Yolico

YD580E Series

Multifunction vector Drive

220V AC 3-phase 0.4 ~ 220kW
380V AC 3-phase 0.75~ 450kW

User Guide

Ver 1.0

Perface

First of all, thank you for purchasing the YD580(E) series inverter developed and produced by YOLICO! YD580E series inverter is a general-purpose high-performance current vector inverter, which is mainly used to control and regulate 3-phase AC Asynchronous or synchronous motors Speed & Torque. YD580E adopts high-performance vector control technology, low speed and high torque Output, with good dynamic characteristics, super overload capacity, with user programmable functions and background software monitoring, communication bus functions, It supports a variety of encoder types, with rich and powerful combination functions and stable performance. It can be used in textile, papermaking, wire drawing, machine tools, packaging, food， Drives for fans, pumps and various automated production equipment.

Drawing of the appearance of the product

First use

For users who use this product for the first time, they should read this manual carefully first. If you have any questions about some features and performance, please contact us
Our company's technical support staff to get help that is beneficial for the proper use of this product.

Meets standards

The relevant certification directives and standards are shown in the following table, and whether the relevant certification qualifications are obtained are subject to the product nameplate identification.

Certification	Mark	Directives		Standard
CE	CE	EMC directives	2014/30/EU	EN 61800-3
		LVD directives	2014/35/EU	EN 61800-5-1
		RoHS directives	2011/65/EU	EN 50581

- Under the conditions of correct installation and use, it meets the requirements of the IEC/EN 61800-3 standard, please refer to Peripheral Connection and Constant for details
  See the EMC Problem Rectification section.

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Safety Precautions

Security Notice

- ◆ When installing, operating, and maintaining the product, please read and comply with this safety precautions first.
- ◆ In order to ensure the safety of people and equipment, when installing, operating and maintaining the product, please follow all the instructions on the product logo and manual Safety Precautions.
- ◆ The "Caution", "Warning" and "Danger" items in the manual do not represent all safety precautions that should be observed
  There are additions with safety precautions.
- ◆ This product should be used in an environment that meets the requirements of the design specifications, otherwise it may cause failure and work caused by failure to comply with relevant regulations
  Abnormal or damaged parts are not within the scope of product quality assurance.
- ◆ Our company will not assume any legal responsibility for personal safety accidents and property losses caused by illegal operation of products.

Definition of security level

Danger	"Danger" means that failure to do so would result in death or serious bodily injury.
Warning	"Warning" means that failure to do so could result in death or serious bodily injury.
Caution	"Caution" If not performed as directed, it may result in minor bodily injury or damage to the device.

Safety Precautions

Unpacking and acceptance

Caution

- ◆ Before unpacking, check the outer packaging of the product is good、damaged、soake、 damp or deformed, etc.
- ◆ Please open the package in hierarchical order, and it is strictly forbidden to knock violently!
- ◆ When unpacking, check the surface of the product and accessories for damage, rust, bruises, etc.
- ◆ After unpacking, carefully check the packing list the number and information and accessories are complete.

Warning

- ◆ When unpacking, please do not install and accessories if you find that there are signs of damage, rust, and use!
- ◆ Do not install if you find water has entered product, some parts are missing,or damaged when you open the box!
- ◆ Carefully check the packing list, if you find the packing list does not match the product name, do not install it!

Storage and transportation

Caution

- ◆ The storage temperature and humidity meet the requirements according to conditions of the product.
- ◆ Avoid storage and transportation such as water or rain, strong sunlight,electric field, magnetic field, vibration, etc.
- ◆ Avoid storing for more than 3 months, and if too long, take closer precautions and carry out inspections.
- ◆ The products are packaged and then transported by vehicle, using a closed box for long-distance transportation.
- ◆ It is strictly forbidden to transport this product in combination with equipment or items that may affect or damage it.

Warning

- Be sure to use professional loading and unloading equipment to move large or heavy equipment and products!
- Be sure to grasp the product shell when moving to avoid the product parts from falling, or there is a risk of injury!
- Carry gently, attention to object under feet, and prevent tripping or falling, or will be injured or product be damaged!
- When the equipment is lifted by a lifting tool, it is forbidden for personnel to stand or stay below.

When installing

Warning

- Please be sure to read the product instruction manual and safety precautions carefully before installation!
- It is strictly forbidden to modify this product!
- It is strictly forbidden to screw the fixing bolts and red marked bolts of product parts and components!
- Do not install this product in places with strong electric fields or strong electromagnetic interference!
- When installed in the cabinet, needs to be protected by fireproof shell, electrical and mechanical shell, etc device, the degree of protection shall comply with the relevant IEC standards and local laws and regulations.

Danger

- It is strictly forbidden for non-professionals to install, wiring, maintain, inspect or replace parts!
- Install, wiring, maintenance, inspection, replacement require professional with sufficient electrical knowledge.
- The installer must be familiar with the product installation requirements and related technical information.
- If install transformer or strong electromagnetic interference, install shielding protect device to avoid malfunction!

When wiring

Danger

- It is strictly forbidden for non-professionals to install, wiring, maintain, inspect or replace parts!
- Do not wiring when the power is on, otherwise there will be a risk of electric shock.
- Before wiring, cut off the power to all devices and wait at least 10 minutes before wiring, etc.
- Be sure that the equipment and products are well grounded, otherwise there is a risk of electric shock.
- Comply with ESD regulations and wear electrostatic bracelet for wiring to avoid damaging the product.

Warning

- It is strictly forbidden to connect the Input supply to the Output, or it will cause damage or even cause fire.
- When drive connecte to motor, ensure phase sequence is accurate and consistent, avoid reverse rotate of motor.
- Cable must meet require of diameter and shielding, Shielding layer of shielded cable needs grounded at one end!
- Once wiring is complete, make sure there are no fallen screws or exposed cables inside the product.

When power on

Danger

- Before power on, confirm that the product is well installed, the wiring is firm, and the motor is allowed to restart.
- Before power on, confirm that the power supply meets the requirements to avoid damage or fire!
- When power on, the mechanical device may move suddenly and should be kept away from the mechanism.
- After power on, do not open product protection cover, or there is a risk of electric shock!
- It is strictly forbidden to touch any terminal of the device under power, or there is a risk of electric shock!
- It is strictly forbidden to disassemble any parts of product under power, or there is a risk of electric shock!

Runtime

Danger

- It is strictly forbidden to touch any terminal in the operating state, or there is a risk of electric shock!
- It is strictly forbidden to disassemble any part in the operating state, or there is a risk of electric shock!
- It is strictly forbidden to touch the case, fan or resistor to test the temperature, or it may cause burns!
- It is strictly forbidden for non-professional to detect signal during operation, or cause personal injury or damage!

Warning

- During operation, avoid other metal objects falling into the equipment, or the equipment will be damaged!
- Do not use the contactor on/off method to control the start and stop, otherwise it will cause damage!

Maintenaing

Danger

- It is strictly forbidden for non-professionals to install, wiring, maintain, inspect or replace parts!
- It is strictly forbidden to maintain the equipment in the energized state, otherwise there is a risk of electric shock!
- After power off devices, wait at least 10 minutes before performing operations such as device maintenance.

Warning

- Please carry out daily and regular inspections in accordance with the maintenance requirements and keep records.

Repairing

Danger

- It is strictly forbidden for non-professionals to install, wiring, maintain, inspect or replace parts!
- It is strictly forbidden to repair the equipment in the energized state, otherwise there is a risk of electric shock!
- After power off devices, wait at least 10 minutes before performing operations such as device maintenance.

Warning

- Please report the equipment for repair in accordance with the product warranty agreement.
- If failure, professional will troubleshoot and repair in via the maintenance instruction, and make record.
- Please follow the product wearing parts replacement instructions for replacement.
- Do not continue to use a machine that has already been damaged, as this will cause more damage.
- After replacing the device, be sure to check the wiring and set the parameters of the device again.

At the end of life

Warning

- Please scrap according to national regulations and standards to avoid property damage or casualties!
- Scrapping is carried out in accordance with industrial waste disposal standards to avoid environmental pollution.

Security Identification

In order to ensure the safe operation and maintenance of the equipment, please be sure to follow the safety signs affixed to the equipment and products, and do not damage, damage, or Peel off the security marking. The safety signs are described as follows:

Security Identification	Content description
	◆ Read user manu before install & operate, or it will be risk of elec-shock! ◆ Don't remove cover when power is on and within 10 min of the power cut-off! ◆ For mainten, check, and wiring, turn off power supply on input and output Wait 10 minu,start work after the power indicator is completely turned off.

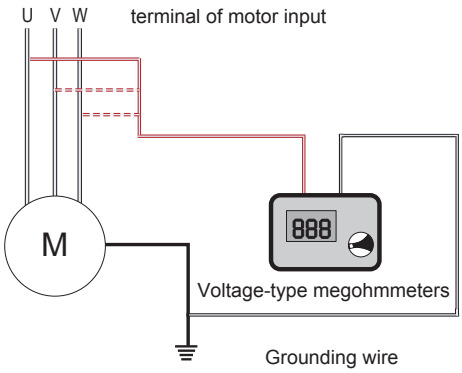
Precautions

1） RCD requirements for leakage protectors

When the equipment is in operation, a large leakage current will flow through the protective grounding conductor, please install a Type B leakage protector (RCD) on the primary side of the power supply. When selecting a leakage protector (RCD), the transient and steady-state leakage currents to the ground that may occur during the start-up and operation of the equipment should be considered A dedicated RCD with measures to suppress higher harmonics, or a general-purpose RCD with 300mA （$I_{\Delta n}$ 2 ~ 4 times of the current for the protection conductor）。

2） Motor insulation inspection

Before the motor is used for the first time, before it is reused after a long time and when it is regularly inspected, the motor insulation inspection should be done to prevent the motor from winding The insulation of the group fails and damages the inverter. When checking the insulation, be sure to separate the motor wiring from the inverter, and it is recommended to use 500V voltage Megohmmeter should ensure that the measured insulation resistance is not less than 5MΩ.



3） Thermal protection of the motor

If the rated capacity of the motor and the inverter does not match, especially when the rated power of the inverter is greater than the rated power of the motor, it must be adjusted

The relevant parameter values of motor protection in the inverter or the installation of a thermal relay in front of the motor to protect the motor.

4） Operate above the power frequency

This inverter provides an output frequency of 0Hz~500Hz. If the customer needs to operate above 50Hz, please consider the bearing capacity of the mechanism.

5） Vibration of mechanical devices

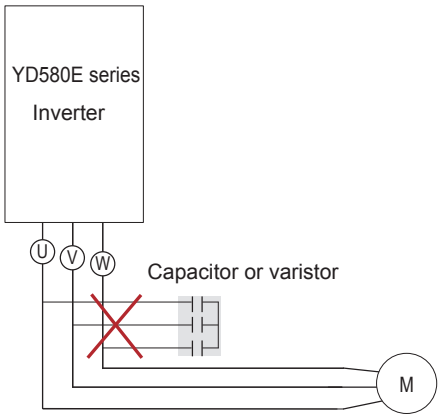
At some output frequencies, the inverter may encounter the mechanical resonance point of the load device, and the frequency parameter of the inverter can be set by setting the frequency jump parameter in the inverter Count to avoid.

6） About motor heating and noise

Because the output voltage of the inverter is a PWM wave, which contains a certain harmonic, the temperature rise, noise and vibration of the motor are compared with the power frequency operation There will be a slight increase.

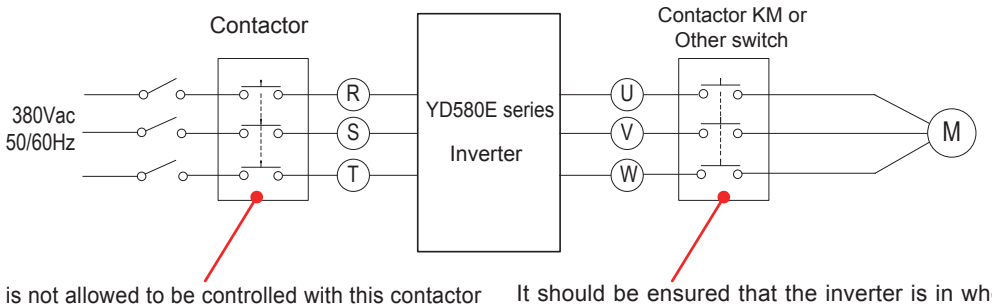
7） When there is a varistor or capacitor to improve the power factor on the output side

If the inverter outputs a PWM wave, do not install a capacitor to improve the power factor or a lightning protection varistor on the output side, as it is easy to cause conversion The frequency converter is overcurrent instantaneously and even damages the frequency converter.



8) Contactor and other switch device used in the input and output of Inverter

If a contactor is installed between the power supply and the input of the inverter, it is not allowed to use this contactor to control the start and stop of the inverter。It must be needed When using the contactor to control the start and stop of the inverter, the interval should not be less than 1 hour. Frequent charging and discharging can easily reduce the capacitors in the inverter with life.If there is a switching device such as a contactor between the output terminal and the motor, it should be ensured that the inverter is on and off when there is no output. Otherwise, it is easy to cause damage to the module in the inverter.



It is not allowed to be controlled with this contactor start and stop of the inverter; Must be used, the interval should not be less than 1 hour

It should be ensured that the inverter is in when there is no output perform the operation on and off, otherwise it cannot be done due to KM normal arc extinguishing, damage to contactor, guide cause circuit breakage and damage to the inverter.

9) Use other than the rated voltage value

It is not suitable to use the inverter outside the allowable operating voltage range specified in the manual, which is easy to cause damage to the components in the inverter. If needed, Use the appropriate step-up or step-down device to transform the power supply and input it to the inverter.

10) Three-phase input is changed to two-phase input

The three-phase inverter in the YD580E series cannot be converted to two-phase use. Failure to do so will result in malfunction or damage to the inverter.

11) Surge suppressors

The inverter is equipped with a varistor to suppress the surge voltage generated when the inductive load around the inverter is turned on and off. When around If the inrush voltage energy generated by the inductive load is large, be sure to use a surge suppressor or a diode on the inductive load.

NOTE

- Do not connect the "Surge Suppressor" to the Output side of the drive.

12） Altitude and Derating are used

In areas with an altitude of more than 1000m, the heat dissipation effect of the inverter is worse due to the thin air, and it is necessary to reduce the derating (for every 100m increase in altitude, the derating is 1%, and the maximum altitude is 3000m; When the temperature exceeds 40°C, it needs to be used by 1.5% for every 1°C increase in temperature, and the maximum operating temperature is 50°C). In this case, please contact us for technical advice.

13） Some special usage

If you need to use a method other than the wiring diagram provided in this manual, such as a common DC bus, please contact us.

14） Pay attention to the scrapping of the inverter

Electrolytic capacitors in the main circuit and electrolytic capacitors on the printed circuit may explode when incineration. Toxic gases are produced when plastic parts are incinerate. Please dispose of it as industrial waste.

15） About the adapter motor

● The standard adaptation motor is a quadrupole squirrel cage “Asynchronous Induction Motor”. If it is not the above motor, please be sure to choose the Inverter according to the rated current of the motor frequency converters;

● The cooling fan of the non-inverter motor is coaxially connected with the rotor shaft, and the cooling effect of the fan is reduced when the speed is reduced In case of overheating, a strong exhaust fan should be installed or replaced with a variable frequency motor;

● The inverter has built-in adaptation to the standard parameters of the motor, and it is necessary to identify the motor parameters or modify the default values according to the actual situation In order to meet the actual value as much as possible, otherwise it will affect the operation effect and protection performance;

● The rated current of the pole change motor is different from that of the standard motor, so please check the maximum current of the motor and select the appropriate inverter. Please The number of poles must be switched after the motor is stopped.

● Due to a short circuit inside the cable or motor, it will cause the inverter to alarm, or even blow up. Therefore, it is important to perform a short-circuit test on the insulation of the initially installed motor and cable, and also to perform this test frequently during routine maintenance. Note that when doing this test, it is important to disconnect the inverter from the part being tested.

● The speed control range of the motor varies depending on the lubrication method and manufacturer.

● If you are operating a motor outside of the speed control range, please consult the motor manufacturer.

Chapter 1 Product Information

1.1 Nameplate Model 14
1.2 Description of each part.....15

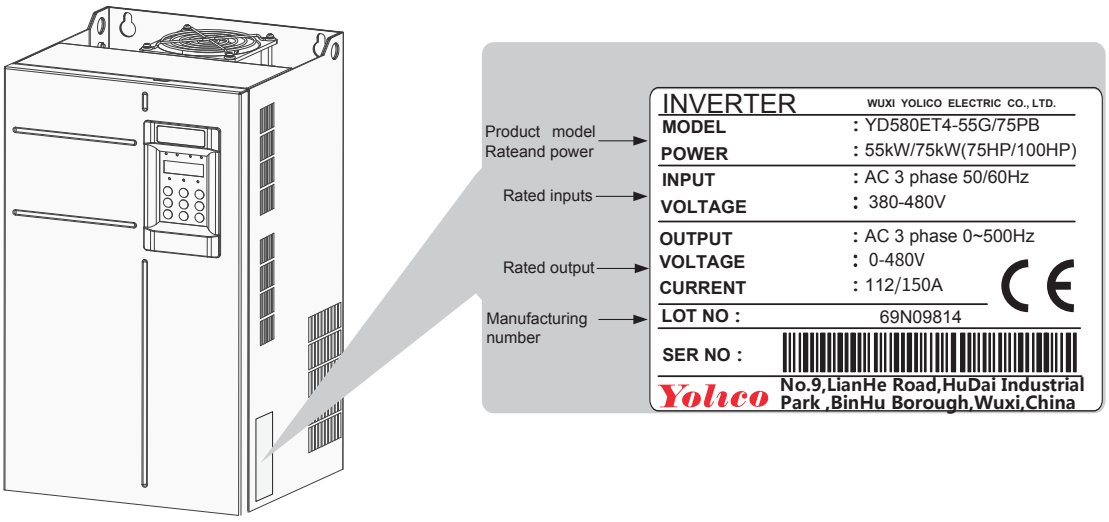
Chapter 1 Product Information

Safety Precautions

note

- Do not grasp the front or terminal cover to carry the inverter. If only the front cover is grasped, Inverter will fall and there is a risk of smashing;
- When operating drive, follow the step set forth in the ESD prevention measures.or the inside of the inverter will be damaged due to static electricity circuits.

1.1 Nameplate Model



YD580E T4- 18P5G / 22P B

Mark	Product name
YD580E	Synchronous drive

Mark	Voltage level
T4-	3PH 380~480V

Mark	Power Rating (kW)
0P7	0.75kW
1P5	1.5kW
...	...
450	450kW

Mark	Overload type
G	150%*60s level

Mark	尾缀说明
NULL	Without
-L	With Output AC reactor
-T	With DC reactor
-A	Auxi-electrical cabinets

Mark	Brake unit
NULL	Without
B	With

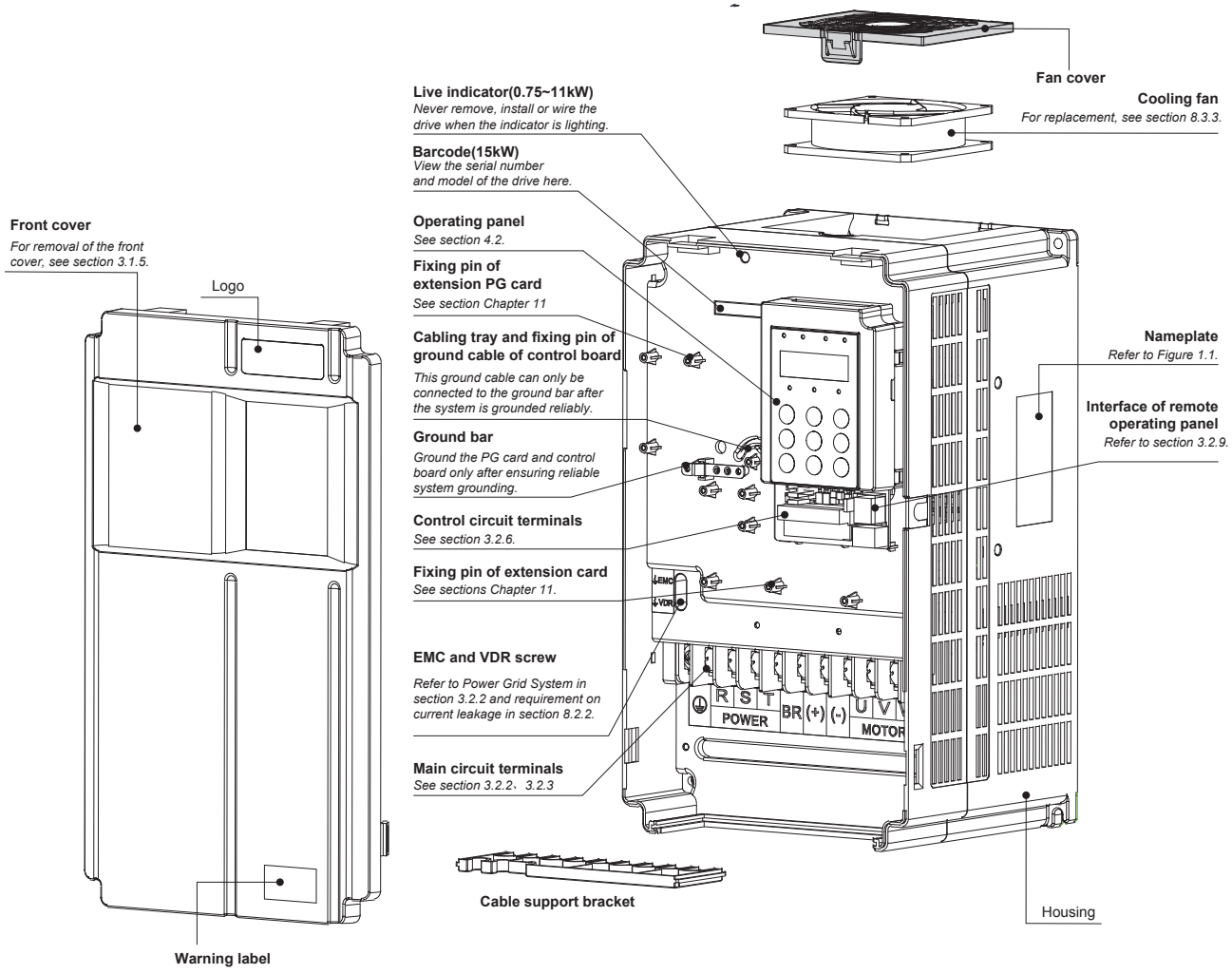
Mark	Overload type
P	120%*60s level

Mark	Power Rating (kW)
1P5	1.5kW
2P2	2.2kW
...	...
500	500kW

Figure 1-1 Product naming and nameplate identification

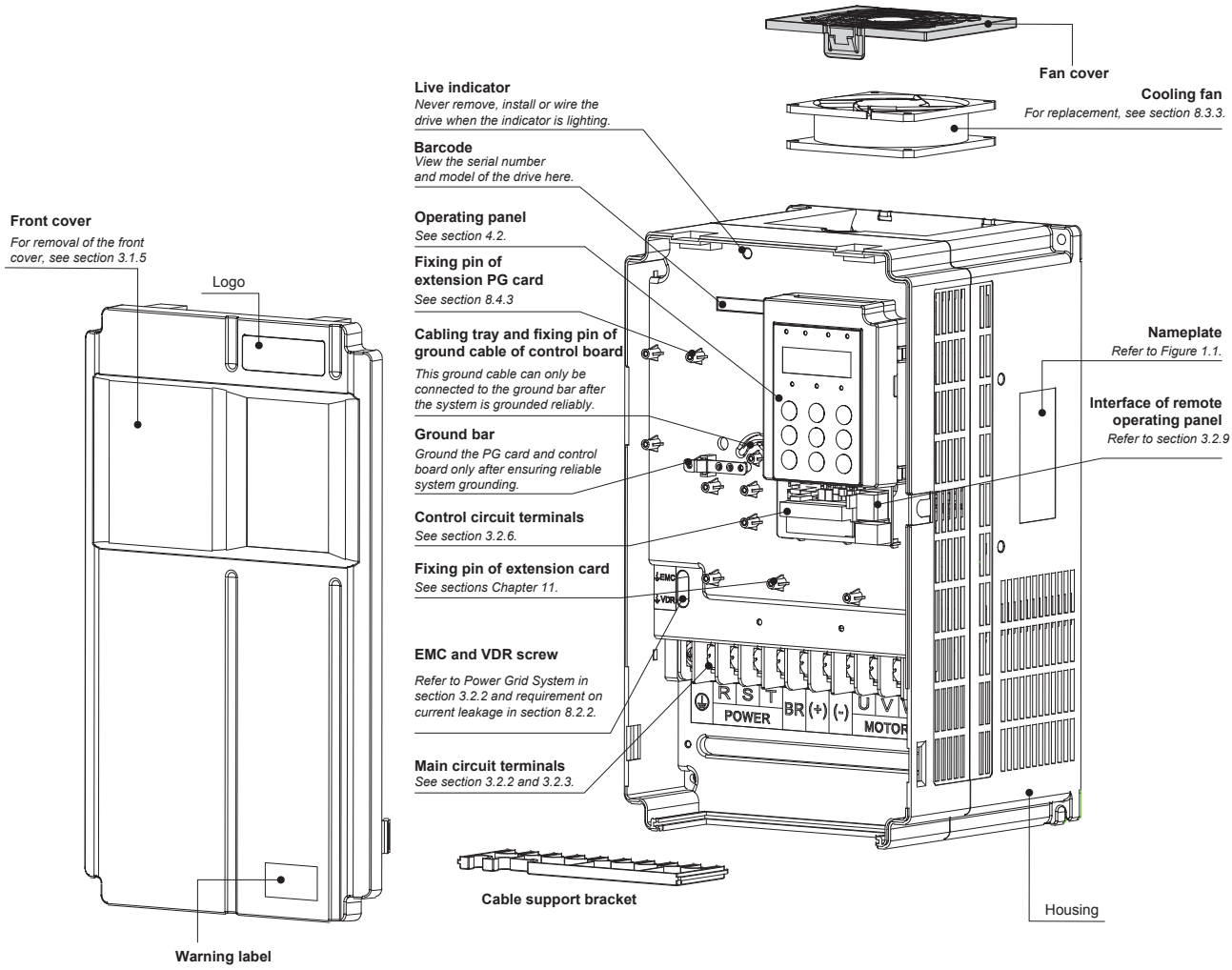
1.2 Description of each part

YD580E series inverter has two types of structure, which are
Plastic Structure (YD580ET4-0P7G/1P5PB ~ YD580ET4-22G/30PB) and sheet
Metal Structure (YD580ET4-30G/45P(B) ~ YD580ET4-450G/500P (-L)). As shown in the figure below:



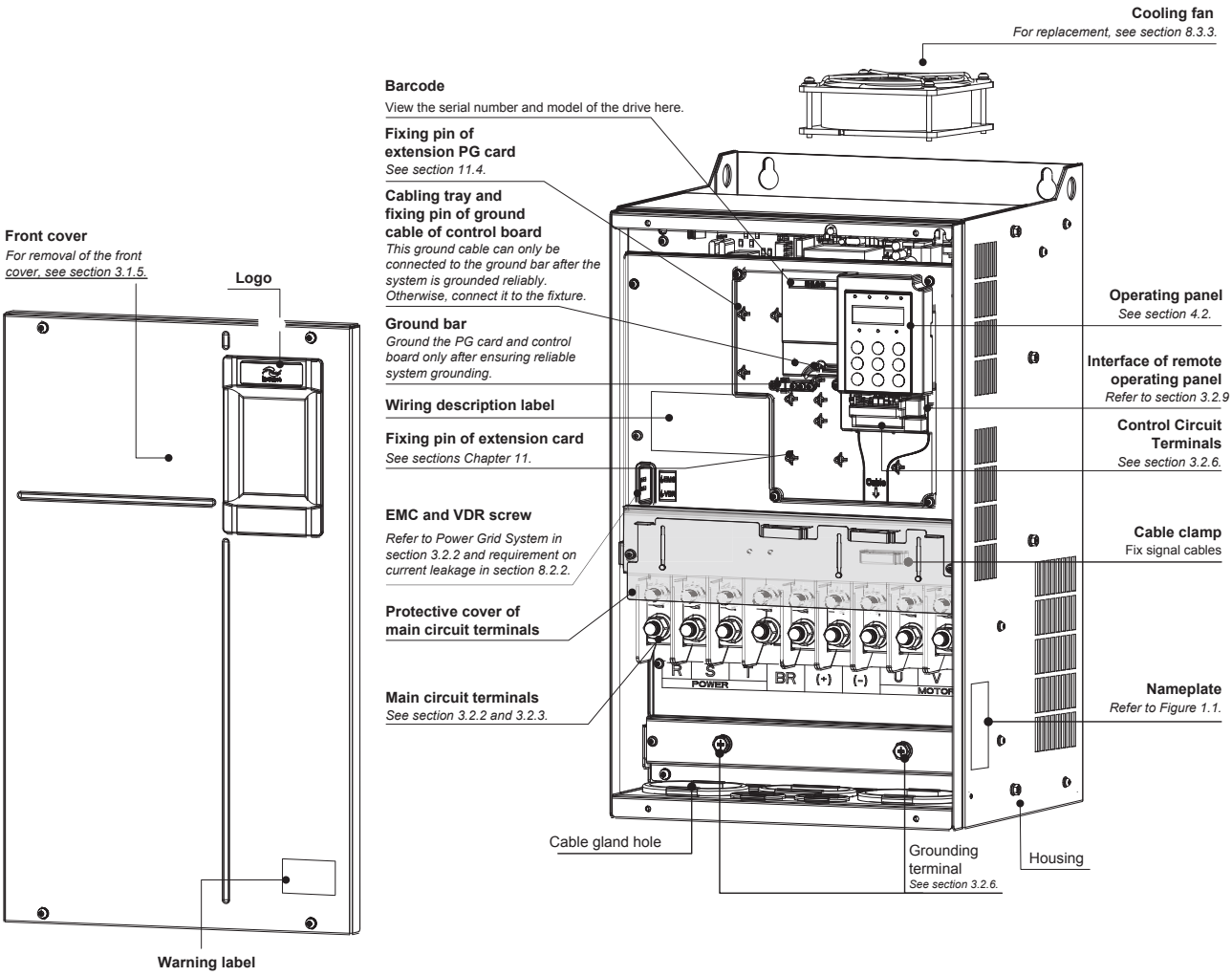
Identification		Description
⚠	📖	Note！ Please be sure to read the user manual before installation and operation.
⚠	10min	Danger! In the power-on state and within 10 minutes of cutting off the power supply,Do not remove the upper cover;

Figure 1-2 Product component diagram
[3-phase 380V ~ 480V, YD580ET4-0P7G/1P5PB ~YD580ET4-15G/18P5PB]



Identification		Description
⚠	📖	Note！ Please be sure to read the user manual before installation and operation.
⚡	10min	Danger! In the power-on state and within 10 minutes of cutting off the power supply,Do not remove the upper cover;

Figure 1-3 Schematic diagram of product components
[three-phase 380V~480V, YD580ET4-18P5G/22PB ~ YD580ET4-22G/30PB]



Identification		Description
⚠	📖	Note！ Please be sure to read the user manual before installation and operation.
⚠	10min	Danger! In the power-on state and within 10 minutes of cutting off the power supply,Do not remove the upper cover;

Figure 1-4 Schematic diagram of product components
[3-phase 380V~480V, YD580ET4-45G/55P(B) ~ YD580ET160G/200P(-L)]

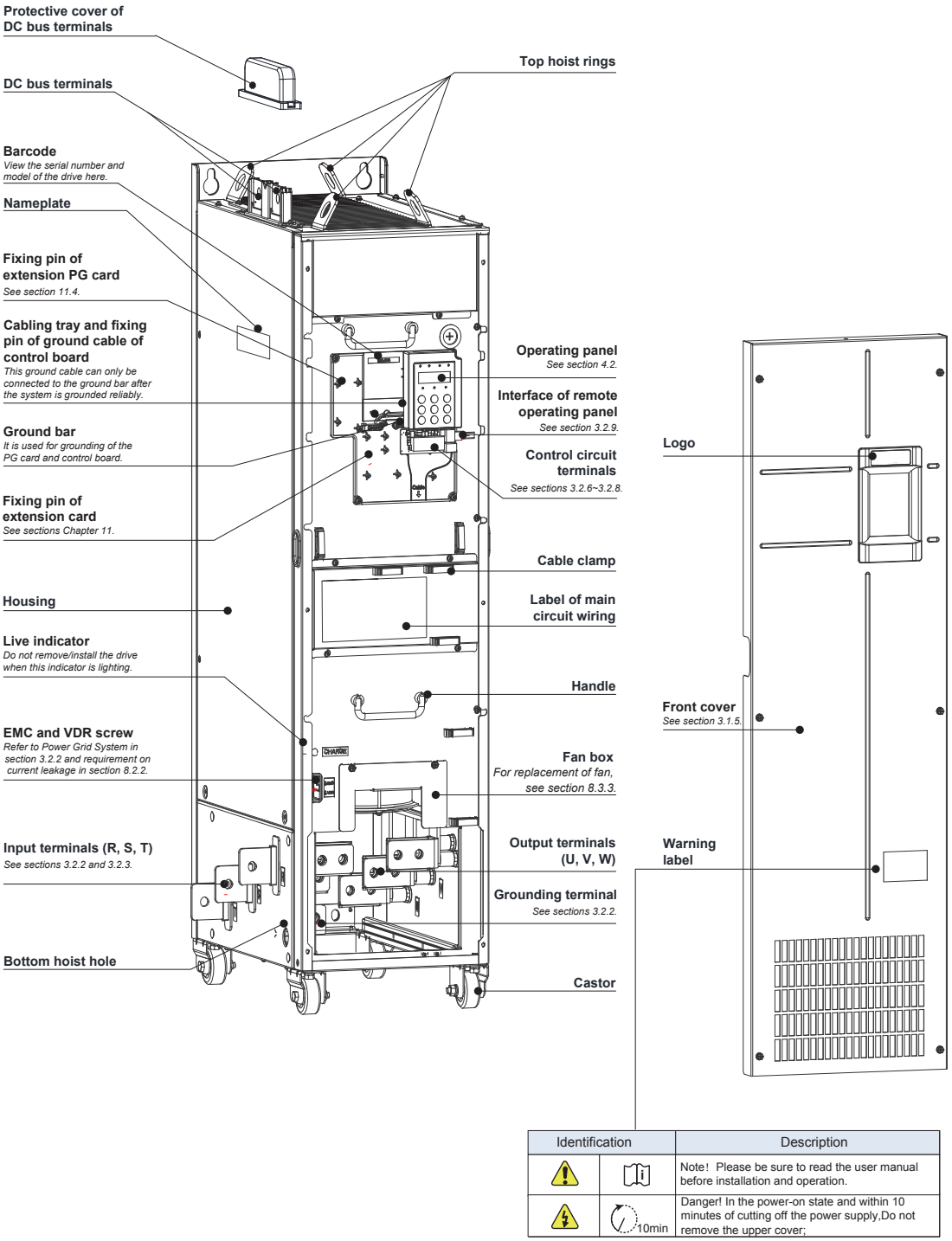
NOTE

- The number and location of cooling fans vary slightly depending on the type of equipment.

For YD580ET4-45G/55P(B)~YD580ET4-55G/75P(B) models,there is one cooling fan on top of the device;

For YD580ET4-75G/90P(B)~YD580ET4-110G/132P models, there are two cold on the top of the device But the fan;

For YD580ET4-132G/160P~YD580ET4-160G/200P models, there are two cooling fans on the bottom of the unit.



Identification	Description
	Note！ Please be sure to read the user manual before installation and operation.
10min	Danger! In the power-on state and within 10 minutes of cutting off the power supply,Do not remove the upper cover;

Figure 1-5 Schematic diagram of product components
[three-phase 380V~480V, YD580ET4-200G/220P ~ YD580ET4-450G/500P]

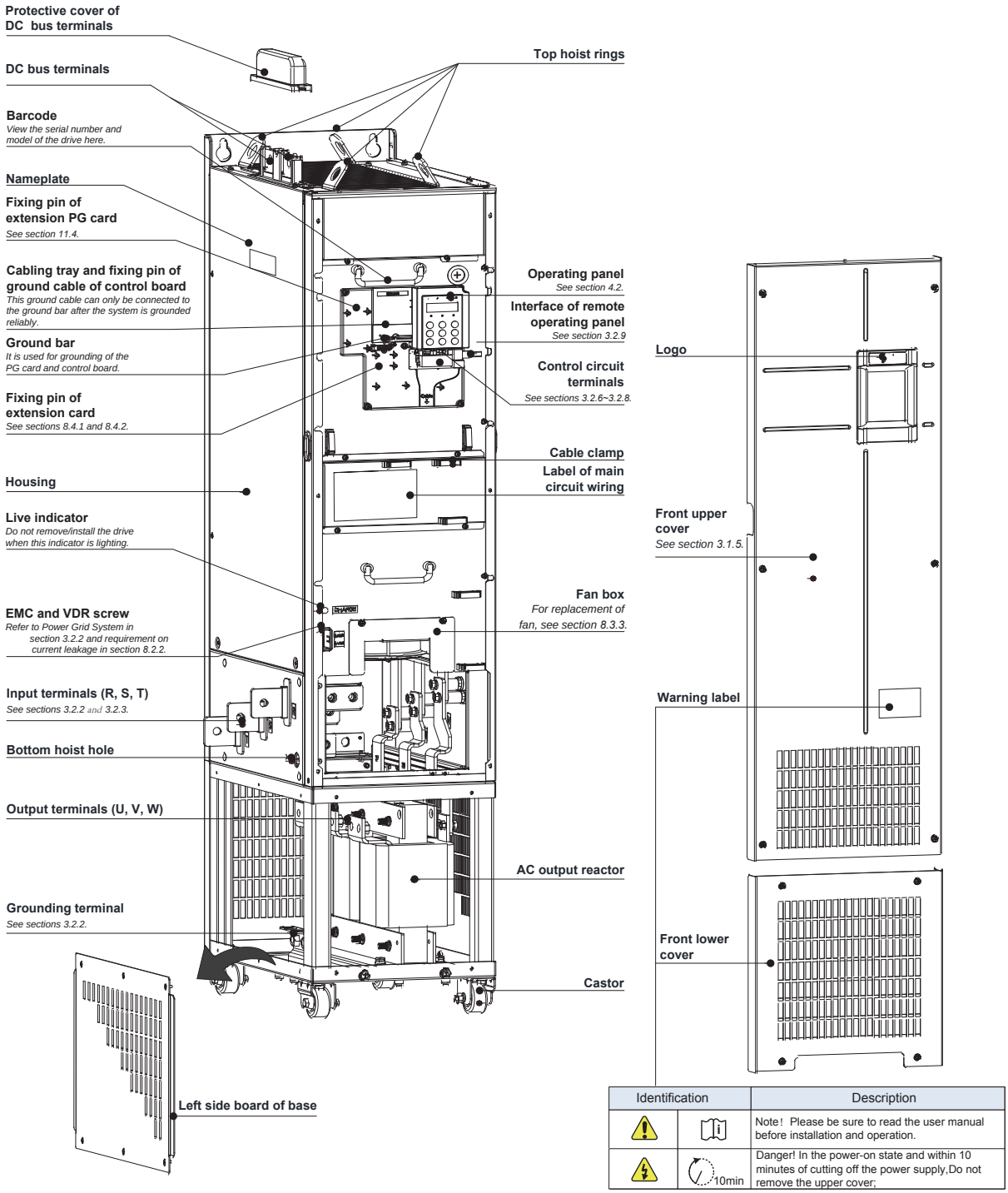
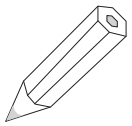


Figure 1-6 Schematic diagram of product components
[three-phase 380V~480V, YD580ET4-200G/220P-L ~ YD580ET4-450G/500P-L]

Memo NO. _____

Date / /



Chapter 2 System Connection

2.1 YD580E System Connection Diagram.....23
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Chapter 2 System Connection

Safety Precautions

Danger

- It is strictly forbidden to wire when power on, or there will be a risk of electric shock!
- Be sure to keep the circuit breaker in the OFF state.

Warning

- When install inverter in a closed cabinet , use a cooling fan to fully cool it to make the inverter keep inlet air temperature of inverter below 50°C, or it may cause overheating.

Caution

- When install inverter, cover the upper of the inverter with cloth or paper to prevent metal shaving, oil, and water from the hole during drilling into inside of the inverter. If foreign matter gets inside inverter, it may cause inverter to malfunction, so remove it after the work is finished If cloth or paper continues to be covered on it, the ventilation effect will be worse, resulting in abnormal heating of inverter!
- When using the drive, please follow the steps specified in the ESD prevention measures, otherwise the drive will be damaged due to static electricity!
- The torque characteristics are different when driving with an inverter and when driving with a commercial power supply, so check the load torque characteristics of the machine to be connected Sex.
- Do not lift the inverter with the housing removed, as this may cause damage to the inverter's circuit board or terminal strip!

2.1 YD580E System Connection Diagram

When using YD580E series inverter to control asynchronous motor to form a control system, it is necessary to install various electrical components on the input and output sides of the inverter to ensure the safety and stability of the system. The product system composition of three-phase 380V~480V 0.75kW and above power is shown in the following figure:

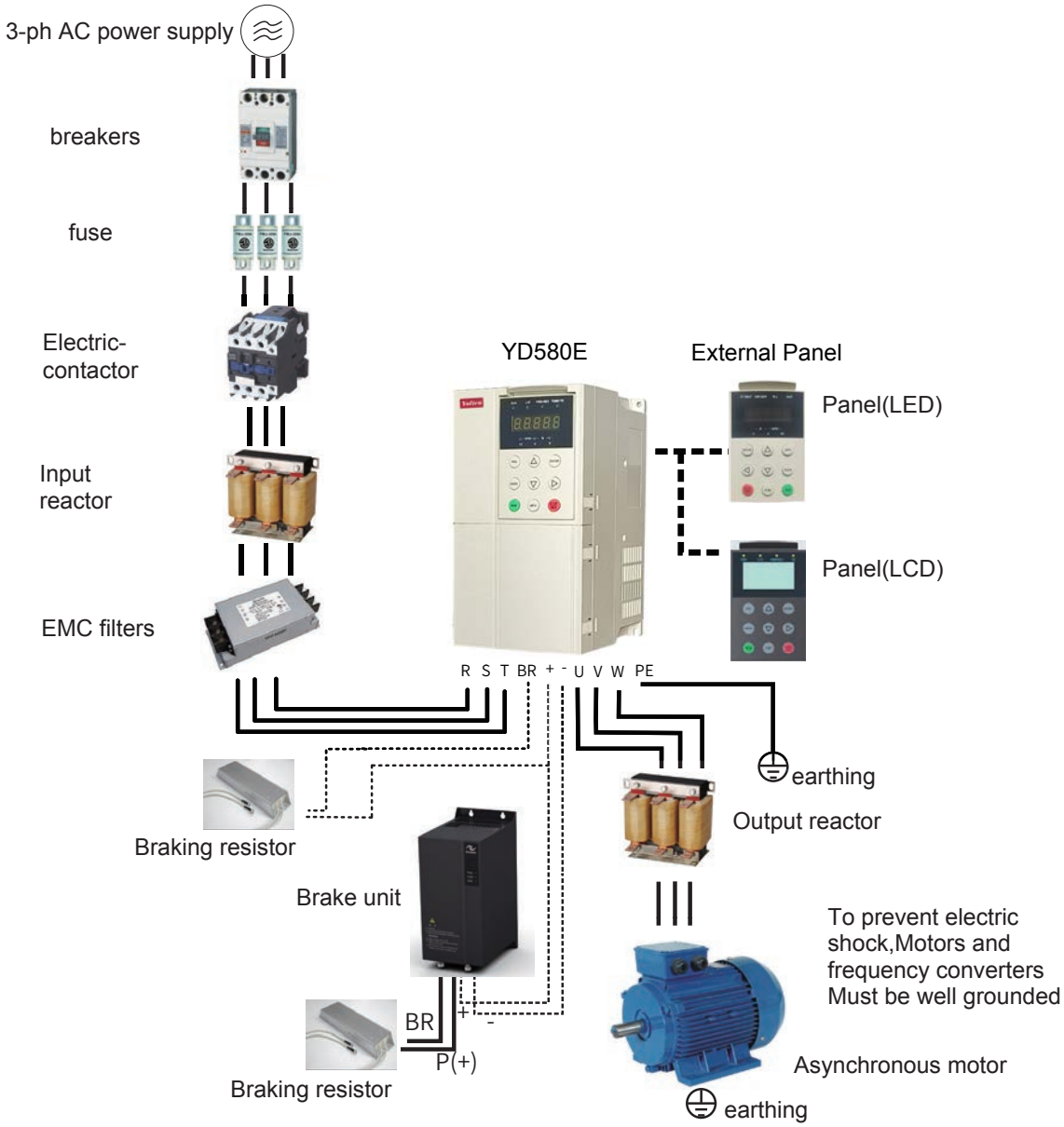

Figure 2-1 YD580E series system configuration

NOTE

● The above picture is only used as a schematic diagram of the YD580E inverter system connection, please refer to Chapter 9 "Specifications and Selection" for the selection of peripheral equipment.。

2.2 YD580E System Configuration Diagram

Table 2-1 Instructions for using the peripheral electrical components of the YD580E inverter system

Accessory	Installation location	Feature description
breakers	between the power supply and the input side of the inverter	breaker: Cut off the power in the event of overcurrent ,Prevent accidents
		Leakage protection circuit breaker: inverter may generate leakage current when it is working, Cut off the power supply to prevent accidents
fuse	ditto	Prevent accidents due to short circuit and protect semiconductor devices
Electric-contactor	between the breaker and inverter input	The inverter is power on and off, and frequent power-on and off-power operations or direct start-up operations of the inverter through the contactor should be avoided.
Input reactor	Inverter input side	Increase the power factor on the input side; Eliminate higher harmonics on the input to prevent damage to other equipment;Eliminates input current imbalance caused by power supply phase imbalance.
EMC filters	Inverter input side	Reduce external conduction and radiation interference of the inverter; Improve the anti-interference ability of the inverter to the power supply.
DC reactors	30kW the above standard DC reactor; 18.5~22kW DC optional reactor	Increase the power factor on the input side; Improve the efficiency and thermal stability of the inverter; Eliminate input higher harmonics to reduce conducted and radiated
Braking Resistor	Inverter main circuit terminal (+), BR	With B model, please use the brake resistor as an option;
Brake unit	Inverter main circuit terminal (+), (-)	The motor consumes regenerative energy through the braking resistor when decelerating.
Output reactor	On the output side of the inverter and the motor , close to the inverter installation	The inverter output contain high harmonics. When the distance between motor and inverter is far, due to the line there is a large distributed apacitance. some harmonics may resonate in the loop, bring two effect a) Destroy insulation of motor, and damage the motor for a long time. b) large leakage current is generated, causes frequent protect of inverter. if distance between inverter and motor is more than 100m,recommended to install output reactor.
dv/dt reactors	Close to inverter on the output side	Option dv/dt reactor protect motor insulation and reduce bearing current.
Output magnetic ring	Close to inverter on the output side	The output magnetic ring is mainly used to reduce the bearing current.
Motor	Inverter output side	Please follow the recommendations to select the appropriate motor.
External Panel	External Panel interface	External keyboard LED Type, LCD keyboard Type

● Do not install capacitors or surge suppressors on the output side of the inverter, otherwise it will cause the failure of the inverter or the capacitance and surge suppressor of damage.

● The input/output (main circuit) of the inverter contains harmonic components, which may interfere with the communication equipment near the inverter. Anti-interference can be installed Filters to minimize interference.

Chapter 3 Installation and Wiring

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Chapter 3 Installation and Wiring

3.1 Installation

3.1.1 Installation Environment

1) Ambient temperature: The ambient temperature has a great impact on the life of the inverter, and the operating ambient temperature of the inverter is not allowedExceeding the allowable temperature range (-10°C~ 50°C).

2) Install the inverter on the surface of a flame-retardant object, and there should be enough space around it to dissipate heat. The inverter is prone to produce a large amount when working

Heat. And install it vertically on the mounting support with screws.

3) Install it in a place where it is not easy to vibrate. The vibration should not be greater than 0.6G. Pay special attention to stay away from equipment such as punches.

4) Avoid direct sunlight, humidity, and water droplets.

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

6) Avoid installation in places with oil and dust.

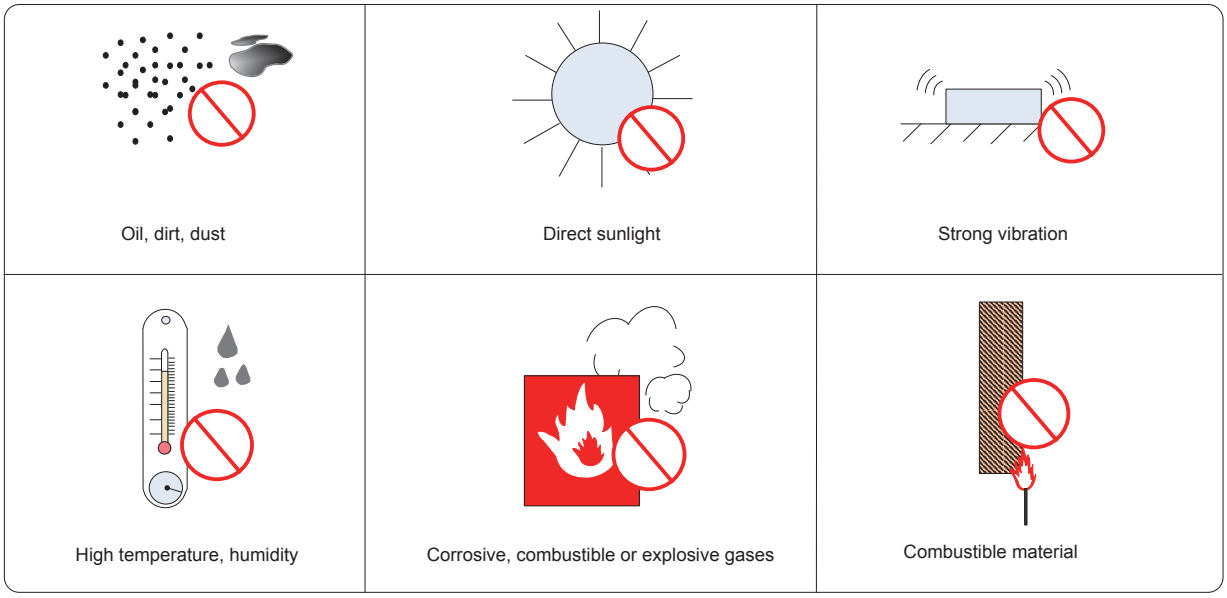


Figure 3-1 Requirements for the installation environment

7) YD580E series products are cabinet installation products, which need to be installed in the final system for use, and the final system should be provided corresponding fireproof enclosures, electrical protective enclosures and mechanical protective enclosures, etc., and comply with local laws and regulations and relevant IEC Standard requirements:

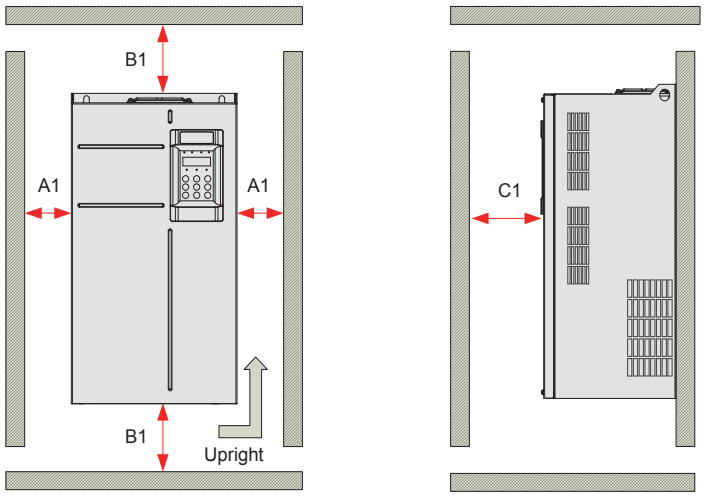
3.1.2 Installation space and orientation

1） Installation space

YD580E series inverters are reserved for installation and partition space depending on the power level.

◆ Single machine installation

（Front view） (Side View)

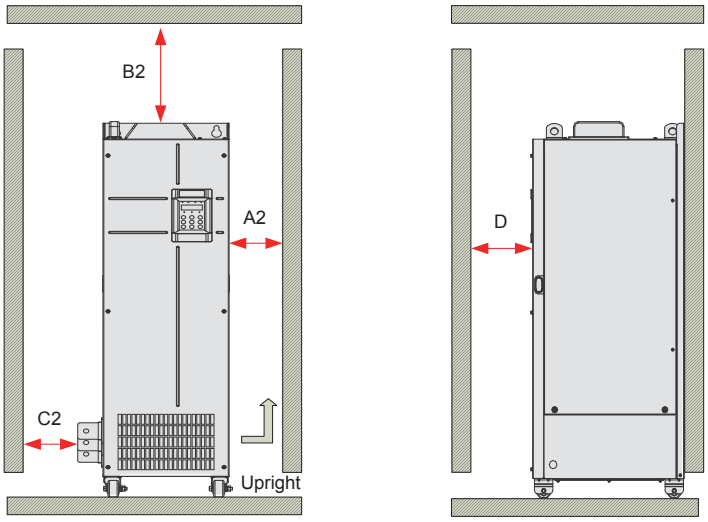


Installation space requirements

Power Rating	Clearance Requirements（unit mm）		
0.75kW~15kW	A1≥10	B1≥100	C1≥40
18.5kW~22kW	A1≥10	B1≥200	C1≥40
30kW~37kW	A1≥50	B1≥200	C1≥40
45kW~160kW	A1≥50	B1≥300	C1≥40

Figure 3-2 Installation space of a single machine (YD580ET4-0P7G/1P5PB-YD580ET4-160G/200P)

（Front view） (Side View)



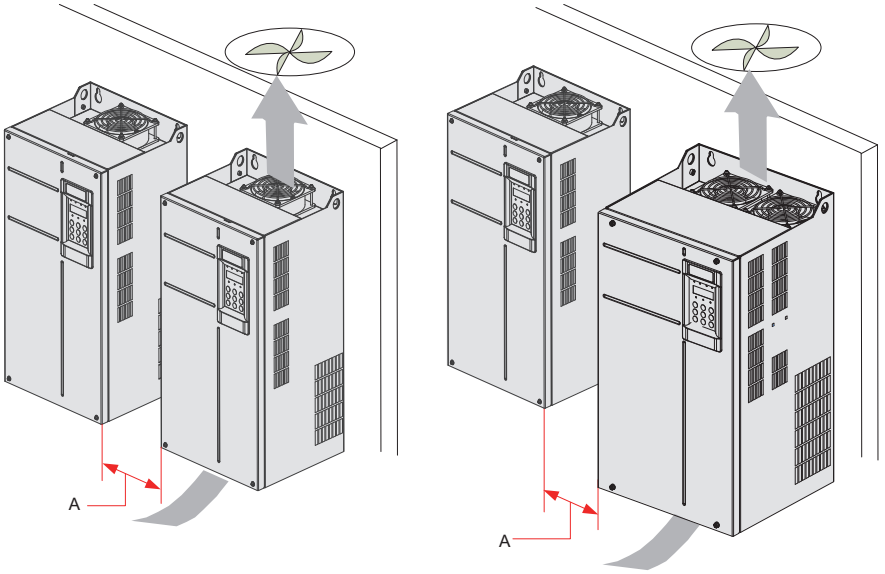
Installation space requirements

Power Rating	Clearance Requirements（unit mm）			
200kW~450kW	A2≥10	B2≥250	C2≥20	D≥20

Figure 3-3 Installation space of a single machine (YD580ET4-200G/220P-YD580ET4-450G/500P)

◆ Multiple machines installed

The heat dissipates from the bottom to the top when the YD580E series inverter dissipates heat, and when multiple inverters are working, they are usually installed side by side, the upper part of the machine to align, especially for drives of different volumes.



Installation space requirements

Power Rating	C. R.（unit mm）
0.75kW~15kW	A≥10
18.5kW~22kW	A≥10
30kW~37kW	A≥50
45kW~160kW	A≥50

Figure 3-4 Multiple machines of the YD580ET4-0P7G/1P5PB-YD580ET4-160G/200P model are installed side by side

◆ Upper and lower row installation

In the case of the upper and lower row installation, because the heat of the lower row inverter will cause the temperature of the upper row inverter to rise, which will cause the overheating/ overload fault of the upper row inverter, measures such as installing a heat insulation deflector should be taken, as shown in the following figure:

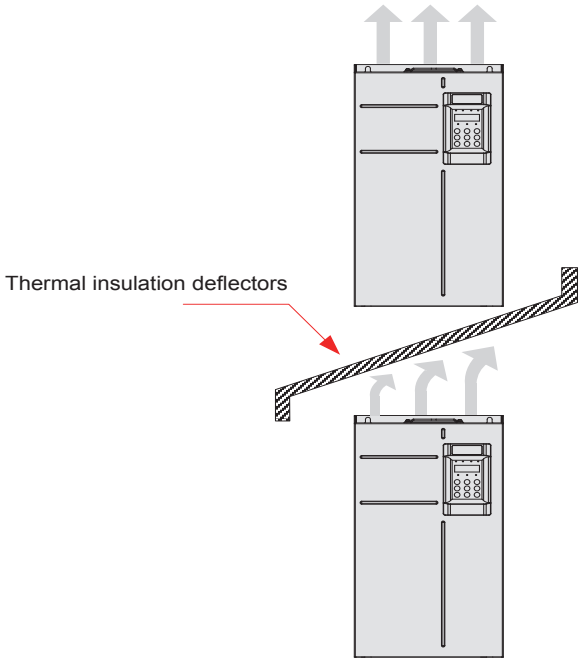


Figure 3-5 Installation requirements for the upper and lower rows

NOTE

● YD580ET4-200G/220P(-L)-YD580ET4-450G/500P(-L) models only support single installation in the cabine t, and do not support side-by-side installation or upper and lower row installation.
If you have installation needs, please contact the manufacturer.

2） Installation orientation

When installing the inverter, please install it vertically upward, and it is forbidden to install it in other directions such as lying down, lying on the side, and standing upside down.

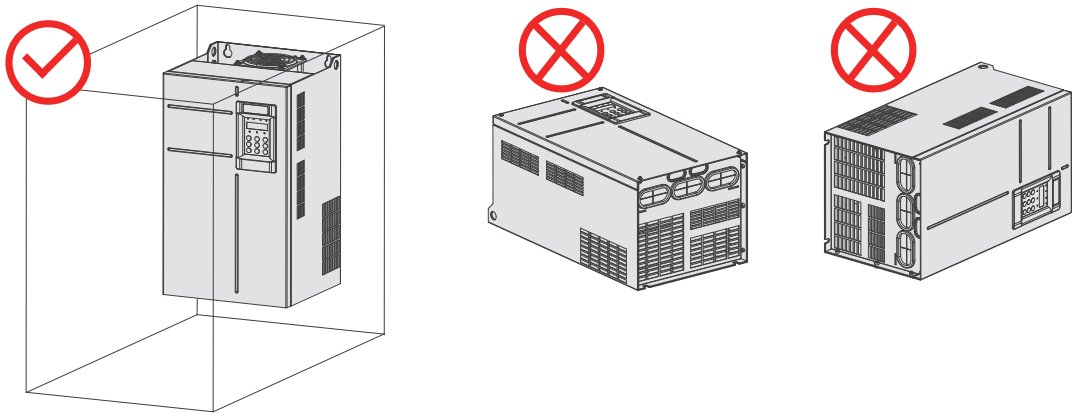


Figure 3-6 Installation direction

3.1.3 Wall-mounted and flush-mounted

YD580E series supports different installation methods according to different power levels:
YD580ET4-0P7G/1P5PB~160G/200P machines it supports wall-mounted and flush-mounted;
YD580ET4-200G/220P~450G/500P models support cabinet installation.
Please combine the specific model and safety
For the needs of the application, follow the installation instructions below for product installation.
Only YD580ET4-0P7G/1P5PB~YD580ET4-160G/200P models support wall mounting and flush mounting.

note

● The installation space requirements are shown in Figure 3-2, and it is necessary to ensure that the inverter has enough space for heat dissipation
Consider the heat dissipation of other devices in the cabinet;
● Install the inverter vertically upwards to facilitate heat dissipation upwards. If there are multiple inverters in the cabinet, please side by side
Installation. When it is necessary to install up and down, please refer to Figure 3-4 to install the thermal insulation deflector;
● When you need to use the mounting bracket, the material of the mounting bracket must be flame retardant;
● For applications with metal dust, it is recommended to use an installation cabinet that can completely enclose the inverter to make the frequency conversion
The device is isolated from the metal dust, and the space in the fully sealed cabinet should be as large as possible; At this point, it is recommended to dissipate heat
The device is installed by means of external installation.

3.2 Connection

3.2.1 Standard wiring diagram

The typical wiring is shown in the figure below, please note that the wiring part at the double arrow in the figure is different for the 0.75kW~75kW model and the 90kW~450kW model.

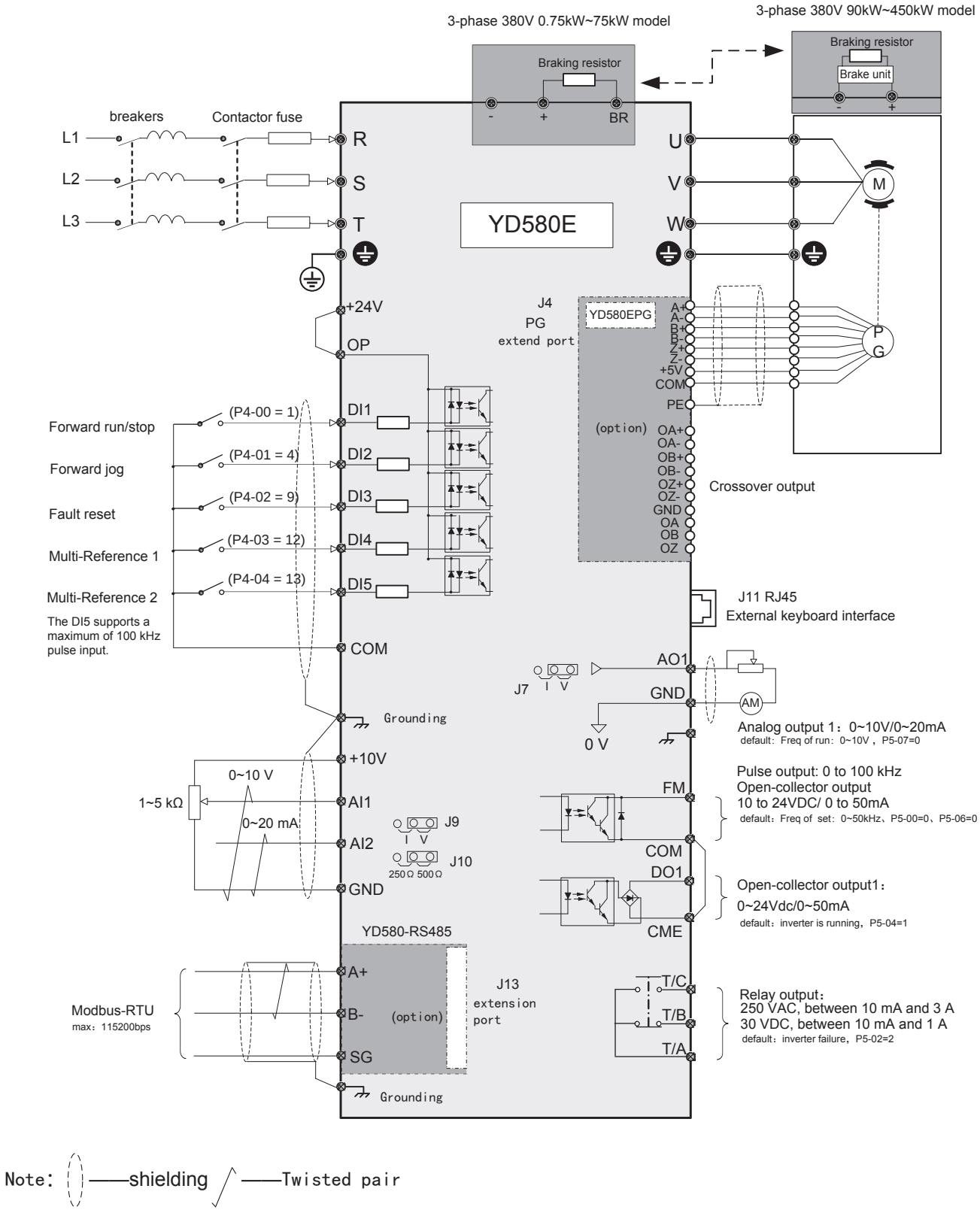


Figure 3-26 Typical wiring diagram of 3-phase 380V~480V

3.2.2 Function of main circuit terminal

1） YD580E Series inverter main circuit terminals

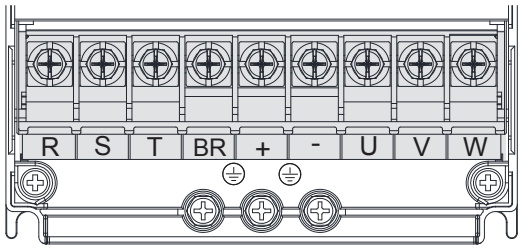


Figure 3-27 YD580ET4-0P7G/1P5PB ~ YD580ET4-15G/18P5PB main circuit

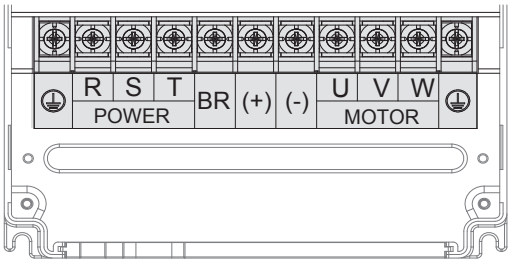


Figure 3-28 YD580ET4-18P5G/22PB ~ YD580ET4-160G/200P main circuit

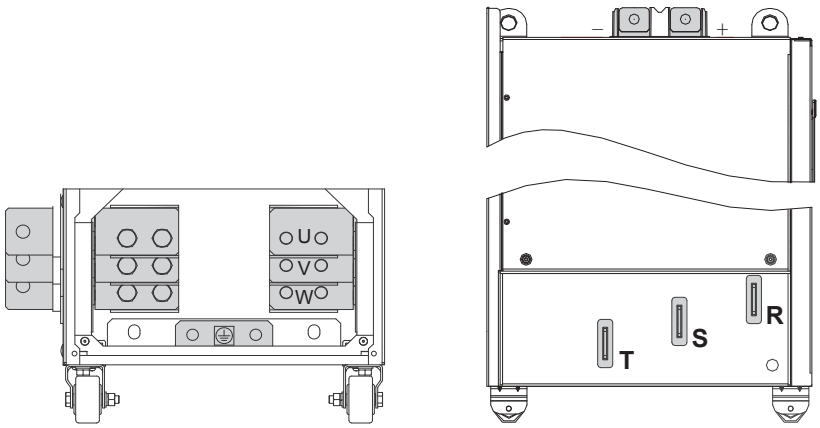


Figure 3-29 YD580ET4-200G/220P(-L) ~ YD580ET4-450G/500P(-L) main circuit

Table 3-3 Main circuit terminals of YD580E series inverters

Terminal marking	Terminal name	Feature description
R、S、T	3-phase power input	AC input three-phase power connection point
(+) 、 (-)	DC bus positive、negative	Common DC bus input , and connect external braking units
(+) 、BR	Braking resistor connection	Braking resistor connection point
U、V、W	Inverter output terminal	Connect a three-phase motor
⏚	Ground Terminal (PE)	Protective grounding

2） Selection of main circuit cables

Symmetrical shielded cables are recommended for the input and output main circuit cables. The use of symmetrically shielded cables reduces electromagnetic emissions throughout the conduction system compared to four-core cables.

