting the AC drive and the motor.
27	E027	Initial position fault	The motor parameters are not set based on the actual situation	Check that the motor parameters are set correctly and whether the setting of rated current is too small
28	E028	Hard ware current protection	1.the load is too big or load blocked 2. motor auto tuning is not good 3.AC drive power is too small	1.Check motor and load 2.Try to run with VF control 3.Change bigger power AC drive
29	E029	Motor over-speed	1: The encoder parameters are set incorrectly. 2: The motor auto-tuning is not performed. 3: motor over speed setting is not correct	1.reset encoder parameters 2.motor parameters identify 3.to set parameters properly.
30	E030	Too large speed deviation	1: The encoder parameters are set incorrectly. 2: The motor auto-tuning is not performed. 3: Motor setting is not correct	1: Set the encoder parameters properly. 2: Perform the motor auto tuning. 3: Set motor parameters correctly based on the actual situation.
31	E033	Runtime PID feedback is lost	The PID feedback is less than the P9.26 setting value 2. PID feedback loop break line 3. PID feedback sensor fault	1.Set P9.26 as an appropriate value 2.Check the PID feedback signal line 3.Check the PID feedback sensor
32	E035	User-defined fault 1	1. (44) User-defined fault 1 signal through multifunctional terminal DI	1. Reset operation

SN	Fault code	Fault name	Possible Causes	Solutions
33	E036	User-defined fault 2	1. The (45) user-defined fault 2 signal is input through the multifunctional terminal DI	1. Reset operation
34	E045	AEMF identification	1. Motor parameters are not set correctly 2. P2.16 reverse EMF is wrongly set during static identification 3. Abnormal in identification during dynamic identification 4. Demagnetization occurs in the motor 5. The reverse electric momentum of the motor is indeed too large or too small	1. Set motor parameters correctly, especially rated frequency and rated speed. 2. Check whether the P2.16 setting is too big or too small and modify it. 3. Check whether the motor is completely unloaded during dynamic identification, and whether the motor rotates to 40% of the rated speed of the motor during identification. If the motor fails to rotate to 40% of the rated speed during identification due to the connection of the load, it is necessary to disengage the load and identify it again. 4. Check whether the motor demagnetizes. 5. If it is confirmed that the back electromotive force of the motor is too large or too small, you can press the "STOP" key to reset this warning and continue the next operation.
35	E065	User-defined overload threshold value	1. The actual output current is greater	1.Reset the operation

SN	Fault code	Fault name	Possible Causes	Solutions
			than the set value of PC.05	
36	E065	User-defined overload threshold value	1.The actual output current is greater than the PC.05 set value	1.Reset the operation
37	E066	Over-temperature alarm threshold of the first channel of the temperature card	1. The current access temperature is too high 2. Temperature sensor wiring is loose 3. HF. 01 Alarm temperature setting is not appropriate	1.Heat and dissipate the access point device 2.HF. 01 Set up the appropriate alarm valve value or temperature sensor and wiring
38	E067	Over-temperature alarm threshold of the second channel of the temperature card	1. The current access temperature is too high 2. Temperature sensor wiring is loose 3. HF. 02 Alarm temperature setting is not appropriate	1. Heat dissipate the access point device 2. HF. 02 Set up the appropriate alarm valve value or temperature sensor and wiring
39	E068	Temperature card third channel over-temperature alarm threshold	1. The current access temperature is too high 2. Temperature sensor wiring is loose 3. HF. 03 Alarm temperature setting is not appropriate	1. Heat dissipate the access point device 2. HF. 03 Set up the appropriate alarm valve value or temperature sensor and wiring

Chapter 8. Maintenance and Troubleshooting

The influence of the ambient temperature, humidity, dust and vibration will cause the aging of the devices in the AC drive, which may cause potential faults or reduce the service life of the AC drive. Therefore, it is necessary to carry out routine and periodic maintenance.

7.1 Routine Maintenance

Routine maintenance involves checking:

Whether the motor sounds abnormally during running

Whether the motor vibrates excessively during running

Whether the installation environment of the AC drive changes.

