TCKK®

TK500▶

User Manual
Heavy-Load Vector Frequency Converter

Zhejiang Taikong Electric Co., LTd

Catalog

INTRODUCTION

First of all, thank you for purchasing and using the TK500 series converter developed and produced by our company!

TK500 series converter is a one-size-fits-all high-performance current vector converter, mainly used to control and regulate the speed and torque of three-phase AC asynchronous motors. TK500 adopts high-performance vector control technology, low speed and high torque output, with good dynamic characteristics, super overload capacity, stable performance, powerful protection, simple human-machine interface and easy operation. It can be used for weaving, paper making, wire drawing, machine tools, packaging, food, fans, pumps and various automatic production equipment drives.

This manual will provide you with the installation, wiring, functional parameters, daily maintenance, troubleshooting and other related details and notes of the TK500 series converter. In order to use the TK500 series converter correctly, fully utilize the excellent performance of the product and ensure the safety of users and equipment, please be sure to read this manual in detail before using this series converter.

Due to the continuous improvement of our products, the information provided by us is subject to change without notice. If you have any questions about the use of this series converter or have special requirements, please feel free to contact our after-sales service center, we will be happy to serve you!

Safety Precautions

Safety Statements

◆ read and follow these safety precautions when installing, operating, and maintaining the product;

◆ For personal and equipment safety, follow all safety precautions marked on the product and described in the manual when installing, operating, and maintaining the product;

◆ The "Danger", "Warning" and "Caution" in the manual do not represent all safety precautions to be observed and are intended to supplement all safety precautions;

◆ The product should be used in an environment that conforms to the design specifications, otherwise it may cause malfunction, and abnormal function or damage to parts caused by failure to comply with the relevant regulations is not covered by the product quality warranty;

◆ We will not bear any legal responsibility for personal safety accidents, property damage, etc. caused by non-compliant operation of the product.

Security Level Definition

 Danger
"Danger" indicates that if not operated in accordance with the rules, it can lead to death or serious physical injury.

 Warning
"Warning" indicates that if not operated in accordance with the rules, it can lead to death or serious physical injury.

 Caution
"Caution" means that if not operated in accordance

with the rules, it can lead to minor physical injury or equipment damage.

⚠ Caution

◆ Before opening the package, please check whether the outer
packaging of the product is intact, whether there is damage, wet,
moisture, deformation, etc;

◆ Please open the package according to the hierarchical order, and
violent knocking is strictly prohibited;

◆ When opening the box,please check the surface of the product and
product accessories for damage, rust, bruises, etc;

◆ After opening the package, please check the packing list carefully to
see if the product and product accessories are complete in quantity
and information.

⚠ Warning

◆ If you find damage, rust, signs of use, etc when opening the package,
please do not install;

◆ If you find water, missing parts or damaged parts inside the product
when opening the package, please do not install;

◆ Please check the packing list carefully. If you find that the packing
list does not match the product name, please do not install.

When storing and transporting

⚠ Caution

◆ Please store and transport the product in accordance with the storage

and transport conditions, with the storage temperature and humidity meeting the requirements;

◆ Avoid storage and transport in splashing rain, direct sunlight, strong electric fields, strong magnetic fields, strong vibrations, etc;

◆ Avoid storing the product for longer than 3 months, and when storing it for longer periods of time, please carry out tighter protection and necessary tests;

◆ Please pack the product strictly before transporting it by vehicle, closed boxes must be used for long distance transport.

◆ Avoid transporting this product with equipment or articles that may affect or damage this product.

⚠ Warning

◆ Please use professional loading and unloading equipment to move large or heavy equipment and products!

◆ When handling the product with your bare hands, please make sure you hold onto the product casing to avoid dropping the product parts, otherwise there is a risk of injury!

◆ When handling products, please be sure to lift gently and pay attention to objects under your feet at all times to prevent tripping or falling, otherwise there is a risk of injury or damage to the product!

◆ No one is allowed to stand or stay underneath the equipment when it is being lifted by a lifting tool.

When installing

⚠️ Warning

◆ Please read the product instructions and safety precautions carefully before installation!

◆ Modification of this product is strictly prohibited!

◆ It is strictly forbidden to unscrew the fixing bolts and red marked bolts of the product parts and components!

◆ Do not install this product in places with strong electric fields or strong electromagnetic wave interference!

◆ When this product is installed in a cabinet or terminal equipment, the cabinet or terminal equipment needs to be provided with appropriate protective devices such as fireproof enclosures, electrical protective enclosures and mechanical protective enclosures, and the level of protection should comply with the relevant IEC standards and local legal and regulatory requirements.

⚠️ Danger

◆ Installation, wiring, maintenance, inspection or component replacement by non-professionals is strictly prohibited!

◆ The installation, wiring, maintenance, inspection and replacement of parts of this product should only be carried out by professionals with adequate electrical knowledge who have received training in electrical equipment.

◆ The installer must be familiar with the product installation requirements and relevant technical data.

◆ When it is necessary to install equipment with strong electromagnetic wave interference, such as transformers, please install a shielding protection device to avoid false operation of this product!

When wiring

⚠ Danger

◆ Installation, wiring, maintenance, inspection or component replacement by non-professional personnel is strictly prohibited!

◆ Do not carry out wiring work while the power is on, as there is a risk of electric shock.

◆ Before wiring, disconnect all equipment from the power supply. Please wait at least 10 minutes before wiring the unit as there will be residual voltage in the capacitors after disconnection.

◆ Always ensure that the equipment and products are well earthed, otherwise there is a risk of electric shock.

◆ Please follow the ESD procedures and wear an ESD bracelet for wiring and other operations to avoid damage to the equipment or the circuitry inside the product.

⚠ Warning

◆ It is strictly forbidden to connect the input power to the output of the device or product, as this may cause damage to the device or even

cause a fire.

◆ When connecting the drive to the motor, please ensure that the phase sequence of the drive and motor terminals are identical to avoid reverse rotation of the motor.

◆ The cable used for wiring must comply with the corresponding wire diameter and shielding requirements, and the shielding layer of shielded cables needs to be reliably earthed at one end!

◆ Once wiring is complete, ensure that there are no dropped screws or exposed cables inside the unit or product.

When Power-on

⚠ Danger

◆ Before powering up, please make sure that the equipment and products are well installed and firmly wired, and that the motor unit is allowed to restart.

◆ Before powering up, please make sure that the power supply meets the requirements of the equipment to avoid causing damage to the equipment or starting a fire!

◆ When the power is turned on, the mechanical device of the equipment or product may act suddenly, so be careful to stay away from the mechanical device.

◆ After powering up, do not open the cabinet door of the pair of equipment or the protective cover of the product, otherwise there is a

danger of electric shock!

◆ It is strictly forbidden to touch any of the equipment's terminals in an

energised state, otherwise there is a risk of electric shock!

◆ It is strictly forbidden to dismantle any device or part of the

equipment and products in an energised state, otherwise there is a risk

of electric shock!

When Operating

⚠ Danger

◆ It is strictly forbidden to touch any of the equipment's terminals in the

operating state, otherwise there is a risk of electric shock!

◆ It is strictly forbidden to dismantle any device or part of the

equipment and products in the operating state, otherwise there is a

danger of electric shock!

◆ It is strictly forbidden to touch the device casing, fan or resistor etc. in

order to test the temperature, as this may cause burns!

◆ It is strictly forbidden for non-professional technicians to test the

signals during operation, as this may cause personal injury or

equipment damage!

⚠ Warning

◆ During operation, avoid dropping other items or metal objects etc.

into the device, otherwise damage to the device is caused!

◆ Do not use the contactor on and off method to control the equipment

start and stop, otherwise cause equipment damage!

⚠ Danger

◆ Installation, wiring, care and maintenance, inspection or part replacement of the equipment by non-professionals is strictly prohibited!

◆ Do not carry out maintenance in an energised state, otherwise there is a risk of electric shock! Please wait at least 10 minutes after switching off the power to all equipment before carrying out maintenance or other operations.

⚠ Warning

◆ Please perform routine and periodic inspection and maintenance of equipment and products in accordance with equipment maintenance and care requirement, and keep maintenance records.

⚠ Danger

◆ Installation, wiring, care and maintenance, inspection or part replacement of the equipment by non-professionals is strictly prohibited!

◆ It is strictly forbidden to carry out maintenance on the equipment in an energised state, otherwise there is a risk of electric shock!

◆ After disconnecting all equipment, wait at least 10 minutes before

checking, servicing, etc. the equipment.

⚠️ Warning

◆ Please follow the product warranty agreement to report the equipment for repair.

◆ When equipment malfunctions or is damaged, troubleshooting and repair of equipment and products will be carried out by professional personnel in accordance with maintenance instructions, and maintenance records will be kept.

◆ Please follow the product wear parts replacement guide.

◆ Do not continue to use a machine that has been damaged, as this may cause further damage!

◆ After replacing the unit, be sure to redo the unit wiring check and parameter settings.

When Scrapped

⚠️ Warning

◆ Please in accordance with the relevant state regulations and standards for equipment, product scrapping, so as not to cause property damage or casualties!

◆ Please follow the industrial waste disposal standards for the disposal and recycling of end-of-life equipment and products to avoid polluting the environment.

Safety label

To ensure safe operation and maintenance of the equipment, always observe the safety labelling affixed to the equipment and products and do not damage, injure or remove the safety labels.The safety labels are described as follows:

Safety label	Content discription
	◆ Please be sure to read the instruction manual before installation and operation, otherwise there is a danger of electric shock! ◆ Do not remove the cover while it is switched on and within 10 minutes of switching off the power! ◆ For maintenance, inspection, and wiring, wait 10 minutes after turning off the power to the input and output sides, and wait until the power indicator turns off completely before starting work.

Announcements

1) Leakage protector RCD requirements：

The equipment will generate large leakage currents across the protective earth conductor during operation, so please install a type B earth leakage protector (RCD) on the primary side of the power supply. When selecting a leakage protector (RCD), consider the transient and steady state leakage currents to ground that may occur during start-up and operation of the

equipment, and select a special RCD with measures to suppress high harmonics, or a general-purpose RCD with 300mA ($I_{\Delta n}$ is 2~4 times the current of the protective conductor).

2)   Motor insulation check

When the motor is used for the first time, before re-use after a long period of time and during regular inspections, the motor insulation check should be done to prevent damage to the frequency converter due to the insulation failure of the motor windings. When checking the insulation, the motor wires must be separated from the converter, and it is recommended to use a 500V megohmmeter, which should ensure that the measured insulation resistance is not less than 5MΩ.
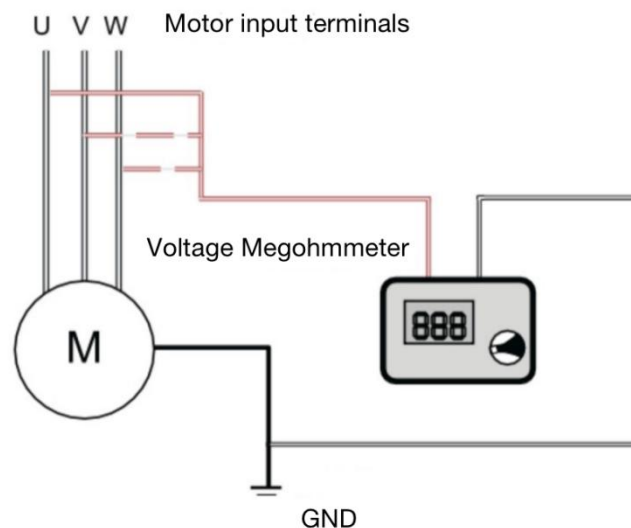
3)   Thermal protection of motors

If the selected motor does not match the rated capacity of the converter, especially when the rated power of the converter is greater than the rated power of the motor, be sure to adjust the value of the motor protection

parameters in the converter or install a thermal relay in front of the motor to protect the motor.

4)   Operating above working frequency

This converter provides output frequency from 0Hz to 500Hz. If the customer needs to operate above 50Hz, please consider the capacity of the mechanism.

5)   Vibration of mechanical devices

The converter may encounter mechanical resonance points of the load device at some output frequencies, which can be avoided by setting the jump frequency parameter within the converter.

6)   About motor heat and noise

Since the output voltage of the converter is a PWM wave, which contains certain harmonics, the temperature rise, noise and vibration of the motor will increase slightly compared with the industrial frequency operation.

7)   Output side with pressure sensitive devices or capacitors to improve power factor

The converter outputs PWM wave, please do not install capacitors to improve power factor or varistors for lightning protection on the output side, which may cause instantaneous overcurrent or even damage to the converter.
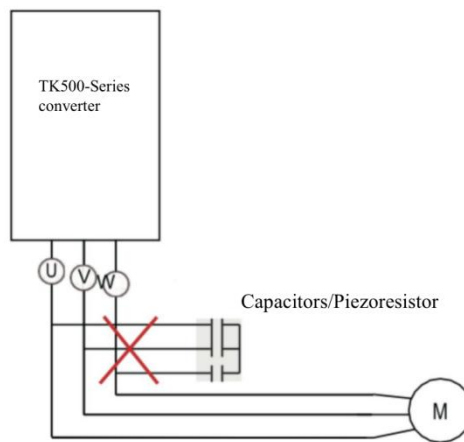
8)   Switching devices such as contactors for inverter inputs and outputs

If a contactor is installed between the power supply and the inverter input, it is not permitted to use this contactor to control the inverter start/stop. If it is necessary to use this contactor to control the inverter start/stop, the interval should not be less than 1 hour. Frequent charging and discharging will easily reduce the service life of the capacitor in the inverter. If there is a switching device such as a contactor between the output terminal and the motor, make sure that the inverter is operated when there is no output, otherwise it is easy to cause damage to the module in the inverter.
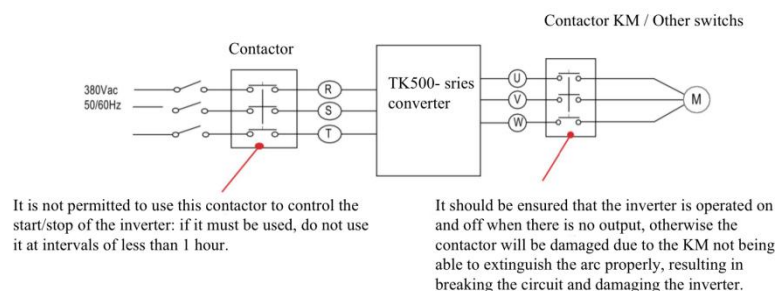
9)   Use of non-rated voltage

It is not suitable to use the frequency converter outside the permissible operating voltage range specified in the manual, which may cause damage to the devices inside the inverter. If necessary, use the appropriate step-up or step-down device to transform the power supply and input it to the inverter.

10)   Change three-phase input to two-phase input

Do not change the three-phase frequency converter to two-phase in the tk500 series, as this will result in malfunction or damage to the inverter.

11)   Surge suppressor

The frequency converter is equipped with an internal varistor to suppress the surge voltage generated when the inductive loads around the frequency converter are switched on and off. When the surge voltage generated by the surrounding inductive loads is large in energy, be sure to use a surge suppressor or a diode on the inductive loads.

·**Do not connect the surge suppressor to the output side of the inverter!**

12)   Altitude and the use of derating

In the altitude of more than 1000m, due to the thin air cause inverter heat dissipation effect becomes poor, it is necessary to reduce the amount of use (height of every 100m, 1% reduction, the maximum use of altitude of

3000m; more than 40 ° C, the need to be in accordance with the temperature of every 1 ° C rise 1.5% reduction in the use of the temperature, the maximum use of temperature 50 ° C). Please contact us for technical advice.

13)   Special Uses

If the customer needs to use a method other than the recommended wiring diagrams provided in this manual, such as a common DC bus, please consult us.

14)   Attention when scrapping converters

Electrolytic capacitors in the main circuit and electrolytic capacitors on the printed circuit board may explode when incinerated. Toxic gases are generated when plastic parts are incinerated. Please dispose of them as industrial waste.

15)   About adaptable motors

●   The standard motor is a four-pole squirrel-cage asynchronous induction motor. For motors other than the above, please be sure to select the inverter according to the rated current of the motor;

●   The cooling fan of non-inverter motor is coaxially connected with the rotor shaft, and the cooling effect of the fan decreases when the rotational speed decreases, therefore, the motor should be equipped with a strong exhaust fan or replaced with an inverter motor in case of overheating;

- The inverter has built-in standard parameters for the motor, according to the actual situation it is necessary to identify the motor parameters or modify the default values to match the actual values as much as possible, otherwise it will affect the operating effect and protection performance;

- The rated current of a variable pole motor is different from that of a standard motor, so check the maximum current of the motor and select the appropriate inverter. Be sure to switch poles after the motor stops;

- A short circuit inside the cable or motor can cause the inverter to alarm or even blow up. Therefore, please conduct insulation short-circuit test on the motor and cable firstly installed, and also need to conduct this test frequently in daily maintenance. Note that the inverter must be completely disconnected from the tested part when doing this test;

- Speed control range of motors varies depending on lubrication method and manufacturer;

- When operating the motor outside the speed control range, consult the motor manufacturer.

Chapter 1 Product Information

Safety Precautions
⚠ **Caution**
●   Do not hold the inverter by the front cover or the terminal cover. If you grasp the front cover plate only, the main body will fall and there is a risk of injury.   ●   When operating the inverter, follow the procedures specified for Electro-Static Discharge (ESD). Failure to do so may damage the circuits inside the inverter due to static electricity.

Nameplate and model number

NOTE ·Three-phase 380V~480V, 30G and below with built-in brake unit

TK500 converter Technical specifications

Table 1-1 TK500 Frequency converter models and technical data（Three-phase380V~480V）

Item		Norm														
Input power		0007	0015	0022	0033	0040	0050	0075	0110	0150	0185	0220	0300	0370	0450	0550
Applicable motor capacity		0.75	1.5	2.2	3.0	4.0	5.5	7.5	11.0	15.0	18.5	22.0	30.0	37.0	45.0	55.0
Output	Rated output current	1.5	3.8	5.0	7.5	8.0	13.0	17.0	25.0	32.0	37.0	45.0	60.0	75.0	90.0	110.0
	Output voltage	Three-phase 0 ~ input voltage.														
	Max. output frequency	500Hz(can be changed by parameters)														
	Carrier frequency	0.8kHz~8.0kHz(Automatic adjustment of carrier frequency according to load characteristics)														
	Overload capacity	150% rated current 60s														
Input	Rated Input Current	2.4	4.6	6.3	9.0	11.4	16.7	21.9	32.2	41.3	49.5	59.0	57.0	69.0	89.0	106.0
	Rated Voltage/ frequency	AC:Three phase380V~480V,50/60Hz														
	Permissible voltage fluctuation range	-15%~10%,Actual allowable range:AC 323V~528V.														
	Permissible frequency fluctuation range	±5%,Actual allowable range:47.5Hz~63Hz														
	Power capacity（kVA）	2.8	4.1	5.0	6.7	9.5	12	17.5	22.8	33.4	42.8	45.0	54.0	63.0	81.0	97.0
Item		Norm														
Input power		0750	0930	1100	1320	1600	1850	2000	220	250	280	315	355	400	450	500
Applicable motor capacity		75	90	110	132	160	185	200	220	250	280	315	355	400	450	500
Output	Rated output current	150	180	220	260	320	370	400	440	480	520	630	700	800	900	1000
	Output voltage	Three-phase 0 ~ input voltage.														
	Max. output frequency	500Hz(Can be changed by parameters)														
	Carrier frequency	0.8kHz~8.0kHz	0.8kHz~6.0kHz													
		Automatic adjustment of carrier frequency according to load characteristics														
	Overload capacity	150% rated current 60s														
Input	Rated Input Current(A)	139.0	164.0	196.0	240.0	287.0	323.0	365.0	410.0	441.0	495.0	565.0	617.0	687.0	782.0	820.0
	Rated Voltage/ frequency	AC:Three phase380V~480V,50/60Hz														
	Permissible voltage fluctuation range	-15%~10%,Actual allowable range:AC 323V~528V.														
	Permissible frequency fluctuation range	±5%,Actual allowable range:47.5Hz~63Hz														
	Power capacity（kVA）	127	150	179	220	263	305	334	375	404	453	517	565	629	716	800

Table 1-1 TK500 Frequency converter technical specifications

Item		Technical Specifications
Basic Functions	Input Frequency Resolution	Digital Settings:0.01Hz Analogue Settings:Max frequency×0.025%
	Control Mode	Sensorless Vector Control(SVC) V/F Control
	Starting torque	0.25Hz/150%(SVC)
	Speed Range	1:200(SVC)
	Steady Speed Accuracy	± 0.5%(SVC)
	Torque Increase	Automatic Torque Increase;Manual Torque Increase:0.1%~30%.
	V/F Curve	Four Ways:Linear;Multipoint;Full V/F separation;Incomplete V/F Separation.
	Acceleration/Deceleration Curve	Linear or S-curve acceleration and deceleration; Four acceleration/deceleration times,time scale:0.0~6500s.
	DC Brake	DC braking start frequency:0.00Hz~Max frequency; Braking time:0.0~36.0s; Braking action current value:0.0%~100%.
	Inching Control	Inching frequency range:0.00Hz~50.00Hz; Inching acceleration/deceleration time:0.0s~6500s.
	Simple PLC、Multi-speed operation	Up to 16 speeds via built-in plc or control terminals
	Built-in PID	Closed-loop control systems for process control can be easily realised
	Automatic Voltage Regulator(AVR)	Can automatically keep the output voltage constant when the grid voltage changes
	Overpressure and overcurrent speed control	Automatic limitation of current and voltage during operation to prevent frequent over-current and over-voltage tripping.
	Fast current limit function	Minimise overcurrent faults
	Torque limiting and control of instantaneous non-stop	"Digger" feature, automatic limiting of torque during operation to prevent frequent overcurrent trips; vector control mode for torque control; Compensate for voltage drop during transient power failure by feeding energy back to the load, maintaining the inverter in continuous operation for a short period of time
Customised Functions	Fast current limiting	Avoiding frequent overcurrent faults in converters
	Virtual IO	Five virtual DIDO for simple logic control.
	Timing Control	Timing control function: set time range 0.0Min

		~ 6500Min.
	Multi-motor switching	Two sets of motor parameters for switching control of two motors
	Multi-threaded bus support	Support six fieldbuses:Modbus、 Profibus-DP、 CANlink、 CANopen、 Profinet、 EtherCAT
	Multi-Encoder Support	Supports differential、 open collector、UVW、 Rotary transformers
	Powerful background software	Support inverter parameter operation and virtual oscilloscope function; Virtual oscilloscope for monitoring the internal status of the converter.
Operating	Run command	Operation panel giving, control terminal giving, serial communication port giving. Can be switched in a variety of ways
	Frequency command	Ten frequency commands:Digital feed, analogue voltage feed, analogue current feed, pulse feed, serial port feed.Can be switched in a variety of ways.
	Auxiliary frequency command	Ten auxiliary frequency commands:Flexible implementation of auxiliary frequency trimming and frequency synthesis
	Input terminals	Standard: ● Five DI terminals, one of which supports high-speed pulse inputs up to 100kHz. ● Two AI terminals, one supports 0 to 10V voltage input only, and one supports 0 to 10V voltage input or 0 to 20mA current input. Extended: ● Five DI terminals ● One AI terminal,supports -10V to 10V voltage input,and supports PT100/PT1000
	Output terminals	Standard: ● One high-speed pulse output terminal (open-collector type optional) ● Support 0~100kHz square wave signal output ● One DO terminal ● One relay output terminal ● One AO terminal, supports 0-20mA current output or 0-10V voltage output Extended: ● One DO terminal ● One relay output terminal

		● One AO terminal, supports 0~20mA current output or 0~10V voltage output.
Display & Keyboard Operation	LED Display	Display parameters
	Key lock and function selection	Partial or total locking of keys, defining the scope of action of some keys to prevent misuse.
Protection function	Phase loss protection	Input phase loss protection, output phase loss protection
	Instantaneous overcurrent protection	Shutdown at 250% or more of rated output current
	Overvoltage protection	Shutdown when the main circuit DC voltage is over 820V
	Undervoltage protection	Shutdown when the main circuit DC voltage is lower than 350V
	Overheating protection	Protection is triggered when the inverter bridge overheats
	Overload protections	150% of rated current 60s shutdown (for TD500-T450G: 130% rated current 60s shutdown)
	Overcurrent protection	Shutdown protection for exceeding 2.5 times the rated current of the inverter
	Braking protection	Brake unit overload protection, braking resistor short circuit protection
	Short circuit protection	Output short-circuit protection between phases, output short-circuit protection to ground
	Location of use	Indoors, out of direct sunlight, free of dust, corrosive gases, flammable gases, oil mist, water vapour, dripping water or salt, etc.
	Altitude	No derating is required for use below 1000m, and there is no derating of 1% for 100m above 1000m, please contact the manufacturer for more than 3000m. (Note: 0.4 ~ 3kW drive maximum use altitude of 2000m If you need to use to 2000m above sea level, please contact the manufacturer.)
	Environmental temperature	-10 ˚C ~ +40 ˚C temperatures above 40 require derating, Derated by 1.5% for every 1 ˚C rise in ambient temperature, up to 50 ˚C.
	Humidity level	Less than 95% RH, no condensation.
	Vibrations	Less than 5.9m/s^2(0.6g)
	Storage temperature	-20 ˚C ~ +60 ˚C

External and mounting dimensions

TK500-T0007 g3~TK500-T7000 G3 overall size
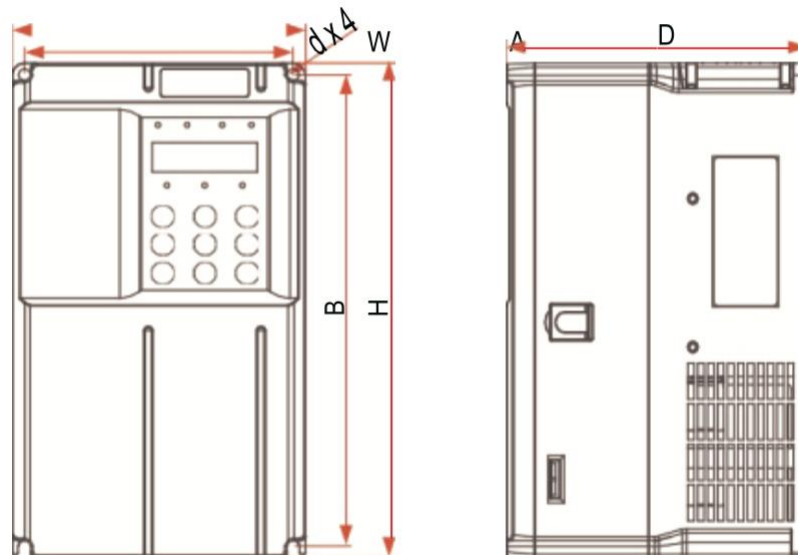
Figure 1-1 TK500-T0007 G3 ~ TK500-T0150 G3External dimensions and mounting dimensions

Table 1-3 TK500-T0007 G3 ~ TK500-T7200 G3Dimensions of external shape and mounting
holes(Three-phase 380V-480V)