◆ Recommended Power Cable Type – Symmetrical Shielded Cable:

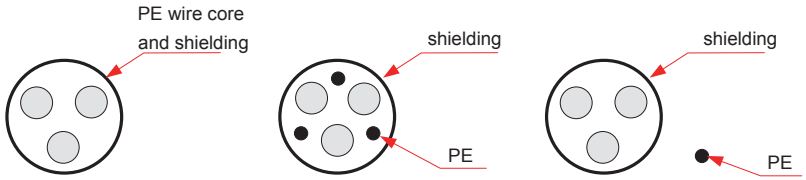


Figure 3-30 Recommended power cable type

◆ No-Recommended Power Cable Type – Asymmetrical Shielded Cable:

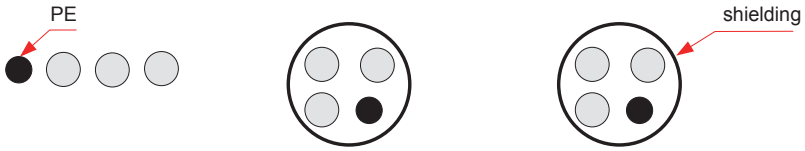


Figure 3-31 No-Recommended power cable type

3） Input power supply R, S, T

- The input side wiring of the inverter has no phase sequence requirement.
- The specifications and installation of the external main circuit wiring should comply with local regulations and relevant IEC standards.
- For the wiring of the main return route, please select the copper wire of the corresponding size according to the recommended value of the main return cable selection in "3.2.3 Distribution and size of the main circuit terminals".
- The filter should be installed close to the input terminals of the inverter, and the connecting cables between them should be less than 30cm. The ground terminal of the filter.The grounding terminals of the sub and the inverter should be connected together, and ensure that the filter and the inverter are installed on the same conductive mounting plane, which is connected to the main grounding of the cabinet.

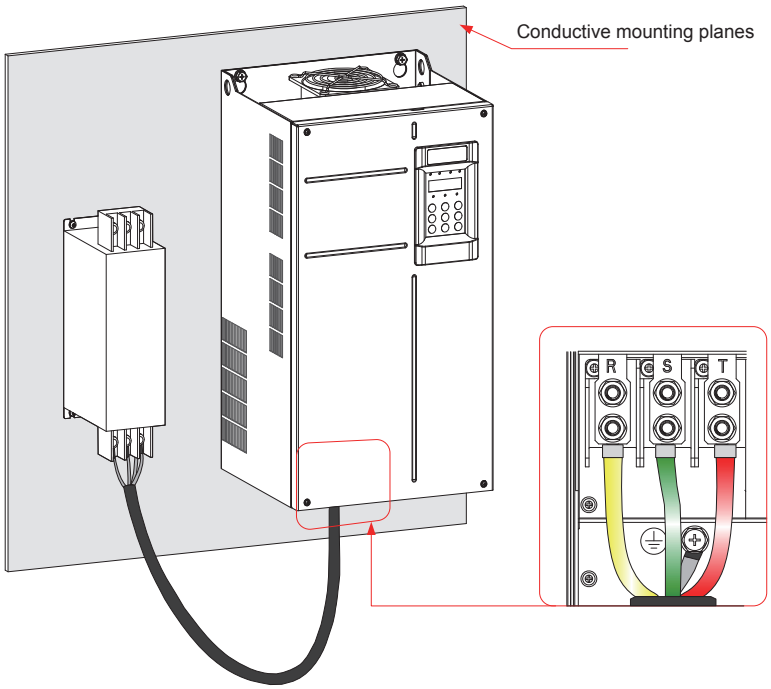


Figure 3-32 Filter installation

4) DC bus (+), (-)

● Note that there is residual voltage on the DC bus (+) and (-) terminals just after the power failure, and the wiring operation can only be carried out after the CHARGE light is turned off and the power failure is confirmed for 10 minutes, otherwise there is a risk of electric shock.

● When using external brake components for 90kW and above, pay attention to the polarity of (+) and (-) should not be reversed, otherwise it will cause damage to the inverter and brake components or even fire.

● The wiring length of the brake unit should not exceed 10m. Twisted pair or tight two-wire parallel wiring should be used.

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

5) The braking resistor is connected to the terminal (+) and BR

● For models of 75kW or less and with a built-in braking unit, the brake resistor connection terminal is only valid.

● The braking resistor should be selected according to the recommended value, and the wiring distance should be less than 5m. Failure to do so may result in damage to the inverter.

● Be careful that there should be no combustibles around the braking resistor. Avoid overheating the braking resistor and igniting the surrounding devices.

● After connecting the braking resistor, the model with a braking unit of 75kW or less and a built-in braking unit can reasonably set the "P9-08" braking utilization rate and the "P6-15" braking unit operation starting voltage parameters according to the actual load;

6) U, V, W on the output side of the inverter

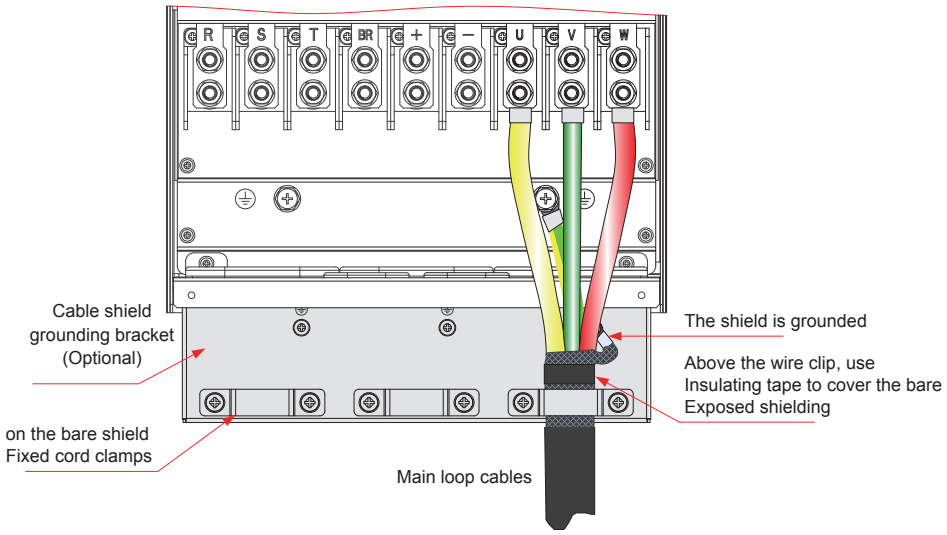


Figure 3-33 Wiring of the shield layer

The cable shield grounding bracket shown in Figure 3-34 is an optional accessory that needs to be purchased separately (applicable to YD580ET4-160G/220P and earlier models), and its installation instructions are as follows:

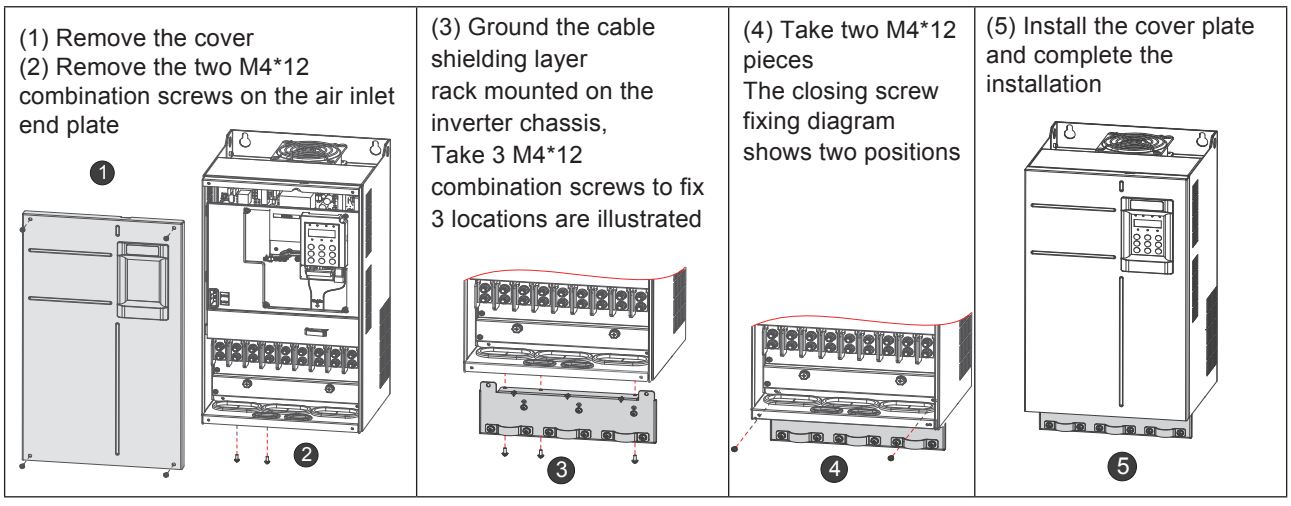


Figure 3-34 Installation of the grounding bracket of the cable shield

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

● For the wiring of the main return route, please select the corresponding size of copper wire according to the value of "Table 9-8 YD580E Selection Guide for Peripheral Electrical Components of Frequency Inverter".

● Capacitors or surge absorbers should not be connected to the output side of the inverter, otherwise the inverter will often be protected or even damaged.

● When the motor cable is too long, due to the influence of distributed capacitance, it is easy to produce electrical resonance, which causes the motor insulation to be damaged or generated The large leakage current makes the inverter over-current protected. When the length of the motor cable is greater than 100m, an AC output reactor must be installed near the inverter.

● It is recommended to use shielded wire for the output motor cable, and the shielding layer needs to be lapped 360° on the structure with the cable shielding grounding bracket, and the shielding lead wire is crimped to the PE terminal.

● The motor cable shield lead wire should be as short as possible and not less than 1/5 of the length.

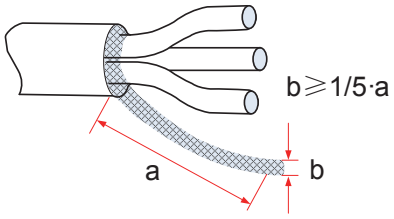


Figure 3-35 The shield layer of the motor cable is the drawing intent

7） Ground terminal ⏚ （PE）

● The terminals must be reliably grounded, and the ground wire resistance must be less than 10Ω. Failure to do so will cause the device to work abnormally or even be damaged.

● Do not share the ground terminal ⏚ and the N-terminal of the power neutral wire.

● The size of the protective grounding conductor is selected according to the "Table 9-8 YD580E Partial Peripheral Electrical Component Selection Guide for Frequency Inverter".

● The protective grounding conductor must be made of yellow and green cables.

● The position of the main loop shield ground.

● The inverter is recommended to be installed on the conductive metal mounting surface to ensure that the entire conductive bottom of the inverter is well overlapped with the mounting surface;

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

8) Requirements for cable protection of the main return route

● In the lug copper tube and cable core part of the main return cable, the casing should be heat shrinkable, and ensure that the casing completely covers the cable conductor part points, as shown in the figure below:

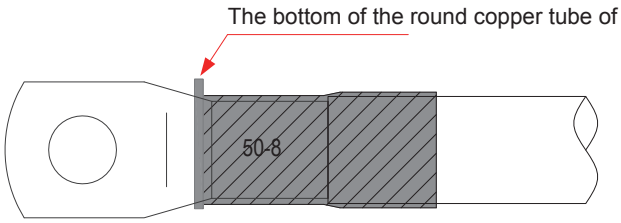


Figure 3-36 Heat shrinkage of cable conductor and sleeve

9) Requirements for pre-amp protection devices

● Appropriate protection devices should be installed on the input distribution lines, and the protection devices should provide over-current protection, short-circuit protection and isolation protection and other protection functions.

● When selecting protection devices, factors such as the current capacity of the main circuit cable, the requirements of the system overload capacity and the short-circuit capacity of the pre-stage distribution of the equipment should be considered, and the recommended values should be selected according to the recommended values in "Table 9-8 YD580E Selection Guide for Peripheral Electrical Components of Inverter".

10） Grid system requirements

● This product is suitable for the grid system with neutral point grounded, if it is used in the IT power grid system (grid system with neutral point not grounded), it is necessary to remove the varistor (VDR) to ground jumper and the safety capacitor (EMC) to ground jumper, the No. 1 and No. 2 screws as shown in the figure below, and the filter cannot be installed, otherwise it may cause injury or damage to the inverter.

● In the case of a leakage circuit breaker, if there is a leakage protection phenomenon during starting, the safety capacitor (EMC) can be jumped to ground,Remove the No. 2 screw as shown in the image below.

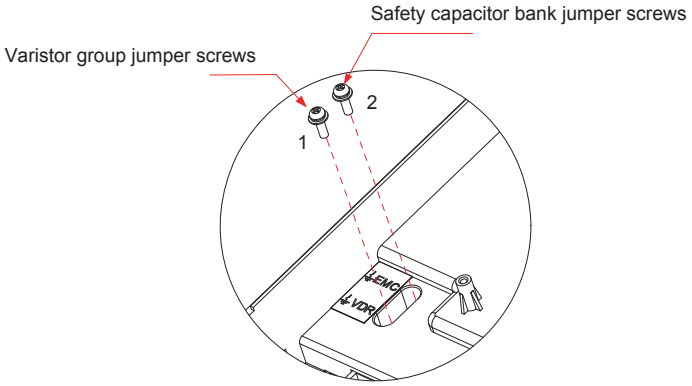


Figure 3-37 Position of varistor (VDR) and safety capacitor (EMC) jumpers to ground

3.2.3 Distribution of main circuit terminal.

● YD580ET4-200G/220P(-L)~YD580ET4-450G/500P(-L) models have a side copper bar by default, a nd users can remove the side copper bar according to their needs;

● The recommended data and models in each table in this subsection are for reference only, and the width of the wire diameter selected by the user cannot be greater than the width of the terminal size in the figure;

●IEC cable selection is based on:

- EN 60204-1 and IEC 60364-5-52 standards;
- PVC insulation;
- 40°C ambient temperature, 70°C surface temperature;
- symmetrical cables with copper mesh shielding;
- No more than 9 cables can be placed side by side in the same cable tray.

● In the table below, 3 x 10 represents 1 x 3 cores and 2x (3x95) represents 2 x 3 cores.

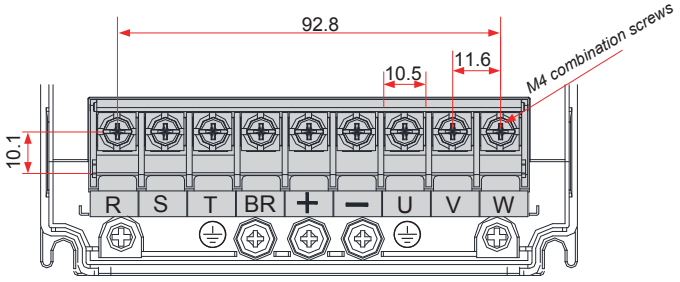


Figure 3-38 main circuit terminal size of
YD580ET4-0P7G/1P5PB ~ YD580ET4-5P5G/7P5PB 3-phase 380V ~ 480V.

Table 3-6 Selection of YD580ET4-0P7G/1P5PB ~ YD580ET4-5P5G/7P5PB Main Return Cable (3-phase 380V ~ 480V)

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tighten Torque N·m
YD580ET4-0P7G/1P5PB	2.4	3 x 0.75	TNR0.75-4	0.75	TNR0.75-4	1.2
YD580ET4-1P5G/2P2PB	4.6	3 x 0.75	TNR0.75-4	0.75	TNR0.75-4	1.2
YD580ET4-2P2G/3P7PB	6.3	3 x 0.75	TNR0.75-4	0.75	TNR0.75-4	1.2
YD580ET4-3P7G/5P5PB	11.4	3 x 1.5	TNR1.25-4	1.5	TNR1.25-4	1.2
YD580ET4-5P5G/7P5PB	16.7	3 x 2.5	TNR2-4	2.5	TNR2-4	1.2

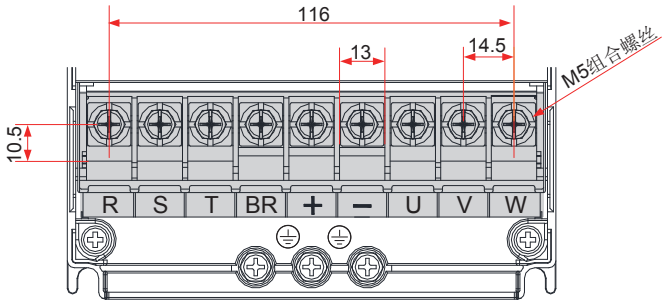


Figure 3-39 YD580ET4-7P5G/11PB ~ YD580ET4-11G/15PB 3-phase 380V ~ 480V.

Table 3-6 YD580ET4-7P5G/11PB~YD580ET4-11G/15PB Main circuit cable selection (3-phase 380V ~ 480V)

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tighten Torque N·m
YD580ET4-7P5G/11PB	21.9	3 x 4	TNR3.5-5	4	TNR3.5-5	2.8
YD580ET4-11G/15PB	32.2	3 x 6	TNR5.5-5	6	TNR5.5-5	2.8

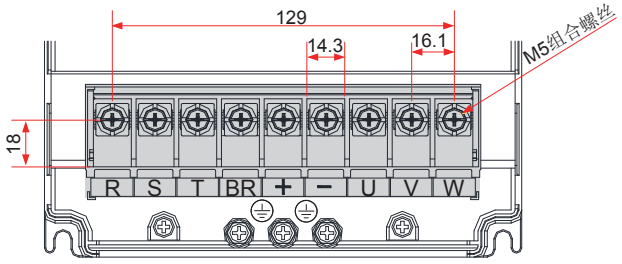


Figure 3-40 YD580ET4-15G/18P5PB 3-phase 380V ~ 480V; main circuit terminal size

Table 3-7 YD580ET4-15G/18P5PB Selection of main circuit cable (3-phase 380V ~ 480V)

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tighten Torque N·m
YD580ET4-15G/18P5PB	41.3	3 x 10	TNR8-5	10	TNR8-5	2.8

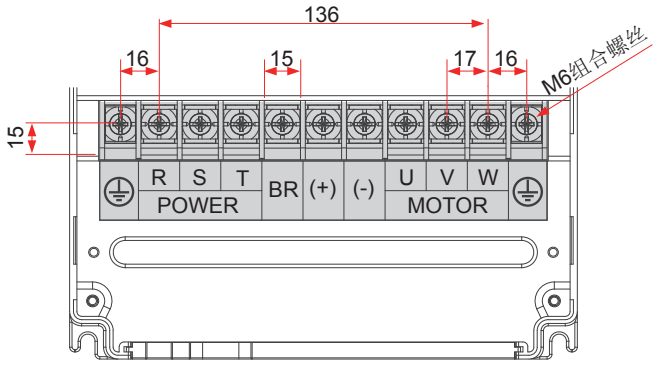


Figure 3-41 YD580ET4-18P5GB/22P(-T)~YD580ET4-22G/30PB(-T) 3-phase 380V ~ 480V;

Table 3-8 YD580ET4-18P5G/22PB(-T)~YD580ET4-22GB/30PB(-T) Main Circuit Cable Selection (3-phase 380 ~ 480V)

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tighten Torque N·m
YD580ET4-18P5GB/22P(-T)	49.5	3 x 10	GTNR10-6	10	GTNR10-6	4.0
YD580ET4-22GB/30P(-T)	59	3 x 16	GTNR16-6	16	GTNR16-6	4.0

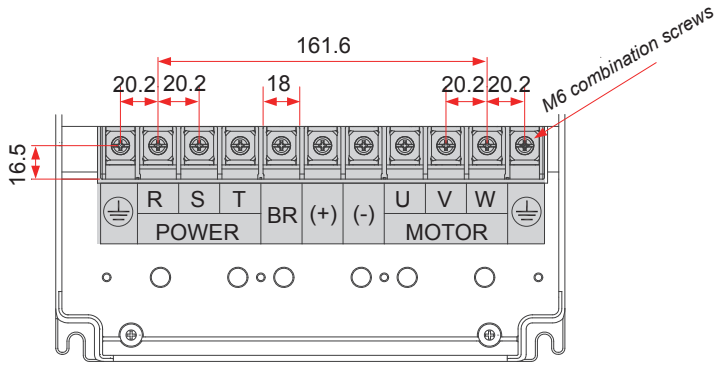


Figure 3-42 YD580ET4-30G/37P(B) ~ YD580ET4-37G/45P(B) 3-phase 380V ~ 480V;

Table 3-9 YD580ET4-30G/37P(B)~YD580ET4-37G/45P(B) Main Circuit Cable Selection (3-phase 380V ~ 480V)

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tightening Torque N·m
YD580ET4-30G/37P(B)	57	3 x 16	GTNR16-6	16	GTNR16-6	4.0
YD580ET4-37G/45P(B)	69	3 x 25	GTNR25-6	16	GTNR16-6	4.0

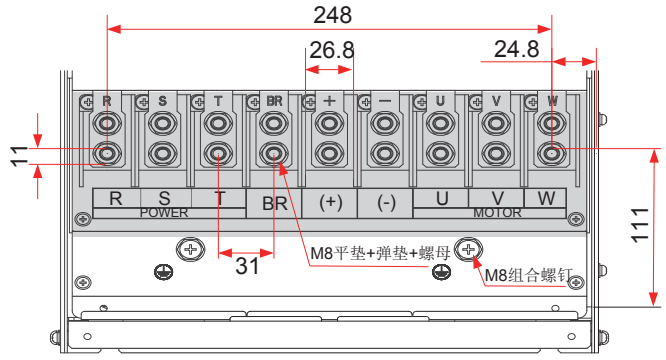


Figure 3-43 YD580ET4-45G/55P(B) ~ YD580ET4-55G/75P(B) 3-phase 380 ~ 480V;

Table 3-10 YD580ET4-45G/55P(B)~YD580ET4-55G/75P(B) Main Circuit Cable Selection (3-phase 380 ~ 480V)

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tightening Torque N·m
YD580ET4-45G/55P(B)	89	3 x 35	GTNR35-8	16	GTNR16-8	10.5
YD580ET4-55G/75P(B)	106	3 x 50	GTNR50-8	25	GTNR25-8	10.5

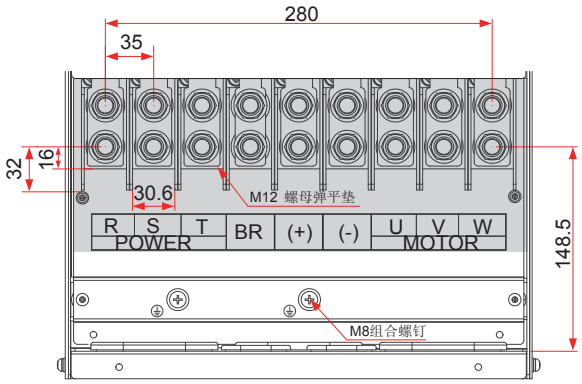


Figure 3-44 YD580ET4-75G/90P(B) ~ YD580ET4-90G/110P ~ YD580ET4-110G/132P 3-phase 380V ~ 480V

Table 3-11 YD580ET4-75G/90P~YD580ET4-90G/110P~YD580ET4-110G/132P Main circuit cable (3-phase 380V ~ 480V)

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tightening Torque N·m
YD580ET4-75G/90P(B)	139	3 x 70	GTNR70-12	35	GTNR35-12	35.0
YD580ET4-90G/110P	164	3 x 95	GTNR95-12	50	GTNR50-12	35.0
YD580ET4-110G/132P	196	3 x 120	GTNR120-12	70	GTNR70-12	35.0

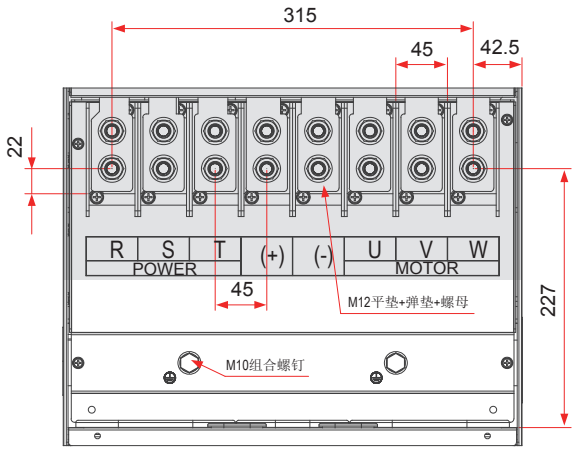


Figure 3-45 YD580ET4-132G/160P ~ YD580ET160G/220P

Table 3-12 YD580ET4-132G/160P ~ YD580ET4-160G/200P Selection of main circuit cables

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tightening Torque N·m
YD580ET4-132G/160P	240	3 x 150	BC150-12	95	BC95-12	35.0
YD580ET4-160G/200P	287	3 x 185	BC185-12	95	BC95-12	35.0

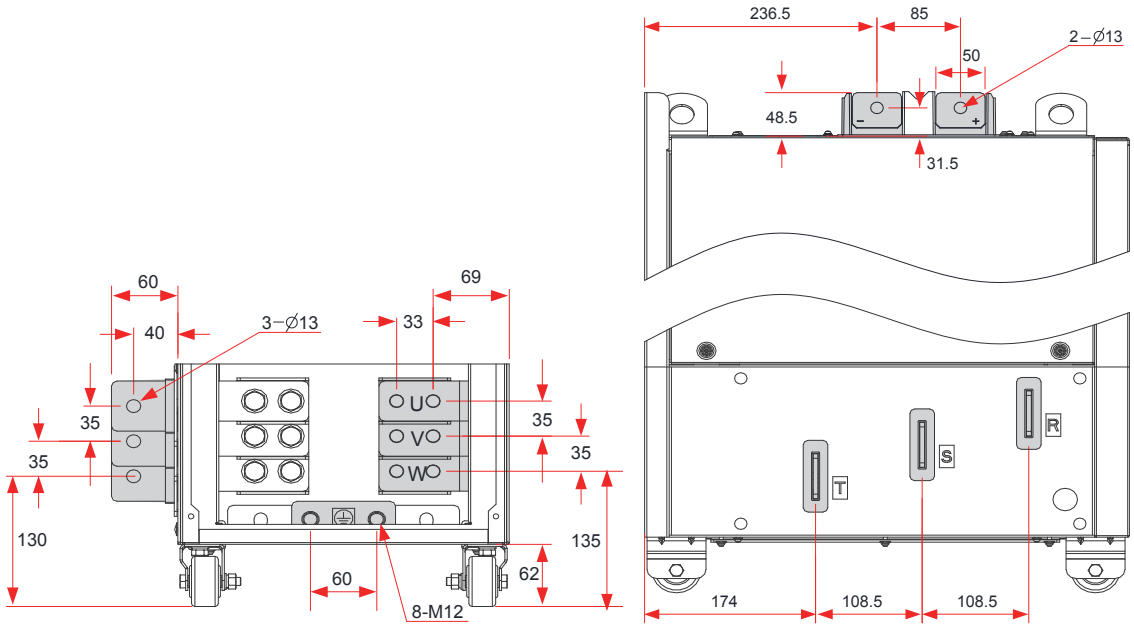


Figure 3-46 YD580ET4-200G/220P~YD580ET4-220G/250P Main circuit terminal size without output reactor

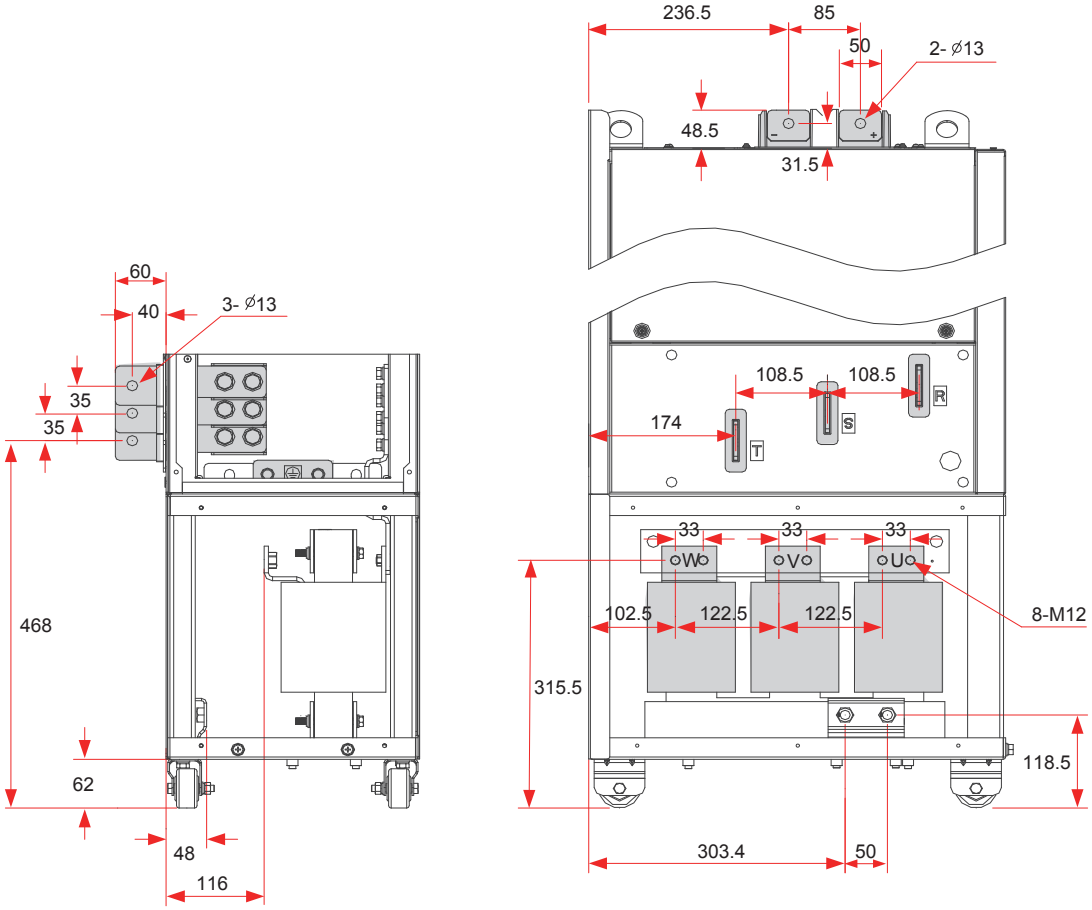


Figure 3-47 YD580ET4-200G/220P-L~ YD580ET4-220G/250P-L main circuit terminal size

(with output reactor)

Among them, the side outlet copper bar in the above figure can be disassembled as needed, and the size of the main circuit terminal after disassembly is as follows:

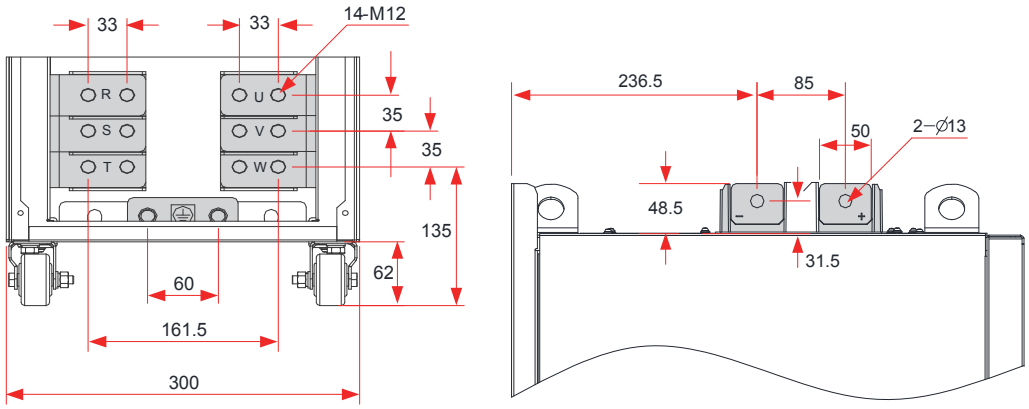


Figure 3-48 Terminal size of YD580ET4-200G/220P-L~ YD580ET4-220G/250P-L main circuit without side exit busbar and output reactor

Table 3-13 YD580ET4-200G/220P(-L)~YD580ET4-220G/250P(-L) main circuit cable selection

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tightening Torque N·m
YD580ET4-200G/220P(-L)	365	2 x (3 x 95)	BC95-12	95	BC95-12	35.0
YD580ET4-220G/250P(-L)	410	2 x (3 x 120)	BC120-12	120	BC120-12	35.0

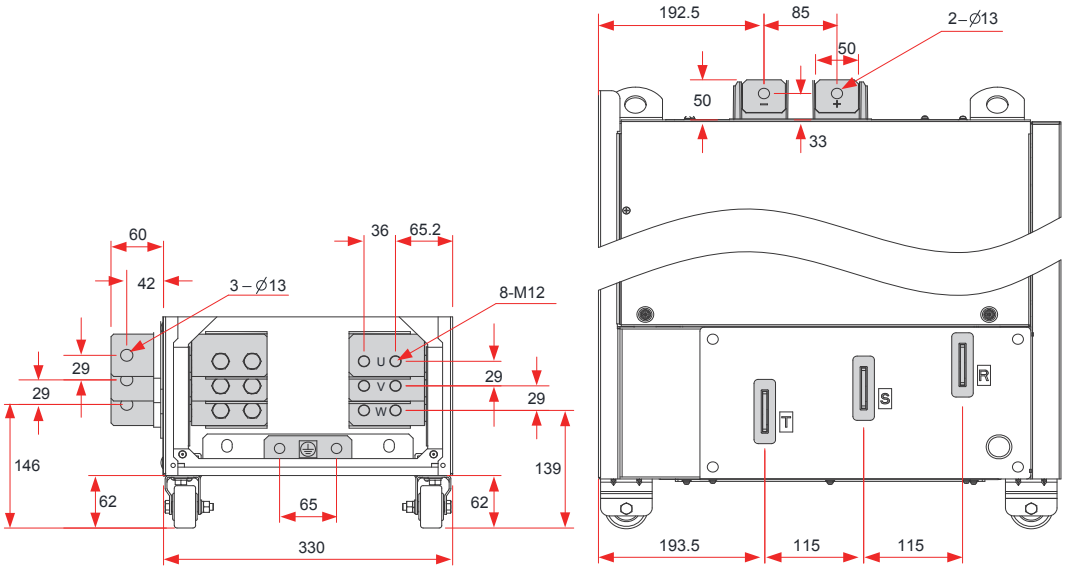


Figure 3-49 YD580ET4-250G/280P~YD580ET4-280G/315P Main circuit terminal size without output reactor

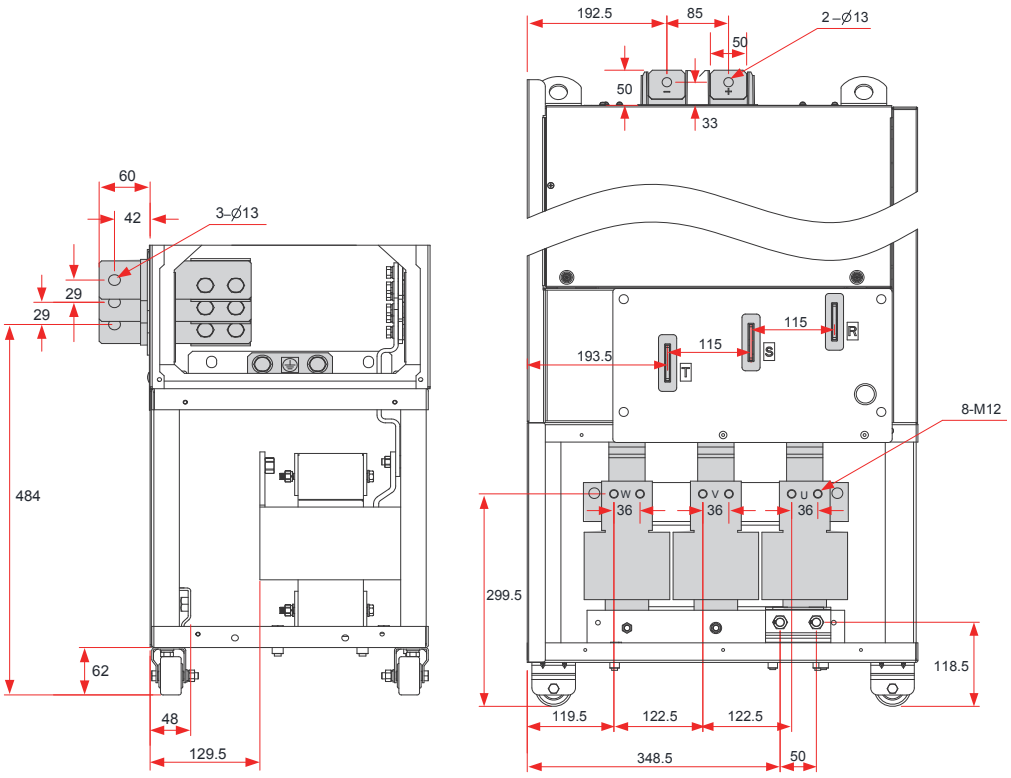


Figure 3-50 YD580ET4-250G/280P-L~ YD580ET4-280G/315P-L Main circuit terminal size (with output reactor)

Among them, the side outlet copper bar in the above figure can be disassembled as needed, and the size of the main circuit terminal after disassembly is as follows:

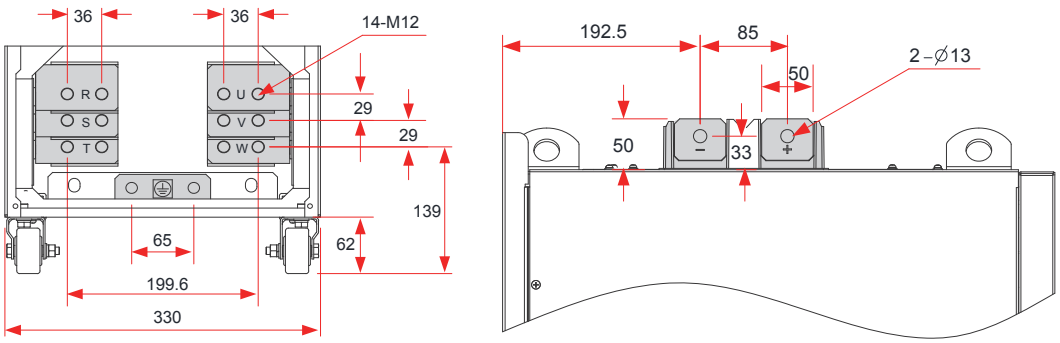


Figure 3-51 YD580ET4-250G/280P~ YD580ET4-280G/315P Main circuit terminal size (without side output busbar and without output reactor)

Table 3-14 YD580ET4-250G/280P(-L)~YD580ET4-280G/315P(-L) main circuit cable selection

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tightening Torque N·m
YD580ET4-250G/280P(-L)	441	2 x (3 x 120)	BC120-12	120	BC120-12	35.0
YD580ET4-280G/315P(-L)	495	2 x (3 x 150)	BC150-12	150	BC150-12	35.0

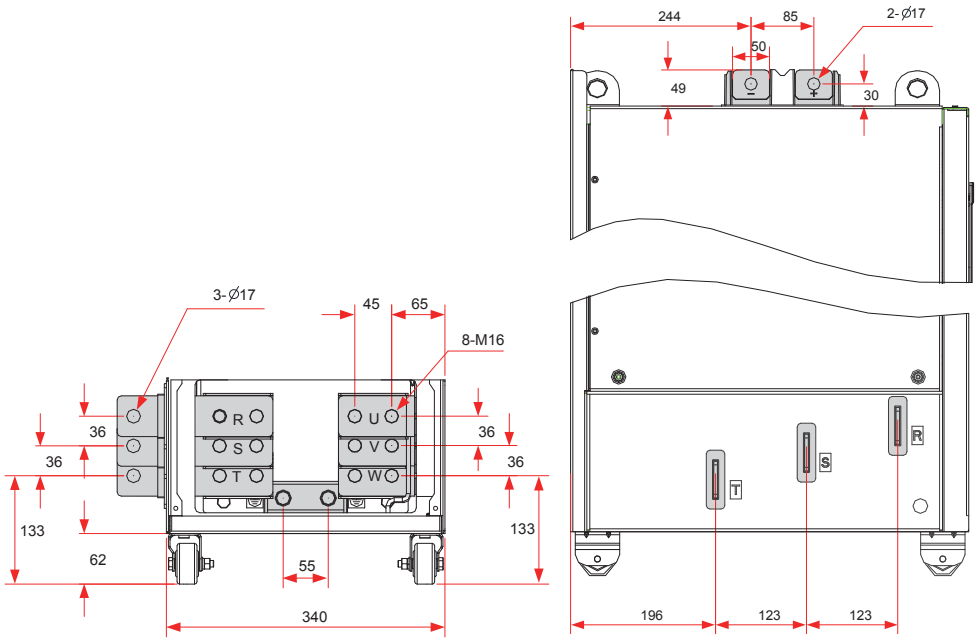


Figure 3-52 YD580ET4-315G/355P~YD580ET4-450G/500P Main circuit terminal size (without output reactor)

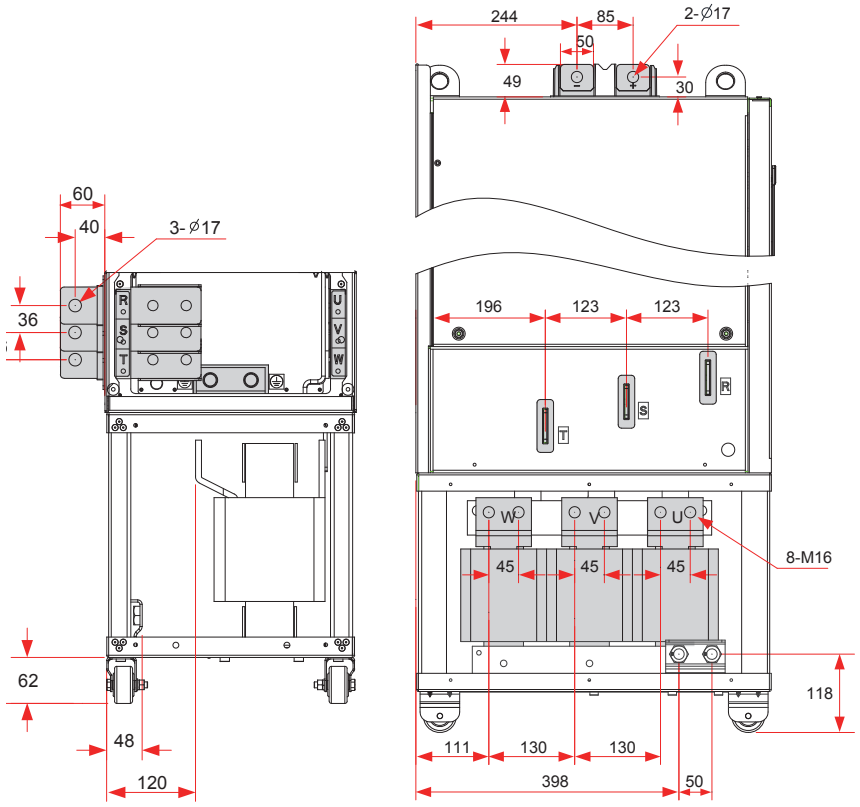


Figure 3-53 Terminal size of YD580ET4-315G/355P-L~YD580ET4-450G/500P-L main circ uit (with output reactor)

Among them, the side outlet copper bar in the above figure can be disassembled as needed, and the size of the main circuit terminal after disassembly is as follows:

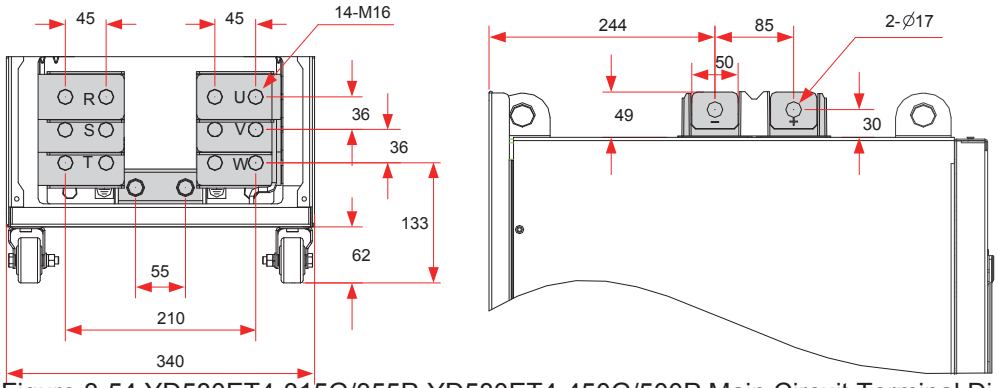


Figure 3-54 YD580ET4-315G/355P-YD580ET4-450G/500P Main Circuit Terminal Di me nsions (Without Side Exit Busbar, Without Output Reactor)

Table 3-15 YD580ET4-315G/355P(-L)~YD580ET4-450G/500P(-L) main circuit cable selection

Inverter model	Rated input current A	Power Input/Output Cable mm^2	Crimp Terminal Model	Ground Cable mm^2	Crimp Terminal Model	Tightening Torque N·m
YD580ET4-315G/355P(-L)	565	2 x (3 x 185)	BC185-16	185	BC185-16	85.0
YD580ET4-355G/400P(-L)	617	2 x (3 x 185)	BC185-16	185	BC185-16	85.0
YD580ET4-400G/450P(-L)	687	2 x (3 x 240)	BC240-16	240	BC240-16	85.0
YD580ET4-450G/500P(-L)	782	2 x (3 x 240)	BC240-16	240	BC240-16	85.0

The above recommended wire lug manufacturers are GTNR series、TNR and BC series wire lugs.

GTNR series TNR series BC 系列

Figure 3-55 Appearance of each series of lugs

NOTE

● For details on the selection of wire lugs, please refer to "9.5 Selection Guide for Cables, Circuit Breakers, and Contactors" in this manual.

3.2.4 Tool Requirs of main circuit terminal

Please refer to the terminal size of the main circuit terminal connection and select the appropriate installation tool for wiring and tightening. Here's a list of the installation tools:

Table 3-16 Requirements for wiring and installation tools for main circuit terminals (3-phase 380V ~ 480V)

Inverter model	Main circuit terminal fasteners	Tools
YD580ET4-0P7G/1P5PB	M4 combination screws	Phillips screwdriver (3# slot)
YD580ET4-1P5G/2P2PB		
YD580ET4-2P2G/3P7PB		
YD580ET4-3P7G/5P5PB		
YD580ET4-5P5G/7P5PB		
YD580ET4-7P5G/11PB	M5 combination screws	Phillips screwdriver (3# slot)
YD580ET4-11G/15PB		
YD580ET4-15G/18P5PB		
YD580ET4-18P5G/22PB	M6 combination screws	Phillips screwdriver (3# slot)
YD580ET4-22G/30P(B)		
YD580ET4-30G/37P(B)		
YD580ET4-37G/45P(B)		
YD580ET4-45G/55P(B)	M8 nuts, pads, pads	Socket wrench (13# socket)
YD580ET4-55G/75P(B)		
YD580ET4-75G/90P(B)	M12 nuts, pads, pads	Socket wrench (19# socket), Socket Extension rod (150mm)
YD580ET4-90G/110P		
YD580ET4-110G/132P		
YD580ET4-132G/160P		
YD580ET4-160G/200P		
YD580ET4-200G/220P(-L)	M12 nuts, pads, pads	Socket wrench (19# socket), Socket Extension (250mm)
YD580ET4-220G/250P(-L)		
YD580ET4-250G/280P(-L)		
YD580ET4-280G/315P(-L)		
YD580ET4-315G/355P(-L)	M16 nuts, pads, pads	Socket wrench (24# socket), Socket Extension (250mm)
YD580ET4-355G/400P(-L)		
YD580ET4-400G/450P(-L)		
YD580ET4-450G/500P(-L)		

3.2.5 Function of Control circuit terminal

When wiring the control loop, if it involves jumper operation, PG card access or function expansion card access, you need to remove the outer cover plate of the inverter first (see "3.1.5 Removal and Installation of the Cover" for specific removal methods). After the outer cover is removed, the position of the control board, jumper cables, and the installation position of each expansion card are shown in the following figure. (Please refer to "Chapter 11 Optional Cards" in this manual for details on how to install the optional card.)

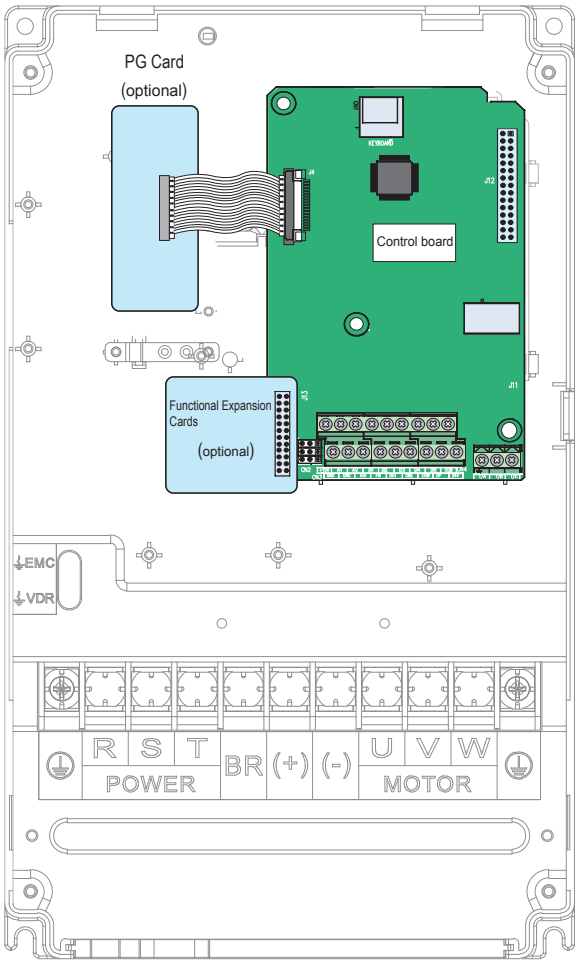


Figure 3-56 YD580E control board

3.2.6 Distribution of Control circuit terminal

◆ Control loop terminal arrangement

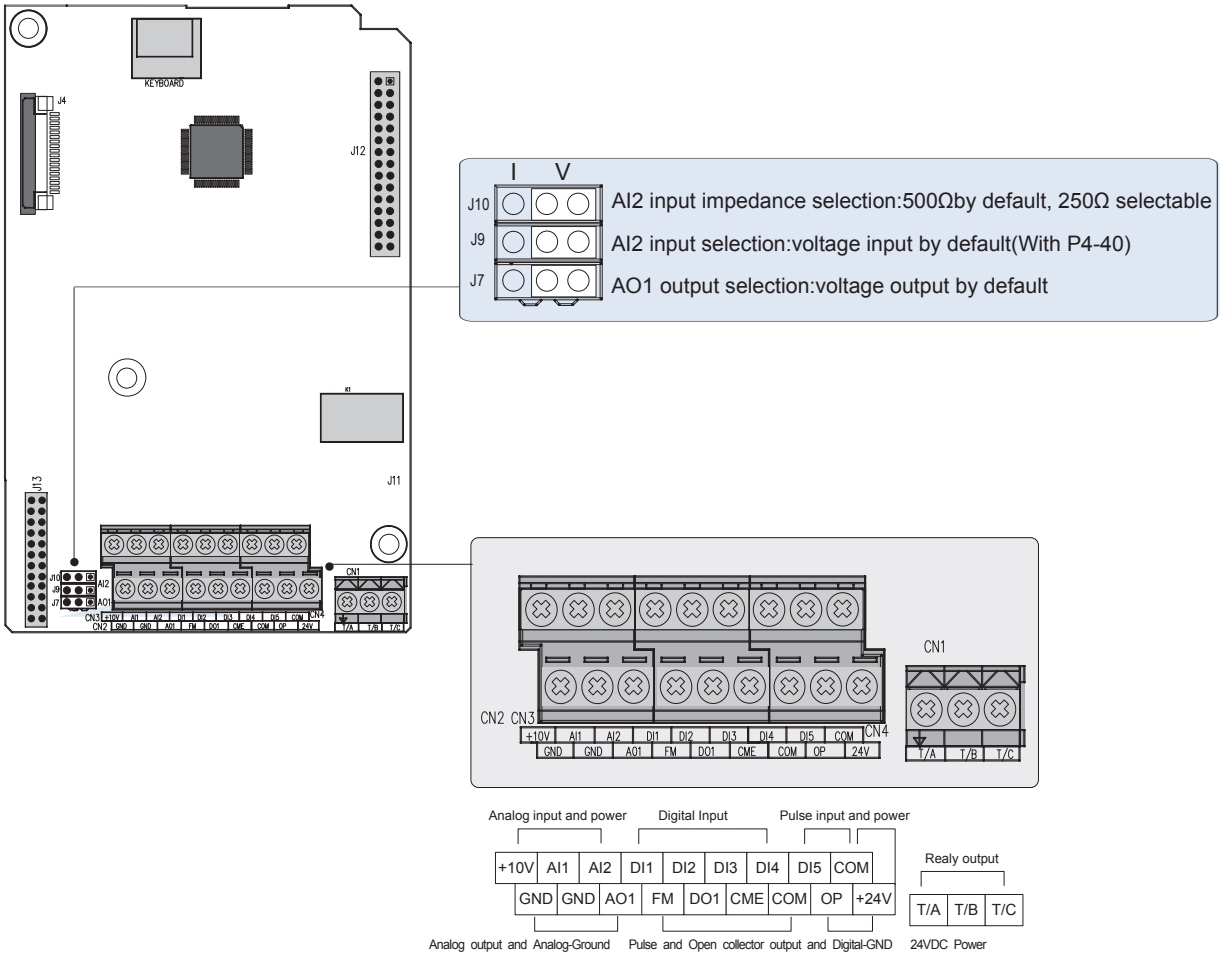


Figure 3-57 Terminal layout of the control circuit

Table 3-17 YD580E inverter control terminal function description

Type	Terminal	Name	Description
Power supply	+10V-GND	+10 V power supply	Provides +10 V power supply to an external unit.， Max. output current: 10 mA Generally used to supply an external potentiometer of 1 to 5 kΩ
	+24V-COM	+24 V power supply	Provides +24 V power supply to an external unit.Generally used to supply the DI/DO terminals and external sensors Max. output current: 170 mA 【note 1】
	OP	Input terminal for external power supply	Connected to +24 V by default. When DI1 to DI5 need to be driven by external signals, OP must be disconnected from + 24 V and connected to an external power supply.
Analog inputs	AI1-GND	Analog input 1	Voltage range of inputs: 0 to 10 VDC Input impedance: 22 kΩ
	AI2-GND	Analog input 2	Input voltage range: 0 to 10 VDC/0 to 20 mA，Either a voltage or a current input,determined by jumper J9。 Input impedance：22 kΩ (voltage input),，500 Ω or 250 Ω (current input) by J10。【note 2】
Analog output	AO1-GND	Analog output 1	Either a voltage or a current output,determined by jumper J7. Output voltage range：0V~10V Output current range：0mA~20mA

Type	Terminal	Name	Description
Digital inputs	DI1- OP	Digital input 1	Optical lotus isolation, compatible with bipolar inputs Input impedance: 1.39kΩ Voltage range at effective level input: 9V~30V
	DI2- OP	Digital input 2	
	DI3- OP	Digital input 3	
	DI4- OP	Digital input 4	
	DI5- OP	High-speed pulse input	In addition to the characteristics of DI1~DI4, it can also be used as a high-speed pulse input channel. Maximum input frequency: 100kHz Input impedance: 1.03kΩ
Digital outputs	DO1-CME	Digital output 1	Optical lotus isolation, bipolar open collector output Output voltage range: 0V~24V Output current range: 0mA~50mA Note: The digital output ground CME is internally isolated from the digital input ground COM, but at the factory the CME and COM have been externally shorted (DO1 is driven by +24V by default). When DO1 If you want to drive from an external power supply, you must disconnect the external shorting of the CME from the COM.
	FM- COM	High-speed pulse output	Constrained by parameter H2-01 "FM terminal output mode selection"; When output as a high-speed pulse, the maximum frequency is 100kHz; When used as an open collector output, it is the same as the DO1 specification.
Relay outputs	T/A-T/B	(NC) terminal	Contact actuation capability: 250Vac，3A，COSØ=0.4 30Vdc，1A
	T/A-T/C	(NO) terminal	
Auxiliary interfaces	J13	Extension card interface	28-pin terminals, interface with optional cards (I/O expansion cards, PLC cards, various bus cards, etc.).
	J4	PG card interface	Selectable: OC, differential, resolver and other encoder interfaces
	J11	External OP interface	External Keyboard
Jumpers 【Note 3】	J7	AO1-Out select	Voltage and current input are optional, and the default is voltage input
	J9	AO2-Out select	Voltage and current input are optional, and the default is voltage input
	J10	AI2-input impedance select	500Ω, 250Ω optional, default is 500Ω

NOTE

● [Note 1] When the ambient temperature is greater than 23°C, the user needs to derate the output current by 1.8mA for every 1°C increase in ambient temperature. The maximum output current is 170mA at 40°C ambient temperature, and the current of the DI terminal must also be taken into account when the user shorts the OP to 24V.

● [Note 2] Please choose 500Ω or 250Ω impedance according to the load capacity of the signal source, and the selection is based on the maximum output voltage of the signal source, for example, if you use 500Ω impedance, you need to ensure that the maximum output voltage of the signal source is not less than 10V, so as to ensure that AI2 can measure a current of 20mA.

● [Note 3] : Figure 3-57 shows the position of jumpers J7, J9, and J10 on the control board.

3.2.7 Instructions of Control circuit terminal

◆ Cable selection for control loops

All control cables must be shielded. Separate shielded wires should be used for different analog signals. Shielded twisted pair cables are recommended for digital signal cables.

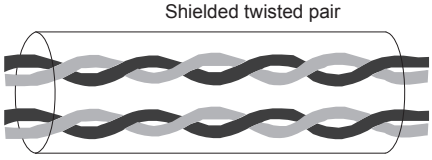


Figure 3-58 Shielded twisted pair cable

◆ Cabling requirements for control loops

Motor cables should be laid away from all control cables.

It is recommended that the motor cables, input power cables, and control loop cables are not in the same cable duct. Avoid electromagnetic interference caused by the coupling of motor cables and control loops for long distances and walking lines.

When the control loop and the drive line must be crossed, the crossing angle should be 90 degrees.

Recommended Cable Routing Diagram:

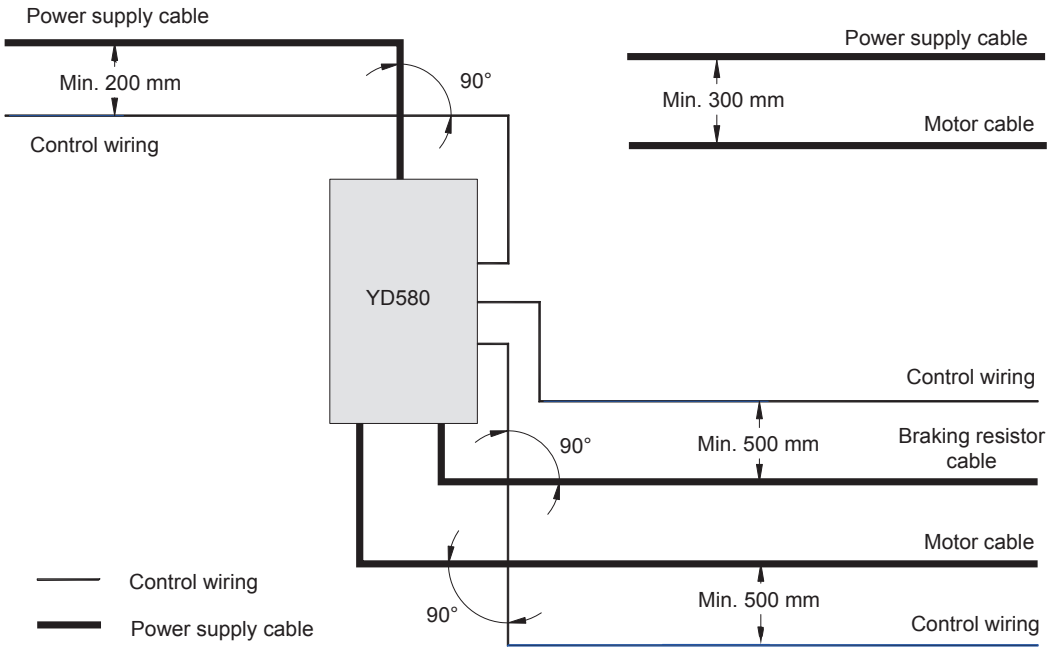


Figure 3-59 Cable wiring diagram

◆ Analog input terminal AI1

Because the weak analog voltage signal is particularly susceptible to external interference, it is generally necessary to use shielded cables, and the wiring distance should be as short as possible, not more than 20m, as shown in Figure 3-60. In some situations where the analog signal is seriously interfered with, a filter capacitor or ferrite core needs to be added to the analog signal source side, as shown in Figure 3-62.

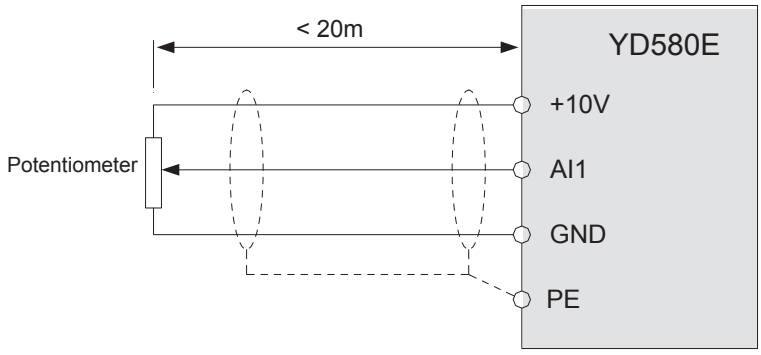


Figure 3-60 Wiring diagram of analog input terminals

The shielding layer of the analog terminal should be led out of the shield on the inverter side and connected to PE.

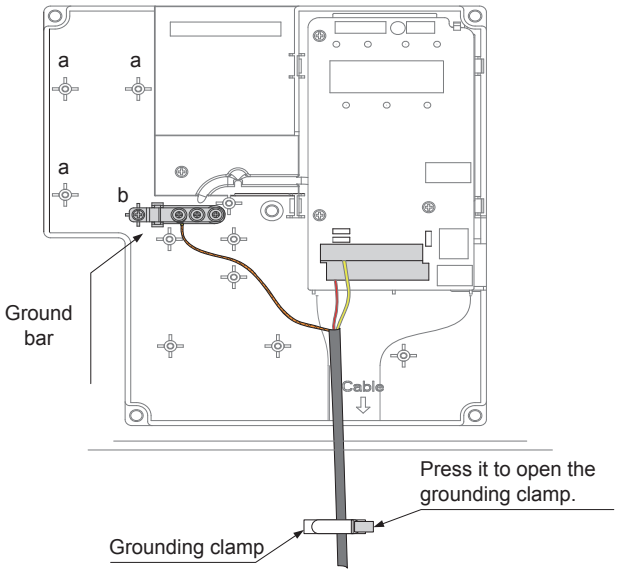


Figure 3-61 Grounding of the shield layer of an analog terminal

◆ Analog input terminal AI2

When AI2 uses voltage signal input, the wiring description is the same as that of AI1;

When AI2 selects current signal input, AI2 is the current inflow direction, GND is the current outflow direction, and the J9 jumper jumps to the "I" side.