Whether the AC drive's cooling fan works normally

Whether the AC drive overheats

7.2. Routine cleaning involves

Keep the AC drive clean all the time.

Remove the dust, especially metal powder on the surface of the AC drive, to prevent the dust from entering the AC drive.

Clear the oil stain on the cooling fan of the AC drive.

7.3. Periodic Inspection

Perform periodic inspection in places where inspection is difficult.

Periodic inspection involves:

Check and clean the air duct periodically.

Check whether the screws become loose.

Check whether the AC drive is corroded.

Check whether the wiring terminals show signs of arcing;

Before measuring the insulating resistance with mega meter (500 VDC) mega meter recommended), disconnect the main circuit from the AC drive.

Do not use the insulating resistance meter to test the insulation of the control circuit. The high voltage test need not be performed again because it has been completed before delivery.

7.4. Main circuit insulation test

Replacement of Vulnerable Components

The vulnerable components of the AC drive are cooling fan and filter electrolytic capacitor. Their service life is related to the operating environment and maintenance status. Generally, the service life is shown as follows:

Component	Service Life	Possible Damage Reason	Judging Criteria
Fan	2 to 3 years	Bearing worn •Blade aging	Whether there is crack on the blade • Whether there is abnormal vibration noise upon startup
Electrolytic capacitor	4 to 5 years	Input power supply in poor quality • High ambient temperature • Frequent load jumping • Electrolytic aging	Whether there is liquid leakage. • Whether the safe valve has projected. • Measure the static capacitance. • Measure the insulating resistance.

7.5. Storage of the AC Drive

For storage of the AC drive, pay attention to the following two aspects:

1) Pack the AC drive with the original packing box provided by vendor

2) Long-term storage degrades the electrolytic capacitor. Thus, the AC drive must be energized once every 2 years, each time lasting at least 5 hours. The input voltage must be increased slowly to the rated value with the regulator.

9.5. Warranty Agreement

1) Free warranty only applies to the AC drive itself.

2) Vendor will provide 18-month warranty (starting from the leave-factory date as indicated on the bar-code) for the failure or damage under normal use conditions. If the equipment has been used for over 18 months, reasonable repair expenses will be charged.

3) Reasonable repair expenses will be charged for the damages due to the following causes:

- Improper operation without following the instructions
- Fire, flood or abnormal voltage.
- Using the AC drive for non-recommended function

4) The maintenance fee is charged according to vendor's uniform standard. If there is an agreement, the agreement prevails.

Appendix A. Selection of Power of Braking Resistor

In theory, the power of the braking resistor is consistent with the braking power. But in consideration that the de-rating is 70%, you can calculate the power of the braking resistor according to the formula 0.7 x Pr = Pb x D.

Pr refers to the power of resistor.

D refers to the braking frequency (percentage of the regenerative process to the whole working process)

Application	Elevator	Winding and unwinding	Centrifuge	Occasional braking load	General application
Braking Frequency	20%–30%	20%–30%	50%–60%	5%	10%

Below table provides data for reference. You can select different resistance and power based on actual needs. However, the resistance must not be lower than the recommended value. The power may be higher than the recommended value.

The braking resistor model is dependent on the generation power of the motor in the actual system and is also related to the system inertia, deceleration time and potential energy load. For systems with high inertia, and/or rapid deceleration times, or frequent braking sequences, the braking resistor with higher power and lower resistance value should be selected.

Below table recommended values of braking resistor

AC drive models	Commended Power	Commended Braking resistor	Built in /external	Remark
Single phase 220V				
KM1000-2S0.75G	80W	≥150Ω	Built in option	Added B when built in after model
KM1000-2S1.5G	100W	≥100Ω		
KM1000-2S2.2G	100W	≥70Ω		
Three phase 220V				
KM1000-2T0.75G	150W	≥110Ω	Built in option	Added B when built in after model
KM1000-2T1.5G	250W	≥100Ω		
KM1000-2T2.2G	300W	≥65Ω		
KM1000-2T3.7G	400W	≥45Ω		
KM1000-2T5.5G	1000W	≥22Ω	Built in option	Same as above
KM1000-2T7.5G	1000W	≥16Ω		
KM1000-2T11G	1500W	≥11Ω	Built in option	Same as above
KM1000-2T15G	2500W	≥8Ω		