Model	Instillation Position (mm)		Size (mm)			Installation Aperture(mm)	Weight(kg)
	A	B	H	W	D		
TK500-T0007 G3	94	150	163	106	142	ø5	
TK500-T0015 G3							
TK500-T0022 G3							
TK500-T0030 G3							
TK500-T0040 G3	115	175	186	126	172	ø5	
TK500-T0055 G3							
TK500-T0075 G3	136	230	245	150	175	ø6	
TK500-T0110 G3							
TK500-T0150	200	305	320	220	200	ø6	

G3						
TK500-T0185 G3						
TK500-T0220 G3	110	344	360	190	210	ø7
TK500-T0300 G3						
TK500-T0370 G3	150	420	435	230	230	ø7
TK500-T0450 G3	200	495	510	260	255	ø8
TK500-T0550 G3	215	630	650	300	280	ø8
TK500-T0750 G3						
TK500-T0930 G3	200	630	660	350	300	ø10
TK500-T1100 G3						
TK500-T1320 G3	250	815	830	400	315	ø12
TK500-T1600 G3						
TK500-T1850 G3	360	885	900	480	350	ø12
TK500-T2000 G3						
TK500-T2200 G3						
TK500-T2500 G3	360	922	950	500	350	ø14
TK500-T2800 G3						
TK500-T3150 G3	500	1030	1060	650	360	ø14
TK500-T3550 G3						
TK500-T4000 G3	500	1265	1300	650	380	ø14
TK500-T4500 G3						
TK500-T5000 G3						

TK500-T5600 G3	800	1310	1350	1000	390	ø14	
TK500-T6300 G3							

Frequenecy converter model	Recommended power of braking resistor	Recommended Resistance Value of Braking Resistor	Brake units	Note
Three-Phase 220V				
TK500-2T0.4GB	150W	≧150Ω	Standard built-in	No special instructions
TK500-2T0.75GB	150W	≧110Ω		
TK500-2T01.1GB	250W	≧100Ω		
TK500-2T2.2GB	300W	≧65Ω		
TK500-2T3.7GB	400W	≧45Ω		
TK500-2T5.5GB	800W	≧22Ω		
TK500-2T7.5GB	1000W	≧16Ω		
TK500-2T11G	1500W	≧11Ω	Built-in optional	Add "B" to the inverter model number.
TK500-2T15G	2500W	≧8Ω		
TK500-2T18.5G	3.7kW	≧6.7Ω	External	HPBUN-45-2T
TK500-2T22G	4.5kW	≧6.7Ω	External	HPBUN-45-2T
TK500-2T30G	5,5kW	≧5Ω	External	HPBUN-60-2T
TK500-2T37G	7.5kW	≧3.3Ω	External	HPBUN-90-2T
TK500-2T45G	4.5kW×2	≧5Ω×2	External	HPBUN-60-2T×2
TK500-2T55G	5.5kW×2	≧5Ω×2	External	HPBUN-60-2T×2
TK500-2T75G	16kW	≧3.3Ω×2	External	HPBUN-90-2T×2
Three-Phase 380V				
TK500T0.7GB	150W	≧300Ω	Standard built-in	No special instructions
TK500T1.5GB	150W	≧220Ω		
TK500T2.2GB	250W	≧200Ω		
TK500T3.7GB	300W	≧130Ω		
TK500T5.5GB	400W	≧90Ω		
TK500T7.5GB	500W	≧65Ω		
TK500T11GB	800W	≧43Ω		
TK500T15GB	1000W	≧32Ω		
TK500T18.5	1300W	≧25Ω	Built-in optional	Add "B" to the inverter model number.
TK500T22	1500W	≧22Ω		
TK500T30	2500W	≧16Ω		
TK500T37	3.7kW	≧12.6Ω	External	HPBUN-45-T
TK500T45	4.5kW	≧9.4Ω	External	HPBUN-60-T
TK500T55	5.5kW	≧9.4Ω	External	HPBUN-60-T
TK500T75	7.5kW	≧6.3Ω	External	HPBUN-90-T
TK500T90	4.5kW×2	≧9.4Ω×2	External	HPBUN-60-T×2
TK500T110	5.5kW×2	≧9.4Ω×2	External	HPBUN-60-T×2
TK500T132	6.5kW×2	≧6.3Ω×2	External	HPBUN-90-T×2
TK500T160	16kW	≧6.3Ω×2	External	HPBUN-90-T×2
TK500T200	20kW	≧2.5Ω	External	HPBU-200-B

TK500T220	22kW	$\geqq 2.5\Omega$	External	HPBU-200-B
TK500T250	12.5kW×2	$\geqq 2.5\Omega×2$	External	HPBU-200-B×2
TK500T280	14kW×2	$\geqq 2.5\Omega×2$	External	HPBU-200-B×2
TK500T315	16kW×2	$\geqq 2.5\Omega×2$	External	HPBU-200-B×2
TK500T355	17kW×2	$\geqq 2.5\Omega×2$	External	HPBU-200-B×2
TK500T400	14kW×2	$\geqq 2.5\Omega×3$	External	HPBU-200-B×3
TK500T450	15kW×2	$\geqq 2.5\Omega×3$	External	HPBU-200-B×3

Selection of Brake Units and Braking Resistors

Selection of braking resistor power

Theoretically the power of the braking resistor is the same as the braking power, but considering that the derating is 70%, it can be based on the equation:

$$0.7 \times Pr = Pb \times D$$

Pr-Power of the resistor;

D-Braking frequency, i.e. the proportion of the regeneration process to the overall working process.

Common Applications	Elevator	Unwinding and picking up	Centrifuges	Occasional braking loads	General Occasions
Braking frequency value	20% ~ 30%	20% ~ 30%	50% ~ 60%	5%	10%

The table above is the guidance data, the user can choose different resistance value and power according to the actual situation, (but the resistance value must not be less than the recommended value in the table, the power can be big.) The selection of braking resistor needs to be determined according to the power generated by the motor in the actual application system has a relationship with the inertia of the system,

deceleration time, the energy of the bit energy load, etc., and needs to be selected by the customer according to the actual situation. The larger the inertia of the system, the shorter the deceleration time and the more frequent the braking, the larger the power and the smaller the resistance value of the braking resistor.

Main circuit and control circuit wiring

Standard Wiring Diagram
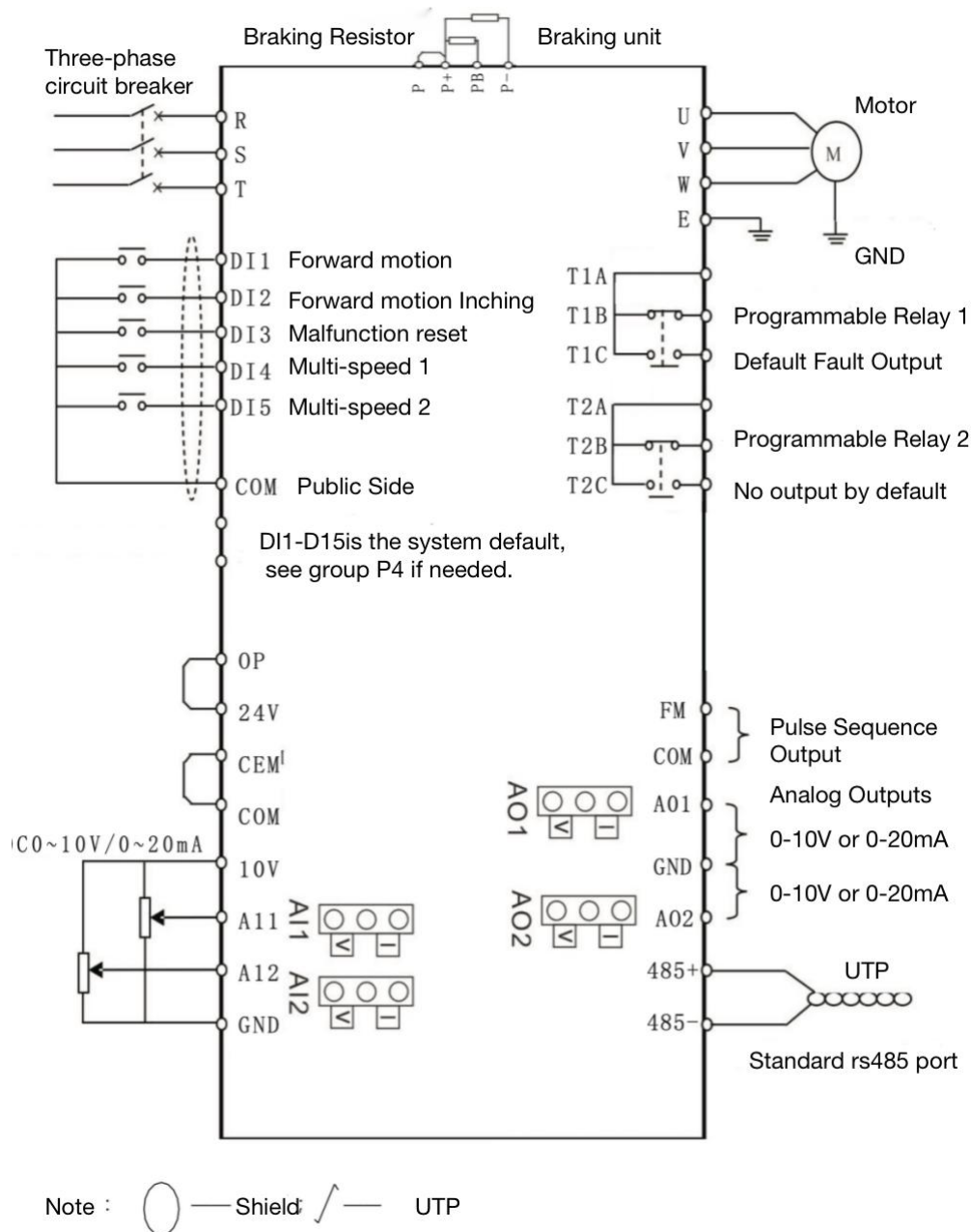
Figure 1-2 Three-Phase 380V ~ 480V Typical Wiring Diagram

Main circuit terminal function description and precautions

1) TK500-series frequency converter main circuit terminal.

BR	R	S	T	⏚	U	V	W	+

Figure 3-27 TK500-T0007G3 ~ TK500-T0030G3Main Circuit terminal distribution chart

PB	R	S	T	U	V	W	P+	⏚

Figure 3-28 TK500-T0040G3 ~ TK500-T0055G3Main Circuit terminal distribution chart

P+	PB	R	S	T	U	V	W	⏚

Figure 3-29 TK500-T0075G3 ~ TK500-T0110G3Main Circuit terminal distribution chart

P+	R	S	T	⏚	U	V	W	PB

Figure 3-30 TK500-T0150G3 ~ TK500-T0185G3Main Circuit terminal distribution chart

+	−	R	S	T	U	V	W	PB

Figure 3-31 TK500-T0220G3 ~ TK500-T0300G3Main Circuit terminal distribution chart

R	S	T	+	P	−	U	V	W

Figure 3-27 TK500-T0370G3 ~ TK500-T0450G3Main Circuit terminal distribution chart

Table 1-3 TK500series frequency converter main circuit terminals discription

Terminals Marking	Terminals Name	Function Description
R、S、T	Three-phase power input terminals	AC input three-phase power connection point
(+)、(-)	DC bus positive and negative terminals	Common DC bus input point, connection points for external brake units 37kW and above
(+)、BR	Brake resistor connection terminals	Braking resistor connection point for 30kW and below
U、V、W	Frequency converter output terminals	Connecting a three-phase motor

2) Main circuit cable selection

The use of symmetrically shielded cables is recommended for input and output main loop cables. The use of symmetrically shielded cables reduces the electromagnetic radiation of the entire conduction system compared to four-core cables.

3) Input power R、S、T

Input side wiring of the inverter, no phase sequence required.

External main circuit wiring is sized and installed in accordance with local codes and relevant IEC standards.

The filter should be installed close to the input terminals of the inverter, and the connecting cable between them should be less than 30 cm. the grounding terminals of the filter and the inverter should be connected together, and make sure that the filter and the inverter are installed on the same conductive mounting plane, which is connected to the main ground of the cabinet.

4) DC bus (+)、(-)

● Note that there is residual voltage at the DC bus terminals after a power outage, wait for the CHARGE light to go out and confirm that the power has been off for 10 minutes before carrying out wiring operations, otherwise there is a risk of electric shock.

● When using external braking components for 90kW and above, please note that the (+)、(-) polarity should not be reversed, otherwise it will lead to damage or even fire to the inverter and braking components.

● The wiring length of the brake unit should not exceed 10m and should be wired in parallel with twisted pairs or tight twins.

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

5) Brake Resistor Connection Terminals(+)、BR

● The braking resistor connection terminal is only valid for models with

30kW or less and confirmed to have a built-in braking unit.

● Refer to the recommended value for braking resistor selection and the wiring distance should be less than 5m, otherwise it may cause damage to the inverter.

● Pay attention to the braking resistor around there can not be combustible materials, to avoid overheating of the braking resistor ignited around the device.

● After connecting the braking resistor, for models under 30kW with built-in braking unit, set the parameters of "P6-15" braking utilization rate and "P9-08" braking unit operating start voltage reasonably according to the actual load.

6) Frequency converter output side

● External main circuit wiring specifications and installation methods need to comply with local regulations and relevant IEC standards.

● Capacitors or surge receivers must not be connected to the output side of the inverter, as this may cause frequent protection or even damage to the inverter.

● When the motor cable is too long, it is easy to produce electrical resonance due to the influence of the distributed capacitance, which can cause damage to the insulation of the motor or produce a large leakage current to make the inverter overcurrent protection. When the length of motor cable is more than 100 meters, AC output reactor

should be installed near the inverter.

● Output motor cables are recommended to be shielded, the shield needs to be lapped 360° on the structure with the cable shield grounding bracket and the shield lead is crimped to the PE terminal.

● Motor cable shield leads should be as short as possible and not less than 1/5 the length in width.

7) Ground terminal　(PE)

● The terminal must be reliably grounded, the grounding wire resistance must be less than 10 Ω, otherwise it will lead to abnormal operation or even damage to the equipment.

● The ground terminal and the power supply zero N terminal must not be shared.

● The protective grounding conductor must be a yellow-green cable.

● Main circuit shield grounding location

● The inverter is recommended to be mounted on a conductive metal mounting surface, ensuring that the entire conductive bottom of the inverter is well lapped to the mounting surface.

● The filter should be installed on the same mounting surface as the inverter to ensure the filtering effect of the filter.

8) Grid system requirements

This product is intended for use in neutral grounded grid systems. If used in IT grid systems (neutral insulated to ground or grounded via high

impedance), it is necessary to remove both the Varistor (VDR) jumper to ground and the Safety Capacitor (EMC) jumper to ground, as shown in the figure below for screws 1 and 2, and not to install a filter, as this may result in injury or damage to the inverter.

In the case of an earth leakage circuit breaker, if there is a jump in the earth leakage protection during startup, the safety capacitor (EMC) can be removed from the ground wire, as shown in the following figure, screw No. 2.
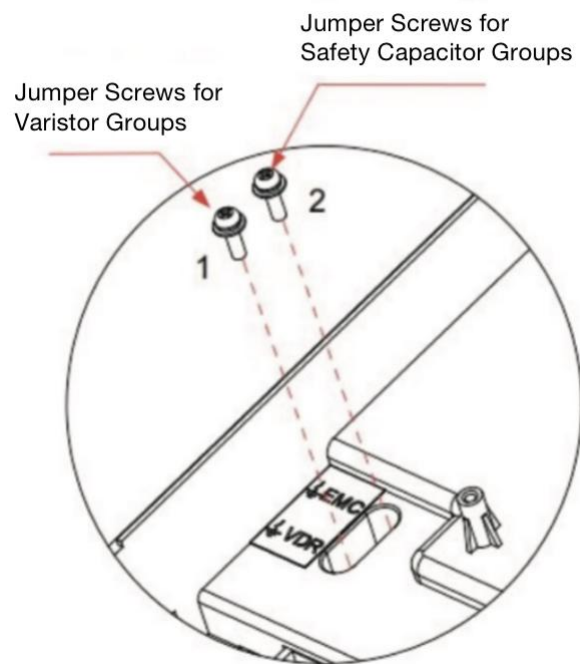
Figure1-4 Diagram of Varistor(VDR)、Safety Capacitors(EMC) Ground

Jumper Location

Control Panel

1) Control Circuit Terminals Distribution

Control circuit terminals arrangement
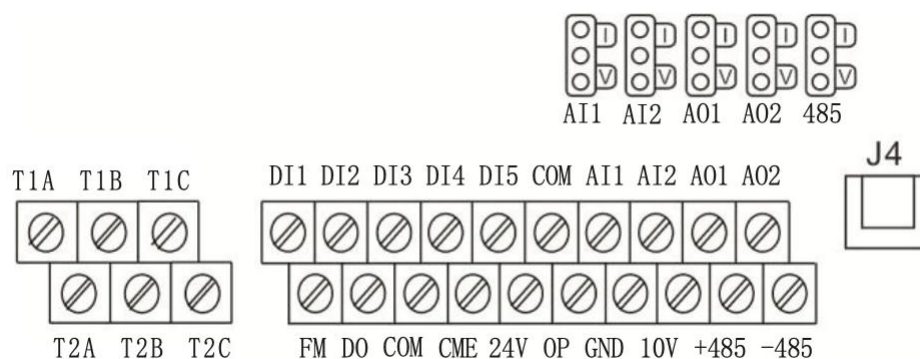
Figure1-5 Control Circuit Terminals Arrangement Diagram

Table1-4 Function description of TK500 converter control terminals

Form	Terminal Symbols	Terminal Name	Function Description
Power	+10V-GND	External+10v Power suply	Provides +10V external power supply,maximum output current:10mA; Generally used as an external potentiometer operating power supply,potentiometer resistance range:1kΩ~5kΩ
	+24V-COM	External+24v Power suply	Provides +24V external power suply,typically used as a power supply for digital input/output terminals and external sensors; Maximum output current:200mA[Note1]
	OP	External power input terminal	Factory default is connected to +24V; When external signals are used to drive DI1 to DI5, OP must be connected to the external power supply and disconnected from the +24V power supply terminal.
Analog Input	AI1-GND	Analog input terminal 1	Input range:0Vdc~10Vdc/0mA~20mA, Determined by AI1 jumper

			selection on the control panel; Input impedance:22kΩ for voltage input.
	AI2-GND	Analog input terminal 2	Input range:0Vdc~10Vdc/0mA~20mA, Determined by AI2 jumper selection on the control panel; Input impedance:22kΩ for voltage input.
Analog Output	AO1-GND	Analog output 1	Voltage/Current output determined by AO1 jumper selection on the control panel; Output voltage range:0V~10V; Output current range:0mA~20mA
	AO2-GND	Analog output 2	Voltage/Current output determined by AO2 jumper selection on the control panel; Output voltage range:0V~10V; Output current range:0mA~20mA
Jumper	AI1	AI1 Input selection	Voltage and current inputs are selectable, default is voltage input
	AI2	AI2 Input selection	Voltage and current inputs are selectable, default is current input
	AO1	AO1 output selection	Voltage and current outputs are selectable, default is voltage output
	AO2	AO2 output selection	Voltage and current outputs are selectable, default is current output
	485	RS485 Termination Matching Resistor Selection Jumper	RS485 Termination Matching Resistor Selection
Digital Input	DI1	Digital input1	Optical coupling isolation, bipolar input compatible; Input impedance:1.39 kΩ; Voltage range at effective level input:9V~30V
	DI2	Digital input2	
	DI3	Digital input3	
	DI4	Digital input4	
	DI5	High-speed pulse input terminal	In addition to the features of DI1 to DI4, it can also be used as a high-speed pulse input channel; Maximum input frequency:100Hz; Input impedance:1.03kΩ

Digital Output	DO1-CME	Digital input 1	Optical coupling isolation, bipolar open collector outputs; Output voltage range: 0V~24V; Output current range:0mA~50mA Note:The digital output ground CME is internally isolated from the digital input ground COM, but CME and COM are externally shorted at the factory (at this time DO1 is driven by +24V by default). When DO1 wants to be driven by an external power supply, CME and COM must be disconnected from the external short.
	FM-COM	High-speed pulse output	Subject to parameter P5-00 "FM Terminal Output Method Selection"; When used as a high-speed pulse output, the maximum frequency is 100kHz; When used as an open collector output, same specification as DO1.
Relay Output 1	T1A-T1B	Normally closed terminals	Contact Driving Capability:250Vac,3A,COSø=0.4 30Vdc, 1A
	T1A-T1C	Normally open terminals	
Relay Output 2	T2A-T2B	Normally closed terminals	Contact Driving Capability:250Vac,3A,COSø=0.4 30Vdc, 1A
	T2A-T2C	Normally open terminals	

[Note1]Derating is required when the ambient temperature exceeds 23°C. For every 1°C increase in ambient temperature, the output current decreases by 1.8mA. The maximum output current is 170mA at 40°C ambient temperature, and the current at the DI terminal should be

taken into account when the user short-circuits the OP to 24V.

2) Control circuit terminal wiring instructions

● Cable selection for control circuits

All control cables must be shielded. Use separate shielded cables for different analog signals. Shielded twisted pair cables are recommended for digital signals.
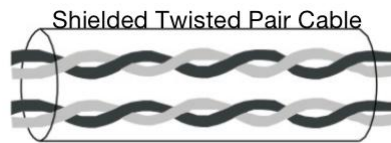
Figure3-58 Shielded Twisted Pair Cable

● Control circuit wiring requirements

Motor cables should be routed away from all control cables.

It is recommended that motor cables, input power cables, and control loop cables are not in the same raceway. Avoid electromagnetic interference caused by coupling of motor cables and control circuit long distance parallel lines.

When control circuits and drive lines must be crossed, the angle of crossing should be 90 degrees.

Chapter 2 Panel Operation

Panel Operating Instructions

TK500 series frequency converters can be operated, monitored and controlled via LED operation panels.

LED Operation Panel Introduction

With the operation panel, you can set/modify parameters, monitor the working status, and control the operation (start and stop) of the inverter. The appearance of the operation panel and the names of the operation keys are shown as follows:

Figure 2-1 Diagram of operation panel

Function Indicator

In the table below, ![on] means the light is on, ![off] means the light is

off, and means it is flashing.

Indicator Status		Status Description
RUN (Operation Indicator Light)	RUN	Light off: Shutdown
	RUN	Lamp on: Running
LOCAL/REMOT (Operation Command Indicator)	LOCAL/ REMOT	Light off: Panel Control
	LOCAL/ REMOT	Light on: Terminal Control
	LOCAL/ REMOT	Light Flashing: Communication Control
FED/REV (Forward/Reverse Rotation Indicator)	FED/REV	Light off: Forward Rotation Operation
	FED/REV	Light on: Reverse Rotation Operation
TUNE/TC Tuning/ Torque Control/ Error Indicators	TUNE/TC	Light off: Normal Operation
	TUNE/TC	Light on: Torque Control Mode
	TUNE/TC	Slow Flashing: Tuning State(1 time/ second)

		Fast Flashing: Error State(4 times/ second)
	TUNE/TC	

LED Display Area

5-digit LED display on the operation panel shows the set frequency, output frequency, various monitoring data and alarm codes. Table 2-2 shows the correspondence between the actual content and the LED display.

LED Display	Actual Content	LED Display	Actual Content	LED Display	Actual Content	LED Display	Actual Content
0	0	6	6	C	C	N	N
1	1	7	7	c	c	P	P
2	2	8	8	d	d	R	R
3	3	9	9	E	E	T	T
4	4	A	A	F	F	U	U
5	5	b	B	L	L	u	u

Keyboard Button Functions

Button	Button Name	Button Function
PROG	Programming Button	First level menu entry or exit.
ENETER	Confirm Button	Step-by-step access to menu, setting parameters and confirmation
△	Incremental Button	Increment of data or parameters

	Decrement Button	Decrement of data or parameters
$\triangledown$		
$\triangleleft$	Shift Button	The display parameters can be selected cyclically under the shutdown display interface and the operation display interface; When modifying a parameter, you can select the modification bit of the parameter.
RUN	Run Button	Used for operation in the "Operator Panel" start/stop control mode.
STOP	Stop/Reset Button	By pressing this button during the run state, can stop the running operation, this feature is subject to parameter P7-02; Can be used to reset the operation when there is a error alarm condition.
MF.K	Multi-Function Selector	Switch between the selected functions according to the set value of P7-01.

How To View& Modify Paremeters

The operation panel of the TK500 inverter utilizes a three-level menu structure for parameter settings and other operations.The first level is Functional Parameter Group, the second level is Parameters, the third level is Parameter Values.

