Contents

Preface

Thank you for purchasing the 500Series AC Drive developed by **Shenzhen iNDVS Technology Co., Ltd.** The 500Series AC Drive is a general-purpose high performance Current vector control AC Drive. Mainly used to control and adjust the three-phase AC asynchronous motor speed and torque.

500 series uses high-performance vector control technology, Low speed high torque output, Has good dynamic characteristics, Super overload capacity, rich and powerful functions, stable performance. It is used to drive various automation production equipment involving Textile, Paper-making, Wire-drawing, Machine tool, Packing, Food, Fan and Pump.

This manual describes the correct use of the 500Series AC Drive, including selection, parameter setting, commissioning, maintenance & inspection. Read and understand the manual before use and forward the manual to the end user.

Notes

- The drawings in the manual are sometimes shown without covers or protective guards, to explain the details of the product.
- Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions.
- The drawings in the manual are shown for description only and may not match the product you purchased.
- The instructions are subjected to change, without notice, due to product upgrade, specification modification as well as efforts to increase the accuracy and convenience of

the manual. ◆ Contact our agents or customer service center if you have problems during the use.
◆ When unpacking, please confirm carefully: The model name of the machine and the AC Drive rating are the same as your order. The packing containing your ordered machine (with product certification), user manual (with product warranty card). ◆ If the product is damaged during transport, If you find that there is some omission or damage, please promptly contact with our company or your supplier for solution.

Chapter 1

Safety information and precautions

Chapter 1 Safety information and precautions

Definition of security:

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

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

 **WARNING :**indicates that failure to comply with the notice will result in personal injury or property damage.

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

1.1 Safety Information

Using stage	Safety grade	precautions
Before installation	danger	◆ Do not install the equipment if you find water seepage,component missing or damage upon unpacking. ◆ Do not install the equipment if the packing list does not conform to the product you received.
	Warning	◆ Handle the equipment with care during transportation to prevent damage to the equipment. ◆ Do not use the equipment if any component is damaged or missing.Failure to comply will result in personal injury. ◆ Do not touch the components with your hands. Failure to comply will result in static electricity damage.
During installation	Danger	◆ Install the equipment on incombustible objects such as metal, and keep it away from combustible materials. Failure to comply may result in a fire.

		◆ Do not loosen the fixed screws of the components, especially the screws with red mark.
	Warning	◆ Do not drop wire end or screw into the AC drive. Failure to comply will result in damage to the AC drive. ◆ Install the AC drive in places free of vibration and direct sunlight ◆ When two AC drives are laid in the same cabinet, arrange the installation positions properly to ensure the cooling effect.
During installation	Danger	◆ Wiring must be performed only by qualified personnel under instructions described in this manual. Failure to comply may result in unexpected accidents. ◆ A circuit breaker must be used to isolate the power supply and the AC drive. Failure to comply may result in a fire. ◆ Ensure that the power supply is cut off before wiring. Failure to comply may result in electric shock. ◆ Tie the AC drive to ground properly by standard. Failure to comply may result in electric shock.
	Terminals	◆ Never connect the power cables to the output terminals (U,V, W) of the AC drive. Pay attention to the marks of the wiring terminals and ensure correct wiring. Failure to comply will result in damage to the AC drive. ◆ Never connect the braking resistor between the DC bus **WARNING** (+) and (-). Failure to comply may result in a fire. ◆ Use wire sizes recommended in the manual. Failure to comply may result in accidents. ◆ Use a shielded cable for the encoder, and ensure that the shielding layer is reliably grounded.
Before power-on	Danger	◆ Check that the following requirements are met: - the voltage class of the power supply is consistent with the rated voltage rated voltage class of the AC drive. - The input terminals (R, S, T) and output terminals (U, V, W) are properly connected. ◆ No short-circuit exists in the peripheral circuit.The wiring is secured - Failure to comply will result in damage to the AC drive ◆ Do not perform the voltage resistance test on any part of the AC drive because such test has been done in the factory. Failure to , drive because such test has been done in the factory. Failure to
	Warning	◆ Cover the AC drive properly before power-on to prevent electric shock.

		◆ All peripheral devices must be connected properly under the instructions described in this manual. Failure to comply will result in accidents.
After power-on	Danger	◆ Cover the AC drive properly before power-on to prevent electric shock. ◆ All peripheral devices must be connected properly under the instructions described in this manual. Failure to comply will result in accidents.
	Warning	◆ Do not touch the rotating part of the motor during the motor auto-tuning or running. Failure to comply will result in accidents. ◆ Do not change the default settings of the AC drive. Failure to comply will result in damage to the AC drive.
During operation	Danger	◆ Do not touch the fan or the discharging resistor to check the temperature. Failure to comply will result in personal burnt. ◆ Signal detection must be performed only by qualified personnel during operation. Failure to comply will result in personal injury or damage to the AC drive.
	Warning	◆ Avoid objects falling into the AC drive when it is running. Failure to comply will result in damage to the AC drive. ◆ Do not start/stop the AC drive by turning the contactor ON/OFF.Failure to comply will result in damage to the AC drive.
During maintenance	Danger	◆ Repair or maintenance of the AC drive may be performed only by qualified personnel. Failure to comply will result in personal injury or damage to the AC drive. ◆ Do not repair or maintain the AC drive at power-on. Failure to comply will result in electric shock. ◆ Repair or maintain the AC drive only ten minutes after the AC drive is powered off. This allows for the residual voltage in the capacitor to discharge to a safe value. Failure to comply will result in personal injury. ◆ Ensure that the AC drive is disconnected from all power supplies before starting repair or maintenance on the AC drive. ◆ Set and check the parameters again after the AC drive is replaced. ◆ All the pluggable components must be plugged or removed only after power-off. ◆ The rotating motor generally feeds back power to the AC drive. As a

		result, the AC drive is still charged even if the motor stops, and the power supply is cut off. Thus ensure that the AC drive is disconnected from the motor before starting repair or maintenance on the AC drive.

1.2 General Precautions

1) Requirement on residual current device (RCD)

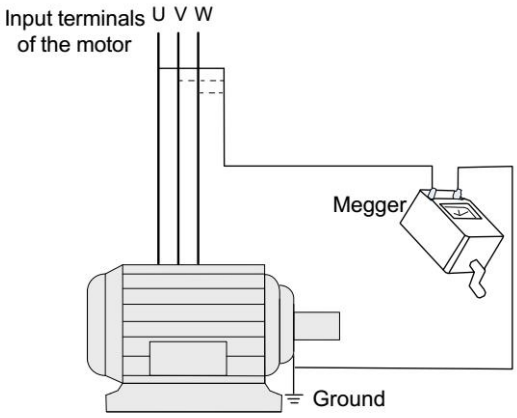
The AC drive generates high leakage current during running, which flows through the protective earthing (PE) conductor. Thus install a type-B RCD at primary side of the power supply. When selecting the RCD, you should consider the transient and steady-state leakage current to ground that may be generated at startup and during running of the AC drive. You can select a specialized RCD with the function of suppressing high harmonics or a general-purpose RCD with relatively large residual current.

2) High leakage current warning

The AC drive generates high leakage current during running, which flows through the PE conductor. Earth connection must be done before connection of power supply. Earthing shall comply with local regulations and related IEC standards.

3) Motor insulation test

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



4) Thermal protection of motor

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

5) Running at over 50 Hz

The AC drive provides frequency output of 0 to 500 Hz (Up to 300 Hz is supported if the AC drive runs in CLVC and SFVC mode). If the AC drive is required to run at over 50 Hz, consider the capacity of the machine.

6) Vibration of mechanical device

The AC drive may encounter the mechanical resonance point at some output frequencies, which can be avoided by setting the skip frequency.

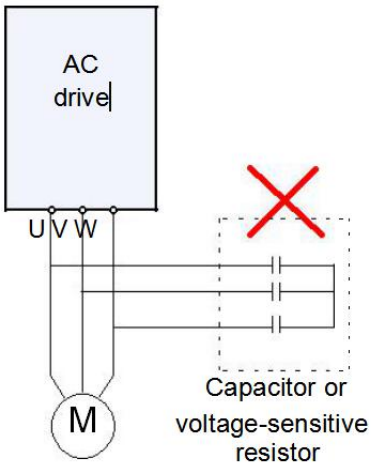
7) Motor heat and noise

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

8) Voltage-sensitive device or capacitor on output side of the AC drive

Do not install the capacitor for improving power factor or lightning protection voltage-sensitive resistor on the output side of the AC drive because the output of

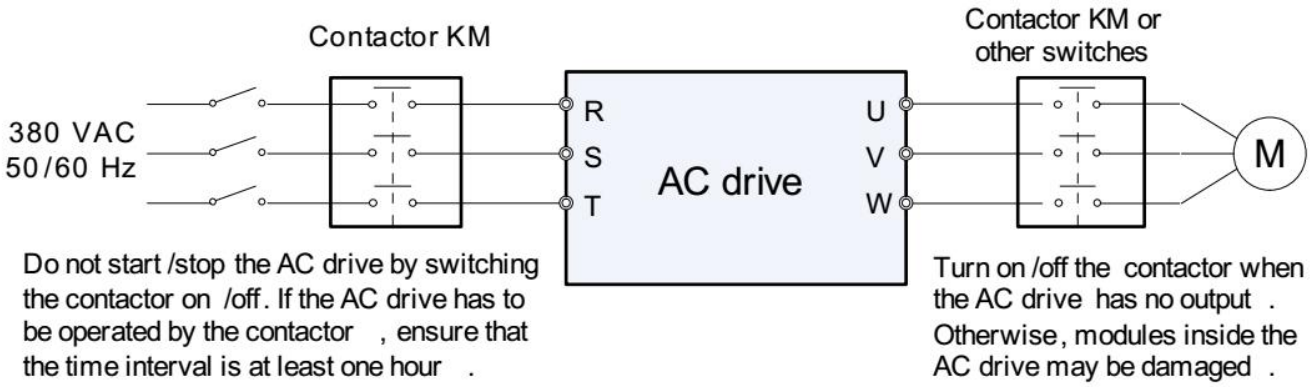
the AC drive is PWM wave. Otherwise, the AC drive may suffer transient over-current or even be damaged.



9) Contactor at the I/O terminal of the AC drive

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

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



10) When external voltage is out of rated voltage range

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

11) Prohibition of three-phase input changed into two-phase input

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

12) Surge suppressor

The AC drive has a built-in voltage dependent resistor (VDR) for suppressing the surge voltage generated when the inductive loads (electromagnetic contactor, electromagnetic relay, solenoid valve, electromagnetic coil and electromagnetic brake) around the AC drive are switched on or off. If the inductive loads generate a very high surge voltage, use a surge suppressor for the inductive load or also use a diode.Do not connect the surge suppressor on the output side of the AC.

13) Temperature and de-rating

The regular using temperature of this 500 series AC Drive is - 10℃~ + 50℃ When the temperature more than 50 need to de-rate using,The temperature rises by 1.5% degrees centigrade.

14) Altitude and de-rating

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

14) Some special usages

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

15) Disposal

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

16) About adaptable Motor

• The standard adaptable motor is adaptable four-pole squirrel-cage asynchronous induction motor or PMSM. For other types of motor, select a proper AC drive according to the rated motor current.

• The cooling fan and rotor shaft of non-variable-frequency motor are coaxial, which results in reduced cooling effect when the rotational speed declines. If variable speed is required, add a more powerful fan or replace it with variable-frequency motor in applications where the motor overheats easily.

• The standard parameters of the adaptable motor have been configured inside the AC drive. It is still necessary to perform motor auto-tuning or modify the default values based on actual conditions. Otherwise, the running result and protection performance will be affected.

• The AC drive may alarm or even be damaged when short-circuit exists on cables or inside the motor. Therefore, perform insulation short-circuit test when the motor and cables are newly installed or during routine maintenance. During the test, make sure that the AC drive is disconnected from the tested parts.

Chapter 2

Product Information

Chapter 2 Product Information

iNDVS AC Drive s have been tested and inspected before leaving the manufacturer. Before unpacking the product, please check product packaging for shipping damage caused by careless transportation and whether the specifications and type of the product complies with the order. If any questions, please contact the supplier of **iNDVS** products, or directly contact the company.

※Inspect that the contents are complete (500 series AC Drive , operation manual, warranty card, keyboard extension line every each unit.)

※Check the nameplate on the side of the AC Drive to ensure that the product you have received is the right one you ordered.

2.1 Nameplate

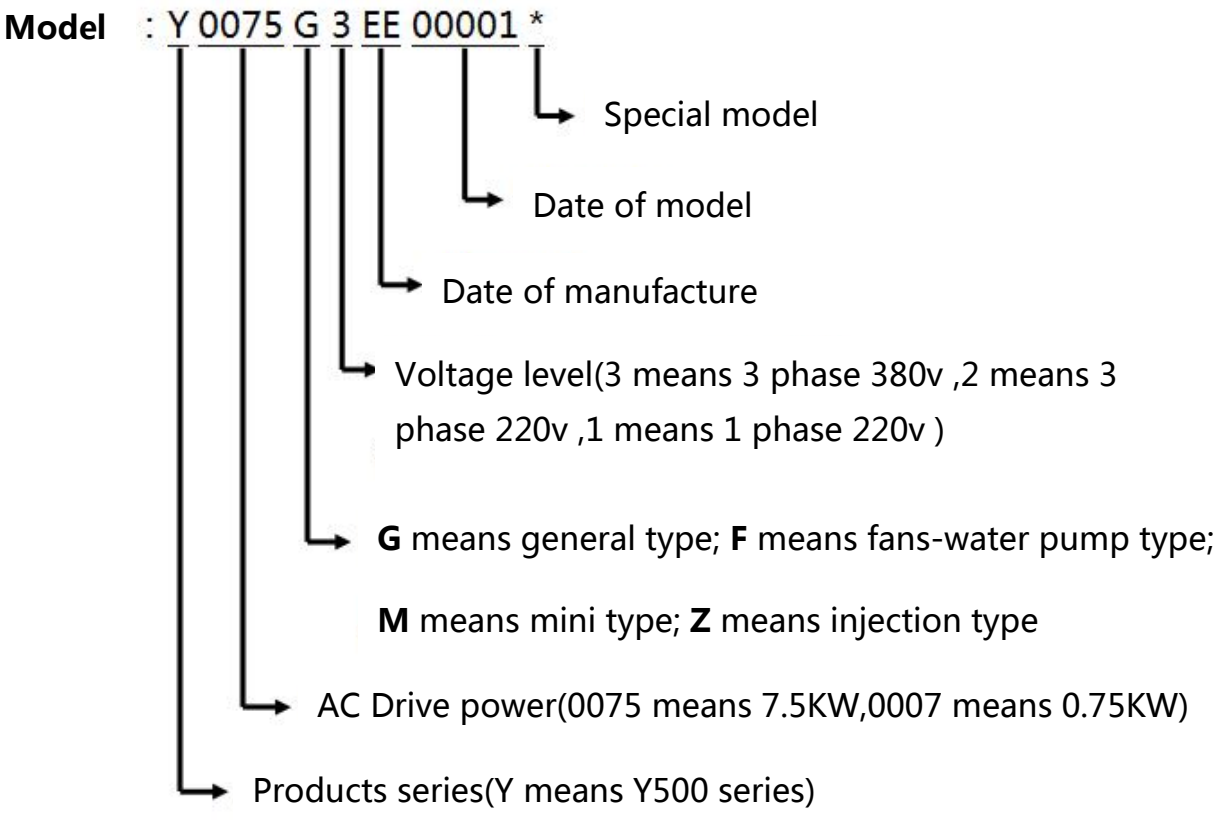


Fig. 2.1

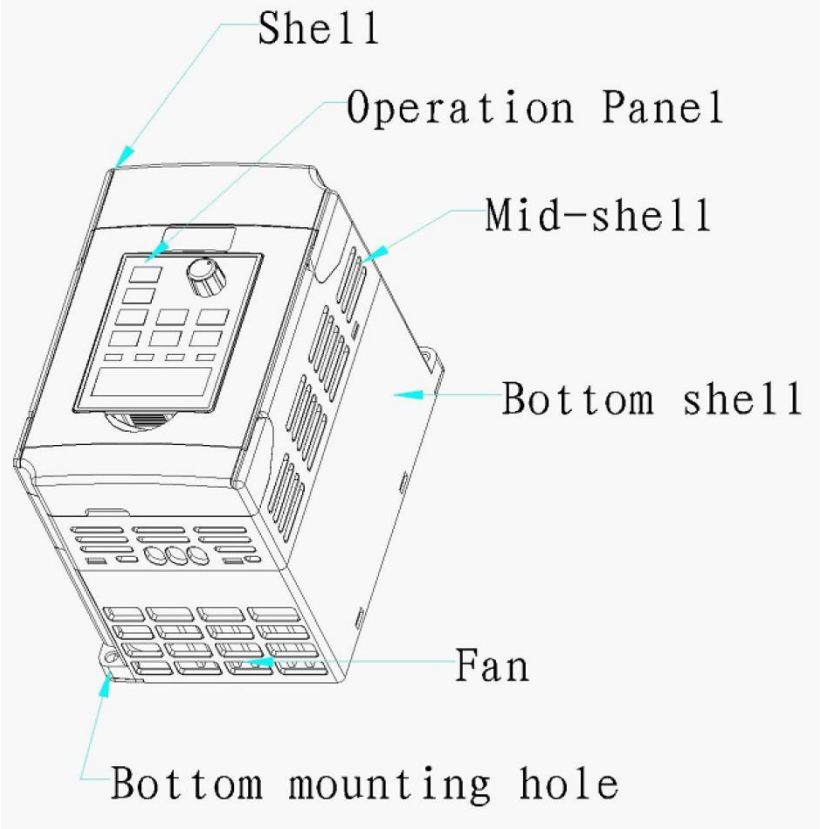


Fig. 2.1

2.2 products series

2.2.1 AC Drive from 0.4kw to 200kw /220v(200-240Vac)

AC Drive model	Adapted motor		Rated input current(A)	Shape case
	KW	HP		
Y0004M1	0.4	0.5	2.5	00
Y0007M1	0.75	1	4	00
Y0015M1	1.5	2	7	00
Y0007G1	0.75	1	4	001
Y0015G1	1.5	2	7	001
Y0022G1	2.2	3	10	001
Y0040G1	4	5	16	002
Y0055G1	5.5	7.5	25	003
Y0075G1	7.5	10	32	003

Y0110G1	11	15	45	004
Y0150G1	15	20	60	004
Y0185G1	18.5	25	75	004
Y0220G1	22	30	90	005
Y0300G1	30	40	110	005
Y0370G1	37	50	150	006
Y0450G1	45	60	170	006
Y0550G1	55	70	210	007
Y0750G1	75	100	300	007
Y0930G1	93	125	340	008
Y1100G1	110	150	380	008
Y1320G1	132	175	470	008
Y1600G1	160	210	600	009
Y1850G1	185	250	650	009
Y2000G1	200	260	725	009

Table 2.2.1

2.2.2 AC Drive from 0.75kw to 500kw /380v(300-500Vac)

AC Drive model	Adapted motor		Rated input current(A)	Shape case
	KW	HP		
Y0007G3	0.75	1	4	001
Y0015G3	1.5	2	7	001
Y0022G3	2.2	3	10	001
Y0040G3	4	5	16	002
Y0055G3	5.5	7.5	13	002
Y0075G3	7.5	10	16	002
Y0110G3	11	15	25	003
Y0150G3	15	20	32	003
Y0185G3	18.5	25	38	003
Y0220G3	22	30	45	004
Y0300G3	30	40	60	004
Y0370G3	37	50	75	004
Y0450G3	45	60	90	005
Y0550G3	55	70	110	005
Y0750G3	75	100	150	006
Y0930G3	93	125	170	006
Y1100G3	110	150	210	007
Y1320G3	132	175	250	007
Y1600G3	160	210	300	007