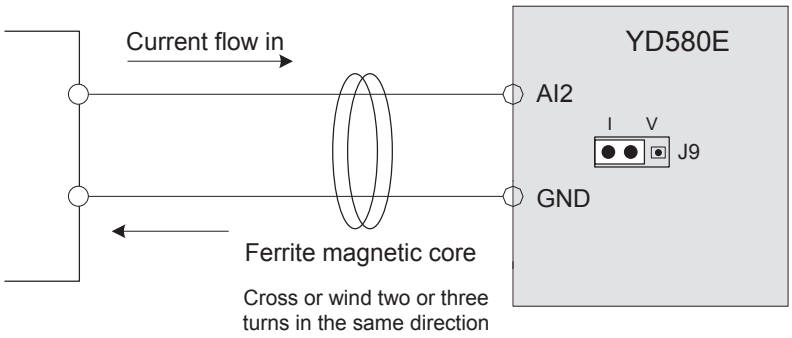


Figure 3-62 Wiring diagram of analog AI2 input terminal processing

◆ Digital input terminals DI1-DI5

1） Leakage wiring

● Leakage wiring

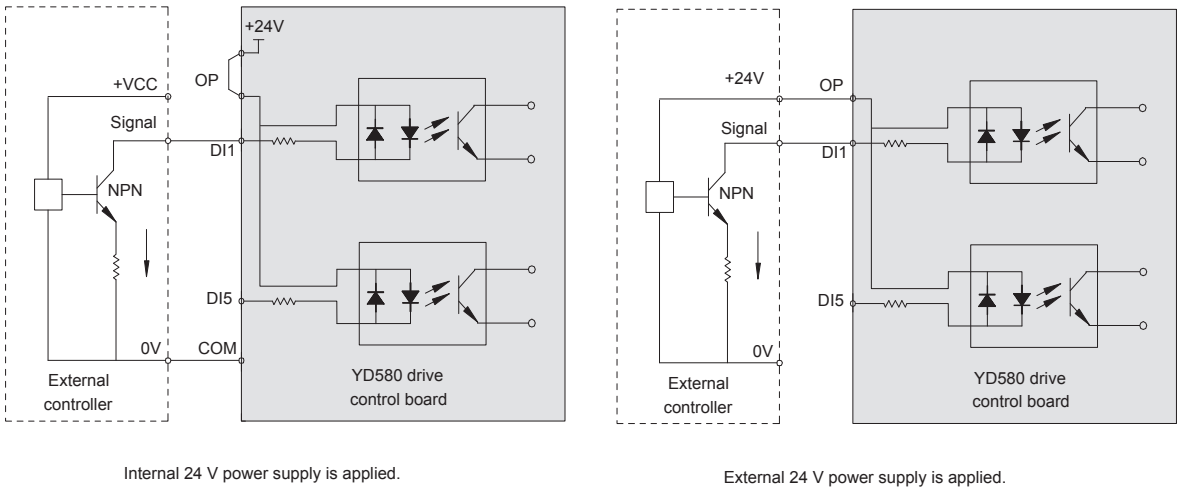


Figure 3-63 Leakage wiring mode

The most common wiring method is to use the 24V power supply inside the inverter, shorting the inverter OP with the 24V terminal and connecting the inverter COM terminal to the 0V of the external controller.
If an external 24V power supply is used, the short connector between +24V and OP must be removed, the 24V positive terminal of the external power supply must be connected to the OP terminal, and the external power supply 0V must be connected to the corresponding DI terminal after passing through the controller control contact.

note

● Under this wiring method, the DI terminals of different inverters cannot be used in parallel, otherwise it may cause DI malfunction; If needed
If the DI terminals are connected in parallel (between different inverters), a diode (anode connected to DI) needs to be connected in series at the DI terminal, and the diode needs to meet the following requirements: IF >40mA, VR>40V, as shown in Figure 3-64.

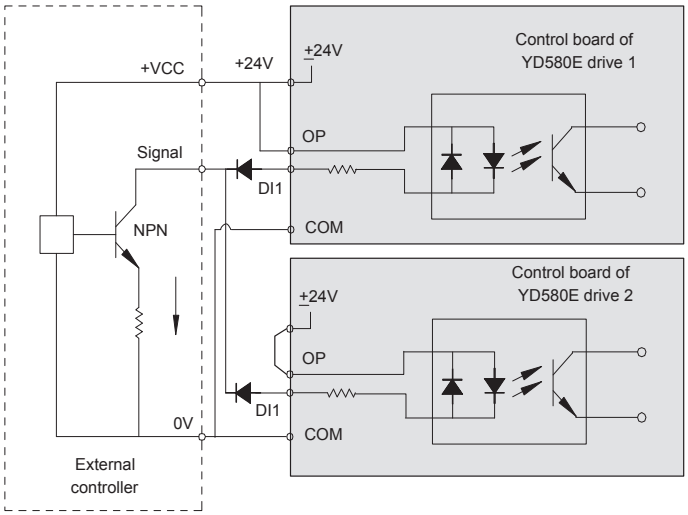


Figure 3-64 Leaky wiring of multiple inverter DI terminals

2） Source wiring

● Source wiring

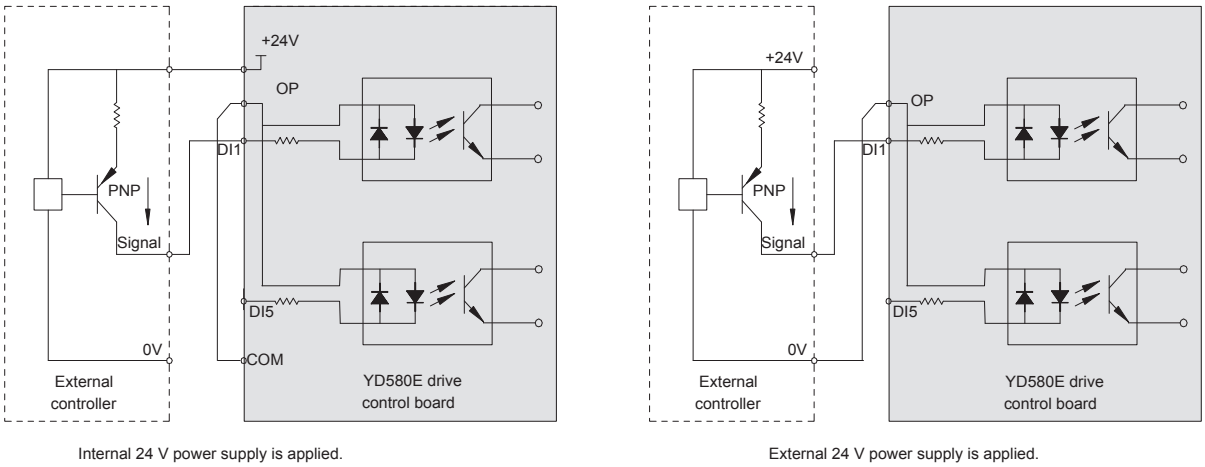


Figure 3-65 Source wiring mode

If the internal 24V power supply of the inverter is used, the short circuit between the +24V and the OP must be removed, the OP must be connected to the COM, and the +24V must be connected to the common termination of the external controller.

If an external power supply is used, the short connector between the +24V and the OP must be removed, and the 0V of the OP and the external power supply must be connected together, and the 24V positive terminal of the external power supply must be connected to the corresponding DI terminal after passing through the control contact of the external controller.

3) High-speed input terminal terminal DI5 description

The maximum allowable frequency of DI5 as a high-speed pulse input is 100kHz.

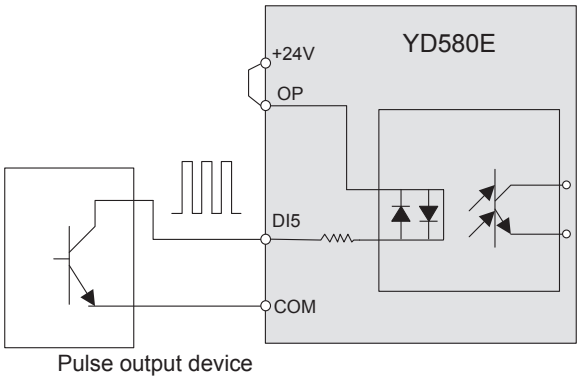


Figure 3-66 High-speed pulse input

◆ Digital output terminal DO

When the digital output terminal needs to drive the relay, absorber diodes should be installed on both sides of the relay coil. Otherwise, it is easy to cause damage to the DC 24V power supply. The driving capacity is not more than 50mA.

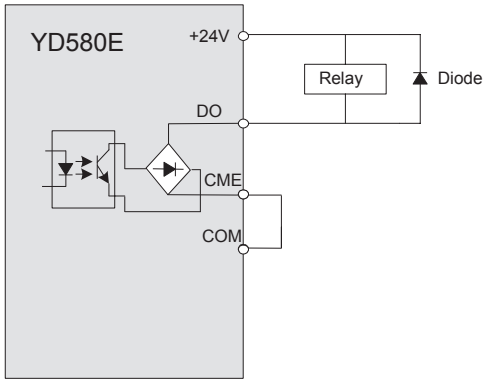


Figure 3-67 Wiring diagram of the digital output terminal

CAUTION

- Be sure to install the polarity of the absorber diode correctly. As shown in Figure 3-67. Otherwise, when the digital output terminal has an output, it will be turned immediately.The DC 24V power supply burns out.
- The digital output ground CME is internally isolated from the digital input ground COM, but the CME and COM are already externally shorted at the factory (this).DO1 defaults to +24V drive). When DO1 wants to be powered by an external power supply, it must disconnect the CME from the COM Department shorted.

◆ High-speed digital outlet FM

When the FM terminal is FMP continuous pulse output, the maximum output frequency is 100kHz.

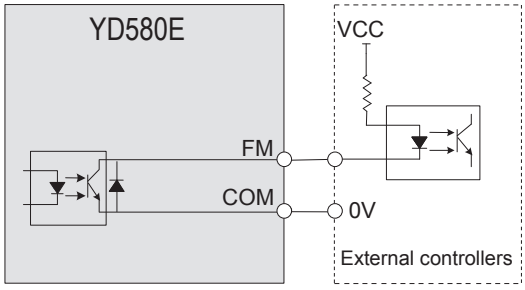


Figure 3-68 Wiring diagram of a high-speed digital output terminal

◆ Relay output terminal

Inductive loads (relays, contactors, and motors) can all cause voltage spikes when the current is cut off. Varistors are used to protect the relay contacts, and absorption circuits such as varistors, RC absorption circuits, diodes, etc. are installed on the inductive loads to ensure minimal interference during shutdown.

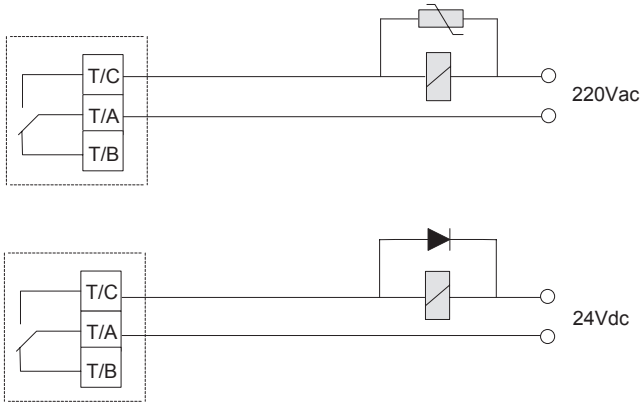


Figure 3-69 Anti-interference handling of relay output terminals

3.2.8 Tool Requirs of Control circuit terminal

● Tubular terminals

Please use tubular terminals with insulating sleeves;

In the case of single wire or stranded wire, the exposed length of the core is 6mm.

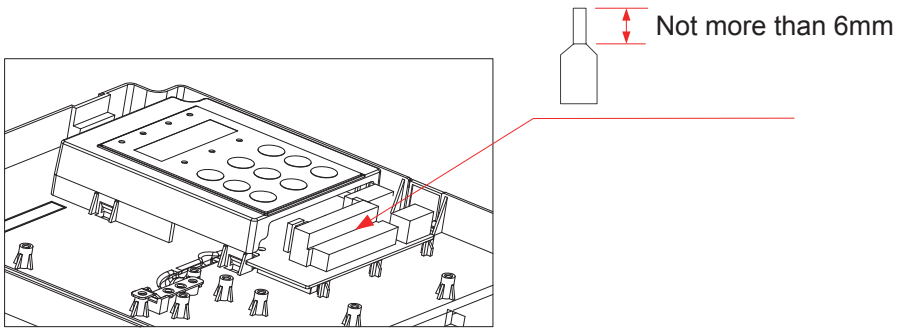


Figure 3-70 Requirements for tubular terminals of control lines

Table 3-18 Control cable specifications

Ctrl Board termal	Single Wire (AWG/mm2)	Twisted Wire (AWG/mm2)	Tightening Torque (N·m)
	0.2~0.75	(AWG24~18)	0.565

Chapter 4 Operating Panel (Keypad & Display)

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Chapter 4 Operating Panel

4.1 Introduction

YD580E series inverter can be operated by LED operation panel or LCD operation panel for parameter operation, status monitoring and control.

In addition to the LED operation panel that comes with the inverter, users can also choose to configure the LED operation panel (YKEY059) or LCD operation panel (YKEY060) to realize the external introduction of the panel. Among them, the parameters can be modified and viewed through the LED operation panel, and its appearance and use are described in "4.2 LED Operation Panel Introduction"; Through the optional LCD operation panel, it can realize functions such as parameter copying and downloading. For details on how to use this keyboard, see "Introduction to the 4.3 LCD Operation Panel".

4.2 Introduction to LED Operator Panel

With the operation panel, you can set and modify the parameters of the inverter, monitor the working status, and control the operation (start, stop) and other operations.
The appearance of the operation panel and the names of the operation keys are shown in the following figure:

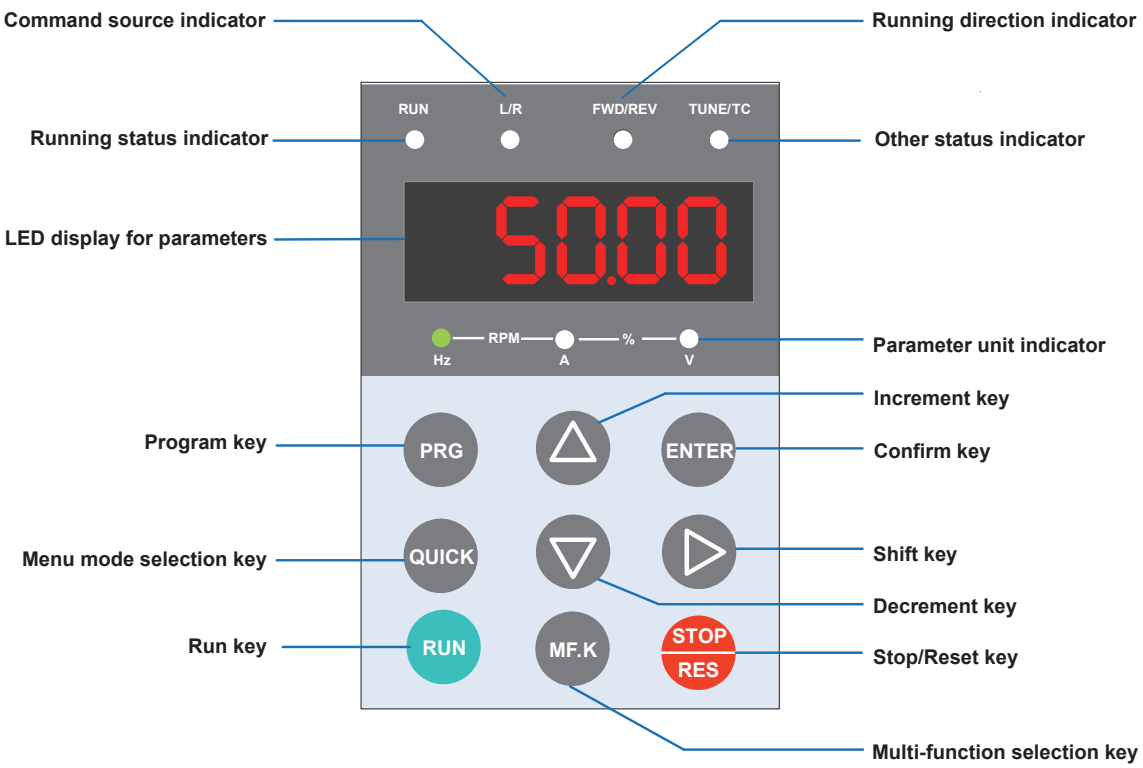


Figure 4-1 Details of the operating panel

4.2.1 Function Indicator

Table 4-1 Indicator descriptions on the operation panel

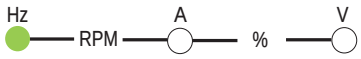
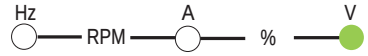
■ Status Indicators

There are four red LED status indicators at the top of the operating panel.

Indicator	Indication
○ RUN	OFF indicates the STOP status.
	ON indicates the RUNNING status.
○ L/R	OFF indicates under operating panel control.
	ON indicates under terminal control.
	FLASHING indicates under serial communication control.
○ FWD/REV	OFF indicates reverse motor rotation.
	ON indicates forward motor rotation.
○ TUNE/TC	ON indicates torque control mode.
	FLASHING SLOWLY (once a second) indicates auto-tuning status.
	FLASHING QUICKLY (four times a second) indicates a fault condition.

■ Unit Indicators

There are three red unit indicators below the data display. These indicators operate individually or in pairs to show the units used to display data,

Indicator appearance	Meaning
	Hz for frequency
	A for current
	V for voltage
	RPM for motor speed
	Percentage

4.2.2 LED display area

There are a total of 5-digit LED displays on the operation panel, which can display the setting frequency, output frequency, various monitoring data, and alarm codes.

Table 4-2 Actual correspondence and LED display correspondence table

LED Display	Indication	LED Display	Indication	LED Display	Indication	LED Display	Indication
0	0	6	6	C	C	N	N
1	1	7	7	c	c	P	P
2	2	8	8	d	D	r	R
3	3	9	9	E	E	t	T
4	4	A	A	F	F	U	U
5	5, S	b	B	L	L	u	u

4.2.3 Keyboard Button Function

Table 4-3 Keyboard key function list

Key	Key Name	Function
PRG	Programming	• Enter or exit Level I menu. • Return to the previous menu.
ENTER	Decrement	• Enter each level of menu interface. • Confirm displayed parameter setting.
△	Increment	• When navigating a menu, it moves the selection up through the screens available. • When editing a parameter value, it increases the displayed value. • When the AC drive is in RUN mode, it increases the speed.
▽	Decrement	• When navigating a menu, it moves the selection down through the screens available. • When editing a parameter value, it decreases the displayed value. • When the AC drive is in RUNNING mode, it decreases the speed.
▷	Shift	• Select the displayed parameter in the STOP or RUNNING status. • Select the digit to be modified when modifying a parameter value
RUN	RUN	Start the AC drive when using the operating panel control mode. It is inactive when using the terminal or communication control mode.
STOP RES	Stop/Reset	• Stop the AC drive when the drive is in the RUNNING status. • Perform a reset operation when the drive is in the FAULT status. Note: The functions of this key can be restricted by using function P7-02.
MF.K	Multifunction	Perform a function switchover as defined by the setting of P7-01, for example to quickly switch command source or direction.
QUICK	Menu mode selection	Press it to switch over between menu modes as defined by the setting of PP-03.

4.2.4 How to view and modify parameters

YD580E The operation panel of the inverter adopts a three-level menu structure for parameter setting and other operations. The three-level menus are:

After entering each level of menu, when the display bit flashes, you can press keys, keys, and keys to modify them. Figure 4-2 shows the operation process.

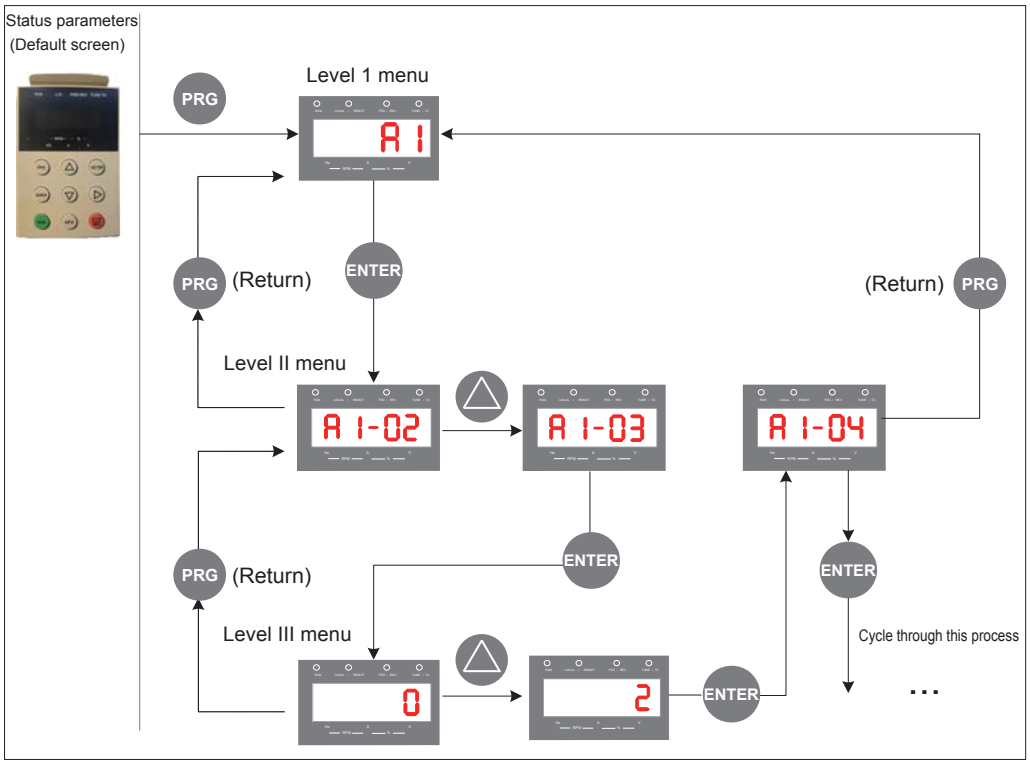


Figure 4-2 Flowchart of the three-level menu

Example

Example of changing the parameter PC-01 from 0000.0% to 0050.0% 。

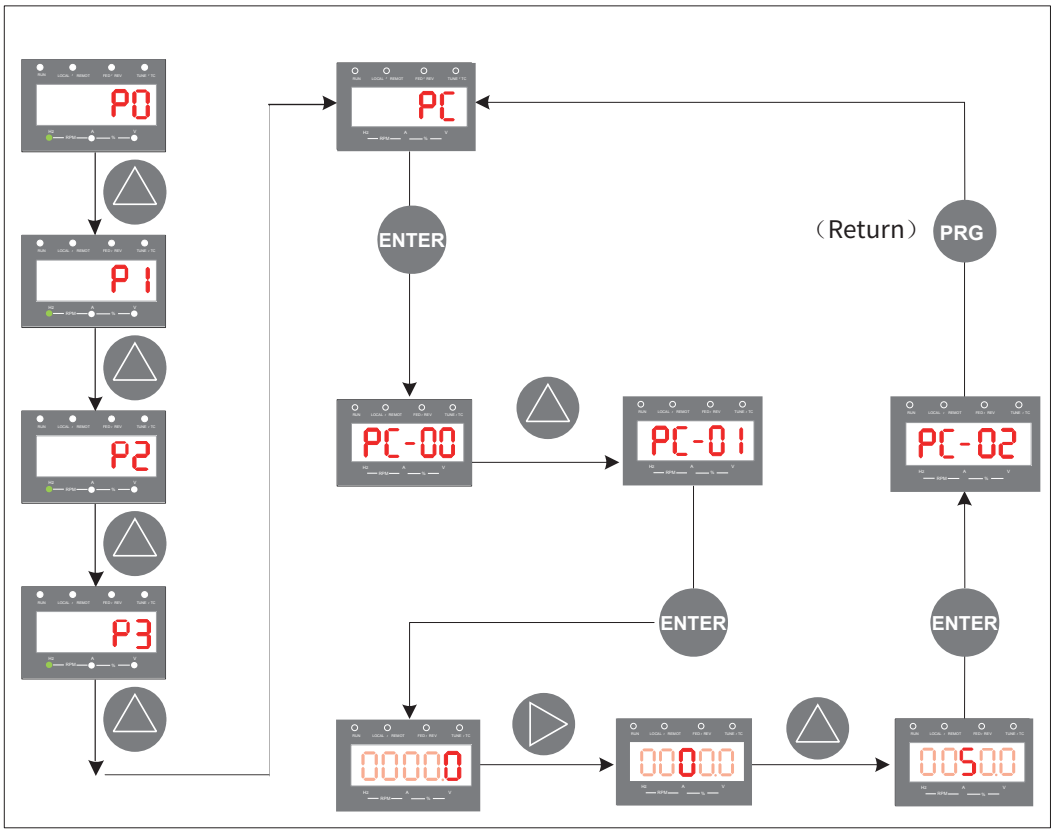


Figure 4-3 Parameter modification

a） When operating in the third-level menu, you can press (PRG) key or ENTER key to return to the second-level menu. The differences between the two are:

Press the ENTER key to save the set parameters and return to the secondary menu and automatically transfer to the next parameter, and press the (PRG) key to discard the current parameter modification and directly return to the secondary menu of the current parameter serial number.

b） In the third-level menu state, if the parameter does not have a flashing bit, it means that the parameter cannot be modified, which may be due to the following reasons:

(1) The parameter is a parameter that cannot be modified, such as the type of inverter, the actual detection parameter, the operation record parameter, etc.

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

4.2.5 Parameter composition

Table 4-4 Parameter components

Parameter groups	Description	illustrate
P0 ～ PP	Basic parameters	Parameters such as operation instructions, frequency commands, motor parameters, control modes, AI/AO feature correction, and optimization control.
A0 ～ AC	Advanced parameters	
U0	Monitor parameters	Display of basic monitoring parameters of the inverter.

Before viewing parameters with the operation panel, set parameter PP-02 (function parameter group display selection) to ensure that the parameter group you want to view is in the display state. The following figure shows how to view the parameter group number:

Function	define	default	range of set	Description
PP-02	Functional parameters are displayed in groups to select	11	Single-digit: U-group display select 0: No display; 1: Display Ten-digit: A-group display select 0: No display; 1: Display	Used for group A, group U parameters or not Controls for display.

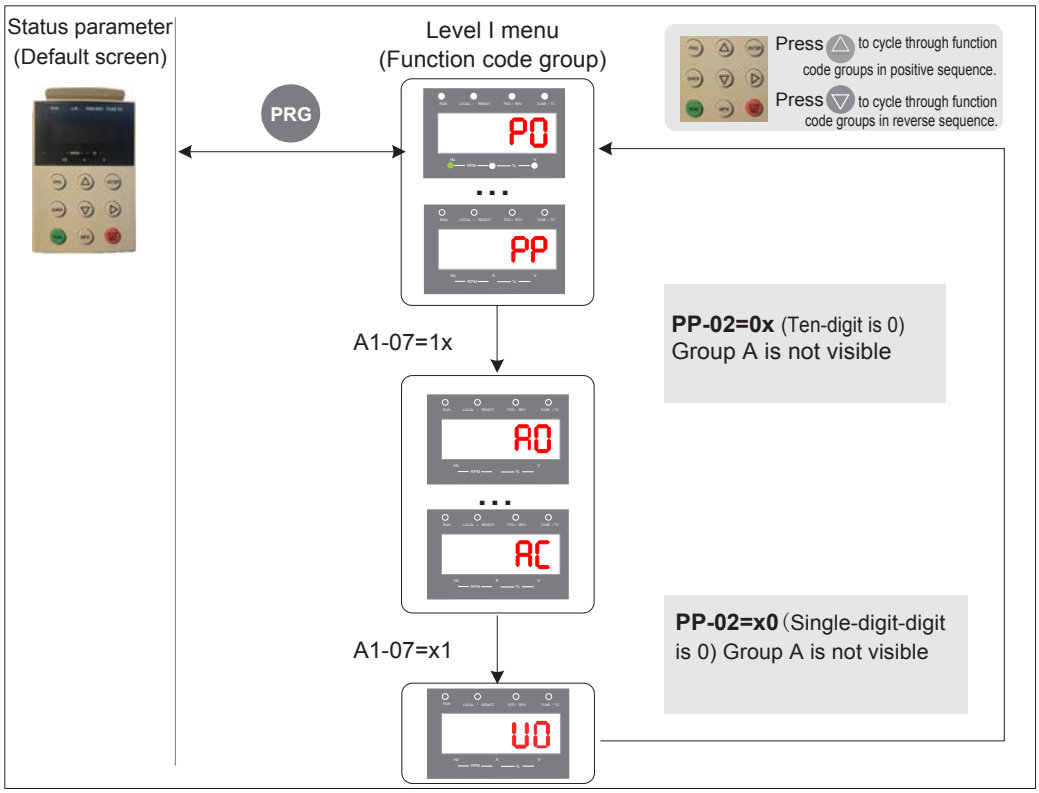


Figure 4-4 Viewing the parameter group number

4.2.6 Parameter Lookup

YD580E series inverter has many parameters, and a total of three parameter check methods are provided. By default, it is the basic viewing method (you can view all parameter groups), and through the parameter settings (PP-03), you can also provide two ways to quickly check the parameters, so that users can quickly find them.

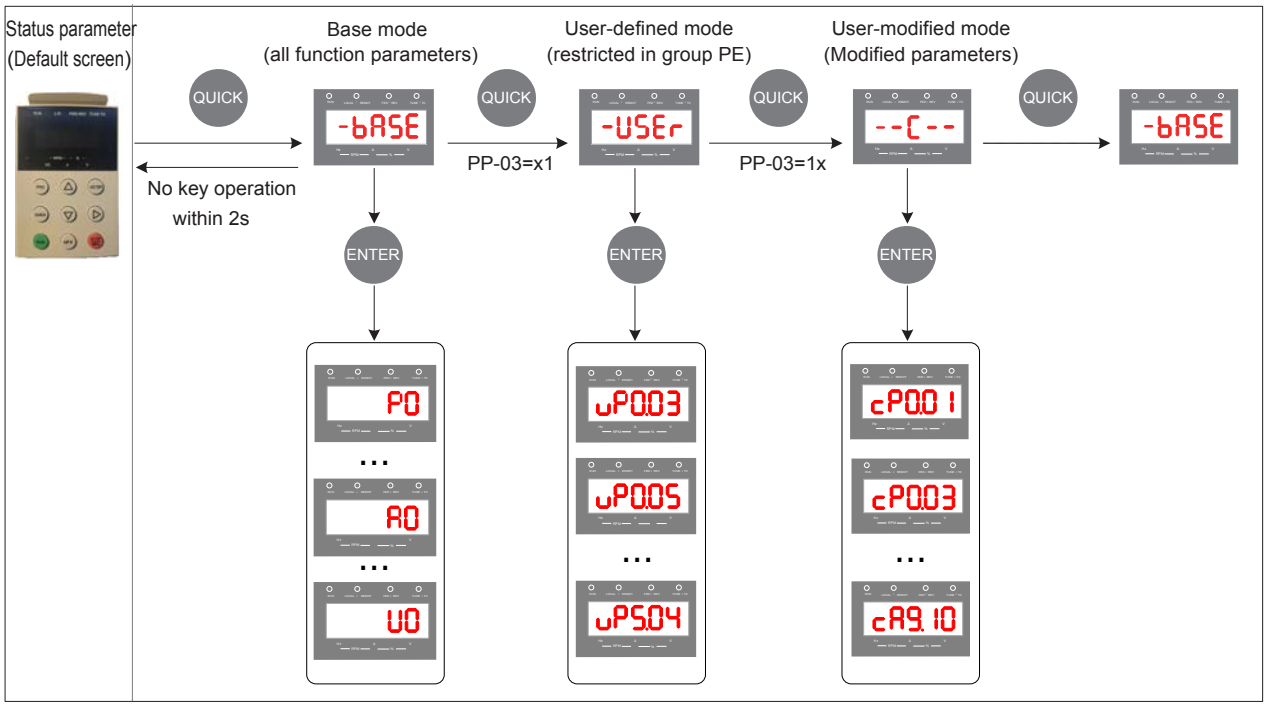
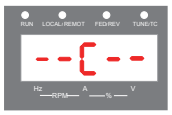


Figure 4-5 Schematic diagram of how to view parameters and parameters

In the figure above, in the user-defined mode menu, the display form of the parameters is "uP3.02", which indicates the function parameter P3-02, which is defined by the user Modifying the parameters in the menu is the same as modifying the corresponding parameters in the normal programming state.

There are three parameter query methods provided, and the display mode and display code of each parameter are as follows:

How to diaplay parameters	display	illustrate
User-defined parameters		View user-defined parameters
User-changed parameters		Look at the different parameters from the factory value
Functional parameter mode		See all parameters

1) Basic access methods

The basic parameter group is all the parameters of the inverter, which can be queried or modified according to the operation method introduced in subsection 4.2.。 Three parameters are displayed

The mode is switched by the QUICK key on the panel, and the method of consulting or modifying after entering each group of parameters is the same as 4.2 small

The method of operation by keyboard is the same in the section.

2) Quick access method

If you want to display the user-defined groups and the user-changed parameter groups, you need to set the parameter PP-03 to 11。

parameter	define	default	range of set	illustrate
PP-03	The function parameter group displays the selection	00	Single-digit: -USEr display-sel 0: Not displayed; 1: Visible Sen-digit: --C-- display-sel 0: Not displayed; 1: Visible	Decide on user custom groups, user changes Change whether the parameter group is displayed.

◆ View user-defined parameter groups -USEr

Press the QUICK key on the panel to enter the "User-Defined Parameters" mode and view the user-defined parameters.

User-defined parameter method: Users can customize commonly used parameters by setting the parameters of PE group (PE-00 ~ PE-29), up to 30 parameters, and PE group has 16 custom parameters (PE-00 ~ PE-15) by default, and users can also modify the default parameters according to their specific needs. If one of the parameters of the PE group is set to uP0.00, it means that no custom parameters have been formulated.

Table 4-5 Common parameters of user-defined menus

parameter	define	name	parameter	define	name
PE-00	P0-01	Control Mode	PE-01	P0-02	Run command select
PE-02	P0-03	Main-freq command select	PE-03	P0-07	Freq-source overlay select
PE-04	P0-08	Preset frequency	PE-05	P0-17	Acceleration time
PE-06	P0-18	Decelerate time	PE-07	P3-00	V/F curve setting
PE-08	P3-01	Torque boost	PE-09	P4-00	DI1 function select
PE-10	P4-01	DI2 terminal function select	PE-11	P4-02	DI3 function select
PE-12	P5-04	DO1 output selection	PE-13	P5-07	AO1 output selection
PE-14	P6-00	Startup Mode	PE-15	P6-10	Stop Mode

◆ Review the parameters that have been changed by the user --C--

Press the QUICK key on the panel to enter the "User Change Parameters" mode to view the parameters that are different from the factory values.

This mode allows the user to quickly access the modified parameters. In the Parameters changed by the user group, the parameters that have been modified by the user are listed, that is, the current set value is different from the factory value. These parameters are lists that are automatically generated by the drive.

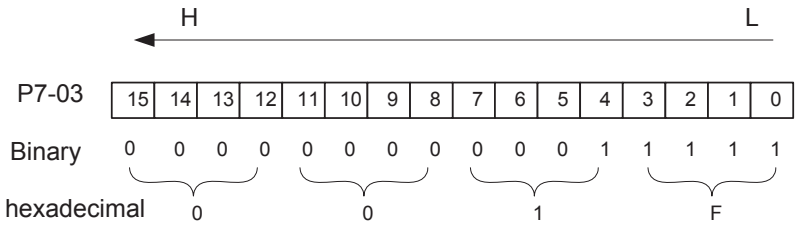
3） Status parameter

In the shutdown or running state, use the keys on the operation panel to switch each byte of the parameters P7-03, P7-04, and P7-05.Multiple status parameters can be displayed.

There are 32 running state parameters in the running state, and the parameters P7-03 (running display parameter 1) and P7-04 (running display parameter 2) select whether the corresponding parameter of each parameter is displayed according to the binary bits. There are 13 shutdown state parameters in the shutdown state, and the parameter P7-05 (shutdown display parameter) selects whether the corresponding parameter of each bit is displayed according to the binary bits.

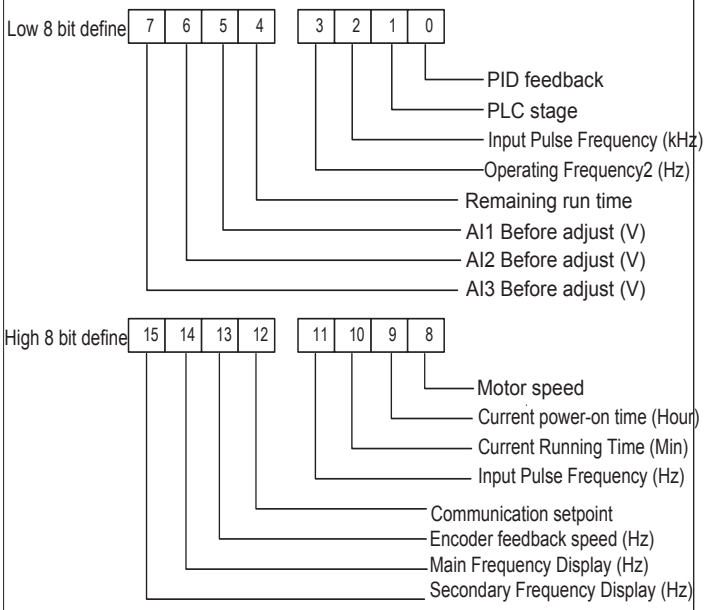
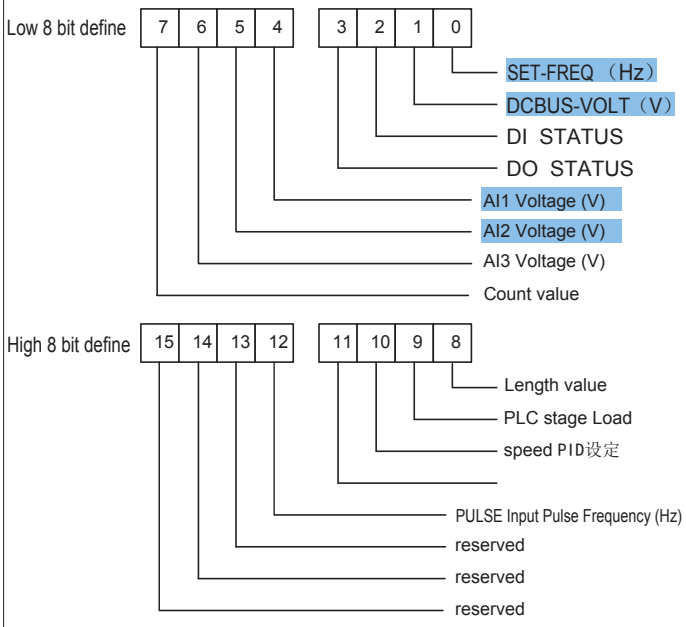
In the shutdown or running state, use the keys on the operation panel to switch each byte of the parameters P7-03, P7-04, and P7-05.Multiple status parameters can be displayed.

1. Set the corresponding bit to 1 according to the correspondence between each byte in the parameter P7-03 (operation display parameter 1) and the above parameters.
2. Convert this binary number to hexadecimal and set it to P7-03. The keyboard setting value is displayed as P.001F.
3. Use the keys on the operation panel to toggle each byte of the parameter P7-03 to view the value of the relevant parameter. The settings are shown in the following figure:



The method of viewing other status parameters is the same as that of P7-03. The correspondence of each byte of the status parameter in P7-03, P7-04, and P7-05 is as follows:

parameter	define	default	range of set	Parameter description
P7-03	Run display parameter 1	1F	0000 ～ FFFF	If you need to display the following parameters during operation, set the corresponding position to 1, convert the binary number to hexadecimal and set it to P7-03. Low 8 bit define 7 6 5 4 3 2 1 0 RUN-FREQ（Hz） SET-FREQ （Hz） DCBUS-VOLT（V） OUT-VOLT（V） OUT-CURR（A） OUT-POWER（kW） OUT-TORQU（%） DI STATUS High 8 bit define 15 14 13 12 11 10 9 8 DO STATUS AI1 VOLT（V） AI2 VOLT（V） AI3 VOLT（V） Count value Length value Load speed display PID setting Note: The shaded part is the default factory display.

<table>
<tr><th>parameter</th><th>define</th><th>default</th><th>range of set</th><th>Parameter description</th></tr>
<tr><td>P7-04</td><td>Run display parameter 2</td><td>33</td><td>0000 ～ FFFF</td><td>If you need to display the following parameters during operation, set the corresponding position to 1, convert the binary number to hexadecimal and set it to P7-04.
 
</td></tr>
<tr><td>P7-05</td><td>Stop display parameter</td><td>0</td><td>0000 ～ FFFF</td><td>If you need to display the following parameters during stopping, set the corresponding position to 1, convert the binary number to hexadecimal and set it to P7-05.
 

Note: The shaded part is the default factory display.</td></tr>
</table>

NOTE

● After the inverter is powered off, the parameters displayed are the parameters selected before the inverter is powered off.

4.2.7 Multi-function button operation

The MF.K key on the operation panel is a multi-function key, which can be used by the parameter P7-01 (MF. K key function selection) sets the function of the MF.K key. In the shutdown or running state, you can use this key to switch the operation command or the rotation direction of the inverter, or realize the jog of forward and reverse rotation.

parameter	define	default	range of set	Parameter description
P7-01	MF.K Choice of features	0	0: MF.K invalid	This key is invalid
			1: Operation panel and terminals Toggle or operate the panel with Communication switching	P0-02 is set to 0 (operation panel), and there is no effect when the MF.K key is pressed; P0-02 is set to 1 (terminal), and the terminal and operation surface can be realized by the MF.K key switching between plates; P0-02 is set to 2 (communication), and communication and operation surfaces can be realized through the MF.K key switching between plates;
			2: Forward and reverse switching	Use the MF.K key to switch the direction of the frequency command. This feature is only run from the command source The command is valid when the command is an operation panel.
			3: Forward jog	Forward jog action (FJOG) is achieved by using the MF.K key of the keyboard. The function is only in commands Source Run Command is valid when the operation panel is used.
			4: Reverse jog	Reverse jog action (RJOG) is achieved by using the MF.K key of the keyboard. The function is only in commands Source Run Command is valid when the operation panel is used.

4.3 Introduction to LCD Operator Panel

The YKEY060 is an external operator panel (optional) for the YD580E, which uses LCD display and supports parameter copy and download Function, users can easily change parameters through this panel, provide Chinese display, more simple and convenient to use. YKEY060.For more information about the external operation panel, please refer to the YKEY060 Smart Operation Keyboard User Manual.

1) Appearance and Interface:

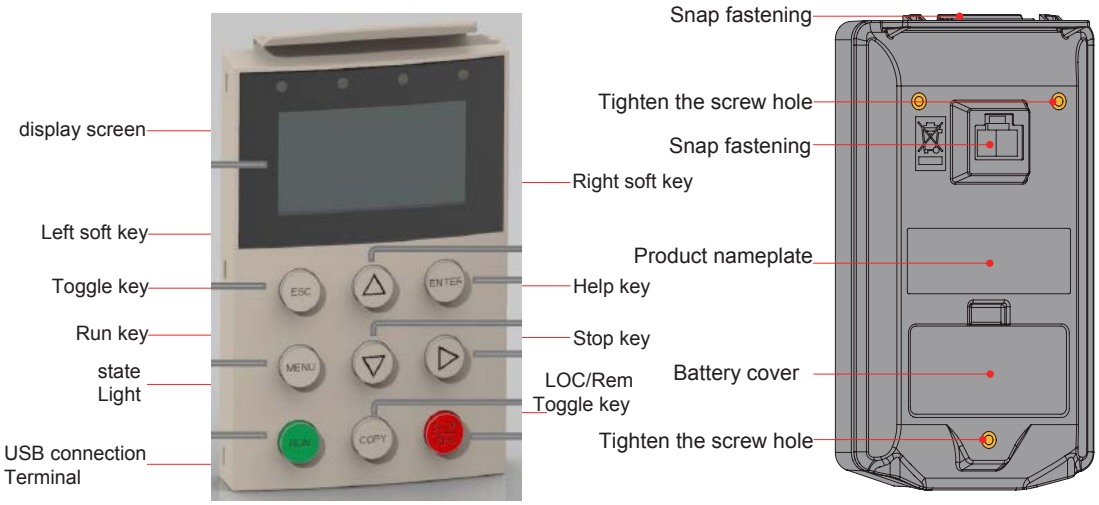


Figure 4-6 Appearance of YKEY060

2) Keyboard installation dimensions

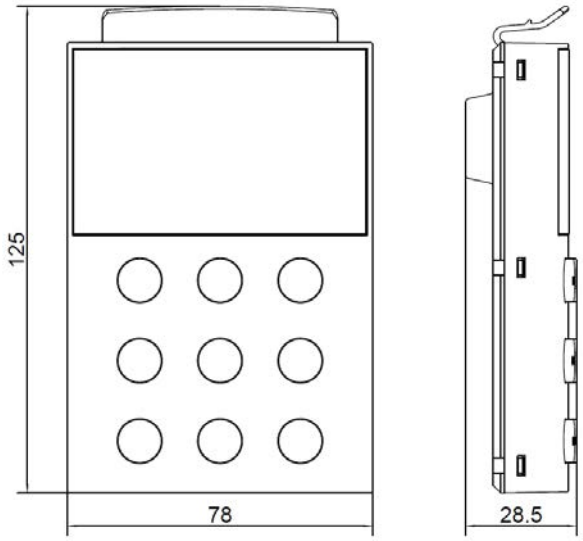
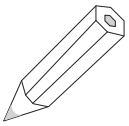


Figure 4-7 YDKEY060 external operation panel dimensions

Memo NO. _____

Date / /



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Chapter 5 Basic Operation and Trial Operation

This chapter introduces the basic debugging steps of the inverter, mainly including the frequency command setting of the inverter, the control of start and shutdown, and the trial operation of the inverter-controlled motor can be realized according to the content of this chapter.

5.1 Quick adjusting Guide

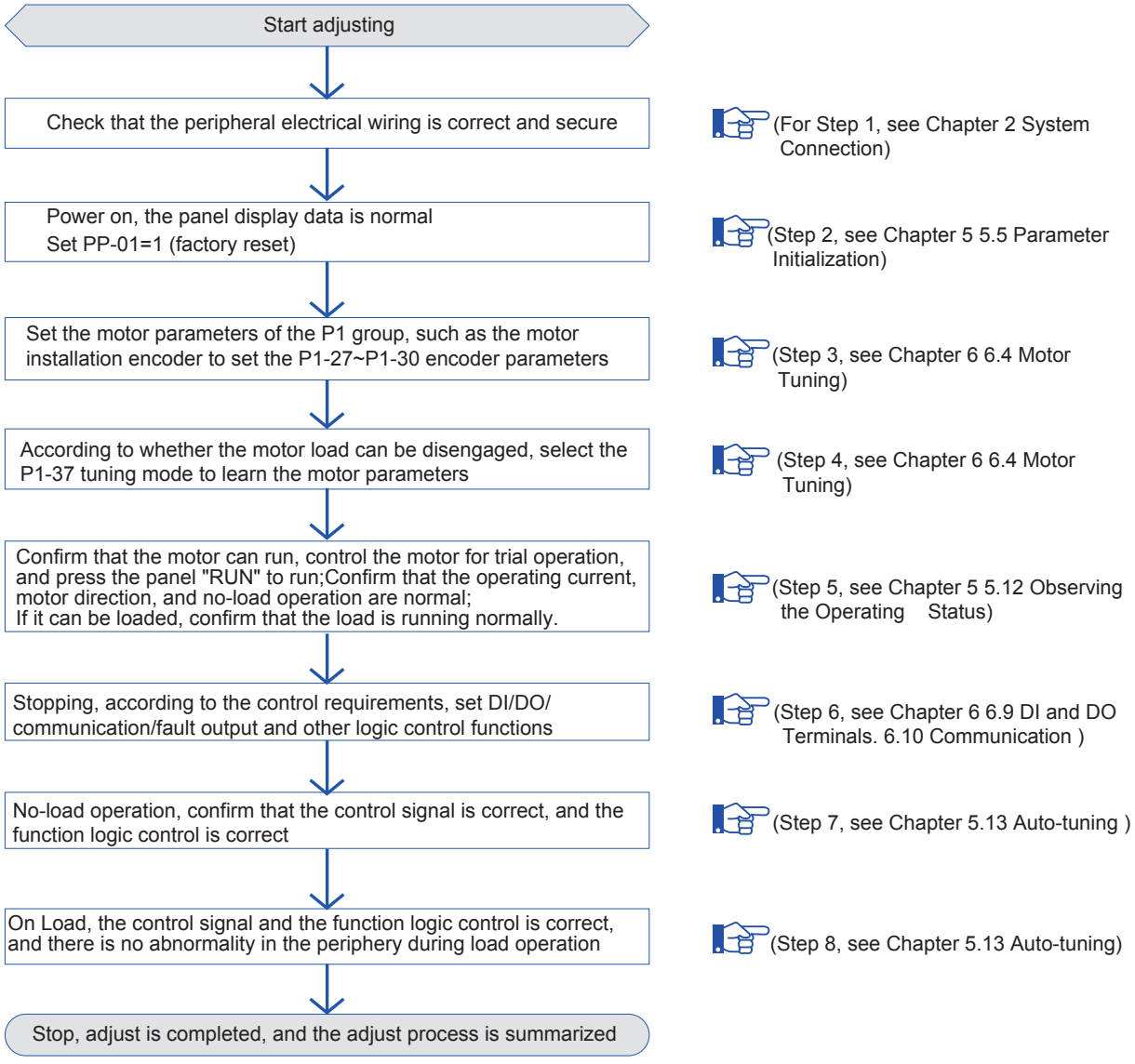

Figure 5-1 Quick adjusting steps

5.2 Flow chart of inverter commissioning

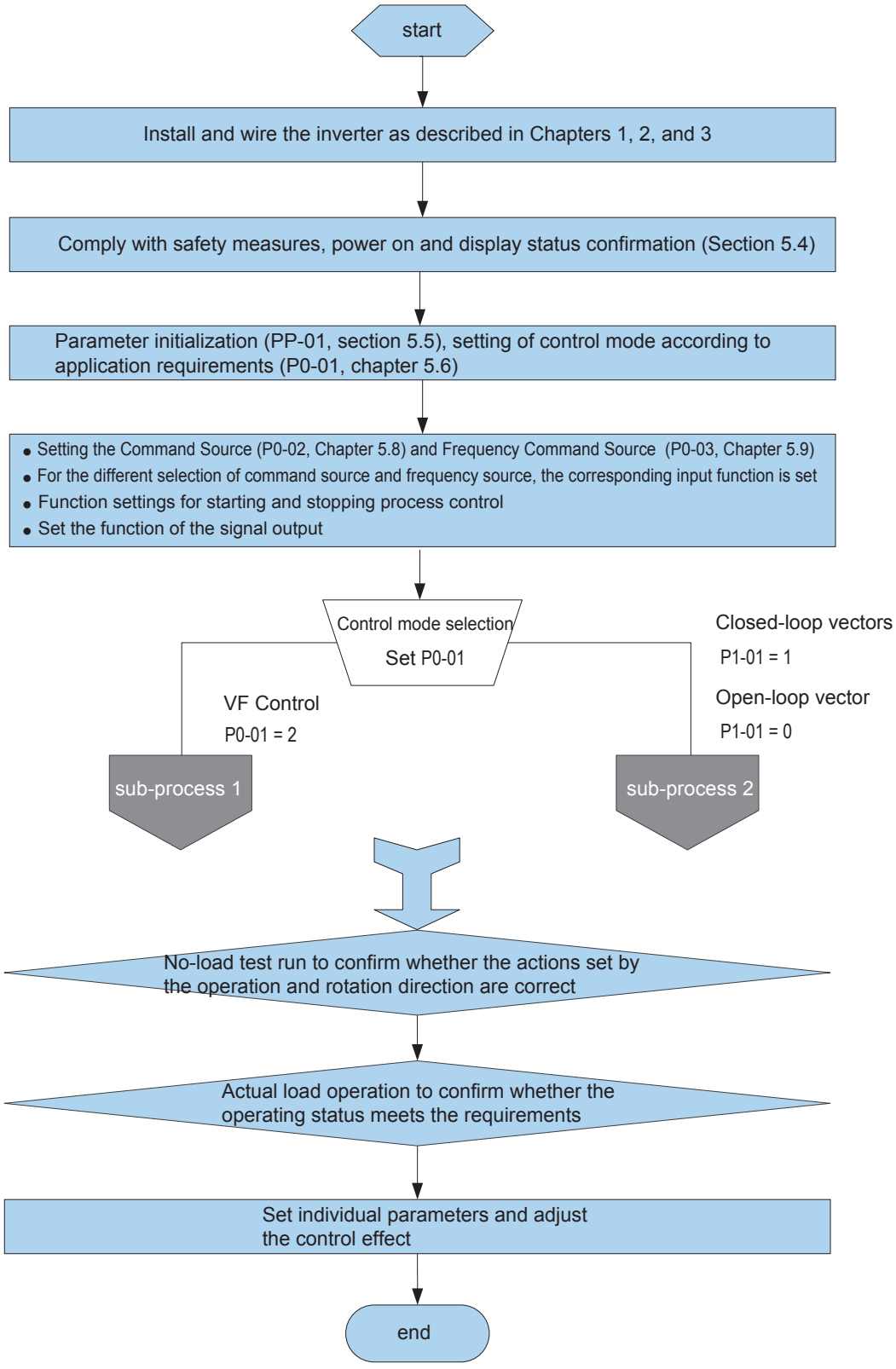

Figure 5-2 Flow chart of inverter commissioning

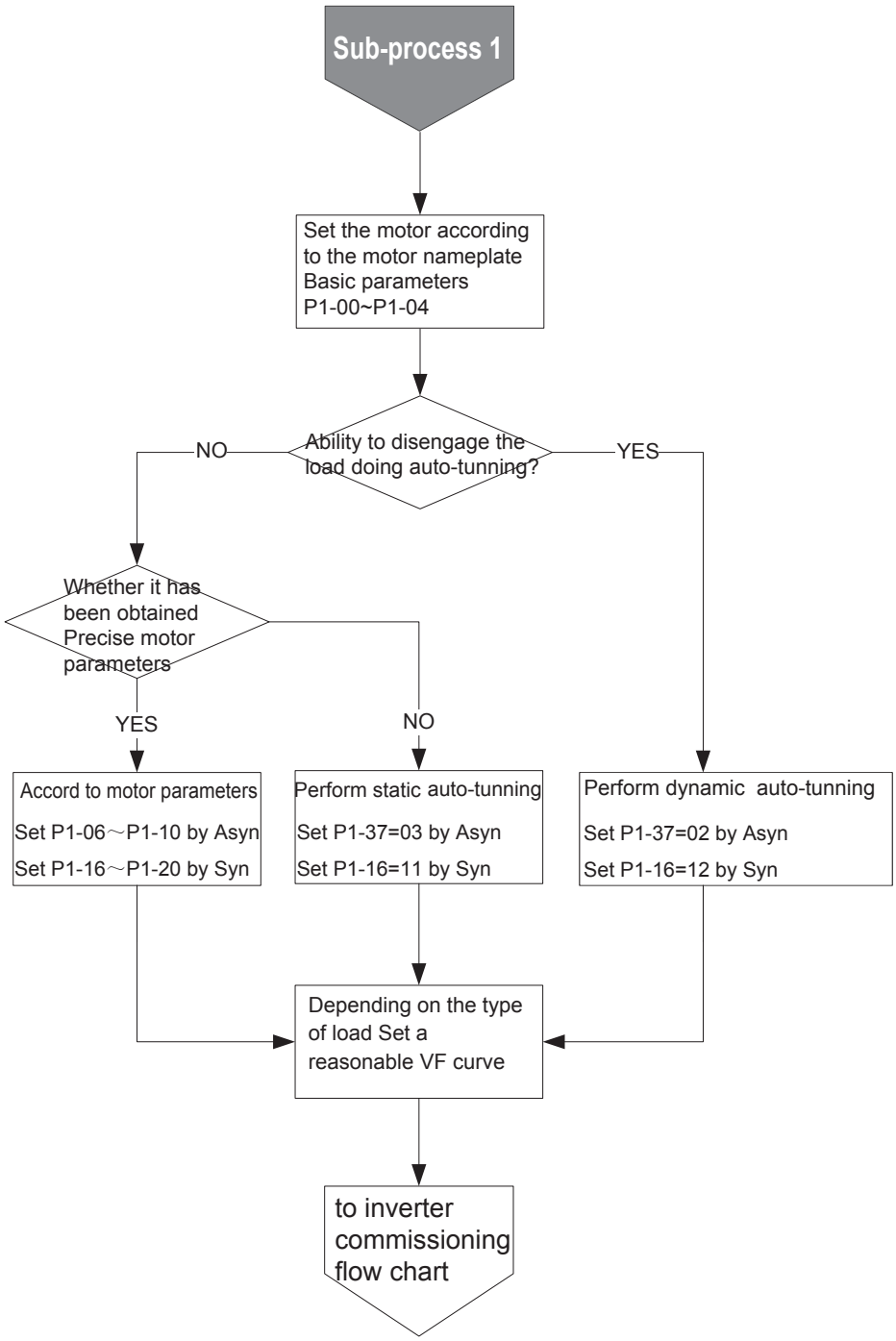

Figure 5-3 Inverter debugging Sub-process 1 (V/F control)

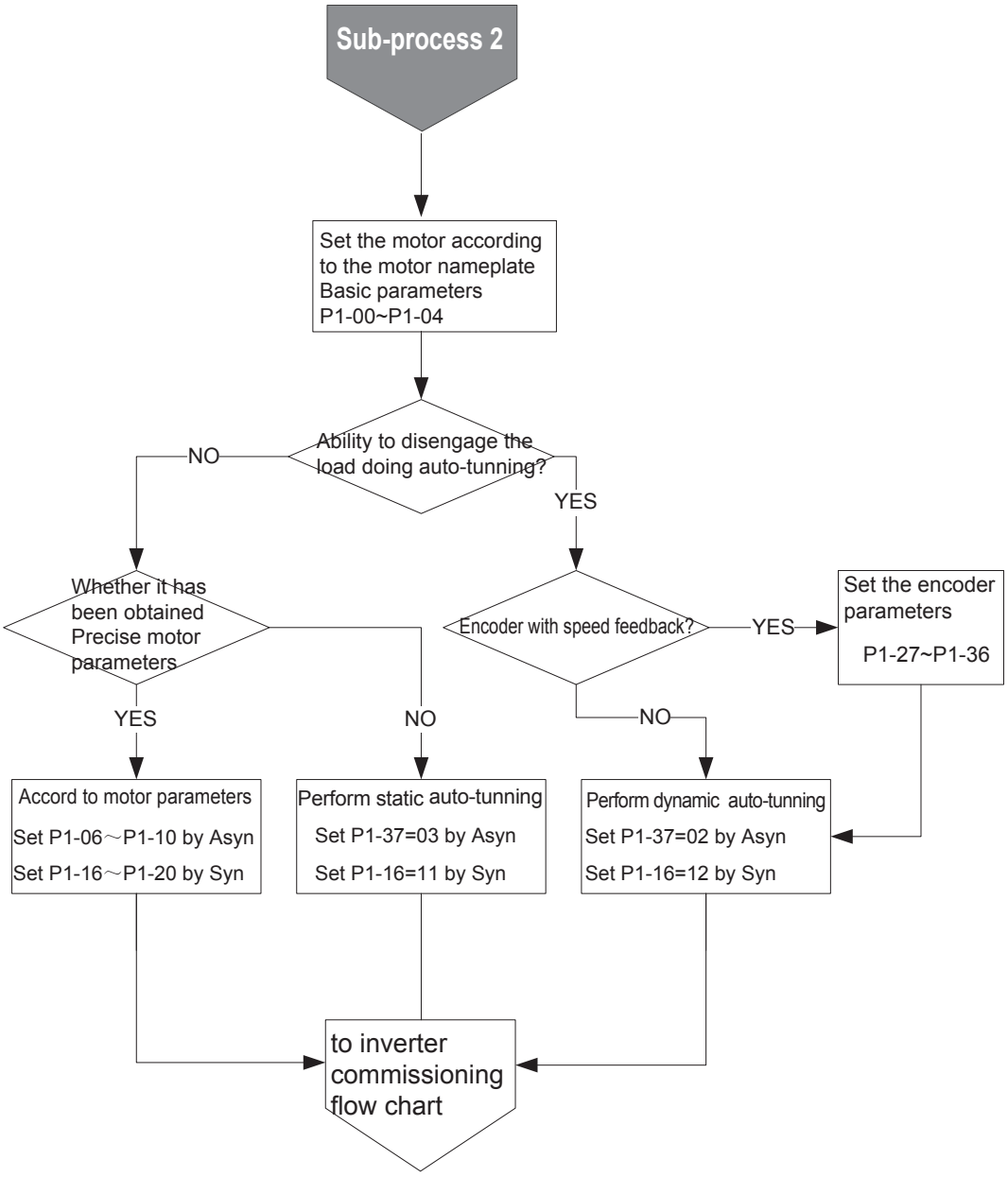

Figure 5-4 Inverter debugging Sub-process 2 (vector control)

5.3 Confirm before turning on the power

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

item	content
Confirmation the power voltage	Confirm the power voltage is correct: AC380V~480V 50/60Hz.
	Reliable wiring of the power input terminals (R/S/T).
	Confirm that the drive and motor are properly grounded
Confirm the connection between output terminal of inverter and terminal of motor	Check inverter output (U/V/W) and motor terminal are firmly connected
Confirm the connect of inverter control terminal	Confirm control terminal of inverter and other device are securely connected.
Confirm the status of inverter control terminal	Check all terminals of inverter control loop are in OFF state (inverter not in run)
Confirmation of the load	Confirm motor is unloaded and not connected to the mechanical system

5.4 Display status confirmation after power on

When the power is turned on, the operator in normal state is displayed as shown below.

state	display	illustrate
Normal		The factory default display is a digital setting of 50.00Hz
fault		When the inverter is in a shutdown state, the fault type is displayed

5.5 Parameter Initialization

The inverter's settings can be restored to factory settings, and after initialization, the PP-01 will automatically reset to zero.

PP-01	Parameter initialization		default value	0
	range of set	0	No action	
		1	Factory restore parameters, excluding motor parameters	
		2	Clear the record information	
		4	Back up the user's current parameters	
		501	Restore user backup parameters	

1：Factory restore parameters, excluding motor parameters

After setting PP-01 to 1, most of the functional parameters of the inverter are restored to the manufacturer's factory parameters, but the motor parameters, frequency command decimal point (P0-22), fault record information, cumulative running time (P7-09), cumulative power-on time (P7-13), and cumulative power consumption(P7-14) and the temperature of the inverter module radiator (P7-07) are not restored.

2：Clear the record information

Clear the inverter fault record information, cumulative running time (P7-09), cumulative power-on time (P7-13), and cumulative power consumption (P7-14).

4：Back up the user's current parameters

Back up the parameters set by the current user. Back up the current set values of all function parameters. In order to facilitate the recovery of customers after parameter adjustment is out of order.

501：Restore user backup parameters

Restore the previously backed up user parameters, i.e. restore the parameters backed up by setting PP-01 to 4.

5.6 Basis for selection of Motor Control Mode

parameter	illustrate	Applications
P0-01： Motor control Method	Set to 0: No Speed Sensor Vector Control (SVC)	Refers to open-loop vector control, which is suitable for the usual high-performance control occasions The inverter can only drive one motor. Such as machine tools, centrifuges, wire drawing machines, Injection molding machine and other loads.
	Set to 1: With Speed Sensor Vector Control (FVC)	Refers to closed-loop vector control, the motor side must be equipped with an encoder, and the inverter must be Optional PG card of the same type as the encoder. Suitable for high-precision speed control or torque control. One inverter can only drive one motor. as High-speed papermaking machinery, lifting machinery, elevators and other loads.
	Set to 2: V/F control (speed open-loop control)	It is suitable for those with low load requirements, or one inverter dragging multiple motors Occasions, such as fans, pump loads. It can be used to drag multiple units with one inverter The occasion of the motor.

5.7 Frequency Command Selection

P0-03	Main frequency select		default	0
	Set the range	0	Digital setting (preset frequency P0-08, UP/DOWN can be modified, no memory when power is off)	
		1	Digital setting (preset frequency P0-08, UP/DOWN can be modified, power-down memory)	
		2	AI1	
		3	AI2	
		4	AI3	
		5	Pulse setting (DI5)	
		6	Multi-speed instructions	
		7	PLC	
		8	PID	
		9	Communication given	

5.7.1 Digital setting of the operation panel

1) Set P0-03 = 0: Digital setting (no memory when power off)

Set the initial value of the frequency to the value of P0-08 "Provisioned frequency". The set frequency value of the inverter can be changed by the ▲ key and ▼ key of the keyboard (or the UP and DOWN of the multi-function input terminal). After the inverter is powered off and powered on again, the set frequency value is restored to the P0-08 "Digital Setting Preset Frequency" value.

2) Set P0-03 = 1: Digital setting (power-off memory)

When the inverter is powered off and powered on again, the set frequency is the set frequency at the time of the last power failure, and it is remembered by the correction amount of the keyboard ▲ and ▼ keys or terminals UP and DOWN.

5.7.2 Analog Input (AI)

The YD580E control board provides 2 analog input terminals (AI1, AI2) and the optional I/O expansion card provides an additional 1 analog input terminal (AI3).

Table 5-1 Analog (AI) terminal characteristics

Terminal	name	type	range	Input impedance
AI1-GND【1】	The analog input 1	Voltage	DC 0V~10V	22kΩ
AI2-GND【1】	The analog input 2	Voltage【2】	DC 0V~10V	22kΩ
		Voltage【2】	0mA~20mA	Impedance 500Ω or 250Ω adjust via J10
AI3-GND	Extend card analog input	Voltage	DC -10V~10V	-

【1】 Please refer to "Chapter 3 Figure 3-19" for terminal wiring.

【2】 The J9 jumper selects whether AI2 is a voltage or current input.