After entering each level of the menu, when the display bit is flashing, you can press the ▲, ▼, ► bottons to make modifications. The operation flow is shown below:
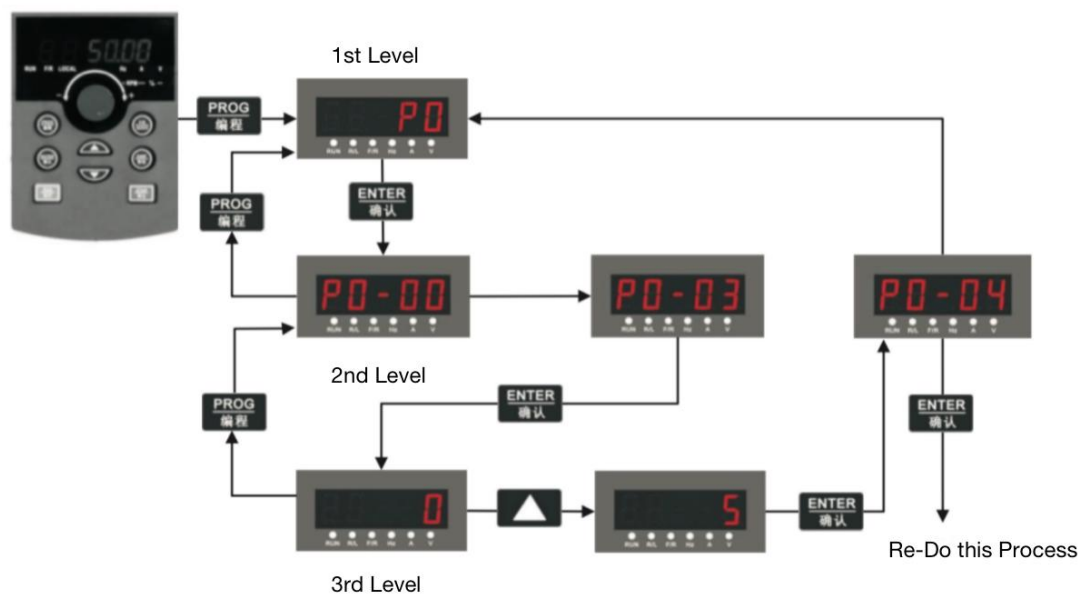
Figure 2-2 Three-Level opration flow

Example of change the setting of P3-02 from 10.00 Hz to 15.00Hz.
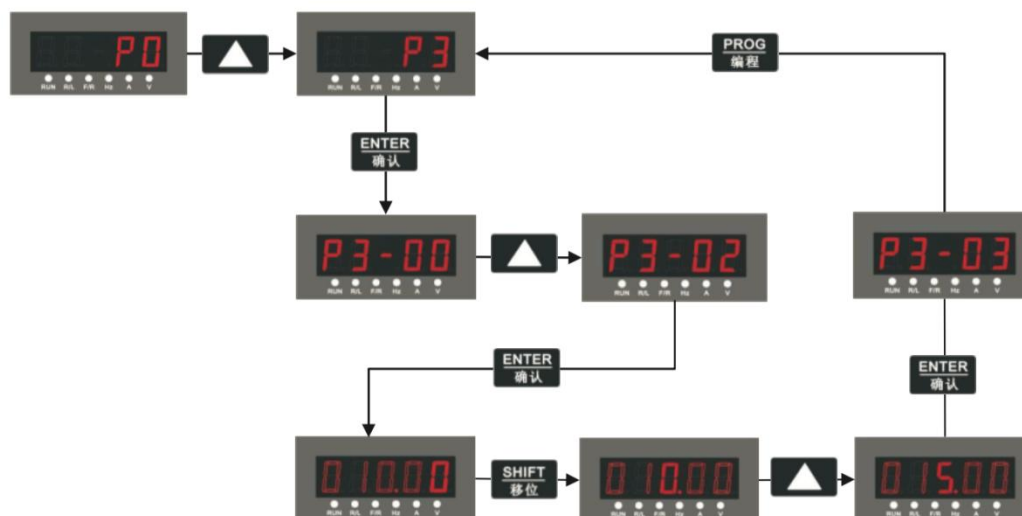
Figure2-3 Diagram of modify parameter

a). When operating in the third-level menu, you can return to the second-level menu by pressing either the PRG button or the ENTER button, the difference between the two bottons:

Press ENTER to save the setup parameter then return to the 2nd menu, and automatically shift to the next parameter; press PRG to abandon the modification and directly return to the 2nd menu of the current parameter number.

b). When you are in the 3rd menu, if the parameter does not have a flashing bit, it means that the parameter cannot be modified, the possible reasons are as follows

(1) This parameter is a non-modifiable parameter, such as frequency converter, actual detection parameters, operation record parameters, etc.

(2) This parameter cannot be modified in the running state, and can only be modified after shutdown.

Composition Of Parameters

Table 2-4 Composition Of Parameters

Parameter Group	Function Dsicription	Explanation
P0 ~ PP	Basic parameters	Run command, frequency command, motor parameters, control mode, AI/AO features correction, optimized control and other parameters.
A0 ~ AC		
U0	Monitor Parameter Groups	Display of basic monitoring parameters of the converter

Before viewing a parameter with the operation panel, set parameter PP-02 (Function Parameter Group Display Selection) to ensure that the parameter you want to view is in the display state.The way to view the parameter group number is as follows.

Parameter	Function Definition	Factory Default	Setup Range	Parameter Description
PP-02	Functional parameter group display selection	11	Unit's digit: Group U display selection 0: No display 1: Display Ten's digit: Group A display selection 0: No display 1. Display	Controls whether Group A and Group U parameters are displayed or not

Panel Tray Cutout Dimensions
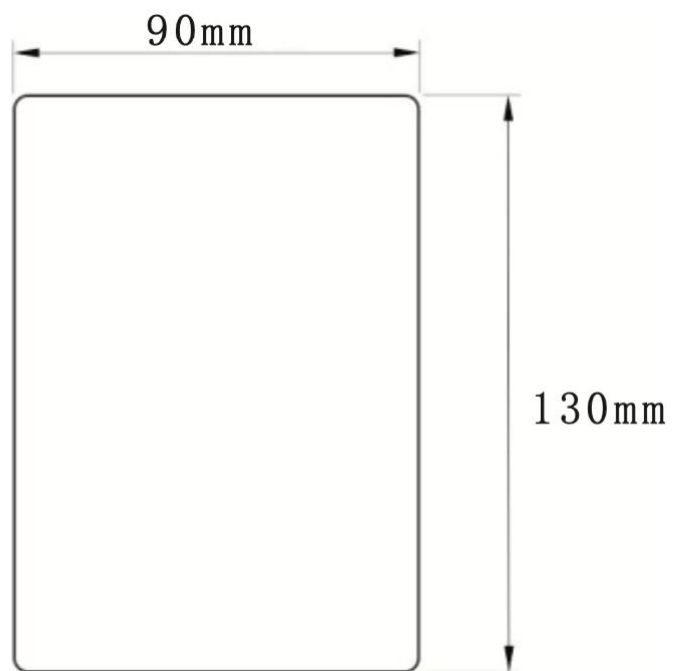
Figure 2-4 Panel tray cutout dimensions

Chapter 3 Operating Procedures & Self-Learning

This chapter will introduce the basic debugging steps of the frequency converter, mainly about the frequency command setting, the control of startup and shutdown. According to this chapter you can realize the trial operation of the trial operation of the converter controlled motor.

Quick Guide to Debugging
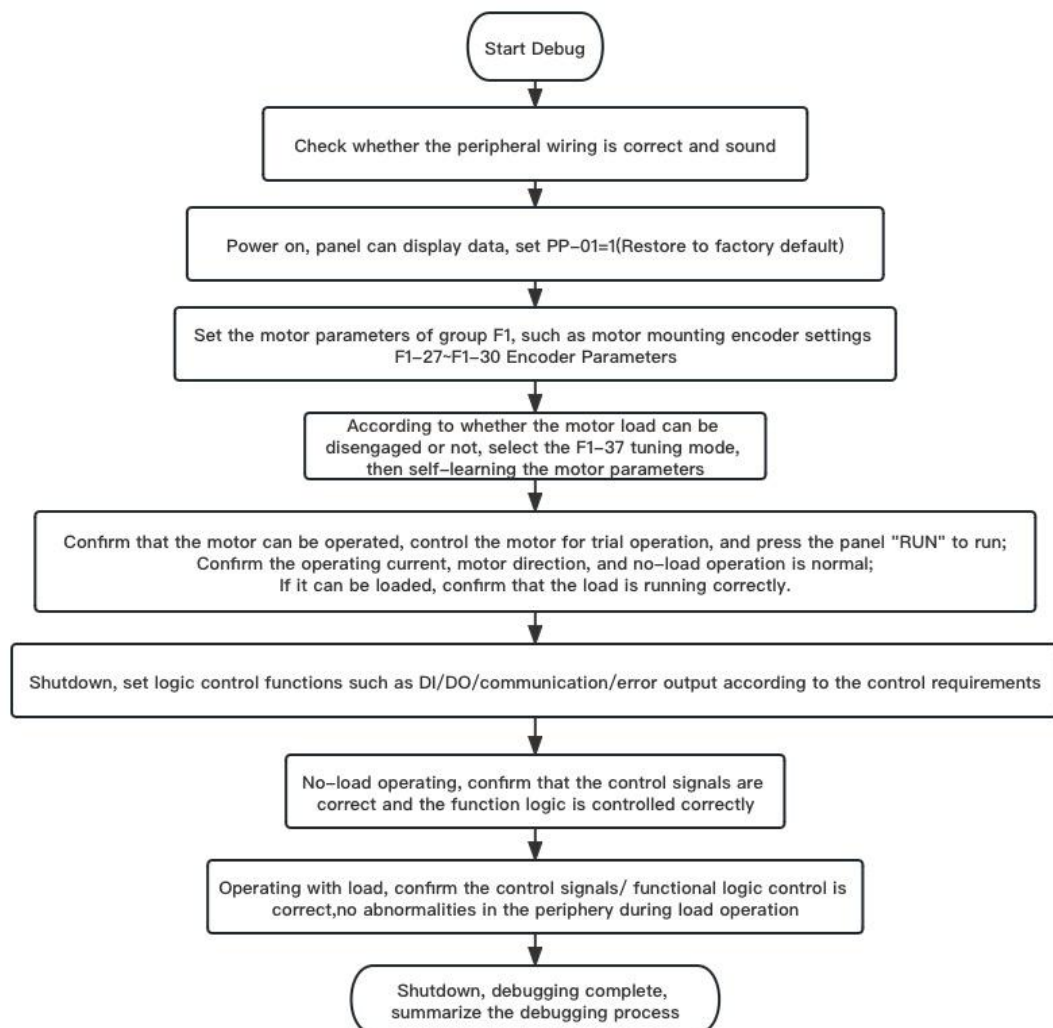
Figure 3-1 Quick Guide to Debugging

General flowchart of converter Debugging

```
┌─────────────────────┐
│   Start Debugging    │
└─────────────────────┘
           │
           ▼
┌──────────────────────────────────────────────┐
│ Install and wire the inverter according to    │
│ the instruction manual.                        │
└──────────────────────────────────────────────┘
           │
           ▼
┌──────────────────────────────────────────────┐
│ Compliance with safety measures, power–on and │
│ confirm display status                         │
└──────────────────────────────────────────────┘
           │
           ▼
┌──────────────────────────────────────────────┐
│ Initialize the parameters(PP–01), set the      │
│ control mode according to the application      │
│ requirements(P0–01)                            │
└──────────────────────────────────────────────┘
           │
           ▼
┌────────────────────────────────────────────────────────────────────────┐
│ ·Set operation command source selection(P0–02), frequency command      │
│  source selection(P0–03);                                               │
│ ·Input funtion settings for different selections of command source and  │
│  frequency source;                                                      │
│ ·Set functions of Start/Stop process control;                           │
│ ·Set functions related to signal output.                                │
└────────────────────────────────────────────────────────────────────────┘
           │
           ▼
┌──────────────────┐   ┌─────────────────┐   ┌──────────────────┐
│ See Subprocess 1 │───│  Control Mode   │───│ See Subprocess 2 │
└──────────────────┘   │ Selection(P0–01)│   └──────────────────┘
                       └─────────────────┘
                              │
                              ▼ (⇕)
                  ◇─────────────────────────────────◇
                  │ No–load operating to confirm that │
                  │ the operation, direction of       │
                  │ rotation and other settings are   │
                  │ correct                           │
                  ◇─────────────────────────────────◇
                              │
                              ▼
                  ◇─────────────────────────────────◇
                  │ Actual–load operating to confirm  │
                  │ that the operating frame meets the│
                  │ requirements                      │
                  ◇─────────────────────────────────◇
                              │
                              ▼
                       ┌──────────────┐
                       │   Finish     │
                       │  Debugging   │
                       └──────────────┘
```

Figure 3-2 General flowchart of converter Debugging
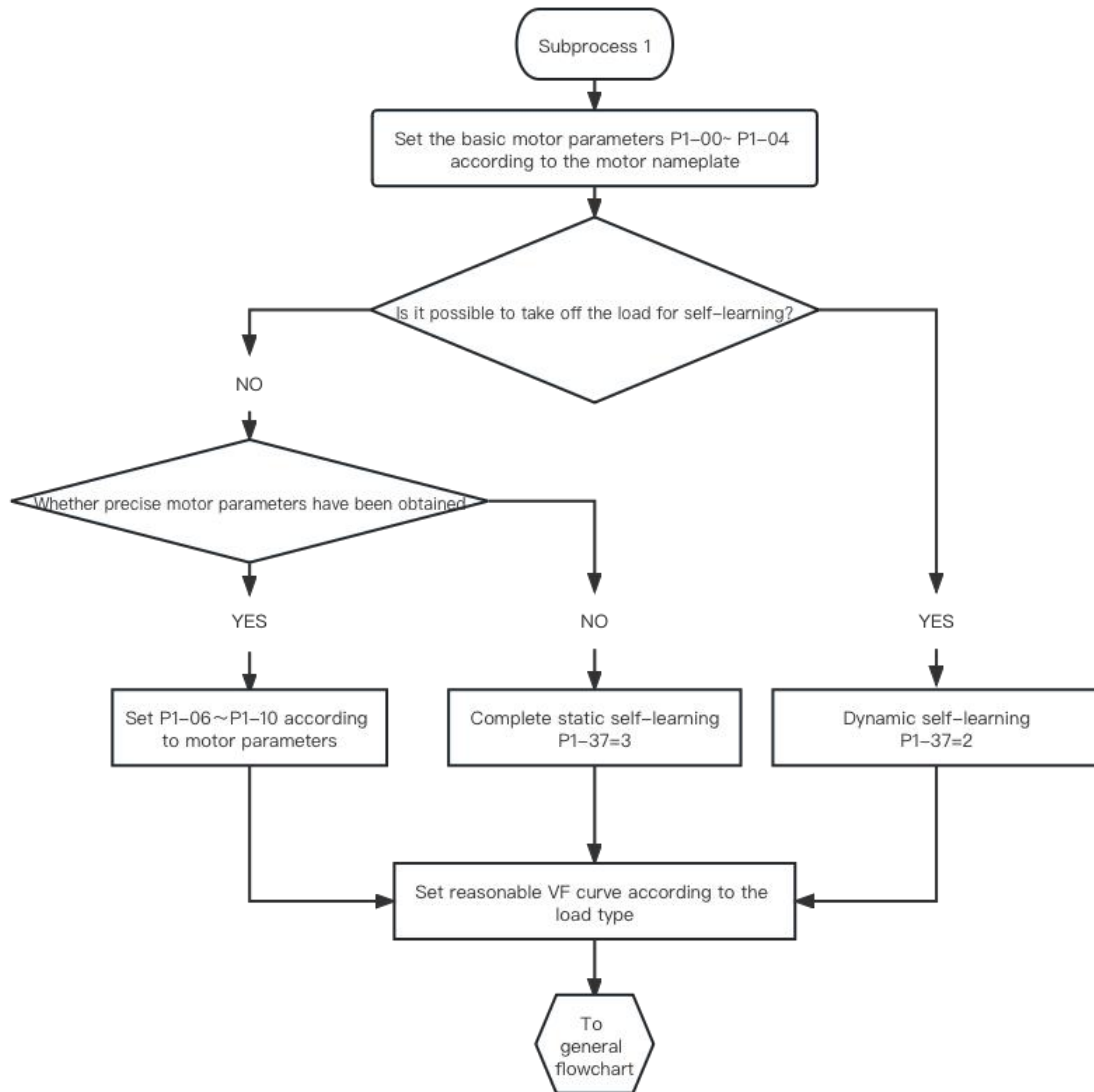
Figure 3-3 Diagram of converter debugging subprocess 1(VF Control)
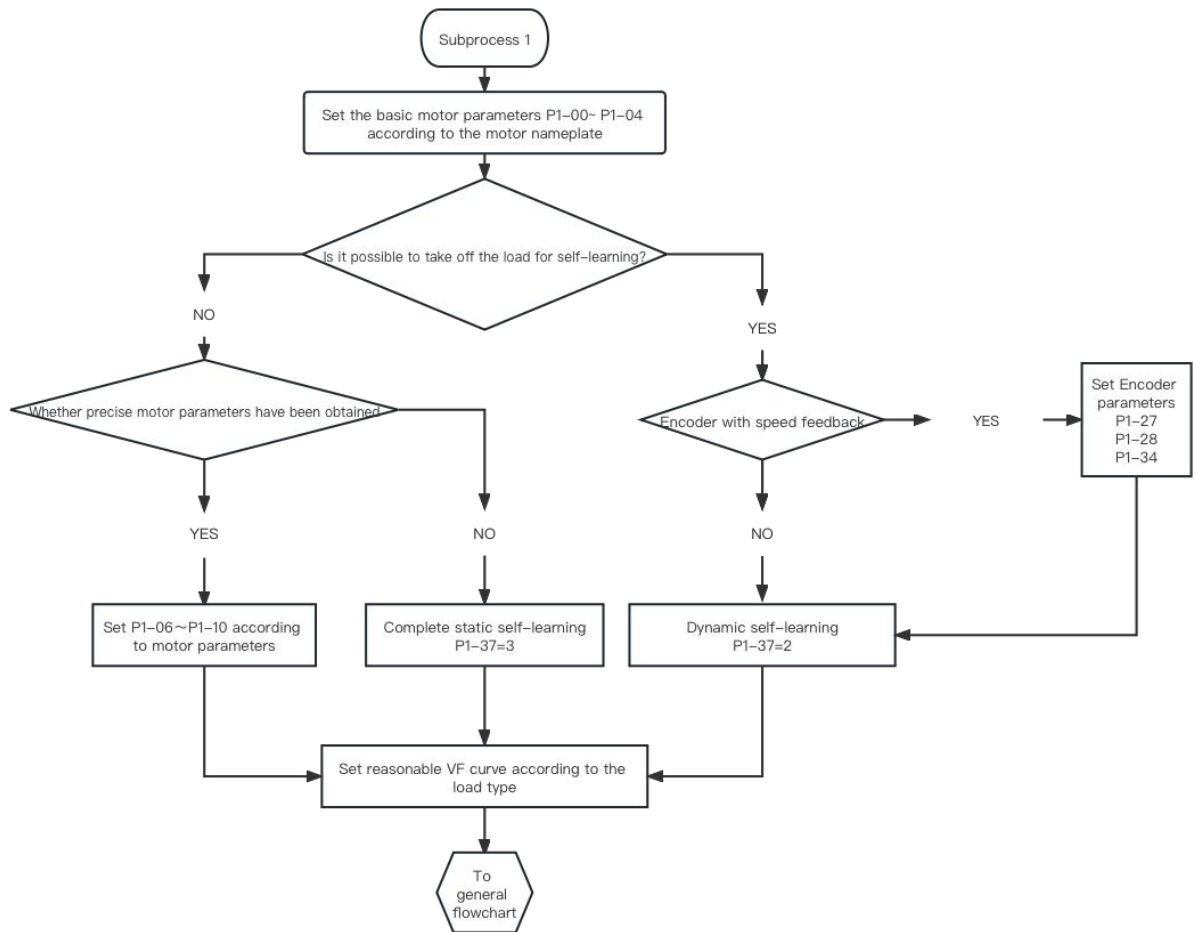
Figure 3-4 Diagram of converter debugging subprocess 2(Vector Control)

Notes before turning the power on

Be sure to check the following items before turning the power on

Item	Content
Confirm the voltage of power supply	Please make sure the power supply voltage is correct.(AC380V~480V) 50/60Hz
	Please connect the power input (R/S/T) terminals reliably
	Please confirm that the converter and motor are properly grounded
Confirm the connection between converter output terminals and motor terminals	Please make sure that the converter output terminals (U/V/W) and motor terminals are securely connected
Confirm the connection of the converter control circuit terminals	Please make sure that the control circuit terminals and other control devices are securely connected
Confirm the status of the converter control terminals	Please make sure that the control circuit terminals are all OFF (the converter is not running)
Confirm the load	Please make sure that the motor is unloaded and not connected to the machanical system

Confirm status of display after power on

When the power is on, the display of the operator under normal condition
is as follows:

Status	Display Content	Description
Normal	**50.00**	The default display is 50.00Hz
Error	**Err02**	The converter is in a shutdown state during a fault, and display the type of error.

Parameters Initialization

The settings of the converter can be restored to default, and after initialization, the PP-01 is automatically changed to zero.

PP-01	Parameter initialization		Default	0
	Setting Range	0	No operation	
		1	Restore Default Parameters (Motor parameters not included)	
		2	Clear Recorded Information	
		4	Backup user's current parameters	
		501	Restore user's backup parameters	

1:Restore Default Parameters (Motor parameters not included)

After setting PP-01 to 1, most of the functional parameters of the converter are restored to default, but the motor parameters, decimal point of the frequency command(P0-22), error record information, cumulative running time(P7-09), cumulative power-on time(P7-13), cumulative power cunsumption(P7-14), and converter heat sink module heat sink temperature(P7-07) will not be restored.

2:Clear Recorded Information

Clear converter error record information, accumulated running time(P7-09), accumulated power-on time(P7-13), accumulated power consumption(P7-14)

4.Backup user's current parameters

Back up the current value of the parameters set by the user, the current setup values of all functional parameters are backed up in order to facilitate the customer to recover after the parameter adjustment is

misaligned.

Selection basis for motor control mode

Parameter	Description	Applications
P0-01：Select Motor Control mode	Set to 0: Vector control without speed sensor	Refers to open-loop vector control, applicable to usual high-performance control occasions, a frequency converter can only drive one motor, such as machine tools, centrifuges, wire drawing machines, injection molding machines and other loads.
	Set to 2: V/F control(Speed open-loop control)	It is suitable for the occasions that do not have high requirements on loads, or one inverter drags multiple motors, such as fans and pumps. Can be used for one converter to drive multiple motors

Self-Learning

There are some ways to allow the converter to obtain the internal electrical parameters of the controlled motor: Dynamic tuning, Static tuning 1, Static tuning 2, Manual parameter input, etc.

Tuning Mode	Application	Tuning Effect
No-load Dynamic Tuning	Where the motor is easily detached from the application	Best
With-load Dynamic Tuning	Where the motor is not easily detached from the application, but it can run with load. Low friction on the load, close to no load at constant speed.	The lower the friction, the better the result.
Static Tuning 1	Where the motor is difficult to disengage from the laod and dynamic tuning operation is not permitted.	General
Static Tuning 2	This mode is recommended for static tuning where the motor is difficult to disengage from the load and dynamic tuning operation is not permitted, the tuning time is longer compare to static tuning 1.	Preferable
Manual Parameter Input	Where the motor is difficult todisengage from the load copy the parameters of the same type of motor that has been successfully tuned by the converter and input them into P1-00~P1-10	Preferable

The steps for automatic tuning of motor parameters are as follows:

The following is an example of how to tune the parameters of the default motor 1. The tuning method for motor 2 is the same, except that the parameter number has to be changed.

Step 1: In the case of a motor that can be completely disconnected from the load, the motor is mechanically partially disengaged from the load in the event of a power failure, allowing the motor to rotate freely with no load.

Step 2: After power-on, select the converter command (P0-02) as the operator panel command channel

Step 3: Enter the nameplate parameters of the motor accurately (e.g P1-00~ P1-05). Please enter the following parameters according to the actual parameters of the motor (selected according to the current motor):

Motor Selection	Parameters
Motor 1	P1-00:Motor type selection; P1-01:Motor rated power; P1-02:Motor rated voltage; P1-03:Motor rated current; P1-04:Motor rated frequency; P1-05:Motor rared speed

Step4: If it is an asynchronous motor, Please select P1-37 (tuning selection, motor 2 corresponds to parameters A2-37) to 2 (asynchronous motor complete tuning), press Enter to comfirm. The keyboard displays TUNE, as shown below:

rUnE

Then press the RUN button on the keyboard, the converter will drive the

motor acceleration and deceleration, forward and reverse operation, the indicator lights up, the tuning operation lasts about 2 minutes, when the above content disappears and returns to the normal parameter display state, means that tuning is complete.

After the complete tuning, the converter automatically calculates the following parameters of the motor:

Motor Selection	Parameters
Motor 1	P1-06:Asynchronous motor stator resistance; P1-07:Asynchronous motor rotor resistance; P1-08:Asynchronous motor leakage inductance; P1-09:Asynchronous motor mutual inductance; P1-10:Asynchronous motor no-load current

If the motor may not be completely disconnected from the load, select 3(Asynchronous Static Tuning 2) for P1-37(A2-37 for motor 2) and press RUN on the keyboard to start the tuning operation of the motor parameters.

Chapter 4 Error diagnosis and coutermeasures

Safety Precautions

Safety Precautions

 Danger

- Do not connect the wires while the power is on, and be sure to keep all circuit breakers OFF, otherwise there is a risk of electric shock.

 Warning

- Make sure that the converter is grounded according to local regulations, otherwise there is a danger of electric shock or fire;
- Do not disassemble the casing or touch the internal circuits when the converter is energized, otherwise there is a risk of electric shock;
- Error checking must be carried out by professionals, non-professionals are strictly prohibited to check, maintain and repair the frequency converter.Otherwise there is a danger of electric shock or fire.
- When installing the converter in a closed cabinet or enclosure box, please use cooling fan or air conditioner, etc. to keep the converter intake air temperature below 50°C, otherwise may result overheating or fire.
- Please tighten all screws to the specified torque, otherwise there may be a risk of fire or electric shock.
- Make sure the input voltage of the product is within the rated voltage range of the nameplate, otherwise there is a danger of electric shock or fire.
- Do not place flammable or explosive materials near the converter.

 Caution

- Please cover the top of the converter with a cloth or paper to prevent metal shavings, oil water, etc. from drilling holes from entering the inside of the converter, which may cause the converter to error if foreign matters enter inside the converter.
- Remove these cloths or papers when the operation is finished. If they continue to be covered, the ventilation will deteriorate, causing the converter to heat up abnormally.

- When operating the inverter, follow the procedures specified for Electro-Static Discharge (ESD), otherwise the internal circuitry of the inverter may be damaged by static electricity.

Guide for adjusting the frequency converter before pre-operation

1) Open-loop vector control mode(Default value P0-01=0)

This control mode is used to control the speed and torque of the motor in applications where the motor does not have encoder speed feedback.This control mode requires self-learning of motor parameters and accomplishes automatic correction of motor parameters.

Problems & Error	Treatment
Report overload or overcurrent error during motor startup	- Set motor parameters (P1-01~P1-05) according to the motor nameplate. - Make motor parameters tuning, perferably complete dynamic tuning of the motor.
Slow response to torque or speed below 5Hz, motor vibration	- Improved torque and speed response requires enhanced speed loop proportional regulation(P2-00 increse the setting value by 10) or reduced velocity loop integration time (P2-01 decrese the setting value by 0.05). - If vibration occurs, it is necessary to reduce the value of P2-00 and increase the value of P2-01.
Slow response to torque or speed above 5Hz, motor vibration	- Improved torque and speed response requires enhanced speed loop proportional regulation(P2-03 increse the setting value by 10) or reduced velocity loop integration time (P2-04 decrese the setting value by 0.05). - If vibration occurs, it is necessary to reduce the value of P2-03 and increase the value of P2-04.
Low accuracy of speed	- When the speed deviation of the motor with load is too large, it is necessary to increase the vector rotation compensation gain (P2-06), increse or decrese by 10%.
High fluctuations of speed	- When the motor speed fluctuates abnormally, the speed filtering time (P2-07)can be increased appropriately by 0.001s.

Error	Teatment
High noise level of motor	● Increase the carrier frequency value (P0-15) by 1kHz (Note: leakage current of motors will increase if the load frequency is raised)
Insufficient motor torque or power	● Check whether the upper limit of torque is limited or not, increase the upper limit of torque in speed mode (P2-10); increase torque command in torque mode.