Y1850G3	185	250	340	008
Y2000G3	200	260	380	008
Y2200G3	220	300	415	008
Y2500G3	250	350	470	008
Y2800G3	280	370	520	008
Y3150G3	315	400	600	009
Y3550G3	355	420	650	009
Y4000G3	400	530	725	009
Y4500G3	450	600	800	009
Y5000G3	500	700	920	009

Table 2.2.2

2.3 products specifications

2.3.1 0.4kw-2.2kw outer shapes & nameplates

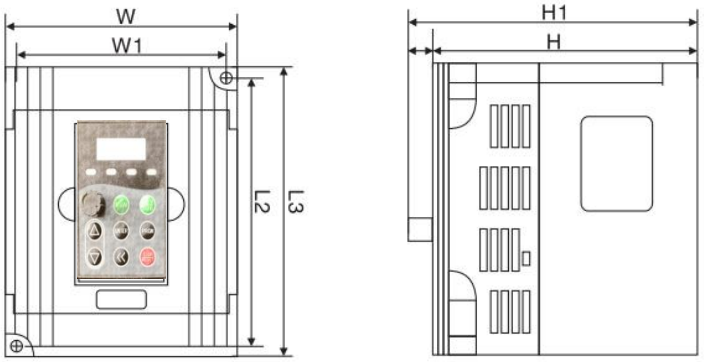


Fig. 2.3.1.1

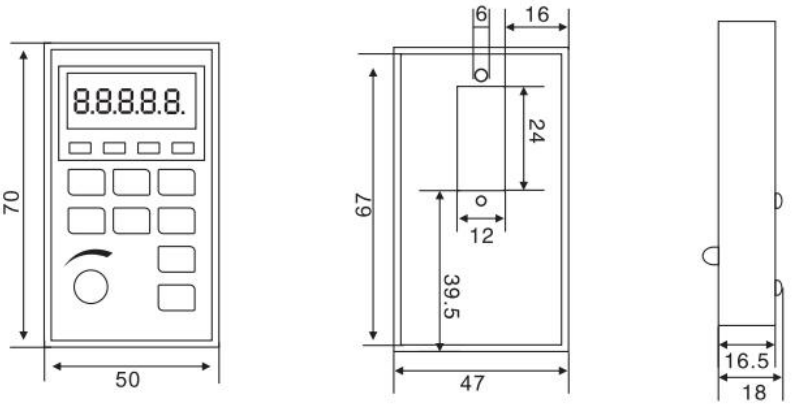


Fig. 2.3.1.2

YP-A keyboard size

2.3.2 4kw-7.5kw outer shapes & nameplates

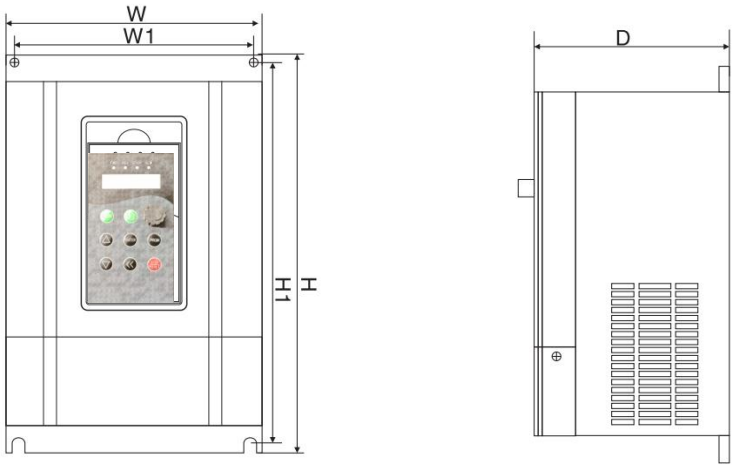


Fig. 2.3.2.1

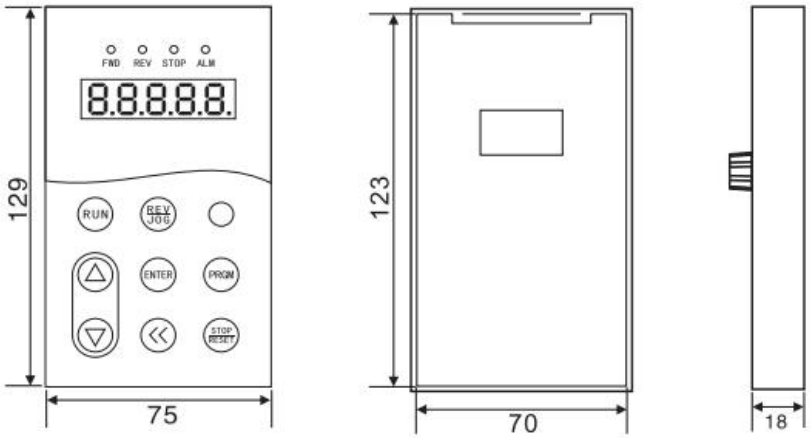


Fig. 2.3.2.2

YP-B keyboard size

2.3.3 003-009 Case

5.5kw-200kw/220v & 11kw-500kw/380v

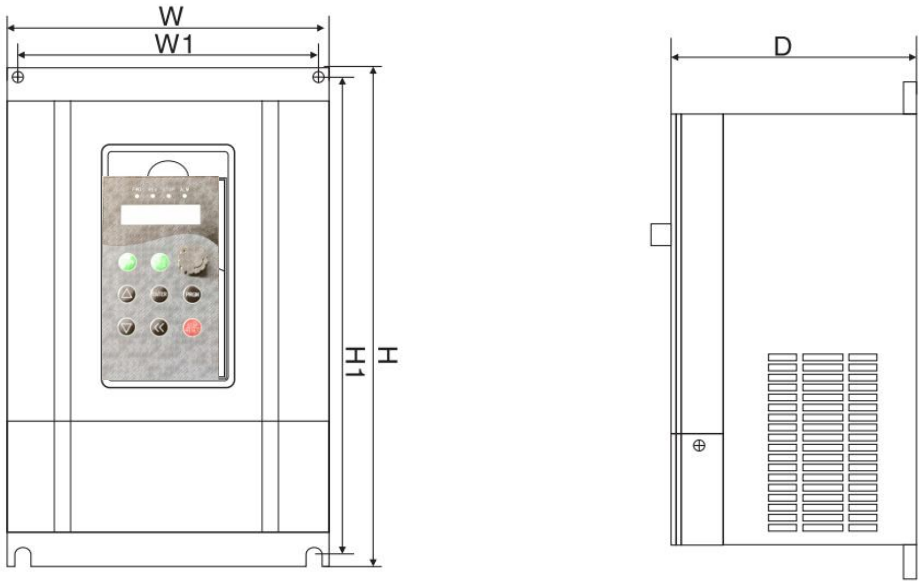


Fig. 2.3.3

2.4 Products specifications

2.4.1 Size 220v-500Series

AC Drive model	0.4kw-2.2kw 220v Single Phase /Three Phase Input & Three Phase Output									
	W (mm)	W1 (mm)	L3 (mm)	L2 (mm)	H (mm)	H1 (mm)	Hole (mm)	N.W. (kg)	G.W. (kg)	Case
M0.4kw-220v M0.75kw-220v M1.5kw-220v	85.5	74	141.5	132	113	123	ø2	0.8	1	00
0.75kw-220v 1.5kw-220v 2.2kw-220v	100	92	152	143	116.5	127	ø2	0.9	1.1	001

AC Drive models	4kw 220v Single Phase /Three Phase Input & Three Phase Output								
	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	N.W. (kg)	G.W. (kg)	Case
4kw-220v	130	115	264	244	153	9	2.8	3.5	002

AC Drive	5.5kw-200kw 220v Single Phase /Three Phase Input & Three Phase Output

model	H (mm)	W (mm)	D (mm)	H1 (mm)	W1 (mm)	R1 (mm)	N.W. (kg)	G.W. (kg)	Case
5.5kw-220v 7.5kw-220v	397.1	212	190.9	378.2	156.5	ø7	9.5	11.5	003
11kw-220v 15kw-220v 18.5kw-220v	463	285	217	447	235	ø7	11.9	17.8	004
22kw-220v 30kw-220v	600.1	385.4	267	580	260	ø9	27	39	005
37kw-220v 45kw-220v	700	473	311	678	343	ø10	43	58	006
55kw-220v 75kw-220v	849	480	389	822.1	369	ø10	85	98	007
93kw-220v 110kw-220v 132kw-220v	1060	650	381	1030	420	ø12	110	132	008
160kw-220v 185kw-220v 200kw-220v	1361	800	392.5	1300	520	ø12	230	250	009

Chart 2.4.1

2.4.2 Size 380v-500Series

AC Drive model	0.75kw-2.2kw 380V Three Phase Input & Three Phase Output									
	W (mm)	W1 (mm)	L3 (mm)	L2 (mm)	H (mm)	H1 (mm)	Hole (mm)	N.W. (kg)	G.W. (kg)	Case
0.75kw-380v 1.5kw-380v 2.2kw-380v	100	92	152	143	116.5	127	ø2	1	1.5	001

AC Drive models	4kw-7.5kw 380V Three Phase Input & Three Phase Output								
	W (mm)	W1 (mm)	H (mm)	H1 (mm)	D (mm)	D1 (mm)	N.W. (kg)	G.W. (kg)	Case
4kw-380v 5.5kw-380v 7.5kw-380v	130	115	264	244	153	9	2.9	3.5	002

AC Drive model	11kw-500kw 380V Three Phase Input & Three Phase Output								
	H (mm)	W (mm)	D (mm)	H1 (mm)	W1 (mm)	R1 (mm)	N.W. (kg)	G.W. (kg)	Case

11kw-380v 15kw-380v 18.5kw-380v	397.1	212	190.9	378.2	156.5	ø7	9.5	11.5	003
22kw-380v 30kw-380v 37kw-380v	463	285	217	447	235	ø7	11.9	17.8	004
45kw-380v 55kw-380v	600.1	385.4	267	580	260	ø9	27	39	005
75kw-380v 93kw-380v	700	473	311	678	343	ø10	43	58	006
110kw-380v 132kw-380v 160kw-380v	849	480	389	822.1	369	ø10	85	98	007
185kw-380v 200kw-380v 220vkw-380v 250kw-380v	1060	650	381	1030	420	ø12	110	132	008
280kw-380v 315kw-380v 355kw-380v 400kw-380v 450kw-380v 500kw-380v	1361	800	392.5	1300	520	ø12	230	250	009

Chart 2.4.2

2.5 Standard specification

Item		Specifications
Basic function	Control system	High performance of current vector control technology to realize 3 phase asynchronous motor control
	Drive performance	High efficiency driving for induction motor and synchronous motor
	Maximum frequency	Vector control：0~500Hz V/F control：0-500Hz
	Carrier frequency	0.5kHz~16kHz; the carrier frequency will be automatically adjusted according to the load characteristics
	Input frequency resolution	Digital setting： 0.01Hz Analog setting： maximum frequency ×0.025%
	Control mode	Open loop vector control(SVC) Closed loop vector control(FVC) V/F control
	Startup torque	G type：0.5Hz/150%(SVC)；0Hz/180%(FVC) P type：0.5Hz/100%

	Speed range	1：100(SVC)	1：1000(FVC)
	Speed stabilizing precision	±0.5%(SVC)	±0.02%(FVC)
	Torque control precision	±5%(FVC)	
	Over load capability	G type：150% rated current 60 seconds; 180% rated current 3 seconds; P type：120% rated current 60 seconds; 150% rated current 3 seconds	
	Torque boost	Auto torque boost function；Manual torque boost 0.1%~30.0%	
	V/F curve	Linear V/F, multi-point V/F and square V/F curve (power of 1.2, 1.4, 1.6, 1.8, 2)	
	V/F separation	In 2 ways：separation ,semi separation	
	Acc. / dec curve	Straight line or S curve acceleration and deceleration mode. Four kinds of acceleration and deceleration time. Acceleration and deceleration time range between 0.0s to 6500s.	
	DC brake	DC brake frequency： 0.00Hz to maximum frequency. Brake time： 0.0s to 36.0s, and brake current value： 0.0% to 100.0%.	
	Jog control	Jog frequency range： 0.00Hz~50.00Hz. Jog acceleration/deceleration time 0.0s~6500.0s.	
	Simple PLC and MS speed running	It can realize at maximum of 16 segments speed running via the built-in PLC or control terminal.	
	Built-in PID	It is easy to realize process-controlled closed loop control system	
	Auto voltage regulation (AVR)	It can keep constant output voltage automatically in the case of change of network voltage.	
	Over-voltage/current stall control	It can limit the running voltage/current automatically and prevent frequent over-voltage/current tripping during the running process	
	Quick current limit	Minimize the over-current fault, protect normal operation of the AC Drive	
	Torque limit & control	"Excavators" characteristics, automatically limit torque during operation, prevent frequent over-current tripping. Closed loop vector mode can realize the torque control.	
Personalized	Instantaneous stop non-stop	When instantaneous power off, voltage reduction is compensated through load feedback energy, which could make AC Drive keep running in a short period of time.	
	Rapid current limit	To avoid AC Drive frequent over-current fault.	
	Virtual IO	5 groups of virtual DI, DO to realize simple logic control	
	Timing control	Timing control function：set time range 0Min~6500.0Min	
	Multiple motor switch	4 groups of motor parameters, which can realize 4-motor switch control	
	Multi-threaded bus support	Support 4 kinds of field bus：RS485, CANlink, CANopen	
	Motor overheat protection	Select optional INDVS C1 analog input DI3x can accept the motor temperature sensor input(PT100、PT1000)	

	Multi-encoder support	Support difference, open collector, UVW, rotary transformer, sine cosine encoder etc.
	Programmable PLC	Select optional user programmable card, which can realize secondary development. Programming mode is compatible with INDVS Company PLC.
	Excellent backend software	Support AC Drive parameter operation and virtual oscilloscope function. AC Drive internal state graphic monitor can be realized through virtual oscilloscope.
Running	Running command channel	Three types of channels： operation panel reference, control terminal reference and serial communication port reference. These channels can be switched in various modes.
	Frequency source	There are totally eleven types of frequency sources, such as digital reference, analog voltage reference , analog current reference, pulse reference , MS speed, PLC, PID and serial port reference.
	Auxiliary frequency source	11 kinds of auxiliary frequency source which can flexible achieve auxiliary frequency tuning, frequency synthesis
	Input terminal	Standard： 6 digital input terminals, DI5 can be used as 100kHz high-speed input pulse. 3 analog input terminals which can be used as 0-10V voltage input or 0~20mA current input. Extended function： 4 digital input terminals;
	Output terminal	Standard： 2 digital output terminals, FM is high-speed pulse output terminal (can be choosen as open circuit collector type), support 0~10kHz square wave signal; 1 relay output terminal; 2 analog output terminals, support 0~20mA output current or 0~10V output voltage; Extended function： 1 digital output terminal; 1 relay output terminal ; 1 analog output terminal, support 0~20mA output current or 0~10V output voltage.
Keyboard operation	LED display	Realize parameter setting, status monitoring function
	OLED display	Optional device, which can offer Chinese / English operating content
	Keyboard potentiometer	Equipped with keyboard potentiometer or coding potentiometer
	Parameter copy	Realize parameter rapid copy through OLED operation panel
	Key lock & function selection	Realize button locking, define operation range for part of buttons to prevent operation fault.
	Protection function	It can implement power-on motor short-circuit detection, input / output phase loss protection, over current protection, over voltage protection, under voltage protection, overheating protection and overload protection.
	Optional parts	OLED operation panel, brake component, multi-function extended card 1.IO extended card 2.user programmable card, RS485 communication card,.communication card, CANlink communication card, CANopen communication card, differential input PG

		card, UVW differential input PG card, rotating AC Drive PG card, OC input PG card.
Environment	Using place	Indoor, and be free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapor, drip or salt.
	Altitude	Below 1000m
	Ambient temperature	-10 ℃ to +40 ℃ (Derating use when under ambient temperature of 40 ℃ to 50 ℃)
	Humidity	Less than 95%RH, without condensing
	Vibration	Less than 5.9m/s2 (0.6g)
	Storage temperature	- 10℃~ + 50℃

Chart 2.5

2.6 Braking Unit & Braking resistor list

Voltage (V)	AC Drive Power (KW)	Braking Unit Specification		Braking Rotation 10% ED
		W	Ω	
Single Phase 220V	0.4	80	200	125
	0.75	80	150	125
	1.5	100	100	125
	2.2	100	70	125
	4.0	300	50	125
Three Phase 380V	0.75	150	300	125
	1.5	150	220	125
	2.2	250	200	125
	4.0	300	130	125
	5.5	400	90	125
	7.5	500	65	125
	11	800	43	125
	15	1000	32	125
	18.5	1300	25	125
	22	1500	16	125
	30	2500	12.6	125
	37	3700	9.4	125
	45	4500	9.4	125
	55	5500	6.3	125
	75	7500	9.4/2	125
	93	9000	9.4/2	125
	11	11000	6.3/2	125

	132	13000	6.3/2	125
	160	16000	2.5	125
	185	18500	2.5	125
	200	20000	2.5	125
	220	22000	2.5/2	125
	250	25000	2.5/2	125
	280	28000	2.5/2	125
	315	32000	2.5/2	125
	355	34000	2.5/2	125
	400	42000	2.5/2	125
	450	45000	2.5/2	125
	500	52000	2.5/2	125

Chart 2.6

Chapter 3

Installation & Wiring

Chapter 3 Installation & Wiring

3.1 Mechanical Installation

3.1.1 Installation Environment Requirements

1) Ambient temperature-10℃~50℃.

2) Avoid electromagnetic interference and keep the unit away from the source of interference.

3) Prevent dropping water, steam, dust powder, cotton fiber or fine metal powder from invasion.

4) Prevent oil, salt and corrosive gas from entering it.

5) Avoid vibration. Vibration should be less than 0.6G. Keep away from punching machine etc.

6) Avoid high temperature, moisture or being wetted due to raining, with the humidity below 95%RH (non-condensing).

7) Prohibit the use in the dangerous environment where inflammable or combustible or explosive gas, liquid or solid exists.

3.1.2 Installation Clearance Requirements

The clearance that needs to be reserved varies with the power class of the 500 Series, as shown in the following figure.

Figure 3.1.2.1 Clearance around the 500 Series for installation

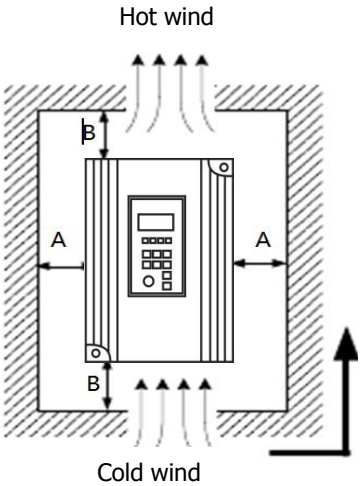


Fig. 3.1.2.1

Installation clearance requirements on the MD380 series AC drives of different power classes

Power Class	Clearance Requirements	
18.5kW~22kW	A≥10mm	B≥200mm
30kW~37kW	A≥50mm	B≥200mm
45kW~110kW	A≥50mm	B≥300mm

Chart 3.1.2

※ When transporting AC Drive , right lifting tools are required to prevent AC Drive

※ from damaging.