KM1000-2T18.5G	3.7 kW	≥8.0Ω	External	KMBU-35-A
KM1000-2T22G	4.5 kW	≥8Ω	External	KMBU-35-A
KM1000-2T30G	5.5 kW	≥4Ω	External	KMBU-70-A
KM1000-2T37G	7.5 kW	≥4Ω	External	KMBU-70-A
KM1000-2T45G	4.5 kW×2	≥4Ω×2	External	KMBU-70-A×2
KM1000-2T55G	5.5 kW×2	≥4Ω×2	External	KMBU-70-A×2
KM1000-2T75G	16kW	≥1.2Ω	External	KMBU-200-A
Three phase 380V				
KM1000-4T0.75GB	150W	≥300Ω	Standard	
KM1000-4T1.5GB	150W	≥220Ω		
KM1000-4T2.2GB	250W	≥200Ω		
KM1000-4T3.7GB	300W	≥130Ω		
KM1000-4T5.5GB	400W	≥90Ω		
KM1000-4T7.5GB	500W	≥65Ω		
KM1000-4T11GB	1000W	≥43Ω		
KM1000-4T15GB	1000W	≥32Ω		
KM1000-4T18.5G	1300W	≥25Ω	Built in option	KMBU-35-B
KM1000-4T22G	1500W	≥22Ω		KMBU-35-B
KM1000-4T30G	2500W	≥16Ω		KMBU-35-B
KM1000-4T37G	3.7 kW	≥16.0Ω		KMBU-35-B
KM1000-4T45G	4.5 kW	≥16Ω		KMBU-35-B
KM1000-4T55G	5.5 kW	≥8Ω		KMBU-70-B
KM1000-4T75G	7.5 kW	≥8Ω		KMBU-70-B
KM1000-4T93G	4.5 kW×2	≥8Ω×2	External	KMBU-70-B×2
KM1000-4T110G	5.5 kW×2	≥8Ω×2	External	KMBU-70-B×2
KM1000-4T132G	6.5 kW×2	≥8Ω×2	External	KMBU-70-B×2
KM1000-4T160G	16kW	≥2.5Ω	External	KMBU-200-B
KM1000-4T185G	18.5 kW	≥2.5Ω	External	KMBU-200-B
KM1000-4T220G	22 kW	≥2.5Ω	External	KMBU-200-B
KM1000-4T250G	12.5 kW×2	≥2.5Ω×2	External	KMBU-200-B×2
KM1000-4T315G	16kW×2	≥2.5Ω×2	External	KMBU-200-B×2
KM1000-4T355G	17kW×2	≥2.5Ω×2	External	KMBU-200-B×2
KM1000-4T400G	14 kW×3	≥2.5Ω×3	External	KMBU-200-B×3
KM1000-4T450G	15kW×3	≥2.5Ω×3	External	KMBU-200-B×3

Appendix B. Communication protocol description

KM series inverter supports Modbus communication protocol, through which the upper computer can control, monitor and modify the functional parameters. KM series communication data can be divided into functional code data and non-functional code data, the latter includes running command, running state, running parameters, alarm information, etc.

A.1 KM functional code data

Function code data is the important setting parameters of frequency converter, and the functional parameters of KM series group P and group H.as follows：

KM series Functional code data	P group (Literacy is available)	P0, P1, P2, P3, P4, P5, P6, P7, P8, P9, PA, Pb, PC, Pd, PE, PF
	H group (Literacy is available)	H0, H1, H2, H3, H4, H5, H6, H7, H8, H9, HA, HB, HC, HD, HE, HF

The function code data mailing address is defined as follows:

1) When the functional code data is read for the communication

For the functional code data of P0 ~ PF and H0 ~ HF groups, the communication address is directly the functional group number, and the lower 16 is directly the functional code number in the functional group. The examples are as follows:

P0.10 function parameters, whose address address is F 00 AH. F0H represents the function parameters of P0 group, and 0 AH represents the hexadecheal data format of function number 16 in the function group.