2) V/F Control Mode (P0-01=2)

This mode is used in applications where the motor does not have encoder speed feedback and is not sensitive to the motor parameters, only need to set the rated voltage and rated frequency values of motor correctly.
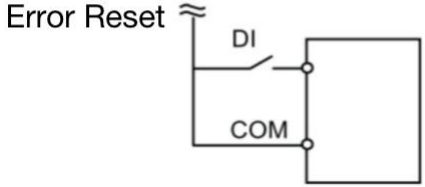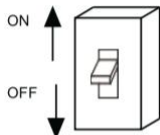
Error	Teatment
Motor oscillation during operation	● Increase the oscillation suppression parameter(P-11) by 10 (Maximum value: 100)
Reports overcurrent when start with high power	● Reduce torque boost (P3-01), adjust by 0.5%
High current during operation	● Set the rated voltage (P1-02) and rated frequency (P1-04) of the motor correctly; ● Reduce torque boost (P3-01), adjust by 0.5%
High noise level of motor	● Increase the carrier frequency (P0-15) value by 1.0kHz (Note: Leakage current will increase if you raise the load frequency of the motor)
Reports overpressure for sudden unloading of heavy load and decelerations	● Confirm that the overvoltage stall enable (P3-23) setting is enabled; Increase overvoltage stall gain (P3-24/P3-25, default set 30) by 10 (Maximum value: 100); ● Reduce overvoltage stall action voltage (P3-22 default set 770V) by 10V (Minimum value: 770V)
Reports overcurrent for sudden heavy-load and acceleration	● Increase overcurrent stall gain (P3-20 default set 20) by 10 (Maximum value: 100); ● Reduce overcurrent stall action current (P3-18 default set 150%) by 10% (Minimum value: 50%)

Alarm and error display for converter

When the converter detects an abnormality, it will cut off the output, and at the same time, the error indicator will flash and the converter error relay contact will operate.

Restart methods when error occurs

Period	Measure	Note
Error	View the last three error time, error type, frequency, current, bus voltage, IO terminals status, Power-on and run time.	Check through P9-14 ~ P9-44
Before error reset	Find the cause from the type of error displayed on the operation panel and release the error, reset after releasing the cause of the error.	Please refer to Error Alarms and Countermeasures for handling.

Period	Measure	Note
Reset after releasing the error.	Set DI at function 9(P4-00~P4-09=9 Error reset), reset function terminal active.	Frequency Converter Error Reset ≋ DI COM
	Confirm P7-02=1(Default), Indicates that the STOP button stop reset function is active in any mode.	Press the red STOP reset button STOP 停止/复位
	Automatic reset after re-powering the converter	ON ↑ OFF ↓
	If the communication function is available, it can be reset by communication. When P0-02=2, write "7" to the 2000H communication address through the upper computer,	Upper Computer

	and the converter can be reset after the error is cleared.		

Error Alarm & Countermeasures

The following types of errors mau be encountered during the use of the converter, please refer to the following methods for simple error analysis.

Error Name	Display Of The Operation Panel	Troubleshooting	Troubleshooting Measures
Inverter unit protection	**Err01**	1. Converter output circuit short circuit; 2. Motor and converter wiring too long; 3. Module overheating; 4. loose wires inside the converter; 5. Motherboard error; 6. Driver board error; 7. Inverter module error.	1. Check external error; 2. Add a reactor or output filter; 3. Check air ducts for blockage and fans for proper functioning; 4. Operate and troubleshoot problems; 5. Plug in all the cables. 6. Seek technical support; 7. Seek technical support; 8. Seek technical support.
Acceleration Overcurrent	**Err02**	There is a ground or short circuit in the output circuit of the inverter	● Troubleshooting external errors, detecting whether there are short circuits in the motor or interrupting contactors
		Control mode FVC or SVC without parameter identification	● Set the motor parameters according to the motor nameplate and perform motor parameter identification
		Rapid acceleration condition, acceleration time	● Increase acceleration time

		setting is too short	
		Inadequate setting of overcurrent loss suppression	• Verify that the lost speed inhibit function (P3-19) is enabled; • The setting of the overrun speed action current (P3-18) is too high, it is recommended to adjust it within 120% to 150%. • The overcurrent loss suppression gain setting is too low, recommended to adjust within 20 to 40
		Improper manual torque increase or V/F curve	• Adjust manual boost torque or V/F curve
		Start rotating motors	• Select speed tracking to start or wait for the motor to stop and then start again
		Subjected to external disturbances	• Check the history of error records, if the error current value is far from reaching the overcurrent value, you need to find the source of interference, if there is no other source of interference may be the driver board or Hall device errors
Deceleration Overcurrent	**Err03**	There is a ground or short circuit in the output circuit of the inverter.	• Troubleshooting external errors, detecting whether there are short circuits in the motor or interrupting contactors
		Control mode FVC or SVC without parameter identification	• Set the motor parameters according to the motor nameplate and perform motor parameter identification
		Rapid deceleration condition, acceleration time setting is too short	• Increase deceleration time
		Inadequate setting of overcurrent loss	• Verify that the lost speed inhibit function (P3-19) is

			suppression	•	enabled; • The setting of the overrun speed action current (P3-18) is too high, it is recommended to adjust it within 120% to 150%. • The overcurrent loss suppression gain setting is too low, recommended to adjust within 20 to 40
			No braking unit and braking resistor installed	•	Install braking units and braking resistors
			Subjected to external disturbances	•	Check the history of error records, if the error current value is far from reaching the overcurrent value, you need to find the source of interference, if there is no other source of interference may be the driver board or Hall device errors
Constant Speed Overcurrent	**Err04**		There is a ground or short circuit in the output circuit of the inverter	•	Troubleshooting external errors, detecting whether there are short circuits in the motor or interrupting contactors
			Control mode FVC or SVC without parameter identification	•	Set the motor parameters according to the motor nameplate and perform motor parameter identification
			Inadequate setting of overcurrent loss suppression	•	Verify that the lost speed inhibit function (P3-19) is enabled; • The setting of the overrun speed action current (P3-18) is too high, it is recommended to adjust it within 120% to 150%. • The overcurrent loss suppression gain setting is too low, recommended to adjust within 20 to 40

		Frequency converter selection is not suitable	• In stable operation, if the operation current has exceeded the rated current of the motor or the rated output current of the frequency converter, please use a frequency converter with larger power registration.
		Subjected to external disturbances	• Check the history of error records, if the error current value is far from reaching the overcurrent value, you need to find the source of interference, if there is no other source of interference may be the driver board or Hall device errors
Acceleration Overvoltage	**Err05**	High input voltage	• Adjust voltage to normal range
		There is an external force dragging the motor operation during acceleration	• Eliminate the additional power or add braking resistors
		Inappropriate overvoltage suppression setting	• Confirm that the overvoltage suppression function (P3-23) is enabled.; • The overvoltage suppression voltage (P3-22) setting is too high, and it is recommended that it be adjusted within the range of 770V to 700V; • The overvoltage suppression gain (P3-24) is set too low, and it is recommended that it be adjusted within 30 to 50.
		No braking unit and braking resistor installed	• Install braking units and resistors
		Acceleration time is too short	• Increase acceleration time
Deceleration Overvoltage	**Err06**	Inappropriate overvoltage suppression setting	• Confirm that the overvoltage suppression function (P3-23) is enabled.; • The overvoltage suppression

			voltage (P3-22) setting is too high, and it is recommended that it be adjusted within the range of 770V to 700V; ● The overvoltage suppression gain (P3-24) is set too low, and it is recommended that it be adjusted within 30 to 50.
		There is an external force dragging the motor operation during deceleration	● Eliminate the additional power or add braking resistors
		Deceleration time is too short	● Increase deceleration time
		No braking unit and braking resistor installed	● Install braking units and resistors
Constant Speed Overvoltage	**Err07**	Inappropriate overvoltage suppression setting	● Confirm that the overvoltage suppression function (P3-23) is enabled.; ● The overvoltage suppression voltage (P3-22) setting is too high, and it is recommended that it be adjusted within the range of 770V to 700V; ● The overvoltage suppression gain (P3-24) is set too low, and it is recommended that it be adjusted within 30 to 50; ● The maximum rising frequency of overvoltage suppression is set too low, it is recommended to adjust it within 5-20Hz.
		There is an external force dragging the motor operation during deceleration	● Eliminate the additional power or add braking resistors.
Buffer Power Error	**Err08**	Bus voltage fluctuates up and down at the undervoltage point	● Seek technical support.
Under Voltage Error	**Err09**	Instantaneous power outage	● Enabling the Instant Stop Non-Stop function (P9-59)

				prevents instantaneous blackout undervoltage faults
		The voltage at the input of the converter is not in the range required by the specification	●	Adjust voltage to positive production range
		Abnormal bus voltage	●	Seek technical help
		Rectifier bridge, buffer resistor, driver board, control board abnormality	●	seek technical help
Converter Overload	**Err10**	Whether the load is too high or motor blocking occurs	●	Reduce load and check motor and mechanical condition
		Frequency converter selection is not suitable	●	Check and troubleshoot problems in external wiring
Motor Overload	**Err11**	Check if the motor protection parameter P9-01 was set appropriately	●	Set this parameter correctly
		Whether the load is too high or motor blocking occurs	●	Reduce load and check motor and mechanical condition
Input Loss Phase	**Err12**	Three-phase input power abnormal.	●	Check and troubleshoot problems in external wiring
		Driver board, lightning protection board, main control board, rectifier bridge error	●	Seek technical help
Output loss Phase	**Err13**	Motor error	●	Check for motor disconnection
		Leads from inverter to motor not working properly	●	Troubleshooting external problems
		Converter three-phase output imbalance during motor operation	●	Check the three-phase winding of the motor for normalcy and troubleshooting
		Driver board, IGBT module error	●	Seek tenichal help

Module Overheating	**Err14**	High ambient temperature	● Reduced ambient temperature
		Clogged air ducts	● Clear the air ducts.
		Fan damage	● Replace the fan
		Module thermistor damaged	● Seek the services of manufacturer
		Inverter module damaged	● Seek the services of manufacturer
External Equipment Error	**Err15**	Signaling of external errors via multi-function terminal DI	● Troubleshoot external faults, confirm that the machinery allows restarting (P8-18), reset operation
		Signaling of external faults via virtual IO function	● Verify that the virtual IO group parameters for group A1 are set correctly and reset to run.
Communication Error	**Err16**	The upper computer is not working properly	● Check the upper computer wiring
		Communication cable not working properly	● Check the communication connection cable
		Communication expansion card P0-28 incorrect setting	● Correctly set the communication expansion card type
		Incorrect setting of communication parameter PD group	● Correctly set communication parameters
		After the above test is completed and the error still can not be solved, you can try to restore the default settings	
Contactor Error	**Err17**	Driver board and power supply error	● Seek the services of manufacturer
		Contactor error	● Seek the services of manufacturer
		Lightning protection board error	● Seek the services of manufacturer
Current Detection Error	**Err18**	Check for Hall device error	● Seek the services of manufacturer
		Driver board error	● Seek the services of manufacturer
Motor Tuning Errors	**Err19**	Motor parameters not set according to nameplate	● Correctly set the motor parameters according to the nameplate

		Parameter recognition process timeout	• Check converter to motor leads
		• Check that the number of encoder wires is set correctly (P1-27) and that the encoder signal wires are connected correctly and securely.	
Encoder Error	**Err20**	Encoder model mismatch	• Correctly set the encoder type according to the actual situation
		Encoder wiring error	• Check PG card power and program
		Encoder damaged	• Replace encoder
		PG card error	• Replace PG card
EEPROM R/W Error	**Err21**	EEPROM chip damaged	• Seek the services of manufacturer
Short-Circuit Error to Ground	**Err23**	Motor shorted to ground	• Replace cable or motor
Cumulative Running Time Reach Limit	**Err26**	Accumulated running time reaches the set value	• Clear logging information using the parameter initialization function
User-defined Error 1	**Err27**	Input signal for user-defined error 1 via multi-function terminal DI	• Reset
		Input signal for user-defined fault 1 via virtual IO function	• Reset
User-defined Error 2	**Err28**	Input signal for user-defined error 2 via multi-function terminal DI	• Reset
		Input signal for user-defined fault 2 via virtual IO function	• Reset
Cumulative Power-Up Time Reach Limit	**Err29**	Cumulative power-up time reaches the set value	• Clear logging information using the parameter initialization function
Loss of Load Failure	**Err30**	Converter running current less than P9-64	• Verify that the load is disengaged or that the P9-64 and P9-65 parameters are set to match actual operating conditions.

PID Report Loss Error when running	**Err31**	PID feedback less than PA-26 set point	● Check the PID feedback signal or set PA-26 to an appropriate value.
Wave-by-wave current limiting faults	**Err40**	Whether the load is too large or motor blocking occurs	● Reduce load and check motor and mechanical condition
		Frequency converter selection is incorrect	● Select converters with higher power ratings
Switch motor error during operation	**Err41**	Change the current motor selection via terminals during converter operation	● Always change the motor after the converter is OFF
Excessive speed deviation error	**Err42**	Incorrect encoder parameterization	● Set the parameters of encoder correctly
		No parameter identification	● Identify the motor parameters
		The speed deviation detection parameter P9-69, P9-70 is not set correctly	● Reasonably set detection parameters according to the actual situation
Motor overspeed error	**Err43**	Incorrect encoder parameterization	● Set the encoder parameters correctly
		No parameter identification	● Perform motor parameter identification
		Motor overspeed detection parameters P9-67 and P9-68 are not set properly.	● Reasonably set detection parameters according to the actual situation
Motor overheating error	**Err45**	Loose temperature sensor wiring	● Test and troubleshoot temperature sensor wiring
		Motor high temperature	● Increase the carrier frequency or take other heat dissipation measures
Mater-Slave Control Slave error	**Err55**	Check the slave while report error	● Troubleshoot by slave error codes
Current detection or brake error	**Err60**	Check for Hall, Driver Board	● Seek the services of manufacturer

4.6Common Failures and Handling Methods

No.	Symptom	Possible Reasons	Resolution
1	No display on power-up	Grid voltage is absent or too low	● Check the input power supply
		The switching power supply on the inverter drive board error	● Check if 24V and 10V output voltages on the control board are correct.
		Broken wires between control board, driver board, and keyboard.	● Re-plugging 8- and 34-pole wires
		Inverter buffer resistor damaged	● Seek for the services of manufacturer
		Control board, keypad damaged	
		Rectifier bridge damaged	
2	After powering up, it keeps displaying: **TD500**	Poor contact of the wires between the driver board and the control board	● Re-plugging 8- and 28-pole wires
		Related devices on the control board damaged	● Seek for the services of manufacturer
		Motor or motor wires are shorted to ground	
		Hall error	
		Grid voltage too low	
3	Power-On display alarm **Err23**	Motor or output wire shorted to ground	● Measure the insulation of the motor and output wires with a megger.
		converter damaged	● Seek for the services of manufacturer
4	Power on the converter display is normal, after running, the display shows "TD500" and stops immediately.	Damaged or blocked fan	● Replace fan
		Short circuit in peripheral control terminal wiring	● Clear the external short circuits

		TD500		
5	Frequent Err14 (module overheating) error **Err14**	Carrier frequency set too high	●	Reduce carrier frequency
		Damaged fan or clogged air duct	●	Replace the fan and clean the air ducts
		Internal devices of the inverter (thermistor or other) damaged	●	Seek for the services of manufacturer
6	Motor does not rotate after converter operation	Incorrect wiring between converter and motor	●	Verify that the wiring between the inverter and the motor is correct.
		Converter parameters (Motor parameters) setting error	● ● ● ●	Restore default parameters and reset the parameter set Check that the encoder parameters are set correctly and that the motor rated parameters are set correctly, such as the rated frequency and rated speed of the motor. Check that P0-01 (control mode) and P0-02 (operation mode) are set correctly. In V/F mode, under heavy load startup, adjust P3-01 (torque boost) parameter
		Poor contact between driver board and control board wires	●	Reconnect the wires to make sure the wiring is secure
		Driver Board error	●	Seek for the services of manufacturer
7	DI terminal error	Incorrect parameters setting	●	Check and reset P4 group related parameters
		External signal error	●	Reconnect external signal wires
		OP and +24V jumper loose	●	Reconfirm the OP and +24V jumpers and make sure they are tight.
		Control board damaged	●	Seek for the services of manufacturer
8	Motor speed cannot be increased with	Encoder Error	●	Replace the code plate and reconfirm wiring

	closed-loop vector control	Incorrect wiring or poor contact of the encoder	● Re-wire to ensure good contact
		PG card error	● Replace PG card
		Driver board error	● Seek for the services of manufacturer
9	Frequent overcurrent and overvoltage errors reported by converter	Incorrect setting of motor parameters	● Reset motor parameters or perform motor tuning
		Inappropriate acceleration and deceleration times	● Set appropriate acceleration and deceleration times
		Load fluctuate	● Seek for the services of manufacturer
10	Power up (or run) with error17 **Err17**	Soft start contactor does not engage	● Check if contactor cables are loose. ● Check if contactor is damaged. ● Check if 24V power supply to contactor is abnormal. ● Seek for the services of manufacturer
11	Motor stops freely or has no braking ability when decelerating or stopping at deceleration	Encoder disconnection or overvoltage stall protection in effect	● In vector control mode with speed sensor (P0-01=1), please check the encoder wiring. ● If the braking resistor has been configured, select "Overvoltage stall enable" to "Invalid" (set P3-23=0) to disable overvoltage stall.

Chapter 5 Maintenance

Maintenance

<table>
<tr><td>Safety Precautions</td></tr>
</table>

 Danger

- Do not operate the wiring under power-on conditions, otherwise there is a risk of electric shock;
- Disconnect all power to the equipment before performing the inspection.After cutting off the input power, please wait at least a few minutes for the power indicator to turn off before operating because there is still residual voltage on the DC pointing inside the converter.When powering up again, you need to wait for the interval power-up time specified by the converter;
- Do not change the wiring, remove the cables, remove the option card or replace the cooling fan after the converter has been powered up, otherwise there is a risk of electric shock!
- Be sure to ground the motor's ground terminal, otherwise there is a risk of electric shock from contact with the motor casing.
- Non-professional electrical personnel, do not carry out maintenance, servicing and repairs
- Installation, wiring, debugging, repair, inspection and component replacement, please have personnel familiar with the installation, debugging, maintenance, and electrical construction of frequency converters

 Warning

- Do not leave the converter running with the case removed.
- In order to illustrate the details of the product, the illustrations in this manual are sometimes shown with the cover and end caps removed, so be sure to operate the inverter in accordance with the manual under the specified cover and safety cover.
- Tighten the screw terminals according to the specified tightening force to prevent loose connections from heating up the wire connections and causing fire.
- Do not connect the wrong range of main circuit input voltage to prevent abnormal operation due to the rated voltage input to the converter exceeding the permissible range.

- Do not allow flammable materials to contact with the converter or install the converter on flammable materials.

⚠ **Caution**

- Follow the instructions in this manual for proper fan replacement. Especially for the direction of the fan outlet, if it is in the wrong direction, it will result in poor cooling effect and will not be able to perform the cooling function.
- Do not disassemble the motor while the converter is running, as this may cause electric shock and damage to the converter.
- Use shielded cables for control circuit wiring.
- Reliably grounding the shield at one end to prevent the converter from acting abnormally.
- Do not change the inverter circuit or it will cause damage to the converter.
- Correctly connect the converter output circuit terminals to the motor circuit terminals.
- If you need to change the running direction of the motor, please switch the output terminals of the inverter arbitrarily.

- Do not operate a damaged converter to avoid damage to equipment other than the converter.

Routine inspection

Due to the influence of temperature, humidity, dust and vibration of the environment, it will lead to the aging of the internal devices, resulting in the occurrence of potential failures or reducing the service life. Therefore, it is necessary to implement routine and regular maintenance and repair of converters, especially for high-temperature environments, frequent starting and stopping occasions, the presence of AC power and load fluctuations in the environment, the presence of large vibration or shock environment, the presence of dust / hydrochloric acid corrosive environment should be shortened periodic inspection intervals.

In order to ensure that the converter functions properly and that the product is not damaged, please check the following items daily, make a copy of the inspection confirmation form for use, and sign the

"Confirmation" seal on the confirmation column after each check.

Inspection Item	Inspection Content	Countermeasures	Confirmation Column
Motor	Whether the motor has abnormal sound and vibration	● Check for abnormal mechanical connections; ● Check if the motor is out of phase; ● Check if the motor fixing screws are secure.	
Fan	Abnormal use of converter and motor cooling fan	● Check if the inverter cooling fan is running; ● Check if the cooling fan on the motor side is abnormal ● Check if the ventilation passages are blocked ● Check if the ambient temperature is within the permissible range	
Installation Environment	Electrical cabinet& Cable duct	● Check if the converter inlet and outlet cables have insulation breakage ● Check if the mounting bracket have vibration ● Check if the copper rows and connecting cable terminals are free from looseness and corrosion.	
Load	Whether the operating current of the inverter exceeds the rated current of the converter and the rated current of the motor (Within a certain period of time)	● Check if the motor parameters are set correctly ● Check if the motor is overloaded ● Check for excessive machanical vibration	
Input Voltage	The power supply voltage between the main circuit and control circuit	● Check if the input voltage is within the allowable range ● Check if there are heavy loads around to start.	

Regular Checkup

Regular Checkup Item

⚠️ Danger

● To prevent electric shock, do not carry out inspection work in an electrified state, otherwise there is a risk of electric shock. ● Before checking, please cut off the power of all equipments and wait for more than 10 minutes in order to avoid the danger caused by the residual voltage of the capacitor inside the converter.	

Please check regularly for areas that are difficult to check during operation, always keep the frequency converter in a clean state, effectively remove the dust on the top of the frequency converter to prevent the accumulation of dust into the internal of converter, especially metal dust, and effectively removes oil from converter cooling fans.

Inspection Item	Inspection Content	Countermeasures	Confirmation Column
Entire machine	Check if surfaces are free of trash, dirt, and dust accumulation	● Confirm that the converter cabinet is powered off; ● Remove trash or dust with a vacuum cleaner to avoid contact with parts; ● Gently wipe off the oil with a soft cloth soaked in a mild detergent.	
Cable	Check if power cords and connections for discoloration; insulation for deterioration or cracking	● Replace cracked cables; ● Replace damaged connection terminals	
Periphery of electromagnetic contactor	Check if the electromagnetic contactor close securely or make a	● Replace abnormal components	

	strange noise when it is in motion; Check if the electromagnetic contactor have short-circuited, water-soiled, swollen or cracked peripheral devices		
Duct vent	Check if the air duckts and heat sinks are blocked; whether the fan is damaged	● Clean air ducts ● Replace fan	
Control circuit	Check if the control components have poor contact, the terminal screws are loose, whether the control cables have insulation cracks	● Clean foreign matter from the surface of control wiring and connection terminals. ● Replace damaged and corroded control cables	

Main circuit insulation test

Note: When measuring the insulation resistance with a megohmmeter (please use a DC 500V megohmmeter), disconnect the main circuit line from the converter.Do not test the control circuit insulation with an insulation resistance meter, please refer to the following diagram (high voltage (>500V) testing is strictly prohibited and is done at the factory)
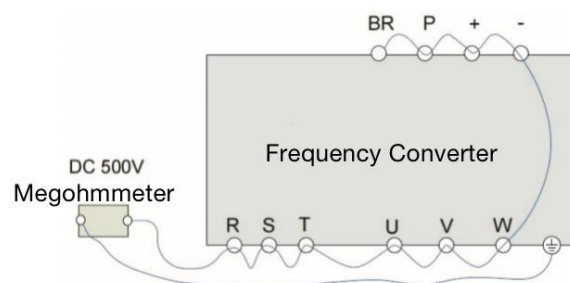
Figure 8-1 Diagram of Main circuit insulation test

Requires measurements greater than 5MΩ.

Before testing, remove the piezoresistor screws and disconnect the piezosensitive access:
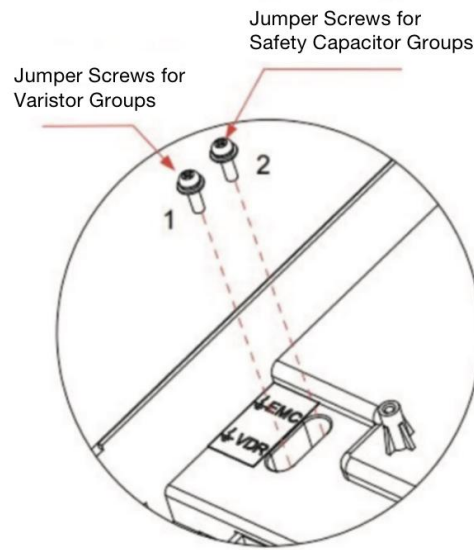
Figure 6-2 Diagram of Varistor(VDR)、Safety Capacitors(EMC) Ground

Converter wear parts replacement

Life of wearing parts

converter wearing parts are mainly cooling fans and electrolytic capacitors for filtering, whose life is closely related to the use of the environment and maintenance conditions. The general life time is as follows:

Device Name	Duration of life[Note]
Cooling fan	≥ 5 years
Electrolytic capacitor	≥ 5 years

[Note]:The life time is the time of use under the following conditions, and the user can determine the replacement year based on the operating time

1) Environment Temperature: 40 ˚C

2) Load Ratio: 80%

3) Operating Rate: 24Hrs/day

Cooling Fan Replacement

1)   Possible causes of damage: bearing aging, blade aging

2)   Judgment criteria: whether there are cracks in the fan blades, whether there are abnormal vibration sounds when the power is turned on, and whether the fan blades are running abnormally.

Filter Electrolytic Capacitors

1)   Possible causes of damage: Poor input power quality, high ambient temperature, frequent load jumps, electrolyte aging.

2)   Judgment criteria: Check if there are liquid leakage and the safety valve is protruding. Measurement of electrostatic capacitance and insulation resistane

3)   Filter Capacitor Replacement: Because the filter capacitor involves the internal components of the converter, it is forbidden for users to replace it by themselves, please contact our company for replacement.

Converter Storage

After the user purchases the converter, the following points must be noted for temporary storage and long-term storage:

1)   When storing, better pack in the original packaging in our box;

2)　　　　Do not leave the whole machine for a long time under humidity, high temperature or outdoor exposure to the sun;

3)　　　　Long-term storage will lead to the deterioration of electrolytic capacitors, must ensure that within 6 months to power on once, power on time of at least 5 hours, the input voltage must be used to slowly increase the regulator to the rated value or consult the frequency converter professional for technical support.

Warranty statement for converter

Free warranty coverage refers only to the converter itself.

Under normal use state, in case of error or damage, our company is responsible for 12 months warranty (From the date of delivery based on the barcode on the body, in accordance with the agreement if there is a contractual agreement). For more than 12 months, reasonable repair costs will be charged.

Within 12-month period, a maintenance fee shall be charged for the following situations:

1)　　　　Damage to the machine caused by the user's not following the instructions in the instruction manual.

2)　　　　Damage due to fire, flood, abnormal voltage, etc.

3)　　　　Damage caused when using the converter for non-normal functions

4)   Use of the converter beyond the stated specifications

5)   Force majeure (natural disasters, earthquakes, lightning

strikes) and secondary damages caused by these causes

The relevant service costs are calculated according to the manufacturer's

standardized criteria. If there is a covenant, the covenant will take

precedence. Please refer to the Product Warranty Card for detailed

warranty instructions.