※ The number of stacked box of the AC Drive is not permitted higher than the limit.

※ Please don’ t run the AC Drive if there is damage or lacking of components.

※ Do not place heavy objects on the AC Drive .

※ Please prevent screw, cable pieces or other conductive objects or oil inflammable objects invading the AC Drive .

※ Do not make it fall or have a strong impact.

※ Confirm if the installation location and object could withstand the weight of the AC Drive .

The AC Drive must be installed by wall hooking、indoor room with adequate ventilation, with enough space left between it and the adjacent objects or **retaining board (walls) around, as shown in the picture below：**

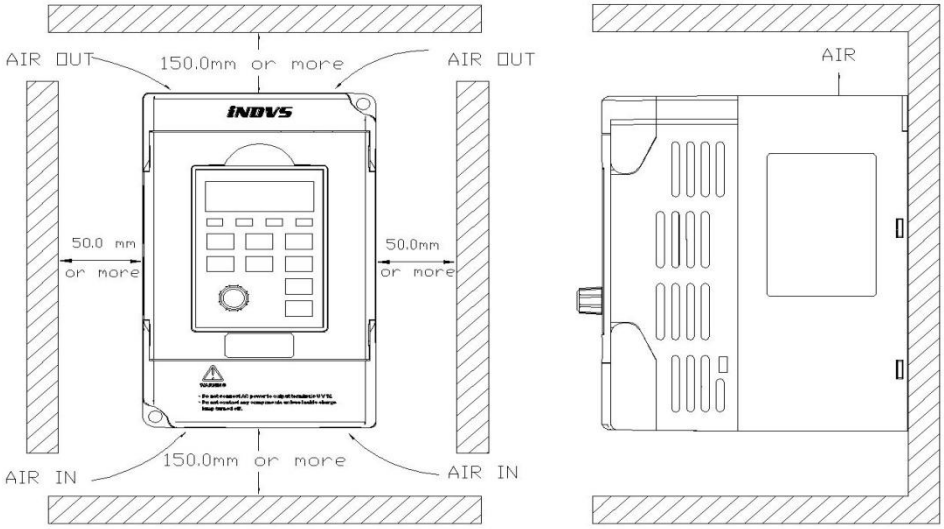


Fig. 3.1.2.2

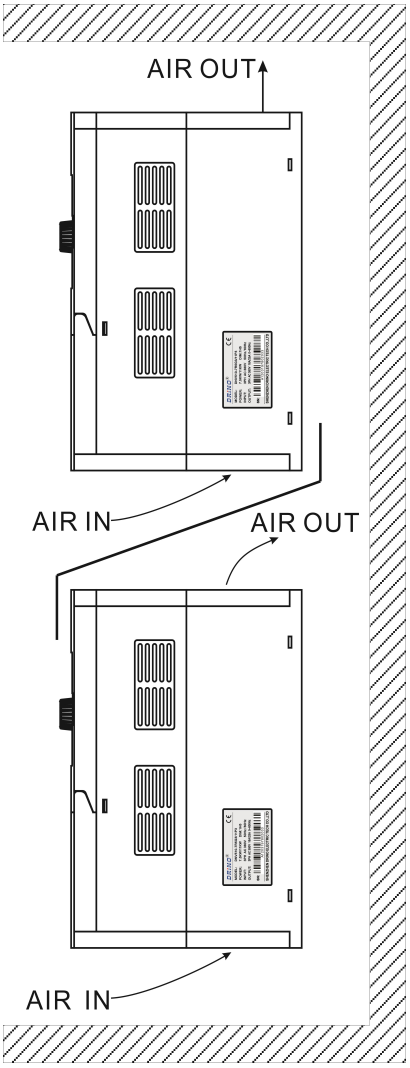


Fig. 3.1.2.3

Heat dissipation problems should be concerned when doing mechanical installation, please mind rules below：

1) Mounting space is shown in chart 3.1.2, which could ensure the heat sinking space of the AC Drive . However, the heat sinking of other devices in the cabinet shall also be considered.

2) Install the AC Drive vertically so that the heat may be expelled from the top. However, the equipment cannot be installed upside down. If there are multiple AC Drives in the cabinet, parallel installation is better. In the applications where up-down installation is required, please install the thermal insulating guide plate referring to the Fig. 3.2.1.2 and 3.1.2.3 for standalone installation and up-down installation.

3) Installing support must be flame retardant materials.

4) It is suggested that cooling cabinet be put outside at places where powder dust exists. Space inside the sealed cabinet shall be large as much as possible.

3.2 Electrical Installation

3.2.1 Description of Main Circuit Terminals

Terminal Name	Function description
R、S、T	Three phase power input terminal
P+、PB	Braking resistance reserved terminal(0.4KW~7.5KW)
U、V、W	Three phase AC output terminal
PE	Earth terminal

Chart . 3.2.1

3.2.2 Caution of Main Circuit wiring

1) Input Power R、S、T：

- AC Drive input side connection, no phase sequence requirements.
- The specifications and installation methods of the external power wiring should comply with the local regulations and related IEC standards.
- Please refer to the following table for power cable wiring：

AC Drive Model		Recommended breaker specifications	Recommended contactor specification	Recommended input side main loop wire (㎡)	Recommended output side main loop wire(㎡)	Recommended control loop wire(㎡)
Single Phase 220V	0.4KW	16	10	2.5	2.5	1.5
	0.75KW	16	10	2.5	2.5	1.5
	1.5KW	20	16	4	2.5	1.5
	2.2KW	32	20	6	4	1.5
Three Phase 380V	0.75KW	10	10	2.5	2.5	1.5
	1.5KW	16	10	2.5	2.5	1.5
	2.2KW	16	10	2.5	2.5	1.5
	4KW	25	16	4	4	1.5
	5.5KW	32	25	4	4	1.5
	7.5KW	40	32	4	4	1.5

※This chart is for reference only, not as a standard

Chart 3.2.2.1

500series AC Drive Lectotype guidance for peripheral electrical components

2）Brake resistance connection terminal（P+）、PB：

- The reference value of the brake resistance selection and the line distance should be less than 5m.Otherwise, the AC Drive may be damaged.

3） AC Drive output side U、V、W:

- The specifications and installation methods of the external power wiring should comply with the local regulations and related IEC standards.
- For power cable wiring, please refer to the wiring shown in Figure 3.2.3.
- The AC Drive side can not be connected to the capacitor or surge absorber, otherwise it will be caused to protect and even damage.
- When the motor cable is too long, because of the influence of distributed capacitance, it is easy to generate electric resonance, resulting in the insulation failure of motor, or the large leakage current, which makes the AC Drive overcurrent protection. When the length of the motor cable is more than 100m, the AC output reactor must be installed near the frequency converter.
- 4） Earthing terminal PE:
- The terminals must be reliably grounded, and the grounding wire must be less than 10 Omega. Otherwise, it will result in abnormal or even damage to the equipment work.
- Can not share the ground terminal and the power zero line N terminal.
- The impedance of a grounding conductor must be required to meet the requirements of a large short circuit current that may occur when a fault occurs.
- Protection of grounding conductors must be made of yellow green cable.

5） Requirements for the pre - stage protection device:

- Appropriate protective devices should be installed on the input distribution lines. Protection devices need to provide over current protection, short circuit protection and isolation protection and other functions.
- When selecting protective devices, factors such as power cable current capacity, system overload capacity and short-circuit capability of equipment before power distribution should

be considered. Generally, please choose according to recommended values in 3.2.3 table recommendation.

3.2.3 Description of Main Circuit Terminals

※ 1) Description of Main Circuit Terminals of Single-phase AC Drive

T/A	T/B	T/C	AO1	DI5	DI4	DI3	DI2	DI1	COM	GND	AI2	AI1	AM	10V

Mini 0.4kw-1.5kw AC Drive terminal

Chart 3.2.3.1

※ 2) Description of Main Circuit Terminals of Three Phase AC Drive

T/A	T/B	T/C	DI1	DI2	DI3	DI4	DI5	AO1	COM	10V	AM	AI1	AI2	-	+	GND

General 0.75kw-7.5kw AC Drive terminal

Chart 3.2.3.2

T/A1	T/B1	T/A	T/B	T/C	A01	AO2	DI1	DI2	DI3	DI4	DI5	OP
COM	COM	24V	FM	AM	AI1	AI2	10V	GND	GND	-	+	

General 11kw-500kw AC Drive terminal

Chart 3.2.3.3

3.3 Control circuit terminals description

500series Terminals function description：

Type	Terminal sign	Terminal Name	Function Description
Power supply	+10V-GND	External terminal of 10V power supply	Provide +10V power supply for external units, with maximum output current of 10mA. It is generally used as the operating power supply for the external potentiometer. The potentiometer resistance range is 1kΩ to 5kΩ.
	+24V-COM	External terminal Of 24V power supply	Provide +24V power supply for external units. It is generally used as the operating power supply for digital input/output terminal and the external sensor. Maximum output current： 200mA.

	SP	External power input terminals	When using external signal to drive DI1~DI6 ,SP should be connected to external power supply, connection with +24V as factory default.
Analog input	AI1-GND	Analog input terminal 1	1. Input voltage range： DC 0V to 10V /4mA to 20mA, chosen by jumper J3 on control board. 2. Input impedance： 22kΩ of voltage input, 500Ω of current input.
	AI2-GND	Analog input terminal 2	1. Input range：DC 0V~10V/4mA~20mA，chosen by jumper JP4 on control board. 2. Input impedance： 22kΩ of voltage input, 500Ω of current input.
	AI3-GND	Analog input terminal 3	1. Input range：DC 0V~10V/4mA~20mA，chosen by jumper JP5 on control board. 2. Input impedance： 22kΩ of voltage input, 500Ω of current input. 3. Factory default：J6 connected to 1-2 keyad keyboard potentiometer. If AI3 is needed to be connected, please jump 2-3. 4. When using extended function card AI3x, please take off J6.
Digital Input	DI1-SP	Digital Input 1	1. Optical coupling isolation，bipolar input. 2. Input impedance：4.7kΩ. 3. Electrical level input range：9V~30V.
	DI2-SP	Digital Input 2	
	DI3-SP	Digital Input 3	
	DI4-SP	Digital Input 4	
	DI5-SP	Digital Input 5	1. Input impedance：2.4 kΩ.
	DI6-SP	Digital Input 6	-
	HDI DI5-SP	High-speed pulse input terminal	DI5 can be used as high-speed pulse input channel. Maximum input frequency：100kHz.
Analog output	AO1-GND	Analog output 1	The voltage or current output is determined by jumper J1 on the control panel. Output voltage range： 0V to 10V. Output current range： 0mA to 20mA.
	AO2-GND	Analog output 2	The voltage or current output is determined by jumper J2 on the control panel. Output voltage range： 0V to 10V. Output current range： 0mA to 20mA.
Digital Output	DO1-COM	Digital output 1	Optical coupling isolation, dual polarity open collector output. Output voltage range：0V to 24V. Output current range：0mA to 50mA.
	FM-COM	High-speed pulse output	When used as high-speed pulse output , maximum frequency can reach 100kHz. Function code P5.00 as constraints.
Relay output	TB1-TC1	Normally closed	Contact driving capacity：AC250V，3A，COSø=0.4.
	TA1-TC1	Normally open	
Auxiliary	J12	Extended function card interface	28 needle terminals , for selectable card please refer to interface configuration, table 3-3.3.

interface	J13	PG card interface	14 needle terminals , for selectable card please refer to interface configuration, table 3-3.3.
	J7	External keyboard interface	External keyboard.