HC.05 function parameters, whose mailing address is AC05, where ACH represents the function parameters of the HC group, and 05H represents the hexadecimal data format of the serial number 5 of the function code in the function group.

2) When the functional code data is written for the communication

For the function code data of P0 ~ PF group, its communication address is 16 points high, and according to whether EEPROM is written, it is 00~0F or F0~FF. 16 points low is directly the serial number of the function code in the function group. The examples are as follows:

● Write the function parameter P0.10

Without writing to the EEPROM, the mailing address is 000 AH

When the EEPROM needs to be written, its mailing address is F 00 AH

For the data of the P0 ~ PF group of function code, its communication address is 16 years high, and according to whether EEPROM needs to be written, it is divided into P0 ~ PF or H0 ~ HF, and 16 percent low is directly the serial number of the function code in the function group. Examples are as follows:

● Write the function parameters HC.05

When writing to the EEPROM is not required, the mailing address is 1C05H

When the EEPROM needs to be written, its mailing address is AC05H

A.2 KM series of non-functional code data

Non-functional code data	status data (read only)	Monitoring parameters, fault description of frequency converter and operating status of frequency converter
	controlling parameter (write only)	Control command, communication set point, digital output terminal control, analog output AO1 control, analog output AO2 control, high-speed pulse (FMP) output control, and parameter initialization

1) Status data

The status data is divided into group C monitoring parameters, frequency converter fault description, and frequency converter operating status

● Group C parameter monitoring parameters

Monitoring data of Group C is described in Chapter 5 and Chapter 6, with the address defined as follows:

C0~C3, its mailing address high 16 is 50~53, low 16 is the serial number of monitoring parameters in the group, as follows: C0.11, its mailing address is 500 BH.

● Fault description of the frequency converter

When reading the fault description of the converter, the communication address is fixed to 3100H, and the upper computer can obtain the current fault code of the converter by reading the address data. The fault code is defined in Chapter 5 PC.13 function code.

● Operation status of the frequency converter

When reading the operating status of the frequency converter, the communication address is fixed to 3000H. By reading the address data, the upper computer can obtain the current operating status information of the frequency converter, which is defined as follows：

Frequter operating status address	Read the state word definition
3000H	1: Is running
	2: Reverse operation
	3: Downtime

2) Control parameters

The control parameters are divided into control command, digital output terminal control, analog output AO1 control, analog output AO2 control, and high-speed pulse (FMP) output control.

● control command

When P0.01 (command source) is selected as 2: communication control, the upper computer can control the start and stop of the inverter through the communication address. The control command is defined as follows：

Control the command mailing address	Command function
2000H	1: Is running
	2: Reverse operation
	3: Positive point movement

	4: Reverse point movement
	5: Slow down
	6: Free shutdown
	7: Fault reset

●Communication set value

Communication Set point in the main user KM series, the frequency source, torque upper limit source, VF separation voltage source, PID given source, PID feedback source are selected as the given data of communication given timing. Its mailing address is 4000H, and when the host computer sets the mailing address value, the data range is-10000~10000, corresponding to the relative given value of-100.00%~100.00%.

Communication setpoint address	Command content
4000H	-10000~10000 indicates-100.00%~100.00%

● Digital output terminal control

When the digital output terminal function is selected as 39: communication control, the upper computer can control the inverter digital output terminal through the communication address, defined as follows:

The digital output terminal controls the mailing address	Command content
2003H	BIT 0: DO 1 output control BIT 1: DO 2 output control BIT 2: RELAY1 output control BIT 3: RELAY2 output control BIT 4: FMR output control BIT5：VDO1 BIT6：VDO2 BIT7：VDO3 BIT8：VDO4 BIT9：VDO5

●When the analog output AO1 and AO2, and the high-speed pulse output FM output function is selected as 12: communication setting, the upper computer passes

When the analog output is AO1 and AO2, and the high speed pulse output FM output function is selected as 12: communication setting, the upper computer can control the inverter analog output and high speed pulse output through the communication address, which is defined as follows：

Output control mailing address		Command content
AO1	2001H	0 ~ 7 FFF indicates between 0% and 100%
AO2	2002H	
FMP	2004H	

● Parameter initialization

This function is required when the parameter initialization of the inverter is required through the upper computer.