Chapter 6 Communication

Communication Data Address Definition

TK500 series converter supports Modbus-RTU communication protocal. User programmable cards and point-to-point communication are derivatives of the CANlink protocol.The host computer through these communication protocols can realize the control, monitor and function parameter modify and view operations.

TK500 communication data can be divided into parameter data, non-parameter data, the latter includes operating commands, operating status, operating parameters, alarm messages and so on.

TK500 Parameters Data

TK500 Parameters Data	Group P(R/W)	P0、P1、P2、P3、P4、P5、P6、P7、P8、P9、PA、PB、PC、PD、PE、PF
	Group A(R/W)	A0、A1、A2、A3、A4、A5、A6、A7、A8、A9、AA、AB、AC

The parameter data communication address is defined as follows:

1)   When reading parameter data for communication

For the parameter data of P0~PF and A0~AC groups, the high sixteen bits of the communication address are directly for the function group number, and the low sixteen bits are directly for the parameter serial number in the function group, examples are given below:

P0-16 function parameter, its communication address is F010H, where

F0H represents the function parameter of P0 group, and 10H represents the hexadecimal data format of parameter number 16 in the function group.

AC-08 function parameter with communication address AC08, where ACH represents the AC group function parameter and 08H represents the hexadecimal data format of parameter number 8 in the function group.

2)   When writing parameter data as communication

For the parameter data of group P0 to PF, the high sixteen bits of the communication address are distinguished as 00~0F or F0~FF depending on whether they are written to EEPROM or not, and the low sixteen bits are directly the serial number of the parameter in the function group, examples are given below:

----Write function parameters P0-16:

If there is no need to write to the EEPROM, the communication address is 0010H;

When writing to EEPROM, the communication address is F010H.

For the parameter data of A0 ~ AC group, the high sixteen bits of its communication address are distinguished from 40 ~ 4C or A0 ~ AC according to whether it needs to be written to EEPROM, and the low sixteen bits are directly the serial number of the parameter in the function group, examples are goven below:

----Write Function Parameters AC-0:

When there is no need to write to the EEPROM, the communication

address is 4C08H ;

When writing to EEPROM, the communication address is AC08H.

Non-parametric data of TK500

Non-parametric data of TK500	Status Data (Read-Only)	U group monitoring parameters, converter error description, converter operation status
	Control Parameter (Write-Only)	Control commands, communication set value, digital output terminal control, analog output AO1 control, analog output AO2 control, high-speed pulse (FMP) output control, parameter initialization

1） Status Data

The status data are devided into U group monitoring parameters,

converter error description, converter operation status

●   U group monitoring parameters

The U group monitoring data is described in "Chapter 8 Function

Parameter List" and "Chapter 6 Parameter Description", and its address is

defined as follows: U0, the high sixteen bits of its communication address

are 70 to 7F, and the low sixteen bits are the serial number of the

monitoring parameter in the group, example as follows:

U0~11 communication address is 700BH

●   Converter error description

When the communication reads the error description of the frequency

converter, the communication address is fixed to 8000H, and the host

computer can get the current error code of the frequency converter by

reading the data of this address, and the error code description can be seen in "Appendix C Function Parameter List", P9-14, defined in the parameters.

● Converter operation status

When the communication reads the running status of the converter, the communication address is fixed to 3000H, and the host computer can get the current running status information of the converter by reading the address data, defined as follows:

Converter operation status communication address	Read status word definition
3000H	1: Forward motion
	2: Reverse motion
	3: Shut down

2) Control Parameter

The status data are devided into Control commands, communication set values, digital output terminal control, analog output AO1 control, analog output AO2 control, high-speed pulse (FMP) output control, parameter initialization.

● Control commands

When P0-02 (Command Source) is selected as 2: Communication Control, the host computer can realize the control of start/stop and other related commands of the converter through this communication address, and the control commands are defined as follows:

Control command communication address	Command Function
2000H	1: Forward motion
	2: Reverse motion
	3: Forward point-to-point motion

	4:Reverse point-to-point motion
	5:Free stop
	6:Deceleration stop
	7:Error reset

●   Communication Set Value

The communication set value is mainly used to select the frequency source, upper torque limit source, V/F separate voltage source, PID given source, PID feedback source, etc. in TK500 as the given data for the communication set value. The communication address is 1000H, and when the host computer sets the communication address value, the data range is -10000 to 10000, corresponding to the relative given value -100.00% to 100.00%.

●   Digital output terminal control

When the digital output terminal function is selected as 20: communication control, the host computer can realize the control of the digital output terminal of the inverter through this communication address, which is defined as follows:

Communication address of digital output terminal control	Command Content
2001H	BIT0:DO1 Output Control
	BIT1:DO2 Output Control
	BIT2:RELAY1 Output Control
	BIT3:RELAY2 Output Control
	BIT4:FMR Output Control
	BIT5:VDO1
	BIT6:VDO2
	BIT7:VDO3
	BIT8:VDO4
	BIT9:VDO5

● Analog output AO1 control, analog output AO2 control, high-speed pulse (FMP) output control

When analog output AO1 control, analog output AO2 control, high-speed pulse (FMP) output function is selected as 12: communication setting the host computer can realize the control of the analog and high-speed pulse output of the converter through this communication address, which is defined as follows:

Output control communication address		Command Content
AO1	2002H	0 to 7FFF means 0% to 100%.
AO2	2003H	
FMP	2004H	

● Parameter initialization

This function is required when the parameter initialization operation of the converter needs to be realized through the host computer.

If PP-00 (user password) is not 0, it is necessary to verify the password through communication first, and after the verification passes, within 30 seconds, the host computer carries out the parameter initialization operation.

The communication address for user password verification is 1F00H, and the password verification can be completed by directly writing the correct user password to this address.

The address for parameter initialization for communication is 1F01H, and its data content is defined as follows:

Parameter initialization communication address	Command Function
1F01H	1:Restore default parameters

	2:Clearing Recorded Information
	4:Restore user backup parameters
	501:Backup user's current parameters

Modbus Communication Protocols

TK500 series converter provides RS485 communication interface and supports Modbus-RTU slave communication protocol. Users can realize centralized control through computer or PLC, set converter running commands, modify or read parameters, read converter working status and error information through this communication protocol.

This serial communications protocol defines the content of the information transmitted in serial communications and the formats used, including: the host polling (or broadcast) format; the host's encoding methods, include: parameters of the requested action, transmission data and error checking etc. The same structure is used for the slave's response, include: action confirmation, return data, error checking, etc. If the slave makes an error in receiving a message, or fails to complete an action requested by the host, it will organize a error message as a response back to the host.

Application

The frequency converter is connected to a PC/PLC control network with RS485 bus as a communication slave.

Bus Structure

1) Hardware interfaces

The RS485 expansion card TD38TX1 hardware needs to be inserted in the converter.

2) Topological structure

Single-host-multiple-slave systems. Each communicating device in the network has a unique slave address, with one device acting as the communication master (Usually PC, PCL, HMI, etc.), initiates the communication, reads or writes the parameters to the slave, and the other devices act as the communication slaves, respond to the host's inquiry or communication operation. Only one device can send data at the same moment while the others are receiving.

The setting range of the slave address is 1~ 247, 0 is the broadcast communication address. Slave addresses in the network must be unique.

3) Communication transmission method

Asynchronous serial, half-duplex transmission method. Data is sent one frame at a time during serial asynchronous communication in the form of telegrams. The MODBUS-RTU protocol specifies that when the idle time without data on the communication data line is greater than the transmission time of 3.5byte, it indicates the start of a new communication frame.

| | Host Send 1 | Slave Answer 1 | Host Send 2 | Slave Answer 2 |
| Greater than 3.5 Byte transfer time | Data Frames | Greater than 3.5 Byte transfer time | Data Frames | |
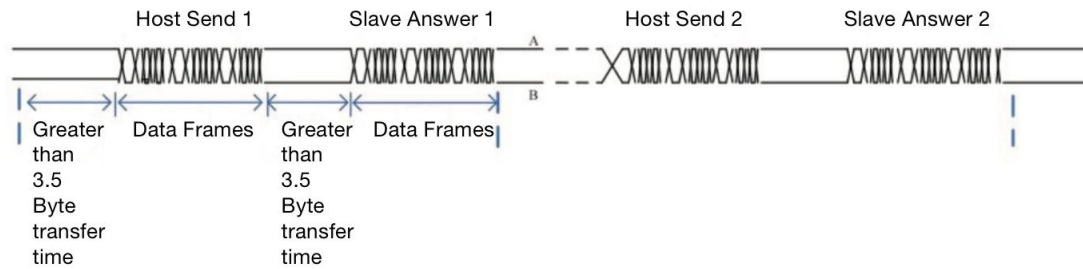
The built-in communication protocol of TK500 series inverter is MODBUS-RTU slave communication protocol, which can respond to the host's "query/command" or make corresponding actions according to the host's "query/command" and communicate data response.

A host can be a personal computer (PC), an industrial control device or a programmable logic controller (PLC), etc. The host can either communicate individually to a particular slave or issue a broadcast message to all subordinate slaves. For an individual access "query/command" from the host, the accessed slave has to return an answer frame; for a broadcast message from the host, the slave does not have to respond back to the host.

Communications Data Structure

The communication data format of MODBUS-RTU protocol of TK500 series inverter is as follows. The inverter only supports reading or writing of Word type parameters, and the corresponding communication read operation command is 0x03; the write operation command is 0x06, and it does not support reading or writing operation of bytes or bits:
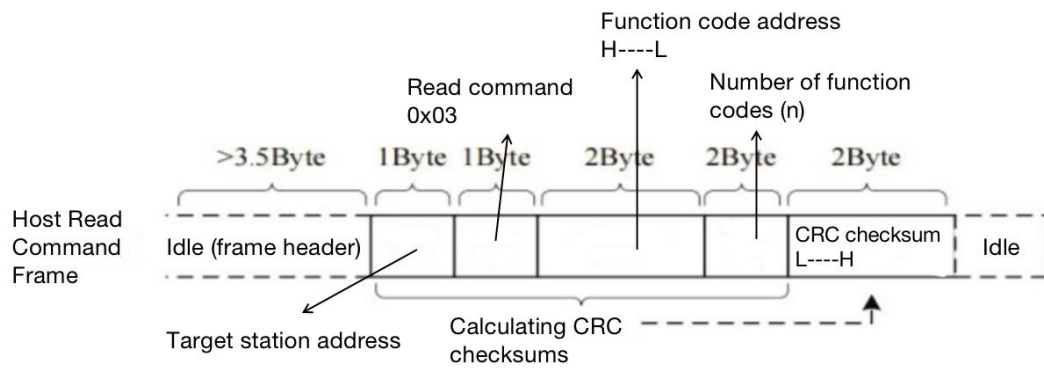
Theoretically, the host computer can read several consecutive parameters at once (i.e. where n can be up to 12), but be careful not to cross the last parameter of this parameter group, otherwise it will reply with an error.
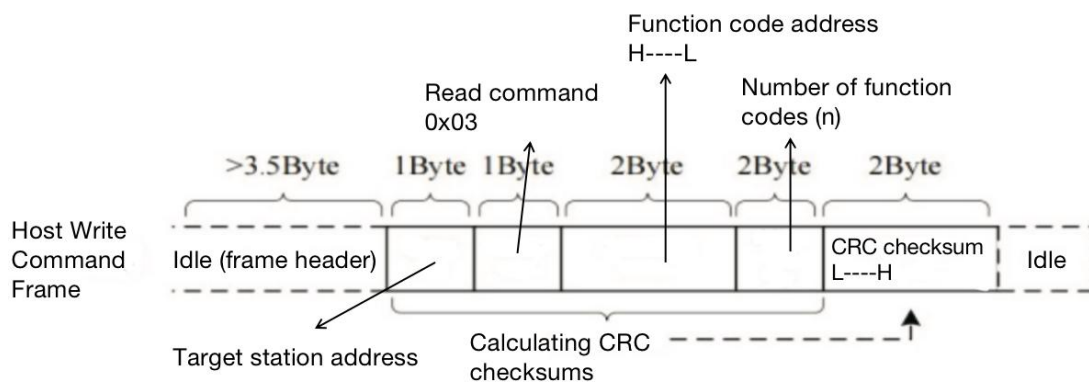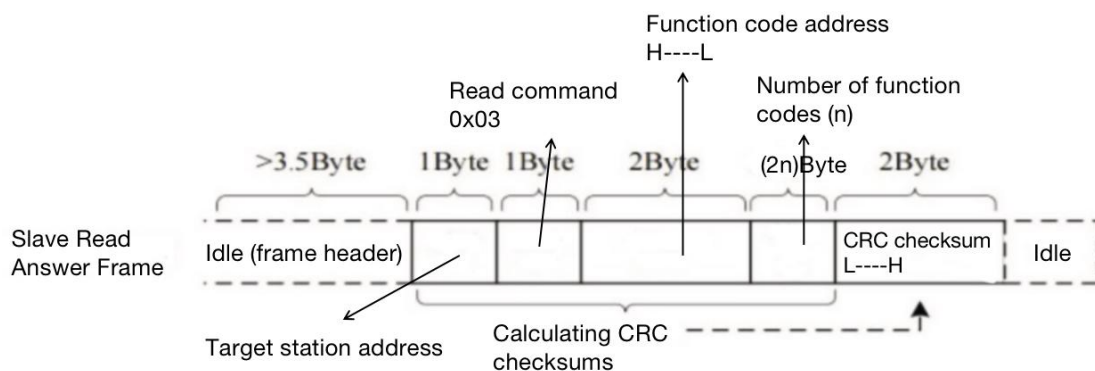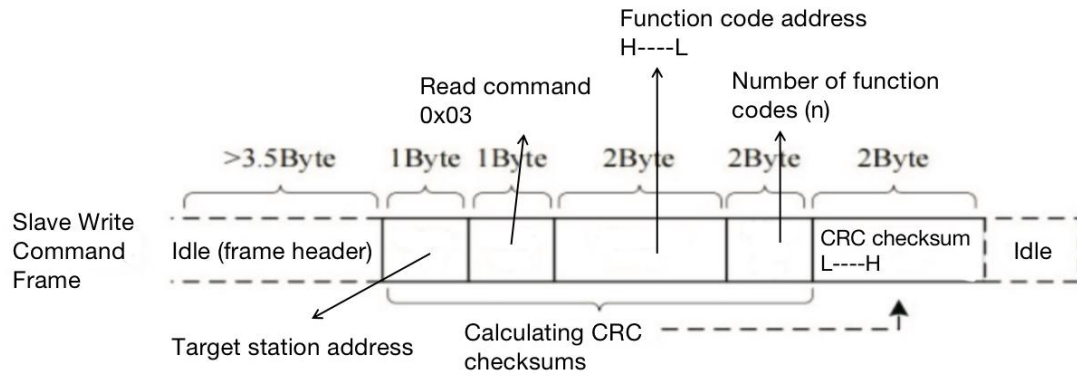
If the slave detects an error in the communication frame or the read/write

is unsuccessful due to other reasons, it will reply with an error frame.

Type of error:

01: Command Code Error
02: Address Error
03: Data Error
04: The order could not be processed
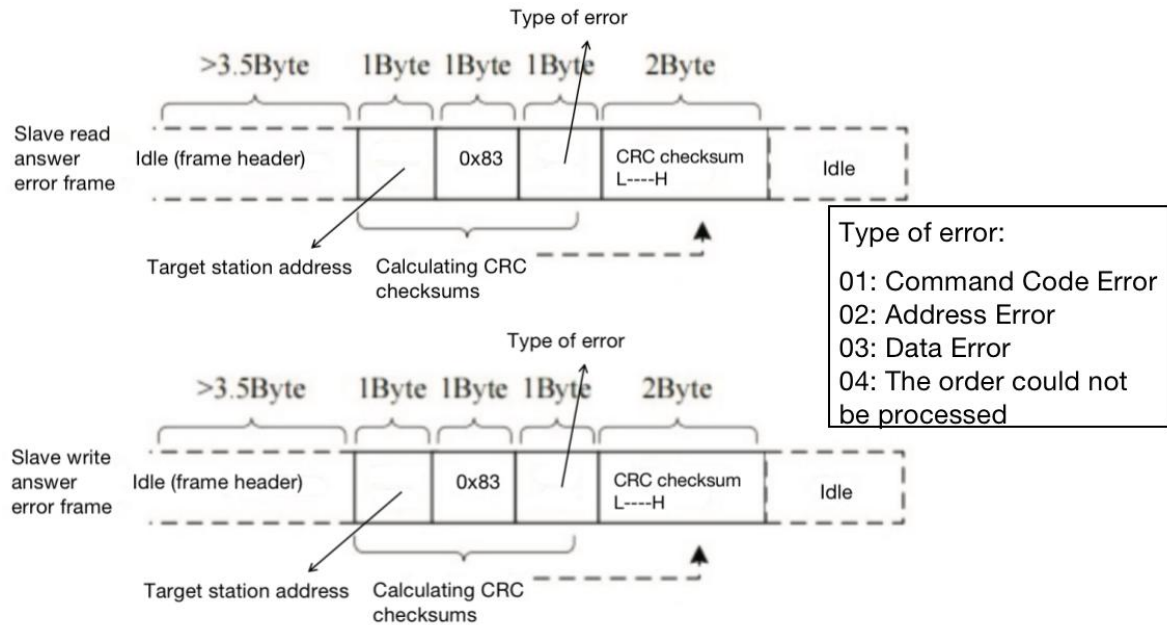
Data Frame Field Description:

Header START	Idle greater than 3.5 character transfer time
Slave Address ADR	Communication address range:1~247; 0=Broadcas address
Command Code CMD	03: Read slave parameter; 06: Write slave parameter
Parameter Address H	Parameter address inside the inverter,
Parameter Address L	hexadecimal representation; divided into parametric and non-parametric (such as running status parameter commands, etc.) parameters, etc., see the address definition for details. Transmit with high byte first, low byte second.
Number Of Parameter H	The number of parameters read in this frame, 1

Number Of Parameter L	means read one parameter. When transmitting, the high byte comes first and the low byte comes second. This protocol can only rewrite one parameter at a time without the field
Data H Data L	The data to be answered, or the data to be written, is transmitted with the high byte first and the low byte second.
CRC CHK Low CRC CHK High	Detection value: CRC16 calibration value. Transmit with low byte first, high byte second. For details of the calculation method, see the description of the CRC checksum in this section.
END	At 3.5 characters

CRC checksum method:

CRC (Cyclical Redundancy Check) uses the RTU frame format and the message includes an error detection field based on the CRC method. The CRC field detects the contents of the entire message. The CRC field is two bytes containing a 16-bit binary value. It is calculated by the transmitting device and added to the message The receiving device recalculates the CRC of the received message and compares it with the value in the received CRC field; if the two CRC values are not equal, there is a transmission error.

The CRC is first deposited into 0xFFFF, and then a procedure is called to process the consecutive 8-bit bytes in the message with the value in the current register. Only the 8Bit data in each character is valid for the CRC; the start and stop bits and the parity bit are not valid.

During the CRC generation process, each 8-bit character is individually differentiated (XORed) from the register contents, resulting in a shift

towards the least significant bit, with the most significant bit filled with a 0. The LSB is extracted and detected, and the register is individually differentiated from the pre-set value if the LSB is a 1, or not if the LSB is a 0. The entire process is repeated 8 times, with the register being differentiated from the pre-set value if the LSB is a 1. The whole process is repeated 8 times. After the last bit (bit 8) is completed, the next 8-bit byte is individually differentiated from the current value of the register, and the final value in the register is the CRC value after all the bytes in the message have been executed. the CRC is added to the message, with the low byte first, followed by the high byte. The simple CRC function is as follows:

```
unsigned int crc_chk_value (unsigned char*data_value, unsigned char length)
{
            unsigned int crc_value=0xFFFF;
            int i;
            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);
}
```

Address definition of communication parameters:

Read and write parameters (some parameters cannot be changed and are for factory use or monitoring only)

Parameter address labeling rules

Parameter group number and label as parameter address representation rules:

High bytes: P0~PF (Group P) A0~AC(Group A) 70~7C(Group U)

Low bytes: 00~FF

For example, to access parameter P3-12, the access address of the parameter is 0xF30C;

Note: Group PF: parameters can neither be read nor changed;

Group U: Read only, no parameter changes.

Some parameters cannot be changed when the converter is in the running state; Some parameters cannot be changed regardless of the state of the converter; When changing parameters, also pay attention to the range, unit and related description of the parameter.

Parameter group number	Address for communication access	Communication modifies the parameter address in RAM
Group P0~PE	0xF000~0xFEFF	0x0000~0xEFF
Group A0~AC	0xA000~0xACFF	0x4000~0x4CFF
Group U0	0x7000~0x70FF	

Since the life of the EEPROM will be reduced if the EEPROM is stored frequently, there are some parameters that do not need to be stored in the communication mode, so it is sufficient to change the value in the RAM.

If the parameter is a group P parameter, to realize the change function, just change the high bit P of the parameter address to 0. If the parameter is a group A parameter, to realize the change function, just change the high bit A of the parameter address to 4. The communication parameter addresses are indicated as follows:

High Byte: 00~0F (Group P), 40~4C (Group A)

Low Byte:00~FF

Example:

Parameter P3-12 is not stored in the EEPROM and is indicated as 030C;

Parameter A0-05 is not stored in the EEPROM and is indicated as 4005;

This address indicates that you can only do write RAM, not read, and when reading, it is an invalid address. Shutdown/Operation Parameters section:

Parameter Address	Parameter Description	Parameter Address	Parameter Description
1000H	Communication set value (Decimal) : -10000~10000	1010H	PID Setting
1001H	Operating Frequencie	1011H	PID Feedback
1002H	Bus Voltage	1012H	PID Steps
1003H	Output Voltage	1013H	PULSE Input pulse frequency, unit 0.01kHz
1004H	Output Current	1014H	Feedback speed in 0.1Hz
1005H	Output Power	1015H	Remaining running time
1006H	Output Torque	1016H	AI1 Pre-correction voltage
1007H	Operating Speed	1017H	AI2 Pre-correction voltage
1008H	DI Input Lable	1018H	AI3 Pre-correction voltage
1009H	DO Output Lable	1019H	Linear Velocity
100AH	AI1 Voltage	101AH	Current power-on time
100BH	AI2 Voltage	101BH	Current Runtime
100CH	AI3 Voltage	101CH	PULSE Input pulse frequency,

			unit 1Hz
100DH	Count Value Input	101DH	Communication Set Value
100EH	Length Value Input	101EH	Actual feedback speed
100FH	Load Speed	101FH	Main Frequency X Display
-	-	1020H	Auxiliary Frequency Y Display

- The communication set value is a percentage of the relative value, 10000 means 100.00%, and -10000 means -100.00%.

- For data with a frequency scale, the percentage is a percentage of the relative maximum frequency (P0-10); for data in the torque scale, the percentage is P2-10, A2-48 (Torque upper limit digit setting, corresponding to the first and second motors)

Control command input to converter: (Write Only):

Command Word Address	Command Function
2000H	0001: Forward Motion
	0002: Reverse Motion
	0003:Forward point-to-point motion
	0004:Reverse point-to-point motion
	0005:Free stop
	0006:Deceleration stop
	0007:Error Reset

Read Converter Status: (Read Only)

Status Word Address	Status Word Function
3000H	0001: Forward Motion
	0002: Reverse Motion
	0003: Shut Down

Parameter Lock Password Verification: If the actual password value is returned, it means the password verification passed. (If there is no password, the password is 0 and the checksum returns 000H)

Password Address	Enter the contents of the password
1F00H	*****

Digital output terminal control: (Write Only)

Command Address	Command Content
2001H	BIT0: DO1 Output Control
	BIT1: DO2 Output Control
	BIT2: RELAY1 Output Control
	BIT3: RELAY2 Output Control
	BIT4: FMR Output Control
	BIT5: VDO1
	BIT6: VDO2
	BIT7: VDO3
	BIT8: VDO4
	BIT9: VDO5

Analog output AO1 control: (Write Only)

Command Address	Command Content
2002H	0~7FFF means 0%~100%

Analog output AO2 control: (Write Only)

Command Address	Command Content
2003H	0~7FFF means 0%~100%

Pulse (PULSE) output control: (Write Only)

Command Address	Command Content
2004H	0~7FFF means 0%~100%

Connverter Error Description:

Converter Error Address	Frequency converter error information	
8000H	0000: Error-Free	0015: Parameter read/write Error
	0001: Reserve	0016: Converter Hardware Error
	0002: Acceleration Overcurrent	0017: Motor short circuit Error to ground
	0003: Deceleration Overcurrent	
	0004: Constant Speed Overcurrent	0018: Reserve
		0019: Reserve
	0005: Acceleration Overvoltage	001A: Reach Runtime
	0006: Deceleration Overvoltage	001B: User-defined Error 1
	0007: Constant Speed Overvoltage	001C: User-defined Error 1
		001D: Reach Power-On Time
	0008: Buffer Resistor Overload Error	001E: Loss Load
		001F: Loss of PID feedback at runtime
	0009: Undervoltage Error	0028: Fast Current Limit Timeout Fault

	000A: Converter Overload	0029: Switching motor failure during
	000B: Motor Overload	operation
	000C: Input Loss Phase	002A: Excessive speed deviation
	000D: Output Loss Phase	002B: Motor overspeed
	000E: Module Overheat	002D: Motor over-temperature
	000F: External Error	005A: Encoder harness setting error
	0010: Communication Error	005B: Encoder not connected
	0011: Contactor Error	005C: Initial position error
	0012: Current Detection Error	005E: Speed feedback error
	0013: Motor Tuning Error	
	0014: Encoder/PG card Error	

Group PD Communication Parameter Description

PD-00	Baud	Default Value	5005
	Setting Range	Bit: Modbus baud rate	
		0: 300bps	5: 9600bps
		1: 600bps	6: 19200bps
		2: 1200bps	7: 38400bps
		3: 2400bps	8: 57600bps
		4: 4800bps	9: 115200bps

This parameter is used to set the data transmission rate between the host computer and the converter. Note that the baud rate set by the host computer and the converter must be the same, otherwise the communication cannot be carried out. The higher the baud rate, the faster the communication.

PD-01	Data Format	Default Value		0
	Setting Range	0: No Checksum: Data Format <8, N, 2>		
		1: Even Checksum: Data Format <8, E, 1>		
		2: Odd Checksum: Data Format <8, O, 1>		
		1: No Checksum: Data Format <8, N, 1>		

The data format set by the host computer and the converter must be the same, otherwise the communication can not be carried out.

PD-02	Local Address	Default Value		1

	Setting Range	1~247, 0 for 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 for the broadcast address), which is the basis for realizing point-to-point communication between the host computer and the converter.

PD-03	Response Delay	Default Value	2ms
	Setting Range	0~20ms	

Response Delay: It is the intermediate interval time between the end of converter data acceptance and sending data to the host computer. If the response delay time is less than the system processing time, the response delay time will be based on the system processing time. If the response delay time is longer than the system processing time, the system will delay and wait after processing the data until the response delay time arrives before sending the data to the host computer.