3.4 Terminal wiring diagram

3.4.1 Single Phase wiring type

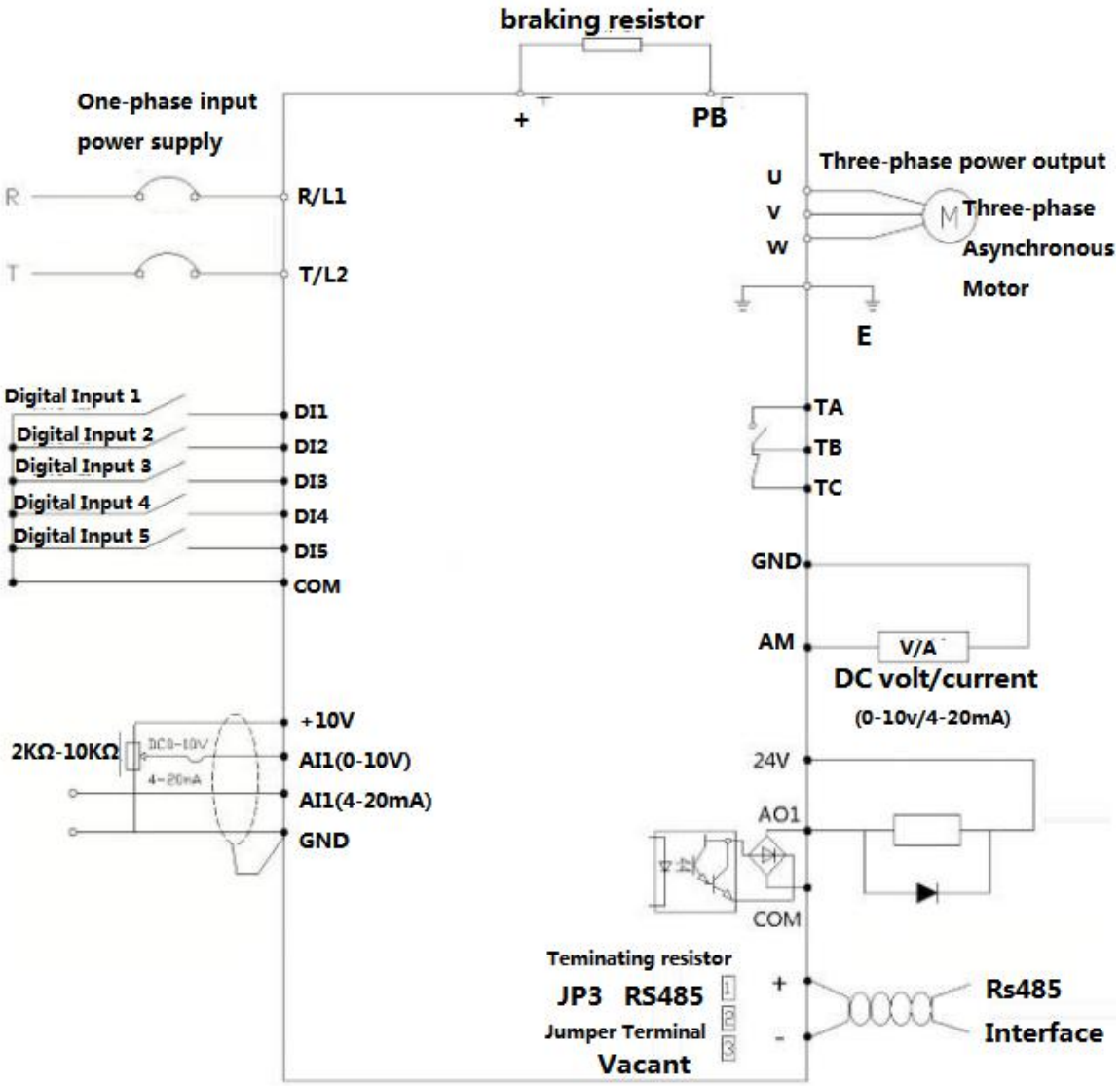


Fig. 3.4.1

3.4.2 Three Phase wiring type

3.4.2.1 General 0.75kw-7.5kw AC Drive wiring type

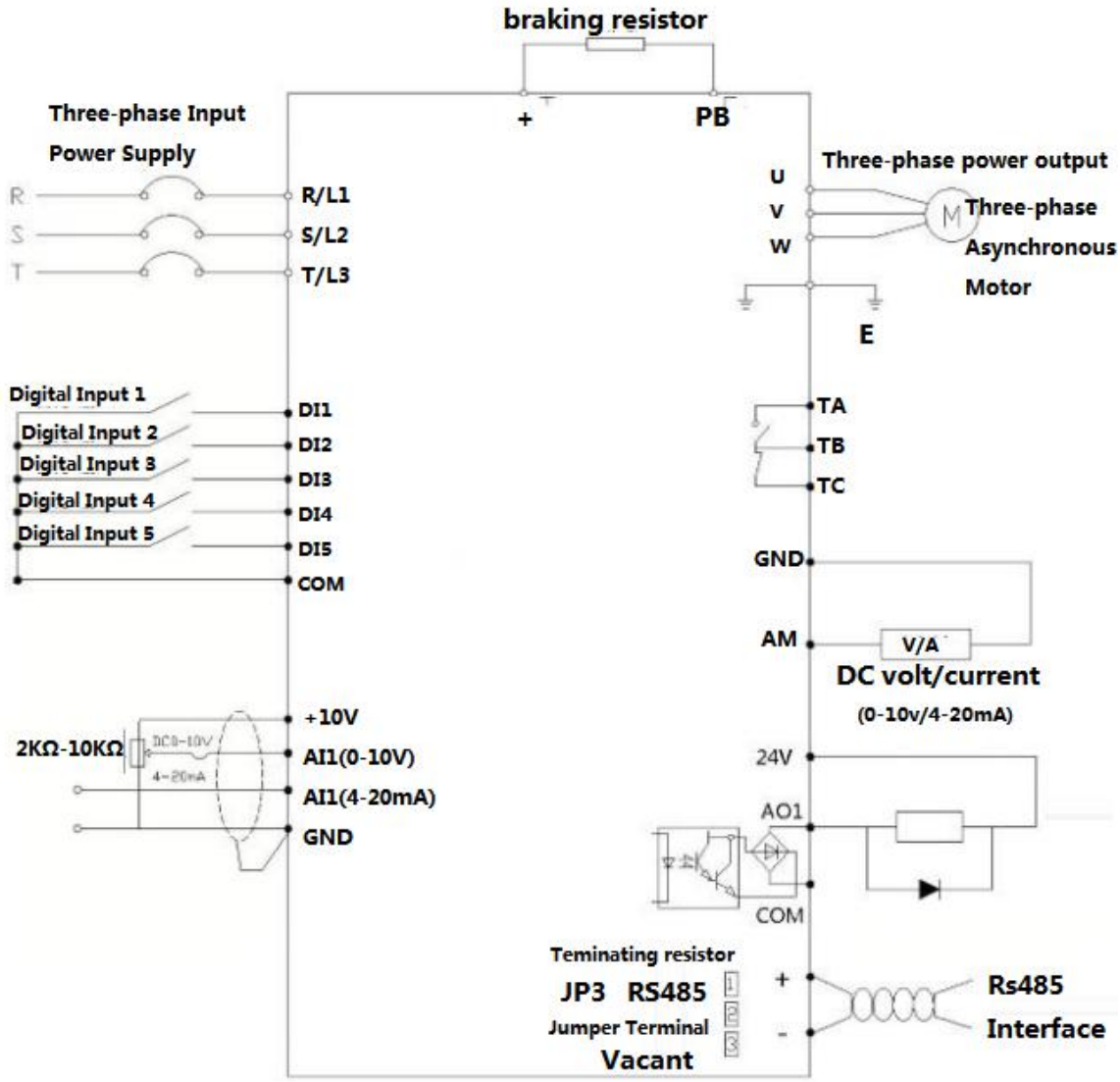


Fig. 3.4.2.1

3.4.2.2 General 11kw-500kw AC Drive terminal wiring type

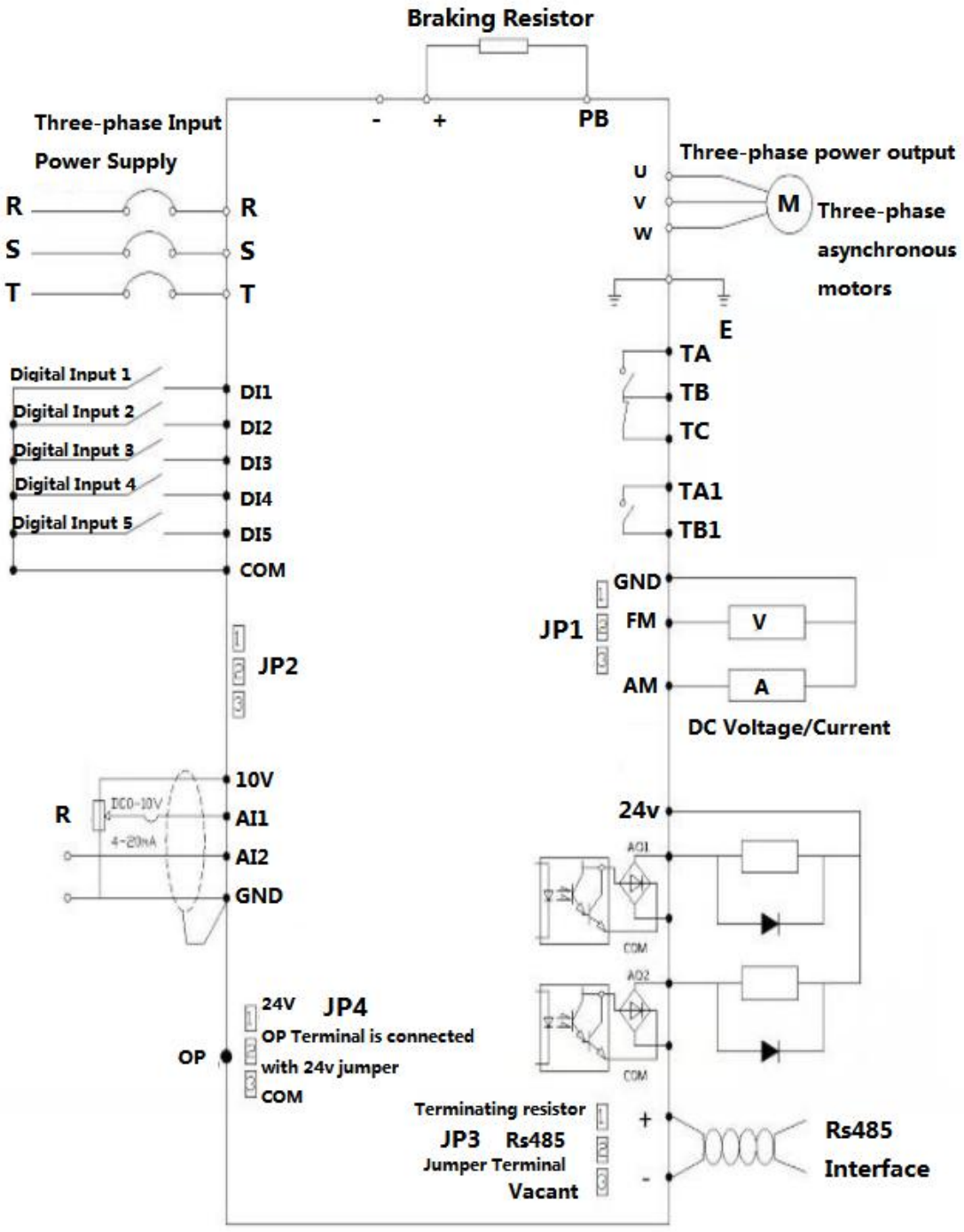


Fig. 3.4.2.2

Chapter 4

Keyboard operation instructions

Chapter 4. Keyboard operation instructions

4.1 Operation Panel

You can modify the parameters, monitor the working status and start or stop the 500 series by operating the operation panel, as shown in the following figure.

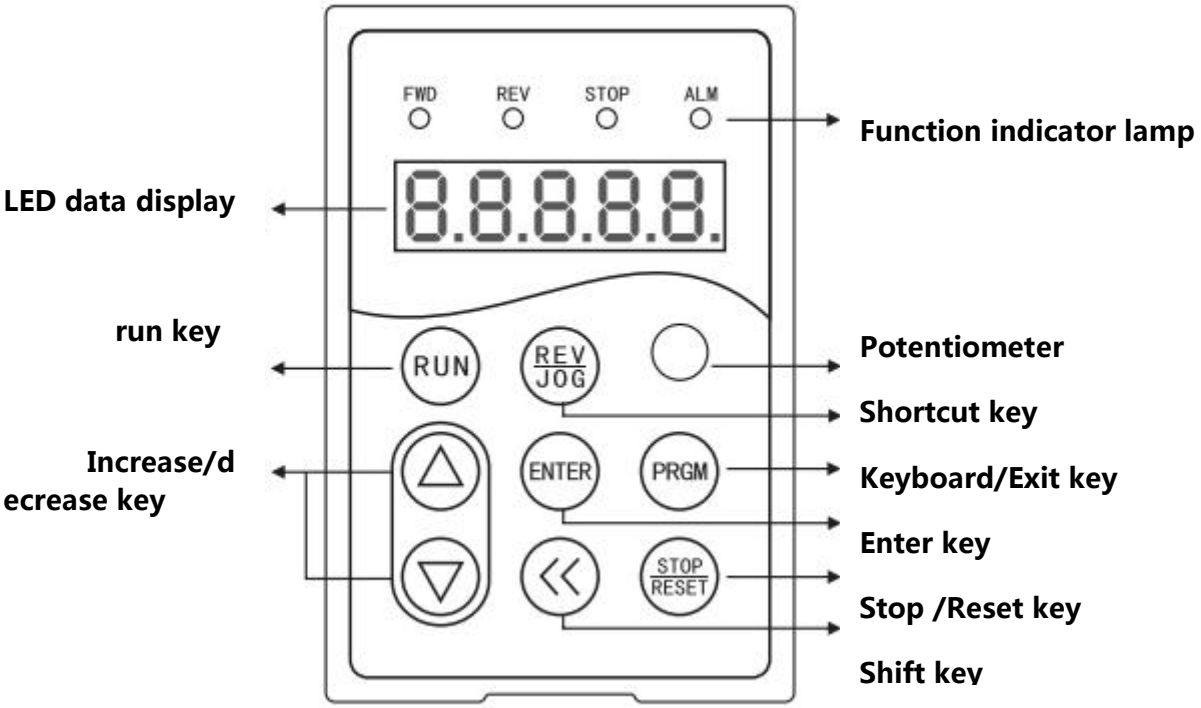


Fig. 4.1.1

4.1.1 Function indicator lamp instructions

- FWD：ac drive **forward indicator** lighting
- REV：ac drive **reset indicator** lighting
- STOP：ac drive **pause indicator** lighting
- ALM :ac drive **fault indicator** lighting

4.2 Description of Keys on the Operation Panel

Key sign	Name	Function description
PRGM	Program	Enter or exit Level I menu.
ENTER	Confirm	Enter the menu interfaces level by level, and confirm the parameter setting.
▲	Increase	Increase the data or the function code.
▼	Decrease	Decrease the data or the function code.
<<	Shift	Select the displayed parameters in turn in the stop or running state, and select the digit to be modified when modifying parameters.
RUN	Run	Start the AC drive in the operation panel control mode.
STOP/ RESET	stop/reset	Stop the AC drive when it is in the running state and perform the reset operation when it is in the fault state. The functions of this key are restricted in **P7-02**.
REV/JOG	Multi-function selection	Perform function switchover (such as quick switchover of command source or direction) according to the parameter named **P7-01**.

4.2.1 parameter setting

The three level menus are：

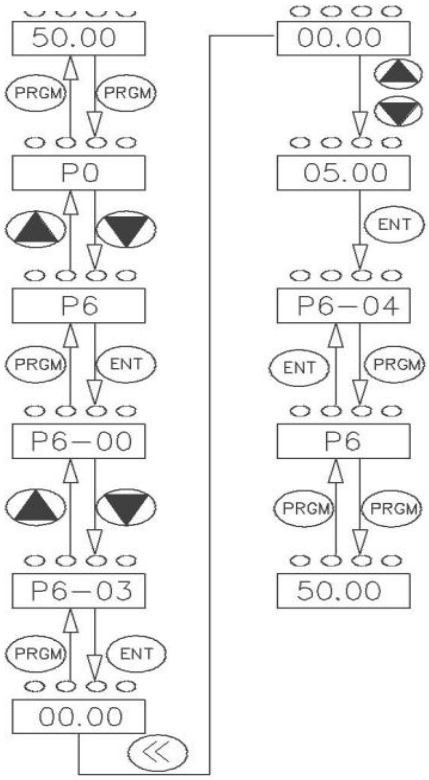
1、 Function code number（Level I）

2、 Function code marking（Level II）

3、 Function code set value（Level III）

Notes：When operating on the three level menu, the Level II can be returned by **PRGM** or **ENT.** The difference between them is: according to **ENT**, set the parameters into the control panel, then return to the level II, and automatically transfer to the next function code: **PRGM** directly returns to the level II, does not store parameters, and stays in the current function code.

E.G.：Change the function code **P6-03** from 00.00 to 05.00:



Three level menu operation chart

Fig. 4.2.1

In the state of the level III, if the parameter does not have a flashing bit, it indicates that the function code can not be modified,This may be because:

1.Such a function code is only readable, such as, AC drive model, actually detected parameter and running record parameter.

2,Such a function code cannot be modified in the running state and can only be changed at stop.

4.2.2 Self learning of motor parameter

The method of obtaining the internal electrical parameters of the controlled motor by the AC Drive has：Dynamic tuning、Static tuning 1、Static tuning 2、Manual input of motor parameters.

The self - learning operation steps of the motor parameters are as follows：

The 1st step：If the motor can completely disconnect with the load, in the case of power failure, the motor will be detached from the mechanical motor and the load part, so that the motor can be freely rotated.

The 2nd step：After power-on, the AC Drive command source **(P0-02)** is selected as the command channel of the operation panel.

The 3rd step：Input the nameplate parameters of the motor (such as P1-00 to P1-05) correctly, please input the following parameters according to the actual parameters of the motor:

	Parameter	
Input according to the motor nameplate	**P1-00**: motor type select	**P1-01**: motor rated power
	P1-02: motor rated voltage	**P1-03**: motor rated current
	P1-04: motor rated power	**P1-05**: motor rated revolving speed

Chart 4.2.2

The 4th step: if it is asynchronous motor, then **P1-37** please select 2 (complete tuning of the asynchronous machine), press ENTER key,meanwhile the keyboard displays TUNE. Then press the RUN key on the keyboard panel, the AC Drive will drive the motor to increase or decelerate, and turn it into operation. The running indicator lights up, and the tuning operation duration is about 2 minutes. When the above display information is gone, it returns to the normal parameter display state, indicating that the tuning is completed.

After this complete tuning, the AC Drive automatically calculates the following parameters of the motor：

	Parameter
Motor	P1-06: Stator resistance of asynchronous motor
	P1-07: Rotor resistance of asynchronous motor
	P1-08: The leakage inductance of asynchronous motor
	P1-09: Induction motor mutual inductance
	P1-10: Asynchronous motor no-load current

Chart 4.2.3

If the motor can not be completely removed from the load，parameter **P1-37** please choose **3**（asynchronous motorStatic tuning 2），Then press the **RUN** key on the keyboard panel to start the tuning of the motor parameters.

Chapter 5

Operation Cases and Descriptions

Chapter 5 Operation Cases and Descriptions

5.1 Keyboard Panel Run, Stop, Up, Down for Speed

Parameter Settings:

P0-02=0 (Factory Default)

P0-03=0 (Digital setting, Frequency setting is Parameter **P0-08**; Power-down does not remember)

P0-03=1 (Digital setting, Frequency setting is Parameter **P0-08**; Power down memory)

Speed Control: Press "▲" key to increase Frequency, "▼" key to decrease Frequency

5.2 Keyboard start, stop; keyboard potentiometer for speed control

Parameter Settings:

P0-02=0 (Factory Default)

P0-03=4 (Factory Default)

Start, stop: press "RUN" key FWD indicator light On to Run; press "STOP / RESET" key to stop;

If you want the keyboard to Forward and Reverse, set **P7-01 = 2** and press the (REV / JOG) key. REV indicator light On.

Speed control: panel potentiometer knob (clockwise frequency increase, counterclockwise is the opposite)

5.3 External terminal Run, Stop; External potentiometer for Speed

Parameter Settings:

P0-02=1 P0-03=2

Start, stop: "**DI1-COM**" short-circuit frequency "FWD" indicator light On;

"**DI2-COM**" short-circuit "REV" indicator light On;

The AC Drive stops when the **DI1-DI2** terminal is disconnected from **COM**.

Speed control: Rotate the external potentiometer (**10V AI1 GND**)

If the AC Drive is powered up, set **P8-18 = 0** (start protection selection)

5.4 External terminal Run, Stop; external analog voltage signal speed control (0-10V)

Parameter Settings:

P0-02=1 P0-03=2

Start, stop: "**DI1-COM**" short-circuit frequency "FWD" indicator light On;

"**DI2-COM**" short-circuit "REV" indicator light On;

The AC Drive stops when the **DI1-DI2** terminal is disconnected from **COM.**

Speed control: Analog voltage signal (**AI1 GND**- "0-10V or 0-5V voltage signal)

Analog voltage signal linearity adjustment parameters in the **P4-13 --- P4-17**, generally do not need to adjust

5.5 External terminal Run, Stop; External analog current signal speed (4-20MA)

Parameter Settings:

P0-02=1 P0-03=3

Start, stop: "**DI1-COM**" short-circuit frequency "FWD" indicator light On;

"**DI2-COM**" short-circuit "REV" indicator light On;

The AC Drive stops when the **DI1-DI2** terminal is disconnected from **COM**.

Speed control: Analog current signal (AI2 GND- "4-20MA analog current signal)

Analog current signal linearity adjustment parameters in the **P4-18 --- P4-22**, generally do not need to adjust.

5.6 External terminal up, down key to control speed

Panel Start:

Parameter Settings:

P0-02=0 P0-03=0 P4-00=6 P4-01=7

Start and stop: Press "RUN" key FWD operation indicator light On, press (REV / JOG) key REV indicator light (set **P7-01 = 2**); Press (STOP / RESET) to stop the AC Drive.

Speed control: (**DI1 --- COM**) Short-circuit speed increases, (**DI2-COM**) short-circuit speed decreases

External start:

Parameter Settings:

P0-02=1 P0-03=0 P4-00=6 P4-01=7 P4-02=01 P4-02=02

Start, stop: "**DI3-COM**" shorted FWD indicator light On, the AC Drive is running;

"**DI4-COM**" shorted REV indicator light On, the AC Drive is running; otherwise the AC Drive stops.

Speed control: (**DI1-COM**) Short-circuit speed increases, (**DI2-COM**) Short-circuit speed decreases.

If you need frequency memory function: **P0-23=1**

5.7 Multi-speed setting of AC Drive

Panel Start:

P0-02=0 P0-03=6 P4-00=12 P4-01=13 P4-02=14 P4-00=15

(P4 parameter group definition multi-speed function, 12 for multi-step speed 1, 13 for multi-step speed 2, 14 for multi-speed 3, 15 for multi-speed 4; 4 terminals can be combined into 16 speeds)

Start, stop: press "RUN" key, FWD indicator light On, AC Drive run; press REV/JOG key, REV indicator light on, (Set **P7-01=2**); Press STOP/RESET key, AC Drive stops.

External start:

P0-02=1 P0-03=6 P4-00=12 P4-01=13 P4-02=14 P4-03=15 P4-04=01

Start, Stop: "**DI1-COM** "terminal short-circuit to start operation, disconnect the AC Drive to stop running.

Speed control: Define the multi-speed terminal and **COM** short circuit, AC Drive display frequency.

Multi-speed table:

4 multi-segment instruction terminals can be combined into 16 states, The 16 states correspond to 16 instruction sets, as shown in Table 1:

Table 1 Multi-segment Instruction Function Description

K4	K3	K2	K1	Instruction set	Corresponding parameters
OFF	OFF	OFF	ON	Multi - segment instruction 1	**PC-01**
OFF	OFF	ON	OFF	Multi - segment instruction 2	**PC-02**
OFF	OFF	ON	ON	Multi - segment instruction 3	**PC-03**
OFF	ON	OFF	OFF	Multi - segment instruction 4	**PC-04**
OFF	ON	OFF	ON	Multi - segment instruction 5	**PC-05**
OFF	ON	ON	OFF	Multi - segment instruction 6	**PC-06**
OFF	ON	ON	ON	Multi - segment instruction 7	**PC-07**

ON	OFF	OFF	OFF	Multi - segment instruction 8	**PC-08**
ON	OFF	OFF	ON	Multi - segment instruction 9	**PC-09**
ON	OFF	ON	OFF	Multi - segment instruction 10	**PC-10**
ON	OFF	ON	ON	Multi - segment instruction 11	**PC-11**
ON	ON	OFF	OFF	Multi - segment instruction 12	**PC-12**
ON	ON	OFF	ON	Multi - segment instruction 13	**PC-13**
ON	ON	ON	OFF	Multi - segment instruction 14	**PC-14**
ON	ON	ON	ON	Multi - segment instruction 15	**PC-15**

Chart 5.7.1

When the frequency source is selected as multi-speed,function code **PC-00~PC-15** 100.0%, corresponds to the maximum frequency **P0-10.** Multi-segment instructions in addition to multi-speed function, but also can be used as a PID source, Or as a voltage source for V / F separation control, to meet the need to switch between different setpoints.

Table 2 Acceleration / deceleration time selection terminal function description

Terminal 2	Terminal 1	Acceleration or deceleration time selection	Corresponding parameters
OFF	OFF	Acceleration time 1	**P0-17、P0-18**
Terminal 2	Terminal 1	Acceleration or deceleration time selection	Corresponding parameters
OFF	ON	Acceleration time 2	**P8-03、P8-04**
ON	OFF	Acceleration time 3	**P8-05、P8-06**
ON	ON	Acceleration time 4	**P8-07、P8-08**

5.8 AC Drives three-wire system settings

P4-11	Terminal command mode		Factory default	0
	Predetermined area	0	Two-wire type 1	
		1	Two-wire type 2	
		2	Three-wire type 1	
		3	Three-wire type 2	

Chart 5.8.1

This parameter defines four different ways of controlling the AC Drive to run via external terminals.

0：Two-wire mode 1: This mode is the most commonly used two-wire mode. The terminals **DI1, DI2** are used to determine the forward and reverse run of the motor. The function

Function code	Name	Settings	Function description
P4-11	Terminal command mode	0	Two-wire type 1
P4-00	**DI1** Terminal function selection	1	Running Forward (FWD)
P4-01	**DI2** Terminal function selection	2	Reverse run (REV)

Chart 5.8.2

code is set as follows:

K1	K2	Running Command
0	0	Stop
0	1	Reverse
1	0	Forward
1	1	Stop

Chart 5.8.3

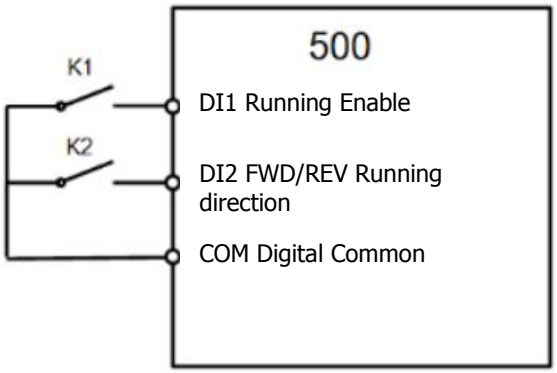


Fig.5.8.1

As Figure 5.8.1 shows, in this control mode, K1 close, the AC Drive is running forward. K2 close, reverse run. K1, K2 are closed or disconnected at the same time, the AC Drive stop running.