If P0.13 (user password) is not 0, the password needs to be verified through communication first. After the verification passes, the upper computer initializes the parameters within 30 seconds.

The communication address for user password verification is F700H. If the correct user password is directly written to the address, the address for parameter initialization address is F00D, and the data content is defined as follows：

The parameter initializes the mailing address	Command function
F00DH	1: Restore the factory parameters
	2: Clear record information
	201: To restore the user backup parameters
	5: Backup the user's current parameters

KM series frequency converter provides RS485 communication interface and supports Modbus-RTU slave communication protocol. Users can realize centralized control through the computer or PLC, set the frequency converter operation command through the communication protocol, modify or read the function code parameters, and read the working state and fault information of the frequency converter.

A.3 Agreement content

The serial communication protocol defines the information content and usage format transmitted in the serial communication. This includes: host polling (or broadcast) format; host coding method, including: required action function code, transmission data and error check. The response of the slave also adopts the same structure, including: action confirmation, return data and error verification, etc. If the slave has an error while receiving the information, or cannot complete the action required by the host, it will organize a failure information and feed it back to the host in response.

1） apply styles

The frequency converter is connected to the "single-master and multi-slave" PC / PLC control network with RS485 bus, as the communication slave.

2）bus configuration；bus structure

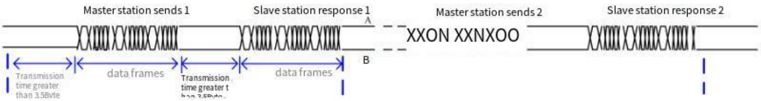
● topology structure；　topological structure

Single-host multi-slave system. Each communication device in the network has a unique station address, in which one device is used as the communication host (often flat PC host, PLC, HMI, etc.), actively initiate communication, read or write parameters on the slave, while other devices are for the communication slave, in response to the host's inquiry or communication operation of the host. Only one device can send the data at the same time, while the other devices are in the receiving state.

The setting range of the slave address is 1~247,0 is the broadcast communication address. The slave address in the network must be unique.

● Communication transmission mode

Asynchronous serial, semi-duplex transmission mode. In the process of serial asynchronous communication, the data sends one frame of data at a time in the form of a message. It is agreed in the MODBUS-RTU protocol that when the idle time without data on the communication data line is greater than the transmission time of 3.5 Byte, the start of a new communication frame is indicated.



The built-in communication protocol of KM series inverter is Modbus-RTU slave communication protocol, which can respond to the "query / command" of the host, or make corresponding actions according to the "query / command" of the host, and communicate the data response.

The host can refer to a personal computer (PC), industrial control equipment or programmable logic controller (PLC), etc. The host can not only communicate to a slave alone, but also release broadcast information to all the lower slave. For the separate access query / command of the host, the visited slave returns a reply frame; for the broadcast information, the host needs no feedback response to the host.

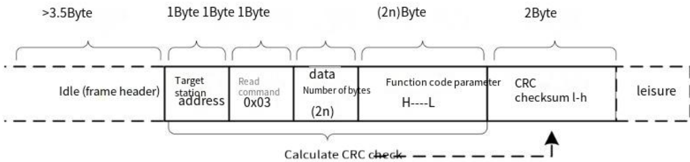
A.4 Communication data structure

The Modbus protocol communication data format of KM series frequency converter is as follows. frequency converter only supports reading or writing Word-type parameters, the corresponding communication read command is Ox 03; write command is 0x06, and no byte or bit reading is supported：

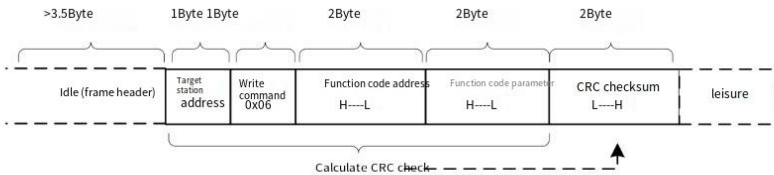
The main station reads the command frame

In theory, the upper computer can read several consecutive function codes at a time (that is, n can be up to 12), but it should be noted that it cannot cross the last function code of this function code group, otherwise the reply will be wrong.