PD-04	Communication Timeout	Default Value	0.0s
	Setting Range	0.0s (Invalid); 0.1~60.0s	

When this parameter is set to 0.0s, the communication timeout time parameter is invalidated.

When this parameter is set to a valid value, if the interval between one communication and the next exceeds the communication timeout period, the system will report a communication failure error (Err16). Normally, it is set to invalid. If you set this parameter in a system with continuous communication, you can monitor the communication status.

PD-05	Communication Protocol Selection	Default Value	0

	Setting Range	0:Non-standard Modbus-RTU protocol; 1: Standard Modbus-RTU protocol

PD-05=1: Select the standard Modbus protocol, see section B.3

Communication Profile Structure of this protocol.

PD-05=0: When read command is used, the slave returns one more byte

than the standard Modbus protocol, and other read/write operations are

the same as the standard Modbus protocol operations.

PD-06	Communication reading current resolution	Default Value	0
	Setting Range	0: 0.01A; 1: 0.1A	

Used to determine the output unit of the current value when the

communication reads the output current.

Adoption of PC serial software communication

Communication wiring using PC serial port software

Serial to 485 to 485+, 485-.

1.1 Wiring: A to 485+, B to 485-, USB to 485 cable plugged into the

computer;

1.2 Inverter parameter setting:

P0-02=2 Start-stop communication control

Pd-00=5005 Baud rate 9600

Pd-02 Set to 1 Station number

P0-03=9 Frequency communication given

Pd-01=0 No Checksum, 8-N-2

Pd-05=31 Standard Modbus protocol

Serial software and data sending

Open the serial port after setting up

Send command

3.1General Command

Table 1 Example of a command			
Number	Command	Description	Note
1	01 06 20 00 00 01 43 CA	Forward motion	Write operation
2	01 06 20 00 00 02 03 CB	Reverse motion	Write operation
3	01 06 10 00 27 10 97 36	Frequency converter runs from 0.00 to 50.00Hz	Write operation

4	01 06 20 00 00 06 02 08	Deceleration stop	Write operation
5	01 06 20 00 00 05 42 09	Free stop	Write operation
6	01 06 20 00 00 03 C2 DB	Foward point-to point motion	Write operation
7	01 06 20 00 00 04 83 C9	Reverse point-to-point motion	Write operation
8	01 06 20 00 00 07 C3 C8	Error reset	Write operation
9	01 06 10 00 1B 58 86 00	Set converter working frequency at 35.00Hz	Write operation
10	01 06 10 00 09 A4 8A E1	Set converter working frequency at 12.34Hz	Write operation

3.2Command Calculation Method

The checksum type is selected as CRC16

A: Input the calculation 01 06 20 00 00 01, the result of the calculation shows 43CA. This can be accomplished by entering 01 06 20 00 00 01 43 CA as an instruction.

B: If the operating frequency is set to 50.00, Input 5000*2=10000 decimal (hexadecimal 9736 equivalent) for 50Hz. 1388 for 25Hz.

For example, to set the frequency 35.00, enter 3500*2=7000 (hex 1B58).

01 06 10 00 1B 58 86 00 (The first 8 bits are the beginning of the frequency command, the red 4 bits are the actual frequency value, and the last 4 bits are the check bits.)

3.3Read Data

01 03 10 03 00 01 70 CA Operating Output Voltage

01 03 10 04 00 01 C1 0B Operating Output Voltage

Violet: Converter address and read commands

Red: Parameter function

Green: Address start reading 1 set of data

Black: CRC16 check digit

Chapter 7 Functional Parameter List

PP-00 is set to a non-zero value, i.e., a user password is set. In Function Parameter Mode and User Change Parameter Mode, the Parameter Menu can only be accessed after the password is entered correctly, and to cancel the password, you need to set PP-00 to zero.

Converter user password is only used to lock the panel operation, after setting the password, through the keyboard operation parameter reading and writing, every time after exiting the operation need to re-enter the password verification. Read/write operations can be performed directly without a password during communication operations (except for group PP and PF).

The parameter menu in user-customized parameter mode is not password-protected.

Groups P and A are the basic function parameters, and group U is the monitoring function parameter. The symbols in the parameter table are described as follows:

"☆": Indicates that the set value of the parameter can be changed when the converter is in the shutdown and running state;

"★": Indicates that the set value of this parameter cannot be changed when the inverter is in the running state;

"●": Indicates that the value of the parameter is the actual test record

value and cannot be changed;

"*": Indicates that the parameter is a "manufacturer's parameter", limited to the manufacturer's settings and prohibited from user operation.

Summary table of basic functional parameters

Parameter	Name	Setting Range	Default Value	Form Of Change	Pagination
Group P0 Basic Function Group					
P0-00	GP type display	1: Type G (Constant Torque Load Models)	Determined by model	●	-
P0-01	First motor control mode	0: Vector control without speed sensor (SVC) 1: Reserve 2: V/F Control	2	★	-
P0-02	Run command selection	0: Operation panel 1: Terminal 2: Communication	0	☆	
P0-03	Main frequency command input selection	0: Digital setting (no memory for power-down) 1: Digitaling (no memory for power-down) 2: AI1 3: AI2 4: Panel Potentiometers 5: Pulse setting (DI5) 6: Multisession command 7: Simple PLC 8: PID 9: Communication given	4	★	
P0-04	Auxiliary frequency command input selection	Same as P0-03 (Main frequency command input selection)	0	★	
P0-05	Auxiliary frequency command range	0: Relative to maximum frequency 1: Relative to the main	0	☆	

		selection during stacking	frequency command			
P0-06	Auxiliary frequency command range when stacked	0%~150%	100%	☆	
P0-07	Frequency command overlay selection	Ones place: Frequency command selection. 0: Main Frequency Command 1: Primary and secondary results 2: Switching between main frequency command and auxiliary frequency command 3: Main frequency instruction and main and auxiliary operation result switching 4: Auxiliary frequency command and main and auxiliary operation result switching Tens place: Frequency Instruction Main and Auxiliary Arithmetic Relationships 0: Main + Auxiliary 1: Main - Auxiliary 2: Maximum value of them 3: Minimum value of them	00	☆	
P0-08	Preset Frequency	0.00Hz~Maximum frequency (P0-10)	50.00Hz	☆	
P0-09	Operating Direction	0: Default direction of operation 1: Operate in the opposite direction of the default direction	0	☆	
P0-10	Maximum Frequency	50.00Hz~500.00Hz	50.0.Hz	★	
P0-11	Upper Limit	0: P0-12 setting	0	★	

	Frequency Command Selection	1: AI1 2: AI2 3: AI3 4: Pulse setting 5: Communication given			
P0-12	Maximum frequency	Minimum frequency P0-14~ Maximum frequency P0-10	50.00Hz	☆	
P0-13	Maximum frequency bias	0.00Hz ~ Maximum frequency P0-10	0.00Hz	☆	
P0-14	Minimum frequency	0Hz~ Maximm frequency P0-12	0.00Hz	☆	
P0-15	Carrier frequency	Determined by model	Determined by model	☆	
P0-16	Carrier frequency adjusted with temperature	0: No 1: Yes	1	☆	
P0-17	Acceleration time 1	0.00s~ 650.00s (P0-19=2); 0.0s~ 6500.0s (P0-19=1); 0s~ 65000s (P0-19=0);	Determined by model	☆	
P0-18	Deceleration time1	0.00s~ 650.00s (P0-19=2); 0.0s~ 6500.0s (P0-19=1); 0s~ 65000s (P0-19=0);	Determined by model	☆	
P0-19	Acceleration and deceleration time unit	0: 1s; 1: 0.1s 2: 0.01s	1	★	
P0-21	Auxiliary frequency command bias frequency during stacking	0.00Hz ~ Maximum frequency (P0-10)	0.00Hz	☆	
P0-22	Frequency command resolution	2: 0.01Hz	2	★	
P0-23	Digital set frequency shutdown memory selection	0: Without memory 1: With memory	0	☆	
P0-24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2	0	★	

P0-25	Acceleration and deceleration time reference frequency	0: Maximum frequency 1: Set frequency 2: 100Hz	0	★	
P0-26	Runtime frequency command UP/DOWN reference	0: Operating frequency 1: Set frequency	0	★	-
P0-27	Selection of running instruction bundling main frequency instruction	Ones place: Selection of operation panel boudling frequency Source 0: unbound 1: Digital Setting Frequency 2: AI1 3: AI2 4: AI3 5: Pulse setting (DI5) 6: Multi-speed 7: Simple PLC 8: PID 9: Communication Setting Tens place: Terminal Binding Frequency Source Selection Hundreds place: Communication Binding Frequency Source Selection	0000	☆	
P0-28	Communication protocol selection	0: Modbus protocol 1: Profibus-DP, CANopen, Profinet, EtherCAT protocols	0	★	
Group P1 First motor parameters					
P1-00	Motor type selection	0: General asynchronous motors 1: Variable frequency asynchronous motors	0	★	
P1-01	Motor rated power	0.1kW~1000.0kW	Determined by model	★	
P1-02	Motor rated voltage	1V~2000V	Determined by model	★	
P1-03	Motor rated	0.01A~655.35A	Determined	★	

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		(Converter power≤ 55kW) 0.1A~6553.5A (Converter power > 55kW)	by model		
P1-04	Motor rated frequency	0.01Hz~ Maximum frequency	Determined by model	★	
P1-05	Motor rated speed	1rpm~65535rpm	Determined by model	★	
P1-06	Asynchronous motor stator resistance	0.001Ω~65.535Ω (Converter power≤55kW) 0.0001Ω~6.5535Ω (Converter power > 55kW)	Tuning parameter	★	
P1-07	Asynchronous motor rotor resistance	0.001Ω~65.535Ω (Converter power≤ 55kW) 0.0001Ω~6.5535Ω (Converter power > 55kW)	Tuning parameter	★	
P1-08	Leakage reactance of asynchronous motors	0.01mH~655.35mH (Converter power≤ 55kW) 0.001mH~65.535mH (Converter power > 55kW)	Tuning parameter	★	
P1-09	Mutual inductive resistance of asynchronous motors	0.1mH~6553.5mH (Converter power≤ 55kW) 0.01mH~655.35mH (Converter power > 55kW)	Tuning parameter	★	
P1-10	Asynchronous motor no-load current	0.01A~P1-03 (Converter power≤ 55kW) 0.1A~P1-03 (Converter power > 55kW)	Tuning parameter	★	
P1-27	Number of encoder lines	1~65535	1024	★	
P1-28	Encoder Type	0: ABZ Incremental Encoders 2: Rotary Transformer	0	★	
P1-30	ABZ Incremental Encoder AB Phase Sequence	0: Forward 1: Reverse	0	★	
P1-34	Rotary Transformer Pole Pairs	1~65535	1	★	
P1-36	Speed Feedback PG Break	0.0s: No action; 0.1s~10.0s			

	Detection Time			★	
P1-37	Tuning Options	0: No action 1: Parameter tuning of stationary part of asynchronous motor 2: Dynamic complete tuning of asynchronous motors 3: Asynchronous motor stationary fully tuned	0	★	
Group P2 First motor vector control parameters					
P2-00	Speed loop proportional gain 1	1~100	30	☆	
P2-01	Speed loop integration time 1	0.01s~ 10.00s	0.50s	☆	
P2-02	Switching frequency 1	0.00~P2-05	5.00Hz	☆	
P2-03	Velocity loop proportional gain 2	1~100	20	☆	
P2-04	Speed loop integration time 2	0.01s~ 10.00s	1.00s	☆	
P2-05	Switching frequency 2	P2-02~ Maximum frequency	10.00Hz	☆	
P2-06	Vector Control Differential Gain	50%~200%	100%	☆	
P2-07	SVC speed feedback filtering time	0.000s~0.100s	0.015s	☆	
P2-09	Torque limit command selection in speed control mode	0: Set by P2-10 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication Given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) The full scale range of options 1-7 corresponds to P2-10.	0	☆	
P2-10	Digital setting of maximum torque limit in speed	0.0%~200.0%	150.0%	☆	

		control mode				
P2-11	Torque maximum limit command selection in speed control mode (power generation)	0: Set by P2-10 (No distinction between electric and power generation) 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: Communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 8: Set by P2-12 The full scale range of options 1-7 corresponds to P2-12.	0	☆	
P2-12	Digital setting of maximum torque limit in speed control mode (power generation)	0.0%~200.0%	150%	☆	
P2-13	Excitation regulation proportional gain	0~60000	2000	☆	
P2-14	Excitation regulation integral gain	0~60000	1300	☆	
P2-15	Torque regulation proportional gain	0~60000	2000	☆	
P2-16	Torque Regulation Integral Gain	0~60000	1300	☆	
P2-17	Ring factor properties of speed	Ones place: Integral separation 0: Invalid 1: Valid	0	☆	
P2-21	Maximum torque coefficient in weak magnetic region	50%~200%	100%	☆	
P2-22	Generation power limit enable	0: Invalid 1: Full effective 2: Constant speed	0	☆	

		effective 3: Deceleration effective			
Group P3 V/F Control Parameter					
P3-00	V/F Cueve setting	0: Linear V/F 1: Multipoint V/F 2~9: Reserve 10: V/F full separate mode 11: V/F half separate mode	0	★	
P3-01	Torque Boost	0.0%: (Auto torque boost) 0.1~30.0%	Determined by model	☆	
P3-02	Torque boost cutoff frequency	0.00Hz~ Maximum frequency	50.00Hz	★	
P3-03	Multi-point V/F Frequency Point 1	0.00Hz~P3-05	0.00Hz	★	
P3-04	Multi-point V/F Voltage Point 1	0.0%~ 100%	0.0%	★	
P3-05	Multi-point V/F Frequency Point 2	P3-03~P3-07	0.00Hz	★	
P3-06	Multi-point V/F Voltage Point 2	0.0%~ 100%	0.0%	★	
P3-07	Multi-point V/F Frequency Point 3	P3-05~ Motor rated frequency (P1-04)	0.00Hz	★	
P3-08	Multi-point V/F Voltage Point 3	0.0%~ 100%	0.0%	★	
P3-10	V/F Overexcitation Gain	0~200	64	☆	
P3-11	V/F Oscillation Rejection Gain	0~100	40	☆	
P3-13	V/F separated voltage source	0: Digital setting (P3-14) 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Multisession command 6: Simple PLC 7: PID 8: Communication given Note: 100% Corresponds to rated motor voltage	0	☆	
P3-14	Voltage acceleration time	0~ Motor rated voltage	0V	☆	

		for V/F separation				
P3-15	Voltage acceleration time for V/F separation	0.0~1000.0s Note: Indicates the time for 0V to change to the rated motor voltage.	0.0s	☆	
P3-16	Voltage digital setting for VF separation	0V~Motor rated voltage	0V	☆	
P3-17	V/F Separate stop mode selection	0: Frequency/voltage independently reduced to 0 1: The voltage is reduced to 0 and then the frequency is reduced	0	☆	
P3-18	Over-loss rapid-action current	50%~200%	150%	★	
P3-19	Overspeed loss enable	0: Invalid 1:Valid	1 (Valid)	★	
P3-20	Overspeed loss suppression gain	0~100	20	☆	
P3-21	Compensation coefficient for speed over loss speed action current	50%~200%	50%	★	
P3-22	Overvoltage stall operation voltage	Three phase 380V~480V models: 330V~800V Three phase 200V~240V models: 330V~800V		★	
P3-23	Overvoltage stall enable	0: Invalid 1: Valid	1 (Valid)	★	
P3-24	Overvoltage stall suppression frequency gain	0~100	30	☆	
P3-25	Overvoltage stall suppression voltage gain	0~100	30	☆	
P3-26	Overpressure stall maximum rise frequency limit	0~50Hz	5Hz	★	
Goup P4 Input Terminal					
P4-00	DI1 terminal function selection	0: No function 1: Forward motion FWD	1	★	

| P4-01 | DI2 terminal function selection | or running command
2: Reverse motion REV or forward-reverse running direction (Note: When set to 1 or 2, it needs to be used in conjunction with P4-11, please refer to the parameter description for details.)
3: Three-wire operation control
4: Forward jogging (FJOG)
5: Reverse jogging (RJOG)
6: Terminal UP
7: Terminal DOWN
8: Free stop | 4 | ★ | |

Schedule 1 Multi-Segment Command Function Description

DI1	DI2	DI3	DI4	DI5	Instruction Setting	Corresponding Parameter
ON	OFF	OFF	OFF	OFF	Multi-segment instruction 0	PC-00
ON	ON	OFF	OFF	OFF	Multi-segment instruction 1	PC-01
ON	OFF	ON	OFF	OFF	Multi-segment instruction 2	PC-02
ON	ON	ON	OFF	OFF	Multi-segment instruction 3	PC-03
ON	OFF	OFF	ON	OFF	Multi-segment instruction 4	PC-04
ON	ON	OFF	ON	OFF	Multi-segment instruction 5	PC-05
ON	OFF	ON	ON	OFF	Multi-segment instruction 6	PC-06
ON	ON	ON	ON	OFF	Multi-segment instruction 7	PC-07
ON	OFF	OFF	OFF	ON	Multi-segment instruction 8	PC-08
ON	ON	OFF	OFF	ON	Multi-segment instruction 9	PC-09
ON	OFF	ON	OFF	ON	Multi-segment instruction 10	PC-10
ON	ON	ON	OFF	ON	Multi-segment instruction 11	PC-11
ON	OFF	OFF	ON	ON	Multi-segment instruction 12	PC-12
ON	ON	OFF	ON	ON	Multi-segment instruction 13	PC-13
ON	OFF	ON	ON	ON	Multi-segment instruction 14	PC-14
ON	ON	ON	ON	ON	Multi-segment instruction 15	PC-15

Parameter	Name	Setting Range	Default Value	Form Of Change	Pagination
P4-02	DI3 Terminal	9: Error Reset (RESET)	9	★	

		function selection	10: Run Pause			
P4-03	DI4 Terminal function selection	11: External Fault Normal Open Input	12	★		
P4-04	DI5 Terminal function selection	12: Multi-Segment Command Terminal 1	13	★		
P4-05	DI6 Terminal function selection	13: Multi-Segment Command Terminal 2	0	★		
P4-06	DI7 Terminal function selection	14: Multi-Segment Command Terminal 3	0	★		
P4-07	DI8 Terminal function selection	15: Multi-Segment Command Terminal 4	0	★		
P4-08	DI9 Terminal function selection	16: Acceleration and deceleration time selection terminals 1	0	★		
P4-09	DI10 Terminal function selection	17: Acceleration and deceleration time selection terminals 2 18: Frequency command switching 19: UP/DOWN Setting clear (terminal, keypad) 20: Control command switching terminal 1 21: Acceleration and deceleration prohibition 22: PID Pause 23: Simple PLC state reset 24: Pause in oscillation frequency 25: Counter Input 26: Counter Reset 27: Length Count Input 28: length reset 29: Torque Control Prohibition 30: Pulse frequency input (Only valid for DI5) 31: Reserve 32: Immediate DC braking 33: External Fault Normally Closed Input 34: Frequency modification enable 35: Reverse the direction	0	★		

		of PID action			
		36: External Stop terminal 1			
		37: Control command switching terminal 2			
		38: PID integral pause			
		39: Main and preset frequency switching			
		40: Auxiliary frequency and preset frequency switching			
		41: Motor terminal selection function			
		42: Reserve			
		43: PID parameter switching			
		44: User-defined error 1			
		45: User-defined error 2			
		46: Speed control/torque control switching			
		47: Emergency stop			
		48: External Stop terminal 2			
		49: Deceleration DC Brake			
		50: This run-time is cleared to zero			
		51: Two-wire/three-wire switching			
		52: Reverse frequency prohibition			
		53-59: Reserve			
P4-10	DI filtering time	0.000s~1.000s	0.010s	☆	
P4-11	Terminal command method	0: Two-wire 1 1: Two-wire 2 2: Three-wire 1 3: Three-wire 2	0	★	
P4-12	Terminal UP/DOWN change rate	0.001Hz/s~65.535Hz/s	1.00Hz/s	☆	
P4-13	AI curve 1 minimum input	0.00V~P4-15	0.00V	☆	
P4-14	AI curve 1 minimum input setting	-100%~+100%	0.0%	☆	

P4-15	AI curve 1 maximum input	P4-13~+10V	10.00V	☆	
P4-16	AI curve 1 maximum input setting	-100%~+100%	100.0%	☆	
P4-17	AI1 Filtering Time	0.00s~10.00s	0.10s	☆	
P4-18	AI curve 2 minimum input	0.00V~P4-20	0.00V	☆	
P4-19	AI curve 2 minimum input setting	-100%~+100%	0.0%	☆	
P4-20	AI curve 2 maximum input	P4-18~+10V	10.00V	☆	
P4-21	AI curve 2 maximum input setting	-100%~+100%	100.0%	☆	
P4-22	AI2 Filtering Time	0.00s~10.00s	0.10s	☆	
P4-23	AI curve 3 minimum input	-10.00V~P4-25	-10.00V	☆	
P4-24	AI curve 3 minimum input setting	-100%~+100%	-100.0%	☆	
P4-25	AI curve 3 maximum input	P4-23~+10V	10.00V	☆	
P4-26	AI curve 3 maximum input setting	-100%~+100%	100.0%	☆	
P4-27	AI3 Filtering Time	0.00s~10.00s	0.10s	☆	
P4-28	Pulse Input Minimum Frequency	0.00kHz~P4-30	0.00kHz	☆	
P4-29	Pulse input minimum frequency setting	-100.0%~100.0%	0.0%	☆	
P4-30	Pulse Input maximum Frequency	P4-28~100.00kHz	50.00kHz	☆	
P4-31	Pulse Input maximum Frequency setting	-100.0%~100.0%	100.0%	☆	
P4-32	Pulse Filtering Time	0.00s~10.00s	0.10s	☆	
P4-33	AI curve selection	Ones place: AI1 curve selection:	321	☆	

		1: Curve 1 (2 points, refer to P4-13~P4-16) 2: Curve 2 (2 points, refer to P4-18~P4-21) 3: Curve 3 (2 points, refer to P4-23~P4-26) 4: Curve 4 (4 points, refer to A6-00~A6-07) 5: Curve 5 (2 points, refer to A6-08~A6-15) Tens place: AI2 curve selection (Same as above) Hundreds place: AI3 curve selection (Same as above)			
P4-34	AI below minimum input setting selection	Ones place: AI below minimum input setting selection 0: Minimum input setting 1: 0.0% Tens place: AI2 below minimum input setting selection, same as above Hundreds place: AI3 below minimum input setting selection, same as above	000	☆	
P4-35	DI1 Latency	0.0s~3600.0s	0.0s	★	
P4-36	DI2 Latency	0.0s~3600.0s	0.0s	★	
P4-37	DI3 Latency	0.0s~3600.0s	0.0s	★	
P4-38	DI terminal active mode selection 1	0: High level active 1: Low level active Ones place: DI1 Tens place: DI2 Hundred place: DI3 Thousands place: DI4 Ten thousands place: DI5	00000	★	
P4-39	DI terminal active mode selection 2	0: High level active 1: Low level active Ones place: DI6 Tens place: DI7 Hundred place: DI8 Thousands place: DI9 Ten thousands place: DI10	00000	★	
Group P5 Output Terminal					

P5-00	FMP Output function selection	0: Pulse Output (FMP) 1: Switching output (FMR)	0	☆	
P5-01	FMR function selection (open collector output terminal)	0: No output 1: Converter operating 2: Error output (Caused by free stop)	0	☆	
P5-02	Programmable Relay 1	3: Frequency level detection 1	2	☆	
P5-03	Programmable Relay 2	4: Reach frequency 5: Zero speed in operation (No output during shutdown)	0	☆	
P5-04	DO1 output function selection		1	☆	
P5-05	Expansion card DO2 output function selection	6: Motor overload pre-warning 7: Converter overload pre-warning 8: Reach set count value 9: Reach specify count value 10: Reach length 11: Simple PLC cycle complete 12: Reach cumulative running time 13: Frequency limited 14: Torque limited 15: Ready for operation 16 : AI1> AI2 17: Reach maximum frequency 18: Reach minimum frequency (No output during shutdown) 19: Undervoltage state 20: Communication setting 21: Reserve 22: Reserve 23: In zero speed operation2 (With output when shut down) 24: Reach cumulative power on time 25: Frequency level detection2	4	☆	

		26: Reach frequency 1 27: Reach frequency 2 28: Reach current 1 29: Reach current 2 30: Time arrival 31: AI1 Input Over Limit 32: Offloading 33: Running in reverse 34: Zero current state 35: Module temperature reaches 36: Output current overrun 37: Reach minimum frequency (With output when shut down) 38: Warning (All errors) 39: Overheating 40: Reach the limit time (This time) 41: Error (Error for free stop and with undervoltage)			
P5-06	FMP output function selection	0: Operating frequency 1: Set frequency	0	☆	
P5-07	AO1 output function selection	2: Output current 3: Motor output torque	0	☆	
P5-08	AO2 output function selection	(Absolute value, % relative to motor) 4: Output power 5: Output voltage 6: Pulse input (100.0% Corresponding to 100.0kHz) 7: AI1 8: AI2 9: AI3 (Expansion card) 10: Length 11: Count value 12: Communication setting 13: Motor speed 14: Output current (100.0% Corresponding to 1000.0A) 15: Output voltage	1	☆	

		(100.0% Corresponding to 1000.0V) 16: Motor output torque (Actual value, % relative to motor)			
P5-09	FMP output maximum frequency	0.01kHz~100.00kHz	50.00kHz	☆	
P5-10	AO1 zero bias coefficient	-100.0%~+100.0%	0.0%	☆	
P5-11	AO1 Gain	-10.00~+10.00	1.00	☆	
P5-12	AO2 zero bias coefficient	-100.0%~+100.0%	0.0%	☆	
P5-13	AO2 Gain	-10.00~+10.00	1.00	☆	
P5-17	FMR output latency	0.0s~3600.0s	0.0s	☆	
P5-18	RELAY1 output latency	0.0s~3600.0s	0.0s	☆	
P5-19	RELAY2 output latency	0.0s~3600.0s	0.0s	☆	
P5-20	DO1 output latency	0.0s~3600.0s	0.0s	☆	
P5-21	DO2 output latency	0.0s~3600.0s	0.0s	☆	
P5-22	DO output terminal valid state selection	0: Positive logic 1: Negative logic Ones place: FMR Tens place: RELAY1 Hundreds place: RELAY2 Thousands place: DO1 Ten thousands place: DO2	00000	☆	
Group P6 Start-Stop Control					
P6-00	Start method	0: Direct launch 1: Speed tracking restart 2: Pre-excitation start (AC asynchronous machines)	0	☆	
P6-01	Rotation speed tracking method	0: Starting with the downtime frequency 1: Start with the working frequency 2: Start with the maximum frequency	0	★	
P6-02	RPM tracking fast or slow	1~100	20	☆	