Table 5-2 Procedure for setting an analog quantity (AI) as a frequency command

Setup steps	parameters	illustrate	
AI Selection: The frequency index is selected according to the characteristics of the AI input of the order	P0-03	P0-03 = 2	choice AI1
		P0-03 = 3	choice AI2
		P0-03 = 4	choice AI3
The AI voltage [1] corresponds to the frequency curve: Select any of the 5 curves individually Meaning one	P4-33	In general, the default value P4-33 = 321 is used, AI1 uses curve 1, AI2 uses curve 2, AI3 uses curve 3.	
The AI voltage [1] corresponds to the frequency Line Setting: Set the input and setting of the AI voltage Correspondence of quantities	P4-13 ~ P4-16【2】	Curve 1	Typical Setting Curve [3]
	P4-18 ~ P4-21	Curve 2	Typical Setting Curve [4]
	P4-23 ~ P4-27	Curve 3	Typical Setting Curve [5]
	A6-00 ~ A6-07	Curve 4	See Section 6.2.3 for instructions
	A6-08 ~ A6-15	Curve 5	
	P4-34	AI Below Minimum Input Setting Selection [2]	
	P0-10	When AI is used as a given frequency, the voltage/current input corresponds to 100.0% of the setting, which is the relative maximum frequency P0-10.	
AI filter time	P4-17	The default is 0.1s, the parameter is set according to the fast response requirements and the interference of the field signal, the parameter should be reduced if the fast response is required, and the filtering time should be increased if the field interference is large.	

【1】 When analog input is set current type, 1mA is equivalent to 0.5V voltage, i.e., 20mA corresponds to 10V.

【2】 When analog input voltage is greater than the set "Maximum Input" (P4-15), the analog voltage is calculated as the "Maximum Input", and similarly, when analog input voltage is less than the set "Minimum Input" (P4-13), it is calculated as the minimum input or 0.0% according to the setting of "AI Below Minimum Input Setting Selection" (P4-34).

【3】 A typical setup curve for AI1 is shown in the figure below.

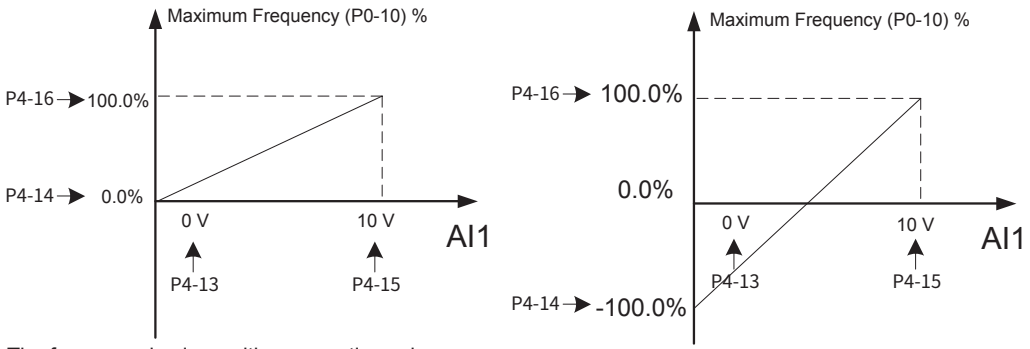

Figure 5-5 Typical setup curve for AI1

【4】 AI2 is used as a voltage input with a typical setting curve similar to AI1, and when used as a current type, it is generally set at 4 ~ 20 mA 0 ~ 50Hz or -50 ~ 50Hz.

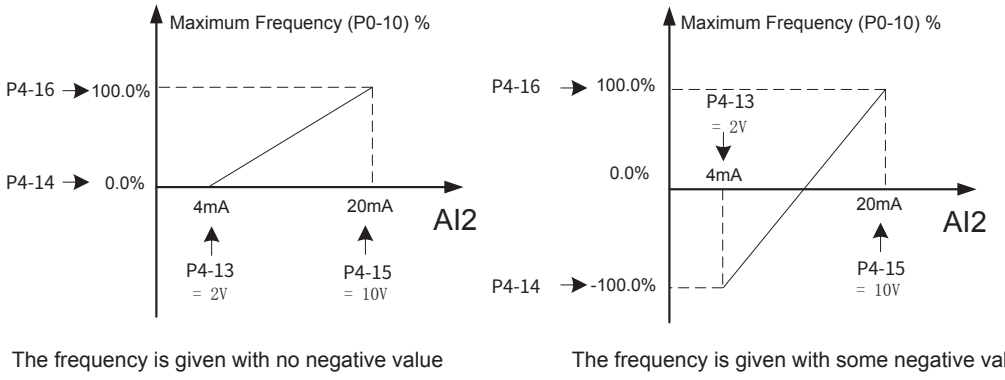

Figure 5-6 Typical setup curve for AI2

[5] The typical setting curve of AI3 is shown in the figure below, and the correspondence between the two setting methods between 0V ~ 10V is exactly the same, but when a negative voltage is input, the setting method shown in the left figure limits the voltage to 0V (minimum voltage P4-24).

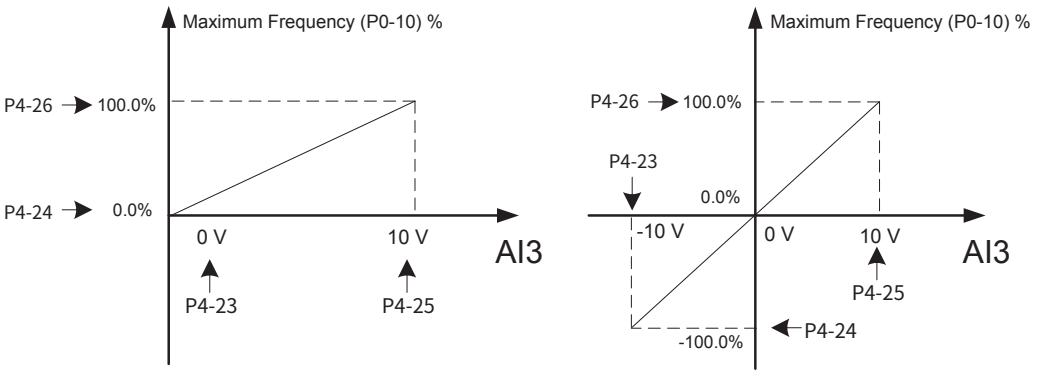

Figure 5-7 Typical setup curve of AI3

5.7.3 Digital pulse input (DI5)

The frequency is given by means of a high-speed pulse at the DI5 terminal.

Pulse given signal specifications: voltage range 9V ~ 30V, frequency range 0kHz ~ 100kHz.

Table 5-3 Procedure for setting the digital pulse input (DI5) as a frequency command

Setup steps	parameters	illustrate
The digital pulse input (DI5) is used as the frequency command	P0-03 P4-04	Set P0-03 = 5 , main frequency command as "Pulse Setting (DI5)" Set P4-04 = 30， D15 terminal function as "Pulse Frequency Input"
Set the curve between the pulse frequency and the set frequency	P4-28 ～ P4-31	Typical Setup Curve 【1】
	P0-10	When Pulse is given as a frequency, it corresponds to 100.0% of the setting, which maximum frequency is P0-10.
Sets the filtering time for the set frequency	P4-32	Set the filtering time for the frequency

【1】 A typical setup curve when a digital pulse input is used as a frequency command is shown in the figure below:

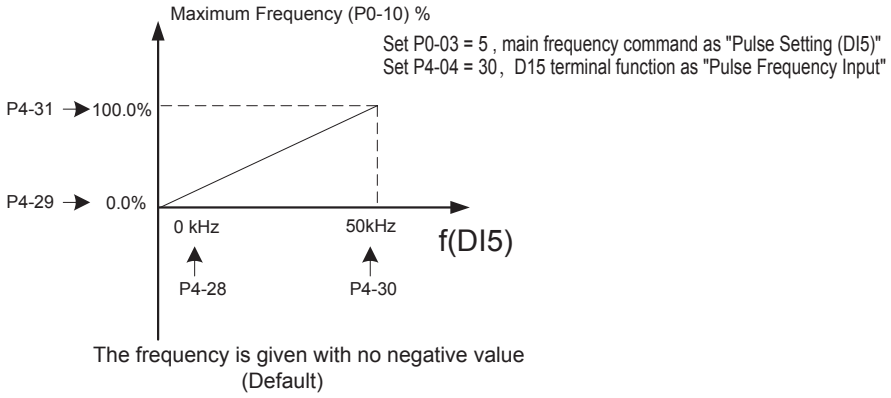

Figure 5-8 Typical setting curve of DI5 as a frequency command

5.7.4 Master Frequency communication given

YD580E installation communication card (optional) can realize 4 upper computer communication methods: Modbus, Profibus-DP, CANopen and CANlink. Different communication methods can be set up via the P0-28, as detailed in the table below, where CANlink is always valid and does not need to be set.

For details of the optional card, please refer to "Chapter 11 Optional Card", and users can choose according to their needs.

Setup steps	parameters	illustrate	
communication is used as the frequency command	P0-03	P0-03=9	
Choose the method of communication	P0-28	MODBUS	P0-28 = 0
		Profibus-DP	P0-28 = 1
		CANopen	P0-28 = 1
CANlink is always valid and requires no set-up. For the relevant parameter settings for each communication method, please refer to Chapter 6 6.10 Communication			

5.7.5 Multi-Speed command

When selecting the multi-segment command operation mode, it is necessary to digitally input different state combinations of DI terminals to correspond to different set frequency values.

Table 5-4 Procedure for setting a multi-speed as a frequency command

Setup steps	parameters	illustrate	
Multi-Speed as main frequency	P0-03	P0-03= 6	
Determine the number of segments that require multi-stage speeds	-----	Max 16 speeds with 4 DI terminals. The correspondence between the number of segments and DI is as follows: 2 speeds: 1 DI terminal K1 3-4 speeds: 2 DI terminals K1, K2 5-8 speeds: 3 DI terminals K1, K2, K3 9-16 speeds: 4 DI terminals K1, K2, K3, K4	
Set the DI terminal to a multi-speed function	P4-00 ～ P4-09	Multi-command terminal K1	Set 12
		Multi-command terminal K2	Set 13
		Multi-command terminal K3	Set 14
		Multi-command terminal K4	Set 15
Set the frequency corresponding to each multi-band speed 【note】	PC-00 ～ PC-15	The frequency setting corresponding to the speed is set as %, and 100% corresponds to the maximum frequency P0-10.	
	P0-10	When the frequency command is Multi-Speed, 100.0% of the parameter PC-00~PC-15 corresponds to max frequency P0-10.	

[Note]: 4 multi-segment command terminals can be combined into 16 states, and these 16 states correspond to 16 command settings. The details are shown in the following table:

Table 5-5 Terminal combinations for the multi-speed command function

K4	K3	K2	K1	Command settings	Corresponds to Max %
OFF	OFF	OFF	OFF	Multi-speed 0	PC-00
OFF	OFF	OFF	ON	Multi-speed 1	PC-01
OFF	OFF	ON	OFF	Multi-speed 2	PC-02
OFF	OFF	ON	ON	Multi-speed 3	PC-03
OFF	ON	OFF	OFF	Multi-speed 4	PC-04
OFF	ON	OFF	ON	Multi-speed 5	PC-05
OFF	ON	ON	OFF	Multi-speed 6	PC-06
OFF	ON	ON	ON	Multi-speed 7	PC-07
ON	OFF	OFF	OFF	Multi-speed 8	PC-08
ON	OFF	OFF	ON	Multi-speed 9	PC-09
ON	OFF	ON	OFF	Multi-speed 10	PC-10
ON	OFF	ON	ON	Multi-speed 11	PC-11
ON	ON	OFF	OFF	Multi-speed 12	PC-12
ON	ON	OFF	ON	Multi-speed 13	PC-13
ON	ON	ON	OFF	Multi-speed 14	PC-14
ON	ON	ON	ON	Multi-speed 15	PC-15

5.8 Start and Stop Commands

P0-02	command select		default	0
	range	0	panel（LED OFF）	
		1	terminal（LED ON）	
		2	commuication（LED FLASH）	

Select the input channel for the inverter control command.

Inverter control commands include: start, stop, forward, reverse, jog, etc.

0: Operation panel command channel ("LOCAL/REMOT" light is off);

The RUN, STOP/RES buttons on the operation panel are used to control the operation command.

1: Terminal command channel ("LOCAL/REMOT" light is on);

The multi-function input terminal functions such as FWD, REV, JOGF, JOGR, etc., are used to control the operation command.

2: Communication command channel ("LOCAL/REMOT" light flashes)

5.8.1 Start-stop operation panel

The operation command is controlled by the RUN, STOP/RES buttons on the operation panel, and the "LOCAL/REMOT" on the operator is the light
Extinguished state. For details on the buttons, please refer to "Chapter 4 Panel Operation".

5.8.2 Terminal start-stop (DI)

P4-11	terminal command method		dafault	0
	range	0	2-wire 1	
		1	2-wire 2	
		2	3-wire 1	
		3	3-wire 2	

This parameter defines 4 different ways in which the operation of the drive can be controlled via an external terminal.

For the convenience of explanation, the following three terminals of DI1 ~ DI10 multi-function input terminals, DI1, DI2, and DI3, are arbitrarily selected as external terminals. That is, by setting the value of P4-00 ~ P4-02 to select the function of DI1, DI2, DI3 three terminals, the detailed function definition is see P4-00 ~ P4-09 setting range.

0: 2-wire 1: This mode is the most commonly used two-wire mode. Terminals DI1 and DI2 determine the forward and reverse operation of the motor.

The parameters are set as follows:

parameter	name	vaule	Description
P4-11	Terminal command mode	0	2-wire 1
P4-00	DI1 function selection	1	Forward (FWD)
P4-01	DI2 function selection	2	Reverse (REV)

K1	K2	Run command
1	0	FWD
0	1	REV
1	1	STOP
0	0	STOP

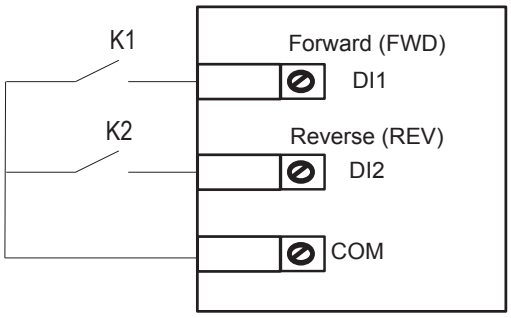

Figure 5-9 2-wire 1

As shown in the figure above, in this control mode, the K1 is closed and the inverter is running in a forward rotation. K2 is closed and reversed, K1 and K2 are closed or disconnected at the same time, and the inverter stops running.

1: 2-wire 2: When using this mode, the DI1 terminal function is the enable terminal for operation, and the DI2 terminal function determines the direction of operation.

The parameters are set as follows:

parameter	name	vaule	Description
P4-11	Terminal command mode	1	2-wire 2
P4-00	DI1 function selection	1	Enable operation
P4-01	DI2 function selection	2	Forward/Reverse

K1	K2	Run command
1	0	FWD
1	1	REV
0	0	Stop
0	1	Stop

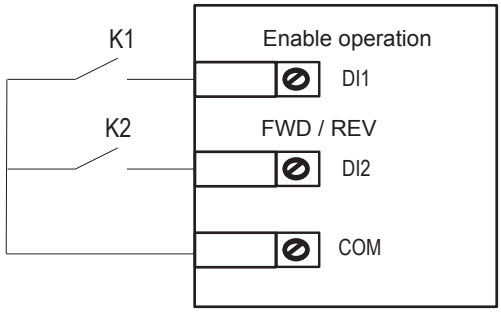

Figure 5-10 2-wire 2

As shown in the figure above, in the closed state of K1, K2 disconnects the inverter and rotates forward, and K2 closes the inverter reverse; The K1 is disconnected and the drive stops.

2: 3-wire 1: DI3 in this mode is the enabling terminal, and the direction is controlled by DI1 and DI2 respectively.

The parameters are set as follows:

parameter	name	vaule	Description
P4-11	Terminal command mode	2	3-wire 1
P4-00	DI1 function selection	1	Forward (FWD)
P4-01	DI2 function selection	2	Reverse (REV)
P4-02	DI3 function selection	3	3-wire control

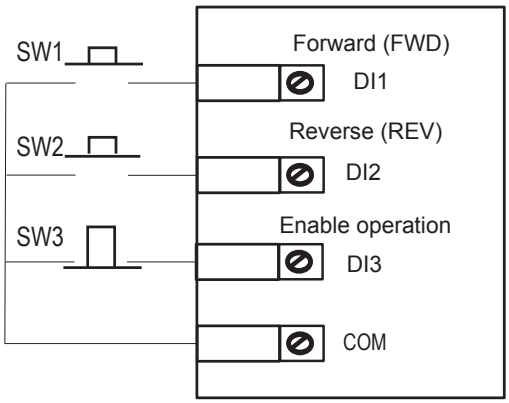

Figure 5-11 3-wire 1

As shown in the figure above, in this control mode, when the SW3 button is closed, press the SW1 button to turn the inverter forward, press the SW2 button to reverse the inverter, and the SW3 button to disconnect the inverter to stop instantly. In normal start and operation, it is necessary to keep the SW3 button closed, and the command of the SW1 and SW2 buttons will take effect at the closing action edge, and the operation state of the inverter shall be subject to the last key action of the 3 buttons.

3: 3-wire 2: DI3 in this mode is the enable terminal, the command is given by DI1, and the direction is determined by the state of DI2.

The parameters are set as follows:

parameter	name	vaule	Description
P4-11	Terminal command mode	3	3-wire 2
P4-00	DI1 function selection	1	Enable operation
P4-01	DI2 function selection	2	Forward/reverse
P4-02	DI3 function selection	3	3-wire control

K	Run Way
0	FWD
1	REV

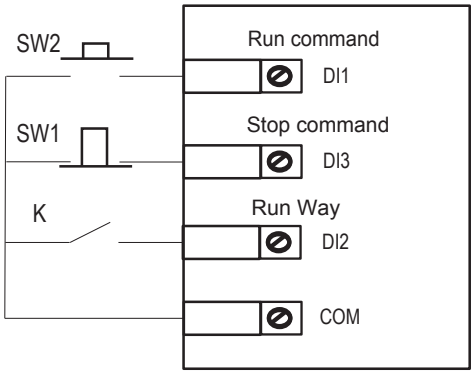

Figure 5-12 3-wire 2

As shown in the figure above, in this control mode, in the closed state of the SW1 button, press the SW2 button inverter to run, K disconnects the inverter to rotate, and K closes the inverter to reverse; The SW1 push-button disconnects and stops the inverter instantly. During normal start-up and operation, the SW1 button must be kept closed, and the command of the SW2 button takes effect at the closing action edge.

5.8.3 Communication start-stop

Communication start and stop means that the running command is given by the host computer through communication, and YD580E needs to install a communication card (optional) to communicate with the host computer. Different communication methods can be set up via P0-28, as detailed in the table below, where CANlink is always active and does not need to be set.

For details of the optional card, please refer to Chapter 11 "Optional Card", and users can choose according to their needs.

Setup steps	parameters	illustrate	
frequency command is communication	P0-02	P0-02 = 2	
Select a communication method	P0-28	MODBUS	P0-28 = 0
		Profibus-DP	P0-28 = 1
		CANopen	P0-28 = 1
CANlink is always valid and requires no set-up. For the relevant parameter settings for each communication method, please refer to Chapter 6 6.10 Communication			

5.9 Startup Process Setup

5.9.1 Startup Mode Selection

P6-00	Startup mode	default	0
	range	0	Direct start
		1	Speed search
		2	Pre-excitation start (AC asynchronous motor)
		3	SVC Quick Start

0：Direct start

If the starting DC braking time is set to 0, the inverter will start to operate from the starting frequency. If the starting DC braking time is not 0, the DC braking will be done first, and then the operation will start from the starting frequency. It is suitable for small inertial loads, and the motor may rotate when starting.

It is suitable for most small inertial loads, and the frequency curve of the start-up process is shown below. Its "DC braking" function before starting is suitable for elevators and heavy load drives, and "starting frequency" is suitable for equipment drives that require starting torque impact starting, such as cement mixer equipment.。

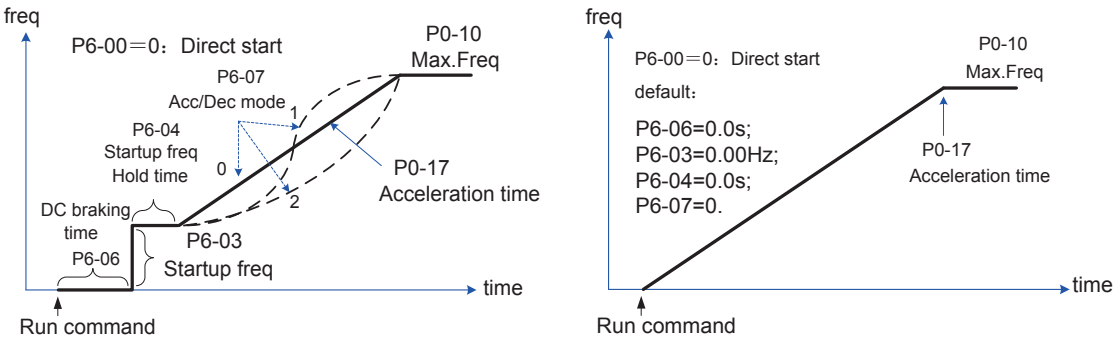

Figure 5-13 Direct startup mode

1：Speed search

It is suitable for the drive of large inertial mechanical load, the frequency curve of the starting process is as shown in the following figure, if the inverter starts running, the load motor is still running by inertia, and the speed tracking is taken to start and then start, which can avoid the occurrence of overcurrent in the start.

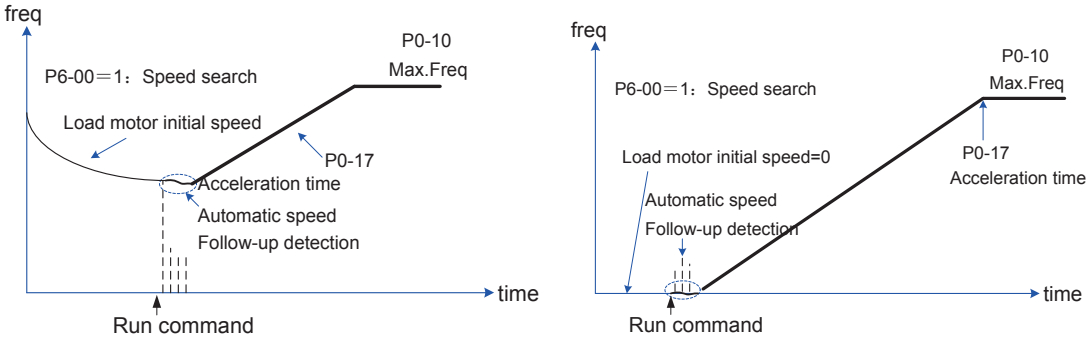

Figure 5-14 speed search mode

2：Pre-excitation start (AC asynchronous motor)

This method is only applicable to inductive asynchronous motor loads. Pre-excitation of the motor before start-up can improve the fast response characteristics of the asynchronous motor and meet the application requirements of short acceleration time, and the frequency curve of the start-up process is as follows:

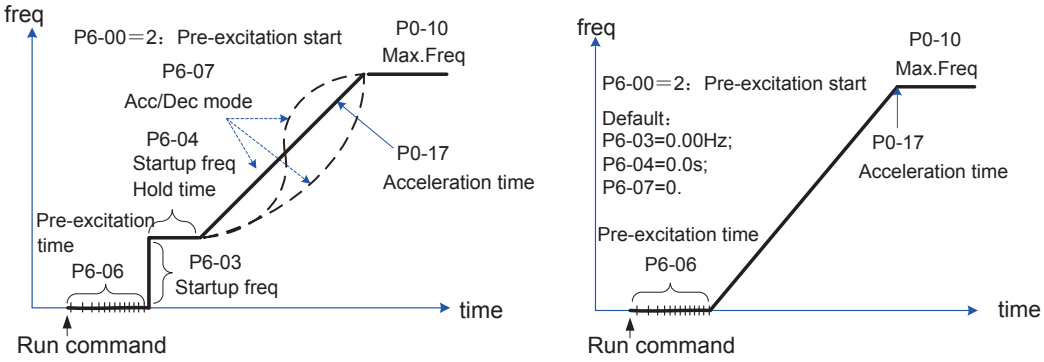

Figure 5-15 Pre-excitation start-up mode

3：SVC Quick Start

Set P6-00=3, this mode is only applicable to the SVC control mode of the asynchronous machine, which can shorten the acceleration time, and can enable the mode when the system inertia is large and needs to be started quickly, but there will be torque impact.

5.9.2 Startup Frequency

P6-03	Startup frequency	default	0.00Hz
	range	0.00Hz ～ 10.00Hz	
P6-04	Startup frequency hold time	dfault	0.0s
	range	0.0s ～ 100.0s	

In order to ensure the motor torque at start-up, set the appropriate starting frequency. In order for the magnetic flux to be fully established when the motor starts, the starting frequency needs to be maintained for a certain period of time.

The start-up frequency P6-03 is not limited by the lower frequency limit. However, when the target frequency is less than the starting frequency, the inverter will not start and will be in standby mode.

The start-up frequency hold time is not included in the acceleration time, but is included in the runtime of the simple PLC.

5.10 Stopping Process Setup

There are 2 Stopping modes of the inverter, which are deceleration stop and free stop, which are selected by the parameter P6-10. It is possible to choose whether or not to use the DC braking function at the end of the shutdown section.

5.10.1 Stopping mode selection

P6-10	Stopping mode	default	0
	range	0	deceleration stop
		1	free stop

0：deceleration stop After the stop command is valid, the inverter reduces the output frequency according to the deceleration time, and stops after the frequency drops to 0.

1：free stop After the stop command is valid, the inverter immediately terminates the output, and the motor stops freely according to the mechanical inertia.

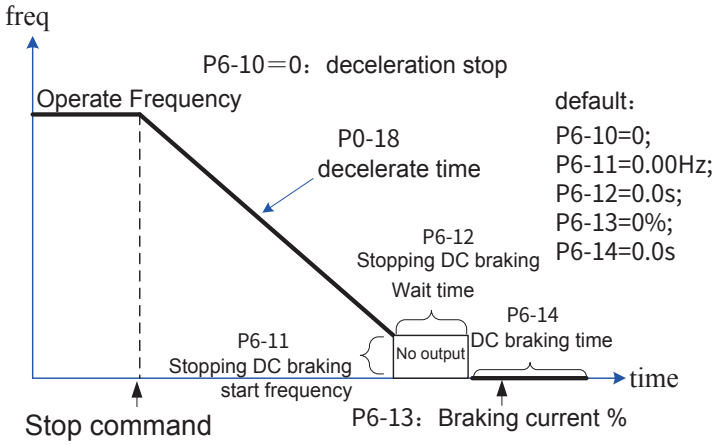

Figure 5-16 deceleration and stopping

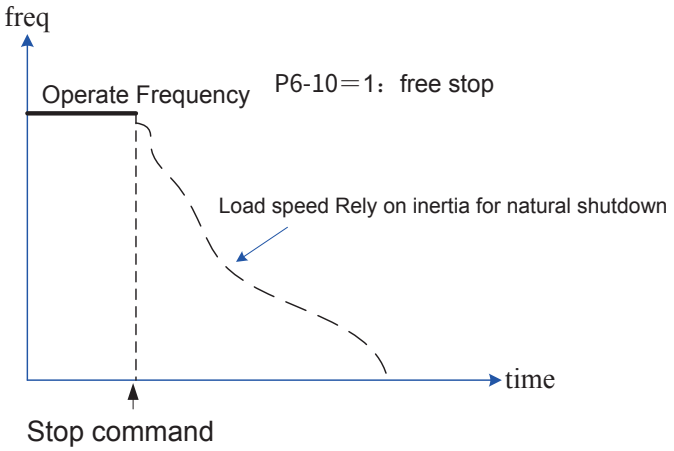

Figure 5-17 Free stop

5.10.2 Stopping DC braking

parameter	define	dafault	range	description
P6-11	Stopping DC braking Start frequency	0.00Hz	0.00Hz~ Max-freq	During the deceleration shutdown, when the operating frequency is reduced to that frequency, it starts DC braking process.
P6-12	Stopping DC braking Wait time	0.0s	0.0s~ 100.0s	After operating-freq is reduced to the start-freq of DC braking of the shutdown, the inverter is the first Stop the output for a while before starting the DC braking process. For defense Stop the overcurrent and other faults that may be caused by DC braking at a higher speed.
P6-13	Stopping DC braking current	50%	0%~ 100%	There are two cases of the relative base value of the parking DC braking current. 1) When the rated current of the motor is less than or equal to 80% of the rated current of the inverter, is the percentage base value of the relative motor rated current. 2) When the rated current of the motor is greater than 80% of the rated current of the inverter, it is Relative to 80% of the inverter current rating is a percentage basis.
P6-14	Stopping DC braking Time	0.0s	0.0s~ 100.0s	The amount of time the DC braking amount is maintained. If this value is 0, the DC braking process is canceled.

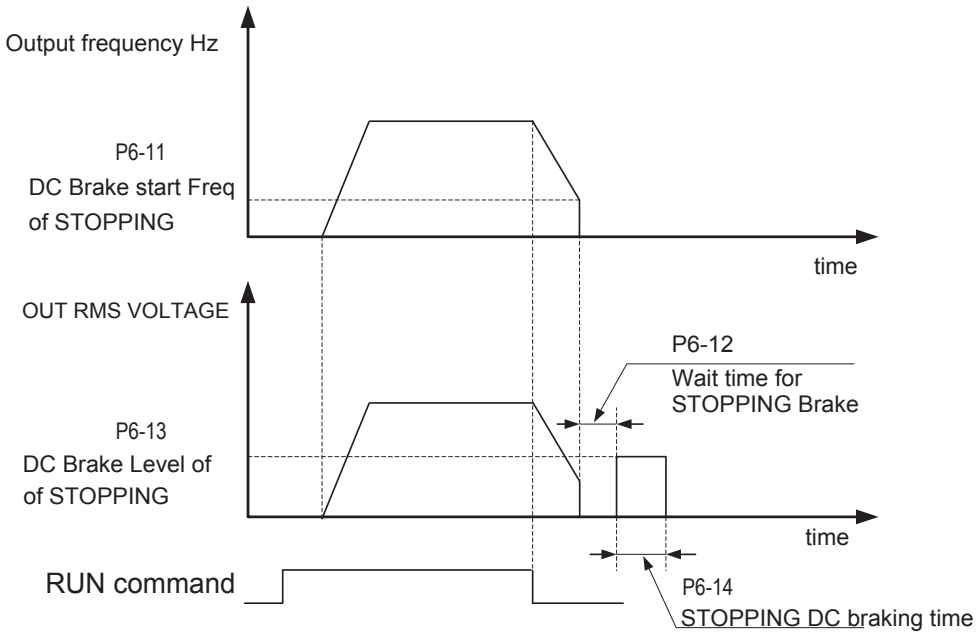

Figure 5-18 DC braking process of STOPPING

5.11 Acceleration and Deceleration Time Setting

P0-17	Acceleration time 1	dafault	model determine
	range	0.00s ～ 650.00s（P0-19=2） 0.0s ～ 6500.0s（P0-19=1） 0s ～ 65000s（P0-19=0）	
P0-18	Decelerate time1	default	model determine
	range	0.00s ～ 650.00s（P0-19=2） 0.0s ～ 6500.0s（P0-19=1） 0s ～ 65000s（P0-19=0）	
P0-25	Acc/Dec time reference frequency	default	0
	range	0	Max.Freq（P0-10）
		1	Set frequency
		2	100Hz

Acceleration time refers to the time required for the inverter to accelerate from zero frequency to the reference frequency of acceleration and deceleration (determined by P0-25), as shown in Figure 5-19 t1.

The deceleration time refers to the time required for the inverter to decelerate from the base frequency of acceleration and deceleration (determined by P0-25) to the zero frequency, as shown in Figure 5-19 t2.

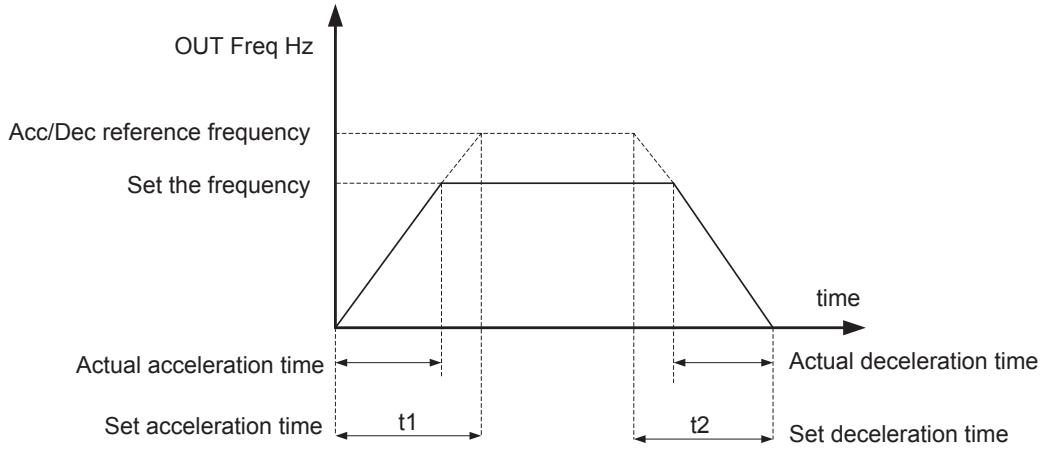

Figure 5-19 Acceleration and deceleration times

YD580E provides 4 groups of acceleration and deceleration time, users can use the digital input termina l DI to switch the selection (terminal function 16, 17), and the four groups of acceleration and deceleration time can be set by the following parameters:

Group 1: P0-17、P0-18;

Group 2: P8-03、P8-04;

Group 3: P8-05、P8-06;

Group 4: P8-07、P8-08;

P0-19	unit of acc/dec time		default	1
	range	0	1 s	
		1	0.1 s	
		2	0.01 s	

In order to meet the needs of various fields, YD580 provides 3 acceleration and deceleration time units, which are 1 second, 0.1 second and 0.01 second.

NOTE

- When modifying this function parameter, the number of decimal places displayed in the 4 groups of acceleration and deceleration times will change, and the corresponding acceleration and deceleration time will also change, so special attention should be paid to the application process.

5.12 Observe the running status

5.12.1 Digital output DO

The control board comes with 3 DO outputs, namely FM, DO1, and TA/TB/TC, of which FM and DO1 are transistor outputs, which can drive 24Vdc low-voltage signal circuits, and TA/TB/TC are relay outputs, which can drive 250Vac control circuits.

Two outputs can be extended through an external expansion card, namely DO2 and PA/PB/PC, where DO2 is the transistor output and PA/PB/PC is the relay output.

By setting the values of the function parameters H2-02 to H2-06, each DO output function can be defined, which can be used to indicate various working states and alarms of the inverter, with a total of about 40 function settings, so that users can realize specific automatic control requirements. For specific setting values, refer to "6.9.2 Digital Output Terminal Functions (DO)" for details.

PORT	parameter	Output signal characteristics
FM-COM	P5-00=0，P5-06	Transistor, can output high-frequency pulse 10Hz ~ 100kHz; Drive capacity: 24Vdc, 50mA
	P5-00=1，P5-01	Transistor; Drive capacity: 24Vdc, 50mA
TA-TB-TC	P5-02	Relays; Drive capacity: 250Vac, 3A
PA-PB-PC	P5-03	Expansion Cards, Relays; Drive capacity: 250Vac, 3A
DO1-CME	P5-04	Transistor; Drive capacity: 24Vdc, 50mA
DO2-CME	P5-05	Expansion cards, transistors; Drive capacity: 24Vdc, 50mA

When P5-00, the FM port is a high-speed pulse output working mode, the frequency of the output pulse is used to indicate the value of the internal operating parameters, the larger the reading, the higher the output pulse frequency, when 100% of the reading, it corresponds to the maximum frequency of FMP output set in P5-09. As for the properties to be indicated for the internal parameters, they are defined by the P5-06 parameter.

5.12.2 Analog output AO

The inverter supports a total of 2 AO outputs, of which AO1 is the control board and AO2 needs to be externally expanded. AO1 and AO2 can be used to indicate internal operating parameters in analog mode, and the indicated parameter properties can be selected by parameters P5-07 and P5-08.

PORT	Input signal characteristics
AO1-GND	J7 short circuit "V" identification position, can output 0 ~ 10Vdc signal
	J7 short circuit "I" identification position, can output 0 ~ 20mAc signal
AO2-GND	This port is provided on the expansion board and can output 0 ~ 10Vdc signal

P5-10	AO1 bias coefficient	default	0.0%
	range of set	-100.0% ～ +100.0%	
P5-11	AO1 gain	default	1.00
	range of set	-10.00 ～ +10.00	
P5-12	Ex-card AO2 bias coefficient	default	0.00%
	range of set	-100.0% ～ +100.0%	
P5-13	Ex-card AO2 gain	default	1.00
	range of set	-10.00 ～ +10.00	

The above parameters can be used to customize the desired AO output curve.

If the zero bias is denoted by "b", the gain denoted by k, the actual output denoted by Y, and the standard output denoted by X, then the actual output is:

Y=kX ＋ b。

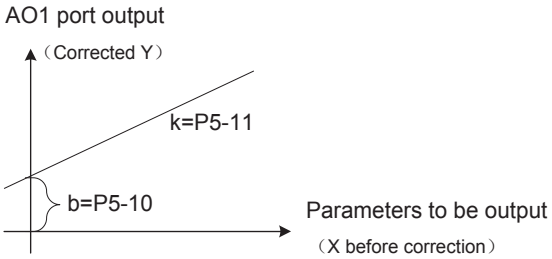

Figure 5-20 AO signal correction characteristic curve

Among them, the bias coefficient of AO1 and AO2 corresponds to 10V (or 20mA) at 100%, and the standard output refers to the amount represented by the analog output corresponding to the output of 0V ~ 10V (or 0mA ~ 20mA) without bias and gain correction.

For example, if the analog output content is the operating frequency, if you want the frequency to be 0 Hz, the corrected output is 8 V, and when the frequency is 40 Hz, the corrected output is 4 V. Then the AO1 gain (P5-11) should be set to -0.5 and the AO1 bias coefficient (P5-10) should be set to 80%.

5.13 Auto-tuning

The methods for the inverter to obtain the internal electrical parameters of the controlled motor are: dynamic tuning, static tuning 1, static tuning 2, manual input of motor parameters, etc.

Tuning method	Availability	Tuning effects
No-load dynamic tuning P1-37 = 2 or 12	The motor is most convenient to detach from the application system	Best
On-load dynamic tuning P1-37 = 2 or 12	When it is inconvenient to detach the motor from the application system, it can be transported with the load. The friction of the load is small, and it is close to no-load when running at a constant speed.	The less friction, better
Static tuning 1 P1-37 = 1 or 11	It is difficult to detach the motor from the load, and dynamic tuning operation is not allowed.	normal
Static tuning 2 P1-37 = 3	It is difficult to detach the motor from the load, and it is not allowed to be dynamically tuned to run the occasion, static This mode is recommended for tuning, and the tuning time is longer than static tuning1.	better
Enter the parameters manually	The previous inverter was successfully tuned The parameters of the same type of motor are copied and input to the corresponding parameters of P1-00 ~ P1-20	better

The steps for auto-tuning of motor parameters are as follows:

The following takes the parameter tuning method of the default motor 1 as an example to explain, and the tuning method of motor 2 is the same, but the parameter number should be changed in a targeted manner.

Step 1: If the motor can be completely disconnected from the load, in the case of power failure, the motor is mechanically separated from the load part, so that the motor can rotate freely without load.

Step 2: After powering on, first select the inverter command command (P0-02) as the command channel of the operation panel.

Step 3: Accurately enter the nameplate parameters of the motor (such as P1-00 ~ P1-05), please enter the following parameters according to the actual parameters of the motor (selected according to the current motor):

Motor selection	parameter
Motor 1	P1-00：Motor type P1-01 Motor power rating P1-02：Motor rated voltage P1-03 Motor rated current P1-04：Motor rated frequency P1-05 Motor rated speed
Motor 2	A2-00 ～ A2-05: Same definitions as above

If you have an encoder, enter the encoder parameters (P1-27、P1-28、P1-30).

Step 4: If it is an asynchronous motor, then P1-37 (tuning selection, motor 2 corresponds to A2-37 parameters) please select 2 (complete tuning of asynchronous machine), press ENTER key to confirm, at this time, the keyboard will display TUNE, as shown in the following figure:

Then press the RUN key on the keyboard panel, the inverter will drive the motor to accelerate and decelerate, forward and reverse operation, the running indicator light is lit, and the tuning operation duration is about 2 minutes.

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

Motor selection	parameter
Motor 1	P1-06：Stator resistance of asynchronous motors P1-08：Rotor resistance of asynchronous motors P1-10：leakage inductance resistance of asynchronous motors P1-07：mutual inductance reactance of asynchronous motors P1-09：No-load current of asynchronous motor
Motor 2	A2-06 ～ A2-10：Same definitions as above

If the motor cannot be completely disconnected from the load, select 3 (static tuning 2 of asynchronous machine 2) for P1-37 (A2-37 for motor 2), and then press the RUN key on the keyboard panel to start the tuning operation of motor parameters.

Chapter 6 Parameter Description

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Chapter 6 Parameter Description

6.1 How to set the operation command

The operation command is used to control the start, stop, forward rotation, reversal, jog operation of the inverter, etc. There are 3 ways to run commands, namely operation panel, terminal, and communication. Set the parameters P0-02 and select the input mode for running the command.

parameter	define	default	range	illustrate
P0-02	Run command selection	0	0	Operator panel
			1	Terminal
			2	communication

1) Set the operation command through the "Operation Panel".

Set the parameter P0-02=0, and use the RUN key and STOP/RES key on the operation panel to control the operation command of the inverter. Press the RUN button on the keyboard to start the inverter (the RUN indicator lights up), and when the inverter is running, press the STOP/RES key on the keyboard.

The inverter stops running (the RUN indicator goes off). For details on how to operate the Control Panel, refer to "Chapter 4 Panel Usage".

2) Set the operation command through the "terminal".

Set the parameter P0-02=1, and use the terminal to control the start and stop of the inverter.

Set the parameters P4-11 and set the control mode of the terminal command. There are four command modes for terminals, which are 2-wire type 1, 2-wire type 2, 3-wire type 1, and 3-wire type 2.

parameter	define	default	range	illustrate
P4-11	Terminal command mode	0	0: 2-wire 1 1: 2-wire 2 2: 3-wire 1 3: 3-wire 2	Four different ways to control the operation of the drive via an external terminal

The multi-function input terminal of DI1~DI10 can be arbitrarily selected as the external input terminal. That is, the function of the DI1~DI10 input terminal is selected by setting the value of P4-00~P4-09, and the detailed function definition is referred to the function selection of P4-00(DI1)~P4-09(DI10) terminal in the "Appendix A/B Function Parameter Table".

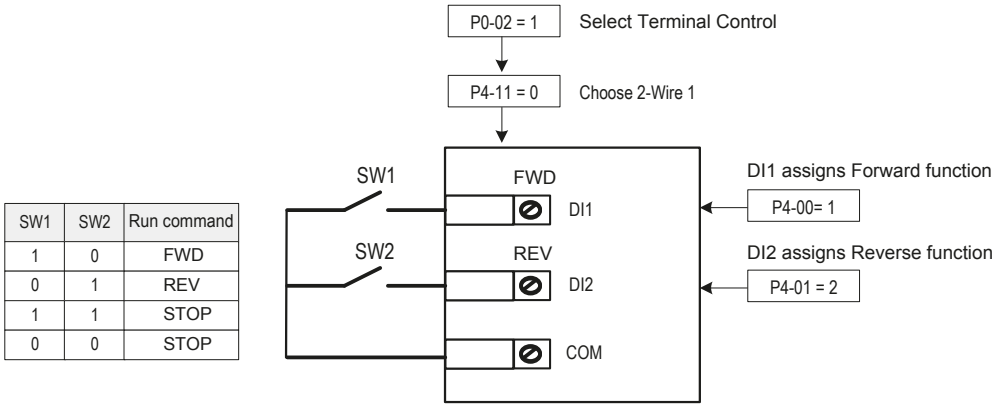
- 2-wire 1: P4-11=0 This is the most commonly used 2-wire pattern.

For example, the DI1 terminal assigns the forward running function, and the DI2 terminal assigns the reverse running function. Connect the forward running switch to the DI1 terminal and the reverse running switch to the DI2 terminal.

parameter	name	value	illustrate
P4-11	Terminal command mode	0	2-wire 1
P4-00	DI1 function selection	1	Forward rotation (FWD)
P4-01	DI2 function selection	2	Reverse rotation (REV)

When the control switch SW1 is closed and SW2 is disconnected, the motor rotates forward; When the control switch SW1 is disconnected and SW2 is closed, the motor reverses;

When both SW1 and SW2 are disconnected or both closed, the motor is not running. As shown in the figure below:



SW1	SW2	Run command
1	0	FWD
0	1	REV
1	1	STOP
0	0	STOP

Figure 6-1 Schematic diagram of wiring and parameter settings in 2-wire 1

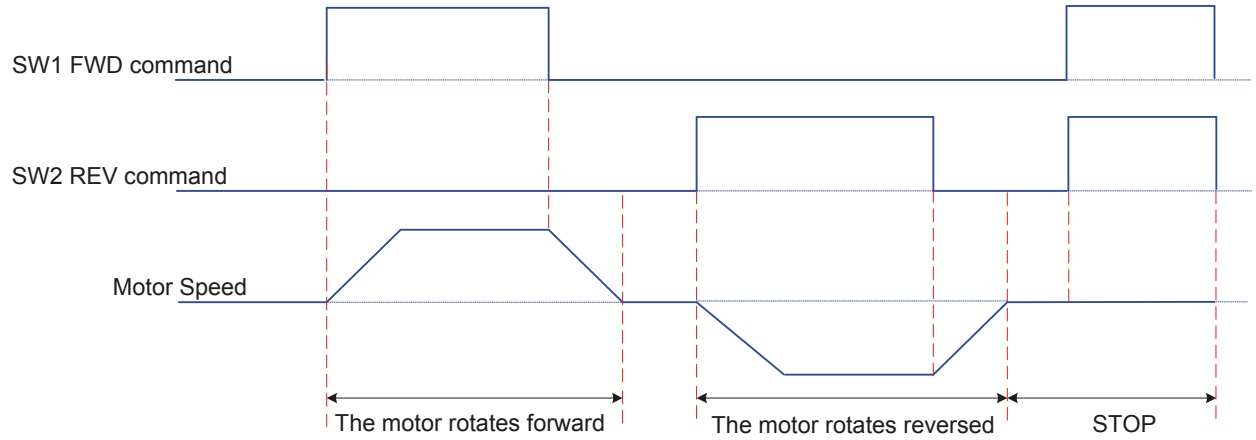


Figure 6-2 2-wire mode1 Timing diagram (normal)

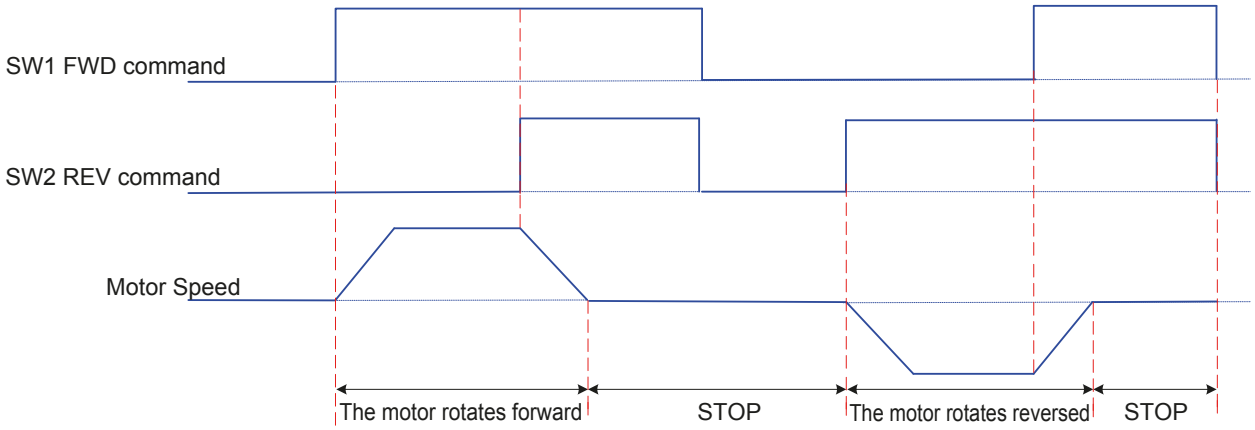


Figure 6-3 2-wire mode 1 Timing diagram (exception)

- 2-wire 2: P4-11 = 1

For example, the DI1 terminal assigns the running command function, and the DI2 terminal assigns the positive and negative running direction functions, and the methods used and set the parameters are as follows:

parameter	name	value	illustrate
P4-11	Terminal command mode	1	2-wire 2
P4-00	DI1 function selection	1	Run command
P4-01	DI2 function selection	2	FWD/REV running direction

When the control switch SW1 is closed, operation is enabled. The motor rotates forward when SW2 is disconnected; The motor reverses when SW2 is closed. When SW1 is disconnected,The SW2 does not operate when the motor is disconnected or closed. As shown in the figure below:

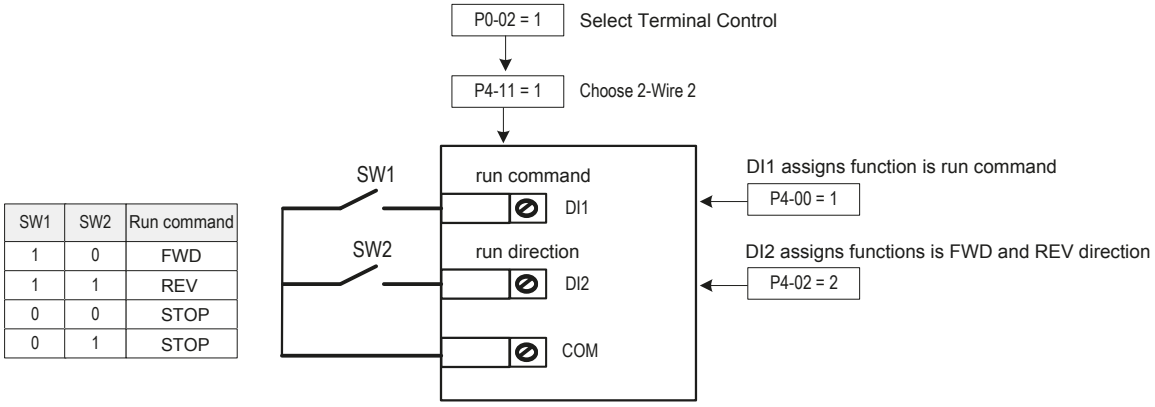


Figure 6-4 Schematic diagram of wiring and parameter settings in 2-wire mode 2

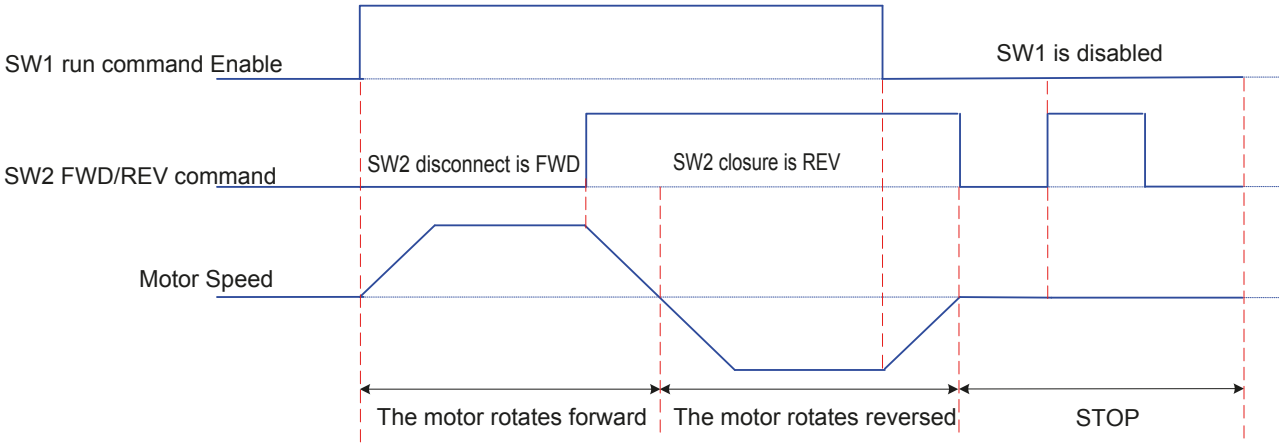


Figure 6-5 2-wire 2 Timing diagram

- 3-wire 1: P4-11 = 2

For example, the DI3 terminal assigns a three-wire operation control function, the DI1 terminal assigns a forward operation function, and the DI2 terminal assigns a reverse operation function. This control mode requires the inverter to use the button as the inverter start-stop switch, connect the start-stop button to the DI3 terminal, the forward running button to the DI1 terminal, and the reverse operation button to the DI2 terminal. The following table describes how to use and set parameters:

parameter	name	value	illustrate
P4-11	Terminal command mode	2	3-wire 1
P4-00	DI1 function selection	1	Forward rotation (FWD)
P4-01	DI2 function selection	2	Reverse rotation (REV)
P4-02	DI3 function selection	3	3-wire control

SW3 is a normally closed button, and SW1 and SW2 are normally open buttons. When the SW3 button is closed, press the SW1 button to turn the inverter forward, press the SW2 button to reverse the inverter, and the SW3 button to disconnect the inverter to stop instantly. During normal start-up and operation, the SW3 button must be kept closed, and the commands of the SW1 and SW2 buttons take effect immediately after the closing action.

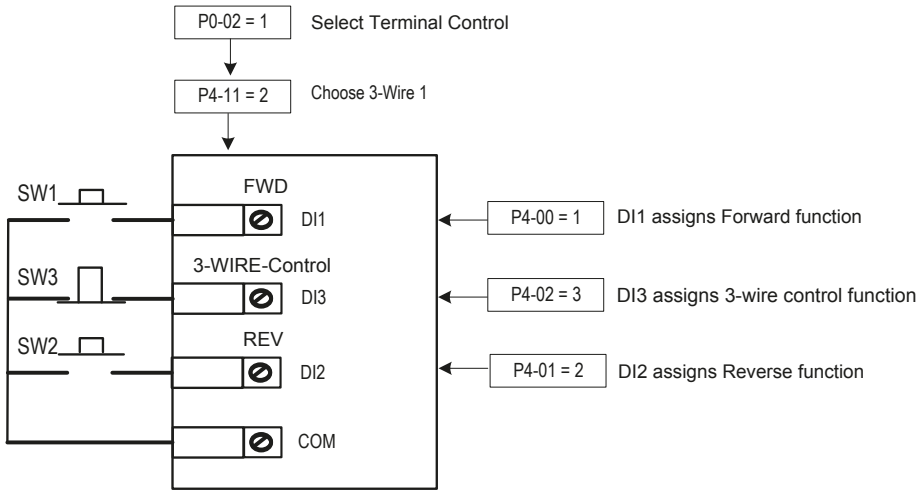


Figure 6-6 Wiring and parameter settings in 3-wire mode 1

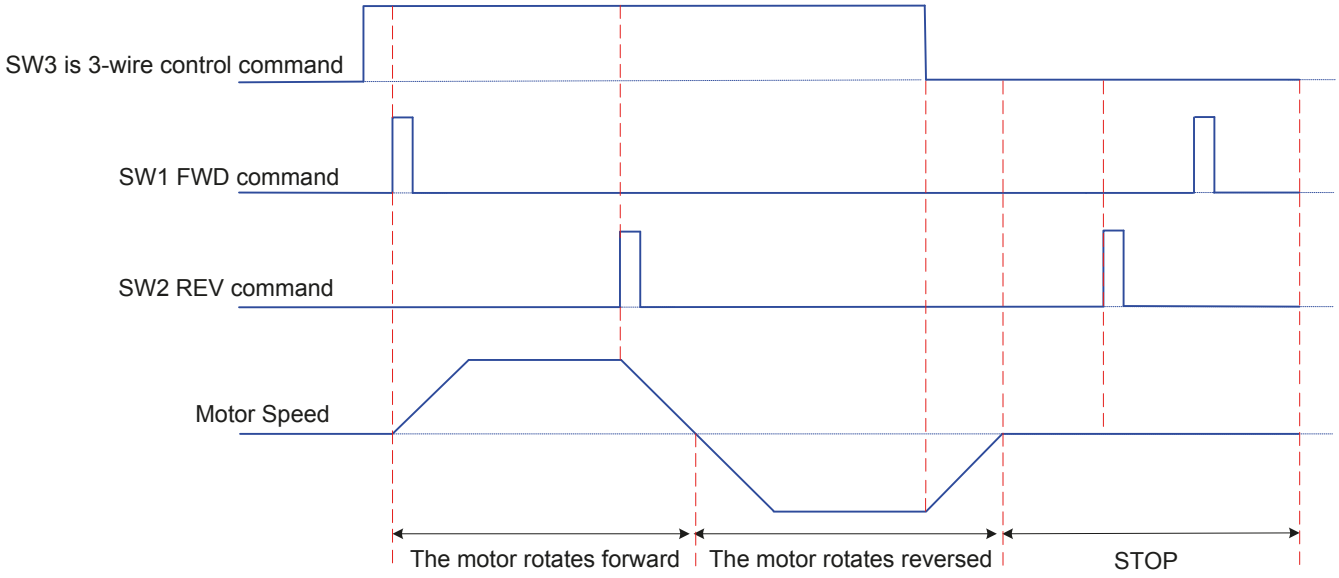


Figure 6-7 Timing diagram of 3-wire mode 1

- 3-wire 2: P4-11=3

For example, the DI3 terminal assigns a three-wire operation control function, the DI1 terminal assigns the running command function, and the DI2 terminal assigns the forward/reverse running direction function. Connect the start-stop button to the DI3 terminal, and enable the operation to connect to the DI1 terminal; The forward/reverse running button is connected to the DI2 terminal. The parameters are set as follows:

parameter	name	value	illustrate
P4-11	Terminal command mode	3	3-wire 2
P4-00	DI1 function selection	1	Run command
P4-01	DI2 function selection	2	FWD/REV running direction
P4-02	DI3 function selection	3	3-wire control

When the SW3 button is closed, and the SW1 button is pressed, if SW2 is open, the inverter is forward, and if SW2 is closed, the inverter is reversed. The SW3 push-button disconnects and the inverter stops instantly. During normal start-up and operation, the SW3 button must be kept closed, and the command of the SW1 button is in effect along the closing action.

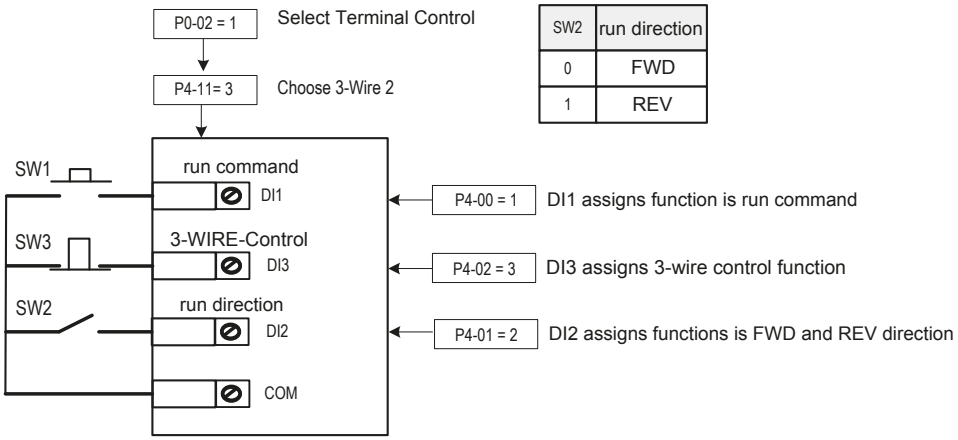


Figure 6-8 3-wire mode 2 Wiring and parameter settings

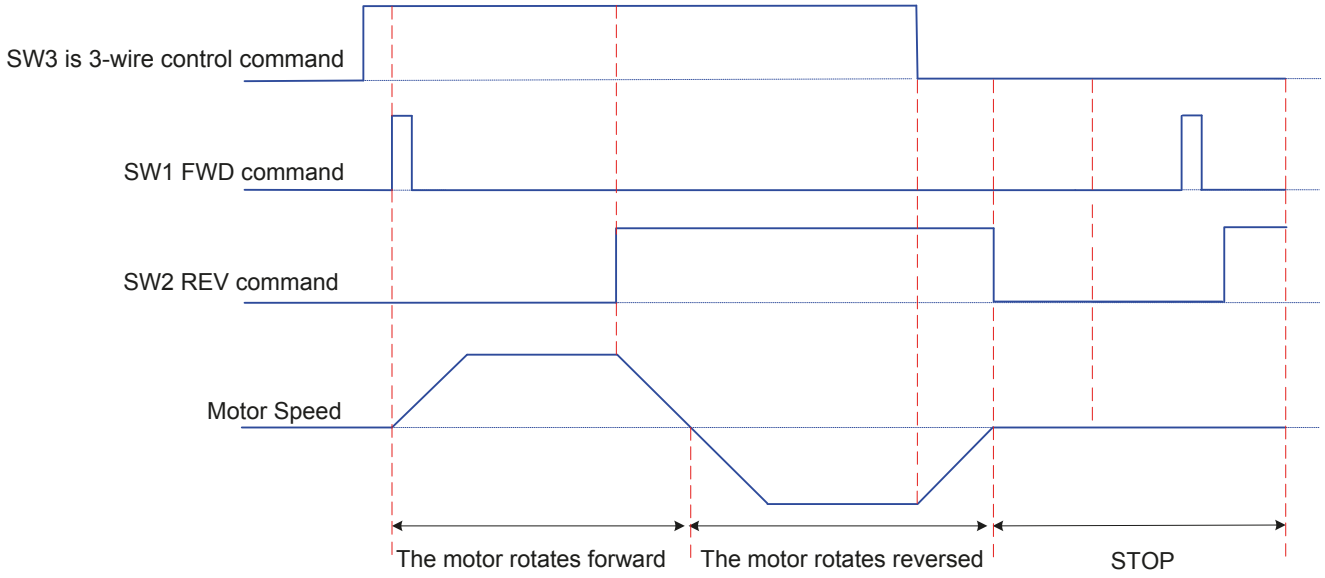


Figure 6-9 Timing diagram of 3-Wire mode 2

3). Set the operation command through "Communication".

Set the parameter P0-02=2 and communicate the given running command with the communication (the "LOCAL/REMOT" light flashes on the operation panel). Reversal can be realized

Command control related to the start and stop of the frequency.

YD580E supports 4 host computer communication modes: Modbus, Profibus-DP, CANopen, CANlink, these 4 communication methods cannot be used at the same time. When using communication, you must install a communication card, YD580E's 4 kinds of communication cards are optional, users can choose according to their needs, if the communication protocol is Modbus, Profibus-DP or CANopen, you need to select the corresponding serial communication protocol according to P0-28. The CANlink protocol is always valid.

parameter	define	value	range
P0-28	Serial communication protocol selection	0	0: MODBUS protocol 1: Profibus-DP or CANOpen protocal

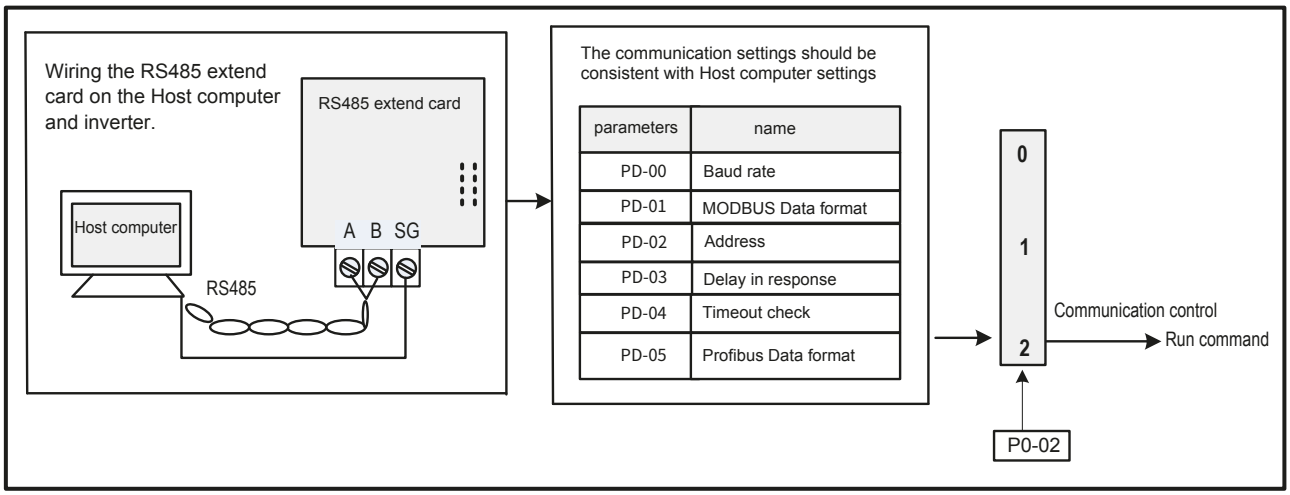


Figure 6-10 Schematic diagram of running commands using communication settings

When the operation instruction is given by communication, the host computer should send a write command to the inverter. The following uses the Modobus protocol as an example to illustrate the process of communicating a given running instruction. For example, when using communication to make the inverter run in reverse, send a write command to 01 06 20 00 00 02 03 CB. The meaning of each byte is as follows: inverter identity: 01H (can be set), write command: 06H, control command communication address: 2000H, control command: 02H (reverse running), CRC check: 03CBH. (For other communication addresses and control commands, please refer to "Appendix B: Communication Data Address Definition and Modbus Communication Protocol")

Host computer command		response from inverter	
ID	01H	ID	01H
CMD	06H	CMD	06H
Address H	20H	Address H	20H
Address L	00H	Address L	00H
Data H	00H	Data H	00H
Data L	02H	Data L	02H
CRC H	03H	CRC H	03H
CRC L	CBH	CRC L	CBH

6.2 Frequency Command Input Method

There are four input methods for frequency commands, namely, selecting primary frequency commands, selecting auxiliary frequency commands, selecting primary and secondary frequency instruction overlays, and selecting command sources to bind primary frequency commands.