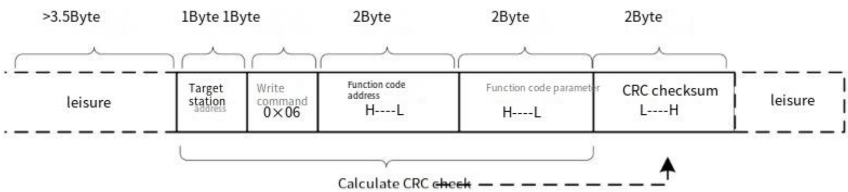
Read the response frame from the station



The main station writes the command frame



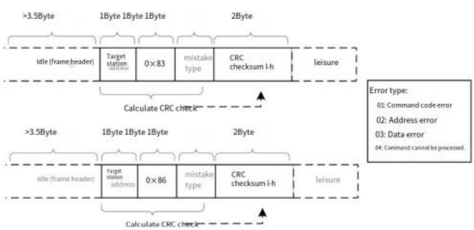
Write the answer frame from the station



If the communication frame error is detected by the machine, or causes unsuccessful reading and writing due to other reasons, the error frame will be answered。

From the station to read the answer error frame

From the station write answer error frame



1） Description of the data frame field：

Function code address START	More than 3.5 characters of the transfer time is idle
From the machine address KMR	Address address range: 1 ~ 247; 0 = Broadcast address
command code；operation code CMD	03: Read the slave parameters; 06: Write the slave parameters
Function code address H	The parameter address inside the inverter is indicated in 16 decimal system; it is divided into functional codes and non-functional codes (such as running status parameters, running commands, etc.). See the address definition for details. When transmitting, high bytes are in front and low bytes are back.
Function code address L	
The number of functional codes, H	If the number of functional codes read in this frame is 1 indicates that 1 functional code is read. When transmitting, high bytes are in front and low bytes are back. This agreement can only rewrite one function code at a time, without this field.
The number of functional codes, L	
data H	Answer data, or data to be written, is transmitted with high bytes earlier and low bytes later.
data L	
CRC CHK Low level	Detection value: CRC16 check value. When transmitting, low bytes are in front and high bytes are back. The calculation method is described in this section of CRC calibration for details.
CRC CHK High level	
END	At the time of 3.5 characters

2) CRC calibration mode:

The CRC (Cyclical Redundancy Check) uses the RTU frame format, and the message includes an error detection domain based on the CRC method. The CRC domain detects the content of the entire message. The CRC domain is two bytes containing a binary value of 16 bits. It is calculated by the transmission device and then added to the message. The receiving device recalculates the CRC that has received the message and compares the value in the received CRC domain, and if the two CRC values are not equal, the transmission error occurs.

CRC is done by first saving 0xFFFF and then calling a process to process the continuous 8-bit bytes in the message with the value in the current register. Only the 8 Bit data in each character is valid for the CRC, and both the start and stop bits and the parity bits are invalid.

During CRC generation, each 8-bit character is different from the register content or (XOR) separately, and the result is moved towards the lowest effective bit, and the highest effective bit is filled with 0. The LSB was extracted for detection, not performed if LSB was 1, register alone and preset values were different, or if LSB was 0. The entire procedure was repeated 8 times. After the last digit (8th digit) is completed, the next 8-bit byte is separately different from the current value of the register. The value in the final register is the CRC value after all bytes in the message。

CRC When added to a message, low bytes join first, and then high bytes. The CRC simple functions are shown as follows：

CRCThe check function is as follows :

```
unsigned int crc _chk_value(unsigned char*data_value, unsigned char length)
  {
        unsigned int crc_value=0xFFFF;
        inti;
        while(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);
  }
```

A.5 Function code parameter address marking rules

Address definition of communication parameters, read and write functional code parameters (some function codes cannot be changed, only for the manufacturer or monitoring use).