P6-03	Start-up frequency	0.00Hz~10.00Hz	0.00Hz	☆	
P6-04	Starting frequency hold time	0.0s~100.0s	0.0s	★	
P6-05	Starting DC braking current/pre-excitation current	0%~100%	50%	★	
P6-06	Starting DC braking current/pre-excitation time	0.0s~100.0s	0.0s	★	
P6-07	Acceleration and deceleration mode	0: Linear acceleration and deceleration 1, 2: Dynamic S-curve acceleration and deceleration	0	★	
P6-08	Proportion of time at the beginning of the S-curve	0.0%~ (100.0%-P6-09)	30.0%	★	
P6-09	Proportion of time at the ending of the S-curve	0.0%~ (100.0%-P6-08)	30.0%	★	
P6-10	Shutdown mode	0: Deceleration stop 1: Free stop	0	☆	
P6-11	Stopping DC braking start frequency	0.00Hz~Maximum frequency	0.00Hz	☆	
P6-12	Shutdown DC braking wait time	0.0s~100.0s	0.0s	☆	
P6-13	Stopping DC braking current	0%~100%	50%	☆	
P6-14	Stopping DC braking time	0.0s~100.0s	0.0s	☆	
P6-15	Brake utilization rate	0%~100%	100%	☆	
P6-18	Speed tracking current	30%~200%	Determined by models	★	
P6-21	Demagnetization time (SVC valid)	0.00s~5.00s	Determined by models	☆	
P6-23	Overexcitation Selection	0: Invalid\ 1: Valid only decelerating 2: Full valid	0	☆	
P6-24	Overexcitation Selection	0~150%	100%	☆	

	Suppression Current Value				
P6-25	Overexcitation gain	1.00~2.50	1.25	☆	
Group P7 Keyboard& Display					
P7-00	Out-of-picture check enable	0~1	0	☆	
P7-01	MF.K button function selection	0: MF.K invalid 1: Switching between operator panel command channel and remote command channel (terminal command channel or communication command channel) 2: Forward and reverse switching 3: Forward jogging 4: Reverse jogging	0	★	
P7-02	STOP/RESET button function	0: Only in keyboard mode, STOP/RESET button function valid 1: In any mode of operation, STOP/RESET button function valid	1	☆	
P7-03	Run display parameter 1	0000~FFFF Bit00: Running frequency (1Hz) Bit01: Set frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI input state Bit08: DO output state Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: AI3 voltage (V) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID setting	1F	☆	
P7-04	Run display	0000~FFFF	0	☆	

	parameter 2	Bit00: PID feedback Bit01: PLC phase Bit02: PULSE pulse input pulse frequency (kHz) Bit03: Operating frequency 2 (Hz) Bit04: Remain operating time Bit05: AI1 voltage before correction Bit06: AI2 voltage before correction Bit07: AI3 voltage before correction Bit08: Motor speed Bit09: Current power on time (Hour) Bit10: Current operating time (Min) Bit11: PULSE input pulse frequency (Hz) Bit12: Communication set value Bit13: Encoder feedback speed Bit14: Mains frequency X display (Hz) Bit14: Auxiliary frequency Y display (Hz)			
P7-05	Shutdown Display Parameters	0000~FFFF Bit00: Set frequency (Hz) Bit01: Bus voltage (V) Bit02: DI input state Bit03: DO output state Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: AI3 voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC phase Bit10: Load speed Bit11: PID setting Bit12: PULSE input pulse Frequency (kHz)	33	☆	

P7-06	Load Transmission Ratio	0.001~65.000	1.000	☆	-
P7-07	Inverter module heat sink temperature	-20℃~120℃	-	●	-
P7-08	Product number	-	-	●	-
P7-09	Cumulative running time	0h~65535h	-	●	
P7-10	Performance version number	-	-	●	
P7-11	Function version number	-	-	●	
P7-12	Load RPM display in decimal places	Ones place: Number of decimal places for U0-14 0: 0 decimal place 1: 1 decimal place 2: 2 decimal place Tens place: Number of decimal places for U0-19/U0-29 1: 1 decimal place 2: 2 decimal place	20	☆	
P7-13	Cumulative power-on time	0~65535 hrs	-	●	-
P7-14	Cumulative power consumption	0~65535 kWh	-	●	-
Group P8 Auxiliary function					
P8-00	Jogging running frequency	0.00Hz~Maximum frequency	2.00Hz	☆	
P8-01	Jogging acceleration frequency	0.0s~6500.0s	20.0s	☆	
P8-02	Jogging deceleration frequency	0.0s~6500.0s	20.0s	☆	
P8-03	Acceleration time 2	0.00s~650.00s (P0-19=2) 0.0s~6500.0s (P0-19=1) 0s~65000s (P0-19=0)	Determined by models	☆	
P8-04	Deceleration time 2	0.00s~650.00s (P0-19=2) 0.0s~6500.0s (P0-19=1) 0s~65000s (P0-19=0)	Determined by models	☆	
P8-05	Acceleration time 3	0.00s~650.00s (P0-19=2) 0.0s~6500.0s (P0-19=1) 0s~65000s (P0-19=0)	Determined by models	☆	

P8-06	Deceleration time 3	0.00s~650.00s (P0-19=2) 0.0s~6500.0s (P0-19=1) 0s~65000s (P0-19=0)	Determined by models	☆	
P8-07	Acceleration time 4	0.00s~650.00s (P0-19=2) 0.0s~6500.0s (P0-19=1) 0s~65000s (P0-19=0)	0.0s	☆	
P8-08	Deceleration time 4	0.00s~650.00s (P0-19=2) 0.0s~6500.0s (P0-19=1) 0s~65000s (P0-19=0)	0.0s	☆	
P8-09	Receive Data Gain (frequency)	-10.00~10.00	1.00	☆	
P8-10	Jump frequency 2	0.00Hz~maximum frequency	0.00Hz	☆	
P8-11	Jump frequency amplitude	0.00Hz~maximum frequency	0.00Hz	☆	
P8-12	Forward and reverse dead time	0.0s~3000.0s	0.0s	☆	
P8-13	Reverse frequency prohibition	0: Invalid 1: Valid	0	☆	
P8-14	Set frequency below lower limit frequency operation mode	0: Operate at lower frequency limit 1: Shutdown 2: 0 speed operating	0	☆	
P8-15	Droop rate	0.00%~100.00%	0.00%	☆	
P8-16	Reach setting cumulative power-up time	0h~65000h	0h	☆	
P8-17	Reach setting cumulative operating time	0h~65000h	0h	☆	
P8-18	Startup Protection Selection	0: No protection 1: With protection	0	☆	
P8-19	Frequency detection value 1	0.00Hz~Maximum frequency	50.00Hz	☆	
P8-20	Frequency detection hysteresis rate 1	0.0%~100.0% (FDT1 level)	5.0%	☆	
P8-21	Frequency Reach Detection Amplitude	0.0%~100.0% (Maximum frequency)	0.0%	☆	
P8-22	Effectiveness of jump frequency during acceleration and deceleration	0: Invalid 1: Valid	0	☆	

P8-25	Acceleration time 1 and acceleration time 2 switching frequency points	0.00Hz~Maximum frequency	0.00Hz	☆	
P8-26	Acceleration time 1 and deceleration time 2 switching frequency points	0.00Hz~Maximum frequency	0.00Hz	☆	
P8-27	Terminal Jogging Priority	0: Invalid 1: Valid	0	☆	
P8-28	Frequency detection value 2	0.00Hz~Maximum frequency	50.00Hz	☆	
P8-29	Frequency detection hysteresis rate 2	0.0%~100.0% (FDT2 level)	5.0%	☆	
P8-30	Arbitrary arrival frequency detection value 1	0.00Hz~Maximum frequency	50.00Hz	☆	
P8-31	Arbitrary arrival frequency detection amplitude 1	0.0%~100.0% (Maximum frequency)	0.0%	☆	
P8-32	Arbitrary arrival frequency detection value 2	0.00Hz~Maximum frequency	50.00Hz	☆	
P8-33	Arbitrary arrival frequency detection amplitude 2	0.0%~100.0% (Maximum frequency)	0.0%	☆	
P8-34	Zero current detection level	0.0%~300.0% 100% corresponds to the rated current of the motor	5.0%	☆	
P8-35	Zero current detection delay time	0.01s~600.00s	0.10s	☆	
P8-36	Output current over limit value	0.0% (Without checksum) 0.1%~300% (Motor rated current)	200.0%	☆	
P8-37	Output current over limit detection delay time	0.00s~600.00s	0.00s	☆	
P8-38	Arbitrary reach current 1	0.0%~300% (Motor rated current)	100.0%	☆	
P8-39	Arbitrary reach	0.0%~300% (Motor rated	0.0%	☆	

		current 1 amplitude	current)			
P8-40	Arbitrary reach current 2	0.0%~300% (Motor rated current)	100.0%	☆	
P8-41	Arbitrary reach current 2 amplitude	0.0%~300% (Motor rated current)	0.0%	☆	
P8-42	Timer function selection	0: Invalid 1: Valid	0	★	
P8-43	Timed runtime selection	0: P8-44 setting 1: AI1 2: AI2 3: AI3 Analog input range corresponds to P8-44	0	★	
P8-44	Scheduled Runtime	0.0Min~6500.0Min	0.0Min	★	
P8-45	AI1 Input voltage protection value minimum limit	0.00V~P8-46	3.10V	☆	
P8-46	AI1 Input voltage protection value maximum limit	P8-45~10.00V	6.80V	☆	
P8-47	Reach module temperature	0℃~100℃	75℃	☆	
P8-48	Cooling Fan Control	0: Fan operation during operation 1: The fan keeps running.	0	☆	
P8-49	Wake-up frequency	Sleeping frequency (P8-51)~Maximum frequency (P0-10)	0.00Hz	☆	
P8-50	Wake-up delay time	0.0s~6500.0s	0.0s	☆	
P8-51	Sleeping frequency	0.00Hz~Wake-up frequency (P8-49)	0.00Hz	☆	
P8-52	Sleeping delay time	0.0s~6500.0s	0.0s	☆	
P8-53	Arrival time for the current operation	0.0Min~6500.0Min	0.0Min	☆	
P8-54	Output power correction factor	0.00%~200.0%	100.0%	☆	
P8-55	Emergency stop deceleration time	0~6553.5	Determined by models	☆	
Group P9 Errors and Protection					
P9-00	Motor overload protection options	0: prohibited 1: allowed	1	☆	
P9-01	Motor overload	0.20~10.00	1.00	☆	

	protection gain			☆	
P9-02	Motor overload warning factor	50%~100%	80%	☆	
P9-03	Overvoltage stall gain	0~100	30	☆	
P9-04	Overvoltage stall protection voltage	650V~800V	770V	☆	
P9-07	Short Circuit to Ground Protection Selection	Ones place: Uplink to ground short circuit protection selection 0: Invalid 1: Valid Tens place: Selection of short-circuit protection to ground before operation 0: Invalid 1: Valid	01	☆	
P9-08	Starting voltage of brake unit operation	Three phase 380V~480V Model: 330.0V~800.0V Three phase 200V~240V Model: 330.0V~800.0V		★	
P9-09	Error auto reset times	0~20	0	☆	
P9-10	Error DO action selection during automatic fault reset	0: No action 1: Action	0	☆	
P9-11	Error auto reset wait time	0.1s~100.0s	1.0s	☆	
P9-12	Input phase loss/contactor suction protection selection	Ones place: Input phase loss protection selection 0: Input phase loss protection prohibited 1: Protection when both software and hardware input out-of-phase conditions are met 2: Protected as long as the software input phase loss condition is met 3: Protects against hardware input phase loss as long as the condition is met	11	☆	

		Tens place: Contactor Suction Protection Selection 0: Prohibited 1: Allowed			
P9-13	Output loss phase protection selection	Ones place: Output loss phase protection selection 0: Prohibited 1: Allowed Tens place: Pre-run output phase loss protection selection 0: Prohibited 1: Allowed	01	☆	
P9-14	Type of first error	0: No error	-	●	
P9-15	Type of second error	1: Reserve 2: Acceleration over current	-	●	
P9-16	Type of third error	3: Deceleration over current 4: Constant speed over current 5: Acceleration over voltage 6: Deceleration over voltage 7: Constant speed over voltage 8: Buffer resistor overload 9: Under voltage 10: Converter overload 11: Motor overload 12: Input loss phase 13: Output loss phase 14: Module overheating 15: External error 16: Communication error 17: Contactor error 18: Current detection error 19: Motor tuning error 20: Encoder/PG card abnormal 21: Parameter read/write error	-	●	

		22: Hardware error 23: Motor shorted to ground 24: Reserve 25: Reserve 26: Reach operating time 27: User-defined error 1 28: User-defined error 2 29: Reach Power-On time 30: Loss load 31: Loss of PID feedback at runtime 40: Fast Current Limit Timeout 41: Switching motors during operation 42: Excessive speed deviation 43: Motor overspeed 45: Motor overheating 51: Initial position error 55: Slave error during master-slave control			
P9-17	Frequency at third (most recent) error	0.00Hz~655.35Hz	0.00Hz	●	
P9-18	Current at third (most recent) error	0.00A~655.35A	0.00A	●	
P9-19	Bus voltage at third (most recent) error	0.0V~6553.5V	0.0V	●	
P9-20	Input terminal state at third (most recent) error	0~9999	0	●	
P9-21	Output terminal state at third (most recent) error	0~9999	0	●	
P9-22	Converter state at third (most recent) error	0~65535	0	●	
P9-23	Power-on time at third (most recent) error	0s~65535s	0s	●	
P9-24	Operating time at third (most recent) error	0s~6553.5s	0.0s	●	

P9-27	Frequency at second (most recent) error	0.00Hz~655.35Hz	0.00Hz	●	
P9-28	Current at second (most recent) error	0.00A~655.35A	0.00A	●	
P9-29	Bus voltage at second (most recent) error	0.0V~6553.5V	0.0V	●	
P9-30	Input terminal state at second (most recent) error	0~9999	0	●	
P9-31	Output terminal state at second (most recent) error	0~9999	0	●	
P9-32	Converter state at second (most recent) error	0~65535	0	●	
P9-33	Power-on time at second (most recent) error	0s~65535s	0s	●	
P9-34	Operating time at second (most recent) error	0s~6553.5s	0.0s	●	
P9-37	Frequency at first (most recent) error	0.00Hz~655.35Hz	0.00Hz	●	
P9-38	Current at first (most recent) error	0.00A~655.35A	0.00A	●	
P9-39	Bus voltage at first (most recent) error	0.0V~6553.5V	0.0V	●	
P9-40	Input terminal state at first (most recent) error	0~9999	0	●	
P9-41	Output terminal state at first (most recent) error	0~9999	0	●	
P9-42	Converter state at first (most recent) error	0~65535	0	●	
P9-43	Power-on time at first (most recent) error	0s~65535s	0s	●	
P9-44	Operating time at first (most recent) error	0s~6553.5s	0.0s	●	

P9-47	Fail-safe action selection 1	Bit: Motor overload (Err11) 　　0:Free stop 　　1:Stop by stopping mode 　　2:Continue to run 　Tenth digit: Input phase loss (Err12) 　Hundred digits: Output phase failure (Err13) 　Thousand digits: external fault (Err15) 　Ten thousand: communication abnormality (Err16)	00000	☆	
P9-48	Fail-safe action selection 2	Bit: Encoder/PG card abnormality (Err20) 　　0:Free stop 　Ten bits: Parameter read/write abnormality (Err21) 　　0:Free stop 1:Press to stop the machine. 　Hundred bits: Inverter overload fault action selection (Err10) 　　0:Free stop 1:Derating operation 　Thousand bits:Motor overheat(Err45) 　Ten thousand bits:Running time arrived(Err26)	00000	☆	
P9-49	Fail-safe action selection 3	digits: user-defined fault 1(27) 　　0:Free stop 　　1:Stop by stopping mode 　　2:Continue to run 　Tenth position: User-defined fault 2(28) 　　0:Free stop 　　1:Shutdown by stopping mode	00000	☆	

		2:Continue running Hundred digits: Power-on time reached(29) 　0:Free stop 　1:Shutdown by stopping mode 　2:Continue running Thousand position: Load shedding(30) 　0:Free stop 　1:Deceleration stop 　2:Directly jump to 7% of rated frequency of motor and continue to run without dropping load. When load is not dropped, it will automatically return to the set frequency. 10,000 position: Loss of PID feedback during operation(31) 　0:Free stop 　1:Stop by stopping mode 　2:Continue to run			
P9-50	Fail-safe action selection 4	Single digit: excessive speed deviation (42) 　0:Free stop 　1:Stop by stopping mode 　2:Continue running Tenth position:Motor overspeed(43) 　Hundredth position: Initial position error(51)	00000	☆	
P9-54	Frequency selection for continued operation in case of failure	0:Run at current operating frequency 　1:Run at set frequency 　2:Run at upper limit frequency 　3:Run at the lower limit frequency 　4:Run at abnormal standby frequency	0	☆	

P9-55	Abnormal Standby Frequency	0.0%~100.0% (100.0% corresponds to maximum frequency P0-10)	100.0%	☆	
P9-56	Motor Temperature Sensor Type	0:No temperature sensor 1:PT100 2:PT1000	0	☆	
P9-57	Motor overheating protection threshold	0℃~200℃	110°C	☆	
P9-58	Motor overheating pre-alarm threshold	0℃~200℃	90°C	☆	
P9-59	Instant stop non-stop function option	0~3 0:Invalid 1:Constant bus voltage control 2;Deceleration stop 3:Shaking power suppression	0	★	
P9-60	Instantaneous non-stop recovery voltage	80%~100%	85%	★	
P9-61	Instantaneous non-stop voltage recovery judgment time	0.0~100.0s	0.5S	★	
P9-62	Instantaneous non-stop action voltage	60%~100%	80%	★	
P9-63	Load shedding protection options	0:Invalid 1:Valid	0	☆	
P9-64	Dropout detection level	0.0~100.0%	10.0%	☆	
P9-65	Load Drop Detection Time	0.0~60.0s	1.0s	☆	
P9-67	Over speed detection value	0.0% to 50.0% (maximum frequency)	20.0%	☆	
P9-68	Over speed detection time	0.0s:No detection 0.1~60.0s	1.0s	☆	
P9-69	Excessive speed deviation detection value	0.0% to 50.0% (maximum frequency)	20.0%	☆	

P9-70	Excessive speed deviation detection time	0.0s:No detection 0.1~60.0s	5.0s	☆	
P9-71	Instantaneous non-stop gain Kp	0~100	40	☆	
P9-72	Instantaneous stop non-stop integration coefficient Ki	0~100	30	☆	
P9-73	Instantaneous non-stop deceleration time	0~300.0s	20.0s	★	
Group PA PID Function					
PA-00	PID given source	0:PA-01 setting 1:AI1 2:AI2 3:AI3 4:Pulse setting (DI5) 5:Communication setting 6:Multi-segment command setting	0	☆	
PA-01	PID value given	0.0%~100.0%	50.0%	☆	
PA-02	PID Feedback Source	0:AI1 1:AI2 2:AI3 3:AI1-AI2 4:Pulse setting (DI5) 5:Communication given 6:AI1+AI2 7:MAX(JAI1), |AI2 |) 8:MIN(|AI1), |AI2 |)	0	☆	
PA-03	Direction of PID action	0:positive 1:negative	0	☆	
PA-04	PID Feedback Range	0~65535	1000	☆	
PA-05	Proportional gain KP1	0.0~1000.0	20.0	☆	
PA-06	Integration time TI1	0.01s~10.00s	2.00s	☆	
PA-07	Differential time TD1	0.000s~10.000s	0.000s	☆	
PA-08	PID inversion cutoff frequency	0.00 to maximum frequency	0.00Hz	☆	

PA-09	PID Deviation Limit	0.0%~100.0%	0.0%	☆	
PA-10	PID differential limiting	0.00%~100.00%	0.10%	☆	
PA-11	PID given change time	0.00~650.00s	0.00s	☆	
PA-12	PID feedback filtering time	0.00~60.00s	0.00s	☆	
PA-13	PID output filtering time	0.00~60.00s	0.00s	☆	
PA-14	reservations			☆	
PA-15	Proportional gain KP2	0~1000.0	20.0	☆	
PA-16	Integration time TI2	0.01s~10.00s	2.00s	☆	
PA-17	Differential time TD2	0.000s~10.000s	0.000s	☆	
PA-18	PID parameter switching conditions	0:No switching 1:Switching via DI terminal 2:Automatic switching according to deviation 3:Automatic switching according to operating frequency	0	☆	
PA-19	PID parameter switching deviation1	0.0%~PA-20	20.0%	☆	
PA-20	PID parameter switching deviation2	PA-19~100.0%	80.0%	☆	
PA-21	PID initial value	0.0%~100.0%	0.0%	☆	
PA-22	PID initial value holding time	0.00~650.00s	0.00s	☆	
PA-23	reservations			-	
PA-24	reservations			-	
PA-25	PID Integral Properties	Single digit: Separation of points 0:Invalid 1:Valid Tenth digit: whether to stop integrating after the output reaches the limit value 0:continue integration	00	☆	

		1:stop integration		☆	
PA-26	PID feedback loss detection value	0.0%:No judgment of feedback loss 0.1%~100.0%	0.0%	☆	
PA-27	PID feedback loss detection time	0.0s~20.0s	0.0s	☆	
PA-28	PID stopping operation	0: No operation during shutdown 1: Operation during shutdown	0	☆	
PB-05	Setting length	0m~65535m	1000m	☆	
PB-06	Actual length	0m~65535m	0m	☆	
PB-07	Pulses per meter	0.1~~6553.5	100.0	☆	
PB-08	Setting the count value	1~65535	1000	☆	
PB-09	Specify the count value	1~65535	1000	☆	
Group PC Multi-segment instruction, simple PLC					
PC-00	Multi-segment instruction 0	-100.0%~100.0%	0.0%	☆	
PC-01	Multi-segment instruction 1	-100.0%~100.0%	0.0%	☆	
PC-02	Multi-segment instruction 2	-100.0%~100.0%	0.0%	☆	
PC-03	Multi-segment instruction 3	-100.0%~100.0%	0.0%	☆	
PC-04	Multi-segment instruction 4	-100.0%~100.0%	0.0%	☆	
PC-05	Multi-segment instruction 5	-100.0%~100.0%	0.0%	☆	
PC-06	Multi-segment instruction 6	-100.0%~100.0%	0.0%	☆	
PC-07	Multi-segment instruction 7	-100.0%~100.0%	0.0%	☆	
PC-08	Multi-segment instruction 8	-100.0%~100.0%	0.0%	☆	
PC-09	Multi-segment instruction 9	-100.0%~100.0%	0.0%	☆	
PC-10	Multi-segment instruction 10	-100.0%~100.0%	0.0%	☆	
PC-11	Multi-segment instruction 11	-100.0%~100.0%	0.0%	☆	
PC-12	Multi-segment	-100.0%~100.0%	0.0%	☆	

				☆	
	instruction 12				
PC-13	Multi-segment instruction 13	-100.0%~100.0%	0.0%	☆	
PC-14	Multi-segment instruction 14	-100.0%~100.0%	0.0%	☆	
PC-15	Multi-segment instruction 15	-100.0%~100.0%	0.0%	☆	
PC-16	Simple PLC operation method	0:Stop at the end of a single run 1:Single run end hold final value 2:Keep cycling	0	☆	
PC-17	Simple PLC power-down memory selection	Bit: Power-down memory selection 0:No power-down memory 1:Power down memory Ten digits: Shutdown memory selection 0:No shutdown memory 1:Shutdown memory	00	☆	
PC-18	Simple PLC segment 0 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-19	Simple PLC Section 0 Acceleration and Deceleration Time Selection	0~3	0	☆	
PC-20	Simple PLC 1st runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-21	Simple PLC 1st Acceleration and Deceleration Time Selection	0~3	0	☆	
PC-22	Simple PLC 2nd runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-23	Simple PLC 2nd Acceleration and Deceleration Time Selection	0~3	0	☆	
PC-24	Simple PLC segment 3 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-25	Simple PLC 3rd Acceleration and	0~3	0	☆	

	Deceleration Time Selection				
PC-26	Simple PLC segment 4 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-27	Simple PLC 4th Acceleration and Deceleration Time Selection	0~3	0	☆	
PC-28	Simple PLC segment 5 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-29	Simple PLC 5th Acceleration and Deceleration Time Selection	0~3	0	☆	
PC-30	Simple PLC segment 6 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-31	Simple PLC 6th Acceleration and Deceleration Time Selection	0~3	0	☆	
PC-32	Simple PLC segment 7 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-33	Simple PLC 7th Acceleration and Deceleration Time Selection	0~3	0	☆	
PC-34	Simple PLC segment 8 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-35	Simple PLC Section 8 Acceleration and Deceleration Times Selection	0~3	0	☆	
PC-36	Simple PLC segment 9 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-37	Simple PLC 9th Acceleration and Deceleration Time Selection	0~3	0	☆	
PC-38	Simple PLC paragraph 10 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-39	Simple PLC 10th Acceleration and	0~3	0	☆	

	Deceleration Time Selection of Acceleration and Deceleration Time				
PC-40	Simple PLC paragraph 11 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-41	Simple PLC Section 11 Acceleration and Deceleration Timing Selection of Acceleration and Deceleration Time	0~3	0	☆	
PC-42	Simple PLC segment 12 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-43	Simple PLC Section 12 Acceleration and Deceleration Timing Selection of Acceleration and Deceleration Time	0~3	0	☆	
PC-44	Simple PLC paragraph 13 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-45	Simple PLC Section 13 Acceleration and Deceleration Timing Selection of Acceleration and Deceleration Time	0~3	0	☆	
PC-46	Simple PLC paragraph 14 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-47	Simple PLC Section 14 Acceleration and Deceleration	0~3	0	☆	

	Timing Selection of Acceleration and Deceleration Time				
PC-48	Simple PLC paragraph 15 runtime	0.0s(h)~6553.5s(h)	0.0s(h)	☆	
PC-49	Simple PLC Section 15 Acceleration and Deceleration Timing Selection of Acceleration and Deceleration Time	0~3	0	☆	
PC-50	Simple PLC runtime unit	0:s(second) 1:h(hour)	0	☆	
PC-51	Multi-segment Instruction 0 Giving Mode	0:Parameter PC-00 is given 1:AI1 2:AI2 3:AI3 4:Pulse 5:PID 6:Preset frequency (P0-08) is given, UP/DOWN can be modified.	0	☆	
Group PD Communication Parameter					
PD-00	Baud rate	Bit:MODBUS 0:300BPS 1:600BPS 2:1200BPS 3:2400BPS 4:4800BPS 5:9600BPS 6:19200BPS 7:38400BPS 8:57600BPS 9:115200BPS Ten bits:Profibus-DP O. 115200BPs 1:208300BPs 2:256000BPs	5005	☆	