1: Two-wire mode 2: In this mode, the **DI1** terminal function is the run enable terminal，The **DI2** terminal function determines the direction of running. The function code is set as follows:

Function code	Name	Settings	Function description
P4-11	Terminal command mode	1	Two-wire type 2
P4-00	DI1 Terminal function selection	1	Running enable
P4-01	DI2 Terminal function selection	2	Forward and reverse direction of running

Chart 5.8.4

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

Chart 5.8.5

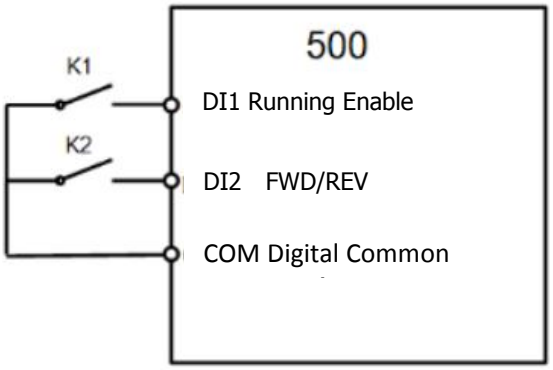


Fig.5.8.2

As Figure 5.8.2 shows, in this control mode, K1 close, K2 disconnect, the AC Drive is running forward. K2 close, reverse run. K1 disconnected, the AC Drive stop running.

2: Three - wire control mode

1: This mode **DI3** is the enable terminal, the directions are controlled by **DI1,DI2**. The function code is set as follows:

Function code	Name	Settings	Function description
P4-11	Terminal command mode	2	Three-wire type 1
P4-00	**DI1** Terminal function selection	1	Forward running (FWD)
P4-01	**DI2** Terminal function selection	2	Reverse running (REV)
P4-02	**DI3** Terminal function selection	3	Three - wire operation control

Chart 5.8.6

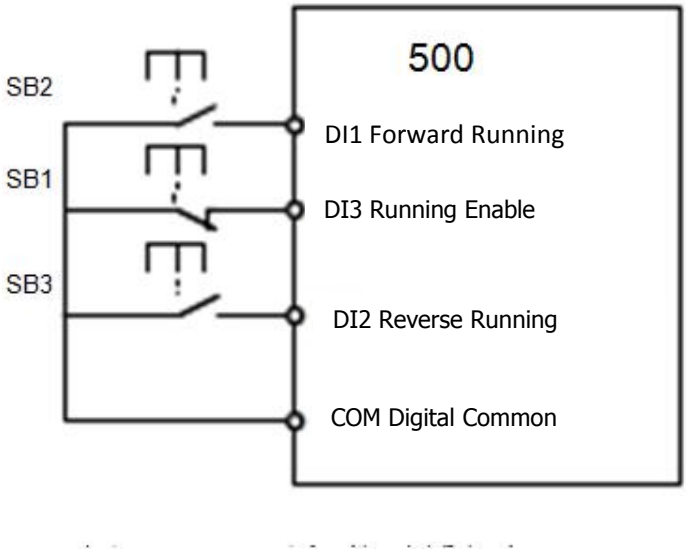


Fig. 5.8.3

As Fig 5.8.3 shows, in this control mode, when the SB1 button is closed, press the SB2 button to turn the AC Drive forward, press the SB3 button to turn the AC Drive reverse, SB1 button turns off the moment the AC Drive stops. Normal start and run, you must keep the SB1 button closed.

SB2, SB3 button command is in the closed action along the entry into force. The operating status of the AC Drive is based on the last button action of the three buttons.

3. Three - wire control mode 2: In this mode, DI3 is the enable terminal, and the run command is given by **DI1**, The direction is determined by the state of **DI2**. The function code is set as follows:

Function code	Name	Settings	Function description
P4-11	Terminal command mode	3	Three-wire type 2
P4-00	**DI1** Terminal function selection	1	Run enable
P4-01	**DI2** Terminal function selection	2	Forward and Reverse direction of running
P4-02	**DI3** Terminal function selection	3	Three - wire operation control

Chart 5.8.7

K	Running direction
0	FWD
1	REV

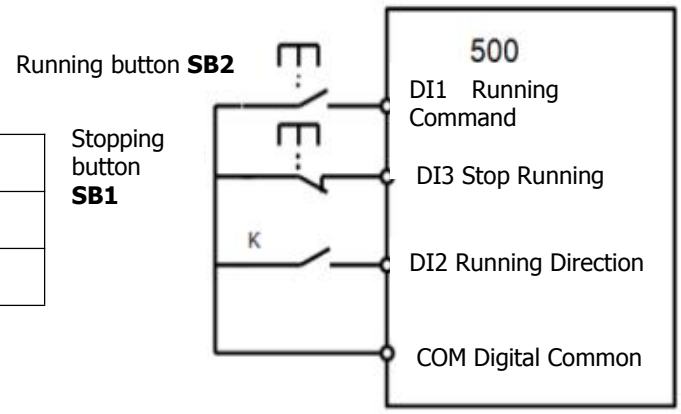


Fig 5.8.4

As Table 5.8.4 shows, in this control mode, when the SB1 button is closed, press the SB2 button to turn the AC Drive running, K disconnected, the AC Drive running forward. K closed, the AC Drive reverse. SB1 button turns off the moment the AC Drive stops. Normal start and run, you must keep the SB1 button closed. SB2 button command is in the closed action along the entry into force.

5.9 AC Drive PID function application (Air compressor, water pump and other constant pressure load applications)

Parameter settings:

P0-02=0 or 1 (Panel start or external start)

P0-03=8 (The frequency given is PID)

PA-00=0 (PID Given source)

PA-01 (PID Given value---- Set according to the size of the pressure gauge or transmitter range and the actual needs)

PA-02=0 or 1 (PID Feedback source----- Select 0 General External Remote Pressure Gauge; Select 1 General External Pressure Transmitter)

Wiring:

Remote pressure gauge: 10V AI1 GND

Pressure Transmitters: 10V AI2 or 24V AI2; Shor circuit COM and GND

5.A The keyboard is running display the parameter settings

Parameter:

P7-03 (LED Running display parameters)

Note: This parameter sets the display status of the AC Drive in the running state (BIT00----- BIT15, total 16 states) , With 4 hexadecimal representation, One bit hexadecimal means 4-bit binary (2 is represented by 0 1, 0 indicates that this state is not displayed，1 indicates that this status is displayed.)

For example, **F7-03=H**.000F,means BIT00----BIT03 is “1111” -----BIT00—BIT03 These four states can be displayed in the running state, you can switch through the "《" button; (Binary 1111 is represented by hexadecimal "F"). That is, the frequency converter in the running state shows the operating frequency, set frequency, bus voltage, output voltage.

5.B The keyboard only shows the speed

Parameter:

P7-03=H.4000

P7-06=6(Indicates that the motor is a 2-pole motor，Speed display 3000)

P7-06=3.000(Indicates that the motor is a 4-pole motor，Speed display 1500)

P7-06=2.000 （Indicates that the motor is a 6-pole motor，Speed display 1000）

Note:

1. H.4000 Convert to binary is“0100 0000 0000 0000”ie: BIT14=1（BIT14= Load speed display）；

2. Because we drag the motor is generally asynchronous motor, there is a slip or the load itself involves a change in the speed ratio, so the **P7-06** parameter settings are generally set to a few points, let it more accurately reflect the actual load speed.

Chapter 6

Function Code Table

Chapter 6 Function Code Table

Group P and Group A are standard function parameters. Group U includes the monitoring function parameters.

The symbols in the function code table are described as follows:

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

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

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

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

6.1 Standard Function Parameters

Function code	Name	Setting Range	Factory Setting	property
P0 Standard Function Parameters				
P0-00	Reserved	Reserved	Reserved	
P0-01	Motor control mode	0 : Speed sensorless vector control (SFVC) 1 : Closed-loop vector control (CLVC) 2 : Voltage/Frequency (V/F)	2	★
P0-02	Command source selection	0 : Operation panel control (LED off) 1 : Terminal control (LED on) 2:Communication control (LED blinking)	0	☆
P0-03	Main frequency source X selection	0:Digital setting (non-retentive at power failure) 1 : Digital setting (Pre-frequency as **P0-08** , UP/DOWN could be changed , retentive at power failure)	1	★

		2：AI1 3：AI2 4：Keyboard potentiometer 5：reserved 6：Multi-reference 7：simple PLC 8：PID 9：Communication setting		
P0-04	Auxiliary frequency source Y selection	Same as **P0-03**(Main frequency source X selection)	0	★
P0-05	Auxiliary frequency source Y range selection	0：Relative to maximum frequency 1：Relative to frequency source X	0	☆
P0-06	Auxiliary frequency source Y range	0% ~ 150%	100%	☆
P0-07	Frequency source stacking selection	Unit's digit Frequency source selection 0：Main frequency source X. 1：Main / auxiliary operation result (10bit determine operation relationship) 2：Switching between X & Y 3：Switching between X & option 1 4：Switching between Y & option 1 Ten's digit ：Relationship between main / auxiliary frequency source 0：Main+auxiliary 1：Main-auxiliary 2：MAX(main frequency source X, auxiliary frequency source Y) 3：MIN(main frequency source X, auxiliary frequency source Y)	00	☆
P0-08	Preset frequency	0.00Hz ~Max frequency（**P0-10**）	50.00Hz	☆
P0-09	Running direction	0：Same direction	0	☆

		1：Reverse direction		
P0-10	Max frequency	50.00Hz ~ 500.00Hz	50.00Hz	★
P0-11	Source of frequency upper limit	0:setting by **P0-12** 1：AI1 2：AI2 3：Keyboard potentiometer 4：reserved 5：communication setting	0	★
P0-12	Frequency upper limit	Frequency lower limit (**P0-14**) to maximum frequency (**P0-10**)	50.00Hz	☆
P0-13	Frequency upper limit offset	0.00Hz ~Max frequency (**P0-10**)	0.00Hz	☆
P0-14	Frequency lower limit	0.00Hz ~frequency upper limit (**P0-12**)	0.00Hz	☆
P0-15	Carrier frequency	0.5kHz ~ 16.0kHz	6	☆
P0-16	Carrier frequency adjusting with temperature	0：NO 1：YES	1	☆
P0-17	Acceleration time 1	0.0s ~ 6500.0s	20	☆
P0-18	Deceleration time 1	0.0s ~ 6500.0s	20	☆
P0-19	Acc./dec. time unit	0：1 s 1：0.1 s 2：0.01 s	1	★
P0-21	Auxiliary frequency source offset frequency	0.00Hz ~Max frequency(**P0-10**)	0.00Hz	☆
P0-22	Frequency command resolution	1：0.1HZ 2：0.01Hz	2	★
P0-23	Digital setup frequency memory selection upon stop	0：Without memory 1：memory	0	☆
P0-24	reserved	Reserved	Reserved	-
P0-25	Acceleration / deceleration	0: Maximum frequency(P0.10) 1：Setting frequency	0	★

	reference frequency	2：100Hz		
P0-26	Frequency UP/DOWN reference upon running	0：Running frequency 1：Setting frequency	0	★
P0-27	Command source & frequency source binding	Unit's digit：Operation panel command bound frequency source selection 0：Without binding 1：Digital setup frequency source 2：AI1 3：AI2 4：AI3(Potentiometer) 5：Reserved 6：Multi-reference 7：Simple PLC 8：PID 9：Communication setup Ten's digit ：Terminal command bound frequency source selection Hundred's digit：Communication command bound frequency source selection Thousand's digit: Self-running bound frequency source selection	0	☆
P0-28	Communication expansion card	0：Modbus protocol 1：reserved	0	☆

P1 Motor parameter

Function code	Name	Setting Range	Factory Setting	property
P1-00	Motor type selection	0：General asynchronous motor 1：Variable frequency asynchronous motor	0	★
P1-01	Rated power	0.1kW～1000.0kW	Model dependent	★
P1-02	Rated voltage	1V ～ 2000V	Model	★

			dependent	
P1-03	Rated current	0.01A～655.35A （AC drive power≤55kW） 0.1A～6553.5A（AC drive power>55kW）	Model dependent	★
P1-04	Rated frequency	0.01Hz ～Max frequency	50Hz	★
P1-05	Rated revolving speed	1rpm ～ 65535rpm	Model dependent	★
P1-06	Asynchronous motor stator resistance	0.001Ω～65.535Ω （AC drive power≤55kW 0.0001Ω～6.5535Ω （AC drive power>55kW）	Model dependent	★
P1-07	Asynchronous motor rotor resistance	0.001Ω～65.535Ω （AC drive power≤55kW） 0.0001Ω～6.5535Ω （AC drive power>55kW）	Model dependent	★
P1-08	Asynchronous motor leakage inductance	0.01mH～655.35mH （AC drive power≤ 55kW） 0.001mH～65.535mH （AC drive power> 55kW）	Model dependent	★
P1-09	Asynchronous motor mutual inductance	0.1mH～6553.5mH （AC drive power≤ 55kW） 0.01mH～655.35mH （AC drive power> 55kW）	Model dependent	★
P1-10	Asynchronous motor no load current	0.01A～P1-03 （AC drive power≤ 55kW） 0.1A～P1-03 （AC drive power > 55kW）	Model dependent	★
P1-11	**P1-11~P1-36**	Reserved	Reserved	-
P1-37	Tuning selection	0：Without operation 1：Asynchronous static tuning 1 2：Asynchronous complete tuning 3：Synchronous static tuning 2	0	★

P2 group Vector control function group

Function	Name	Setting Range	Factory	property

code			Setting	
P2-00	Speed loop proportional gain 1	1 ~ 100	30	☆
P2-01	Speed loop proportional gain 1	0.01s ~ 10.00s	0.50s	☆
P2-02	Switching frequency1	0.00 ~ P2-05	5.00Hz	☆
P2-03	Speed loop proportional gain 2	1 ~ 100	20	☆
P2-04	Speed loop integration time 2	0.01s ~ 10.00s	1.00s	☆
P2-05	Switching frequency 2	P2-02 ~Max frequency	10.00Hz	☆
P2-06	Vector control slip gain	50% ~ 200%	100%	☆
P2-07	Speed-loop filter time	0.000s ~ 0.100s	0.015s	☆
P2-08	Reserved	Reserved	Reserved	-
P2-09	Torque upper limit digital setup in speed control mode	0：function code (P1-10)setting 1：AI1 2：AI2 3：AI3(Potentiometer) 4：reserved 5：Communication setup 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) 1-7 Full range correspondence o P1-10	0	☆
P2-10	Torque upper limit digital setup in speed control mode	0.0% ~ 200.0%	150.0%	☆
P2-11	P2-11—P2-12	Reserved	Reserved	
P2-13	Excitation regulation proportional gain	0 ~ 60000	2000	☆
P2-14	Excitation regulation integration gain	0 ~ 60000	1300	☆

P2-15	Torque regulation proportional gain	0 ~ 60000	2000	☆
P2-16	Torque regulation integration gain	0 ~ 60000	1300	☆
P2-17	Speed loop integration attribute	Unit's digit: integral separation 0 : Invalid 1 : Valid	0	☆

P3 group V/F control parameter

Function code	Name	Setting Range	Factory Setting	property
P3-00	V/F curve setting	0 : Linear V/F 1 : Multi-point V/F 2 : Square V/F 3 : Power of 1.2 V/F 4 : Power of 1.4 V/F 6 : Power of 1.6 V/F 8 : Power of 1.8 V/F 9 : reserved 10 : VF complete separation mode 11 : VF semi separation mode	0	★
P3-01	Torque boost value	0.0% : (automatically Torque boost) 0.1% ~ 30.0%	Model dependent	☆
P3-02	Torque boost cut-off frequency	0.00Hz ~Max frequency	50.00Hz	★
P3-03	Multi-point V/F frequency point F1	0.00Hz ~ P3-05	0.00Hz	★
P3-04	Multi-point V/F voltage point V1	0.0% ~ 100.0%	0.0%	★
P3-05	Multi-point V/F frequency point F2	P3-03 ~ P3-07	0.00Hz	★
P3-06	Multi-point V/F voltage point V2	0.0% ~ 100.0%	0.0%	★
P3-07	Multi-point V/F frequency point F2	P3-05 ~rated frequency (P1-04)	0.00Hz	★
P3-08	Multi-point V/F	0.0% ~ 100.0%	0.0%	★

	voltage point V3			
P3-09	V/F slip compensation gain	0.0% ~ 200.0%	0.0%	☆
P3-10	V/F over-excitation gain	0 ~ 200	64	☆
P3-11	V/F oscillation suppression gain	0 ~ 100	40	☆
P3-12	Reserved	Reserved	Reserved	-
P3-13	V/F separation voltage source	0：Digital setting（**P3-14**） 1：AI1 2：AI2 3：AI3(Potentiometer) 4：reserved 5：MS command 6：Simple PLC 7：PID 8：Communication setup Note：100.0% corresponding to the rated motor voltage	0	☆
P3-14	V/F separation voltage digital setup	0V ~rated voltage	0V	☆
P3-15	Voltage rise time of V/F separation	0.0s ~ 1000.0s Note：It indicates the time for the voltage rising from 0 V to rated motor voltage.	0.0s	☆
P3-16	Voltage decline time of V/F separation	0.0s ~ 1000.0s Note：It indicates the time for the voltage rising from 0 V to rated motor voltage.	0.0s	☆
P3-17	Stop mode selection upon V/F separation	0：Frequency and voltage declining to 0 independently 1：Frequency declining after voltage declines to 0	0	☆
P3-18	Over current stall current	50~200%	150%	★

P3-19	Overflow stall	0 :invalid 1 :valid	1	★
P3-20	Over current stall inhibition gain	0~100	20	☆
P3-21	Speed flow compensation coefficient stall action current	50~200%	50%	★
P3-22	Over voltage stall voltage	650.0V~800.0V	730.0V	★
P3-23	Over voltage stall	0 invalid 、1 valid	1	★
P3-24	Over voltage stall suppression frequency gain	0~100	30	☆
P3-25	Over voltage stall suppression voltage gain	0~100	30	☆
P3-26	Maximum rise frequency limit of over voltage stall	0~50Hz	5Hz	★
P3-27	Reserved	Reserved	Reserved	☆

P4 group input terminal group

Function code	Name	Setting Range	Factory Setting	property
P4-00	DI1 terminal function selection	0：No function 1：Forward command (FWD) 2：Reverse command (REV) 3：Three line running control 4：FWD JOG command （PJOG） 5：REV JOG command （RJOG） 6：UP 7：DOWN	1	★
P4-01	DI2 terminal function selection		2	★

P4-02	DI3 terminal function selection	8：stop freely 9：fault reset（RESET） 10：pause 11：External default normally open input 12：Multi-reference terminal 1 13：Multi-reference terminal 2 14：Multi-reference terminal 3 15：Multi-reference terminal 4 16：Acc./dec.time selection terminal 1 17：Acc./dec.time selection terminal 2 18：Frequency source switching 19：UP/DOWN setup reset (terminal and keyboard) 20：Running command switching terminal 21：Acc./dec forbidden 22：PID pause 23：PLC reset 24：Swing frequency pause 25：Counter input 26：Counter reset 27：Length counting input 28：Length counting reset 29-31：reserved 32：immediate DC braking 33：External default normally closed input	9	★
P4-03	DI4 terminal function selection		12	★
P4-04	DI5 terminal function selection		13	★
P4-05	Reserved		0	★
P4-06	Reserved		0	★
P4-07	Reserved		0	★