6.2.1 Method for Master Frequency commands

Set the parameter P0-03 and select the input of the main frequency command. There are 10 kinds of main frequency instructions of the inverter, which are
Digital setting (no memory when power off),
Digital setting (memory when power off),
Analogy AI1, AI2, AI3,
Pulse input (DI5),
Multi-segment instruction,
Simple PLC,
PID,
Communication.

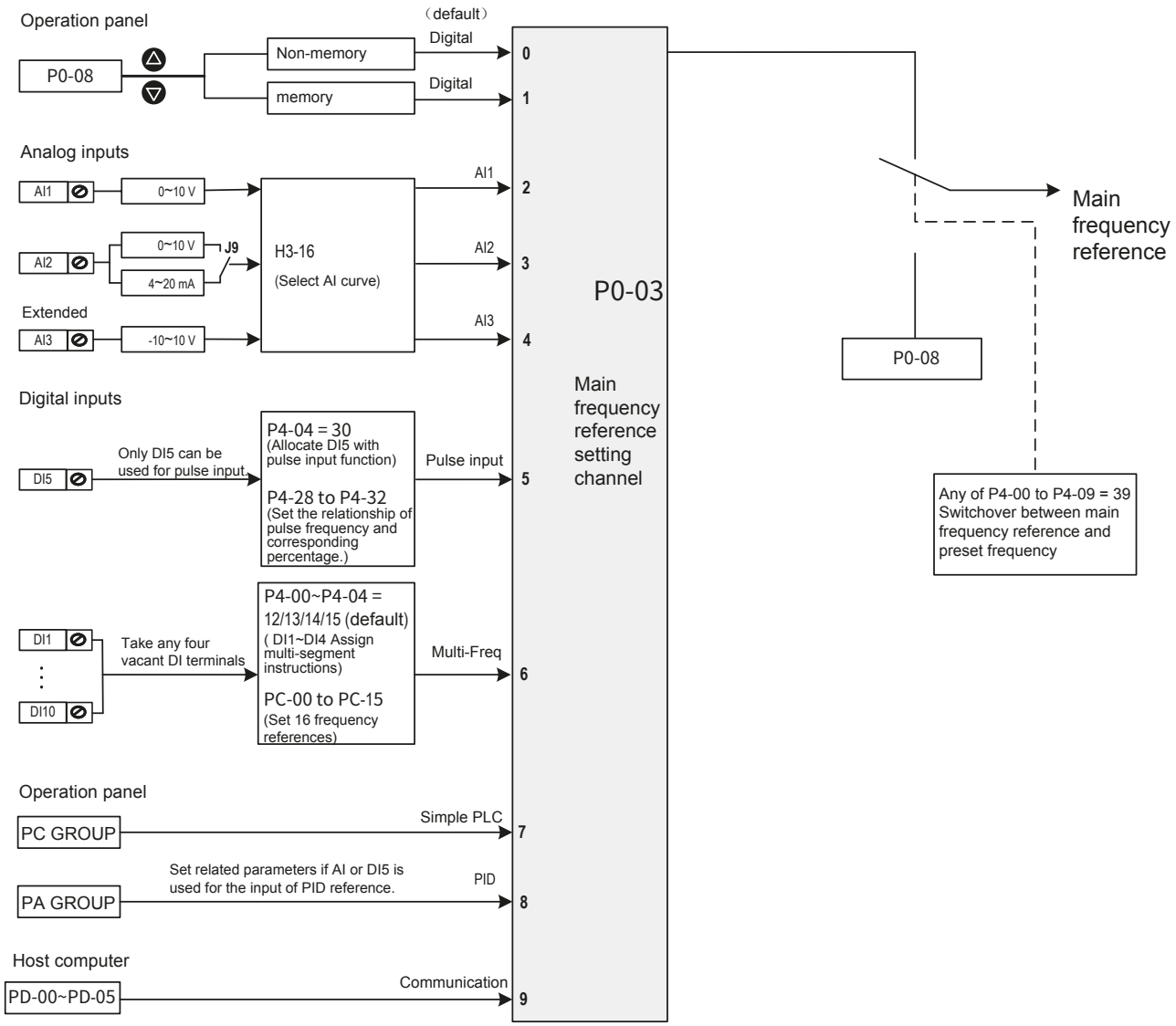


Figure 6-11 Main frequency command selection

parameter	define	default	range	illustrate
P0-03	Main frequency command select	0	0	Digital setting (no memory when power off)
			1	Digital setting (memory when power off)
			2	Analogy AI1
			3	Analogy AI2
			4	Analogy AI3
			5	PULSE（DI5）
			6	Multi-Step
			7	Simple PLC
			8	PID
			9	Communication

6.2.2 Master Frequency (digital setting) via "Panel"

There are two ways to set the master frequency with the control panel:

- P0-03=0（no memory when power off），That is, after the inverter is shut down or powered back on after power failure, the set frequency value is restored to the "preset frequency" (P0-08) set value. The method of setting the preset frequency (P0-08) is passed by the keyboard △ keys and ▽ keys (or UP/DOWN of the multi-function input terminal) to modify the set frequency value of the inverter.
- P0-03=1（memory when power off），That is, when the inverter is powered off and powered on again, the set frequency is the frequency set value at the time of the last power failure.

parameter	define	default	range
P0-08	Preset frequency	50.00Hz	0.00Hz~ Maximum frequency（P0-10）
P0-10	Maximum frequency	50.00Hz	0.00Hz~500.00HZ

NOTE

- In contrast to the parameter P0-23 "Digitally set frequency stop memory selection", P0-23 is used to select whether the frequency correction is memorized or zeroed out when the inverter is stopped. P0-23 is related to shutdown and not to power down memory.
- P0-23=0 "do not remember", use the panel to set P0-08 "preset frequency", and then correct the frequency through the △ keys and ▽ keys of the keyboard or the terminal UP and DOWN, after the inverter stops, the frequency correction value is cleared.
- P0-23=1 "memory", set P0-08 "preset frequency" with the panel, and then correct the frequency through the △ keys and ▽ keys of the keyboard or the terminal UP and DOWN, and the frequency correction value is retained after the inverter stops.

For example, if the P0-28 "Preset Frequency" is set to 40Hz, the preset frequency is adjusted to 45Hz by the △ keys of the keyboard. If P0-23 is set to 0 (no memory), the target frequency after the inverter is stopped will be restored to 40 Hz (the value corresponding to the "preset frequency" of P0-08), and if P0-23 is set to 1 (memory), the target frequency will remain at 45 Hz after the inverter is stopped

parameter	define	value	range
P0-23	Digitally set frequency, stop memory selection	0	0：no memory 1：menory

6.2.3 The main frequency is set by "Analog".

The main frequency is set by analog input, and there are three AI terminals: AI1, AI2, and AI3.

P0-03=2：AI1 Set the main frequency；

P0-03=3：AI2 Set the main frequency；

P0-03=4：AI3 Set the main frequency；

Given that the AI terminal is used as a frequency source, each AI terminal can choose from 5 different AI curves. Therefore, we will first introduce the setting method of the AI curve, and then introduce how the AI terminal selects the corresponding AI curve, and the setting steps are as follows:

set step	parameter	illustrate	
(Step 1) How to set the AI curve: Set the correspondence between the input of the AI voltage/current and the set amount	P4-13 ~ P4-16	Curve 1	common
	P4-18 ~ P4-21	Curve 2	common
	P4-23 ~ P4-27	Curve 3	common
	A6-00 ~ A6-07	Curve 4	
	A6-08 ~ A6-15	Curve 5	
	P4-34	AI is below the minimum input set selection (AI as frequency, voltage/electricity.The corresponding 100.0% of the stream input is the relative maximum frequency P0-10)	
(Step 2) AI terminal selection AI curve method: AI terminal selection curve and filter time setting	P4-33	AI Curve Selection (The AI terminal can select any AI curve. Generally, the default value P4-33 = 321 is used, AI1 selects curve 1, AI2 selects curve 2, and AI3 selects curve 3.)	
	P4-17、P4-22、P4-27	AI1 ~ AI3 filtering time	
(Step 3) The AI terminal is set as the frequency source: The AI input terminal for frequency commands is selected according to the terminal characteristics	P0-03 (Main Frequency Command Input Select)	P0-03 = 2	Select Use AI1
		P0-03 = 3	Choosing to use AI2 selects the voltage or current input for the jumper cap J9 on the control board
		P0-03 = 4	Select Use AI3

- How to set AI curves

There are 5 types of AI curves, of which curve 1, curve 2, and curve 3 are all 2-point curves, and the relevant parameters are P4-13~P4-27. Curves 4 and 5 are both 4-point curves, and the relevant parameters are Group A6. The setting of an AI curve is actually setting the relationship between the analog input voltage (or analog input current) and the set value it represents.

Taking the setting method of AI curve 1 as an example, the relevant parameters are P4-13~P4-16, Figure 6-12 corresponds to the factory default value of AI curve 1, and the detailed parameters and descriptions are shown in the following table:

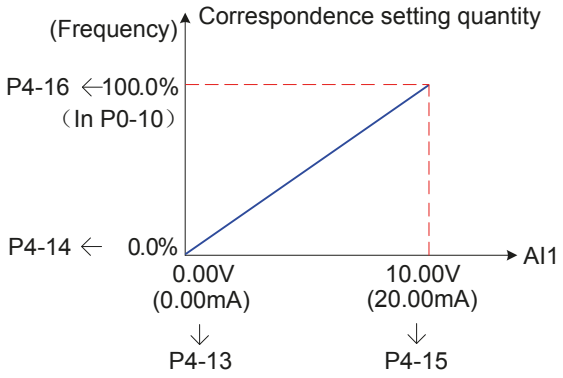


Figure 6-12 AI curve 1 is configured

parameter	define	default	range	illustrate
P4-13	AI curve 1 min. input	0.00V	0.00V~P4-15	When the analog input voltage is less than the set "minimum input" (P4-13), it is calculated as the minimum input or 0.0% according to the setting of "AI below minimum input setting selection" (P4-34).
P4-14	Corresponding percentage of AI curve 1 min. input	0.0%	-100.00%~100.0%	
P4-15	AI curve 1 max. input	10.00V	P4-13~10.00V	When the analog input voltage is greater than the set "Maximum Input" (P4-15), the analog voltage is calculated as "Maximum Input".
P4-16	Corresponding percentage of AI curve 1 max. input	100.0%	-100.00%~100.0%	

NOTE

- When AI is used as a frequency, 100.0% of the voltage or current input is set and is a percentage relative to the "maximum frequency P0-10". When the analog input is a current input, 1mA current is equivalent to 0.5V voltage, and 0~20mA is equivalent to 0~10V voltage.
- Curves 2 and 3 are set up in the same way as curve 1. The relevant parameters of curve 2 are P4-18~P4-21, and the relevant parameters of curve 3 are P4-23~P4-26. Figure 6-13 corresponds to the settings of AI Curve 2.

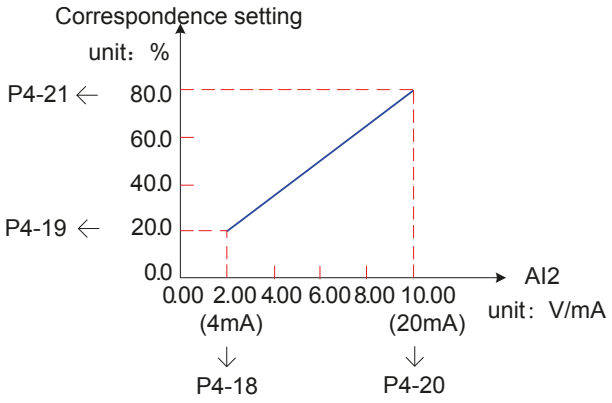


Figure 6-13 AI Curve 2 is configured

parameter	define	default	range	illustrate
P4-18	AI curve 2 min. input	0.00V	0.00V~P4-20	-
P4-19	Corresponding percentage of AI curve 2 min. input	0.0%	-100.00%~100.0%	-
P4-20	AI2 curve max. input	10.00V	P4-18~10.00	-
P4-21	Corresponding percentage of AI curve 2 max. input	100.0%	-100.00%~100.0%	-
P4-23	AI curve 3 min. input	-10V	-10.00V~P4-25	-
P4-24	Corresponding percentage of AI curve 3 min. input	0.0%	-100.00%~100.0%	-
P4-25	AI curve 3 max. input	10.00V	P4-23~10.00V	-
P4-26	Corresponding percentage of AI curve 3 max. input	100.0%	-100.00%~100.0%	-

Curves 4 and 5 function similarly to curves 1~ 3, but curves 1~ 3 are straight lines, while curves 4 and 5 are 4-point curves, which can achieve a more flexible correspondence. Figure 6-14 shows the schematic diagram of curves 4~ 5.

NOTE

- When curves 4 and 5 are set, the minimum input voltage, knee point 1 voltage, knee point 2 voltage, and maximum voltage of the curve must be increased sequentially.

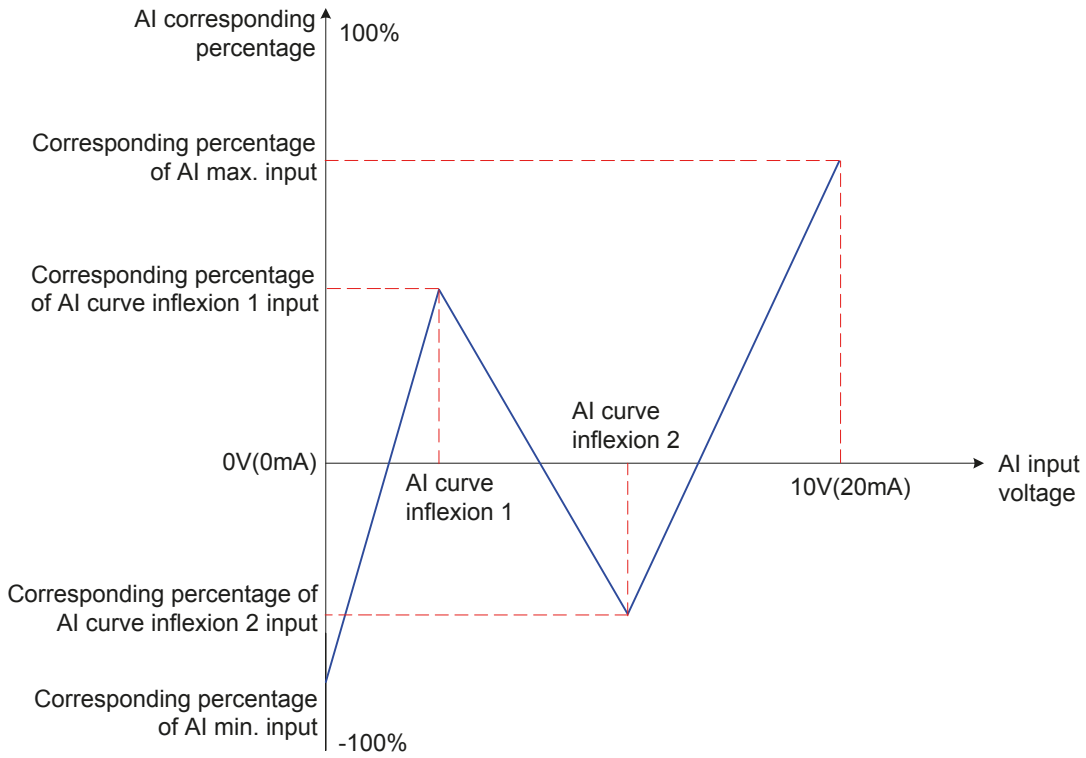


Figure 6-14 Curves 4 and 5 are schematic

parameter	define	default	range	illustrate
A6-00	AI curve 4 min. input	0.00V	-10.00V~A6-02	-
A6-01	Corresponding percentage of AI curve 4 min. input	0.0%	-100.00%~100.0%	-
A6-02	AI curve 4 inflexion 1 input	3.00V	A6-00~A6-04	-
A6-03	Corresponding percentage of AI curve 4 inflexion 1 input	30.0%	-100.0%~100.0%	-
A6-04	AI curve 4 inflexion 1 input	6.00V	A6-02~A6-06	-
A6-05	Corresponding percentage of AI curve 4 inflexion 1 input	60.0%	-100.0%~100.0%	-
A6-06	AI curve 4 max. input	10.00V	A6-04~10.00V	-
A6-07	Corresponding percentage of AI curve 4 max. input	100.0%	-100.0%~100.0%	-
A6-08	AI curve 5 min. input	-10.00V	-10.00V~A6-10	-
A6-09	Corresponding percentage of AI curve 5 min. input	-100.0%	-100.0%~100.0%	-
A6-10	AI curve 5 inflexion 1 input	-3.00V	A6-08~A6-12	-
A6-11	Corresponding percentage of AI curve 5 inflexion 1 input	30.0%	-100.0%~100.0%	-
A6-12	AI curve 5 inflexion 1 input	3.00V	A6-10~A6-14	-
A6-13	Corresponding percentage of AI curve 5 inflexion 1 input	30.0%	100.0%~100.0%	-
A6-14	AI curve 5 max. input	10.00V	A6-12~10.00V	-
A6-15	Corresponding percentage of AI curve 5 max. input	100.0%	-100.0%~100.0%	-

● The method by which the AI terminal selects the AI curve

The setting curves corresponding to the analog input terminals AI1, AI2, and AI3 are selected by the one, ten, and hundred digits of the parameter P4-33, and any of the five curves can be selected for the three analog input terminals.

parameter	define	default	range	illustrate
P4-33	AI curve selection	321	one: AI1 curve selec Curve 1 (2 points, see"P4-13~P4-16") Curve 2 (2 points, see"P4-18~P4-21") Curve 3 (2 points, see"P4-23~P4-26") Curve 4 (4 points, see"A6-00~A6-07") Curve 5 (4 points, see"A6-08~A6-15") ten: AI2 curve select (1~5, same as above) hud: AI3 curve selection (1~5, same a above)	P4-33=321, it means AI1 selects curve 1, AI2 selects curve 2, AI3 selects curve 3, AI3 factory is -10~10V.
P4-17	AI1 filter time	0.10s	0.00s~10.00s	software filter time for the AI input terminal
P4-22	AI2 filter time	0.10s	0.00s~10.00s	
P4-27	AI3 filter time	0.10s	0.00s~10.00s	

The larger the filtering time of the AI input, the stronger the anti-interference ability, but the slower the adjustment response. The smaller the filtering time, the faster the adjustment response, but the weaker the anti-interference ability. When the field analog quantity is easy to be disturbed, it is necessary to increase the filtering time to make the detected analog quantity tend to be stable, but the larger the filtering time, the slower the response speed to the analog detection, and how to set it needs to be weighed according to the actual application situation.

● The AI terminal is used as a method for setting the main frequency

The YD580E control board provides 2 analog input terminals AI1 and AI2, and the optional I/O expansion card provides an additional 1 analog input

Inlet terminal AI3. AI1 terminal is a voltage type input of 0~10V. The AI2 terminal can be a voltage input of 0~10V or a current input of 0mA~20mA, which can be selected by the J9 jumper on the control board (for specific operation methods, please refer to "Chapter 3 Installation and Wiring").

AI3 terminal is a bipolar voltage signal input of -10V~10V. This section describes how to set each AI terminal as the main frequency.

For example, if curve 1 is selected for the AI1 terminal (P4-33 digits are set to 1), and the AI1 voltage input terminal is used as the frequency source, it needs to reach 2V~10V orresponding to 10 Hz~40Hz, and the parameter setting method is as follows:

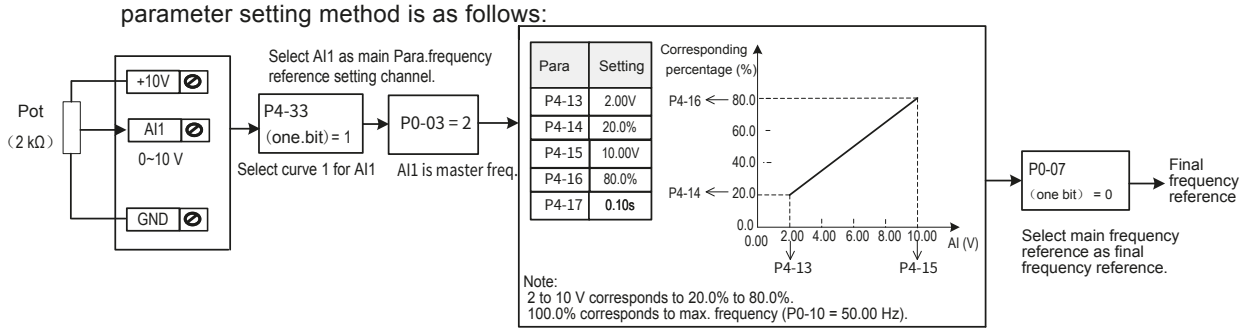


Figure 6-15 Voltage input at AI1 to control frequency reference

The AI2 can be used as an analog voltage input (0V~10V) or as an analog current input (0mA~20mA).

When AI2 is an analog current input, if the input current is 0mA ~ 20mA, the corresponding input voltage is 0V ~ 10V. If the input current is 4mA ~ 20mA, then 4mA corresponds to 2V and 20mA corresponds to 10V.

For example, if AI2 selects curve 2 (P4-33 ten digits are set to 2), AI2 current input needs to reach 4mA~20mA corresponding to 0Hz~50Hz, and the parameter setting method is as follows:

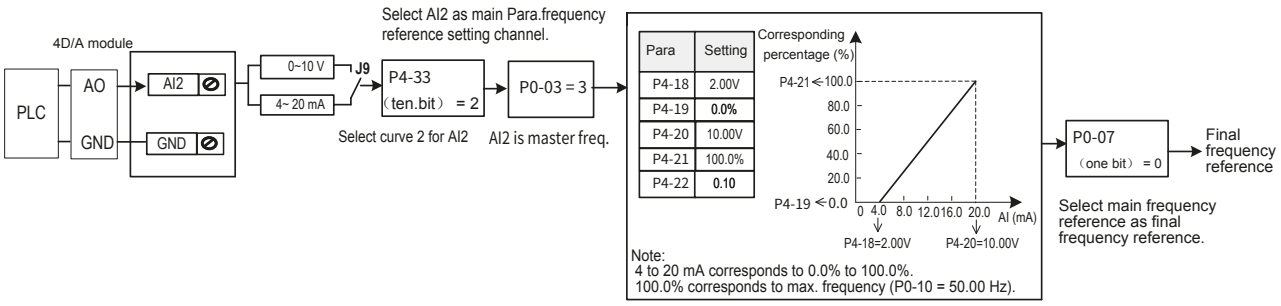


Figure 6-16 Current input at AI2 to control frequency reference

For example, curve 3 is selected for the AI3 terminal (P4-33 hundred is set to 3), and the AI3 voltage input terminal is used as the frequency source (2V~10V corresponds to 10 Hz~50Hz).

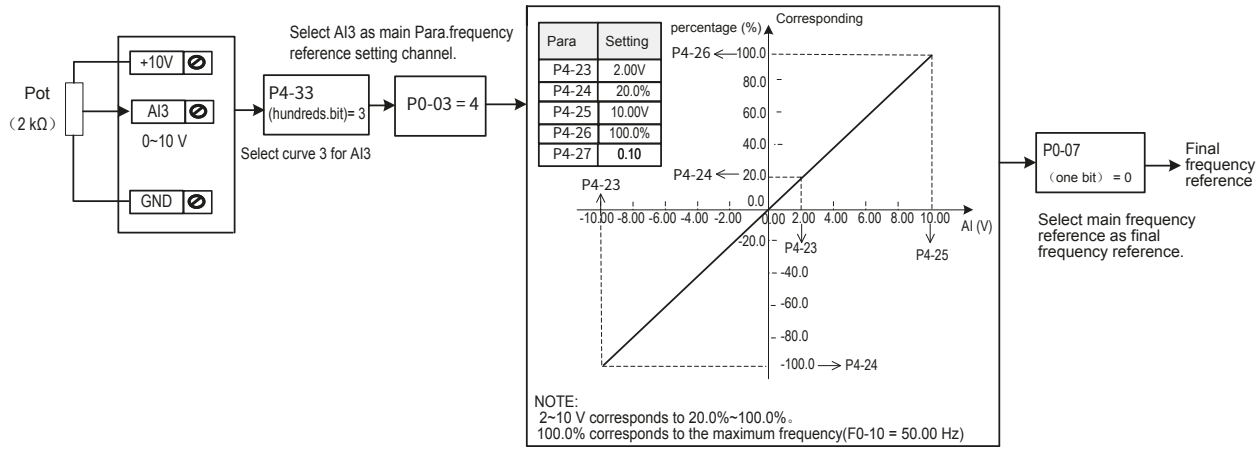


Figure 6-17 Voltage input at AI3 to control frequency reference

6.2.4 The main frequency is set by "Pulse".

Set the parameter P0-03=5, and select the input pulse as the main frequency. When the dominant frequency is "Pulse Given (DI5)", the pulse

Punching can only be input from the multifunction input terminal DI5. Pulse given signal specification: voltage range 9V~30V, frequency range 0kHz~100kHz。

NOTE

- The function with the main frequency set to "Pulse Setting (DI5)" and the "FMP Pulse Output" function at the FM terminal (P5-00) cannot be used at the same time.

parameter	define	default	range	illustrate
P4-28	Pulse min. input	0.00kHz	0.00kHz~P4-30	
P4-29	Corresponding percentage of pulse min. input	0.0%	-100.0%~100.0%	% of relative Max.Freq P0-10
P4-30	Pulse max. input	50.00kHz	P4-28~100.00kHz	
P4-31	Corresponding percentage of pulse max. input	100.0%	-100.0%~100.0%	% of relative Max.Freq P0-10
P4-32	Pulse filter time	0.10s	0.00s~10.00s	

The relationship between the DI5 input pulse frequency and the corresponding setting can be set by P4-28~P4-31. The pulse input corresponds to 100.0% of the setting, which is a percentage of the relative maximum frequency P0-10. The specific settings are as follows:

parameter	name	value	illustrate
P4-04	DI5 function selection	30	Pulse frequency input (valid for DI5 only)
P0-07	Frequency overlay selection	00	Master Frequency Command

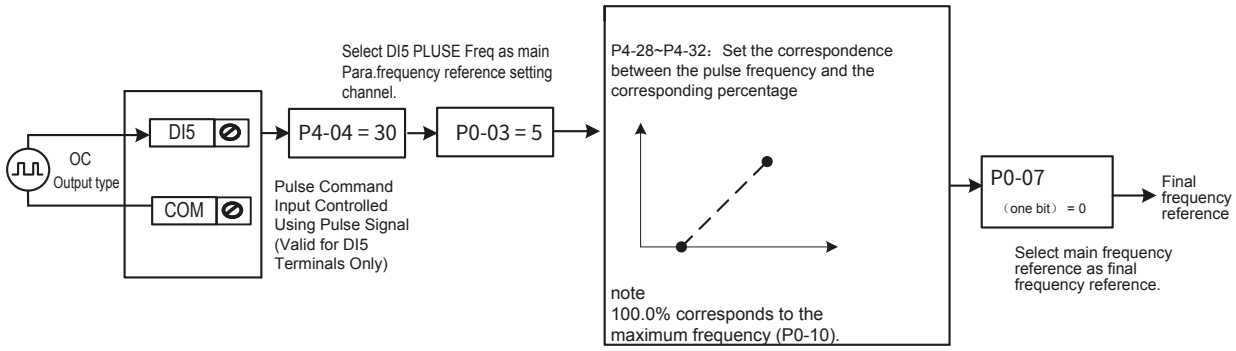


Figure 6-18 Pulse input is set for a given main frequency

6.2.5 Master Frequency via "Multi-Speed

Set the parameter P0-03=6, and select the multi-segment command as the main frequency. Ideal for applications where the frequency of the drive does not need to be continuously adjusted, only a few frequency values need to be used.

The YD580E can be set to run up to 16 levels, which can be selected by the combination of 4 DI terminal input signals. It is also allowed for less than 4 DI terminals for multi-segment frequency givens, and for missing set bits, it is always calculated as status 0.

The correspondence between the number of segments and the number of DI terminals at multi-stage speed:

2 speed: 1 DI terminal K1;

3-4 speeds: 2 DI terminals K1, K2;

5-8 speeds: 3 DI terminals K1, K2, K3;

9-16 speeds: 4 DI terminals K1, K2, K3, K4.

The required multi-band frequency is set by the multi-band frequency table of PC-00~PC-15, and the parameters are as follows:

parameter	define	default	range	illustrate
PC-00	Reference 0	0.0%	-100.0%~100.0%	The parameter value is the set frequency, which is a percentage of the relative maximum frequency. The positive and negative signs are the direction of travel. The acceleration and deceleration times are P0-17 and P0-18 by default.
PC-01	Reference 1	0.0%	-100.0%~100.0%	
PC-02	Reference 2	0.0%	-100.0%~100.0%	
PC-03	Reference 3	0.0%	-100.0%~100.0%	
PC-04	Reference 4	0.0%	-100.0%~100.0%	
PC-05	Reference 5	0.0%	-100.0%~100.0%	
PC-06	Reference 6	0.0%	-100.0%~100.0%	
PC-07	Reference 7	0.0%	-100.0%~100.0%	
PC-08	Reference 8	0.0%	-100.0%~100.0%	
PC-09	Reference 9	0.0%	-100.0%~100.0%	
PC-10	Reference 10	0.0%	-100.0%~100.0%	
PC-11	Reference 11	0.0%	-100.0%~100.0%	
PC-12	Reference 12	0.0%	-100.0%~100.0%	
PC-13	Reference 13	0.0%	-100.0%~100.0%	
PC-14	Reference 14	0.0%	-100.0%~100.0%	
PC-15	Reference 15	0.0%	-100.0%~100.0%	
PC-51	Reference 0 Given method	0	0~6	0: parameter PC-00 is given 1: AI1 analog 2: AI2 analog 3: AI3 analog 4: PULSE(DI5) 5: PID 6: The preset frequency (P0-08) is given, and UP/DOWN can be modified

If the main frequency command is a multi-speed command, the function value of 12~15 is set to the DI terminal function selection, that is, the multi-segment frequency index is specified order input terminal.

parameter	name	value	illustrate
P4-01	DI2 function selection	12	Multi-Speed terminal 1
P4-03	DI4 function selection	13	Multi-Speed terminal 2
P4-06	DI7 function selection	14	Multi-Speed terminal 3
P4-07	DI8 function selection	15	Multi-Speed terminal 4

In the figure below, DI2, DI4, DI7, and DI8 are selected as the signal inputs specified by the multi-speed frequency, and the 4-digit binary number is composed from them in turn, and the multi-frequency is selected according to the state combination value. When (DI2, DI4, DI7, DI8) = (0, 0, 1, 0) and the number of state combinations is 2, the frequency value set by the PC-02 parameter is selected (see Table 6-1 for details on how to select). The target operating frequency is automatically calculated by (PC-02)*(P0-10). The detailed settings are shown in the figure below:

The target operating frequency is calculated. The detailed settings are shown in the figure below:

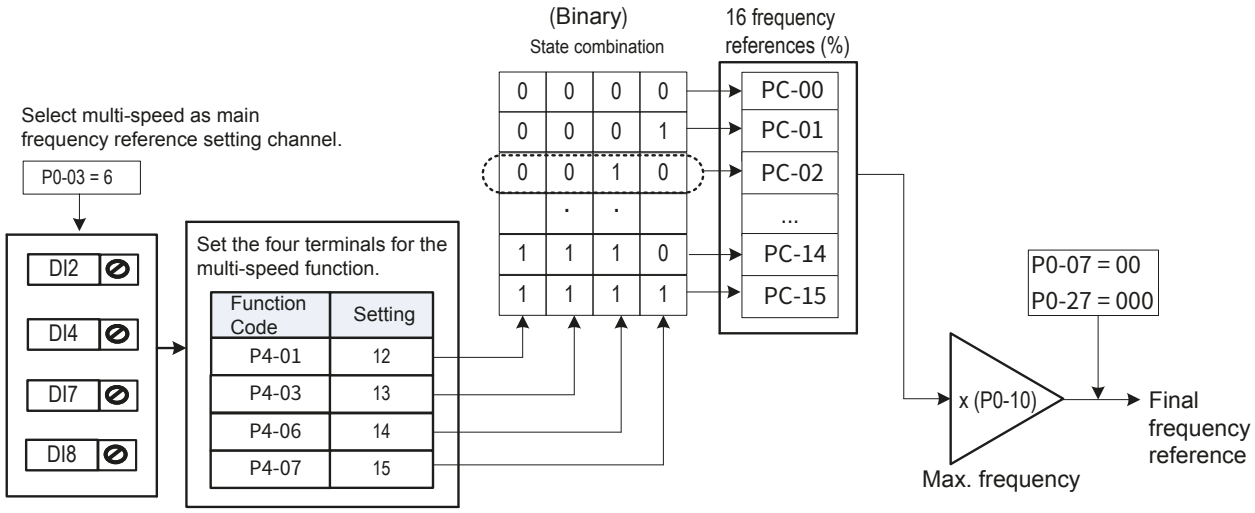


Figure 6-19 Using multi-speed to control frequency reference

4 multi-speed command terminals, which can be combined into 16 states, each of which corresponds to 16 command settings. The details are shown in the following table:

Table 6-1 Functions of multi-speed commands

K4	K3	K2	K1	Multi-set	parameter
OFF	OFF	OFF	OFF	Reference 0	PC-00 (PC-51=0)
OFF	OFF	OFF	ON	Reference 1	PC-01
OFF	OFF	ON	OFF	Reference 2	PC-02
OFF	OFF	ON	ON	Reference 3	PC-03
OFF	ON	OFF	OFF	Reference 4	PC-04
OFF	ON	OFF	ON	Reference 5	PC-05
OFF	ON	ON	OFF	Reference 6	PC-06
OFF	ON	ON	ON	Reference 7	PC-07
ON	OFF	OFF	OFF	Reference 8	PC-08
ON	OFF	OFF	ON	Reference 9	PC-09
ON	OFF	ON	OFF	Reference 10	PC-10
ON	OFF	ON	ON	Reference 11	PC-11
ON	ON	OFF	OFF	Reference 12	PC-12
ON	ON	OFF	ON	Reference 13	PC-13
ON	ON	ON	OFF	Reference 14	PC-14
ON	ON	ON	ON	Reference 15	PC-15

NOTE

- In addition to being used as the main frequency command, the multi-command can also be used as a voltage source for V/F separation (see "6.5.1" for details).
- Setting of the V/F curve" P3-13 in detail) as a setting source for the process PID (see "6.2.1 Selecting the Master Frequency" for details
- The input method of the command "PA-00 Detailed Description").

6.2.6 Master Frequency via "simple PLC

Set the parameter P0-03=7, and select the simple PLC as the main frequency.

When the simple PLC is used as the main frequency, you need to set the parameters PC-00~PC-15 (see subsection 6.2.5 for details of the setting method), and PC-18~PC-49 to set the running time and acceleration and deceleration time of each section. The parameters are detailed in the following table:

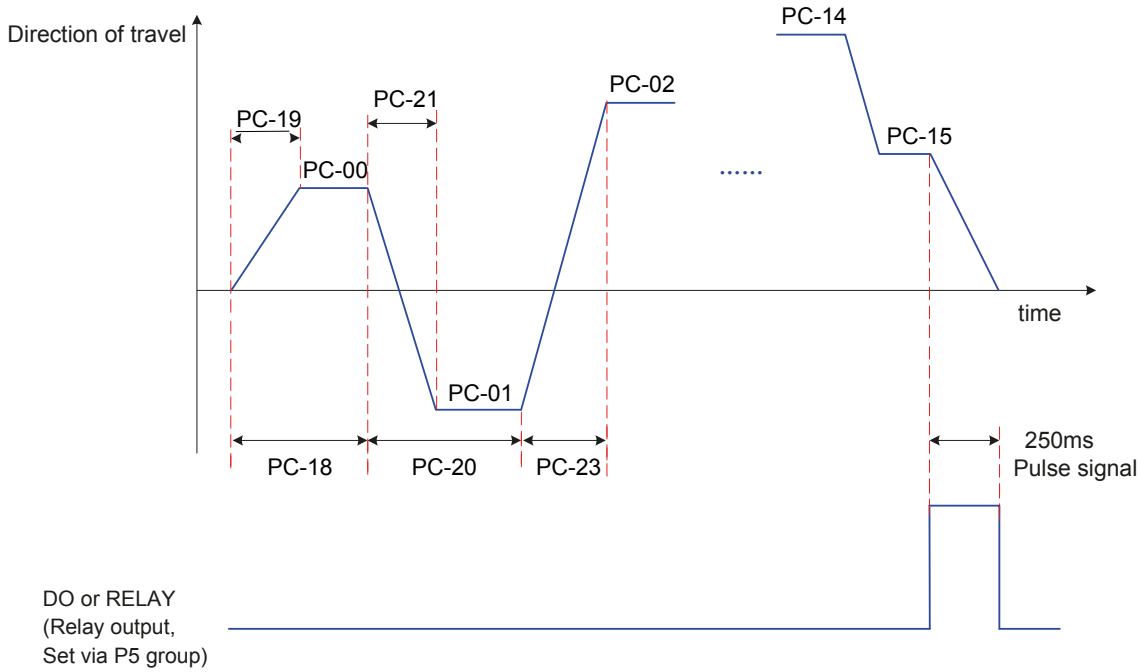


Figure 6-20 A simple PLC as a schematic diagram of the main frequency

parameter	define	default	range	illustrate
PC-18	Running time of simple PLC reference 0	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-19	Acceleration/deceleration time of simple PLC reference 0	0	0~3	-
PC-20	Running time of simple PLC reference 1	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-21	Acceleration/deceleration time of simple PLC reference 1	0	0~3	-
PC-22	Running time of simple PLC reference 2	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-23	Acceleration/deceleration time of simple PLC reference 2	0	0~3	-
PC-24	Running time of simple PLC reference 3	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-25	Acceleration/deceleration time of simple PLC reference 3	0	0~3	-
PC-26	Running time of simple PLC reference 4	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-27	Acceleration/deceleration time of simple PLC reference 4	0	0~3	-
PC-28	Running time of simple PLC reference 5	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-29	Acceleration/deceleration time of simple PLC reference 5	0	0~3	-
PC-30	Running time of simple PLC reference 6	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-31	Acceleration/deceleration time of simple PLC reference 6	0	0~3	-
PC-32	Running time of simple PLC reference 7	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-33	Acceleration/deceleration time of simple PLC reference 7	0	0~3	-
PC-34	Running time of simple PLC reference 8	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-35	Acceleration/deceleration time of simple PLC reference 8	0	0~3	-

parameter	define	default	range	illustrate
PC-36	Running time of simple PLC reference 9	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-37	Acceleration/deceleration time of simple PLC reference 9	0	0~3	-
PC-38	Running time of simple PLC reference 10	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-39	Acceleration/deceleration time of simple PLC reference 10	0	0~3	-
PC-40	Running time of simple PLC reference 11	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-41	Acceleration/deceleration time of simple PLC reference 11	0	0~3	-
PC-42	Running time of simple PLC reference 12	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-43	Acceleration/deceleration time of simple PLC reference 12	0	0~3	-
PC-44	Running time of simple PLC reference 13	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-45	Acceleration/deceleration time of simple PLC reference 13	0	0~3	-
PC-46	Running time of simple PLC reference 14	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-47	Acceleration/deceleration time of simple PLC reference 14	0	0~3	-
PC-48	Running time of simple PLC reference 15	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-49	Acceleration/deceleration time of simple PLC reference 15	0	0~3	-
PC-50	Simple PLC run time unit	0	0：s（sec）；1：h（hour）	-

When the simple PLC is used as the main frequency, the operation mode of the simple PLC is selected by setting PC-16, and the operation stage and operating frequency of the PLC before the power failure or shutdown are selected by setting PC-17. The detailed parameters are as follows:

parameter	define	default	range	illustrate
PC-16	Simple PLC running mode	0	0：Stop after running one cycle	The inverter automatically stops after completing a single cycle, and needs to be given a running command again to start.
			1：Keep final values after running one cycle	After the inverter completes a single cycle, it automatically maintains the operating frequency and direction of the last section, and starts to run from the initial state of the PLC after stopping and restarting.
			2：Repeat after running one cycle	After the inverter completes one cycle, it automatically starts the next cycle and does not stop until there is a stop command.
PC-17	Simple PLC retentive selection	00	one bit：Retentive at power down	Restart the PLC process every time you power up.
			0：no memory 1：menory	Memorize the running stage and running frequency of the PLC before power-off, and continue to run from the memory stage when the next power is turned on
			ten bit：Retentive at stop	The PLC process is restarted with each start-up.
			0：no memory 1：memory	When machine is stopped, the operation stage and frequency of the previous PLC are recorded, and the operation continues from the memory stage during the next operation.
PC-50	Time unit of simple PLC running	0	0：s（sec）；1：h（hour）	Set the unit of time for PLC operation.
PC-51	Reference 0 source	0	0：PC-00 is given 1：AI1 2：AI2 3：AI3 4：Pulse 5：PID 6：The preset frequency (P0-08) is given, UP/DOWN can be modified	-

< Complementary> Simple PLC function can be used as a voltage source for V/F separation in addition to the main frequency. (For details, see "Setting the 6.5.1 V/F Curve" P0-13 for details.)

6.2.7 Master Frequency via "PID"

Set the parameter P0-03=8 and select PID as the main frequency.

PID control is a common method of process control, through the proportional, integral, and differential operations of the difference between the feedback signal of the controlled quantity and the target signal, and by adjusting the output frequency of the inverter, a closed-loop system is formed to stabilize the controlled quantity at the target value. The output of PID control is selected as the operating frequency, which is generally used for on-site process closed-loop control, such as constant pressure closed-loop control, constant tension closed-loop control, etc.

- **Proportional Gain Kp:** Once a deviation between the output and input of the PID is generated, the PID will adjust the control output to reduce the amount under control. The larger the Kp, the faster the deviation decreases, but it is easy to cause oscillation, especially when the lag link is relatively large, Kp decreases, and the possibility of oscillation decreases. But the adjustment speed has become slower. (A proportional gain of 100.0 means that when the deviation between the PID feedback amount and the given amount is 100.0%, the PID regulator adjusts the output frequency command to the maximum frequency.)
- **Integration Time Ti:** Determines the strength of the integration regulation of the PID regulator. The shorter the integration time, the greater the intensity of adjustment. (Integration time.) This means that when the deviation between the PID feedback amount and the given amount is 100.0%, the integration regulator will continuously adjust and adjust the amount to the maximum frequency after this time)
- **Differential time Td:** determines the strength of the PID regulator's adjustment of the rate of change of deviation. The longer the differentiation time, the greater the intensity of adjustment. (Micro.)Minute time means that when the feedback amount changes by 100.0% in that time, the adjustment amount of the differential regulator is the maximum frequency)

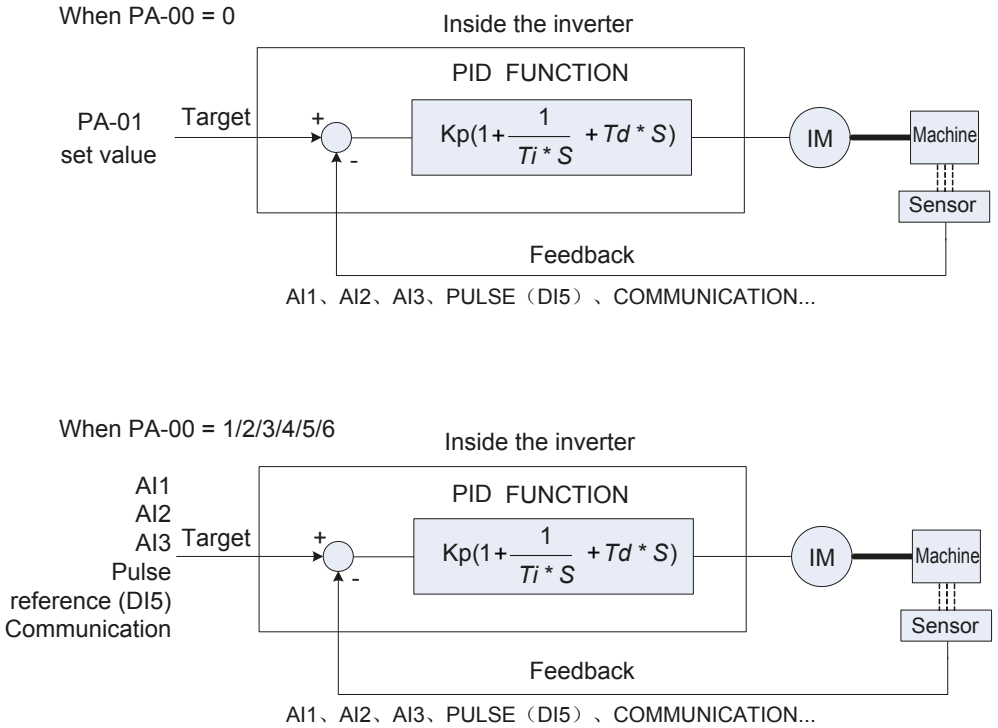


Figure 6-21 PID control function diagram

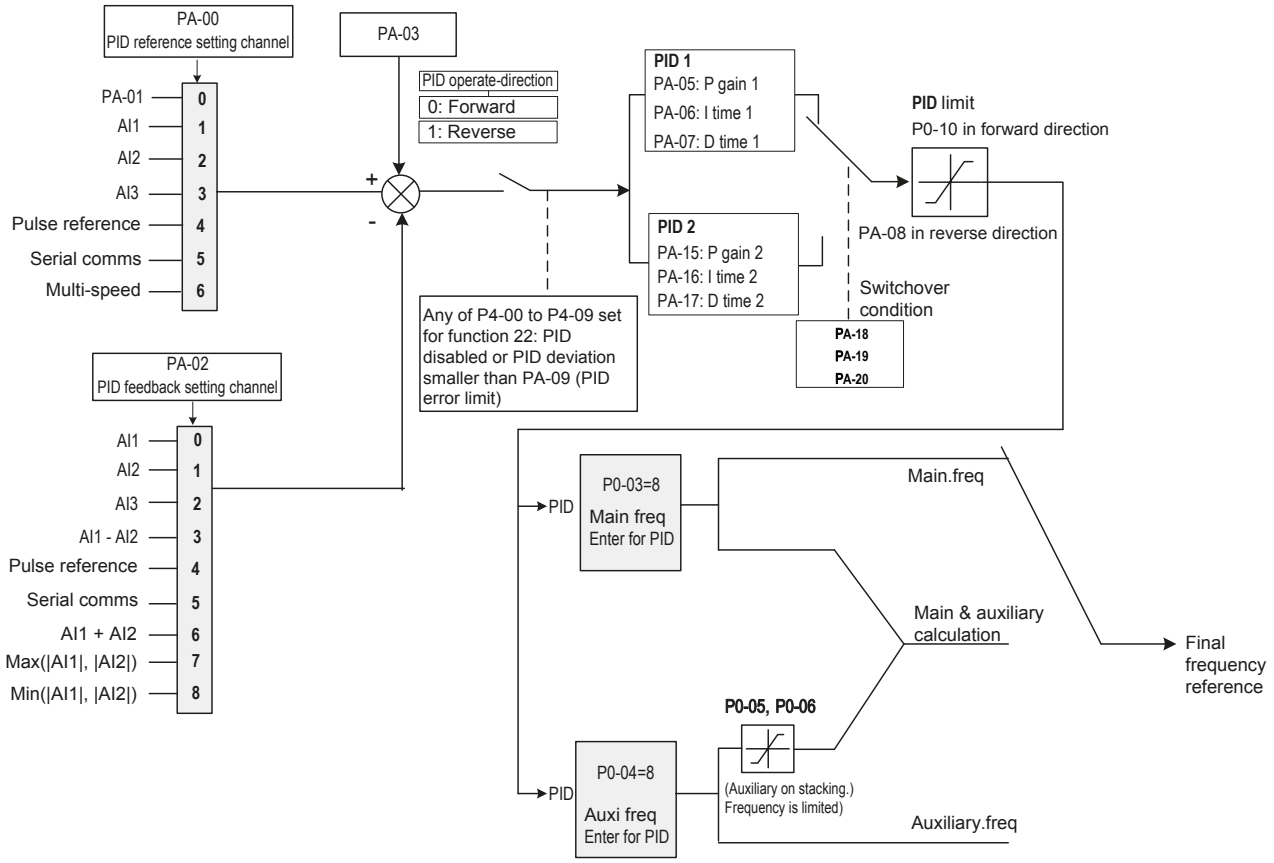


Figure 6-22 Block diagram of process PID control parameters

parameter	define	default	range	illustrate
PA-00	PID reference setting channel	0	0: Set by PA-01 1: AI1 2: AI2 3: AI3 4: Pulse Freq(DI5) 5: Serial comms. 6: Multi-speed	The target amount used to select the PID for a given channel. The set target amount of PID is relative, and the set 100% corresponds to 100% of the feedback signal of the controlled system. Note: When PA-00 selects 6 (multi-stage speed), PC-51 (multi-segment instruction 0 given mode) cannot select 5 (PID given).
PA-01	PID digital setting	50.0%	0.0%~100.0%	This parameter needs to be set when PA-00 is set to 0. 100% of this parameter corresponds to the maximum value of the feedback amount
PA-02	PID feedback setting channel	0	0: AI1 1: AI2 2: AI3 3: AI1 - AI2 4: Pulse Freq (DI5) 5: Serial comms. 6: AI1 + AI2 7: Max. (|AI1|, |AI2|) 8: Min. (|AI1|, |AI2|)	The feedback channel used to select the PID
PA-03	PID operation direction	0	0: Forward	If feedback signal is less than the given signal of the PID, output frequency of the inverter rises.
			1: Reverse	If feedback signal is larger than the given signal of the PID, output frequency of the inverter drops.
PA-04	PID reference and feedback range	1000	0~65535	For example, the parameter value is set to 1000 and the PID is given(0%~100%) and feedback (0~1000) linear correspondence.

parameter	define	default	range	illustrate
PA-05	Proportional gain Kp1	20.0	0.0~1000.0	Most systems can be adjusted using PI
PA-06	Integral time Ti1	2.00s	0.01s~10.00s	
PA-07	Differential time Td1	0.000s	0.000s~10.000s	
PA-08	PID output limit in reverse direction	2.00Hz	0.00~ Max.freq	When the frequency source is pure PID, the reverse cut-off frequency of PID is the minimum value of the current PID output, and when the frequency source is primary+PID, FA-08 acts on the main + PID as a whole and outputs the minimum frequency value after the "main + PID" operation.
PA-09	PID error limit	0.0%	0.0%~100.0%	It helps to balance the accuracy and stability of the system output
PA-10	PID differential limit	0.10%	0.00%~100.0%	In PID regulators, the differential can easily cause the system to oscillate, so the PID differential effect is generally limited to a small range, and PA-10 is used to set the range of the PID differential output.
PA-11	PID reference change time	0.00s	0.00s~650.00s	Refers to the time it takes for a given PID to change from 0.0% to 100.0%.
PA-12	PID feedback filter time	0.00s	0.00s~60.00s	The PID feedback is filtered, which is conducive to reducing the impact of feedback interference, but it will reduce the response performance of the process closed-loop system.
PA-13	PID output filter time	0.00s	0.00s~60.00s	The PID output frequency is filtered, which will attenuate the sudden change in the output frequency of the inverter, but will bring about the degradation of the response performance of the process closed-loop system.
PA-15	Proportional gain Kp2	20.0	0.0~1000.0	If it is used to switch between two sets of PID parameters, it can be switched through the DI terminal, or it can be switched automatically according to the deviation of the PID. The setting of parameters PA-15~PA-17 is similar to that of parameters PA-05~PA-07.
PA-16	Integral time Ti2	2.00s	0.01s~10.00s	
PA-17	Differential time Td2	0.000s	0.000s~10.000s	
PA-18	PID parameter switchover condition	0	0: No switchover	-
			1: Switchover via DI	DI terminal function selection to set to 43 (PID parameter switching terminal), when terminal is invalid, select group 1 (PA-05~PA-07), when terminal is active, select group 2 (PA-15~PA-17).
			2: Auto switchover based on PID error	The absolute value of the deviation between the given and feedback is less than the PID parameter switching deviation 1 (PA-19), and the PID selects parameter group 1. The absolute value of the deviation between the given and feedback is greater than the PID switching bias 2 (PA-20), and the PID selects parameter group 2. When the given deviation from the feedback is between the switching bias 1 and the switching bias 2, the PID parameter is the linear interpolation value of the two sets of PID parameters, as shown in Figure 6-23.
			3: Auto switchover based on running frequency	When the inverter runs between 0 and maximum frequency when it is selected to automatically switch according to the operating frequency, the PID parameter is the linear interpolation value of the two sets of PID parameters.
PA-19	PID error 1 for auto switchover	20.0%	0.00~PA-20	100% of this parameter corresponds to the maximum deviation from the feedback, if PA-18=2.
PA-20	PID error 2 for auto switchover	80.0%	PA-19~100.0%	
PA-21	PID initial value	0.0%	0.0%~100.0%	When the inverter is started, the PID outputs the initial value of the PID (b5-22), and the initial value of the PID is held for a time (b5-23), and the PID starts the closed-loop adjustment operation. Figure 6-21 shows the initial value of PID.
PA-22	PID initial value active time	0.00s	0.00s~650.00s	-
PA-25	PID integral property	00	one bit: Integral separation 0: Disabled 1: Enabled	When the integral separation is invalid, the integral separation is invalid regardless of whether the multi-function digital DI is valid or not. The integration separation is valid, and when the DI terminal integration pause (function 22) is in effect, the PID integration stops the calculation, and only the PID proportional and differential effects are in effect.
			Tens bit: Whether to stop integral when the PID output reache limit 0: Continue integral 1: Stop integral	After the output of the PID operation reaches the maximum or minimum value, you can choose to stop the integration effect, which helps to reduce the overshoot of the PID.

parameter	define	default	range	illustrate
PA-26	Detection level of PID feedback loss	0.0%	0.0%：Nodetection； 0.1%~100.0%；	-
PA-27	Detection time of PID feedback loss	0.0s	0.0s~20.0s	It is used to determine whether the PID feedback is missing. When the PID feedback quantity is less than the feedback loss detection value (PA-26) and the duration exceeds the PID feedback loss detection time (PA-27), the inverter fault alarm Err31 is called.
PA-28	Selection of PID operation at stop	0	0: Disabled 1: Enabled	This parameter is used to select whether the PID will continue to be calculated when the PID is in the shutdown state.In general applications, the PID should stop computation during a shutdown state.

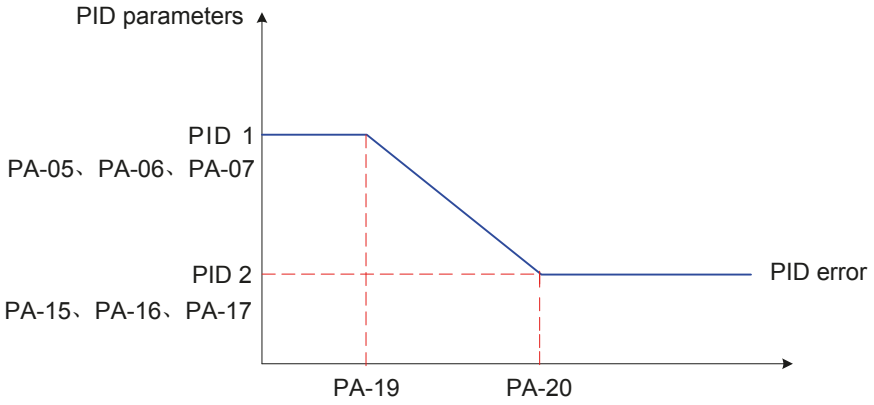


Figure 6-23 Switchover of two groups of PID parameters

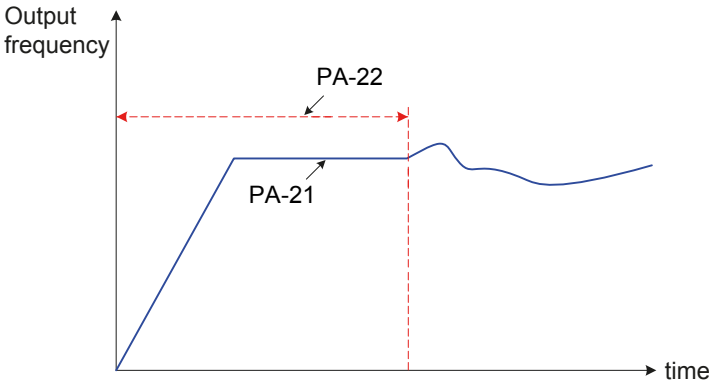


Figure 6-24 The PID initial value function

NOTE

For the upper and lower limits and range of the frequency output when PID is the dominant frequency, the following descriptions are made
(e.g., the frequency source is pure PID or primary + PID)

- When the reversal cut-off frequency is 0 or reversal is prohibited
  (i.e., any of the following three types)

  ①PA-08=0，P8-13=0； ②PA-08=0，P8-13=1； ③PA-08≠0，P8-13=1

  Output upper Limit: The upper of frequency
  Output lower Limit: The lower of frequency
  Output range: lower frequency ~ upper frequency (i.e. P0-14~P0-12)

- When the reversal cut-off frequency is not 0 and reversal is not prohibited
  (i.e., PA-08 ≠ 0,P8-13=0)

  Output upper Limit: The upper of frequency
  Output lower Limit: - Invert the cut-off frequency
  Output range: - Invert the cut-off frequency ~ upper frequency (i.e. -PA-08~P0-12)

Main Frequency via "Communication"

parameter P0-03=9 and select communication as the main frequency.

YD580E supports 4 host computer communication modes: Modbus, Profibus-DP, CANopen, CANlink, these 4 communication methods cannot be used at the same time. When using communication, you must install a communication card, YD580E's 4 kinds of communication cards are optional, users can choose according to their needs, if the communication protocol is Modbus, Profibus-DP or CANopen, you need to select the corresponding serial communication protocol according to P0-28. The CANlink protocol is always valid.

parameter	define	default	range
P0-28	Serial port communication protocol	0	0：Modbus protocol 1：PROFIBUS-DP or CANopen protocol

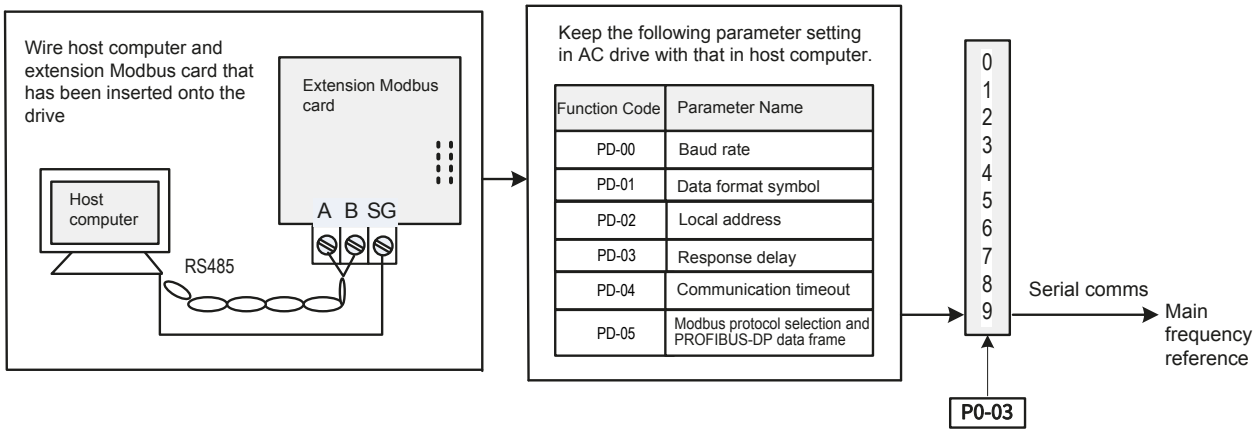


Figure 6-25 Communication is used as a parameter for the main frequency

When the frequency is given by the communication mode, the host computer should send a write command to the inverter. The following is an example of the Modobus protocol to illustrate the process of communicating a given master frequency.

For example, if the frequency is set to 10000 using a given communication method, the write command is 01 06 10 00 27 10 97 36. The meaning of each byte is as follows: Inverter address: 01H (can be set), write command: 06H, address of a given frequency: 1000H, target frequency value: 2710H (converted to decimal 10000), CRC check: 9736H.

Similarly, when the frequency is set to -10000 in a given mode of communication, the write command is 01 06 10 00 D8 F0 D7 4E. where D8F0 -10000 is converted to hexadecimal and takes the lower four digits.

NOTE

- The range of the given frequency of the communication method is -10000 ~ +10000 (decimal), and the corresponding frequency range is -100.00%~+100.00% (-100.00% corresponds to the negative maximum frequency, +100.00% corresponds to the maximum frequency).
- Assume P0-10 "maximum frequency"Set to 50Hz, if the frequency value written in the write command is 2710H, convert the decimal to 10000. The actual write frequency is 50*100%=50Hz.

master command		response from slavor	
ID address	01H	ID address	01H
CMD	06H	CMD	06H
Parameter address H-BYTE	10H	Parameter address H-BYTE	10H
Parameter address L-BYTE	00H	Parameter address L-BYTE	00H
Data content H-BYTE	27H	Data content H-BYTE	27H
Data content L-BYTE	10H	Data content L-BYTE	10H
CRC H-BYTE	97H	CRC H-BYTE	97H
CRC L-BYTE	36H	CRC L-BYTE	36H

6.2.9 Method for Auxiliary Frequency Commands

Set the parameter P0-04 and select the input of the auxiliary frequency command. There are 10 kinds of auxiliary frequency instructions of the inverter, which are digital setting (no memory when power off), digital setting (memory when power down), AI1, AI2, AI3, pulse input, multi-segment instruction, simple PLC, PID, and communication given. As shown in the image:

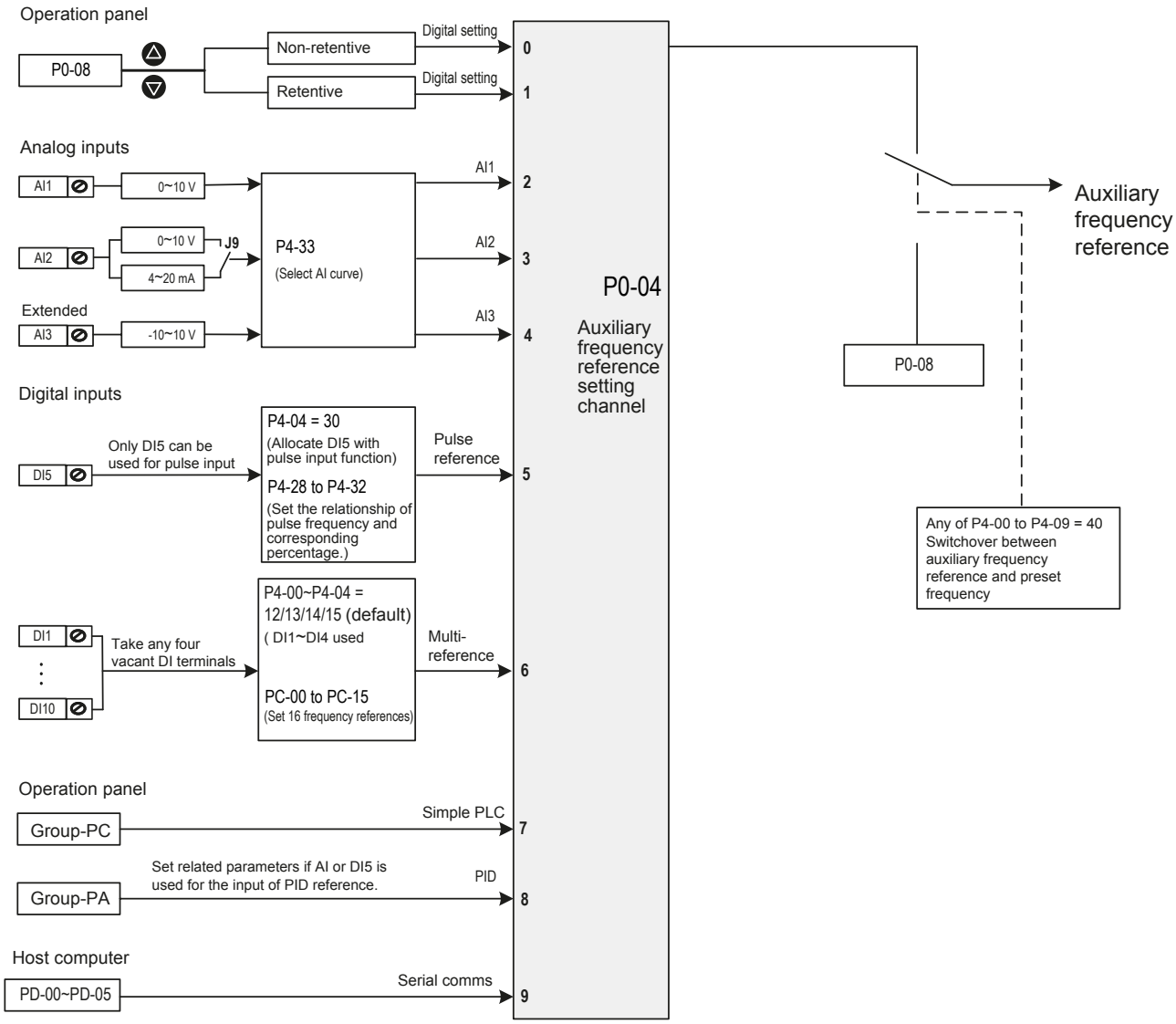


Figure 6-26 select a proper channel to set auxiliary frequency reference

parameter	define	default	range	illustrate
P0-04	Auxiliary frequency reference setting channel selection	0	0	Digital setting (non-retentive at power down)
			1	Digital setting (retentive at power down)
			2	AI1
			3	AI2
			4	AI3
			5	Pulse reference（DI5）
			6	Multi-reference
			7	Simple PLC
			8	PID reference
			9	Serial comms

When used as an independent frequency-given channel, the auxiliary frequency command is used in the same way as the main frequency instruction, which can be used in subsection 6.2.10. When the auxiliary frequency instruction is used as an overlay given (i.e., a composite implementation frequency given of the main frequency instruction and the auxiliary frequency instruction), the use of the auxiliary frequency instruction can be described in subsection 6.2.11.