Represent the rule with the function code group number and the reference code as the parameter address:

High-level bytes: F0~FF (Group P), H 0 ~ HF (Group H), 50~53 (Group C)

Low Bytes: 00 to FF

For example, for the range function code P3.12, the access address of the function code is expressed as 0 xF 30 C;

pay attention to:

● PF group: neither read parameters nor change parameters;

● Group C: Read only, not changing parameters.

Some parameters cannot be changed when the frequency converter is in operation; some parameters cannot be changed; change the function code parameters, note the parameter range, units, and relevant instructions.

Function code group number	Communication access address	Communication fies the function code address in RAM
From the P 0 to the PE group	0xF000 ～ 0xFEFF	0x0000 ～ 0x0EFF
From the H 0 to the HF group	0xA000 ～ 0xAFFF	0x1000 ～ 0x1FFF
Group C0	0x5000 ～ 0x50FF	

Note that because EEPROM is frequently stored, it will reduce the service life of EEPROM, so some function codes are not stored in communication mode, just change the value in RAM.
If it is a P group parameter, to achieve this function, as long as the high F of the function code address into 0.
If it is a group H parameter, to achieve this function, as long as the high A of the function code address into 1 can be achieved.
The corresponding function code address is indicated as follows:
High bytes: 00~0F (P), 10~1F (H)
Low Bytes: 00 to FF
in compliance with:
Function code P3.12 is not stored in EEPROM, and the address is 030C;
Function code H0.05 is not stored in EEPROM, and the address is 1005;
This address means that can only write RAM, cannot read the action, read, invalid address.
For all the parameters, this function can also be implemented using the command code 07H.

1）Monitoring parameters and their communication access address（read only；read-only ）

Monitor the content	Communication read address	Monitor the content	Communication read address
running frequency (Hz)	5000H	PULSE Input pulse frequency (Hz)	5013H
output (A)	5001H	Current power time	5014H
output voltage (V)	5002H	Current run time	5015H
Load speed is shown	5003H	The remaining running time	5016H
Bus bar voltage (V)	5004H	Auxiliary frequency display	5017H
Set Frequency (Hz)	5005H	Auxiliary frequency display	5018H
count value	5006H	Feedback speed (in 0.1Hz)	5019H
Length value	5007H	Encoder feedback speed	501AH
X input mode	5008H	AI1 pre before voltage	501BH
DO output state	5009H	AI2 pre front voltage	501CH
AI1 Voltage (V)	500AH	The torque is given as a set point	501DH

AI2 Voltage (V)	500BH	The PULSE input pulse frequency	501EH
Panel potentiometer voltage (V)	500CH	Communication set value	501FH
PID setting	500DH	Motor temperature value	5022H
output power (kW)	500EH	Process card PT first channel temperature value	5037H
output torque (%)	500FH	Process card PT second channel temperature value	5038H
linear velocity	5010H	Process card PT third channel temperature value	5039H
PID feedback	5011H		
PLC stage	5012H		

Pay attention:

● The communication set point is the percentage of the relative value, 10000 corresponds to 100.00% and-10000 corresponds to-100.00%.

● For the data of frequency dimension, the percentage is the percentage of the relative maximum frequency (P0.04); for the data of torque dimension, the percentage is P3.10, H2-37 (torque upper limit number is set, corresponding to the first and second motors respectively).