P4-08	Reserved	34：Frequency modification enable 35：PID direction reversed 36：External stop terminal1 37：Control command switching terminal 2 38：PID integration suspension 39：Frequency source X and preset frequency switching 40：Frequency source Y and preset frequency switching	0	★
P4-09	Reserved	41：Motor selection terminal 42：reserved 43：PID parameter switching 44：reserved 45：reserved 46：Speed control/ torque control switching 47：emergency stop 48: External stop terminal 2 49：Deceleration DC braking 50：Clear the current running time 51：2-line type / 3-line type switching 52-59：reserved	0	★
P4-10	DI filter time	0.000s ~ 1.000s	0.010s	☆
P4-11	Terminal command mode	0：2-line type 1 1：2-line type 2 2：3-line type 1 3：3-line type 2	0	★
P4-12	Terminal UP/DOWN variation 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	-100.0% ~ +100.0%	0.0%	☆

	corresponding setup			
P4-15	AI curve 1 maximum input	P4-13 ~ +10.00V	10.00V	☆
P4-16	AI curve 1 maximum input corresponding setup	-100.0% ~ +100.0%	100.0%	☆
P4-17	AI1 filter 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 corresponding setup	-100.0% ~ +100.0%	0.0%	☆
P4-20	AI curve 2 maximum input	P4-18 ~ +10.00V	10.00V	☆
P4-21	AI curve 2 maximum input corresponding setup	-100.0% ~ +100.0%	100.0%	☆
P4-22	AI2 filter time	0.00s ~ 10.00s	0.10s	☆
P4-23	P4-23—P-32 reserved	Reserved	Reserved	
P4-33	AI curve selection	Unit digit：AI1 curve selection 1：curve 1（2 point，see the P4-13 ~ P4-16） 2：curve 2（2 point，see the P4-18 ~ P4-21） 3：curve 3（2 point，see the P4-23 ~ P4-26） 4：curve 4（4 point，see the A6-00 ~ A6-07） 5：curve 5（4 point，see the A6-08 ~ A6-15）	321	☆

		Tens' digit : AI2 curve selection , same as unit digit. Hundreds' digit : reserved		
P4-34	A1 below minimum input setup selection	Unit' s digit :AI1 below minimum input setup selection 0: Min input setting 1:0.0% Ten' s digit : AI2 below minimum input setup selection , same as AI1 Hundred' s digit : AI3 below minimum input setup selection , same as AI1	000	☆
P4-35	DI1 delay time	0.0s ~ 3600.0s	0.0s	★
P4-36	DI2 delay time	0.0s ~ 3600.0s	0.0s	★
P4-37	DI3 delay time	0.0s ~ 3600.0s	0.0s	★
P4-38	DI terminal valid mode selection 1	0 : high level valid 1 : low level valid Unit' s digit : DI1 Ten' s digit : DI2 Hundred' s digit : DI3 Thousand' s digit : DI4 Ten thousand' s digit : DI5	00000	★

P5 group output terminal (changeable)

Function code	Name	Setting Range	Factory Setting	property
P5-00	AO1 terminal output mode selection	1 : Pulse output(FMP) Switch output(FMR)	1	☆

P5-01	AO1 selection (open collector output terminal)	0：No output 1: AC Drive in operation 2: Output fault(Stop fault) 3: Frequency level detection FDT1 output 4: Frequency arrival 5: Null speed operation (stop without output) 6: Motor overload pre-alarm 7: AC Drive overload pre-alarm 8: Setup counting value arrived 9：Designated counting value arrived 10: Length arrived 11: PLC circulation end 12: Total running time arrived 13: Frequency limit 14: Torque limit 15: RUN ready 16: AI1>AI2 17: Frequency upper limit arrived 18: Frequency lower limit arrived (stop without output) 19:Undervoltage state output 20: Communication setup 21: Reserved 22: Reserved 23:Null speed operation 2 (Stop with output) 24: Total power-on time arrival 25: Inspection level of FDT2 frequency 26: Frequency 1 arrival output 27: Frequency 2 arrival output 28: Current 1 arrival output 29: Current 2 arrival output 30: Timing arrival output 31: AI1 excessive input	0	☆
P5-01	Relay output selection (TA1.TB1.TC1)		0	☆
P5-02	Expansion card relay output selection(TA2.TB2.TC2)		0	☆
P5-03	DO1 output selection(open collector output terminal)		0	☆
P5-04	Expansion card DO2 output selection		0	☆

		32: Load off 33：Reverse running 34: Zero current state 35: Module temperature arrival 36: Output excessive current 37: Frequency lower limit arrival (output valid when stop) 38: Alarm output 39: Motor over temperature alarm 40: The running time arrival 41：fault output (is the free stop fault also no-output when under-voltage)		
P5-05	**P5-05—P5-06**	Reserved	Reserved	☆
P5-07	AM output function selection	0：running frequency 1：setting frequency 2：output current 3：output torque (Absolute value of torque) 4：output power 5：output voltage 6：reserved 7：AI1 8：AI2 9：reserved 10：length 11：Counting value 12：Communication setup 13：Motor revolving speed 14：Output current (100.0% means 1000.0A) 15：output voltage (100.0% means 1000.0V) 16：output torque (actual value of torque)	0	☆
P5-08	FM output function selection		1	☆
P5-09	Reserved	Reserved	Reserved	-

P5-10	AM zero offset	-100.0% ~ +100.0%	0.0%	☆
P5-11	AM gain	-10.00 ~ +10.00V	1.00V	☆
P5-12	PM zero offset	-100.0% ~ +100.0%	0.0%	☆
P5-13	PM gain	-10.00 ~ +10.00V	1.00V	☆
P5-14	**P5-14—P5-16**	reserved	Reserved	-
P5-17	AO1 output delay time	0.0s ~ 3600.0s	0.0s	☆
P5-18	RELAY1 output delay time	0.0s ~ 3600.0s	0.0s	☆
P5-19	RELAY2 output delay time	0.0s ~ 3600.0s	0.0s	☆
P5-20	AO2 output delay time	0.0s ~ 3600.0s	0.0s	☆
P5-21	FM output delay time	0.0s ~ 3600.0s	0.0s	☆
P5-22	AO output terminal valid state selection	0：Positive logic 1:Negative logic Unit’s digit：AO1 Ten’s digit：delay 1 Hundred’s digit：relay 2 Thousand’s digit：AO2 Ten thousand’s digit：reserved	00000	☆
P5-23	Reserved	Reserved	Reserved	★

P6 group Start/stop control

Function code	Name	Setting Range	Factory Setting	property
P6-00	Start mode	0：straight start	0	
P6-01	P6-01—P6-02	Reserved	Reserved	-
P6-03	Start frequency	0.00Hz ~ 10.00Hz	0.00Hz	☆
P6-04	Start frequency lasting time	0.0s ~ 100.0s	0.0s	★
P6-05	Start dc braking current /pre-excitation current	0% ~ 100%	50%	★

P6-06	Start dc braking time /pre-excitation time	0.0s ~ 100.0s	0.0s	★
P6-07	Acceleration/ deceleration mode	0 : straight acc. /dec. Time 1 : S curve acc. /dec. mode A 2 : S curve acc. /dec. mode B	0	★
P6-08	Initial-segment time proportion of S-curve	0.0% ~ (100.0%-P6-09)	30.0%	★
P6-09	Finishing-segment time proportion of S-curve	0.0% ~ (100.0%-P6-08)	30.0%	★
P6-10	Stop mode	0 : decelerating stop 1 : free stop	0	☆
P6-11	DC braking initial frequency at stop	0.00Hz ~MAX Frequency	0.00Hz	☆
P6-12	DC braking waiting time at stop	0.0s ~ 100.0s	0.0s	☆
P6-13	DC braking current at stop	0% ~ 100%	0%	☆
P6-14	DC braking time at stop	0.0s ~ 100.0s	0.0s	☆
P6-15	Brake utilization ratio	0% ~ 100%	100%	☆
P6-16	**F6-16—F6-20**	Reserved	Reserved	-
P6-21	Degaussing time	0.00~5.00s	0.5s	★

P7 group Keyboard and display

Function code	Name	Setting Range	Factory Setting	property
P7-01	REV/JOG selection	0 : invalid 1 : Switching between operation panel command channel & the remote command channel (terminal command channel or serial port command channel) 2 : Switching between FWD & REV rotation 3 : Forward jog command	0	★

		4：Reverse jog command		
P7-02	STOP/RESET function	0：STOP/RES key is only valid when use the keyboard operation mode. 1：STOP/RES key is valid when use any operation mode.	1	☆
P7-03	LED running displayed parameter 1	0000 ~ PPPP Bit00: running frequency 1(Hz) Bit01: setting frequency (Hz) Bit02: Bus. voltage (V) Bit03: output voltage (V) Bit04: output current (A) Bit05: output power (kW) Bit06: output torque (%) Bit07: DI input state Bit08: AM output state Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: reserved Bit12: Counter Bit13: Length Bit14: Load speed display Bit15: PID setting	H.401F	☆
P7-04	LED running displayed parameter 2	0000 ~ PPPP Bit00：PID feedback Bit01：PLC phrase Bit02：reserved Bit03：running frequency 2（Hz） Bit04：The left running time Bit05：AI1 Pre-correction voltage (V) Bit06：AI2 Pre-correction voltage (V) Bit07：reserved Bit08：line speed Bit09：currently power-on time (Hour) Bit10：currently running time (Min) Bit11：reserved	H.0000	☆

		Bit12：communication setting value Bit13：reserved Bit14：Main frequency X display (Hz) Bit15：Auxiliary Y display (Hz)		
P7-05	LED stopped displayed parameter	0000 ~ PPPP Bit00：setting frequency (Hz) Bit01： Bus. voltage (V) Bit02：DI input state Bit03：AM output state Bit04：AI1 voltage (V) Bit05：AI2 voltage (V) Bit06：reserved Bit07：Counter Bit08：Length Bit09：PLC phrase Bit10：Load speed Bit11：PID setting Bit12：reserved	H.0033	☆
P7-06	Load speed displayed coefficient	0.0001 ~ 6.5000	1.0000	☆
P7-07	AC Drive module radiator temperature	0℃~ 120℃	-	●
P7-08	Rectifier module radiator temperature	-	-	●
P7-09	Accumulative running time	0h ~ 65535h	-	●
P7-10	Product ID	-	-	●
P7-11	Software version No.	-	-	●
P7-12	Load speed display decimal digits	Unit’s digit：U0-14 number of decimal place 0：0 decimal place 1：1 decimal place 2：2 decimal place 3：3 decimal place Ten’s digit：U0-19/U0-29 number of	21	☆

		decimal place 1 : 1 decimal place 2 : 2 decimal place		
P7-13	Accumulative power-on time	0 ~ 65535 h	-	●
P7-14	Accumulative power	0 ~ 65535 kw/h	-	●
P8 Group Auxiliary functions				
Function code	Name	Setting Range	Factory Setting	property
P8-00	JOG running frequency	0.00Hz ~MAX frequency	2.00Hz	☆
P8-01	JOG acceleration time	0.0s ~ 6500.0s	20.0s	☆
P8-02	JOG deceleration time	0.0s ~ 6500.0s	20.0s	☆
P8-03	Acceleration time 2	0.0s ~ 6500.0s	20.0s	☆
P8-04	Deceleration time 2	0.0s ~ 6500.0s	20.0s	☆
P8-05	Acceleration time 3	0.0s ~ 6500.0s	20.0s	☆
P8-06	Deceleration time 3	0.0s ~ 6500.0s	20.0s	☆
P8-07	Acceleration time 4	0.0s ~ 6500.0s	0.00s	☆
P8-08	Deceleration time 4	0.0s ~ 6500.0s	0.00s	☆
P8-09	Hopping frequency 1	0.00Hz ~MAX frequency	0.00Hz	☆
P8-10	Hopping frequency 2	0.00Hz ~MAX frequency	0.00Hz	☆
P8-11	Hopping frequency amplitude	0.00Hz ~MAX frequency	0.01Hz	☆
P8-12	Dead zone time of forward & reverse rotations	0.0s ~ 3000.0s	0.0s	☆
P8-13	Reverse rotation control	0 : allowed 1 : forbidden	0	☆
P8-14	Set frequency below lower limit running	0 : Run with frequency lower limit 1 : stop	0	☆

	mode	2 : No speed running		
P8-15	Droop control	0.00Hz ~ 10.00Hz	0.00Hz	☆
P8-16	Accumulative power-on time arrival setup	0h ~ 65000h	0h	☆
P8-17	Accumulative running time arrival setup	0h ~ 65000h	0h	☆
P8-18	Start protection selection	0 : No protect 1 : protect	0	☆
P8-19	Frequency detection value (FDT1)	0.00Hz ~MAX frequency	50.00Hz	☆
P8-20	Frequency detection hysteresis value (FDT1)	0.0% ~ 100.0% (FDT1 level)	5.0%	☆
P8-21	Frequency arrival detection amplitude	0.0% ~ 100.0% (MAX frequency)	0.0%	☆
P8-22	Acc./dec. hopping frequency validity	0 : invalid 1 : valid	0	☆
P8-23	P8-23--P8-24	Reserved	Reserved	
P8-25	Acc. time1 & acc. time 2 frequency switching point	0.00Hz ~MAX frequency	0.00Hz	☆
P8-26	Dec. time1 & dec. time 2 frequency switching point	0.00Hz ~MAX frequency	0.00Hz	☆
P8-27	Terminal jog priority	0 : invalid 1 : valid	0	☆
P8-28	Frequency detection value (FDT2)	0.00Hz ~MAX frequency	50.00Hz	☆
P8-29	Frequency detection hysteresis value(FDT2)	0.0% ~ 100.0% (PDT2 level)	5.0%	☆
P8-30	Random frequency arrival detection value1	0.00Hz ~MAX frequency	50.00Hz	☆

P8-31	Random frequency arrival detection range1	0.0% ~ 100.0% (MAX frequency)	0.0%	☆
P8-32	Random frequency arrival detection value2	0.00Hz ~MAX frequency	50.00Hz	☆
P8-33	Random frequency arrival detection range2	0.0% ~ 100.0% (MAX frequency)	0.0%	☆
P8-34	Zero-current detection level	0.0% ~ 300.0% 100.0% motor rated current	5.0%	☆
P8-35	Zero-current detection delay time	0.01s ~ 600.00s	0.10s	☆
P8-36	Output current overlimit value	0.0%(No detection) 0.1%~300.0%(Motor rated current)	200.0%	☆
P8-37	Output current overlimit detection delay time	0.00s ~ 600.00s	0.00s	☆
P8-38	Random current arrival 1	0.0%~300.0%(Motor rated current)	100.0%	☆
P8-39	Random current arrival range1	0.0%~300.0%(Motor rated current)	0.0%	☆
P8-40	Random current arrival 2	0.0%~300.0%(Motor rated current)	100.0%	☆
P8-41	Random current arrival range2	0.0%~300.0%(Motor rated current)	0.0%	☆
P8-42	Reserved	Reserved	Reserved	★
P8-43	Reserved	0：P8-44 setting 1：AI1 2：AI2 3：Potentiometer	0	★
P8-44	Reserved	Reserved	Reserved	★
P8-45	AI1 input voltage protection value lower limit	0.00V ~ P8-46	3.10V	☆

P8-46	AI1 input voltage protection value upper limit	P8-45 ~ 10.00V	6.80V	☆
P8-47	Module temperature arrival	0℃~ 100℃	75℃	☆
F8-48	Cooling fan control	0：Cooling fan runs at motor operation 1：Cooling fan runs after power-on	0	☆
P8-49	Wake up frequency	Sleep frequency (P8-51) ~MA X frequency（P0-10)	0.00Hz	☆
P8-50	Wake up delay time	0.0s ~ 6500.0s	0.0s	☆
P8-51	Sleep frequency	0.00Hz ~wake up frequency（P8-49)	0.00Hz	☆
P8-52	Sleep delay time	0.0s ~ 6500.0s	0.0s	☆
P8-53	The running time arrival	0.0 ~ 6500.0 Min	0.0Min	☆
P8-54	Output power correction coefficient	0.00% ~ 200.0%	100.0%	☆

P9 group Fault and Protection

Function code	Name	Setting Range	Factory Setting	property
P9-00	Motor overload protection selection	0：Disable 1：Enable	1	☆
P9-01	Motor overload protection gain	0.20 ~ 10.00	1.00	☆
P9-02	Motor overload pre-alarm coefficient	50% ~ 100%	80%	☆
P9-03	Over-voltage stall gain	0 ~ 100	30	☆
P9-04	Over-voltage stall protection voltage	650V-800V	760V	☆
P9-05	Over current stall gain	0 ~ 100	20	☆
P9-06	Over current stall protection current	100% ~ 200%	150%	☆

P9-07	Ground short circuit protection upon power-on	0 : Invalid 1 : valid	1	☆
P9-08	Fault auto reset times	650 ~ 800V	680V	☆
P9-09	Fault auto reset FAULT DO selection	0 ~ 20	0	☆
P9-10	Fault auto reset FAULT DO selection	0 : Disable 1 : Enable	0	☆
P9-11	Fault auto reset interval time	0.1s ~ 100.0s	1.0s	☆
P9-12	Input phase lack protection selection	Unit’ s digit : Input phase lack protection selection Ten’ s digit : Contactor attracting protection 0 : Forbidden 1 : allowed	00	☆
P9-13	Output phase lack protection selection	0 : Forbidden 1 : Allowed	1	☆
P9-14	The 1^{ST} fault type	0 : No fault 1 : reserved 2 : Acceleration over current 3 : Deceleration over current 4 : Constant speed over current 5 : Acceleration over voltage 6 : Deceleration over voltage 7 : Constant speed over voltage 8 : Control power supply fault 9 : Undervoltage fault	-	●

P9-15	The 2nd fault type	10：AC Drive overload 11：Motor overload 12：Input phase lack 13：Output phase lack 14：Module overheating 15：External equipment fault 16：Communication fault 17：Contactor fault 18：Current inspection fault 19：Motor tuning fault 20：Encoder /PG card fault 21：EEPROM read & write fault 22：AC Drive hardware fault 23：Short circuit to ground fault 24：Reserved 25：Reserved 26：Total running time arrival fault 27：User-defined fault 1 28: User-defined fault 2 29：Total power-on time arrival fault 30：Load off fault 31：PID feedback loss during operation fault 40：Each wave current limiting fault 41：Motor switching fault 42：Reserved 43：Reserved 45：Reserved 51：Reserved 55：Reserved		
P9-16	The latest fault type		-	●
P9-17	The 3rd fault frequency	-	-	●
P9-18	The 3rd fault current	-	-	●
P9-19	The 3rd fault bus voltage	-	-	●

P9-20	The 3rd fault input terminal	-	-	●
P9-21	The 3rd fault output terminal	-	-	●
P9-22	The 3rd fault AC Drive state	-	-	●
P9-23	The 3rd fault power-on time	-	-	●
P9-24	The 3rd fault running time	-	-	●
P9-27	The 2nd fault frequency	-	-	●
P9-28	The 2nd fault current	-	-	●
P9-29	The 2nd fault bus voltage	-	-	●
P9-30	The 2nd fault input terminal	-	-	●
P9-31	The 2nd fault output terminal	-	-	●
P9-32	The 2nd fault AC Drive state	-	-	●
P9-33	The 2nd fault power-on time	-	-	●
P9-34	The 2nd fault running time	-	-	●
P9-35	P9-35—P9-36	Reserved	Reserved	
P9-37	The 1st fault frequency	-	-	●
P9-38	The 1st fault current	-	-	●
P9-39	The 1st fault bus voltage	-	-	●
P9-40	The 1st fault input terminal	-	-	●