6.2.10 Method for Master and Auxiliary superposition

Set the relationship between the target frequency and the primary and secondary frequency commands by setting the parameter P0-07. There are 4-types of relationships:

1. Main frequency command: The main frequency is directly given as the target frequency
2. Auxiliary frequency command: The auxiliary frequency is directly given as the target frequency
3. Main and auxiliary operations: There are 4 situations of main and auxiliary operations, which are
   case1:main + auxiliary,
   case2:main - auxiliary,
   case3:main and auxiliary take the larger value,
   case4:main and auxiliary take the smaller value

4. Frequency switching: the above 3 types, selected or switched by DI. The function of DI is set to 18 (frequency command switching).

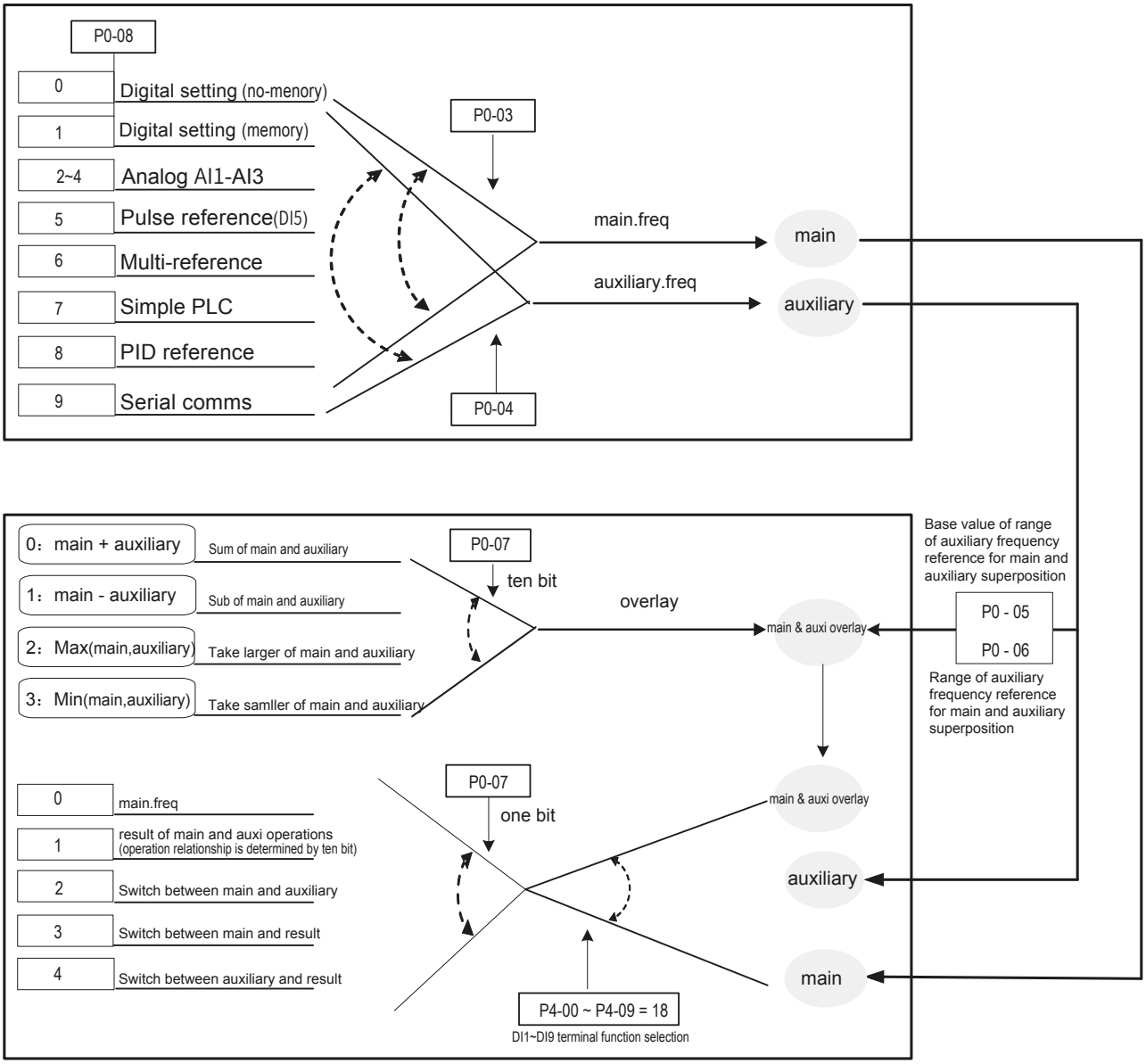


Figure 6-27 Frequency commands are overlay on the main and auxiliary frequency commands

parameter	define	default	range
P0-07	Frequency command overlay selection	00	one bit: Frequency command selection 0: main frequency 1: result of main and auxiliary operations (operation relationship is determined by ten bit) 2: Switch between main and auxiliary 3: Switch between main and result 4: Switch between auxiliary and result ten bit: relationship between main and auxiliary freq 0: main + auxiliary 1: main - auxiliary 2: Max (main,auxiliary) 3: Min (main,auxiliary)
P0-05	Auxiliary frequency command range selection when overlay	0	0: Relative to the maximum frequency 1: Relative to the main frequency instruction
P0-06	Auxiliary Frequency Command Range When overlay	100%	0%~150%

- When main and auxiliary frequencies are compounded to achieve a given frequency, it is necessary to pay attention to:
- 1. When the auxiliary frequency is digital, the preset frequency (P0-08) does not work, and the user adjusts the frequency by UP/DOWN of the keys of the keyboard and key /or terminals.
- 2. When the auxiliary frequency is analog (AI1, AI2, AI3) or pulse given, the input set 100% corresponds to the auxiliary frequency range, which can be set by P0-05 and P0-06.
- 3. The auxiliary frequency and main frequency cannot be set to the same channel, that is, P0-03 and P0-04 should not be set to the same value, otherwise it is easy to cause confusion.
- 4. The superposition function of the main and auxiliary frequency instructions can be used in the occasion of speed closed-loop control, such as the main frequency channel, the auxiliary frequency channel is used for automatic fine-tuning, and the switching of the external DI terminal signal can achieve the required closed-loop control purpose.

6.2.11 Run Command Binding Master Frequency

By setting P0-27, there are 3 types of operation commands that can be set to their respective frequency commands, as shown in the figure below. The command can be switched at any time with the main frequency. This function defines a combination between 3 running commands and 9 frequency givens. When the specified command channel (P0-02) is set with a frequency-bound channel (P0-27 corresponding bit), P0-03 does not work, but is determined by the frequency given channel specified by P0-27.

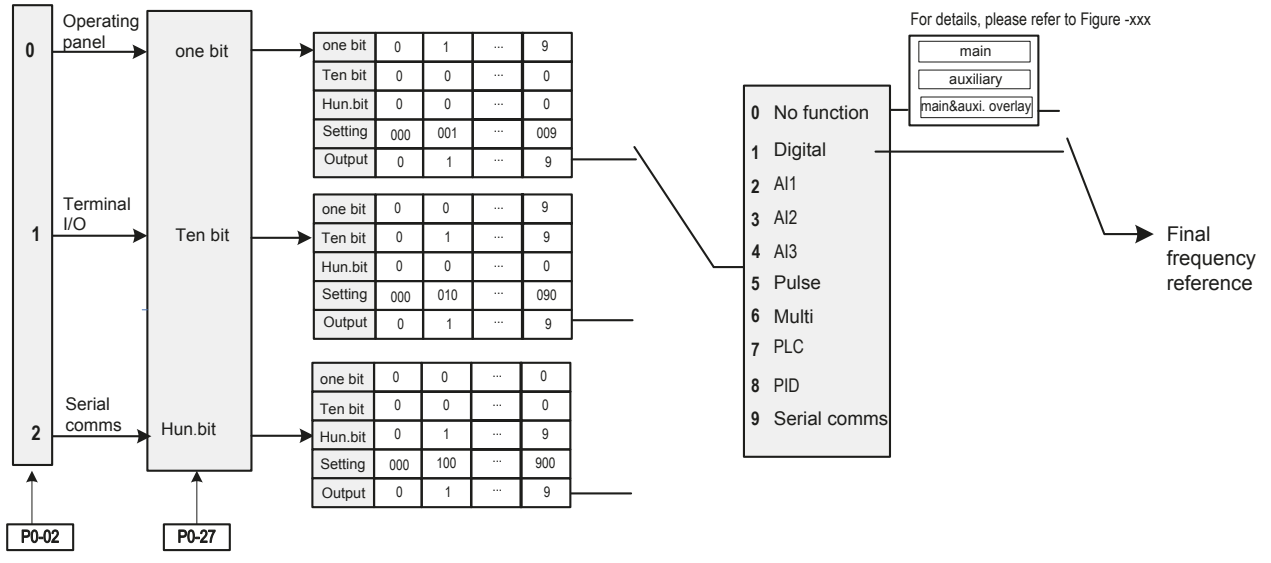


Figure 6-28 Running instructions are bound to the main frequency command

parameter	define	default	range
P0-27	Run command bundles main frequency instruction selection	000	one bit: panel binds main freq. cmd selection 0: No binding 1: Digital setting 2: AI1 3: AI2 4: AI3 5: Pulse setting (DI5) 6: Multi-speed 7: Simple-PLC 8: PID 9: Communication settings tens bit: terminal binds main freq. cmd selection Hundred bit: comm. binds main freq. cmd selection

6.2.12 Frequency Command Limit (Frequency Setting)

Upper frequency: limit the maximum frequency, do not allow the motor to run above a certain frequency;

Lower frequency: limit the minimum frequency , do not allow the motor to run below a certain frequency;

Maximum Frequency: Limit the maximum output frequency;

Upper Frequency Selection: Used to select a given channel for the upper frequency of the upper limit;

Upper Frequency Offset: An offset used to set the upper frequency offset.

parameter	define	default	range
P0-10	Maximum Frequency	50.00 Hz	50.00Hz~500.00Hz
P0-11	Upper Frequency Selection	0	0: P0-12 setting 1: AI1 2: AI2 3: AI3 4: Pulse setting (DI5) 5: Communication given
P0-12	Upper frequency	50.00Hz	Lower Frequency (P0-14) ~ Upper Frequency (P0-10)
P0-13	Upper Frequency Offset	0.00Hz	0.00Hz~ Maximum Frequency P0-10
P0-14	Lower frequency	0.00Hz	0.00Hz~ Upper frequency

6.2.13 Below the Lower Limit Frequency Setting

Set the frequency below the lower limit frequency to run the action: if the running frequency is lower than the lower frequency, to select the operating state of the inverter, set the parameter P8-14.

Zero-speed operation: the inverter is in the running state, the output frequency is 0, and the operation panel RUN light is on.

Stopping: The inverter does not run, and the operation panel RUN light is off.

parameter	define	default	range	illustrate
P8-14	Running mode when frequency reference lower than frequency lower limit	0	0: Run at Lower frequency	Run at frequency reference lower limit
			1: Stop	If the operation is below the lower frequency, the drive will be shut down
			2: Run at zero speed	If the operation is below the lower frequency, the drive will be zero speed

6.3 Start-stop method

This section describes how to start/stop the AC drive.

6.3.1 Startup Method

You can set start mode of the AC drive in P6-00, direct start, catching a spinning motor, preexcited start and SVC quick start.

parameter	define	default	range	illustrate
P6-00	Start mode	0	0: Direct start 1: Catching a spinning motor 2: Pre-excited start 3: SVC quick start	If you need to start a motor that is spinning at high speed, it is recommended to use speed tracking to start again, and pre-excitation start (can only be used for AC asynchronous machines)
P6-01	Mode of catching a spinning motor	0	0: From stop frequency 1: From 50 Hz 2: From max.frequency	-
P6-02	Speed of catching a spinning motor	20	1~100	-
P6-03	Start frequency	0.00Hz	0.00Hz~10.00Hz	When the given frequency is less than the starting frequency, the inverter does not start and is in standby mode.
P6-04	Start frequency holding time	0.0s	0.0s~ 100.0s	This parameter does not work during forward and reverse switching. The start-up frequency hold time is not included in the acceleration time, but is included in the runtime of the simple PLC.
P6-05	DC injection braking 1 level /Pre-excitation level	0%	0%~ 100%	The larger the DC braking current, the greater the braking force, 100% corresponds to the rated current of the motor (the upper limit of the current is 80% of the rated current of the inverter).
P6-06	DC injection braking 1 active time /Pre-excitation active time	0.0s	0.0s~ 100.0s	Activating DC braking is only effective when the starting mode is direct start.

1） Direct Start

Set the parameter P6-00=0, the inverter is directly started, which is suitable for most loads, as shown in Figure 6-29. Adding "starting frequency" before starting is suitable for lifting load occasions such as elevators and lifting, as shown in Figure 6-30. Adding "DC braking" before starting is suitable for occasions when the motor may rotate during starting, as shown in Figure 6-31.

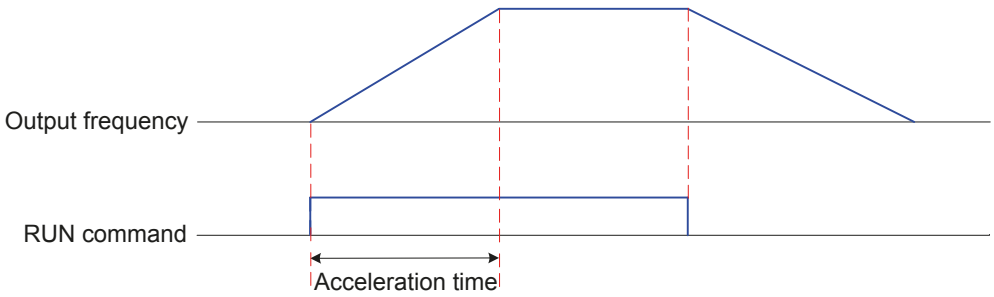


Figure 6-29 Sequence of direct start

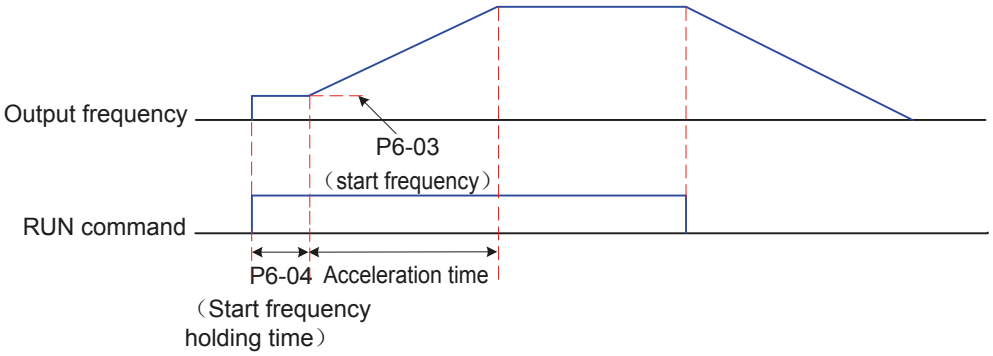


Figure 6-30 Sequence of start with start frequency

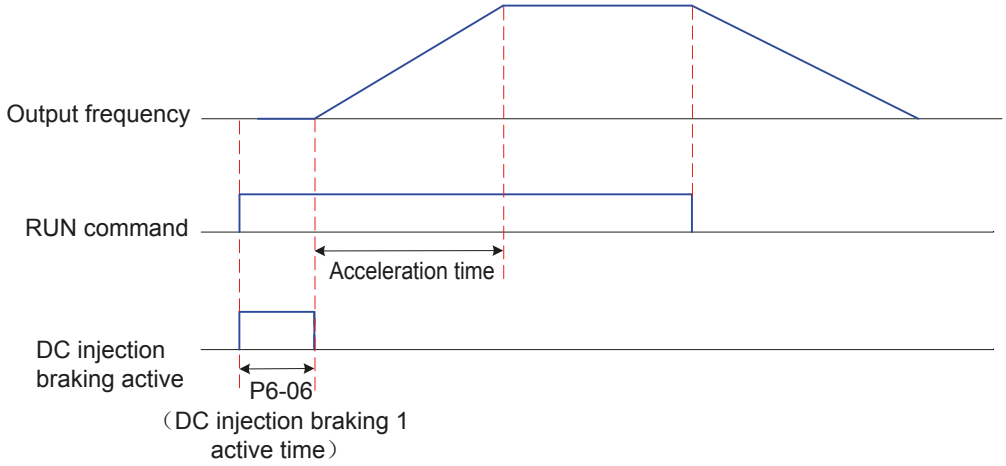


Figure 6-31 Sequence of start with DC injection braking

2） Catching a Spinning Motor

Set P6-00=1, the inverter is speed tracking and then start (the inverter first judges the speed and direction of the motor, and then starts with the frequency of the tracked motor) is suitable for the drive of large inertial mechanical loads, if the inverter starts running, the load motor is still running by inertia, and the speed tracking is taken to start again, which can avoid the occurrence of overcurrent starting. This startup method is only valid in vector control mode.The frequency curve of the start-up process is shown below:

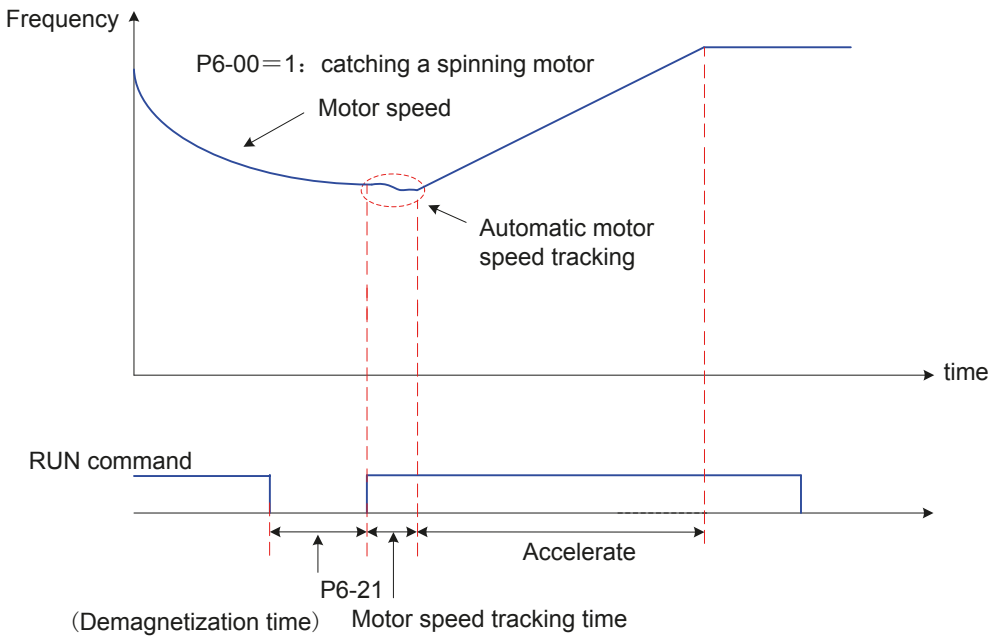


Figure 6-32 Catching a spinning motor

3） Pre-excited Start

Set P6-00=2, the inverter is pre-excited start, this mode is only applicable to the SVC and FVC control mode of asynchronous motor, pre-excitation of the motor before starting, can improve the fast response of the motor and reduce the starting current, the starting sequence is consistent with the DC braking restart.

4） SVC quick start

Set P6-00=3, this mode is only applicable to the SVC control mode of the asynchronous machine, which can shorten the acceleration time, and can enable the mode when the system inertia is large and needs to be started quickly, but there will be torque impact.

6.3.2 Stopping Method

There are two stopping methods for the inverter, which are deceleration parking and free parking.
Set parameter P6-10 Select the stop method of the inverter.

parameter	define	default	range	illustrate
P6-10	Stop mode	0	0: Decelerate to stop 1: Coast to stop	
P6-11	DC injection braking 2 start frequency	0.00Hz	0.00 Hz to max.freq	During the deceleration shutdown, when the operating frequency is reduced to this frequency, the DC braking process begins.
P6-12	DC injection braking 2 delay time	0.0s	0.0s~ 100.0s	After the operating frequency is reduced to the starting frequency of DC braking when the machine is stopped, the inverter stops the output for a period of time before starting the DC braking process.
P6-13	DC injection braking 2 level	0%	0%~ 100%	The larger the DC braking current, the greater the braking force, 100% corresponds to the rated current of the motor (the upper limit of the current is 80% of the rated current of the inverter)
P6-14	DC injection braking 2 active time	0.0s	0.0s~ 100.0s	The DC braking process is canceled when the DC braking time is 0.

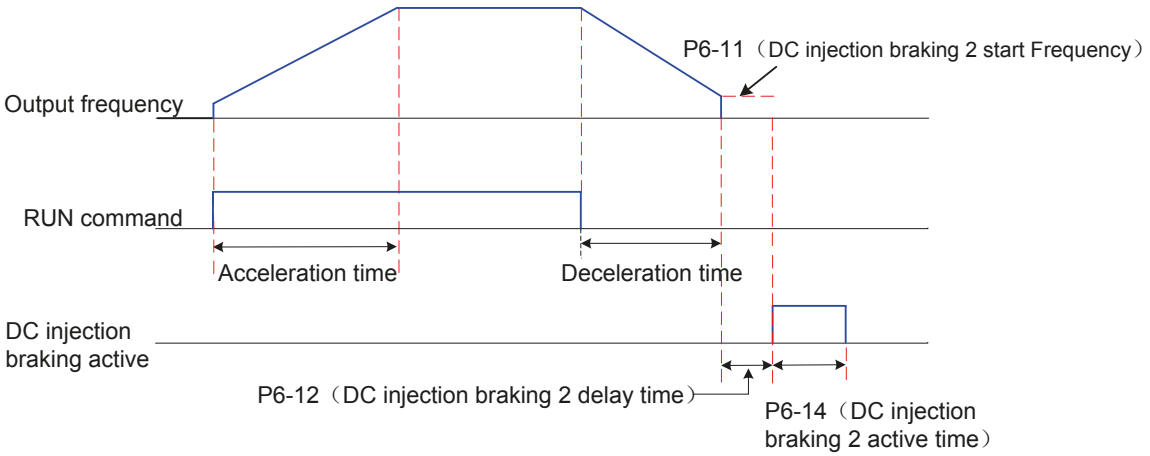


Figure 6-33 Decelerate to stop

1） Decelerate to Stop

Set P6-10=0, the inverter decelerates and stops. (After the shutdown command is valid, the inverter will reduce the output frequency according to the deceleration time, and stop after the frequency drops to 0)

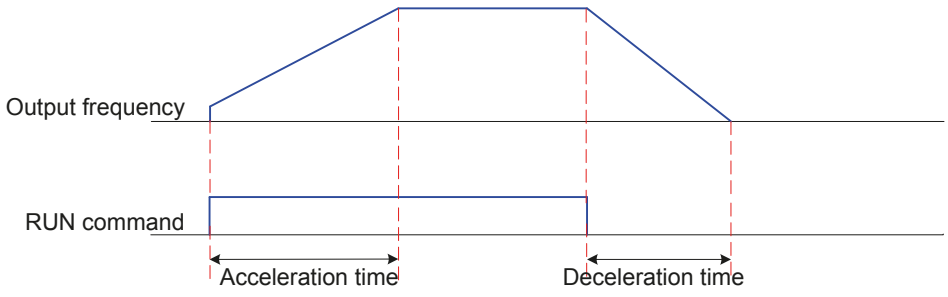


Figure 6-34 Decelerate to stop

2） Coast to Stop

Set P6-10=1, the inverter is free to stop. (After the stop command is effective, the inverter immediately terminates the output, and the motor stops freely according to the mechanical inertia）

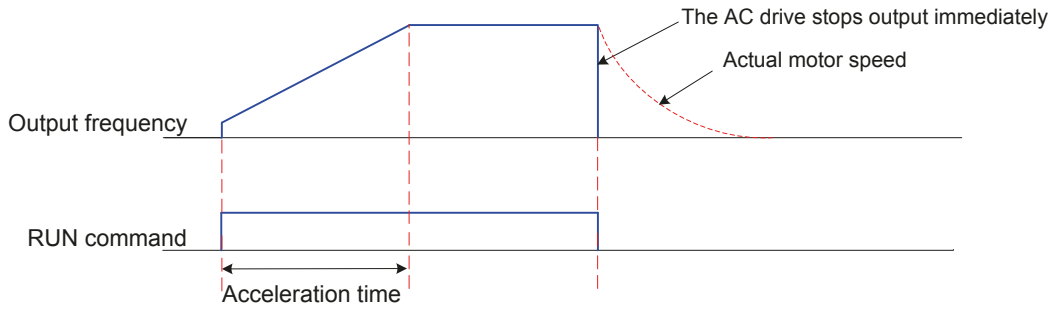


Figure 6-35 Free-parking sequence diagram

6.3.3 Acceleration/Deceleration time & curve set

Acceleration time refers to the time it takes for the inverter to accelerate from zero frequency to the acceleration and deceleration reference frequency (P0-25), and deceleration time refers to the time it takes for the inverter to decelerate from the "acceleration and deceleration reference frequency (P0-25)" to the zero frequency.

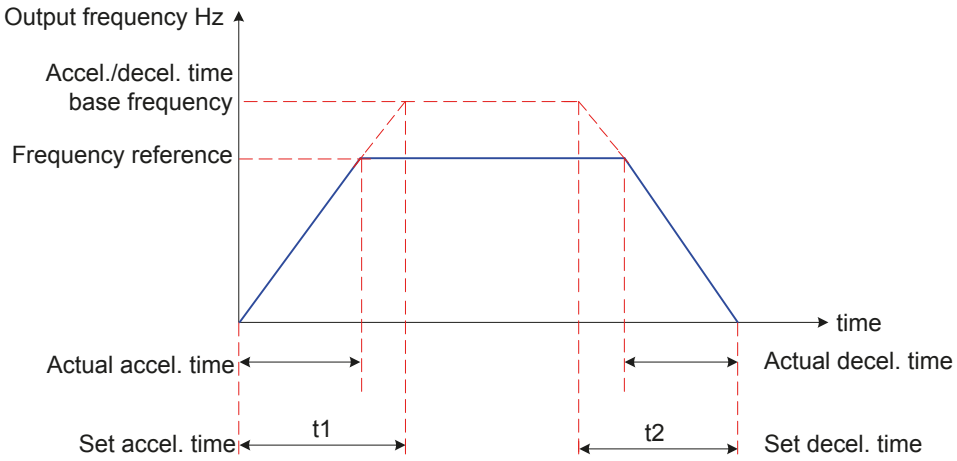


Figure 6-36 Acceleration/Deceleration time

YD580E provides 4 sets of acceleration and deceleration times, which can be switched by using the digital input terminal DI. For example, DI7 and DI8 are selected as input switching terminals.

parameter	name	Setting	Description
P4-06	DI7 function selection	16	Terminal 1 for acceleration/deceleration time selection
P4-07	DI8 function selection	17	Terminal 2 for acceleration/deceleration time selection

DI8	DI7	Accel/Decel Time Selection
OFF	OFF	Accel/Decel time 1：P0-17、P0-18
OFF	ON	Accel/Decel time 2：P8-03、P8-04
ON	OFF	Accel/Decel time 3：P8-05、P8-06
ON	ON	Accel/Decel time 4：P8-07、P8-08

Table 6-2 Selecting acceleration and deceleration times by DI terminals

parameter	define	default	range	illustrate
P0-17	Acceleration time 1	depending on model	0s~65000s	P0-19=0
			0.0s~6500.0s	P0-19=1
			0.00s~650.00s	P0-19=2
P0-18	Deceleration time 1	depending on model	0s~65000s	P0-19=0
			0.0s~6500.0s	P0-19=1
			0.00s~650.00s	P0-19=2
P8-03	Acceleration time 2	depending on model	range is the same as P0-17	-
P8-04	Deceleration time 2	depending on model	range is the same as P0-18	-
P8-05	Acceleration time 3	depending on model	range is the same as P0-17	-
P8-06	Deceleration time 3	depending on model	range is the same as P0-18	-
P8-07	Acceleration time 4	0.0s	range is the same as P0-17	-
P8-08	Deceleration time 4	0.0s	range is the same as P0-18	-
P0-19	Acceleration/ Deceleration time unit	1	0：1 S 1：0.1 S 2：0.01 S	When this parameter is modified, the number of decimal places displayed for the 4 sets of acceleration and deceleration times changes.
P0-25	Acceleration/ Deceleration time base frequency	0	0：Max.Fequ (P0-10) 1：Frequency reference 2：100Hz	-
P6-07	Acceleration/ Deceleration mode	0	0: Linear acceleration /deceleration 1: Static S-curve acceleration/ deceleration 2: Dynamic S-curve acceleration/ deceleration	Select the way the frequency of the inverter changes during the start and stop process. 0: The output frequency increases or decreases in a straight line. 1, 2: In the case of real-time dynamic change of the target frequency, the output frequency increases or decreases in real time according to the S-curve. It is suitable for high comfort requirements and quick real-time response occasions.
P6-08	Time proportion of S-curve start segment	30.0%	0.0%~ (100.0%-P6-09)	Parameters P6-08 and P6-09 are to meet: P6-08+P6-09 ≤ 100.0%.
P6-09	Time proportion of S-curve end segment	30.0%	0.0%~ (100.0%-P6-08)	-

6.4 Auto Tuning

Auto Tuning:You can obtain parameters of controlled motor through motor auto-tuning.
The methods of synchronous motor tuning are: static part parameter tuning, dynamic complete tuning,

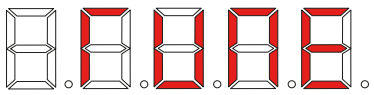
parameter	define	default	range	illustrate
P1-37	Syn-Motor auto- tuning method selection	0	00： No auto-tuning	does not work
			11： Static auto-tuning 1	Only Stator resistance, rotor resistance, leakage inductance
			12： Dynamic auto-tuning	Identify all motor parameters, and confirm encoder parameters in FVC control mode (P1-27~ P1-34)
			set parameters by panel	Enter the parameters of the synchronous motor itself P1-16~P1-20

The following table compares the tuning effects of several tuning methods:

Tuning method	Availability	effect
Static auto-tuning 1	It is difficult to detach the motor from the load, and dynamic tuning operation is not allowed	general
Dynamic auto-tuning	When the motor is conveniently separated from the application system	best
Static auto-tuning 2	It is difficult to detach the motor from the load, and it is not allowed to operate in full dynamic tuning	better

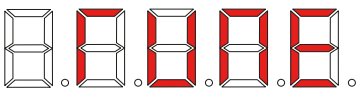
The following describes the method of motor tuning using the parameters of motor 1 (P0-24 set to 0, motor parameter group 1) as an example. If you want to tune the motor 2, first set P0-24 to 1 (motor parameter group 2), the tuning method of motor 2 is similar to that of motor 1, and the relevant parameters refer to A2 group.

1) Static part parameters tuning method of asynchronous or synchronous motor

step	process
Step 1	After powering on, select inverter operation command as the panel (P0-02 is set to 0)
Step 2	Accurate input of motor nameplate parameters (P1-00~P1-05)
Step 3	asyn-motor P1-37 is set to 01 (Static auto-tuning 1), press ENTER to confirm, and display syn0motor P1-37 is set to 11 (Static auto-tuning 1), press ENTER to confirm, and display 
Step 4	Press the RUN key on the panel. The motor does not rotate, and the running indicator light is on. When the TUNE message disappears, the normal parameter display status is returned, indicating that the tuning is complete. The inverter will automatically calculate the value of P1-06~ P1-08(asyn-motor) or P1-16~ P1-18(syn-motor) .

2) Dynamic complete tuning method of asynchronous or synchronous motor

When using a motor with constant output characteristics and high-precision applications, it is necessary to perform dynamic complete tuning under a separate load state for optimal tuning.

step	process
Step 1	After powering on, select inverter operation command as the panel (P0-02 is set to 0)
Step 2	Accurate input of motor nameplate parameters (P1-00~P1-05)
Step 3	Enter encoder parameters (P1-27, P1-28, P1-30
Step 4	syn0motor P1-37 is set to 12 (Dynamic auto-tuning), press ENTER to confirm, and display 
Step 5	Press the RUN key on the panel. The motor does acceleration, deceleration, forward/ reverse operation, and the running indicator light is on. When the TUNE message disappears, the normal parameter display status is returned, indicating that the tuning is complete. The inverter will automatically calculate the value of P1-30 or P1-16~ P1-20 and P1-30.

- In addition to the above , motor tuning can also be manually entered in motor parameters.
- In addition to the operation instructions through the operation panel, the motor can also be tuned through the communication command. Select the Run command by setting P0-02.
- The PKW area of Modbus, Profibus and CANopen supports communication tuning, while the PZD area does not. Communication tuning operation method: Write tuning parameters to P1-37/A2-37 first, and then write the run command.

parameter	define	default	range	illustrate
P1-00	Motor type selection	0	0: Common asynchronous motor	--
			1: Variable frequency asynchronous motor	--
P1-01	Rated power	on model	0.1kW~1000.0kW	P1-00~P1-05 is the motor nameplate ginseng Number. In the use of V/F, SVC, FVC control time, in order to get better control performance, the motor parameters need to be adjusted harmonic, and the accuracy of the tuning results,Closely related to the correct setting of motor nameplate arameters Relevance.
P1-02	Rated voltage	on model	1V~2000V	
P1-03	Rated current	on model	0.01A~655.35A(drive power≤ 55kW) 0.1A~6553.5A(drive power >55kW)	
P1-04	Rated frequency	on model	0.01Hz~ max. frequency	
P1-05	Rated speed	on model	1rpm~65535rpm	
P1-16	Stator resistance of synchronous motor	on model	0.001Ω~65.535Ω(drive power≤ 55kW) 0.0001Ω~6.5535Ω(drive power >55kW)	P1-06~P1-10 is an asynchronous motor Parameters, which can be obtained by motor tuning. Among them, the asynchronous machine is stationary part of the parameters Tuning can only get P1-06~P1-08 3 parameters, the asynchronous machine is dynamic and complete Tunable to obtain P1-06~P1-10.In addition, the encoder phase sequence can also be obtained P1-30。 If the motor is not tuned on site, the above corresponding parameters can be input according to the parameters provided by the motor manufacturer.
P1-17	D-axis inductance of synchronous motor	on model	0.01mH~655.35mH(drive power≤ 55kW) 0.001mH~65.535mH(drive power >55kW)	
P1-18	Q-axis inductance of synchronous motor	on model	0.01mH~655.35mH(drive power≤ 55kW) 0.001mH~65.535mH(drive power >55kW)	
P1-20	Counter electromotive force of synchronous motor	on model	0.0V~6553.5V	

parameter	define	default	range	illustrate
P1-27	Encoder pulses per revolution	1024	1~65535	P1-27 sets pulses per revolution (PPR) of encoder. In FVC mode, P1-27 must be set correctly.Otherwise, motor cannot run properly.
P1-28	Encoder type	0	0: ABZ incremental 2: Resolver 1: UVW incremental 4: UVW Wire-saving	It is necessary to set it correctly according to the actual situation P1-28
P1-30	A/B phase sequence of ABZ incremental encoder	0	0：Forward 1：Reserve	0: Phase A is ahead when the motor is spinning 1: Phase B is ahead when the motor is spinning
P1-34	Number of pole pairs of resolver	1	1~65535	set right number of pole pairs if resolver
P1-36	Encoder wire-break fault detection time	0.0s	0.0s：No detection 0.1s~10.0s	wire-break detection time. If it is set to 0.0s, detection is disabled. If wire-break detection time exceeds the value set in P1-36, the AC drive will trip with Err20.

6.5 Control Performance

6.5.1 Setting the V/F Curve

1） Linear, Multi-point and Square V/F Curve

parameter	define	default	range	illustrate
P3-00	V/F curve setting	0	0, 2-9: Linear V/F 1: Multi-point V/F 10: V/F separation 11: Specific V/F separation	-
P3-01	Torque boost	on model	0.0%~30.0%	-
P3-02	Cut-off frequency of torque boost	50.00Hz	0.00Hz~ max. frequency	-
P3-03	Multi-point V/F frequency 1	0.00Hz	0.00Hz~P3-05	-
P3-04	Multi-point V/F voltage 1	0.0%	0.0%~100.0%	
P3-05	Multi-point V/F frequency 2	0.00Hz	P3-03~P3-07	
P3-06	Multi-point V/F voltage 2	0.0%	0.0%~100.0%	
P3-07	Multi-point V/F frequency 3	0.00Hz	P3-05~ Rated frequency (P1-04)	
P3-08	Multi-point V/F voltage 3	0.0%	0.0%~100.0%	

● General constant-torque linear V/F curve

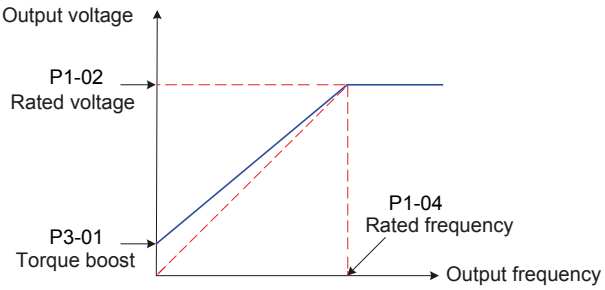


Figure 6-37 General constant-torque linear V/F curve

Below the rated frequency, the output voltage changes linearly with the frequency, which is suitable for general mechanical transmission applications such as large inertia fan acceleration, punch press, centrifuge, water pump, etc.

● User-defined Multi-point V/F curve

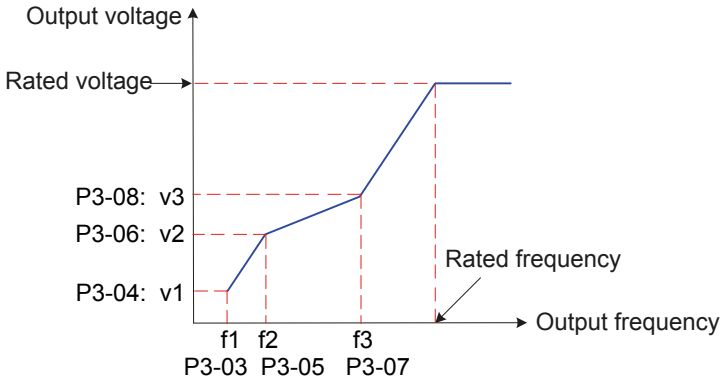


Figure 6-38 User-defined Multi-point V/F curve

P3-03 ~ P3-08 Six parameters define a multi-point V/F curve, the frequency point setting range is 0.00Hz ~ motor rated frequency, the voltage point setting range is 0.0%~100%, corresponding to 0V~ motor rated voltage, the setting value of multi-point V/F curve is usually set according to the load characteristics of the motor. Make sure to set it as follows: P3-03 ≤ P3-05 ≤ P3-07. In order to ensure that the setting is correct, the inverter restricts the relationship between the upper and lower limits of the frequency points P3-03, P3-05 and P3-07, and sets P3-07 first, then P3-05, and finally sets it when setting P3-03;

2） V/F Separation Curve

parameter	define	default	range	illustrate
P3-13	Voltage source for V/F separation	0	0: Set by (P3-14) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Multi-reference 6: Simple PLC 7: PID reference 8: Serial comms. note: 100.0% corresponds to the rated voltage	-
P3-14	Digital setting of voltage for V/F separation	0V	0V~ rated voltage	In V/F semi-split mode, the output voltage is 2 times the set value
P3-15	Voltage rise time of V/F separation	0.0s	0.0s~1000.0s note:The time takes 0V to change to rated voltage	This parameter does not work in V/F semi-split mode, and the voltage acceleration time is the same as P0-17

parameter	define	default	range	illustrate
P3-16	Voltage decline time of V/F separation	0.0s	0.0s~1000.0s note:The time takes 0V to change to rated voltage	This parameter does not work in V/F semi-split mode, and the voltage deceleration time is the same as P0-18
P3-17	Stop mode selection for V/F separation	0	0: Frequency and voltage declining to 0 independently 1: Frequency declining after voltage declines to 0	-

Voltage rise time of V/F separation indicates time required by voltage to rise from 0 to rated motor voltage. See Fig 6-39 t1。

Voltage decline time of V/F separation indicates time required by voltage to decline from rated motor voltage to 0. See 6-39 t2。

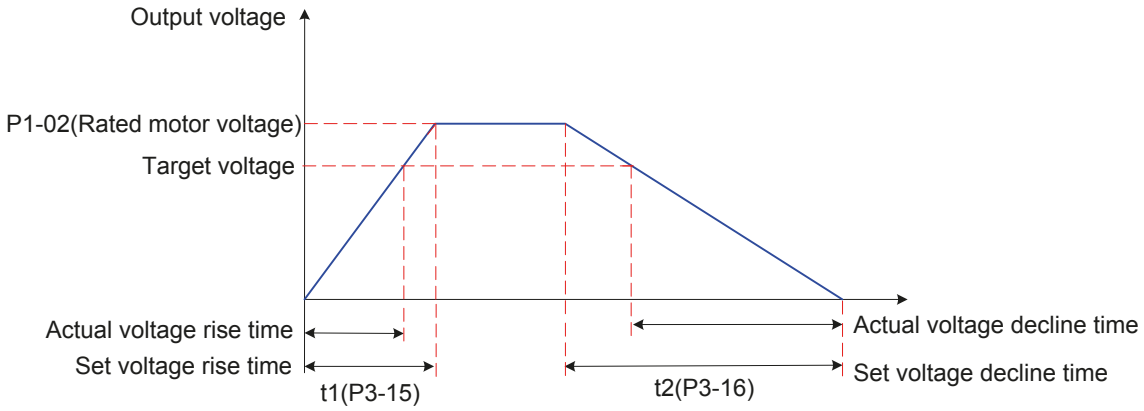


Figure 6-39 V/F separation

6.5.2 Inverter Output Current (Torque) Limit

In the process of acceleration, constant speed and deceleration, if the current exceeds the over-run-out action current (factory value 150%, indicating 1.5 times of the rated current of the inverter), the over-run-out will work, and the output frequency will begin to decrease, until the current returns below the over-run-out speed point, the frequency will begin to accelerate upwards to the target frequency, and the actual acceleration time will be automatically extended, if the actual acceleration time can not meet the requirements, you can appropriately increase the "P3-18 over-run-out speed loss action current".

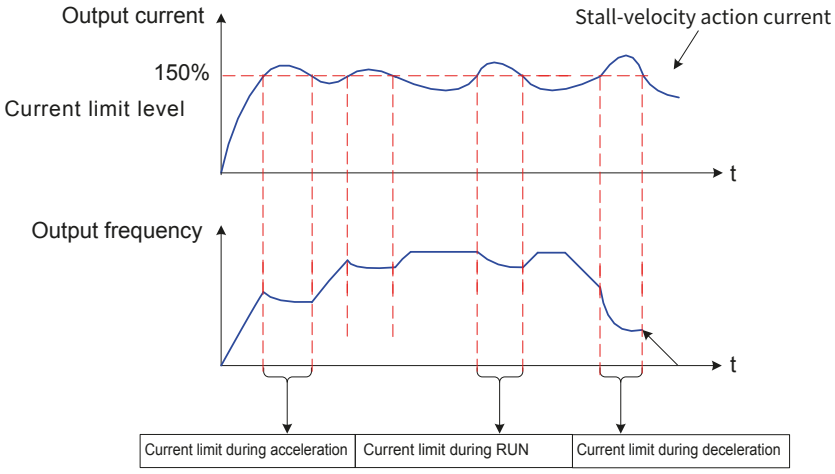


Figure 6-40 Current limit

parameter	define	default	range	illustrate
P3-18	Current limit level	150%	50%~200%	The current that stall-velocity loss suppression action

P3-19	Current limit selection	1	0，1	0: Disabled 1: Enabled
P3-20	Current limit gain	20	0~100	If the current exceeds the over-velocity current point, over-velocity reduction will work,The actual acceleration time is automatically extended.
P3-21	Compensation factor of speed multiplying current limit	50%	50%~200%	Reduce high-speed stall-level and deceleration operating current, the compensation factor is 50% and is ineffective.The operating current in the weak field corresponds to 100% of the recommended setting value of P3-18.

In the high-frequency area, the motor driving current is smaller, relative to the rated frequency below, the same stall current, the speed of the motor drops greatly, in order to improve the running characteristics of the motor, the stall action current above the rated frequency can be reduced, in some centrifuges and other operating frequency is higher, several times the weak magnetic field is required and the load inertia is larger, this method has a good effect on the acceleration performance, can effectively prevent the motor from stalling.

The current limit level above rated frequency = (fs/fn) x k x LimitCur.

- fs: running frequency
- fn: rated motor frequency
- k: compensation factor of speed multiplying current limit level (P3-21)
- LimitCur: current limit level (P3-18)

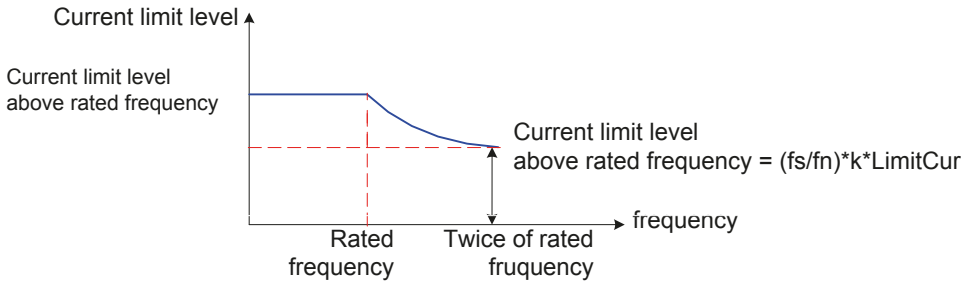


Figure 6-41 Current limit above rated frequency

NOTE

- Current limit level 150% indicates 1.5 times of rated current of the AC drive. For high-power motor with carrier frequency below 2 kHz, lower the current limit level. This is because the overcurrent fast prevention function is enabled in advance of the current limit function due to increase of pulsating current, which will result in insufficient torque output.

6.5.3 Inverter overvoltage stall suppression

If the bus voltage exceeds the overvoltage stall action voltage (P3-22), it means that the electromechanical system has been in the state of power generation (motor speed> output frequency), the overvoltage stall will play a role, adjust the output frequency, the actual deceleration time will be automatically extended, to avoid tripping protection, if the actual deceleration time can not meet the requirements, the overexcitation gain can be appropriately increased.

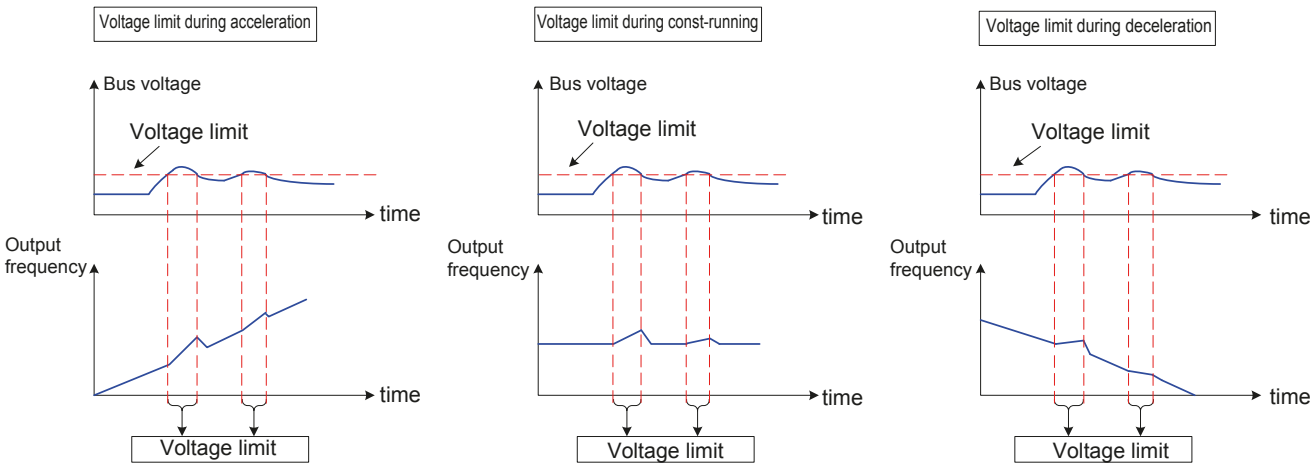


Figure 6-42 Voltage limit

parameter	define	default	range	illustrate
P3-22	Voltage limit	770.0V	650.0V~800.0V	The fun P3-22 is equivalent to that of P9-04.
P3-23	Voltage limit selection	1	0，1	0: Disabled 1: Enabled
P3-24	Frequency gain for voltage limit	30	0~100	Increasing P3-24 will improve the control effect of bus voltage, but the output frequency will fluctuate, and P3-24 can be appropriately reduced, and the function is equivalent to P9-03. Increasing P3-25 can reduce the overshoot of the bus voltage.
P3-25	Voltage gain for voltage limit	30	0~100	
P3-26	Frequency rise threshold during voltage limit	5Hz	0~50Hz	Overvoltage suppresse max.rise freq limit
P9-08	Braking unit applied voltage	760V	650V~800V	-
P3-10	V/F over-excitation gain	64	0~200	The greater the over-excitation gain, the stronger the suppression effect.
P3-11	V/F oscillation suppression gain	40	0~100	-
P9-03	Overvoltage protection gain	30	0~100	The functionality is equivalent to P3-24 and will change with P3-24.
P9-04	Overvoltage protection voltage	770V	650V~800V	The functionality is equivalent to P3-22 and will change with P3-22.

NOTE

When using a braking resistor or an additional braking unit or using an energy feedback unit, please note that:

- Please set the P3-10 "Over-excitation Gain" value to "0", otherwise it may cause the problem of excessive current during operation.
- Please set the P3-23 "Over-voltage Stall Enable" value to "0", otherwise it may cause the problem of prolonged deceleration time.

6.5.4 Improving V/F Running Performance

1) How can I reduce the actual acceleration time in V/F control mode?

phenomenon	measure
Accelerate the process if the motor is found to be solid The acceleration time is much greater than the set fixed acceleration time, which can be taken to The following measures are taken:	If no braking resistor or feedback unit is installed, please increase the P3-18 "V/F Over-Excitation Gain" setting value to "±20" each adjustment.After increasing the P3-18 "V/F Over-excitation Gain" setting value, if the motor oscillation overvoltage fault is caused, reduce the "Overvoltage Stall". Suppress Voltage Gain" setpoint.
	If the target frequency is 3 times or more than 4 times the rated frequency, it is very likely that the motor stall phenomenon will occur during the rapid acceleration process The output frequency of the frequency converter has reached the target frequency, but the actual speed of the motor has been staying at a certain speed in the middle speed section, but the motor is real The speed has been stuck at a lower frequency, or the acceleration time is too long), at this time, the P3-21" double speed loss speed can be adjusted as the current compensation factor" is set to 100%.

1) How can I reduce the actual deceleration time in V/F control mode?

phenomenon	measure
Deceleration process if found that the motor is solid The deceleration time is much greater than the set Fixed deceleration time, which can be taken to The following measures are taken:	If no braking resistor or feedback unit is installed, please increase the P3-10 "V/F Over-Excitation Gain" setting value to "±20" each adjustment.After increasing the P3-10 "V/F Over-excitation Gain" setting value, if the motor oscillation overvoltage fault is caused, reduce the "Overvoltage Stal". Suppress Voltage Gain" setpoint.
	If the inverter is equipped with a braking resistor or energy feedback unit, and the input voltage level of the inverter is 360~420V, please adjust the P9-08 "Brake Unit Action Starting Voltage" setting value to 690V, and adjust the P3-10 "V/F Overexcitation Gain" setting value to 0.
	When using shutdown DC braking, the recommended setting value: P6-11 (stopping DC braking start frequency) = 0.5Hz, P6-13 (stopping DC Braking Current) = 50%; P6-14 (stopping DC Braking Time) = 1s;

3) How to limit the output current under V/F control mode and how to prevent over-current failure in the case of extreme shock loads?

phenomenon	measure
In order to better protect the motor, the upper limit of the input current of the inverter can be adjusted by controlling the upper limit of the motor current:	The "upper limit of inverter output current" can be controlled by adjusting P3-18 "over-velocity loss operating current", "inverter output"Current Limit" = Rated current of the inverter X "Over-velocity operation current" (150% of factory value). It is recommended that "the inverter is lost."The minimum upper limit of the output current should not be less than the rated current of the motor, and the recommended value is 1.5 times of the rated current of the motor.
	Rapid acceleration, rapid deceleration, or shock load types may cause overcurrent faults" or "rapid current limiting faults."EER40", please increase the P3-20 "Overflow Velocity Suppression Gain" setting value, and adjust the amount to "±10" each time There is a high probability that the current will oscillate.

4) How to limit the bus voltage under V/F control mode to prevent over-voltage failure?

phenomenon	measure
In some constant-speed power generation loads (e.g type of oilfield pumping unit), impact sudden loading and unloading (e.g. typically large power punch), the operation process is extremely easy cause overvoltage faults, in order to avoid cause overvoltage failure, if factory ginseng several overvoltage faults will still occur, but also to take the following actions:	Constant speed intermittent power generation load: please reduce the P3-22 "overvoltage stall operating voltage" set value (factory value 770V), non-special If the overvoltage fault still occurs, please adjust the P3-24 "Overvoltage Stall Maximum Rise Frequency Limit" setting value to 10Hz or 20Hz (such as oilfield pumping unit for loads with long periodic power generation time).
	In the event of a voltage failure due to the sudden loading and unloading of the shock, please reduce the P3-22 "overvoltage stall operating voltage" setting value, and it is recommended to adjust it.It is about 720V.
	Large inertia rapid deceleration load: If the inverter is equipped with a braking resistor, and the input voltage level of the inverter is 360~420V,Please adjust the P9-08 "Brake Unit Operation Starting Voltage" setting value to 690V, and adjust the P3-10" V/F overexcitation increase benefit" set to 0. If the voltage is still overvoltage, please reduce the P3-22 "overvoltage stall operating voltage" setting value, it is recommended to adjust it.Around 740V.

6.5.5 Speed Loop

parameter	define	default	range	illustrate
P2-00	Speed loop proportional gain 1	30	1~100	-
P2-01	Speed loop integral time 1	0.50s	0.01s~10.00s	-
P2-02	Switchover frequency 1	5.00Hz	0.00~P2-05	-
P2-03	Speed loop proportional gain 2	20	1~100	-
P2-04	Speed loop integral time 2	1.00s	0.01s~10.00s	-
P2-05	Switchover frequency 2	10.00Hz	P2-02~ max. frequency	-

P2-00 to P2-01 are speed loop PI parameters.

- If running frequency ≤ P2-02 (Switchover frequency 1), PI parameters are P2-00 and P2-01.
- If running frequency ≥ P2-05 (Switchover frequency 2), PI parameters are P2-03 and P3-04.
- If running frequency is between P2-02 and P2-05, PI parameters are obtained from linear switchover between two groups of PI parameters, as shown in Figure 9-2.

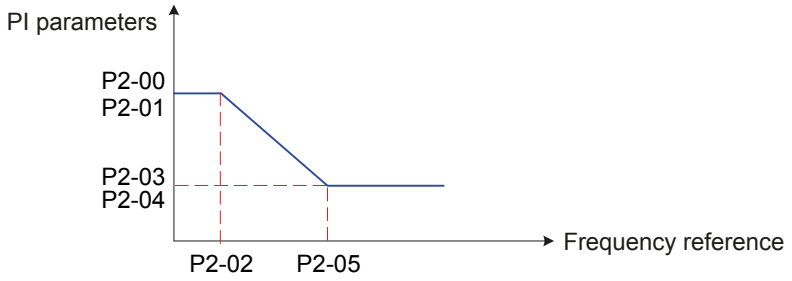


Figure 6-43 Speed loop PI parameters

By setting the scale factor and integration time of the speed regulator, the dynamic response characteristics of the vector control can be adjusted.

Increasing the proportional gain and decreasing the integration time can speed up the dynamic response of the velocity ring. However, too much proportional gain or too little integration time can cause the system to oscillate.

The suggested adjustment method is as follows: if the factory parameters cannot meet the requirements, the factory value parameters should be fine-tuned, first increase the proportional gain to ensure that the system does not oscillate, and then reduce the integration time, so that the system has faster response characteristics and less overshoot.

- If the PI parameter is not set properly, it may cause the speed to overshoot too much. Overvoltage faults can even occur when overshoot falls.

6.5.6 Vector Control Slip Adjustment

parameter	define	default	range	illustrate
P2-06	SVC slip compensate gain	100%	50%~200%	Slip adjust to improve control performance

For vector control (P0-01=0,1), this parameter can adjust the speed stability accuracy of the motor, for example, when the motor runs at a frequency lower than the output frequency of the inverter, this parameter can be increased.

For the vector control of the speed sensor (P0-01=1), this parameter can adjust the output current of the inverter under the same load, such as in the high-power inverter, if the load capacity is weak, this parameter can be gradually reduced. Note: In general, there is no need to adjust this parameter.

6.5.7 SVC Speed Feedback Stability

parameter	define	default	range	illustrate
P2-07	Speed feedback filter time in SVC	0.015s	0.000s~0.100s	-

SVC velocity feedback filtering time only takes effect when P0-01=0, increasing P2-07 can improve the stability of the motor, but the dynamic response becomes weaker, otherwise, the dynamic response is strengthened, but too small will cause the motor to oscillate. In general, no adjustment is required.

6.5.8 Upper torque

SVC velocity feedback filtering time only takes effect when P0-01=0, increasing A0-00 can improve the stability of the motor, but the dynamic response becomes weaker, otherwise, the dynamic response is strengthened, but too small will cause the motor to oscillate. In general, no adjustment is required.

1） Speed control torque upper limit setting

parameter	define	default	range	illustrate
P2-09	Torque limit source in speed control	0	0: P2-10 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Serial comms. 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) 1-7 full-scale range corresponds to P2-10	-
P2-10	Digital setting of torque limit in speed control	150.0%	0.0%~200.0%	The upper limit of torque in the electric state is based on the rated current of the inverter
P2-11	(Regenerative) power limit selection	0	0: P2-10 (motoring & regenerative) 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Serial comms. 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) 1-7 full-scale range corresponds to P2-12	-
P2-12	(Regenerative) power limit	150.0%	0.0%~200.0%	The upper limit of torque in the power generation state is based on the rated current of the inverter

- In the speed control mode, there are 8 ways to set the upper torque source. In the Motoring state, the upper torque source is selected by P2-09, and in the power generation state, the upper torque source is selected by P2-11.
- In the speed control mode, if P2-11 is set to 1~8, the upper torque limit is divided into Motoring state and power generation state, where the upper limit of torque in Motoring state full scale range is set by P2-10, and the upper limit of torque full scale range in power generation state is set by P2-12, the schematic diagram is as follows:

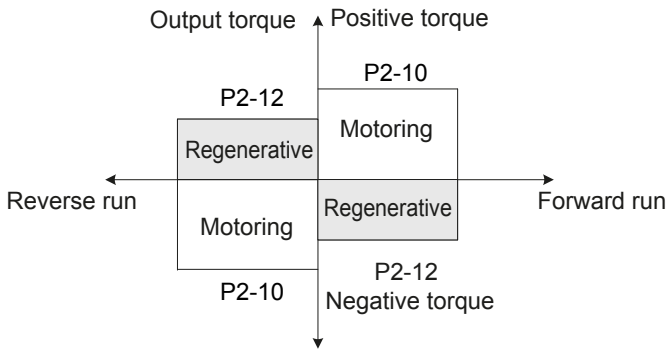


Figure 6-44 Torque limit in speed control

parameter	define	default	range	illustrate
P2-22	Regenerative power limit selection	0	0: Disabled 1: Enabled in the whole process	-
P2-23	Regenerative power limit	In model	100.0~120.0%	-

- In applications such as cam, quick acceleration/deceleration and sudden unloading without using braking resistor, reduce bus voltage overshoot during motor braking so as to prevent occurrence of overvoltage.
- P2-23 is a percentage of rated motor power. If overvoltage still occurs after you set P2-22 = 1 , decrease setting of P2-23

2） Setting Torque Limit in Torque Control

parameter	define	default	range	illustrate
A0-00	Speed/Torque control selection	0	0: Speed control 1: Torque control	-
A0-01	Torque reference source in torque control	0	0: Set by A0-03 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Communication reference 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) 1-7 full-scale range corresponds to A0-03	-
A0-03	Torque digital setting in torque control	150.0%	-200.0%~200.0%	-
A0-05	Forward max. frequency in torque control	50.00Hz	0.00Hz~ max. frequency(P0-10)	-
A0-06	Reverse max. frequency in torque control	50.00Hz	0.00Hz~ max. frequency(P0-10)	-
A0-07	Acceleration time in torque control	0.00s	0.00s~65000s	-
A0-08	Deceleration time in torque control	0.00s	0.00s~65000s	-

- Speed/torque control mode selection（A0-00）

The speed/torque control mode is set by A0-00.

The YD580E has a multi-function digital DI terminal with two functions related to torque control: torque control prohibition (function 29) and speed control/torque control switching (function 46). These two terminals should be used in conjunction with the A0-00 to achieve speed and torque control.

When the speed control/torque control switching terminal (function 46) is invalid, the control mode is determined by A0-00, and if the speed control/torque control switching is effective, the value of the control mode equivalent to A0-00 is reversed.

In any case, when the torque control prohibition terminal is active, the inverter is fixed in a speed control mode.

- Torque control torque command setting（A0-01、A0-03）

d5-02 It is used to select the torque setting command, and there are a total of 8 torque setting methods.

The torque setting is a relative value, 100.0% of the rated torque of the strain inverter (the output torque of the inverter can be viewed through U0-74, 100% of the rated torque of the strain inverter, and the output torque of the motor can be viewed by U0-06, which corresponds to the rated torque of the motor at 100%). The setting range is -200.0%~200.0%, indicating that the maximum torque of the inverter is 2 times the rated torque of the inverter.

When torque command is positive, the inverter runs in the forward direction.

When torque command is negative, the inverter runs in the reverse direction.

- Torque control frequency upper limit setting（A0-05、A0-06）

When torque is controlled, acc/dec time of the upper frequency limit is set at P8-07 (acc) / P8-08 (dec).

It is used to set the forward or reverse maximum operating frequency of the inverter in the torque control mode.

When the inverter torque is controlled, if the load torque is less than the motor output torque, the motor speed will continue to rise, in order to prevent accidents such as flying in the mechanical system, the maximum speed of the motor during torque control must be limited（A0-05/A0-06）。

If it is necessary to dynamically and continuously change the maximum frequency of torque control, it can be achieved by controlling the upper frequency.

- Torque control: torque acceleration and deceleration time setting（A0-07、A0-08）

In the torque control mode, the difference between the output torque of the motor and the load torque determines the speed change rate of the motor and the load, so the speed of the motor may change rapidly, causing problems such as noise or excessive mechanical stress. By setting the torque control acceleration and deceleration time, the motor speed can be changed smoothly, and the torque acceleration and deceleration time corresponds to the time when the torque increases from 0 to A0-03.

It is not recommended to set the torque acceleration and deceleration time in the torque control of small torque start, and the torque control acceleration and deceleration time is 0.00s when the torque response is required quickly.

For example: two motors are hard connected to drag the same load, in order to ensure that the load is evenly distributed, set up a frequency converter as the main engine, adopt the speed control mode, the other frequency converter is the slave and adopt torque control, the actual output torque of the host is used as the torque command of the slave, the torque of the slave needs to follow the master quickly, then the torque control acceleration and deceleration time of the slave is 0.00s.

6.5.9 Current Loop Parameter Description

parameter	define	default	range	illustrate
P2-13	Excitation adjustment proportional gain	2000	0~60000	It is obtained automatically when the motor parameters are tuned
P2-14	Excitation adjustment integral gain	1300	0~60000	
P2-15	Torque adjustment proportional gain	2000	0~60000	
P2-16	Torque adjustment integral gain	1300	0~60000	

The vector control current loop PI adjustment parameters are divided into two groups: excitation and torque, which are automatically obtained after the complete tuning of the asynchronous machine, and generally do not need to be modified.

It should be reminded that the integration regulator of the current loop does not use the integration time as the dimension, but directly sets the integration gain. The PI gain of the current loop is set too large, which may cause the entire control loop to oscillate, so when the current oscillation or torque fluctuates greatly, the proportional gain or integral gain of the PI can be manually reduced.

6.5.10 Boost for weak magnetic field

parameter	define	default	range	illustrate
A5-05	Voltage over modulation coefficient	105%	100%~110%	maximum output voltage coefficient indicates the ability of the maximum output voltage of inverter to be lifted. Increasing A5-05 can improve the maximum load capacity of the weak magnetic field of the motor, but increase of motor current ripple will increase the heat generation of the motor; On the contrary, the maximum load capacity of motor in the weak magnetic field will decrease, but motor current ripple will be reduced, which will reduce heat generated by motor. Generally, no adjustment is required.
P2-21	Max. torque coefficient of field weakening area	100%	50%~200%	This parameter only takes effect if the motor is running above the rated frequency. When the motor needs to accelerate to more than 2 times the rated frequency of the motor and the actual acceleration time is longer, reduce P2-21 appropriately, and when the speed drops greatly after the motor runs at 2 times the rated frequency, increase P2-21 appropriately, and generally does not need to change.