2） Control command input to the frequency converter: (write only）

Command word address	Command function
2000H	0001: Forward turn operation
	0002: reverse operation
	0003: Positive turning point movement
	0004: reverse point movement
	0005: deceleration stop
	0006: Free shutdown
	0007: Fault is reset

3) Read the frequency converter status: (read-only)

status word address	State word function
3000H	0001: Forward turn operation
	0002: reverse operation
	0003: shut down

4) Parameter lock password check: (if 8888H, the password passed)

Password address	Enter the contents of the password
F700H	*****

5) Digital output terminal control: (write only)

Command address	Command content
2003H	BIT 0: DO 1 output control BIT 1: DO 2 output control BIT 2: RELAY1 output control BIT 3: RELAY2 output control BIT 4: FMR output control BIT5：VDO1 BIT6：VDO2 BIT7：VDO3 BIT8：VDO4 BIT9：VDO5

6) Analog output AO1 control: (write only)

Command address	Command content
2001H	0 ~ 7 FFF indicates between 0% and 100%

7) Analog output AO2 control: (write only)

Command address	Command content
2002H	0 ~ 7 FFF indicates between 0% and 100%

8) Pulse (PULSE) Output Control: (write only)

command address	Command content
2004H	0 ~ 7 FFF indicates between 0% and 100%

9） Description of the frequency converter fault

Fault information address	Inverter fault information	
3100H	0000: No fault 0001: E001 accelerates the overcurrent 0002: E002 deceleration overflow 0003: E003 constant speed overcurrent 0004: E004 accelerated overpressure 0005: E005 deceleration overvoltage 0006: E006 Constant voltage 0007: E007 control power supply failure 0008: E008 Under-voltage fault 000A: E010 input missing phase 000B: E011 output phase out 000C: E012 short circuit to the ground 000E: E014 inverter overload 000F: E015 motor overload 0010: The E016 module is overheated 0011: E017 memory failure 0012: E018 External equipment failure 0015: E021 Current detection fault	0016: E022 motor overheating fault 0017: E023 contactor fault 0018: E024 communication fault 0019: E0250 encoder is faulty 001A: E026 Motor identification fault 001B: E027 Initial position failure 001C: E028 Hardware overcurrent protection OO 1 D: E029 motor over-speed fault OO 1 E: E030 speed deviation fault OO 20: E032 load drop fault OO 21: The PID feedback is lost at the E033 run OO 23: E035 User custom fault 1 OO 24: E036 User custom fault 2 002D: E045 0041: E065 User-defined overload fault 0042: E066: Over-temperature fault of the first temperature channel of the process card 0043: E067: Over-temperature fault of the second temperature channel of the process card 0044: E068: Over-temperature fault of the third temperature channel of the process card

Appendix C: Expansion cards

KM1000 in order to achieve high-precision speed and torque control, when the closed-loop vector control of the motor, it needs to configure the corresponding encoder card according to the type of encoder. Usually, a PG card is installed at the SLOT 1 position of the control board. At the same time, for the implementation of more functional requirements, such as: communication card, temperature card, DIDO card, etc. Usually installed at the SLOT 2 position. The following table describes the existing expansion cards. More special application extension cards are in development.

SN	model	describe	explain
1	KM1000-PG1	Multi-function encoder card	Maximum rate: 100kHz Compatible with differential input, collector input, push-pull input Support differential/collector 1:1 frequency division output Support 5V/15V power supply
2	KM1000-RT	Rotary transformer card	Excitation frequency 10kHz
3	KM1000-R01	Relay Extended Card	Expand two-way multi-function relay
4	KM1000-IO1	High-speed electric motor process card	3-way PT100 or PT1000 Temperature probe input 1-way isolated RS485 communication port 1 way multi-function relay output
5	KM1000-IO2	Function extension card	1 way A0 output 1 way multi-function relay output
6	KM1000-PT1	Temperature extension card	Support 2-way PT100 or PT1000 temperature sensor
7	KM1000-PN1	Profinet Communication	Profinet bus adapter card, in line with the internationally accepted Profinet Ethernet standard
8	KM1000-CAN1	CAN communication	Support CANLink Support master-slave control Support for free protocol
9	KM1000IO3-00A	Multi-function expansion card	Support for extensions: 3-way DI terminal 1 channel analog input terminal 1 way multi-function relay output
10	KM1000-4G	IOT expansion card	Support 4G communication, mobile phone operation and monitoring