P9-41	The 1st fault output terminal	-	-	●
P9-42	The 1st fault AC Drive state	-	-	●
P9-43	The 1st fault power-on time	-	-	●
P9-44	The 1st fault running time	-	-	●
P9-45	**P9-45—P9-58**	Reserved	Reserved	☆
P9-59	Transient stop selection	0 invalid 1 Deceleration 2 Deceleration to stop	0	★
P9-60	Transient stop action pause protection voltage	85%	85%~100%	★
P9-61	Transient stop voltage recovery judgment time	0.5s	0.1~100s	★
P9-62	Transient stop action judgment voltage	80%	60%~100%	★
P9-63	Load-off protection selection	0：invalid 1：valid	0	☆
P9-64	Load-off detection level	0.0 ~ 100.0%	10.0%	☆
P9-65	Load-off detection time	0.0 ~ 60.0s	1.0s	☆
P9-67	Over speed detection value	0.0%~ 50.0%（MAX 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%~ 50.0%（MAX frequency）	20.0%	☆
P9-70	Excessive speed deviation detection	0.0s：NO detection 0.1 ~ 60.0s	5.0s	☆

	time			
P9-71	Reserved	Reserved	Reserved	☆
P9-72	Reserved	Reserved	Reserved	☆
P9-73	Instantaneous stop action deceleration time	0~300.0s	20.0s	★

PA group PID function

Function code	Name	Setting Range	Factory Setting	property
PA-00	PID reference source	0：PA-01 setting 1：AI1 2：AI2 3：Potentiometer 4：reserved 5：Communication 6：MS command	0	☆
PA-01	PID reference value	0.0% ~ 100.0%	50.0%	☆
PA-02	PID feedback source	0：AI1 1：AI2 2：Potentiometer 3：AI1-AI2 4：reserved 5：Communication 6：AI1+AI2 7：MAX(|AI1|, |AI2|) 8：MIN(|AI1|, |AI2|)	0	☆
PA-03	PID action direction	0：Positive action 1：Negative action	0	☆
PA-04	PID reference feedback range	0 ~ 65535h	1000	☆
PA-05	Proportional gain Kp1	0.0 ~ 100.0	20.0	☆
PA-06	Integration time Ti1	0.01s ~ 10.00s	2.00s	☆

PA-07	Differential time Td1	0.000s ~ 10.000s	0.000s	☆
PA-08	PID cutoff frequency of reverse rotation	0.00 ~ MAX frequency	2.00Hz	☆
PA-09	PID deviation limit	0.0% ~ 100.0%	0.0%	☆
PA-10	PID differential amplitude limit	0.00% ~ 100.00%	0.10%	☆
PA-11	PID reference change duration	0.00 ~ 650.00s	0.00s	☆
PA-12	PID feedback filter time	0.00 ~ 60.00s	0.00s	☆
PA-13	PID output filter time	0.00 ~ 60.00s	0.00s	☆
PA-14	Reserved	Reserved	Reserved	☆
PA-15	Proportional gain Kp2	0.0 ~ 100.0	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 condition	0：No switching 1：Switching by DI terminal 2：Switching automatically by deviation 3：Switching automatically by running 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 retention time	0.00 ~ 650.00s	0.00s	☆
PA-23	Output deviation forward maximum value	0.00% ~ 100.00%	1.00%	☆
PA-24	Output deviation	0.00% ~ 100.00%	1.00%	☆

	reverse maximum value			
PA-25	PID integration attribute	Unit’ s digit : Integration separation 0 : invalid 1 : valid Ten’ s digit : Whether stop integration when reaching output limit 0 : Continue to integration 1 : Stopping integration	00	☆
PA-26	PID feedback loss detection value	0.0% : No judging 0.1% ~ 100.0%	0.0%	☆
PA-27	PID feedback loss detection time	0.0s ~ 20.0s	0.0s	☆
PA-28	PID stop operation	0 : Stop without operation 1 : Stop with operation	0	

Pb group Swing frequency, fixed length and counting

Function code	Name	Setting Range	Factory Setting	property
Pb-00	Swing setup mode	0 : Relative to the center frequency 1 : Relative to the maximum frequency	0	☆
Pb-01	Swing frequency amplitude	0.0% ~ 100.0%	0.0%	☆
Pb-02	Jump frequency amplitude	0.0% ~ 50.0%	0.0%	☆
Pb-03	Swing frequency cycle	0.1s ~ 3000.0s	10.0s	☆
Pb-04	Triangle wave rise time coef.	0.1% ~ 100.0%	50.0%	☆
Pb-05	Pb-05~Pb-07	Reserved	Reserved	☆
Pb-08	Counting value setup	1 ~ 65535	1000	☆
Pb-09	Designated counting value	1 ~ 65535	1000	☆

PC group MS Speed Function & Simple PLC Function				
Function code	Name	Setting Range	Factory Setting	property
PC-00	MS command 0	-100.0% ~ 100.0%	0.0%	☆
PC-01	MS command 1	-100.0% ~ 100.0%	0.0%	☆
PC-02	MS command 2	-100.0% ~ 100.0%	0.0%	☆
PC-03	MS command 3	-100.0% ~ 100.0%	0.0%	☆
PC-04	MS command 4	-100.0% ~ 100.0%	0.0%	☆
PC-05	MS command 5	-100.0% ~ 100.0%	0.0%	☆
PC-06	MS command 6	-100.0% ~ 100.0%	0.0%	☆
FC-07	MS command 7	-100.0% ~ 100.0%	0.0%	☆
PC-08	MS command 8	-100.0% ~ 100.0%	0.0%	☆
PC-09	MS command 9	-100.0% ~ 100.0%	0.0%	☆
PC-10	MS command 10	-100.0% ~ 100.0%	0.0%	☆
PC-11	MS command 11	-100.0% ~ 100.0%	0.0%	☆
PC-12	MS command 12	-100.0% ~ 100.0%	0.0%	☆
PC-13	MS command 13	-100.0% ~ 100.0%	0.0%	☆
PC-14	MS command 14	-100.0% ~ 100.0%	0.0%	☆
PC-15	MS command 15	-100.0% ~ 100.0%	0.0%	☆
PC-16	PLC running mode	0 : Single running stop 1 : Single running end remaining final value 2 : Continuous circulation	0	☆

PC-17	PLC power off memory selection	Unit’ s digit：Power off memory selection 0：Power off without memory 1：Power off with memory Ten’ s digit：Stop memory selection 0：Stop without memory 1：Stop with memory	00	☆
PC-18	PLC 0segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-19	PLC 0segment acc./dec. time	0 ~ 3	0	☆
PC-20	PLC 1segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-21	PLC 1segment acc./dec. time	0 ~ 3	0	☆
PC-22	PLC 2 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-23	PLC 2 segment acc./dec. time	0 ~ 3	0	☆
PC-24	PLC 3 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-25	PLC 3 segment acc./dec. time	0 ~ 3	0	☆
PC-26	PLC 4 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-27	PLC 4 segment acc./dec. time	0 ~ 3	0	☆
PC-28	PLC 5 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-29	PLC 5 segment acc./dec. time	0 ~ 3	0	☆
PC-30	PLC 6 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-31	PLC 6 segment acc./dec. time	0 ~ 3	0	☆

PC-32	PLC 7 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-33	PLC 7 segment acc./dec. time	0 ~ 3	0	☆
PC-34	PLC 8 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-35	PLC 8 segment acc./dec. time	0 ~ 3	0	☆
PC-36	PLC 9 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-37	PLC 9 segment acc./dec. time	0 ~ 3	0	☆
PC-38	PLC 10 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-39	PLC 10 segment acc./dec. time	0 ~ 3	0	☆
PC-40	PLC 11 segment running time	0.0s(h) ~ 6553.5s(h)	0.0sh)	☆
PC-41	PLC 11 segment acc./dec. time	0 ~ 3	0	☆
PC-42	PLC 12 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-43	PLC 12 segment acc./dec. time	0 ~ 3	0	☆
PC-44	PLC 13 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-45	PLC 13 segment acc./dec. time	0 ~ 3	0	☆
PC-46	PLC 14 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-47	PLC 14 segment acc./dec. time	0 ~ 3	0	☆
PC-48	PLC 15 segment running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PC-49	PLC 15 segment acc./dec. time	0 ~ 3	0	☆

PC-50	Running time unit	0 : seconds 1 : hours	0	☆
PC-51	MS command 0 reference mode	0 : Function code PC-00 setting 1 : AI1 2 : AI2 3 : Potentiometer 4 : served 5 : PID 6 : Pre-frequency (P0-08) UP/DOWN modified	0	☆
Pd group Communication function group				
Function code	Name	Setting range	Default	property
Pd-00	Baud rate	Unit' s digit : MODBUS 0 : 300BPS 1 : 600BPS 2 : 1200BPS 3 : 2400BPS 4 : 4800BPS 5 : 9600BPS 6 : 19200BPS 7 : 38400BPS 8 : 57600BPS 9 : 115200BPS	5005	☆
Pd-01	MODBUS Data format	0 : Without calibration (8-N-2) 1 : Even parity calibration (8-E-1) 2 : Uneven parity calibration (8-O-1) 3 : No calibration (8-N-1) (MODBUS valid)	0	☆
Pd-02	Local address	1-247, 0 is broadcast address	1	☆
Pd-03	MODBUS Response delay	0ms ~ 20ms	2	☆
Pd-04	Excessive communication time	0.0 : invalid , 0.1 ~ 60.0s	0.0	☆

Pd-05	Data transformat selection	Unit’ s digit : MODBUS 0 : Non-standard MODBUS protocal 1 : Standard MODBUS protocal Ten’ s digit : Profibus-DP 0 : PPO1 format 1 : PPO2 format 2 : PPO3 format 3 : PPO5 format	30	☆
Pd-06	Communication read current resolution	0 : 0.01A 1 : 0.1A	0	☆
PE group reserved				
PP group Function code management				
Function code	Name	Setting Range	Factory Setting	property
PP-00	Reserved	0 ~ 65535	0	☆
PP-01	Parameter initialization	0 : No function 01 : Restore to factory default value, motor parameter not included 02 : Clear memory	0	★
PP-02	Parameter display attribute	Unit’ s digit : U group display selection 0 : No display 1 : display Ten’ s digit : A group display selection 0 : No display 1 : display	11	★
PP-03	Reserved	Reserved	Reserved	☆
PP-04	Function codes modification attribute	0 : Can be modified 1 : Can not be modified	0	☆
A0 group Torque control group				
Function code	Name	Setting Range	Factory Setting	property

A0-00	Speed/ torque control mode selection	0 : spreed control 1 : torque control	0	★
A0-01	Torque setup source selection in torque control mode	0 : digit setting 1(A0-03) 1 : AI1 2 : AI2 3 : potentiometer 4 : reserved 5 : communication 6 : MIN(AI1,AI2) 7 : MAX(AI1,AI2)	0	★
A0-02	Reserved	Reserved	Reserved	
A0-03	Torque digital setup in torque control mode	-200.0% ~ 200.0%	150.0%	☆
A0-04	Reserved	Reserved	Reserved	
A0-05	Torque control forward maximum frequency	0.00Hz ~MAX frequency	50.00Hz	☆
A0-06	Torque control reverse maximum frequency	0.00Hz ~MAX frequency	50.00Hz	☆
A0-07	Upper torque filter time	0.00s ~ 65000s	0.00s	☆
A0-08	Lower torque filter time	0.00s ~ 65000s	0.00s	☆

A1 ~A4group reserved

A5 group Control optimization group

Function code	Name	Setting Range	Factory Setting	property
A5-00	DPWM switching frequency upper limit	0.00Hz ~ 15.00Hz	12.00Hz	☆
A5-01	PWM modulation mode	0 : Asynchronous modulation 1 : Synchronous modulation	0	☆

A5-02	Dead-zone compensation mode selection	0 : No compensation 1 : Compensation mode 1 2: Compensation mode 2	1	☆
A5-03	Random PWM depth	0 : Random PWM invalid 1 ~ 10 : PWM carrier frequency random depth	0	☆
A5-04	Rapid current-limiting enable	0 : enable 1 : able	1	☆
A5-05	Current detection compensation	0 ~ 100	5	☆
A5-06	Under-voltage point setup	210 ~ 420V	350V	☆
A5-07	SVC optimization mode selection	1 : optimization mode 1 2 : optimization mode 2	1	☆
A5-08	Dead zone time adjustment	100% ~ 200%	150%	★
A5-09	Over-voltage point setup	200.0V ~ 2500.0V	Model dependant	★

Table 6-1 basis function parameter table

6.2 Monitoring parameters

Function code	Parameter name	MIN unit	Communication address
U0 group basic monitoring parameters			
U0-00	Running frequency (Hz)	0.01Hz	7000H
U0-01	Setting frequency (Hz)	0.01Hz	7001H
U0-02	Bus 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	Reserved	Reserved	Reserved
U0-12	Counting value	1	700CH
U0-13	Reserved	1	700DH
U0-14	Load speed display	1	700EH
U0-15	PID setting	1	700PH
U0-16	PID feedback	1	7010H
U0-17	PLC phrase	1	7011H
U0-18	Reserved	Reserved	Reserved
U0-19	Reserved	Reserved	Reserved
U0-20	The left 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	U0-23-- U0-24	Reserved	Reserved
U0-24	Liner speed	1m/Min	7018H
U0-25	Pulse input frequency	1Min	7019H
U0-26	Current running time	0.1Min	701AH
U0-27	Reserved	Reserved	Reserved
U0-28	Communication setting value	0.01%	701CH
U0-29	Reserved	Reserved	Reserved
U0-30	Main frequency X	0.01Hz	701EH
U0-31	Auxiliary frequency Y	0.01Hz	701PH
U0-32	View any memory address value	1	7020H

U0-33	U0-33—U0-38	Reserved	Reserved
U0-39	Target voltage upon V/F separation	1V	7027H
U0-40	Output voltage upon V/F separation	1V	7028H
U0-41	DI state visual display	1	7029H
U0-42	AO state visual display	1	702AH
U0-43	DI function state visual display 1	1	702BH
U0-44	DI DI function state visual display 2	1	702CH
U0-45	Fault information	1	702DH
U0-58	Phase Z counting	1	703AH
U0-59	Setting frequency (%)	0.01%	703BH
U0-60	Running frequency (%)	0.01%	703CH
U0-61	AC Drive state	1	703DH
U0-62	Reserved	Reserved	Reserved
U0-63	Sent value of point-point communication	0.01%	703PH
U0-64	By number of the station	1	7040H
U0-65	Torque upper limit	0.1%	7041H

Table 6-2 Monitoring parameters

6.3 500 Definition of the communication address

500series AC Drives support the Modbus communication protocol，The host computer can control, monitor and modify the function parameters through the communication protocol.

500 series communication data can be divided into function code data, non functional code data, and the latter includes operation command, running state, running parameter, alarm information ,etc.

1.1 500 series function code data

Function code data is an important setting parameter for AC Drive , as follows :

500-series function code data	P group (read-write)	P0、P1、P2、P3、P4、P5、P6、P7、P8、P9、PA、PB、PC、PD、PE、PP
	A group (read-write)	A0、A1、A2、A5、A6、A7、A8、A9、AA、AB、AC、AD、AE、AP

Definition of the communication address as follows :

1、When reading function code data for communication:

For P0~PP and A0~AP group function code data, Its functional group number if its communication address is sixteen bits high,If lower sixteen bit is directly used for function code in function group.

E.G. :

1） **P0-16** function parameters， Its communication address is P010H，the P0H means P0 group，10H represents the sixteen - level data format of the function code in the function group of the sequence number 16.

2） **AC-08** function parameters，its communication address is AC08，the ACH means AC group，08H represents the sixteen - level data format of the function code in the function group of the sequence number 8.

2

When writing function code data for communication, for P0~PP group data, its communication address is sixteen bits, it is divided into 00~0P or P0~PP according to whether it is written to EEPROM, and the low sixteen bit is directly used for function code in function group serial number.

E.G.:

1）WRITE function code parameter **P0-16**

When no need to write to EEPROM its address is 0010H

When need to write to EEPROM its address is P010H

For A0~AP group data, its communication address is sixteen bits. it can be divided into 40~4P or A0~AP According to whether to write EEPROM. The low sixteen bit is directly used for function code in function group.

E.G.:

2）WRITE function code parameter **AC-08**

When no need to write to EEPROM its address is 4C08H

When need to write to EEPROM its address is AC08H

1.2 Nonfunctional code data

500 Nonfunctional code data	Statue data（read only）	U group、AC Drive fault description、AC Drive running statue
	Control parameter（write only）	Control order、communication setting value,、digit output terminal control、analog output AM control、analog output FM control、high speed pulse (PMP) output control、parameter initialization

1、statue data

statue data divided into U group、AC Drive fault description、AC Drive running statue

1） U group

The details descriptions of the U group data please reference to the 5th & 6th chapter its communication address as follows：

U0~UP，Its communication address is sixteen bits 70~7P, and the lower sixteen is the number of the monitoring parameters in the group，

E.G.：

U0-11，its communication address is 700BH

2）AC Drive fault description

When the communication read AC Drive fails to describe, the communication address is fixed to 8000H. By reading the address data, the host computer can get the fault code of the current AC Drive. The description of the fault code please reference to the 5th chapter, the definition of the **P9-14** function code.

3）AC Drive running statue

When the communication reads the AC Drive running state, the communication address is fixed to 3000H, and the upper machine can read the address data by reading the address data, and it can get the information of the current AC Drive running state. It is defined as follows:

AC Drive running status communication address	definition
3000H	1：Forward running
	2：Reverse running
	3：Stop

2、control parameter

Control parameter divided into control order、communication setting value、digit output terminal control、analog output AM control、analog output FM control、parameter initialization.

1）control order

When **P0-02**(order source) is 2：In communication control, the upper computer can control the switching and stop of the AC Drive through the communication address. The control commands are defined as follows:

Control order communication address	Order function
2000H	1：Forward running
	2：Reverse running
	3：Forward jog
	4：Reverse jog
	5：Free stop
	6：Decelerate stop
	7:Fault reset

2）communication setting value

Communication set points, main users, 500 Series intermediate frequency source, torque upper limit source, V/F separation voltage source, PID given source and PID feedback source are selected as the given data communicated to timing. The communication address is 1000H, and when the upper computer sets the communication address value, the data range is -10000~10000, corresponding to the relative given value -100.00%~100.00%.3）digit output terminal control

The function of the digital output terminal is selected as 20: communication control, the host computer can control the digital output terminal of the AC Drive through the communication address. It is defined as follows:

Digit output terminal control communication address	Order contents
2001H	BIT0：AO1 output control BIT1：AO2 output control BIT2：RELAY1 output control BIT3：RELAY2 output control BIT4：FMR output control BIT5：VDO1 BIT6：VDO2 BIT7：VDO3 BIT8：VDO4 BIT9：VDO5

4）analog output terminals AM、FM

The function of the analog output terminal AM,FM is selected as 20: communication control, the host computer can control the analog terminal of the AC Drive through the communication address. It is defined as follows:

Output control communication address		Order contents
AO1	AO1	0 ~ 7FFF means 0%~ 100%
AO2	AO2	

5）parameter initialization

This function needs to be used when the parameter initialization operation of the frequency converter is needed through the upper computer.