6.5.11 FVC Operation and Boost Performance

1) There is a speed sensor vector control for simple setting steps

- Simple steps to set up speed control

Table 6-3 Simple steps to set the speed control mode with a speed sensor

Step	parameter	illustrate
Confirm inverter wire correctly	-	If the Err19 fault is reported during the tuning process, check whether the wiring is incorrect, and the motor parameters are set correctly.
Set the motor parameters	P1-01、P1-02、P1-03、P1-04、P1-05	
Set encoder type and wire nums	P1-27、P1-28	If Err20 fault, check encoder and PG card are abnormal.
Select control method	P0-01	-
Motor parameter tuning	P1-37	Dynamic tuning takes a while to complete before proceeding to the next step. Try to choose dynamic full tuning (P1-37=2), the load must be disconnected during dynamic tuning, and the motor will run at high speed. If disengaging the load (e.g. lifting, etc.) is not allowed, select static full tuning (P1-37=3)
Set run and freq commands	P0-02、P0-03	-
Test run	A0-00=0	-

- Simple steps to set up torque control

Table 6-4 Simple setting steps for torque control mode with speed sensor

Step	parameter	illustrate
Confirm inverter wire correctly	-	If the Err19 fault is reported during the tuning process, check whether the wiring is incorrect, and the motor parameters are set correctly.
Set the motor parameters	P1-01、P1-02、P1-03、P1-04、P1-05	
Set encoder type and wire nums	P1-27、P1-28	If Err20 fault, check encoder and PG card are abnormal.
Select control method	P0-01	-
Motor parameter tuning	P1-37	Dynamic tuning takes a while to complete before proceeding to the next step. Try to choose dynamic full tuning (P1-37=2), the load must be disconnected during dynamic tuning, and the motor will run at high speed. If disengaging the load (e.g. lifting, etc.) is not allowed, select static full tuning (P1-37=3)
Set run and freq commands	P0-02	-
Set torque control parameters	A0-00、A0-01、A0-03、A0-05、A0-06、A0-07、A0-08	-
Test run	-	-

2) FVC loop settings

- Speed loop loop settings

• If the motor oscillates or makes abnormal noises below the rated frequency, the speed loop is set too strongly, and the speed loop parameter (i.e Decrease the P2-00 and P2-03 values and increase the P2-01 and P2-04 values).

• During rapid acceleration, if the speed of the system is overshoot greatly, the velocity loop Kp needs to be increased (i.e., P2-00, P2-03 values should be increased).decrease the velocity loop Ki (increase the value of P2-01, P2-04).

• In the case of rewinding and unwinding, the dynamic response of the system is ensured because the reel diameter changes and the reel diameter is inversely proportional to the velocity

In the case of large coil diameter, it is necessary to increase the speed loop gain (i.e., increase the speed loop gain in the low-speed section, increase P2-00, and decrease P2-01).

• In very low-speed operation occasions (such as 0.01Hz operation of milling machine), in order to ensure the smoothness of operation, it is necessary to increase the gain of the speed loop, especially to increase the integral gain of the speed loop (increase P2-00, decrease P2-01).

- In the case of poor encoder feedback, the speed loop should not be set too strong, which will affect the dynamic responsiveness of the system. It is necessary to consider improving the feedback signal of the encoder (such as separating the motor power line from the encoder signal line to confirm whether the system is well grounded), otherwise reducing the speed loop parameters will reduce the dynamic responsiveness of the system and affect the working effect of the system.

- Current loop setting

The current loop parameters are obtained automatically after full tuning and generally do not need to be modified. However, fine-tuning can be made in the following cases.

• The motor FVC oscillates or makes abnormal noises during operation, and there are still slight oscillations or abnormal noises after reducing the speed loop parameters, which can be appropriate reduce the current loop parameters (i.e., P2-13，P2-14，P2-15, P2-16).

• The system requires that the overshoot is small, and the speed loop parameter setting should not be too small, if the motor FVC is running with oscillation or abnormal noise,The current loop parameters can be reduced appropriately (i.e., P2-13，P2-14，P2-15, P2-16).

- Fix the problem that the FVC runs to high speed

In some high-speed (such as above 200Hz) operation, FVC operation oscillation or abnormal operation will occur. If the difference is large (such as more than 4Hz), it will be caused by encoder signal distortion (irregular or abnormal duty cycle) and PG card filtering, and the following processing is required:

• Replace the encoder and check if the encoder is damaged or installed in a problem, and if the encoder brand can support this pulse Frequency.
• Replace the PG card (e.g. PGMD card) to prevent the encoder signal from being distorted during high-speed operation Causing problems with the received signal.

- Improved acceleration and deceleration times in FVC control mode

In the case of rapid acceleration and deceleration, the actual acceleration and deceleration time is larger than the set acceleration and deceleration time, if it is necessary to reduce the acceleration and deceleration time, the following improvement measures can be carried out:

• Reducing the acceleration time of the motor can increase the upper torque limit of FVC control (P2-10 can be increased appropriately, up to 180%). It should be noted that increasing the upper torque limit can improve the acceleration time of the motor, but amplifying the upper torque limit will electrify the motor As the flow increases, it is easier to report faults such as overload.
• Optional suitable braking resistor to reduce deceleration time.

- Limit the bus voltage in FVC control mode to prevent overvoltage faults

In some occasions of large inertia or rapid deceleration, the system is easy to report overvoltage fault during deceleration. (The improvement measures are the same as V/F, and the parameters are shared).

6.5.12 Auxiliary Control

parameter	define	default	range	illustrate
A5-00	DPWM switchover frequency upper limit	8.00Hz	5.00Hz~ 15.00 Hz	Increasing this parameter to the max. frequency will reduce motor audible noise
A5-01	PWM modulation pattern	0	0: Asynchronous modulation 1: Synchronous modulation	When the carrier frequency divided by the operating frequency is less than 10, it will cause the output current oscillation or current harmonic to be large, and it can be adjusted to "synchronous modulation" to reduce electricity The effect of harmonics of streaming.
A5-03	Random PWM depth	0	0: Random PWM invalid 1 to 10	"0" indicates that the random PWM is invalid; If the motor is noisy, the setting value can be adjusted (increase by 1 each time) to improve the motor noise.

6.6 Protection Functions

This section describes the functions associated with the protection of frequency converters and motors.

6.6.1 Enabling Protection

The safety protection function of the frequency converter. If P8-18 is set to 1, you can protect against the following two scenarios:

Situation 1: If the inverter is valid when the inverter is powered on (for example, the terminal is closed before the inverter is powered on), the inverter does not respond to the inverter, and the inverter must be removed once first, and the inverter will respond only after the inverter is effective again.

Situation 2: If the inverter fails to reset the inverter and the inverter does not respond to the inverter, the inverter must be removed first to eliminate the operation protection state.

parameter	define	default	range	illustrate
P8-18	Initiate protection selection	0	0: Not protected 1: protection	This setting to 1 prevents the motor from responding to operating commands when powering on or when a fault is reset without knowing it.

6.6.2 Motor Overload Protection Setting

parameter	define	default	range	illustrate
P9-00	Motor overload protection	1	0: Disabled	There is no motor overload protection function, and it is recommended to heat the relay before the motor at this time;
			1: Enabled	The inverter judges whether the motor is overloaded according to the inverse time curve of the motor overload protection.
P9-01	Motor overload protection gain	1.00	0.20~10.00	If you need to adjust the motor overload current and time, set P9-01.
P9-02	Motor overload pre-warning coefficient	80%	50%~100%	The early warning factor is used to determine the extent to which an early warning is given before the motor is overloaded. The higher the value, the smaller the early warning amount.

In order to effectively protect the motor with different loads, the motor overload protection gain needs to be set according to the motor overload capacity. The motor overload protection is an inverse time curve, and the motor overload protection curve is shown in the following figure:

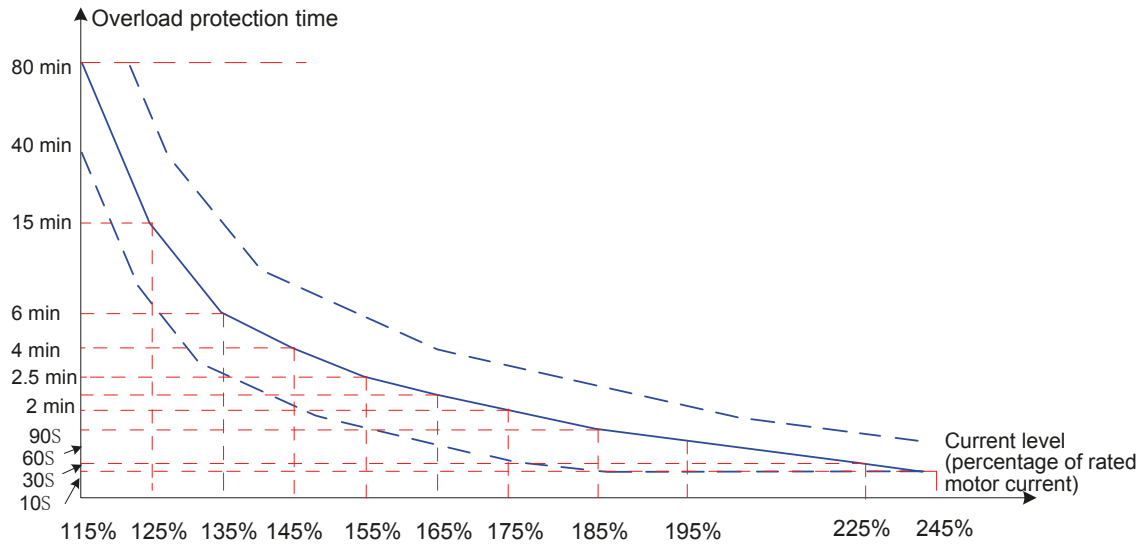


Figure 6-45 Inverse time-lag curve

When the current reaches 175% of the rated current of the motor, it will give an alarm after 2 minutes of continuous operation (Err11);

When the current reaches 115% of the rated current of the motor, it will give an alarm after 80 minutes of continuous operation (Err11);

For example, let's assume that the rated current of the motor is 100A

If P9-01 is set to 1.00, when the motor running current reaches 125% of 100A (125A), after 40 minutes, the inverter will report "Motor Overload Fault (Err11)";

If P9-01 is set to 1.20, when the motor running current reaches 125% (125A) of 100A, after 40*1.2=48 minutes, the inverter reports "motor overload fault (Err11)";

Note: The maximum overload is 80 minutes and the minimum is 10 seconds. Motor overload protection adjustment example: the motor needs to run at 150% motor current for 2 minutes to report overload

From the motor overload graph, it is known that the current of 150% (I) is located in the current range of 145% (I1) and 155% (I2), and the current of 145% is overloaded for 6 minutes (T1) and 155% is overloaded for 4 minutes (T2), and the rated current of 150% of the motor is overloaded for 5 minutes under the default setting. The calculation is as follows:

$$T = T1 + (T2 - T1)*(I - I1)/(I2 - I1) = 4 + (6 - 4)*(150\% - 145\%)/(155\% - 145\%) = 5 \text{ (minutes)}$$

Therefore, it can be concluded that if the motor needs to report overload for 2 minutes at 150% motor current, the "motor overload protection gain" needs to be set to P9-01 = 2 ÷ 5 = 0.4

Note: The user needs to set the value of P9-01 correctly according to the actual overload capacity of the motor, which is too large and prone to the danger of motor overheating damage and the inverter not being protected by alarm in time!

- The motor overload warning coefficient indicates that when the motor overload detection level reaches the set value of this parameter, the multi-function output terminal DO or fault relay (RELAY) outputs the "motor overload pre-warning signal", which is calculated according to the percentage of time that the motor continues to run under an overload point without reporting an overload fault.

For example, when the motor overload protection gain is set to 1.00 and the motor overload warning factor is set to 80%, if the motor current reaches 145% of the rated motor current for 4.8 minutes (80% × 6 minutes), the multi-function output terminal DO or the fault relay RELAY outputs a motor overload warning signal.

- The motor overload warning function is used to give an early warning signal to the control system through DO before the motor overload fault protection. This early warning factor is used to determine the extent to which an early warning is given before the motor is overloaded. The higher the value, the smaller the early warning amount. When the cumulative output current of the inverter is greater than the product of the overload time (Y value of the inverse time curve of motor overload protection) and the "motor overload warning coefficient (P9-02)", the multi-function digital DO of the inverter outputs the effective signal of "motor overload pre-warning". In special cases, when the motor overload warning coefficient P9-02 is set to 100%, the early warning amount is 0, and the pre-alarm and overload protection occur at the same time.

6.6.3 Phase Loss Protection Settings

parameter	define	default	range	illustrate
P9-12	Input phase loss/ precharge relay protection	11	one bit: Input phase loss protection 0: Disabled 1: Enabled Ten bit: Pre-charge relay protection 0: Disabled 1: Enabled	Select whether to protect the input phase loss or contactor pick-up.
P9-13	Output phase loss protection	01	one bit: Output phase loss protection 0: Disabled 1: Enabled Ten bit: Output phase loss protection before running 0: Disabled 1: Enabled	one bit: choose whether to protect the output phase loss, if you select 0 and the actual output phase loss will not report the fault, the actual current is larger than the current displayed on the panel, there is a risk, use with caution Ten bit: It takes about a few seconds to detect the output phase loss during operation, and when there is a risk of starting up after phase loss or low-frequency operation, enabling this function can quickly detect whether there is an output during startup It is recommended not to enable this function when there is a lack of phase, but there are strict requirements for the startup time.

6.6.4 Fault Reset

- The undervoltage fault (Err09) will automatically reset when the bus voltage returns to normal, and is not included in the number of fault automatic resets;
- The short-circuit fault to ground (Err23) cannot be reset automatically or manually, and can only be completely powered off by the inverter and reset after being powered on again;
- After the number of fault automatic resets is reached, the fault action protection selection is executed.

parameter	define	default	range	illustrate
P9-09	Auto reset times	0	0 ~20	When inverter selects fault automatic reset, it is used to set the number of times that can be automatically reset. After this number, the inverter remains in a faulty state.
P9-10	Selection of DO action during auto reset	1	0: Not act 1: Act	If the inverter is equipped with a fault auto-reset function, the fault DO (DO terminal function is selected as 2) during the fault auto-reset period, whether or not it is operated can be set by P9-10.
P9-11	Delay of auto reset	1.0s	0.1s ~100.0s	The waiting time between the inverter fault alarm and the automatic fault reset.

6.6.5 Fault Enabling Protection Selection

parameter	define	default	range	illustrate
P9-47	Fault protection action selection 1	00000	0: Coast to stop 1: Stop according to the stop mode 2: Continue to run one bit: Motor overload (Err11) Ten bit: Input phase loss (Err12) Hundred bit: Output phase loss (Err13) Thousand bit: External fault (Err15) Ten thousand bit: Communication fault(Err16)	-
P9-48	Fault protection action selection 2	00000	one bit: Encoder fault (Err20) 0: Coast to stop 1: Switch over to V/F control, stop according to stop mode 2: Switch over to V/F control, continue to run Ten bit: EEPROM read-write fault (Err21) 0: Coast to stop 1: Stop according to the stop mode Hundred bit: Inverter overload fault action selection (Err10) 0: Coast to stop 1: Stop according to the stop mode Thousand bit: Motor overheat (Err25) Ten thousand bit: Accumulative running time reached (Err26)	When set to 0, the inverter will report an overload fault when it is overloaded, and the output will be blocked at the same time; when set to 1, the inverter will auto reduce the output current to the vicinity of the rated current of the inverter when it is about to be overloaded, so as to avoid the occurrence of overload fault, but the running speed may be reduced or stalled. For lifting loads, set this parameter to 0.

parameter	define	default	range	illustrate
P9-49	Fault protection action selection 3	00000	one bit: User-defined fault 1 (Err27) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Ten bit: User-defined fault 2 (Err28) Hundreds bit: User-defined fault 3 (Err29) Thousands position: Load lost (Err30) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run at 7% of rated motor frequency and restore to the frequency reference if the load recovers Ten thousands position: PID feedback lost during drive running (Err31)	-
P9-50	Fault protection action selection 4	00000	one bit: Too large speed feedback error(Err42) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Ten bit: Motor overspeed (Err43) Hundred bit: Initial position fault (Err51) Thousand bit: Speed feedback fault (Err52) Ten thousand bit: Reserved	-
P9-54	Frequency selection for continuing to run upon fault	0	0: Current running frequency 1: Frequency reference 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency upon abnormality	When a fault occurs during the operation of the inverter, and the handling mode of the fault is set to continue operation, the inverter displays A** and operates at the frequency determined by P9-54
P9-55	Backup frequency upon fault	100.0%	0.0~100.0%（100.0% max. frequency）	

6.6.6 Motor Overheat Protection Options

parameter	define	default	range	illustrate
P9-56	Type of motor temperature sensor	0	0： No sensor 1： PT100 2： PT1000	The motor temperature sensor signal needs to be connected to AI3 and PGND terminals on the YD58IO1 expansion card. Support PT100 and PT1000 motor temperature sensors, The sensor type must be set correctly when in use. The motor temperature value is displayed in U0-34.
P9-57	Motor overheat protection threshold	110°C	0°C ~200°C	When the motor temperature exceeds the motor overheating protection threshold P9-57, the inverter fault alarm (Err45) will be processed according to the selected fault protection action mode (P9-48).
P9-58	Motor overheat pre-warning threshold	90°C	0°C ~200°C	When the motor temperature exceeds the motor overheating pre-alarm threshold P9-58, select the DO terminal of the 39# function (motor overheating pre-alarm) to output a valid signal.

6.6.7 Running instantaneous non-stop(power loss)

The instantaneous stop function allows the system to continue to operate in the event of a short power outage. When the system has a power failure, the inverter makes the motor in the state of power generation, so that the bus voltage is maintained at about "instantaneous stop and non-stop action judgment voltage", so as to prevent the inverter from shutting down due to undervoltage fault caused by too low input voltage. As shown in the figure below:

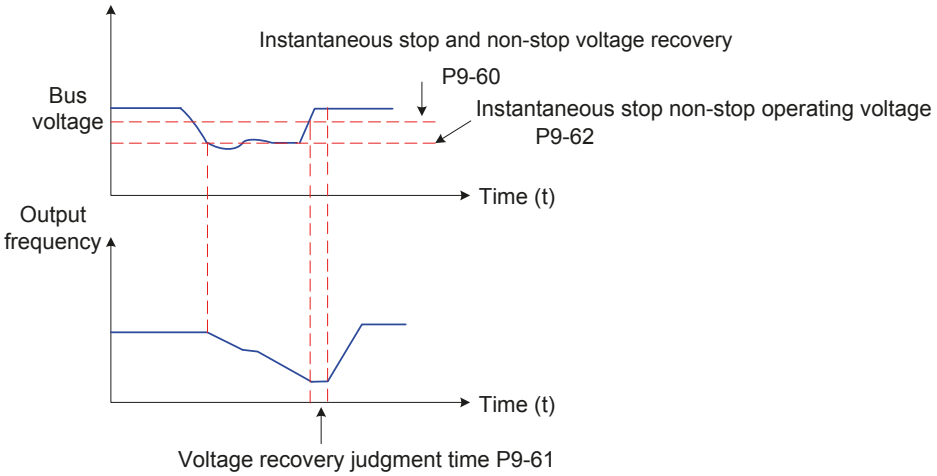


Figure 6-46 Power dip ride-through

parameter	define	default	range	illustrate
P9-59	Power dip ride-through function selection	0	0:Disabled 1: Bus voltage constant control 2:Decelerate to stop	It is recommended to use the "bus voltage constant control" mode for large inertia occasions such as fans, pumps, centrifuges, etc., and the "deceleration and shutdown" mode is recommended for the textile industry.
P9-60	Threshold of power dip ridethrough function disabled	85%	80%~100%	(380V class) 100% 540V compliant
P9-61	Judging time of bus voltage recovering from power dip	0.5s	0.0~100.0s	It is only valid for "bus voltage constant control (P9-59=1)".
P9-62	Threshold of power dip ridethrough function enabled	80%	60%~100%	(380V class) 100% 540V compliant
P9-71	Power dip ride-through gain Kp	0~100	40	It is only effective for "bus voltage constant control (P9-59=1)", if it is easy to under-voltage in the process of instantaneous stopping, please increase Kp and Ki ...
P9-72	Power dip ride-through integral coefficient	0~100	30	
P9-73	Deceleration time of power dip ride-through	0~300.0s	20.0s	Valid only for "Deceleration and Stopping (P9-59=2)" mode

NOTE

- In the "bus voltage constant control" mode, when the power supply is restored to the grid, the output frequency of the inverter will be restored to the target frequency according to the acceleration time;
- In the "Deceleration Stopping" mode, when the grid restores power, the inverter continues to decelerate to 0Hz and shut down until the inverter gives the start command again.

6.6.8 Upper torque

parameter	define	default	range	illustrate
P9-63	Load lost protection	0	0: Disabled 1: Enabled	If the load loss protection function is effective, the output current of the inverter is less than the load loss detection level P9-64, and the duration is greater than the drop detection When the load detection time is P9-65, the inverter performs the load loss protection action (the load loss action can be selected by P9-49, and the default free stop). During the load drop protection, if the load is restored, the drive automatically resumes to operate at the set frequency.
P9-64	Load lost detection level	10.0%	0.0%~100.0%	
P9-65	Load lost detection time	1.0s	0.0~60.0s	

6.6.9 Overspeed Protection

This function is only valid when the inverter is running with a speed sensor vector control (P0-01=1).

parameter	define	default	range	illustrate
P9-67	Overspeed detection level	20.0%	0.0%~50.0% (max. frequency)	When the inverter detects that the actual speed of the motor exceeds the maximum frequency (P0-10), the excess value is greater than the overspeed detection value P9-67, and the duration is greater than the overspeed detection time P9-68, the inverter fault alarm Err43 is processed according to the fault protection action mode (P9-50). When P9-68 is set to 0.0s, the overspeed fault detection is canceled.
P9-68	Overspeed detection time	1.0s	0.0s~60.0s	

6.6.10 Protection excessive speed deviation

This function is only valid when the inverter is operating with a speed sensor vector control.

parameter	define	default	range	illustrate
P9-69	Detection level of speed error	20.0%	0.0%~50.0% (max. frequency)	When the inverter detects that the actual speed of the motor deviates from the set frequency, and the deviation is greater than the detection value (P9-69) of the excessive speed deviation, and the duration is greater than the detection time (P9-70) of the excessive speed deviation, the inverter fault alarm Err42 is handled, and it is handled according to the fault protection action mode (P9-50). When P9-70 is set to 0.0s, the fault detection of excessive speed deviation is canceled.
P9-70	Detection time of speed error	5.0s	0.0s~60.0s	

6.6.11 Under Overvoltage 、 Current limit protection

parameter	define	default	range	illustrate
A5-06	Undervoltage threshold	350V	210~420V	When the bus voltage exceeds the set value of A5-06/A5-09, the inverter fault alarm (Err09/Err05~07)
A5-09	Overvoltage threshold	820V	650V~820V	
A5-04	Overcurrent fast prevention	1	0: Disabled 1: Enabled	It is recommended to turn off this function in lifting occasions such as lifting.

6.7 Monitoring

The monitoring function is to display the status of the inverter on the LED display area of the inverter. There are two ways to view monitoring parameters:

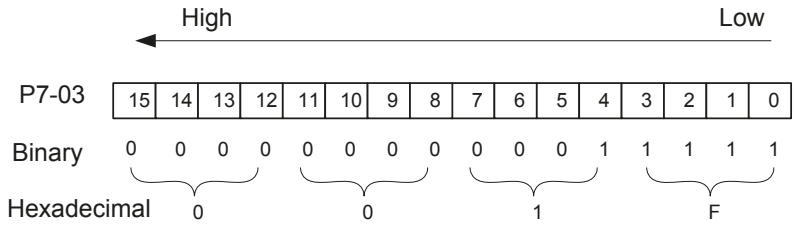
1) In the shutdown or running state, you can use the ▷ keys on the operation panel to switch each byte of the parameters P7-03, P7-04, and P7-05 to display multiple status parameters.

There are 32 running state parameters in the running state, and the parameters P7-03 (running display parameter 1) and P7-04(running display parameter 2) select whether the corresponding parameter of each parameter is displayed according to the binary bits. There are 13 shutdown state parameters in the shutdown state, and the corresponding parameters of each parameter are selected by parameter P7-05 (shutdown display parameter) according to the binary bits.

For example, you want to monitor the parameters in the operating state through the panel: (operating frequency, bus voltage, output voltage, output current, output power, PID setting).

- Set the corresponding bit to 1 according to the correspondence of each byte in parameter P7-03 (running display parameter 1) to the above parameters.
- Convert this binary number to hexadecimal and set it to P7-03. (See below for binary to hexadecimal method)

- Use the key on the operation panel to toggle each byte of parameter P7-03 to view the value of the relevant parameter. The settings are shown in the following figure:



The method of viewing other monitoring parameters is the same as that of P7-03. The correspondence of each byte of the monitoring parameter in P7-03, P7-04, and P7-05 is as follows:

parameter	define	default	range	illustrate
P7-03	LED display running parameters 1	1F	0000~FFFF	If you need to display the following parameters during operation, set the corresponding position to 1, convert the binary number to hexadecimal and set it to P7-03. low-8bit 7 6 5 4 3 2 1 0 Run frequency 1 (Hz) Set frequency (Hz) Bus voltage (V) Output voltage (V) Output current (A) Output power (kW) Output torque (%) DI state (V) high-8bit 15 14 13 12 11 10 9 8 DO state AI1 voltage (V) AI2 voltage (V) AI3 voltage (V) Count value Length value Load speed display PID reference Note: The shaded part is the default factory display.
P7-04	LED display running parameters 2	00	0000~FFFF	If you need to display the following parameters in operation, set the corresponding position to 1, and set the binary number to P7-04 after converting it to hexadecimal. low-8bit 7 6 5 4 3 2 1 0 PID feedback PLC stage Pulse reference (kHz) Run frequency 2 Remaining running time AI1 voltage before correction AI2 voltage before correction AI3 voltage before correction high-8bit 15 14 13 12 11 10 9 8 Motor speed Current power-on time (H) Current running time (Min) Pulse reference (Hz) Communication reference Encoder feedback speed (Hz) Main frequency display (Hz) Auxiliary frequency display (Hz)

parameter	define	default	range	illustrate
P7-05	LED display stop parameters	33	0000~FFFF	If the following parameters need to be displayed during shutdown, set their corresponding position to 1, and set the binary number to P7-05 after converting it to hexadecimal. low-8bit: 7 6 5 4 3 2 1 0 Set frequency (Hz) Bus voltage (V) DI state DO state AI1 voltage (V) AI2 voltage (V) AI3 voltage (V) Count value high-8bit: 15 14 13 12 11 10 9 8 Length value PLC stage Load speed PID reference Pulse reference (kHz) Reserved Reserved Reserved Note: The shaded part is the default factory display.

NOTE

- Once the AC drive is re-powered on after power down, the display includes the selected parameters before power down by default.
- If parameters to be monitored cannot be found in P7-03、P7-04、P7-05, view them in group U0

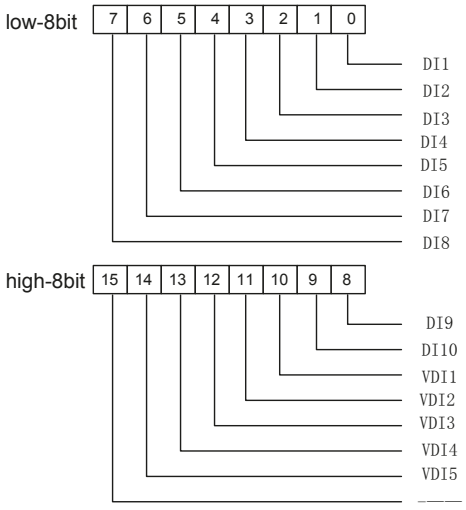
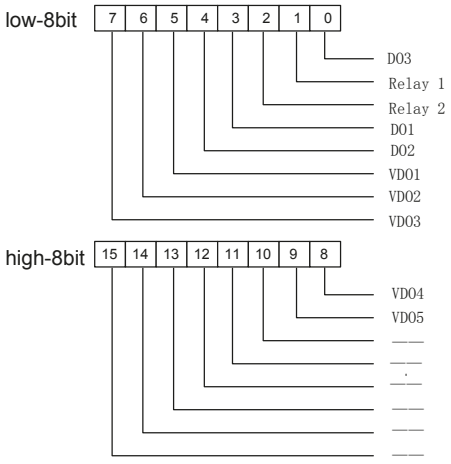
Binary to Hexadecimal Conversion Method:

· Binary numbers, from right to left, correspond to one hexadecimal number for every four digits. If the highest digit is less than four digits, 0 is used to make up. Then convert each four-digit binary into decimal respectively, 0000~1111 corresponds to 0~15 in decimal and 0~F in hexadecimal. According to the correspondence between decimal and hexadecimal, convert decimal to the corresponding hexadecimal. (See the table below for the correspondence)

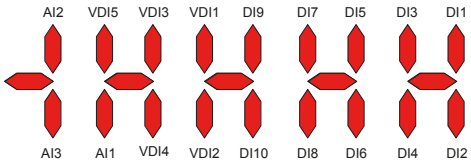
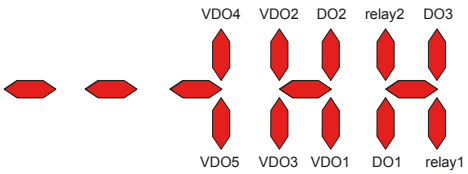
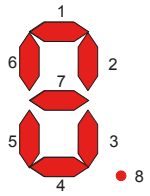
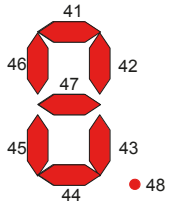
For example, 011 1101 1111 1001 can be divided into 0011 1101 1111 1001 and the hexadecimal number is obtained by looking up the following table 3DF9。

Binary	1111	1110	1101	1100	1011	1010	1001	1000	0111	0110	0101	0100	0011	0010	0001	0000
decimal	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
hexadecimal	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0

2) Use the operation panel to enter the U0 group of parameters and view the monitoring parameters. (For more information on how to operate the panel, please refer to "Chapter 4 Panel Usage"), and the monitoring parameters shown below are only readable.

parameter	define	default	range	illustrate
U0-00	Run frequency	0.01Hz	0.00~500.00Hz	Display absolute value of operating frequency of inverter.
U0-01	Set frequency	0.01Hz	0.00~500.00Hz	Display absolute value of setting frequency of inverter.
U0-02	Bus voltage	0.1V	0.0V~3000.0V	Display the bus voltage value of the inverter
U0-03	Output voltage	1V	0V~1140V	Display output voltage value of inverter during operation
U0-04	Output current	0.01A	0.00A~655.35A (drive power≤ 55kW) 0.0A~6553.5A (drive power >55kW)	Display output current value of inverter during operation
U0-05	Output power	0.1kW	0~32767	Display output power value of inverter during operation
U0-06	Output torque	0.1%	-200.0%~200.0%	Display output torque value of inverter during operation. The 100% base is rated torque of motor
U0-07	DI state	1	0x0000~0x7FFF	Displays the current DI terminal input status value. When converted to binary data, each bit corresponds to a DI input signal. 1 means the input is high, and 0 means the input is low. The correspondence between each bit and the input terminal is as follows: 
U0-08	DO state	1	0x0000~0x03FF	Displays the current DO terminal output status value. When converted to binary data, each bit corresponds to a DO output signal. 1 indicates an output high level and 0 indicates an output low level. The correspondence between each bit bit and the output terminal is as follows: 
U0-09	AI1 voltage (V)	0.01V	0.00V~10.57V	
U0-10	AI2 voltage (V)/ current (mA)	0.01V /0.01mA	0.00V~10.57V 0.00mA~20.00mA	The voltage input or current input can be selected by jumper cap J9 on the control board
U0-11	AI3 voltage (V)	0.01V	0.00V~10.57V	-

parameter	define	default	range	illustrate
U0-12	Count value	1	1~65535	The count value is displayed in the count function
U0-13	Length value	1	1~65535	The length value is displayed in the cut-to-length function
U0-14	Load speed display	Up to O1-08 bits	0~ Rated speed of the motor	Display the load speed
U0-15	PID reference	1	0~65535	PID setting = PID setting (%) * PA-04 (PID given feedback range)
U0-16	PID feedback	1	0~65535	PID feedback = PID feedback (%) * PA-04 (PID given feedback range)
U0-17	PLC stage	1	0~15	A total of 16 speeds
U0-18	Pulse reference	0.01kHz	0.00kHz~100.00kHz	Display DI5 high-speed pulse sampling frequency
U0-19	Feedback speed	0.01Hz	-500.0Hz~500.0Hz (P7-12 ten bit=1)	When parameter P7-12 ten bit (the number of decimal places displayed at the load speed) is set to 1, the number of decimal points of U0-19 is 1, and the display range is -500.0Hz~500.0Hz.
			-320.00Hz~320.00Hz (P7-12 ten bit=2)	When the ten-bit of parameter P7-12 is set to 2, U0-19 The number of decimal points is 2, and the display range is -320.00Hz~320.00Hz
U0-20	Remaining running time	0.1Min	0.0~6500.0Min	Displays the remaining run time when the scheduled run
U0-21	AI1 voltage before correction	0.001V	0.000V~10.570V	Display actual value of the analog input Voltage/ current. The actual voltage/current used is linearly corrected to make the sample voltage/current deviate from the actual input voltage/current to a smaller extent. The actual corrected voltage/ current used is shown for U0-09, U0-10, and U0-11.
U0-22	AI2 voltage (V)/ current (mA) before correction)	0.001V /0.01mA	0.000V~10.570V 0.000mA~20.000mA	
U0-23	AI3 voltage before correction	0.001V	-10.570V~10.570V	
U0-24	Motor speed	1RPM	0~ motor rated speed	Display current operate speed of the motor
U0-25	Current power-on time	1Min	0Min~65000Min	-
U0-26	Current running time	0.1Min	0.0Min~6500.0Min	-
U0-27	Enter the pulse frequency	1Hz	0~65535Hz	Display the DI5 high-speed pulse frequency, which is the same data as U0-18, but in different units.
U0-28	Communication setpoint	0.01%	-100.00%~100.00%	Displays the data written through the mailing address 0x1000. The percentage base is determined by the set value of the address 0x1000.
U0-29	The encoder feedback speed	0.01Hz	-320.00Hz~320.00Hz (P7-12 ten bit= 2)	Display actual motor operate frequency measured by encoder. When the P7-12 ten bit is set to 2, the number of decimal points of U0-29 is 2, and the display range is -320.00Hz~320.00Hz;
			-500.0Hz~500.0Hz (P7-12 ten bit= 1)	When the P7-12ten digit is set to 1, the number of decimal points of U0-29 is 1, and the display range is -500.0Hz~500.0Hz.
U0-30	Main frequency display	0.01Hz	0.00Hz~500.00Hz	Display master frequency setpoint
U0-31	Auxiliary frequency display	0.01Hz	0.00Hz~500.00Hz	Display auxiliary frequency setpoint
U0-34	Motor temperature value	1°C	0°C ~200°C	Displays the motor temperature value sampled by AI3. For motor temperature detection, see P9-56 (Motor Temperature Sensor Type).
U0-35	Target Torque (%)	0.1%	-200.0%~200.0%	Display the current upper torque setting value, and the percentage base is the rated torque of the motor
U0-36	Resolver position	1	0~4095	Displays the signal of the current position of the resolver
U0-37	Power factor angle	0.1°	——	Displays the angle of the power factor that is currently running

parameter	define	default	range	illustrate
U0-38	ABZ position	1	0~65535	Displays the current ABZ or UVW encoder Z-phase pulse count. This value is the number of pulses after 4 frequency octave, if it is displayed as 4000, the actual number of pulses traveled by the encoder is 4000/4=1000 When the encoder rotates forward, the value self-increases, when the encoder is reversed, the value decreases, and when it increases to 65535, it starts counting from 0 again number, restarting the count from 65535 when it is reduced to 0. Look at this value to determine if the encoder is installed properly
U0-39	Target voltage upon V/F separation	1V	0V~ Motor rated voltage	Display target output voltage when running in the V/F split state
U0-40	Output voltage upon V/F separation	1V	0V~ Motor rated voltage	Display actual output voltage when running in the V/F split state
U0-41	DI state display	1	——	DI status display: bright is high, off is low, see 6.9.5 details of AI status 
U0-42	DO state display	1	——	DO status display: bright is high, off is low 
U0-43	DI set for function state display 1 （fun 01-40）	1	——	Displays whether terminal function 1~40 is valid. The keyboard has a total of 5 digital tubes, and the digital tubes represent functions 1~8, 9~16, 17~24, 25~32, and 33~40 respectively from right to left. Each digital tube can represent 8 function options, which are defined as follows: Figure: DI terminal function display: bright is high, off is low 
U0-44	DI set for function state display 1 （fun 41-80）	1	——	Displays whether terminal function 41~59 is valid. The keyboard has a total of 5 digital tubes, and the digital tubes represent functions from right to left 41~48、49~56、57~59. Each digital tube can represent 8 function options, and the definition of digital tube is as follows: The DI terminal function displays: on is high, off is low 
U0-45	Fault information	1	0~51	Displays the fault code of the drive section

parameter	define	default	range	illustrate
U0-58	Phase Z counting	1	0~65535	Displays the current ABZ or UVW encoder Z-phase pulse count. When the encoder rotates forward or reversed, the corresponding value is added by 1 or minus 1, and the value can be checked to check whether the encoder is installed Normal
U0-59	Setting frequency (%)	0.01%	-100.00%~100.00%	Displays the current set frequency, the 100% base is the maximum frequency of the inverter (P0-10)
U0-60	Running frequency (%)	0.01%	-100.00%~100.00%	Displays the current run frequency, the 100% base is the maximum frequency of the inverter (P0-10)
U0-61	drive state	1	Bit1 Bit0	0: Stop 1: Forward 2: Reverse
			Bit3 Bit2	0: constant speed, 1: acceleration, 2: deceleration
			Bit4	0: bus voltage is normal 1: voltage is undervoltage
U0-62	Current fault code	1	0~99	Displays the current fault code, 2 for Err02
U0-63	Sending value of point-point communication	0.01%	-100.0%~100.0%	Display value of torque set by the host when the point-to-point communication is effective, and the 100% base rated torque of motor
U0-64	Number of slaves	1	0~63	Display the number of online slaves that can be viewed by the master
U0-65	Torque upper limit	0.1%	-200.0%~200.0%	Display upper limit of the current given torque, with the 100% base on rated speed of motor
U0-76	Low bit of acc-power consumption	0.1 °	0.0~999.9	The maximum power consumption can be recorded to 65535999.9 kWh, which is sufficient The full power range is used for more than 10 years, the accuracy is 0.1 degrees, and it is displayed by the combination of two parameters: U0-76, U0-77, and U0-76 the low position is displayed, and U0-77 shows the high position, and the conversion relationship is as follows: cumulative power consumption = u0-77 * 10000 + u0-66 Low power and ensure no overflow, compatible with old customers to read the cumulative power consumption P7-14, high power machine customers can directly read the value of U0-77, U0-76
U0-77	High bit of acc-power consumption	1 °	0~65535	

6.8 Process Function

This section mainly introduces the two commonly used process functions of fixed-length control and counting

6.8.1 Fixed-length control function

YD580E has a fixed-length control function, the length pulse can only be collected with the DI5 terminal, and the DI5 terminal function selection should be set to 27 (length count input).

parameter	define	default	range	illustrate
Pb-06	Set length	1000m	0m~65535m	-
Pb-07	Actual length	0m	0m~65535m	The actual length is the monitored value Actual length (P1-07) = number of pulses sampled by the terminal / number of pulses per meter (P1-08)
Pb-08	Number of pulses per meter	100.0	0.1~6553.5	-

In the figure below, the actual length is the monitoring value, and the actual length (Pb-07) = the number of pulses sampled by the terminal / the number of pulses per meter (Pb-08). When the actual length (Pb-07) is greater than the set length (Pb-06), the relay or DO output terminal "lengths arrive" at the ON signal (function selection is 10). During cut-to-length control, the length can be reset via the multi-function DI terminal (DI function set to 28). The specific settings are shown in the following figure:

parameter	define	default	illustrate
P4-04	DI5 terminal function selection	27	Length count input
P4-00~P4-09 (one of them)	DI1~DI10 Terminal function selection	28	Length reset
P5-01~P5-05 (one of them)	Terminal output function selection	10	The length arrives

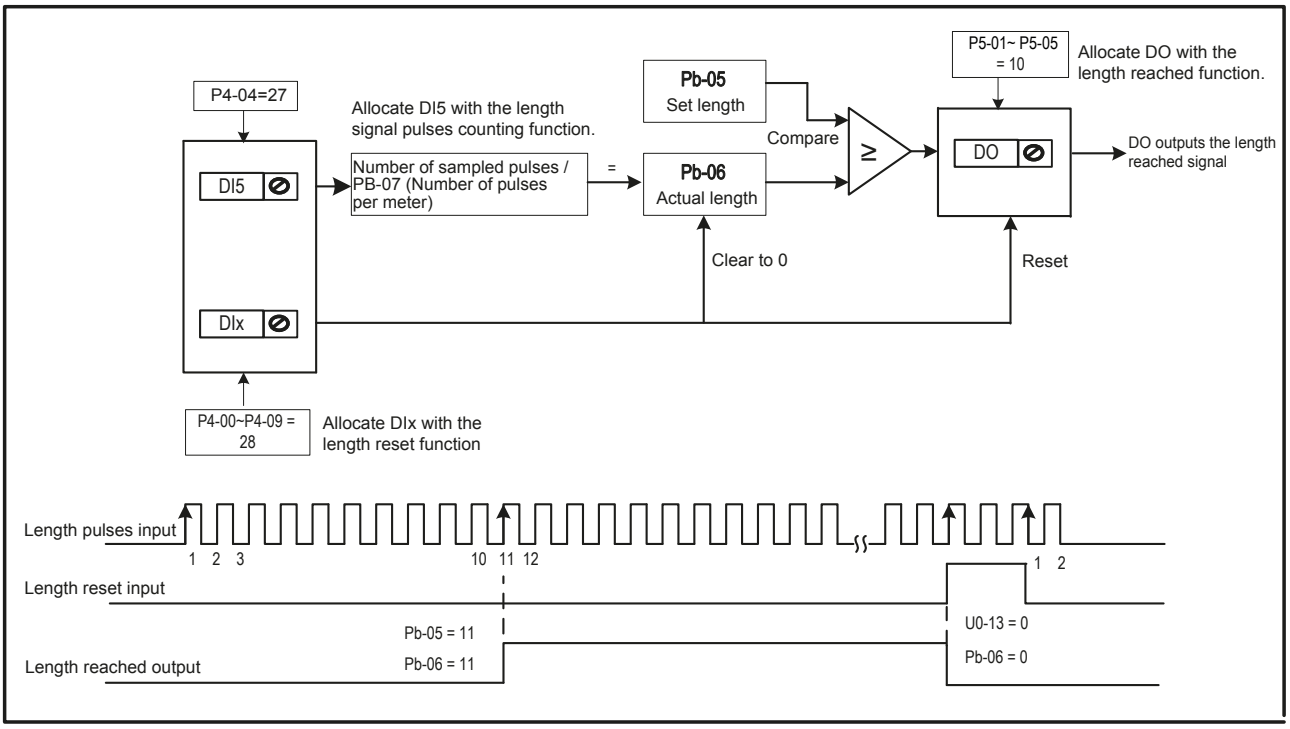


Figure 6-47 Fixed length control

The direction cannot be recognized in the fixed-length control mode, and the length can only be calculated based on the number of pulses.
An automatic shutdown system can be made by feeding back the output T/A-T/B output signal of the relay (RELAY) that reaches the length to the inverter shutdown input terminal.

6.8.2 Counting function

The count value needs to be collected via the DI terminal (at high pulse frequencies, the DI5 port must be used) and the DI terminal function is set to 25 (counter input).

parameter	define	default	range	illustrate
Pb-08	Set count value	1000	1~65535	-
Pb-09	Designated count value	1000	1~65535	The specified count value Pb-09 should not be greater than the set count value Pb-08

In the figure below, the count value needs to be collected by the DI terminal, and the DI terminal function needs to be set to 25 (counter input)

If the count value reaches the set count value (P1-09), the multi-function digital DO outputs the ON signal "The set count value has arrived".

If the count value reaches the specified count value (P1-10), the multi-function digital DO outputs the "Specified Count Value Arrived" ON signal

parameter	define	default	illustrate
P4-00~P4-09（one of them）	DI1~DI10 Terminal function selection	25	Counter input
P4-00~P4-09（one of them）	DI1~DI10 Terminal function selection	26	Counting reset
P5-01~P5-05（one of them）	Terminal function selection	8	Set counting value reached
P5-01~P5-05（one of them）	Terminal function selection	9	Designated counting value reached

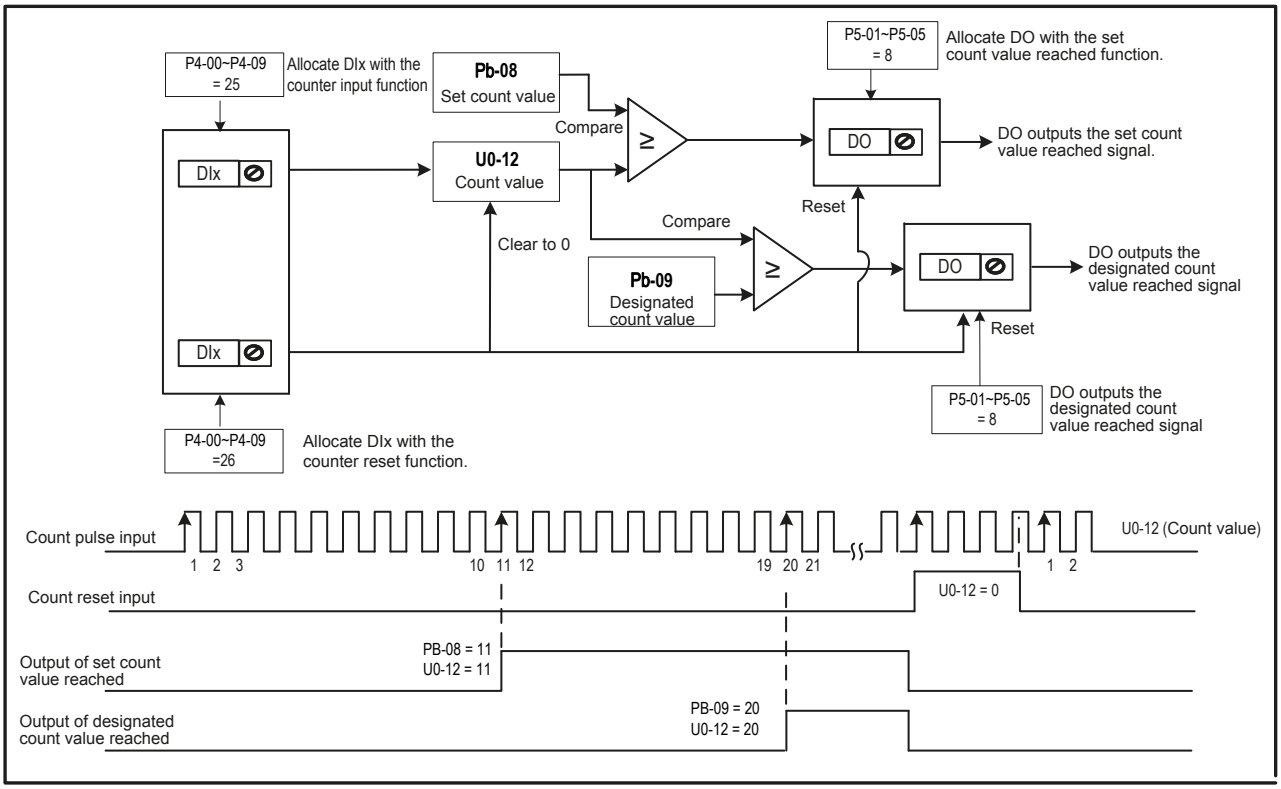


Figure 6-51 Counting function

At higher pulse frequencies, the DI5 port must be used;
The DO ports of Set Count Arrival and Specified Count Arrival cannot be reused.
In the RUN/STOP state of the inverter, the counter will continue to count until the "set counting value" arrives.
The count value can be held in power failure;
The count reaches the DO output signal and feeds back to the inverter shutdown input terminal, which can be made into an automatic shutdown system.

6.8.3 Second motor parameter

YD580E inverter supports two sets of motor parameter switching, motor 1 parameter corresponds to P1 group parameters, motor 2 corresponds to A2 group parameter. There are two ways to switch the parameters of the first motor and the second motor:

1) Select the current effective motor parameter group by setting the parameter P0-24 (motor parameter group selection).

parameter	define	default	range	illustrate
P0-24	Motor parameter group selection	0	0：Motor Parameter Group 1	Select Motor Parameter Group 1
			1：Motor Parameter Group 2	Select Motor Parameter Group 2

2) Select the current valid motor parameter group through the DI terminal function

DI1~DI10 (P4-00~P4-09), select one of the DI terminals arbitrarily, and set the function to 41 (motor selection terminal 1).

If the DI terminal is invalid, motor parameter group 1 is selected, and if the DI terminal is valid, motor parameter group 2 is selected.

parameter	define	value	illustrate
P4-00~P4-09	DI1~DI10 terminal function selection	41	Motor selection terminal 1

If any of the DI terminals in P4-00~P4-09 is set to 41, then the DI terminals preferentially determine which group of motors to choose, and the motor selection is not related to the parameter P0-24. Only when all DI terminals of P4-00~P4-09 are not set to 41, then the motor parameter selection is determined by P0-24 (motor parameter group selection).

3） Motor 2 parameters are as follows:

parameter	define	default	range	illustrate
A2-00	Motor type	0	0	General asyn-motors
			1	Inverter asyn-motors
		2	2	Inverter syn-motors
A2-01	Rated power	Model	0.1kW~1000.0kW	A2-01~ A2-05 is the motor nameplate parameter. When V/F control or vector control is employed In order to obtain better control performance, it is necessary to tune the motor parameters, and the accuracy of the adjustment results is closely related to the correct setting of the motor nameplate parameters.
A2-02	Rated voltage	Model	1V~2000V	
A2-03	Rated current	Model	0.01A~655.35A(drive power≤ 55kW) 0.1A~6553.5A(drive power >55kW)	
A2-04	Rated frequency	Model	0.01Hz~ max. frequency	
A2-05	Rated speed	Model	1rpm~65535rpm	
A2-06	Stator resistance	Model	0.001Ω~65.535Ω(drive power≤ 55kW) 0.0001Ω~6.5535Ω(drive power >55kW)	A2-06~A2-10 is the parameter of the asynchronous motor, which can be obtained by motor tuning Static tuning 1 can only obtain three parameters: A2-06~A2-08, In addition to A2-06~A2-10, the encoder phase sequence A2-30 can also be obtained by dynamic tuning. If the motor is not tuned on site, the above corresponding parameters can be input according to the parameters provided by the motor manufacturer.
A2-07	Rotor resistance	Model	0.001Ω~65.535Ω(drive power≤ 55kW) 0.0001Ω~6.5535Ω(drive power >55kW)	
A2-08	Leakage inductive reactance	Model	0.01mH~655.35mH(drive power ≤**55kW)** 0.001mH~65.535mH(drive power >55kW)	
A2-09	Mutual inductive reactance	Model	0.1mH~6553.5mH(drive power≤ 55kW) 0.01mH~655.35mH(drive power >55kW)	
A2-10	No-load current	Model	0.01A~P1-03(drive power≤ 55kW) 0.1A~P1-03(drive power >55kW)	
A2-27	Encoder pulses per revolution	1024	1~65535	Set the number of pulses per revolution of the encoder. In FVC mode, the number of encoder pulses must be set correctly, otherwise the motor will not run properly.
A2-28	Encoder type	0	0: ABZ incremental 2: Resolver 1: UVW incremental 4: UVW Wire-saving	The A2-28 should be set correctly according to the actual situation, otherwise the inverter may not operate properly.
A2-30	A/B phase sequence of ABZ incremental encoder	0	0: Forward 1: Reverse	0: Phase A is ahead when the motor is spinning (Phase B is ahead when the motor is reversed) 1: When the motor is rotating forward, phase B is ahead (Phase A is ahead when the motor is reversed)
A2-31	Encoder installation angle	0.0°	0.0° ~359.9°	-
A2-34	Number of pole pairs of resolver	1	1~65535	When using a resolver, the pole pair parameters must be set correctly
A2-36	Speed feedback PG disconnection detection time	0.0s	0.0s：Do not act 0.1s~10.0s	It is used to set the detection time of encoder disconnection fault, when set to 0.0s, the inverter does not detect encoder disconnection fault.When the inverter detects a disconnection fault that lasts longer than the A2-36 setup time, the inverter alarms Err20.
A2-37	Asyn-Motor auto-tuning method selection	0	0：Do not act	-
			1：Static tuning (some parameters)	Only identify the stator resistance, rotor resistance, and leakage inductance of the motor parameters
			2：Dynamic Tuning (Full Parameter)	Identify all motor parameters
			3：Static Tuning (Full Parameter)	Identify all motor parameters

parameter	define	default	range	illustrate
A2-16	Stator resistance of synchronous motor	on model	0.001Ω~65.535Ω(drive power≤ 55kW) 0.0001Ω~6.5535Ω(drive power >55kW)	A2-16~A2-20 is parameter of synchronous motor, which can be obtained by tuning. the static part of tuning can only obtain A2-16~A2-18 , and dynamic tuning can obtain A2-16~A2-20, and the encoder phase sequence A2-30 can also be obtained. If the motor is not tuned on site, the above corresponding parameters can be input according to the parameters provided by the motor manufacturer.
A2-17	D-axis inductance of synchronous motor	on model	0.01mH~655.35mH(drive power≤ 55kW) 0.001mH~65.535mH(drive power >55kW)	
A2-18	Q-axis inductance of synchronous motor	on model	0.01mH~655.35mH(drive power≤ 55kW) 0.001mH~65.535mH(drive power >55kW)	
A2-20	Counter electromotive force of synchronous motor	on model	0.0V~6553.5V	

parameter	define	default	range	illustrate
A2-37	Syn-Motor auto-tuning method selection	0	00： No auto-tuning	does not work
			11： Static auto-tuning 1	Only Stator resistance, rotor resistance, leakage inductance
			12： Dynamic auto-tuning	Identify all motor parameters, and confirm encoder parameters in FVC control mode (A2-27~ A2-36)
			set parameters by panel	Enter the parameters of the synchronous motor itself A2-16 ~ A2-20

NOTE

- Note: Please refer to the "Appendix A OR B Function Parameter Table" for other parameters of motor 2, and the specific use is consistent with the "Vector Control Parameters of the First Motor of P2 Group", that is, the functions of A2-38~A2-61 and P2-00~P2-23 are used consistently, please refer to them before use.

6.8.4 User Programmable Multifunction Card Functions

The user-programmable multi-function card is connected to the inverter, which can be easily and quickly controlled by PLC programming to adapt to various process needs. For the specific use of this card, please refer to the "Programmable Multi-function Expansion Card User Manual" for details, and its function needs to be realized with the A7 group parameters of the inverter.

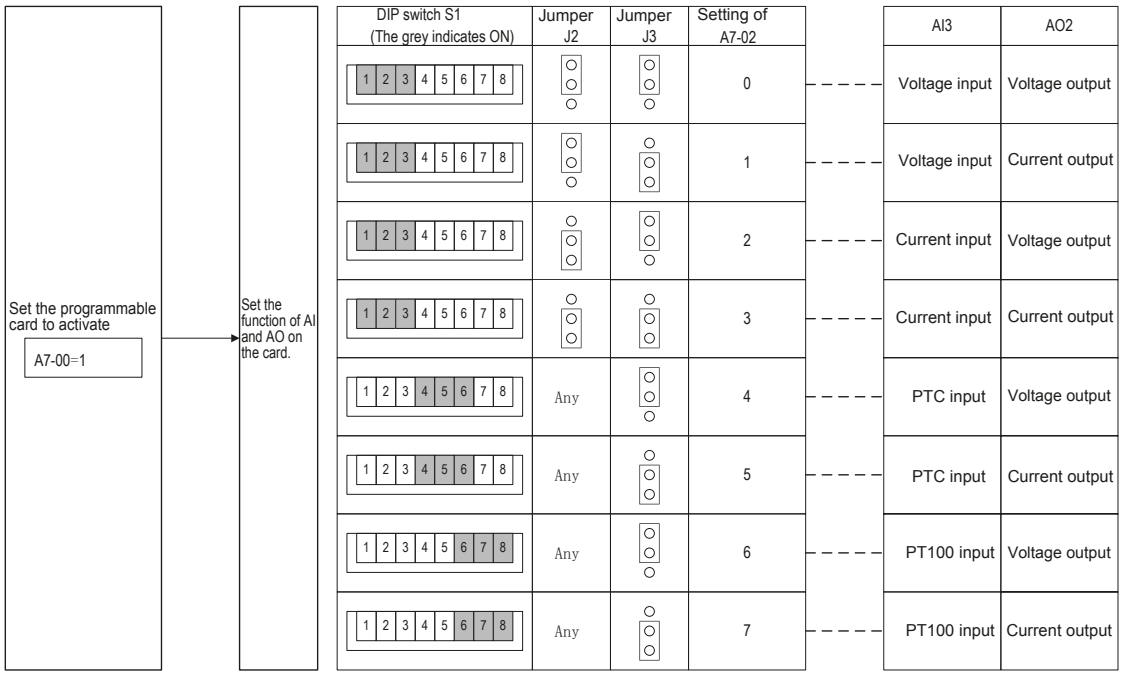


Figure 6-49 User programmable function 1

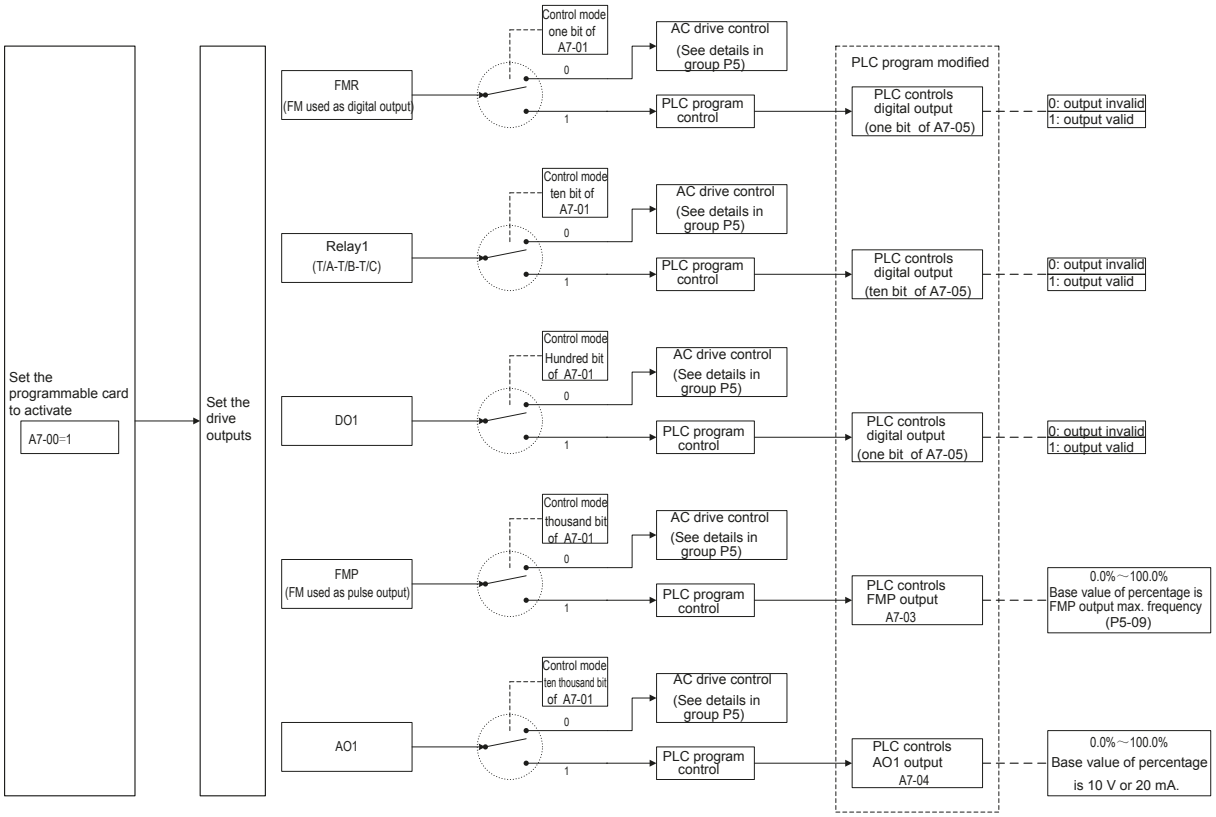


Figure 6-50 User programmable function 2

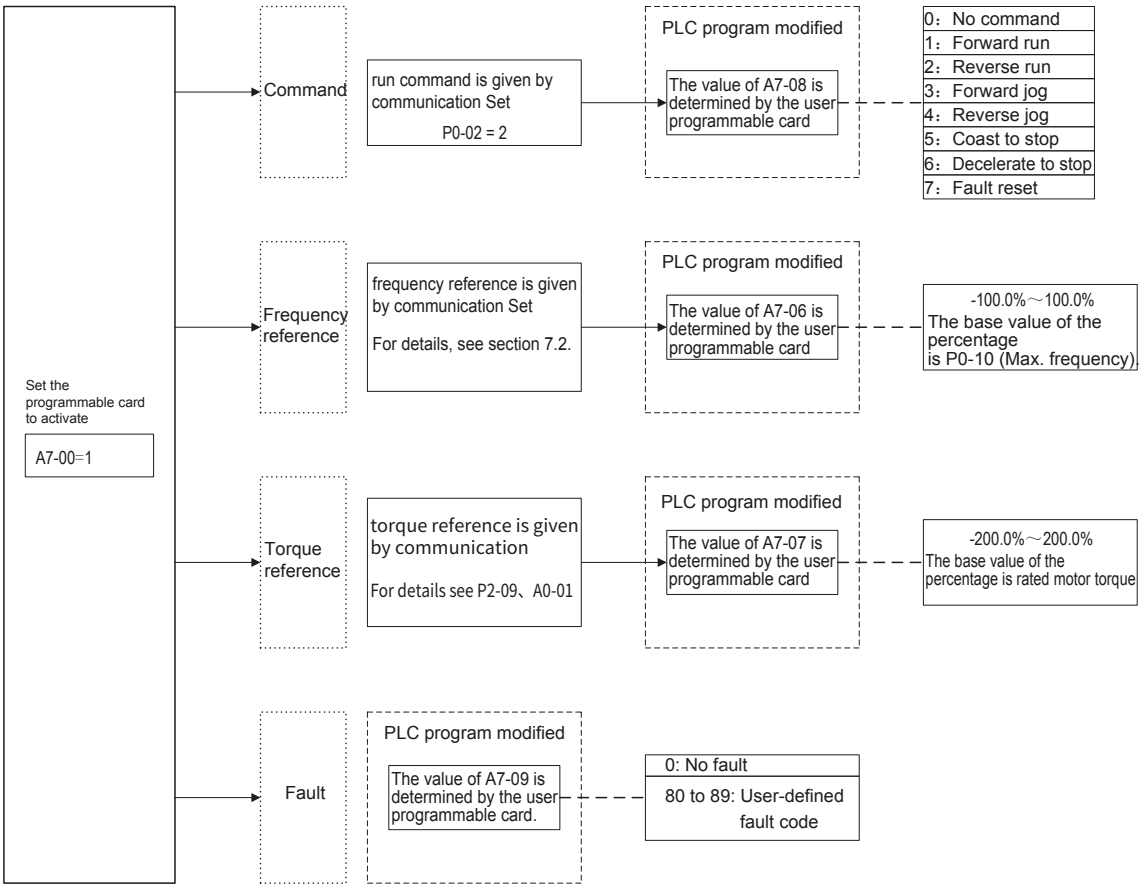


Figure 6-51 User programmable function 3

1） Set whether user programmable card is valid.

parameter	define	default	range	illustrate
A7-00	User programmable function selection	0	0：Disabled	Turn off the interface to the programmable card
			1：Enabled	Turn on the interface to the programmable card

2） Set AI3 and AO2 function on user programmable card

The programmable card is extended with an analog input terminal AI3 and an analog output terminal AO2. It is necessary to set the DIP switch S1, jumper J2 and J3 on the programmable card, and then set A7-02 to correspond; these two settings must be consistent, otherwise the signal transmission and reception data will be abnormal. For details of how to set up, please refer to the User Manual of YD58PC Programmable Multifunction Expansion Card.

parameter	define	default	range	illustrate		
A7-02	User programmable card AI3 and AO2 function selection	0	0~7		AI3	AO2
				0	voltage input	voltage output
				1	voltage input	current output
				2	current input	voltage output
				3	current input	current output
				4	PTC input	voltage output
				5	PTC input	current output
				6	PT100 input	voltage output
				7	PT100 input	current output

3） Set the AC drive output signals

When the programmable card is set to active (A7-00=1), the control source of the inverter output terminal (FMR, relay, DO1, FMP, AO1) is set through parameter H6-02. When the control source of one of the output terminals is set to "PLC Program Control", the actual output of the terminal is determined by the value in the corresponding parameter (A7-03/A7-04/A7-05). The corresponding parameters can be changed by the user through the PLC program (A7-03/A7-04/A7-05) to control the output terminals.

parameter	define	default	range	illustrate
A7-01	Control board output terminal control mode selection	00000	00000~11111	one bit：FMR (FM used as digital output) ten bit：Relay (T/A-T/B-TC) Hundreds bit：DO1 Thousands bit：FMP (FM used as pulse control) Ten Thousands bit：AO1 0：drive control 1：User programmable card control
A7-03	FMP output	0.0%	0.0%~100.0%	When the FMP is set to PLC program control (A7-01 Thousands bit=1), the output of the FMP can be controlled by changing the value of A7-03, and its percentage base is the maximum frequency of the FMP output P5-09.
A7-04	AO1 output	0.0%	0.0%~100.0%	When AO1 is set to PLC program control(A7-01 Thousands bit=1), the AO1 output is controlled by changing the value of A7-04 with a percentage base of 10V (voltage signal) or 20mA (current signal).

parameter	define	default	range	illustrate
A7-05	digital output	000	000~111	When the switching output (FMR/ relay/DO1) is set to PLC program control (A7-01 one bit/ten bit/ hundred bit=1), the switching output state is controlled by changing the value of A7-05. one bit：FMR 0: Disabled 1: Enabled ten bit：Relay 0: Disabled 1: Enabled hundred bit：DO1 0: Disabled 1: Enabled

4） Set command reference

When the programmable card is set to valid (A7-00=1) and the operation instructions are given by the communication mode (PP-02=2), the operation of the inverter is controlled by the value of parameter A7-08. The user PLC program changes the value of parameter A7-08 by operating the corresponding D element, thus controlling the operation of the frequency converter.

parameter	define	default	range	illustrate
A7-08	Programmable card commands given	0	0~7	0：no command 1：FWD 2：REV 3：FWD JOG 4：REV JOG 5：Free Run 6：Deceleration to Stop 7：Fault reset

5） Set frequency reference

The programmable card is set to valid (A7-01=1) and the frequency command is given by the communication mode, and the set frequency of the inverter is determined by the value of the parameter A7-06. The user's PLC program controls the frequency set by the inverter by operating the corresponding D element to change the value of the parameter A7-06.

parameter	define	default	range	illustrate
A7-06	Setting frequency reference via the user programmable card	0.00%	- 100.00%~100.00%	base value of parameter P0-10 (Max. frequency).