		3:512000Bps Hundred bits: Reserved Thousand bits: CANlink baud rate 0:20 1:50 2:100 3:125 4:250 5:500 6:1M			
PD-01	MODBUS data format	0:No checksum(8-N-2) 1:Even parity(8-E-1) 2:Odd parity(8-0-1) 3:No parity(8-N-1) (MODBUS valid)	0	☆	
PD-02	local address	0: Broadcast address 1 to 247. (Modbus.Profibus-DP, CANlink, Profibus-DP, CANlink, Profinet, EthercAt are valid)	1	☆	
PD-03	MODBUS response delay	0~20ms (MODBUS valid)	2	☆	
PD-04	Serial communication timeout	0.0: Invalid 0.1 to 60.0s (Modbus, Profibus-DP, CANopen. Profinet, EtherCAT valid)	0.0	☆	
PD-05	Data transfer format selection	Bit: Modbus 0:Non-standard Modbus protocol 1:Standard Modbus protocol Ten bits: Profibus-DP, CANopen, Profinet, EtherCAT 0:PPO1 format 1:PPO2 format 2:PPO3 format 3:PPO5 format	30	☆	
PD-06	Communication	0:0.01A (valid for ≤55kW)	0	☆	

	reading current resolution	1:0.1A			
PD-08	Profibus-DP, CANopen, Profinet, EtherCAT communications Break detection time	0.0s:Invalid 0.1~60.0s	0	☆	
Group PE User-customized parameters					
PE-00	User parameter 0		U3-17	☆	
PE-01	User parameter 1		U3-18	☆	
PE-02	User parameter 2		F0.00	☆	
PE-03	User parameter 3		F0.00	☆	
PE-04	User parameter 4		F0.00	☆	
PE-05	User parameter 5		F0.00	☆	
PE-06	User parameter 6		F0.00	☆	
PE-07	User parameter 7		F0.00	☆	
PE-08	User parameter 8		F0.00	☆	
PE-09	User parameter 9	P0-00~PP-xx	F0.00	☆	
PE-10	User parameter 10	A0-00~Ax-Xx	F0.00	☆	
PE-11	User parameter 11	U0-00~U0-XX	F0.00	☆	
PE-12	User parameter 12	U3-00~U3-xx	F0.00	☆	
PE-13	User parameter 13		F0.00	☆	
PE-14	User parameter 14		F0.00	☆	
PE-15	User parameter 15		F0.00	☆	
PE-16	User parameter 16		F0.00	☆	
PE-17	User parameter 17		F0.00	☆	
PE-18	User parameter 18		F0.00	☆	
PE-19	User parameter 19		F0.00	☆	
PE-20	User parameter 20		U0-68	☆	
PE-21	User parameter 21		U0-69	☆	
PE-22	User parameter 22	P0-00~PP-xx	F0.00	☆	
PE-23	User parameter 23		F0.00	☆	
PE-24	User parameter 24	A0-00~Ax-XX	F0.00	☆	
PE-25	User parameter 25		F0.00	☆	
PE-26	User parameter 26	U0-00~U0-xx	F0.00	☆	
PE-27	User parameter 27		F0.00	☆	
PE-28	User parameter 28	U3-00~U3-xx	F0.00	☆	
PE-29	User parameter 29		F0.00	☆	
Group FP Parameter Management					
PP-00	user password	0~65535	0	☆	
PP-01	Parameter	0:No operation	0	★	

	initialization	01:Restore factory parameters, excluding motor parameters 02:Clear record information 04:Backup user's current parameters 501:Restore user backup parameters			
PP-02	Functional parameter group display selection	Digit: U group display selection 0:No display 1:Display Tenth digit: Group A display selection 0:No display 1:Display	11	★	
PP-03	Personalized parameter group display selection	Bit: User customized parameter group display selection 0:No display 1:display Tenth digit: user change parameter group display selection 0:No display 1:Display	00	☆	
PP-04	Parameter Modification Properties	0:Modifiable 1:Not modifiable	0	☆	
Group A0 Torque Control Parameters					
A0-00	Speed/torque control method selection	0:Speed control 1:Torque control	0	★	
A0-01	Torque setting selection in torque control mode Selection	0:Digital setting 1 (A0-03) 1:AI1 2:AI2 3:AI3 4:PULSE pulse 5:Communication given 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) (Full scale of 1-7 options, corresponding to A0-03	0	★	

		digital setting)			
A0-03	Digital setting of torque in torque control mode Setting	-200.0% to 200.0%	150.0%	☆	
A0-05	Torque control forward maximum frequency	0.00Hz to maximum frequency	50.00 Hz	☆	
A0-06	Torque control reverse maximum frequency	0.00Hz to maximum frequency	50.00 Hz	☆	
A0-07	Torque rise filter time	0.00s~650.00s	0.00s	☆	
A0-08	Torque drop filtering time	0.00s~650.00s	0.00s	☆	
Group A1 Virtual IO					
A1-00	Virtual VDI1 Terminal Function Selection	0~59	0	★	
A1-01	Virtual VDI2 Terminal Function Selection	0~59	0	★	
A1-02	Virtual VDI3 Terminal Function Selection	0~59	0	★	
A1-03	Virtual VDI4 Terminal Function Options	0~59	0	★	
A1-04	Virtual VDI5 Terminal Function Options	0~59	0	★	
A1-05	Virtual VDI Terminal Valid State Settings Mode	Single digit: Virtual VDI1 Tenth Digit: Virtual VDI2 Hundredths: Virtual VDI3 Thousandths: Virtual VDI4 Ten thousand bits: virtual VDI5	00000	★	

		0: Whether VDI is valid or not is determined by the status of virtual VDOx. 1:Set whether VDI is valid by parameter A1-06			
A1-06	Virtual VDI Terminal Status Settings	0:Invalid 1:Valid Single digit: Virtual VDI1 Tenth position: Virtual VDI2 Hundredths: Virtual VDI3 Thousand: Virtual VDI4 Ten Thousand: Virtual VDI5	00000	★	
A1-07	Function selection when AI1 terminal is used as DI Selection	0~59	0	★	
A1-08	Function selection when AI2 terminal is used as DI Selection	0~59	0	★	
A1-09	Function selection when AI3 terminal is used as DI Selection	0~59	0	★	
A1-10	Valid modes when AI terminal is used as DI Selection	0:High level active 1:Low level active Single digit: AI1 Tenth position: AI2 Hundred: AI3	000	★	
A1-11	Virtual VDO1 output function selection	0:Internal short with physical DIx 1~41: see P5 group physical DO output selection	0	☆	
A1-12	Virtual VDO2 output function selection	0:Internal short with physical DIx 1~41: see P5 group physical DO output selection	0	☆	
A1-13	Virtual VDO3	0:Internal short with	0	☆	

	output function selection	physical DIx 1~41: see P5 group physical DO output selection			
A1-14	Virtual VDO4 output function selection	0:Internal short with physical DIx 1~41: see P5 group physical DO output selection	0	☆	
A1-15	Virtual VDO5 output function selection	0:Internal short with physical DIx 1~41: see P5 group physical DO output selection	0	☆	
A1-16	VDO1 output delay time	0.0s~3600.0s	0.0s	☆	
A1-17	VDO2 Output Delay Time	0.0s~3600.0s	0.0s	☆	
A1-18	VDO3 Output Delay Time	0.0s~3600.0s	0.0s	☆	
A1-19	VDO4 Output Delay Time	0.0s~3600.0s	0.0s	☆	
A1-20	VDO5 Output Delay Time	0.0s~3600.0s	0.0s	☆	

A1-21	VDO output terminal valid state selection	0:Positive Logic
		  1:Reverse logic
		  Single digit: VDO1
		  Tenth position: VDO2
		  Hundredths: VDO3
		  Thousand: VDO4
		  Ten thousand: VDO5
			00000	☆	

Group A2 Second Motor Parameter					
A2-00	Motor type selection	0:Normal asynchronous motor 1:Inverter asynchronous motor	0	★	
A2-01	Motor rated power	0.1kW~1000.0kW	Model Determination	★	
A2-02	Motor rated voltage	1V~2000V	Model Determination	★	
A2-03	Motor rated current	0.01A~655.35A(Inverter power≤55kW)	Model Determinati	★	

		0.1A~6553.5A(Inverter power>55kW)	on		
A2-04	Motor rated frequency	0.01Hz~Maximum Frequency	Model Determination	★	
A2-05	Rated motor speed	1rpm~65535rpm	Model Determination	★	
A2-06	Asynchronous motor stator resistance	0.0012~65.535Ω(Inverter power ≤55kW) 0.0001Ω~6.5535Q(Inverter power>55kW)	Model Determination	★	
A2-07	Asynchronous motor rotor resistance	0.0012~65.535Q(Inverter power ≤55kW) 0.00019~6.5535Q(Inverter power >55kW)	Model Determination	★	
A2-08	Leakage reactance of asynchronous motors	0.01mH~655.35mH(Inverter power≤ 55kW) 0.001mH~65.535mH(Inverter power>55kW)	Model Determination	★	
A2-09	Asynchronous motor mutual inductive resistance	0.1mH~6553.5mH(Inverter power≤55kW) 0.01mH~655.35mH(Inverter power>55kW)	Model Determination	★	
A2-10	Asynchronous motor no-load current	0.01A~A2-03(Inverter power≤55kW) 0.1A~A2-03(Inverter power >55kW)	Model Determination	★	
A2-27	Number of encoder lines	1~65535	1024	★	
A2-28	Encoder Type	0:ABZ incremental encoder 2:Rotary Transformer	0	★	
A2-29	Speed feedback PG selection	0:Local PG 1:Extended PG 2:Pulse input (DI5)	0	★	
A2-30	ABZ Incremental Encoder AB Phase Sequence	0:Forward 1:Reverse	0	★	
A2-31	Encoder mounting	0.0~359.9°	0.0°	★	

	angle			★	
A2-34	Rotary Transformer Pole Pairs	1~65535	1	★	
A2-36	Speed feedback PG break detection time	0.0:No action 0.1s~10.0s	0.0	★	
A2-37	Tuning Options	0:No operation 1:Asynchronous machine static part parameter tuning 2:Dynamic complete tuning of asynchronous machine 3:Asynchronous machine stationary complete tuning	0	★	
A2-38	Velocity loop proportional gain 1	1~100	30	☆	
A2-39	Velocity loop integration time1	0.01s~10.00s	0.50s	☆	
A2-40	Switching frequency 1	0.00~A2-43	5.00Hz	☆	
A2-41	Velocity loop proportional gain 2	1~100	20	☆	
A2-42	Velocity loop integration time2	0.01s~10.00s	1.00s	☆	
A2-43	Switching frequency 2	A2-40 ~ Maximum Frequency	10.00Hz	☆	
A2-44	Vector Control Differential Gain	50% to 200%	100%	☆	
A2-45	SVC torque filtering constant	0.000s~0.100s	0.000s	☆	
A2-47	Torque upper limit source in speed control mode	0:A2-48 setting 1:AI1 2:AI2 3:AI3 4:PULSE pulse 5:Communication given 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) Full scale for options 1-7, corresponding to A2-48 digital settings.	0	☆	
A2-48	Upper torque limit	0.0%~200.0%	150.0%	☆	

	number in speed control mode Character Setting			☆	
A2-49	Upper torque limit instruction in speed control mode Order selection (power generation)	0:Parameter A2-48 setting 1:AI1 2:AI2 3:AI3 4:PULSE pulse setting 5:Communication setting 6:MIN(AI1,AI2) 7:MAX(AI1,AI2) 8:Parameter A2-50 setting The full scale of 1-7 options corresponds to A2-50.	0	☆	
A2-50	Upper torque limit number in speed control mode Character setting (power generation)	0.0% to 200.0%	150.0%	☆	
A2-51	Excitation regulation proportional gain	0~60000	2000	☆	
A2-52	Excitation Regulation Integral Gain	0~60000	1300	☆	
A2-53	Torque Adjustment Proportional Gain	0~60000	2000	☆	
A2-54	Torque Regulation Integral Gain	0~60000	1300	☆	
A2-55	Speed Ring Points Properties	Single digit: Separation of points 0:Invalid 1:Valid	0	☆	
A2-59	Maximum torque coefficient in weak magnetic region	50~200%	100%	☆	
A2-60	Generation power limit enable	0:Invalid 1:Full effective 2:Constant speed 3:Deceleration effective	0	☆	

A2-61	Generation power ceiling	0.0~200.0%	Model Determination	☆	
A2-62	2nd motor control method	0:Vector control without speed sensor (SVC) 1:Vector control with speed sensor (FVC) 2:V/F control	0	★	
A2-63	2nd motor acceleration and deceleration time selection	0:Same as 1st motor 2:Acceleration and deceleration time 2 3:Acceleration and deceleration time 3 4:Acceleration and deceleration time 4	0	☆	
A2-64	2nd Motor Torque Boost	0.0%:Automatic torque increase 0.1%~30.0%	Model Determination	☆	
A2-66	2nd motor oscillation suppression gain	0~100	40	☆	
Group A5 Control Optimization Parameters					
A5-00	DPWM switching upper frequency	5.00Hz to maximum frequency	8.00Hz	☆	
A5-01	PWM modulation mode	0:Asynchronous modulation 1:Synchronous modulation	0	☆	
A5-02	Deadband compensation mode selection	0:No compensation 1:Compensation mode 1	1	☆	
A5-03	Random P W M Depth	0:Random PWM invalid 1~10:PWM carrier frequency random depth	0	☆	
A5-04	Fast Current Limit Enable	0:not enable 1:Enable	1	☆	
A5-05	Voltage overmodulation factor	100~110	105	★	
A5-06	Undervoltage point setting	Three-phase 380~480V model: 140.0V~380.0V Three-phase 200~240V model: 140.0V~380.0V		☆	

A5-08	low-speed carrier frequency	0.0 to 8.0 kHz		★	
A5-09	Overpressure point setting	Three-phase 380~480V model: 200.0V~820.0V Three-phase 200~240V model: 200.0V~400.0V		★	
A5-11	Low-speed DC braking threshold	0.00 to 5.00Hz	0.30Hz	☆	
Group A6 AI Curve Setting					
A6-00	AI Curve 4 Minimum Input	-10.00V~A6-02	0.00V	☆	
A6-01	AI Curve 4 Minimum Input Correspondence Setting	-100.0%~+100.0%	0.0%	☆	
A6-02	AI curve 4 inflection point 1 input	A6-00~A6-04	3.00V	☆	
A6-03	AI Curve 4 Inflection Point 1 Input Corresponding Setting Setting	-100.0% ~ +100.0%	30.0%	☆	
A6-04	AI curve 4 inflection point 2 input	A6-02~A6-06	6.00V	☆	
A6-05	AI Curve 4 Inflection Point 2 Input Corresponding Setting Setting	-100.0% ~ +100.0%	60.0%	☆	
A6-06	AI Curve 4 Maximum Input	A6-04~+10.00V	10.00V	☆	
A6-07	AI Curve 4 Maximum Input Correspondence Setting	-100.0% ~ +100.0%	100.0%	☆	
A6-08	AI Curve 5 Minimum Input	-10.00V~A6-10	-10.00V	☆	
A6-09	AI Curve 5 Minimum Input Correspondence	-100.0%~+100.0%	-100.0%	☆	

	Setting				
A6-10	AI curve 5 inflection point 1 input	A6-08~A6-12	-3.00V	☆	
A6-11	AI Curve 5 Inflection Point 1 Input Corresponding Setting Setting	-100.0% ~ +100.0%	-30.0%	☆	
A6-12	AI curve 5 inflection point 2 input	A6-10~A6-14	3.00V	☆	
A6-13	AI Curve 5 Inflection Point 2 Input Corresponding Setting Setting	-100.0% ~ +100.0%	30.0%	☆	
A6-14	AI Curve 5 Maximum Input	A6-12~+10.00V	10.00V	☆	
A6-15	AI Curve 5 Maximum Input Correspondence Setting	-100.0%~+100.0%	100.0%	☆	
A6-24	AI1 sets the jump point	-100.0%~100.0%	0.0%	☆	
A6-25	AI1 sets the jump range	0.0%~100.0%	0.5%	☆	
A6-26	AI2 sets the jump point	-100.0%~100.0%	0.0%	☆	
A6-27	AI2 sets the jump range	0.0%~100.0%	0.5%	☆	
A6-28	AI3 sets the jump point	-100.0%~100.0%	0.0%	☆	
A6-29	AI3 sets the jump range	0.0%~100.0%	0.5%	☆	
Group A7 User Programmable Card Parameters					
A7-00	User programmable function selection	0:Invalid 1:Valid	0	★	
A7-01	Control Board Output Terminal Control Mode	0:Inverter control 1:User programmable control card control	0	★	

		Selection Selection	Single digit: FMR (FM terminal as switching output) Tenth position: Relay (T/A-T/B-T/C) Hundred bits: DO1 Thousand bits: FMP (FM terminal as pulse output) Ten thousand bits: AO1			
A7-02		Programmable Card Expansion of AIAO Terminal Functions Configuration	0:AI3 voltage input, AO2 voltage output 1:AI3 voltage input, AO2 current output 2:AI3 current input, AO2 voltage output 3:AI3 current input, AO2 current output 4:AI3 PTC input, AO2 voltage output 5:AI3 PTC input, AO2 current output 6:AI3PT100 input, AO2 voltage output 7:AI3PT100 input, AO2 current output	0	★	
A7-03		FMP Output	0.0%~100.0%	0.0%	☆	
A7-04		AO1 output	0.0%~100.0%	0.0%	☆	
A7-05		Switching output	Binary setting Single digit: FMR Tenth position: Relay 1 Hundred bits: DO	000	☆	
A7-06		Programmable Card Frequency Setting	-100.00%~100.00%	0.0%	☆	
A7-07		Programmable Card Torque Setting	-200.0%~200.0%	0.0%	☆	
A7-08		Programmable card command given	0:No command 1:Forward command 2:Reverse command	0	☆	

		3:Forward rotation 4:Reverse rotation 5:Free stop 6:Deceleration stop 7:Fault reset			
A7-09	Programmable Card Feed Failure	0:No fault 80~89:Fault code	0	☆	
Group A8 P2P communication					
A8-00	Point-to-point communication function selection	0:Invalid 1:Valid	0	☆	
A8-01	master-slave selection	0:Master 1:Slave	0	☆	

A8-02	Slave commands follow master-slave message interactions	Bit: Slave commands follow
		  0:Slave does not follow the host run command
		  1:Slave follows the master's run command
		Ten bits: slave fault information transmission
		  0:Slave fault message not transmitted
		  1:Slave fault information is transmitted
		Hundred bits: Host shows slave offline
		
		  0:Slave offline host does not report faults
		  1:Slave offline host reports fault (Err16)
			011	★	

A8-03	Slave receive data role selection	0:Operating frequency 1:Target frequency	0	☆	
A8-04	Receive Data Zero Bias	-100.00%~100.00%	0.00%	★	
A8-05	Receive Data Gain	-10.00~100.00	1.00	★	
A8-06	Point-to-point communication interruption detection time	0.0~10.0s	1.0s	☆	
A8-07	Peer-to-peer communication	0.001~10.000s	0.001s	☆	

	host data sending week　Period				
A8-11	a window (on a computer screen)	0.20~10.00Hz	0.50Hz	☆	
Group AC AIAO Correction					
AC-00	AI1 measured voltage1	-10.00V~10.000V	Factory calibration	☆	
AC-01	AI1 displays voltage 1	-10.00V~10.000V	Factory calibration	☆	
AC-02	AI1 measured voltage2	-10.00V~10.000V	Factory calibration	☆	
AC-03	AI1 display voltage 2	-10.00V~10.000V	Factory calibration	☆	
AC-04	AI2 measured voltage1	-10.00V~10.000V	Factory calibration	☆	
AC-05	AI2 display voltage 1	-10.00V~10.000V	Factory calibration	☆	
AC-06	AI2 measured voltage2	-10.00V~10.000V	Factory calibration	☆	
AC-07	AI2 display voltage 2	-10.00V~10.000V	Factory calibration	☆	
AC-08	AI3 measured voltage1	-10.00V~10.000V	Factory calibration	☆	
AC-09	AI3 display voltage 1	-10.00V~10.000V	Factory calibration	☆	
AC-10	AI3 measured voltage2	-10.00V~10.000V	Factory calibration	☆	
AC-11	AI3 display voltage 2	-10.00V~10.000V	Factory calibration	☆	
AC-12	AO1 target voltage 1	-10.00V~10.000V	Factory calibration	☆	
AC-13	AO1 measured voltage1	-10.00V~10.000V	Factory calibration	☆	
AC-14	AO1 target voltage 2	-10.00V~10.000V	Factory calibration	☆	
AC-15	AO1 measured voltage2	-10.00V~10.000V	Factory calibration	☆	
AC-16	AO2 target voltage1	-10.00V~10.000V	Factory calibration	☆	
AC-17	AO2 measured voltage1	-10.00V~10.000V	Factory calibration	☆	
AC-18	AO2 target voltage2	-10.00V ~10.000V	Factory calibration	☆	

Parameter	Name	Range		Factory calibration	☆	
AC-19	AO2 measured voltage2	-10.00V~10.000V		Factory calibration	☆	

Summary Table of Monitoring Parameters

Parameter	Name	Minimum Unit	Address	Page Number
Group U0 Basic Monitoring Parameter				
U0-00	Operating frequency (Hz)	0.01Hz	7000H	
U0-01	Setting frequency (Hz)	0.01Hz	7001H	
U0-02	Busbar voltage (V)	0.1V	7002H	
U0-03	Output Voltage (V)	1V	7003H	
U0-04	Output current (A)	0.01A	7004H	
U0-05	Output power (kW)	0.1kW	7005H	
U0-06	Output torque (%)	0.1%	7006H	
U0-07	DI input status	1	7007H	
U0-08	DO output status	1	7008H	
U0-09	AI1 voltage (V)	0.01V	7009H	
U0-10	AI2 voltage(V)/current(mA)	0.01V/0.01mA	700AH	
U0-11	AI3 voltage (V)	0.01V	700BH	
U0-12	numerical value	1	700CH	
U0-13	length value	1	700DH	
U0-14	Load speed	1RPM	700EH	
U0-15	PID Setting	1	700FH	
U0-16	PID feedback	1	7010H	
U0-17	PLC stage	1	7011H	
U0-18	Input pulse frequency (Hz)	0.01kHz	7012H	
U0-19	Feedback speed (Hz)	0.01Hz	7013H	
U0-20	Remaining running time	0.1Min	7014H	
U0-21	AI1 voltage before correction	0.001V	7015H	
U0-22	AI2 voltage(V)/current(mA) before correction	0.001V/0.01mA	7016H	
U0-23	AI3 Voltage before correction	0.001V	7017H	
U0-24	Motor speed	1RPM	7018H	
U0-25	Current power-up time	1Min	7019H	
U0-26	Current Runtime	0.1Min	701AH	
U0-27	Input pulse frequency	1Hz	701BH	
U0-28	Communication Setpoint	0.01%	701CH	
U0-29	Encoder feedback speed	0.01Hz	701DH	
U0-30	Main Frequency Display	0.01Hz	701EH	

U0-31	Auxiliary frequency display	0.01Hz	701FH	
U0-32	View any memory address value	1	7020H	
U0-34	Motor temperature value	1°C	7022H	
U0-35	Target torque (%)	0.1%	7023H	
U0-36	rotary position	1	7024H	
U0-37	Power factor perspective	0.1°	7025H	
U0-38	ABZ position	1	7026H	
U0-39	V/F separation target voltage	1V	7027H	
U0-40	V/F Split Output Voltage	1V	7028H	
U0-41	DI input status visualization	1	7029H	
U0-42	Visualization of DO output status	1	702AH	
U0-43	DI function status visualization 1 (functions 01-40)	1	702BH	
U0-44	DI function status visualization 2 (functions 41-80)	1	702CH	
U0-45	error message (computing)	1	702DH	
U0-58	Z Signal Counter	1	703AH	
U0-59	Setting frequency (%)	0.01%	703BH	
U0-60	Operating frequency (%)	0.01%	703CH	
U0-61	Inverter status	1	703DH	
U0-62	Current Fault Code	1	703EH	
U0-63	Point-to-point host communication sends torque values	0.01%	703FH	
U0-64	Number of slaves	1	7040H	
U0-65	Upper torque limit	0.1%	7041H	
U0-66	Communication Expansion Card Model	Displays the communication expansion card model number. Correspondence between the displayed value and the expansion card model number The correspondence between the displayed value and the expansion card model number: 100:CANopen 200:Profibus-DP	7042H	

		300:CANlink 400:Profinet 500:EtherCAT		
U0-67	Communication Expansion Card Software Version Number	Display the communication expansion card version No. .	7043H	

U0-68	Communication Expansion Card Inverter Status	Displays the communication expansion card inverter
		  Bit bits correspond to the status of the
		  Correspondence between bit and status.
		  bit1:running direction
		  bit2:Whether the inverter is faulty or not
		  bit3:Target frequency arrival
		  bit4~bit7:Reserved
		  bit8~bit15:Fault code
			7044H	

U0-69	Frequency transmitted to the communication expansion card	0.01Hz
		  Frequency that the frequency converter transmits to the communication expansion card, the communication expansion card
		  The communication expansion card feeds the information back to the host computer
			7045H	

U0-70	RPM transmitted to the communication expansion card	1RPM
		  The frequency converter transmits to the communication expansion card the rotational speed, and the communication expansion card
		  feeds the information back to the host computer.
			7046H	

U0-71	Current display for communication expansion card (A)	Specialized current display for communication cards Display .	7047H	
U0-72	Communication card error status	Communication Expansion Card Error Status	7048H	

		state .		
U0-73	Motor serial number	0:Motor 1 1:Motor 2	7049H	
U0-74	Inverter output torque	0.1%	704AH	
U0-76	Low cumulative electricity consumption	0.1 degree	704CH	
U0-77	High cumulative electricity consumption	1 degree	704DH	
U0-78	linear velocity	1m/Min	704EH	

Converter Warranty Agreement

1) Within 18 months (Start from the shipment day), we provide free repair parts for quality problems, as well as online technical support and after-sale service. (Shipping costs for repair parts are paid by the buyer);

2) During the warranty period, a repair fee will be charged for damage caused by the following reasons:

A. Damage to the machine caused by errors in use or unauthorized repairs or modifications;

B. Damage to machine due to fire, flood, abnormal voltage, other disasters and secondary disasters, etc;

C. Hardware damage due to man-made drop and transportation after purchase;

D. Damage to the machine caused by not following the user manual provided by our company;

E. Malfunctions and damages caused by obstacles other than the machine (e.g. external equipment factors)

3) In the event of product failure or damage, please fill in the Product Warranty Card correctly and in detail;

4) Maintenance costs are charged in accordance with our latest adjusted " Maintenance Price List";

5) This warranty card will not be reissued under normal circumstances, so please keep it carefully;

6) If there is any problem in the service process, please contact our agent or our company in time.

Customer Service Center

TK500 Converter Warranty Card

Client Information	Address:	
	Corporate Name:	Client:
	Zip Code	TEL:
Product Information	Product Model	
	Fuselage Barcode (Paste here)	
	Agent Name:	
Error Information	(Repair time and contents): Service Engineer:	

Zhejiang Taikong Electric Co., LTd.

HQ: Room 401, Building C2, Wenzhou Safety (Emergency) IndustrialPark, Oujiangkou Industrial Gathering Zone, Dongtou District.Wenzhou City,Zhejiang Province,.China.