If the PP-00 (user password) is not 0, then we first need to check the password through communication. After passing the check, the PC initialization operation in 30 seconds.

The communication address of the user password verification is 1F00H, and the correct user password is written to the address. Then the password can be completed. The address initialization of communication is 1F01H, and the data content is defined as follows:

Parameter initial communication address	Order contents
1F01H	1：Recover the factory parameters
	2：record information correctly
	4：recover the User backup parameters
	501：Recover the user current parameters

Read-write function code parameters(some code could not to be changed but just could be used by the factory)

1.3 function code parameters address marking rules

The function code group number and label parameter address rules:

High byte： P0~PP(P group)、A0~AP(A group)、70~7P(U group)

Low byte：00~PP

E.G.：f choose **P3-12** ,the function code address is 0xP30C；

Note：

1） PP group：Neither read parameters nor change parameters；

2） U group：Only readable, no change of parameters.

Some parameters can not to be changed when the AC Drive is running;Some parameters can not to be changed whatever the AC Drive runs or not.When correcting the function code parameters ,should pay attention to the parameters' range,unit,and related instructions.

Function code group	Communication access address	Correct RAM function code address in the communication
P0 ~ PE group	0xP000 ~ 0xPEPP	0x0000 ~ 0x0EPP
A0 ~ AC group	0xA000 ~ 0xACPP	0x4000 ~ 0x4CPP
U0 group	0x7000 ~ 0x70PP	

Note: It will reduce the service life of EEPROM if it be stored frequently. Therefore, some function codes do not need to be stored in the communication mode, just change the value in RAM.

1)For achieve this P group,change its high byte P of this function code to 0.

2）For achieve this A group,change its high byte A of this function code to 4.

The related function code address show as follows：

High byte：00~0P(P group)、40~4P(A group)

Low byte：00~PP

E.G.：function code **P3-12** not to be stored into EEPROM，the address is 030C；

Function code A0-05 not to be stored into EEPROM ,the address is 4005；

RAM Its address just means to be written rather read.

For all the parameters can also use the command code 07H to realize.

1,Stop / Run parameter parts:

Parameter address	Parameter description	Parameter address	Parameter set
1000H	* Communication set value (Decimal system) –10000 ~ 10000	1010H	PID set
1001H	Running frequency	1011H	PID feedback
1002H	Busbar voltage	1012H	PLC produce
1003H	Output voltage	1013H	Reserved
1004H	Output current	1014H	Reserved
1005H	Output power	1015H	The left running time
1006H	Output torque	1016H	AI1 Pre-correction voltage
1007H	Running speed	1017H	AI2 Pre-correction voltage
1008H	DI input mark	1018H	AI3 Pre-correction voltage
1009H	DO output mark	1019H	Reserved
100AH	AI1 voltage	101AH	Power-on time currently
100BH	AI2 voltage	101BH	Running time currently
100CH	Reserved	101CH	Reserved
100DH	Count value input	101DH	Communication setting value
100EH	Length value input	101EH	Reserved
100PH	Overload speed	101PH	Main frequency X display
–	–	1020H	Main frequency Y display

Note：

1） The set value of the communication is the percentage of the relative value，10000 means 100.00%，-10000 means -100.00%。

2） For the data of frequency dimension, the percentage is the percentage of the relative maximum frequency (**P0-10**). For the torque dimension data, the percentage is **P2-10** and **A2-48** (the upper limit of the torque is digitally set, corresponding to the first, second motor).

2、Control order inputted to AC Drive：（write）

Order address	Order function

2000H	0001：Forward running
	0002：Reverse running
	0003：Forward jog
	0004：Reverse jog
	0005：Free stop
	0006：Decelerate stop
	0007:Fault reset

3、Read the state of the AC Drive：（read）

State character address	State character function
3000H	0001：Forward running
	0002：Reverse running
	0003：Stop

4、Parameter locking cipher check：（If back is 8888H means the checking is valid）

Password address	Input contents
1P00H	*****

5、digit output terminal control：（write）

Order address	Order contents
2001H	BIT0：AO2 output control BIT1：reserved BIT2：RELAY1 output control BIT3：RELAY2 output control BIT4：A01 output control BIT5：VDO1 BIT6：VDO2 BIT7：VDO3 BIT8：VDO4 BIT9：VDO5

6、Analog output AM control：（write）

Order address	Order contents
2002H	0 ~ 7PPP means 0% ~ 100%

7、Analog output FM control：（write）

Order address	Order contents
2003H	0 ~ 7PPP means 0% ~ 100%

8、AC Drive description：

AC Drive fault address	AC Drive fault information	
8000H	0000：No fault 0001：Reserved 0002：Accelerate over current 0003：Decelerate over current 0004：Constant over current 0005：Accelerate over voltage 0006：Decelerate over voltage 0007：Constant over voltage 0008：Buffer resistance overload fault 0009：Undervoltage fault 000A：AC Drive overload 000B：Motor overload 000C：Input phase losing 000D：Output phase losing 000E：Module overheating 000P：External fault 0010：Communication abnormal 0011：Contactor abnormal 0012：Current detecting fault 0013：Motor tuning fault 0014：Reserved	0015：Parameter read-write abnormal 0016：AC Drive hardware fault 0017：Motor to ground short circuit fault 0018：Reserved 0019：Reserved 001A：Running time arrival 001B：User custom fault 1 001C：User custom fault 2 001D：Power-on time arrival 001E：Load off 001P：PID feedback lost when running 0028：Fast current limiting fault 0029：Fault of switching motor at run time 002A：Excessive velocity deviation 002B：Reserved 002D：Reserved 005A：Reserved 005B：Reserved 005C：Reserved 005E：Reserved

Chapter 7

Maintenance and Troubleshooting

Chapter 7 Maintenance and Troubleshooting

7.1 Routine Repair and Maintenance of 500 Series

7.1.1 Routine Maintenance

The influence of the ambient temperature, humidity, dust and vibration will cause the aging of the devices in the AC drive, which may cause potential faults or reduce the service life of the AC drive. Therefore, it is necessary to carry out routine and periodic maintenance.

Routine maintenance involves checking:

1) Whether the motor sounds abnormally during running

2) Whether the motor vibrates excessively during running

3) Whether the installation environment of the AC drive changes

4) Whether the AC drive' s cooling fan works normally

5) Whether the AC drive overheats

Routine cleaning involves:

1)Keep the AC drive clean all the time.

2) Remove the dust, especially metal powder on the surface of the AC drive, to prevent the dust from entering the AC drive.

3) Clear the oil stain on the cooling fan of the AC drive.

7.1.2 Periodic Inspection

Perform periodic inspection in places where inspection is difficult.

Periodic inspection involves:

1) Check and clean the air duct periodically

2) Check whether the screws become loose

3) Check whether the AC drive is corroded

4) Check whether the wiring terminals show signs of arcing.

5) Main circuit insulation test

Note: Before measuring the insulating resistance with megameter (500VDC megameter recommended), disconnected the main circuit from the AC drive. Do not use the insulating resistance meter to test the insulation of the control circuit. The high voltage test need not be performed again because it has been completed before delivery.

7.1.3 Replacement of Vulnerable Components

The vulnerable components of the AC drive are cooling fan and filter electrolytic capacitor. Their service life is related to the operating environment and maintenance status. Generally, the service life is shown as follows:

Component	Service Life
Fan	2 to 3 years
Electrolytic capacitor	4 to 5 years

Note: Standard replacement time is under the following conditions, Users can determine the replacement period according to the running time.

- Ambient temperature: the annual average temperature is about 30 ° C
- Load rate: less than 80%
- Running rate: less than 20 hours per day

1) Cooling Fan

● Possible damage reason: Bearing worn, Blade aging

● Judging Criteria: Whether there is crack on the blade, whether there is abnormal vibration noise upon startup.

2) Filter electrolytic capacitor

● Possible damage reason: Input power supply in poor quality, high ambient temperature, frequent load jumping, electrolytic aging.

● Judging Criteria: Whether there is liquid leakage, whether the safe valve has projected, measure the static capacitance, measure the insulating resistance.

7.1.4 Storage of the AC drive

After purchasing AC drive, for temporary storage and long-term storage, pay attention to the following two aspects:

1) Pack the AC drive with the original box provided by INDVS.

2) Long-term storage degrades the electrolytic capacitor. Thus, the AC drive must be energized once every 2 years, each time lasting at least 5 hours. The input voltage must be increased slowly to the rated value with the regulator.

7.1.5 Warranty Agreement

1) Free warranty only applies to the AC drive itself.

2) INDVS will provide 18-month warranty (Starting from the leave-factory date as indicated on the barcode) for the failure or damage under normal use conditions. If the equipment has been used for over 18 months, reasonable repair expenses will be charged.

3) Reasonable repair expenses will be charged for the damages due to the following causes:

(a) Improper operation without following the instructions

(b) Fire, flood or abnormal voltage

(c) Using the AC drive for non-recommended function

4) The maintenance fee is charged according to INDVS' s uniform standard. If there is an agreement, the agreement prevails.

7.2 Faults and Solutions

500 Series AC drive provide a total Fault information and protective functions. After a fault occurs, the AC drive implements the protection function, and displays the fault code on the operation panel (if the operation panel is available). The corresponding fault types and common solutions for faults are shown in the following table. The table lists only for reference, please do not repair, transform, if can not rule out the fault, please contact our company or agents for technical support.

Figure 7-2 Solutions to the faults of the 500 Series

Fault Name	Display	Possible Causes	Solutions
AC Drive unit protection	Err01	1. The output circuit is grounded or short circuited 2. The connecting cable of the motor is too long 3. The module overheats 4. The internal connections become loose 5. The main control board is faulty 6. The drive board is faulty 7. The AC Drive module is faulty	1. Eliminate external faults 2. Install a reactor or an output filter 3. Check the air filter and the cooling fan 4. Connect all cables properly 5. Contact for Technical support 6. Contact for Technical support 7. Contact for Technical support
Overcurrent during acceleration	Err02	1. The output circuit is grounded or short circuited 2. The control method is vector and no parameter identification 3. The acceleration time is too short 4. Manual torque boost or V/F curve is not appropriate 5. The voltage is too low 6. The startup operation is performed on the rotating motor. 7. A sudden load is added during acceleration 8. The AC drive model is of too small power class	1. Eliminate external faults 2. Perform the motor auto-tuning 3. Increase the acceleration time 4. Adjust the manual torque boost or V/F curve 5. Adjust the voltage to normal range 6. Select rotational speed tracking restart or start the motor after it stops 7. Remove the added load. 8. Select and AC drive of higher power class
Overcurrent during deceleration	Err03	1. The output circuit is grounded or short circuited 2. The control method is vector and no parameter identification 3. The deceleration time is too short	1. Eliminate external faults 2. Perform the motor auto-tuning 3. Increase the deceleration time 4. Adjust the voltage to normal range 5. Remove the added load. 6. Install the braking unit and

		4. The voltage is too low 5. A sudden load is added during deceleration 6. The braking unit and braking resistor are not installed	braking resistor
Overcurrent at constant speed	Err04	1. The output circuit is grounded or short circuited 2. The control method is vector and no parameter identification 3. The voltage is too low 4. A sudden load is added during deceleration 5.The AC drive model is of too small power class	1. Eliminate external faults 2. Perform the motor auto-tuning 3. Adjust the voltage to normal range 4. Remove the added load. 5. Select and AC drive of higher power class
Overvoltage during acceleration	Err05	1. The input voltage is too high 2. An external force drives the motor during acceleration 3. The acceleration time is too short 4. The braking unit and braking resistor are not installed	1. Adjust the voltage to normal range 2. Cancel the external force or install a braking resistor 3. Increase the acceleration time 4. Install the braking unit and braking resistor
Overvoltage during deceleration	Err06	1. The input voltage is too high 2. An external force drives the motor during deceleration 3. The deceleration time is too short 4. The braking unit and braking resistor are not installed	1. Adjust the voltage to normal range 2. Cancel the external force or install a braking resistor 3. Increase the deceleration time 4. Install the braking unit and braking resistor
Overvoltage at constant speed	Err07	1. The input voltage is too high 2. An external force drives the motor during running	1. Adjust the voltage to normal range 2. Cancel the external force or install a braking resistor
Control power supply fault	Err08	1. The input voltage is not within the allowable range	1. Adjust the voltage to normal range
Undervoltage	Err09	1. Instantaneous power failure 2. The AC drive’ s input	1. Reset the fault 2. Adjust the voltage to normal

		voltage is not within the allowable range 3. The bus voltage is abnormal 4. The rectifier bridge and buffer resistor are faulty 5. The drive board is faulty 6. The main control board is faulty	range 3. Contact for Technical support 4. Contact for Technical support 5. Contact for Technical support 6. Contact for Technical support
AC drive overload	Err10	1. The load is too heavy or locked-rotor occurs on the motor 2. The AC drive model is of too small power class	1. Reduce the load and check the motor and mechanical condition 2. Select an AC drive of higher power class
Motor overload	Err11	1. P9-01 is set improperly 2. The load is too heavy or locked-rotor occurs on the motor 3. The AC drive model is of too small power class	1. Set P9-01 correctly 2. Reduce the load and check the motor and mechanical condition 3. Select an AC drive of higher power class
Power input phase loss	Err12	1. The three-phase power input is abnormal 2. The drive board is faulty 3. The lightening board is faulty 4. The main control board is faulty	1. Eliminate external faults 2. Contact for Technical support 3. Contact for Technical support 4. Contact for Technical support
Power output phase loss	Err13	1. The cable connecting the AC drive and the motor is faulty 2. The AC drive’ s three-phase outputs are unbalanced when the motor is running 3. The drive board is faulty 4. The module is faulty	1. Eliminate external faults 2. Check whether the motor three-phase winding is normal 3. Contact for Technical support 4. Contact for Technical support
Module overheat	Err14	1. The ambient temperature is too high 2. The air filter is blocked 3. The fan is damaged 4. The thermally sensitive	1. Lower the ambient temperature 2. Clean the air filter 3. Replace the damaged fan 4. Replace the damaged thermally sensitive resistor

		resistor of the module is damaged 5. The AC Drive module is damaged	5. Replace the AC Drive module
External equipment fault	Err15	1. External fault signal is input via DI 2. External fault signal is input via virtual I/O	1. Reset the operation 2. Reset the operation
Communication fault	Err16	1. The host computer is in abnormal state 2. The communication cable is faulty 3. P0-28 is set improperly 4. THe communication parameters in group PD are set improperly	1. Check the cabling of host computer 2. Check the communication cabling 3. Set P0-28 correctly 4. Set the communication parameters properly
Contactor fault	Err17	1. The drive board and power supply are faulty 2. The contactors is faulty	1. Replace the faulty drive board or power supply board 2. Replace the faulty contactor
Current detection fault	Err18	1. The HALL device is faulty 2. The drive board is faulty	1. Replace the faulty HALL device 2. Replace the faulty drive board
Motor auto-tuning fault	Err19	1. The motor parameters are not set according to the nameplate 2. The motor auto-tunning times out	1. Set the motor parameters according to the nameplate properly 2. Check the cable connecting the AC drive and the motor
EEPROM write fault	Err21	1. The EEPROM chip is damaged	1. Replace the main control board
Short circuit to ground	Err23	1. The motor is short circuited to the ground	1. Replace the cable or motor
Accumulative running time reached	Err26	1. The accumulative running time reaches the setting value	1. Clear the record through the parameter initialization function
Accumulative power-on time	Err29	1. The accumulative power-on time reaches the setting value	1. Clear the record through the parameter initialization function

reached			
Load becoming 0	Err30	1. The AC drive running current is lower than P9-64	1. Check that the load is disconnected or the setting of P9-64 and P9-65 is correct
PID feedback lost during running	Err31	1. The PID feedback is lower than the setting of PA-26	1. Check the PID feedback signal or set PA-26 to a proper value
Pulse-by-pulse current limit fault	Err40	1. The load is too heavy or locked-rotor occurs on the motor 2. The AC drive model is of too small power class	1. Reduce the load and check the motor and mechanical condition 2. Select an AC drive of higher power class
Motor switchover fault during running	Err41	1. Change the selection of the motor via terminal during running of the AC drive	1. Perform motor switchover after the AC drive stops

7.3 Common Faults and Solutions

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

Table 7-3 Troubleshooting to common faults of the AC drive

SN	Fault	Possible Causes	Solutions
1	There is no display at power-on	1. There is no power supply to the AC drive or the power input to the AC drive is too low 2. The power supply of the switch on the drive board of the AC drive is faulty 3. The rectifier bridge is damaged 4. The buffer resistor is faulty 5. The control board or the operation panel is faulty	1. Check the power supply 2. Check the bus voltage 3. Re-connect the 8-core and 28-core cables 4~6. Contact INDVS for technical support

		6. The cable connecting the control board and the drive board and the operation panel breaks	
2	"HC" is displayed at power-on	1. The cable between the drive board and the control board is in poor contact 2. Related components on the control board are damaged 3. The motor or the motor cable is short circuited to the ground 4. The HALL device is faulty 5. The power input to the AC drive is too low	1. Re-connect the 8-core and 28-core cables 2~5. Contact INDVS for technical support
3	" Err23" is displayed at power-on	1. The motor or the motor output cable is short circuited to the ground 2. The AC drive is damaged	1. Measure the insulation of the motor and the output cable with a megger 2. Contact INDVS for technical support
4	The AC drive display is normal upon power-on. But the "HC" displayed after running and stops immediately.	1. The cooling fan is damaged or locked-rotor occurs 2. The external control terminal cable is short circuited	1. Replace the damaged fan 2. Eliminate external fault
5	Err14 (Module overheat) fault is reported frequently	1. The setting of carrier frequency is too high 2. The cooling fan is damaged or the air filter is blocked 3. Components inside the AC drive are damaged (thermocouple or other)	1. Reduce the carrier frequency (P0-15) 2. Replace the fan and clean the air filter 3. Contact INDVS for technical support

6	The motor does not rotate after the AC drive runs	1. Check the motor and the motor cables 2. The AC drive parameters are set improperly (Motor parameters) 3. The cable between the drive board and the control board is in poor contact 4. The drive board is faulty	1. Ensure the cable between the AC drive and the motor is normal 2. Replace the motor or clear mechanical faults 3. Check the re-set motor parameters 4. Contact INDVS for technical support
7	The DI terminals are disabled	1. The parameters are set incorrectly 2. The external signal is incorrect 3. The jumper bar across OP and +24V becomes loose 4. The control board is faulty	1. Check and reset the parameters in group P4 2. Re-connect the external signal cables 3. Re-confirm the jumper bar across OP and +24V 4. Contact INDVS for technical support
8	The motor speed is always low in CLVC mode	1. The encoder is faulty 2. The encoder cable is connected incorrectly or in poor contact 3. The PG card is faulty 4. The drive board is faulty	1. Replace the encoder and ensure the cabling is proper 2. Replace the PG card 3~4. Contact INDVS for technical support
9	The AC drive reports overcurrent and overvoltage frequently	1. The motor parameters are set improperly 2. The acceleration/deceleration time is improper 3. The load fluctuates	1. Re-set motor parameters or re-perform the motor auto-tunning 2. Set proper acceleration/deceleration time 3. Contact INDVS for technical support
10	Err17 is reported upon power-on or running	The soft startup contactor is not picked up	1. Check whether the contactor cable is loose 2. Check whether the contactor is faulty 3. Check whether 24V power supply of the contactor is faulty 4. Contact INDVS for technical support

11	No display upon power-on	Related component on the control board is damaged	Replace the control board

Memo