6） Set torque reference

The programmable card is set to active (A7-01=1), and the torque command is given by the communication mode, and the set torque of the inverter is determined by the value of the parameter A7-07. The user's PLC program changes the value of parameter A7-07 by operating the corresponding D element, thereby controlling the torque set by the inverter

parameter	define	default	range	illustrate
A7-07	Setting torque reference via the user programmable card	0.0%	- 200.0%~200.0%	base value of this parameter is rated motor torque

7） Set user-defined faults

When the programmable card is set to valid (A7-01=1), the user PLC program changes the value of the parameter A7-09 by operating the corresponding D element, and when the overridden value is in the range of 80~89, the inverter produces the corresponding user-defined fault Err80~Err89

parameter	define	default	range	illustrate
A7-09	Programmable card failure given	0	0：No Fault 80~89：User-defined fault coding	Note: When the value written to A7-09 is outside the range of 80~89, it will have no effect.

6.8.5 Master-slave control

The master-slave control function is designed for multi-drive applications, where the system is driven by several frequency converters and the motor shafts are coupled together by gears, chains, or conveyor belts. With master-slave control, the load can be evenly distributed between the transmission units. The external control signal is only connected to the main unit. The master controls the slave through a serial communication link.

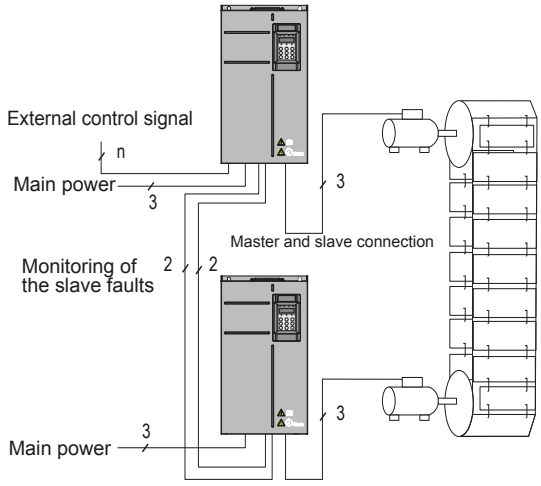
The master is a typical speed control, and the other slavor units follow the torque or speed of the master for a given moment. In general:

· When the motor shaft of the master and slave are rigidly connected by gears, chains, etc., the slave should adopt the torque control mode so that there is no speed difference between the transmission units. (See Figure 6-52.)

· When the motor shaft of the master and slave are flexibly connected, the slave should adopt the speed control mode, because small speed differences are allowed between the transmission units. When both the master and slave are speed controlled, the sag rate is generally used. (See Figure 6-52.)

❑ Rigid connection of the master and slave

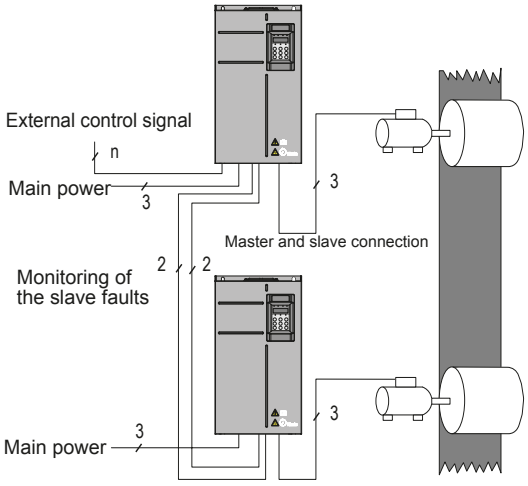
- The master is in speed control.
- The slave follows the torque reference of the master..



Master-slave rigid connection schematic

❑ Flexible connection of the master and slave

- The master is in speed control.
- The slave follows the speed reference of the master.



Master-slave flexible connection schematic

Figure 6-52 Master-slave connection

To avoid control conflict, please:

· Connect all the external control signals to the master only.
· Do not use the operating panel or the field bus to control the slave .

1） Installation

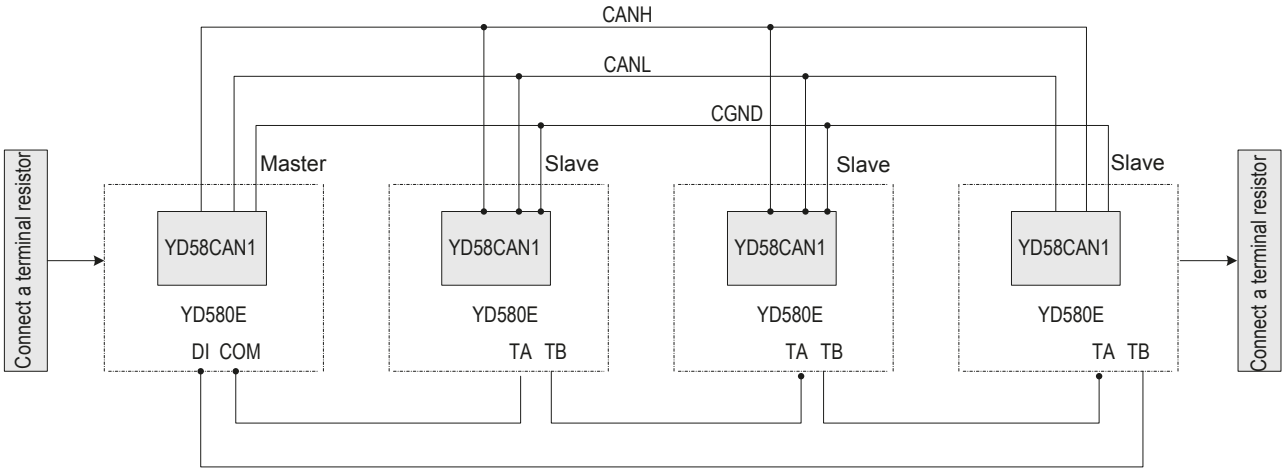


Figure 6-53 Connection of the master and slaves

① The relay acts as a slave fault feedback

② When the slave fails, the slave (A8-02 ten bit = 1) can be selected sends fault information to the master through communication

In the above two ways (choose one can be selected), when the slave fails, the master will stop running

2) Parameter Setting

● Rigid connection

· master：speed control（A0-00=0）

parameter	define	range	default	adjust
PD-00	Baud rate	0000~6009	Keep the same set of thousand bit of parameter for master and slave.	NO
A8-00	Point-point communication	0~1	1	NO
A8-01	Master and slave selection	0~1	0	NO
P0-10	Max. frequency	5.00~500.00Hz	50.00Hz (Master-slave alignment)	NO
P2-10	Upper torque limit	0.0~200.0%	130.0%	YES

· slave：torque control（A0-00=1，When in torque control mode, please do not set the starting frequency, otherwise it will cause a large starting inrush current

parameter	define	range	default	adjust
PD-00	Baud rate	0000~6009	Keep the same set of thousand bit of parame--ter for master and slave.	NO
A8-00	Point-point communication	0~1	1	NO
A8-01	Master and slave selection	0~1	1	NO

parameter	define	range	default	adjust
A8-02	Selection of action of the slave in point to point communication	0: No 1: Yes one bit: slaver to follow master's command ten bit: slaver to send fault information to master when a fault occurs Hundreds bit: slaver to alarm when it becomes off-line(ERR16)	one bit：1 ten bit：1	NO
A8-03	The slave received data	0: Output frequency 1: Frequency reference	0	NO
A8-11	Window width	0.20~10.00Hz	0.50Hz	YES
P0-10	Max. frequency	5.00~500.00Hz	50.00Hz (Master-slave alignment)	NO
P8-07	Acceleration time 4	0.0~6500.0s	0.0s	NO
P8-08	Deceleration time 4	0.0~6500.0s	0.0s	NO
P0-02	Command source selection	0~2	2	NO
A0-00	Speed/Torque control selection	0~1	1	NO
A0-01	Reference source in torque control	0~7	0	NO
A0-03	Torque digital setting in torque control	-200.0~200.0%	130.0%	Same as master P2-10
A0-07	Acceleration time in torque control	0.00~650.00s	0.00s	NO
A0-08	Deceleration time in torque control	0.00~650.00s	0.00s	NO

NOTE

- When the master-slave control, appropriately reduce the A8-11 of the slave, which can improve the starting smoothness, but it should be greater than 0.20Hz, and if the system acceleration and deceleration time is short, it is a rapid acceleration/deceleration, please increase A8-11 appropriately, the larger the A8-11, the weaker the window will take effect.

It is recommended that the initial value of A8-11 be set to half of the rated slip of the motor.

Calculation of the rated slip of the motor

Number of pole pairs of motor (take an integer) = (60 x rated motor frequency)/rated motor speed

Synchronous motor speed = (60 x rated motor frequency)/number of pole pairs of motor

Rated motor slip =

(synchronous motor speed - rated motor speed)/synchronous motor speed x rated motor frequency

● Flexible connection

· master：speed control（A0-00=0）

parameter	define	range	default	adjust
PD-00	Baud rate	0000~6009	Keep the same set of thousand bit of parame--ter for master and slave.	NO
A8-00	Point-point communication	0~1	1	NO
A8-01	Master and slave selection	0~1	0	NO
P0-10	Max. frequency	5.00~500.00Hz	50.00Hz (Master-slave alignment)	NO
P8-15	Droop rate	0.00~10.00Hz	1.00Hz	YES
P0-17	Acceleration time 1	0.0~6500.0s	Keep the same set of parameter for the master and slave.	NO
P0-18	Deceleration time 1	0.0~6500.0s	Keep the same set of parameter for the master and slave.	NO

· slave：speed control（A0-00=1）

parameter	define	range	default	adjust
PD-00	Baud rate	0000~6009	Keep the same set of thousand bit of parame--ter for master and slave.	NO
A8-00	Point-point communication	0~1	1	NO
A8-01	Master and slave selection	0~1	1	NO
A8-02	Selection of action of the slave in point to point communication	0: No 1: Yes one bit: slaver to follow master's command ten bit: slaver to send fault information to master when a fault occurs Hundreds bit:slaver to alarm (ERR16)	one bit：1 ten bit：1	NO
A8-03	The slave received data	0: Output frequency 1: Frequency reference	0	NO
P0-02	Command source selection	0~2	2	NO
P0-03	Main frequency reference setting channel selection	0~9	9	NO
P0-10	Max. frequency	5.00~500.00Hz	50.00Hz (Master-slave alignment)	NO
P0-17	Acceleration time 1	0.0~6500.0s	Keep the same set of parameter for the master and slave.	NO
P0-18	Deceleration time 1	0.0~6500.0s	Keep the same set of parameter for the master and slave.	NO
P8-15	Droop rate	0.00~10.00Hz	1.00Hz	YES
A0-00	Speed/Torque control selection	0~1	0	NO

● Droop Control P8-15：

Droop Control allows for a slight speed difference between the master and slave stations, which in turn avoids collisions between them. The default value for this parameter is 0.00Hz. Only when the master and slave both adopt the speed control mode, the droop rate needs to be adjusted, for each transmission process, the appropriate droop rate needs to be gradually found in practice, it is recommended not to set the P8-15 too much, otherwise the steady-state speed will be reduced when the load is large. Both the master and slave must be set to P8-15.

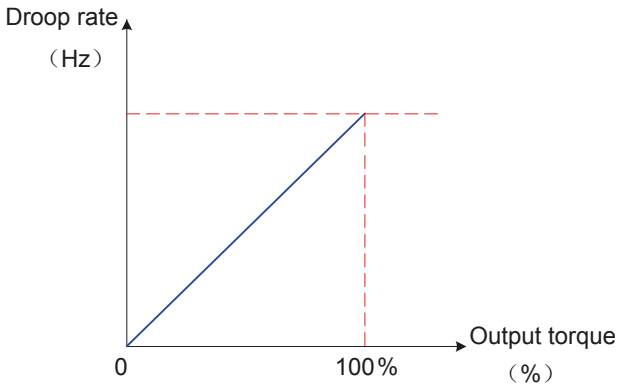


Figure 6-54 Relationship between droop rate and output torque

- Droop speed = rated motor frequency x output torque x droop rate
- Actual AC drive frequency = frequency reference - droop speed

Suppose that P8-15 is set to 10%, rated motor frequency is 50 Hz, and output torque is 50%. Actual drive frequency = 50 Hz – 50 x 50% x (1.00/10) = 47.5 Hz.

parameter	define	default	range	illustrate
A8-00	Point-point communication	0	0: Disabled 1: Enabled	-
A8-01	Master and slave selection	0	0: Master 1: Slave	This function parameter determines whether the AC drive is master or slave
A8-02	Selection of action of the slave in point to point communication	011	one bit:whether to follow master's command 0:NO 1:YES ten bit:whether to send fault information to master when a fault occurs 0:NO 1:YES(Err55 fault from slaver) hundred bit:whether to alarm when it becomes offline 0:NO 1:YES(Err16 fault from slaver)	Note: In the case of an abnormal connection with the slave, the master does not report the fault when it is not running, and the fault is reported when it is running Err16). When the slave controlled by master and slave is P0-02 = 2 (communication control), if A8-02 one bit set 1, the slave runs with the master operation command/stops. if A8-02 ten bit set 1, and when the slave fails, a fault message is sent to the host; if A8-02 hundred bit set 1, and the slave is alarmed when the slave drops.
A8-03	The slave received data	0	0: Output frequency 1: Frequency reference	0: The frequency transmitted by the master to the slave is the running frequency of the master, if the droop rate of P8-15 is not 0, then the frequency transmitted by the master to the slave is the droop control frequency, this situation is applied to the droop control or speed synchronization control (i.e., the slave is the speed mode); in the load distribution control (i.e., the slave is the torque mode), the master is passed to the slave as the master of the running frequency, at this time the value of P8-15 should be ensured to be 0. 1: The target frequency that the master passes to the slave as the master.
A8-04	Zero offset of received data	0.00%	-100.00%~100.00%	Correction of received data A0-00=0, A8-04、A8-05 correct the frequency command A0-00=1, A8-04、A8-05 correct the torque command For details on how to calculate A8-04、A8-05, see subsection 6.9.6
A8-05	Gain of received data	1.00	-10.00~100.00	

parameter	define	default	range	illustrate
A8-06	Point-point comm. interruption detection time	1.0s	0.0s~10.0s	Set the detection time of master or slave communication interruption for peer-to-peer communication, and set it to 0 to indicate that it will not be detected.
A8-07	Master data sending cycle in point-point communication	0.001s	0.001s~10.000s	-
A8-11	Window width	0.50Hz	0.20Hz~10.00Hz	It is used to ensure that the speed of the slave is synchronized with the master within the window range. Appropriately reduce the A8-11 of the slave to improve the starting smoothness, and increase the A8-11 appropriately in the case of rapid acceleration and deceleration, the larger the A8-11, the weaker the window will take effect.

6.9 Input and output terminals

This section describes functions of DI, DO, virtual DI, virtual DO, AI and AO terminals.

6.9.1 Digital input terminal function (DI)

YD580E series inverter is equipped with 5 multi-function digital input terminals as standard (of which DI5 can be used as a high-speed pulse input terminal). If the system needs to add digital input terminals, it can be equipped with "IO expansion card" or "programmable multi-function expansion card", "IO expansion card" has 3 DI input terminals (DI6~DI8), "programmable multi-function expansion card" has 5 DI input terminals (DI6~DI10), each DI terminal can choose any DI terminal function.

parameter	define	default	range	illustrate
P4-00	DI1 function selection	1	0~52	See the table below for details
P4-01	DI2 function selection	4		
P4-02	DI3 function selection	9		
P4-03	DI4 function selection	12		
P4-04	DI5 function selection	13		
P4-05	DI6 function selection	0		
P4-06	DI7 function selection	0		
P4-07	DI8 function selection	0		
P4-08	DI9 function selection	0		
P4-09	DI10 function selection	0		
P4-35	DI1 delay time	0.0s	0.0s~3600.0s	Sets the delay time for the inverter to change the status of the DI terminal Only DI1, DI2, DI3 have the function to set the delay time.
P4-36	DI2 delay time	0.0s	0.0s~3600.0s	
P4-37	DI3 delay time	0.0s	0.0s~3600.0s	
P4-38	DI High and Low Levels Valid Selection1	00000	0: Valid high 1: Valid low bit 0: DI1 valid status setting bit 1: DI2 valid status setting bit 2: DI3 valid status setting bit 3: DI4 valid status setting bit 4: DI5 valid status setting	When active-high is selected, the corresponding DI terminal is valid when it is connected to COM and invalid when it is disconnected. When active-low is selected, the corresponding DI terminal is invalid when it is connected to COM, and it is valid when it is disconnected.

parameter	define	default	range	illustrate
P4-39	DI High and Low Levels Valid Selection2	00000	0: Valid high 1: Valid low bit 0：DI6 valid status setting bit 1：DI7 valid status setting bit 2：DI8 valid status setting bit 3：DI9 valid status setting bit 4：DI10 valid status setting	same as P4-38

● DI 端子功能选择详细说明如下：

set value	function	description
0	No function	Set reserved terminals to 0 to avoid malfunction
1	Forward run (FWD)	2-wire type 1 (P4-11=0) is forward operation, and 2-wire type 2 (P4-11=1) is run command.
2	Reverser run (REV)	3-wire type 1 (P4-11=2) is reversed operation, and 2-wire type 2 (P4-11=3) is reversed direction.
3	3-wire control	It is determined that the inverter operation mode is a 3-wire control mode. If you want to run the command by terminal setting, set parameter P4-11 (terminal command method) to 2 (3-wire type 1) or 3 (3-wire type 2), the terminal function should be set to this function.
4	Forward jog (FJOG)	The operation mode of the inverter is forward jog operation. For details about the jog running frequency and jog acceleration and deceleration time, see the parameters P8-00、P8-01、P8-02 in "6.11.1 Jog Operation".
5	Reverse jog (RJOG)	The operation mode of the inverter is reverse jog operation. For details about the jog running frequency and jog acceleration and deceleration time, see the parameters P8-00、P8-01、P8-02 in "6.11.1 Jog Operation".
6	Terminal UP	The terminals selecting these two functions are used for increment and decrement when frequency reference is input via external DI terminal, or when frequency source is digital setting.
7	Terminal DOWN	
8	Coast to stop	The inverter stops, and the motor stops according to inertia.
9	Fault reset (RESET)	Resets the failure of the inverter, which functions the same as the STOP/RES key on the keyboard. This function enables remote fault reset.
10	RUN disabled	When the terminal set for this function becomes on, the AC drive decelerates to stop and retains all running parameters, such as PLC, wobble and PID parameters. Once the terminal becomes off,the AC drive resumes the running status before stop
11	External fault NO input	When terminal set this function and on, drive detects ERR15 and performs fault protection.
12	Multi-reference terminal 1	16 speeds or 16 other references can be implemented through combinations of 16 states of these four terminals.
13	Multi-reference terminal 2	
14	Multi-reference terminal 3	
15	Multi-reference terminal 4	
16	T1 for acc/dec time select	4 types of acceleration and deceleration times can be selected through the four states of the two terminals, as shown in Table 6-2 for details
17	T2 for acc/dec time select	
18	Frequency command switching	The terminal set for this function is used to perform switchover between two frequency reference setting channels according to setting in P0-07.
19	UP/DOWN setting to zero (terminals, keypads)	When the main frequency is set through the panel, the terminal selects this function to clear the frequency value changed by the key, key, or terminal function UP/DOWN (6 or 7) on the keyboard, returning the given frequency to the value set by P0-08.
20	Command source switchover 1	If command source is terminal control (P0-02 = 1), this terminal is used to perform switchover between terminal control and operation panel control. If command source is communication control (P0-02 =2), this terminal is used to perform switchover between communication control and operation panel control.

set value	function	description
21	Acc/Dec prohibited	This function ensures the AC drive to maintain current frequency output without being affected by external signals (except STOP command).
22	PID disabled	This function disables the PID function. The AC drive maintains current frequency output without supporting PID adjustment of frequency reference.
23	PLC state reset	When the simple PLC function is enabled again after it was disabled in execution process, this function restores original state of simple PLC for the AC drive
24	Wobble disabled	When terminal set for this function becomes on, the wobble function becomes disabled and the drive outputs center frequency.
25	Counter input	Terminal set for this function is used to count pulses..
26	Counter reset	Terminal set for this function is used to clear counter
27	Length signal pulses count	Terminal set for this function is used to count pulses of the length signal
28	Length reset	The terminal set for this function is used to clear length
29	Torque control prohibited	When the terminal set for this function becomes on, torque control is disabled and the AC drive enters speed control.
30	Pulse input as frequency reference (valid only for DI5)	DI5 is used for pulse input as frequency reference
31	Reserved	Reserved
32	Immediate DC injection braking	Once the terminal set for this function becomes on, the AC drive directly switches over to DC injection braking state.
33	External fault NC input	Once terminal set for this function becomes on, the AC drive detects ERR15 and stops.
34	Frequency modification enabled	When terminal set for this function becomes on, the AC drive responds to frequency modification.
35	PID operation direction reverse	When terminal set for this function becomes on, PID operation direction is reversed to direction set in PA-03.
36	External stop 1	When the "Run Command Selection" is set to the operation panel (P0-02=0), the inverter is stopped, which is equivalent to the function of the STOP/RES key on the keyboard.
37	Command source switchover 2	Terminal set for this function is used to perform switchover between terminal control and communication control. If command source is terminal control, the AC drive switches over to communication control after the terminal becomes ON.
38	PID integral disabled	the integral function becomes disabled. However, the proportional and differentiation functions are still effective
39	Switch between main and preset frequency	The main frequency is switched to the preset frequency set in P0-08.
40	Switch between auxiliary and preset frequency	The auxiliary frequency is switched to the preset frequency in P0-08.
41	Motor selection	Select motor 2 when the terminal is active, and motor 1 when the terminal is invalid.
42	Reserved	--
43	PID parameter switchover	If PID parameters switchover is done via DI terminal (PA-18 =1), PID parameters are PA-05~PA-07 when terminal set for this function becomes off; PID parameters are PA-05~PA-07 when terminal set for this function becomes on.
44	User-defined fault 1	If Err27 alarm, inverter process it according to the setting value of P9-49 (fault protection action selection).
45	User-defined fault 2	If Err28 alarm, inverter process it according to the setting value of P9-49 (fault protection action selection).
46	Speed control/ Torque control	This function enables inverter to switch between speed control and torque control. A0-00=0, when the terminal is active, the control mode is torque mode, and when the terminal is invalid, the control mode is speed mode. A0-00=1, when the terminal is active, the control mode is speed mode, and when the terminal is invalid, the control mode is torque mode.
47	Emergency stop (ES)	When the system is in an emergency state, the inverter decelerates according to the P8-55 terminal emergency stop and deceleration time, and the V/F mode emergency stop deceleration time is 0s and decelerates according to the minimum unit time. The input terminal does not need to be closed continuously, and will stop in an emergency even if it is closed for only a moment. Different from the general deceleration time, after the emergency stop deceleration time, disconnect the emergency stop input terminal, if the inverter terminal operation signal is still in the closed state at this time, the inverter will not start, you need to disconnect the running terminal first and then enter the terminal operation instruction again, the inverter will start again.
48	External stop 2	Under any operation command mode (panel control, terminal control, communication control), the inverter slows down and stops. At this time The deceleration time is fixed at deceleration time 4 (P8-08).
49	Deceleration DC injection braking	The inverter first decelerates to the stop DC braking starting frequency (P6-11), and then enters the DC braking state.
50	Clear running time this time	The timer of the inverter was cleared to zero The running time is less than the set value of P8-53, the terminal is valid, and the timing of this operation is cleared. The running time is greater than the set value of P8-53, the terminal is valid, and the timing of this operation is not clear.

set value	function	description
51	2-wire control/3-wire control	Switch between 2-wire and 3-wire control. If P4-11 = 0 (2-wire type 1), switch to (3-wire type 1) when the terminal of this function is active. If P4-11 = 1 (2-wire type 2), switch to (3-wire type 2) when the terminal of this function is active. If P4-11 = 2 (3-wire type 1), switch to (2-wire type 1) when the terminal of this function is active. If P4-11 = 3 (3-wire type 2), switch to (2-wire type 2) when the terminal of this function is active.
52	Reserved	When the terminal is active, the actual frequency set by the inverter is limited to 0 even if the reverse frequency is set. The same function as the reverse frequency inhibition (P8-13).

6.9.2 Digital Output Terminal Function (DO)

YD580E series inverter comes standard with 1 multi-function digital output terminal, 1 multi-function relay output terminal, 1 FM terminal. If the above output terminals do not meet the requirements of the field application, the "IO expansion card" can be optionally equipped (please refer to "Chapter 11 Optional Cards" for the number of output terminals of the expansion card), for example YD58IO1 The multi-function IO expansion card contains 1 multi-function relay output terminal (relay 2),1 multi-function digital output terminal (DO2).

parameter	define	default	range	illustrate
P5-00	FM terminal output mode	0	0: Pulse output (FMP) 1: Digital output (FMR)	FM is a programmable multiplexed terminal that can be used as a high-speed pulse output (FMP) or open-collector output (FMR). When FM used as a pulse, the maximum frequency of the output pulse is 100kHz, and the FMP related functions are described in P5-06.
P5-01	FMR function selection	0	0~41	Functions for selecting 5 digital outputs, where (T/A-T/B-T/C) and (P/A-P/B-P/C) are respectively Relays on the control board and expansion card.
P5-02	Relay (T/A-T/B-T/C) function selection	2		
P5-03	Extension card relay (P/A-P/B-P/C) function selection	0		
	DO1 function selection	1		
P5-05	Extension card DO2 function selection	4		
P5-17	FMR output delay	0.0s	0.0s~3600.0s	-
P5-18	Relay 1 output delay	0.0s	0.0s~3600.0s	-
P5-19	Relay 2 output delay	0.0s	0.0s~3600.0s	-
P5-20	DO1 output delay	0.0s	0.0s~3600.0s	-
P5-21	DO2 output delay	0.0s	0.0s~3600.0s	-
P5-22	DO active mode selection 1	00000	0: Positive logic active 1: Negative logic active bit 0: FMR active mode bit 1: Relay1 active mode bit 2: Relay2 active mode bit 3: DO1 active mode bit 4: DO2 active mode	0: Positive logic (Equivalent normally open contact) Active Status :DO terminal and COM/CME terminal are internally connected. Invalid Status :DO terminal and COM/CME terminal are disconnected. 1: Antilogic (Equivalent Normally Closed Contact) Active Status :DO terminal and COM/CME terminal are disconnected. Invalid Status:DO terminal and the COM/CME terminal communicate internally.

● The functions of the digital output terminals are described in the following figure.

value	function	description
0	No output	Terminal has no function
1	AC drive running	When the AC drive is running and has output frequency (can be zero), terminal set for this function becomes on.
2	Fault output	When a fault occurs and the AC drive stops due to the fault, terminal set for this function becomes on.
3	Frequency level detection 1 output	When the operating frequency is higher than the frequency detection value, the DO outputs a "valid" signal, and when the operating frequency is lower than the detected value minus the FDT hysteresis value (the product of P8-19 and P8-20), the DO output "active" signal is canceled. For detailed descriptions of P8-19 and P8-20, please refer to Appendix C Functional Parameter Table.
4	Frequency reached	Operating frequency of inverter is within a certain range of the target frequency (the product of target frequency ±P8-21 set value and maximum frequency), and DO outputs an "active" signal.
5	Zero-speed running (no output at stop)	When output frequency is 0 during drive running, terminal set for this function becomes on. When the drive stops, terminal becomes off.
6	Motor overload pending	Before motor overload protection action, it is judged according to the overload warning coefficient (P9-02), and the "effective" signal is output after the pre-alarm threshold is exceeded. (For the calculation of the pre-alarm threshold, refer to 6.6 Protection Function)
7	Drive overload pending	10 seconds before inverter overload protection occurs, a "valid" signal is output.
8	Set count value reached	Terminal set for this function becomes on when count value reaches the value set in PB-08.
9	Designated count value reached	Turn on when count value reaches the value set in PB-09. When the count value reaches the value set by PB-09, a "valid" signal is output. Refer to subsection 6.8.3 for the counting function.
10	Length reached	Turn on when detected actual length exceeds value set in PB-05.
11	PLC cycle completed	Turn on because output a pulse signal with 250ms width when PLC runs one cycle.
12	Accumulative running time reached	Turn on when accumulative running time of the AC drive exceeds value set in P8-17.
13	Frequency limited	Turn on when frequency reference exceeds frequency upper or lower limit, and output frequency of inverter also reaches the upper or lower limit.
14	Torque limited	Turn on when inverter output torque reaches toque limit in speed control.
15	Ready for RUN	After inverter is powered on, and non-abnormal state, outputs a "valid" signal.
16	AI1>AI2	When AI1 input is greater than AI2 input, terminal set for this function becomes on.
17	Frequency upper limit reached	Operating frequency reach upper limit frequency (P0-12), a "valid" signal is output.
18	Frequency lower limit reached (no output at stop)	When P8-14 (the operating mode for a given frequency below the lower limit) is set to 1 (shutdown), an "invalid" signal is output regardless of whether the operating frequency reaches the lower limit frequency. When P8-14 (the mode of operation with a given frequency below the lower limit) is set to 0 (operation at the lower limit) or 2 (operation at zero speed) and the operating frequency reaches the lower frequency, a "valid" signal is output.
19	Undervoltage	Terminal set for this function becomes on when undervoltage occurs on AC drive.
20	Communication set	Terminal is active or inactive is determined by communication address 0x2001.
21	Reserved	Reserved
22	Reserved	Reserved
23	Zero-speed running 2 (having output at stop)	When inverter is in operation and the output frequency is 0, a "valid" signal is output. The signal is also "active" when the drive is in a standstill.
24	Accumulative power-on time reached	When cumulative power-on time (P7-13) of inverter exceeds set time set by P8-16 (set cumulative power-on arrival time), a "valid" signal is output.
25	Frequency level detection 2	When operating frequency is higher than frequency detection value, DO output "active" , and when operating frequency is lower than detection value, DO output "valid" that frequency detection lag value (P8-28*P8-29), and the DO output "valid" is canceled. For more information about P8-28、P8-29, refer to Appendix C Function Parameter Table.
26	Frequency 1 reached	Operating frequency of inverter is within the frequency detection range of L4-06 (any arrival frequency detection value 1), and the DO output is "active"Signal. Frequency detection range: P8-30-P8-31×P0-10 (maximum frequency to) ~ P8-30+P8-31×P0-10.
27	Frequency 2 reached	Operating frequency of inverter is within the frequency detection range of L4-08 (any arrival frequency detection value 2), and the DO output is "active"Signal. Frequency detection range: P8-32-P8-33×P0-10 (maximum frequency to) ~ P8-32+P8-33×P0-10.
28	Current 1 reached	Output current of inverter, which is within the range of L6-05 (arbitrary arrival current 1), Outputs a "valid" signal from DO. Current detection range=P8-38-P8-39×P1-03 (motor rated current)~P8-38+P8-39×P1-03.
29	Current 2 reached	Output current of inverter, which is within the range of L6-07 (arbitrary arrival current 2), Outputs a "valid" signal from DO. Current detection range=P8-40-P8-41×P1-03 (motor rated current)~P8-40+P8-41×P1-03.

set value	function	description
30	Timing reached	When timing function selection (P8-42) is valid, the inverter outputs an "active" signal after the running time reaches the set timing time. The timing time is set by P8-43 and P8-44.
31	AI1 input exceeding limit	Terminal set for this function becomes on when AI1 input is larger than value set in P8-46 (AI1 input voltage upper limit) or smaller than value set in P8-45 (AI1 input voltage lower limit).
32	Load lost	Terminal set for this function becomes on when load gets lost.
33	Reverse running	Terminal set for this function becomes on when the AC drive runs in reverse direction.
34	Zero current	Output current of inverter is within the range of zero current and lasts longer than P8-35 (when there is a zero current detection delay), DO outputs a "valid" signal. Zero current detection range =0~ P8-34×P1-03.
35	IGBT temperature reached	When the heat sink temperature of the inverter module (P7-07) reaches the set module temperature arrival value (P8-47), a "valid" signal is output.
36	Output current exceeding limit	When output current of inverter is greater than P8-36 (the output current exceeds the limit value) and the duration exceeds P8-37 (the delay time for the detection of the output current exceeds the limit), the DO outputs a "valid" signal.
37	Frequency lower limit reached (having output at stop)	When operating frequency reaches the lower limit frequency (P0-14), a "valid" signal is output. In the event of a stop, an "valid" signal is also output.
38	Alarm output	When the inverter fails, and the fault protection action is selected to continue operation, the DO terminal outputs a "valid" signal. The fault protection action selection can refer to P9-47~P9-50.
39	Motor overheat pending	Terminal set for this function becomes on when motor temperature reaches value set in P9-58 (Motor overheat pending threshold). You can view motor temperature by using U0-34.
40	Current running time reached	Terminal set for this function becomes on when current running time of the AC drive exceeds value set in P8-53.
41	Fault output	When a fault occurs on the AC drive (except undervoltage), terminal set for this function becomes on.

6.9.3 Virtual Digital Input Terminal Function (VDI)

The virtual digital input function, similar to the DI input function of the control board, can be used as a multi-function digital input.

Here's an example of how to use virtual VDI.

Example 1: When the effective status setting mode (A1-05) of the virtual VDI terminal is set to 00000 (select VDO status to determine the VDI status), the following functions need to be completed: "If the AI1 input exceeds the upper and lower limits, the inverter needs to be alarmed and shut down". You can set it up as follows:：

step	set value
1	Set the function of VDI1 to "User Defined Fault 1" (A1-00=44)
2	Set the VDI1 terminal valid state mode to be determined by VDO1 (A1-05=00000)
3	Set the VDO1 output function to "AI1 input exceeds upper and lower limits" (A1-11=31)

After setting the above steps, when the AI1 input exceeds the upper and lower limits, the VDO1 output is in the ON state, and the VDI1 input terminal status is valid, and the inverter VDI1 receives the user-defined fault 1, and the inverter will alarm Err27 and shut down.

Example 2: When the effective state setting mode (A1-05) of the virtual VDI terminal is set to 11111 (select parameter A1-06 to set the VDI state), the following functions can be completed to complete the following functions: "When the inverter is powered on, the inverter needs to automatically enter the running state", the following setting methods can be adopted:

step	set value
1	Set the function of VDI1 to "Forward Run" (A1-00=1)
2	Setting the VDI1 terminal valid state mode to be set by the parameter (A1-05 = 11111)
3	Set VDI1 terminal status to valid (A1-06=11111)
4	Set the command source to "Terminal Control" (P0-02=1)
5	Set boot protection selection to "Do Not Protect" (P8-18=0)

After setting the above steps, if VDI1 is detected to be valid after the inverter is initialized after powering on, and this terminal corresponds to the forward rotation operation, it is equivalent to the inverter receiving a terminal forward rotation operation command, and the inverter will start forward rotation operation.

parameter	define	default	range	description
A1-00	VDI1 function selection	0	0~59	Virtual VDI1~VDI5 can be used as: Multi-function digital input is used, function 0~52 is the same as ordinary DI setting, 53~59 is retained. For details, please refer to section 6.9.1 P4-00~P4-09.
A1-01	VDI2 function selection	0	0~59	
A1-02	VDI3 function selection	0	0~59	
A1-03	VDI4 function selection	0	0~59	
A1-04	VDI5 function selection	0	0~59	
A1-05	VDI active state setting mode	00000	0: Decided by state of VDOx 1: Decided by A1-06 bit 0: VDI1 bit 1: VDI2 bit 2: VDI3 bit 3: VDI4 bit 4: VDI5	The status of virtual VDI can be set in two ways, and it can be selected by A1-05. Set to 0: Whether VDI is valid depends on whether the VDO output is valid or invalid, and VDIx is uniquely bound to VDOx (x is 1~5). Set to 1: The status of the virtual input terminals is determined by the binary bits of parameter A1-06.
A1-06	Selection of VDI active state	00000	0: Inactive 1: Active bit 0: VDI1 bit 1: VDI2 bit 2: VDI3 bit 3: VDI4 bit 4: VDI5	-

6.9.4 Virtual Digital Output Terminal Function (VDO)

The virtual digital output function, similar to the DO output function of the control board, can be used in conjunction with the virtual digital input VDIx to achieve some simple logic control.
VDO and VDI can be used together to achieve flexible control methods, please refer to the example in Section 6.9.3 Virtual VDI.

parameter	define	default	range	description
A1-11	VDO1 function selection	0	0: Short with physical DIx internally 1~41:See P5 Group Physical DO Output Selection	When the virtual VDOx output function is selected as 0, the output status of VDO1~VDO5 is determined by the DI1~DI5 input state on the control board, and the VDOx and DIx correspond one-to-one. The work of the VDOx when the virtual VDOx output function selected as non-0 The parameters related to the DO output of the P5 group are the same as those of the P5 group, please refer to the relevant parameters of the P5 group in subsection 6.9.6
A1-12	VDO2 function selection	0		
A1-13	VDO3 function selection	0		
A1-14	VDO4 function selection	0		
A1-15	VDO5 function selection	0		
A1-16	VDO1 output delay	0.0s	0.0s~3600.0s	-

parameter	define	default	range	description
A1-17	VDO2 output delay	0.0s	0.0s~3600.0s	-
A1-18	VDO3 output delay	0.0s	0.0s~3600.0s	-
A1-19	VDO4 output delay	0.0s	0.0s~3600.0s	-
A1-20	VDO5 output delay	0.0s	0.0s~3600.0s	-
A1-21	VDO active mode selection	00000	0: Positive logic active 1: Negative logic active bit 0: VDO1 bit 1: VDO2 bit 2: VDO3 bit 3: VDO4 bit 4: VDO5	Positive logic: terminal invalid is 0; terminal valid is 1; Anti-logic: terminal invalid is 1; terminal valid is 0;

6.9.5 Analog input terminals

YD580E series inverter is equipped with 2 analog multi-function input terminals as standard. If the analog input terminal is not sufficient for field application, an "IO expansion card" can be optionally configured (please refer to "Chapter 11 Optional Cards" for the number of analog input terminals of the expansion card), for example YD58IPC1 contains 1 analog input terminal AI3.

The following parameters are used to use AI as DI (see "6.2.3 Setting the Master Frequency" with "Analog Quantities" for more AI functions).

When the AI is used as a DI, the AI terminal state is high if the AI input voltage is greater than 7V and if the AI input voltage is lower

When the AI terminal is 3V, the AI terminal state is low, and when the AI input voltage is between 3V~7V, it is hysteresis. Figure 6-56 illustrates the relationship between the AI input voltage and the corresponding DI state.

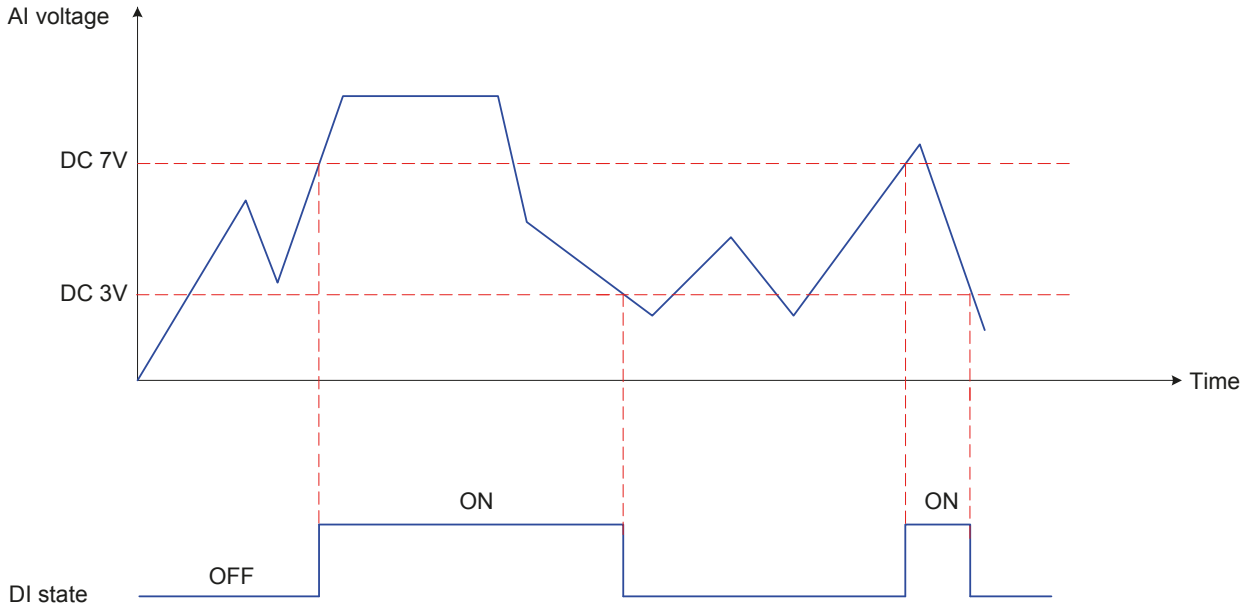


Figure 6-55 Relationship between AI input voltage and DI state

parameter	define	default	range	description
A1-07	Function selection for AI1 used as DI	0	0~59	The function setting when AI is used as DI, the function 0~52 is the same as the normal DI setting, and 53~59 is retained. For details, please refer to Section 6.9.1 for instructions on DI settings for group P4.
A1-08	Function selection for AI2 used as DI	0	0~59	
A1-09	Function selection for AI3 used as DI	0	0~59	
A1-10	Active state selection for AI used as DI	000	0: High level active 1: Low level active) bit 0: AI1 bit 1: AI2 bit 2: AI3	When AI terminal is high, if A1-10 set to 0, the AI, terminal is valid, if A1-10 set to 1, the AI terminal is invalid, When AI terminal is low, if A1-10 set to 0, the AI terminal is invalid, if A1-10 is set to 1, the AI terminal is valid.

6.9.6 Analog and pulse output terminals

YD580E series inverter is equipped with 1 analog output terminal AO1 as standard. If the analog output terminal does not meet the requirements of the field application, an "IO expansion card" can be optionally equipped (see "Chapter 11 Optional Cards" for the number of analog output terminals of the expansion card), for example, YD58IO1 contains one analog output terminal AO2. The following parameters are generally used to correct the zero drift of the analog output and the deviation of the output amplitude. It can also be used to customize the desired AO output curve.

parameter	define	default	range	description
P5-00	FM terminal output mode	0	0: Pulse output (FMP) 1: Digital output (FMR)	The FM terminal is a programmable, multiplexed terminal that can be used as a high-speed pulse output terminal (FMP) or as an open-collector switching output terminal (FMR). When the output FMP is used as a pulse, the maximum frequency of the output pulse is 100kHz, and the FMP related functions are described in P5-06.
P5-06	FMP function selection	0	0~16	See Table 6-5 below for details.
P5-07	AO1 function selection	0	0~16	
P5-08	AO2 function selection	1	0~16	
P5-09	Max. FMP output frequency	50.00kHz	0.01kHz~100.00kHz	When the FM terminal is selected as the pulse output, this parameter is used to select the maximum frequency value of the output pulse.
P5-10	AO1 zero offset coefficient	0.0%	-100.0%~+100.0%	100% of AO1 bias coefficient corresponds to 10V or 20mA. Bias = bias coefficient ×10v (or 20mA)
P5-11	AO1 gain	1.00	-10.00~+10.00	-
P5-12	AO2 zero offset coefficient	0.00%	-100.0%~+100.0%	100% of AO2 bias coefficient corresponds to 10V or 20mA.
P5-13	AO2 gain	1.00	-10.00~+10.00	-

AO (analog output) 0~10V corresponds to 0%~100%, when the AO2 output function is 1 (frequency setting), if the frequency converter sets the frequency to 50% of the maximum frequency, the output voltage of AO2 is 50% ×10 V = 5V.

FM (pulse output) 0~100kHz corresponds to 0%~100%, when the FM output function is 1 (frequency setting), if the frequency converter is set to 50% of the maximum frequency, P5-09 is set to 100kHz, then the output frequency of the FM terminal is 50%×100kHz = 50kHz.

Table 6-5 Correspondence between the functions and ranges of pulse or analog outputs

Value	Output Function	Range
0	Running frequency	0 to max. frequency
1	Frequency reference	0 to max. frequency
2	Output current	0 to 2 times of rated motor current
3	Motor output torque (absolute, percentage of rated torque relative to motor)	0 to 2 times of rated motor torque
4	Output power	0 to 2 times of rated power
5	Output voltage	0 to 1.2 times of rated AC drive voltage
6	Pulse input（100% corresponds to 100.00kHz）	0.01 to 100.00 kHz
7	AI1	0 to 10 V
8	AI2	0 to 10 V (or 0 to 20 mA)
9	AI3	0 to 10 V
10	Length	0 to max. set length
11	Counting value	0 to max. count value
12	Communication reference	0.0% to 100.0%
13	Motor speed	0 to motor speed corresponding to max.output frequency
14	Output current	0.0 to 1000.0 A
15	Output voltage	0.0 to 1000.0 V
16	Motor output torque (actual, percentage relative to motor)	-2 times of rated motor torque to 2 times of rated motor torque

- The AO bias coefficient (P5-10 or P5-12) and AO gain (P5-11 or P5-10) are calculated as follows:

For example, if the analog output is the operating frequency, if you want the frequency to be 0 Hz (X1), the corrected output is 8 V (Y1), and when the frequency is 40 Hz (X2), the corrected output is 4 V (Y2). The gain is calculated as follows:

$$K = \frac{(Y1-Y2) * Xmax}{(X1-X2) * Ymax}$$

The formula for calculating the bias coefficient is:

$$b = \frac{(X1*Y2) - (X2*Y1)}{(X1-X2) * Ymax} \times 100\%$$

From Table 6-6 and Table 6-7, it can be seen that Xmax is the maximum output frequency of 50Hz (assuming that the maximum frequency P0-10 is 50Hz) and Ymax is the voltage and the value is 10V.

$$K = \frac{(8 - 4) \times 50}{(0 - 40) \times 10} = -0.5 \quad \text{(gain)} \qquad b = \frac{(0 \times 4 - 40 \times 8)}{(0 - 40) \times 10} = 80\% \quad \text{(bias coefficient)}$$

Therefore, the AO1 gain (P5-11) should be set to -0.5, and the AO1 bias coefficient (P5-10) should be set to 80%.

Table 6-6 Relationship between analog output signal types and their corresponding maximum values (Ymax):

AO1 output signal	Corresponding Max. Output (Ymax)
Voltage	10 V
Current	20 mA

Table 6-7 Relationship between the analog output content and its corresponding maximum value (Xmax).

analog output content	corresponding maximum value (Xmax)
Running frequency	max. out frequency
Frequency reference	max. out frequency
Output current	2 times of rated motor current
Output torque (absolute value)	2 times of rated motor torque
Output power	2 times of rated power
Output voltage	1.2 times of rated AC drive voltage
Pulse input	100.00 kHz
AI1	10 V
AI2	10 V or 20 mA
AI3	10 V
Length	max. set length
Counting value	max. count value
Communication reference	100.0%
Motor speed	motor speed corresponding to max. output frequency
Output current	1000.0 A
Output voltage	1000.0 V
Output torque (actual value)	±2 times of rated motor torque

6.10 Communication

The drive support communication links, such as Modbus, PROFIBUS-DP, CANlink (always valid), or CANopen.
You can monitor and control of the AC drive, for example, view or modify function parameters by using a host computer.
Make sure to set communication parameters correctly. Otherwise, communication may fail.

parameter	define	default	range	description
P0-28	Serial port communication protocol	0	0: Modbus protocol 1: PROFIBUS-DP or CANopen protocol	The CANLink protocol is always valid
PD-00	Baud rate	5005	Single digits: Modbus 0: 300bps 1: 600bps 2: 1200bps 3: 2400bps 4: 4800bps 5: 9600bps 6: 19200bps 7: 38400bps 8: 57600bps 9: 115200bps Ten digits: Profibus-DP 0: 115200bps 1: 208300bps 2: 256000bps 3: 512000bps Hundreds: Reserved Thousands: CANLink 0: 20Kbps 1: 50Kbps 2: 100Kbps 3: 125Kbps 4: 250Kbps 5: 500Kbps 6: 1Mbps	This parameter is used to set the data transmission rate between the host computer and the inverter. The higher the baud rate, the faster the communication speed. Note that the baud rate set by the host computer and the inverter must be consistent, otherwise, the communication cannot be carried out.
PD-01	Modbus data format symbol	0	0: No check: The data format < 8, N, 2, > 1: Even test: data format<8,E,1> 2: Odd check: data format<8,O,1> 3: No check: The data format < 8, N, 1>	The data format set by the host computer and the inverter must be consistent, otherwise, the communication cannot be carried out
PD-02	Local address	1	1~247,0 is the broadcast address	When the local address is set to 0, it is the broadcast address, and the upper computer broadcasts the function. The local address is unique (except for the broadcast address), which is the basis for the point-to-point communication between the host computer and the inverter.
PD-03	Modbus response delay	2	0~20ms	The interval between the end of inverter data acceptance and the sending of data to the upper computer. If the response delay is less than the system processing time, the response delay is subject to the system processing time. If the response delay is greater than the system processing time, the system will delay waiting until the response delay time is reached, and then send data to the host computer after the system has finished processing the data.
PD-04	Serial port communication timeout	0.0	0.0s (invalid) 0.1~60.0s	If this parameter is set to 0.0s, the communication timeout period is invalid. Normally, it is set to be invalid. In a system of continuous communication, this parameter can be used to monitor the communication situation. If the interval between this communication and the next communication exceeds PD-04 (communication timeout period), the system will report a communication fault error false (Err16).

parameter	define	default	range	description
PD-05	MODBUS、Profibus-DP protocol data frame	00	Single digit: Modbus 0: Non-standard Modbus protocol 1: Standard Modbus protocol	Single digits: 0: When reading the command, the slave returns one byte more than the standard Modbus protocol. 1: Select the standard Modbus protocol.
PD-06	Current resolution read by comm.	0	0：0.01A（≤ 55kW valid） 1：0.1A	The output unit used to determine the current value when the communication reads the output current
PD-08	CANlink communication timeout time	0	0.0 (Invalid) 0.1 to 60.0	-

NOTE

- PD-06=0 is only valid for the inverter power ≤ 55kW (the low power current is displayed to two decimal places), and the current value output unit can be determined by selecting this parameter when the current is read by communication. The purpose is that when the customer's host computer is programmed to read the current, it can be calculated by one decimal place, and there is no need to consider the conversion of the current decimal point inconsistency in the size and power of the inverter.

6.10.1 Read and Write Parameters

1） Read Function Parameters

For function parameters in groups P0 to PF and A0 to AF, the highest eight bits in communication address indicate function code group, while the lowest eight bits indicate hexadecimal number converted from SN in function code group.

For example, communication address of P0-16 is F010H, in which F0H indicates function code group F0 and 10H is the hexadecimal number converted from 16. Communication address of AC-08 is AC08H, in which ACH indicates function code group AC and 08H is the hexadecimal number converted from 8.

To read desired function parameter, host computer needs to send a read command to the AC drive. Here takes the Modbus protocol as an example to describe communication process of reading the drive data.

For example, to read P0-10, read command is 01 03 F0 0A 01 DE D7 (hexadecimal). In the command,

Table 6-8 The host computer reads the inverter data

Master Command		Slave Response	
ADDR	01H	ADDR	01H
CMD	03H	CMD	03H
Parameter address high bits	F0H	Parameter address high bits	F0H
Parameter address low bits	0AH	Parameter address low bits	0AH
Number of function parameters	01H	Number of function parameters	01H
CRC high bits	DEH	CRC high bits	DEH
CRC low bits	D7H	CRC low bits	D7H
-	-	-	

2) Write Function Parameters

For function parameters in groups P0 to PF, the highest eight bits in communication address indicate 00 to 0F or F0 to FF according to whether to write parameter to EEPROM, while the lowest eight bits indicate the hexadecimal number converted from SN in function code group.
For example, host computer writes data to P0-16. If not writing to EEPROM, communication address is 0010H. If writing to EEPROM, communication address is F010H.
For function parameters in groups A0 to AF, the highest eight bits in communication address indicate 40 to 4F or A0 to AF according to whether to write parameter to EEPROM, while the lowest eight bits indicate the hexadecimal number converted from SN in function code group.
For example, host computer writes data to AC-08. If not writing to EEPROM, communication address is 4C08H. If writing to EEPROM, communication address is AC08H.
To write data, host computer needs to send a write command to the AC drive. Here takes Modbus protocol as an example to describe communication process of writing data to the AC drive.
For example, to write 2 to AC-16 (not writing to EEPROM), write command is 01064C1000021F5E (hexadecimal). In the command,

- 01H (settable): AC drive address
- 06H: write command
- 4C10H: communication address of AC-16
- 02H: writing data
- 1F5EH: CRC check

Master Command		Slave Response	
ADDR	01H	ADDR	01H
CMD	06H	CMD	06H
Parameter address high bits	4CH	Parameter address high bits	4CH
Parameter address low bits	10H	Parameter address low bits	10H
Writing data high bits	00H	Number of function parameters	00H
Writing data low bits	02H	CRC high bits	02H
CRC high bits	1FH	CRC high bits	1FH
CRC low bits	5EH	CRC low bits	5EH

6.10.2 Reading Status Parameters

State parameters include monitoring parameters in group U (U0 to UF), drive fault information and drive running status.

●● The highest 8 bits in communication of parameters in U0 to UF is 70 to 7F, while lowest eight bits indicate the hexadecimal number converted from SN in function code group. For example, communication address of U0-11 is 700BH.
●● Communication address of the drive fault information is 8000H. You can obtain current fault codes by using host computer to read the address.
●● Communication address of drive running status is 3000H. Word in the read information is defined as 1: forward run, 2: reverse run, 3: stop.

Here takes CANopen protocol as an example to describe communication process of host computer to read drive running status.
First set P0-28 = 1 to select CANopen protocol. Suppose that DIP setting of Node-ID of the AC drive is 0x05 (modifiable, range: 1 to 63), and drive running status is 1: forward run.
The format of message sent by the master is as follows:

1） The format of message sent by the master is as follows:

Message ID (Hex)	RTR	Data (Hex)
0x605	0	40 30 00 00 00 00 00 00

0x605 = 0x600 + 0x05 (Node-ID DIP setting)

2）Format of response message returned by the slave is as follows:

Message ID (Hex)	RTR	Data (Hex)
0x585	0	40 30 00 00 00 00 00 00

0x585 = 0x580 + 0x05 (Node-ID DIP setting)

Sending message and response message are described as follows:

Sending Message		Response Message	
Message ID	605H	Message ID	605H
RTR	0 (binary)	RTR	0 (binary)
Read command	40H	Response to read command	4B
Communication address high bits	30H	Communication address high bits	30H
Mapping address	00H	Mapping address	00H
Communication address low bits	00H	Communication address low bits	00H
Reserved	00H	Data low byte	01H
Reserved	00H	Data high byte	00H
Reserved	00H	Data 3	00H
Reserved	00H	Data 4	00H

If you need to use the CANopen protocol to read the monitoring parameters, inverter fault descriptions, and other inverter operating statuses, refer to the format of sending packets for read operation and the format of returning packets for read operation for specific message organization methods.

Table 6-9 Format of packets sent during read operations

CAN	CANopen Data	Description
11-bit ID	0x600 + Node-ID	The Node-ID of the equipment is set via the DIP switch.
RTR	0	Remote frame sign "0"
DATA0	Command code returned	Correct: 0x4B Incorrect: 0x80
DATA1	Index low byte	Function parameter group (0xF0 for group P0)
DATA2	Index high byte	Mapping address
DATA3	Sub-index	SN in the function parameter group (0x02 for 02)
DATA4	Data 1	Data low byte
DATA5	Data 2	Data high byte
DATA6	Data 3	Correct: 0
DATA7	Data 4	Incorrect: SDO operation failed error code

Table 6-10 Packet format returned by the read operation

CAN	CANopen Data	Description
11-bit ID	0x580 + Node-ID	The Node-ID of the equipment is set via the DIP switch.
RTR	0	Remote frame sign "0"
DATA0	Command code (0x40)	0x40 read command
DATA1	Index low byte	Function parameter group (0xF0 for group P0)
DATA2	Index high byte	Mapping address
DATA3	Sub-index	SN in the function parameter group (0x02 for 02)
DATA4	Data 1	Reserved
DATA5	Data 2	Reserved
DATA6	Data 3	Reserved
DATA7	Data 4	Reserved

6.10.3 Control Command

When P0-02 = 2, you can write running command via communication on host computer, such as forward run, reverse run, forward jog, reverse jog and stop of the AC drive.
Communication address and descriptions of running command are defined in the following table.

RUN Command Communication Address	RUN Command Description
2000H	1: Forward run
	2: Reverse run
	3: Forward jog
	4: Reverse jog
	5: Coast to stop
	6: Decelerate to stop
	7: Fault reset

Here takes CANlink protocol as an example to describe communication process of host computer to write running command to the AC drive.
Before writing the running command, set baud rate and local address. The settings of related parameters are as follows:

Function Parameter	Setting Description
PD-00 (Baud rate)	Select the CANlink baud rate in thousands position of PD-00. You must set the same baud rate in the master and slave. Otherwise, the communication will not be implemented.
PD-02 (Local address)	The CANlink address range is 1 to 63.

Suppose that CANlink master address is 0x01 and AC drive address is 0x02 (settable, range: 1 to 63). The running command to be written is reverse jog. The communication address is 0x2000.
The format of the message sent by the master is as follows:

Message ID (Hex)	Data Length	Data (Hex)
0x11050201	4	00 04 20 00

2） The format of the response message returned by the slave is as follows:

Message ID (Hex)	Data Length	Data (Hex)
0x10050102	4	00 04 20 00

Sending message and response message are described as follows:

Sending Message			Response Message		
Message ID 11050201H	Arbitration sign	1000 (binary)	Message ID 11050102H	Arbitration sign	1000 (binary)
	Q&A sign	1 (binary)		Q&A sign	1 (binary)
	Command code	05H		Command code	05H
	Target address	02H		Target address	01H
	Source address	01H		Source address	02H
Data length		4 (decimal)	Data length		4 (decimal)
Write data high byte		00H	Write data high byte		00H
Write data low byte		04H	Write data low byte		04H
Write address high byte		20H	Write address high byte		20H
Write address low byte		00H	Write address low byte		00H

If it is necessary to use the CANlink protocol to write other control commands to the inverter, the inverter can be controlled. For details on how packets are organized, see the following table: CANlink Frame for Write Operations and CANlink Frames for Write Operations.

Table 6-11 Write CANlink frames

CAN	CANlink	Description
IDbit28–25	Arbitration sign	The arbitration sign of the command frame is 1000.
IDbit24	Q&A sign	Q&A sign: 1 is the question frame.
IDbit23–16	Command code	Write register command is 0x05.
IDbit15–8	Target address	CANlink target address
IDbit7–0	Source address	CANlink local address
DATA1	Data	Write data high byte
DATA2	Data	Write data low byte
DATA3	Data	Write address high byte
DATA4	Data	Write address low byte

Table 6-12 Writes return CANlink frames

CAN	CANlink	Description
IDbit28–25	Arbitration sign	The arbitration sign of the command frame is 1000.
IDbit24	Q&A sign	Q&A sign: 0 is the answer frame.
IDbit23–16	Command code	Write register command is 0x05.
IDbit15–8	Target address	CANlink target address
IDbit7–0	Source address	CANlink local address
DATA1	Data	Write data high byte
DATA2	Data	Write data low byte
DATA3	Data	Write address high byte
DATA4	Data	Write address low byte

6.10.4 Setting Frequency, Torque

If the main frequency, upper torque, V/F separation voltage, PID given, PID feedback, etc. are selected as "communication given", the frequency, torque, etc. should be written through the communication address 1000H. The data range that can be set by the host computer is -10000~10000, which corresponds to -100.00%~100.00% of the given value.

For example, the main frequency selection (P0-03) of the inverter is set to a given communication, and when the host computer wants to write the frequency, it must send a write command to the inverter. The following uses the Modbus protocol as an example to illustrate the process. When the frequency is set to 8000 using the communication method, the write command is 01 06 10 00 1F 40 84 CA

Each byte represents the following meanings, inverter address: 01H (can be set), write command: 06H, address of a given frequency: 1000H, target frequency value: 1F40H (converted to decimal 8000), CRC check: 84CAH. Similarly, when the torque is set to -8000 in a given way of communication, the write command is sent

01 06 10 00 E0 C0 C4 9A . where E0C0 is -8000 converted to hexadecimal and takes four lower digits.

Note: The range of the given frequency for the communication method is -10000 ~ +10000 (decimal), and the corresponding frequency range is -100.00%~ +100.00% (-100.00% corresponds to the negative maximum frequency, 0.00 corresponds to the minimum frequency, and +100.00% corresponds to the maximum frequency). Assuming that F0-10 Max Frequency is set to 50Hz, if the frequency value written in the write command is 1F40H, convert the decimal to 8000. Then the actual write frequency value is 50*80.00%=40Hz.

Master Command		Slave Response	
ADDR	01H	ADDR	01H
CMD	06H	CMD	06H
Parameter address high bits	4CH	Parameter address high bits	4CH
Parameter address low bits	10H	Parameter address low bits	10H
Writing data high bits	00H	Number of function parameters	00H
Writing data low bits	02H	CRC high bits	02H
CRC high bits	1FH	CRC high bits	1FH
CRC low bits	5EH	CRC low bits	5EH

6.10.5 Digital outputs (DO, RELAY, FMR)

If a digital output terminal is set for function 20: Communication setting, you can control digital output by using host computer.
The communication address and command of digital outputs are defined in the following table. Related communication address and command are as follows:

Communication Address	Command Description
2001H	Bit0: DO1 output
	Bit1: DO2 output
	Bit2: Relay1 output
	Bit3: Relay2 output
	Bit4: FMR output
	Bit5: VDO1
	Bit6: VDO2
	Bit7: VDO3
	Bit8: VDO4
	Bit9: VDO5

6.10.6 Control of Analog and High-speed Pulse Output (AO, FMR)

When the analog output AO1 (P5-07) and AO2 (P5-08) and the FMP output (P5-06) output function is selected as 12 (communication setting), the host computer can control the analog and high-speed pulse output of the inverter by using the communication mode. The control address and command content are defined as follows:

Communication Address		Command Description
AO1	2002H	0 to 7FFF indicates 0% to 100%.
AO2	2003H	
FMP	2004H	

NOTE

- The data that is used to write commands to the inverter by means of communication is corrected and output.

6.10.7 Initializing Parameter

You can initialize parameters via host computer by using this function. If FP-00 (user password) is set to a non-zero value, verify password on host computer.
Once password passes verification, host computer performs parameter initialization within 30s. The communication address of password verification is 1F00H. Directly write correct user password to this address to complete verification.
The communication address and parameter initialization command are defined in the following table.

Communication Address	Command Description
1F01H	1: Restore factory parameters
	2: Clear the records
	4: Restore the user backup parameters
	501: Back up the current user parameters

6.11 Accessibility

6.11.1 Jog

Jog is used to test equipment. In jog running, P6-00 must be set to 0 (direct start) and P6-10 must be set to 0 (Decelerate to stop).

parameter	define	default	range	description
P0-25	Acceleration/ Deceleration time base frequency	0	0: Max freq (P0-10) 1: Freq reference 2: 100 Hz	-
P8-00	Jog frequency	2.00Hz	0.00Hz~ Max freq	-
P8-01	Jog acceleration time	20.0s	0.0s~6500.0s	Jog acceleration time refers to the time it takes for inverter to accelerate from zero to the P0-25.
P8-02	Jog deceleration time	20.0s	0.0s~6500.0s	Jog deceleration time refers to the time it takes for inverter to accelerate from zero to the P0-25.
P8-27	Set highest priority to terminal JOG function	0	0: Disabled 1: Enabled	When P8-27=1, any DI terminal function (P4-00~P4-09) is set to 4 (forward jog) or 5 (reverse jog) during operation, the jog operation status will take effect immediately.

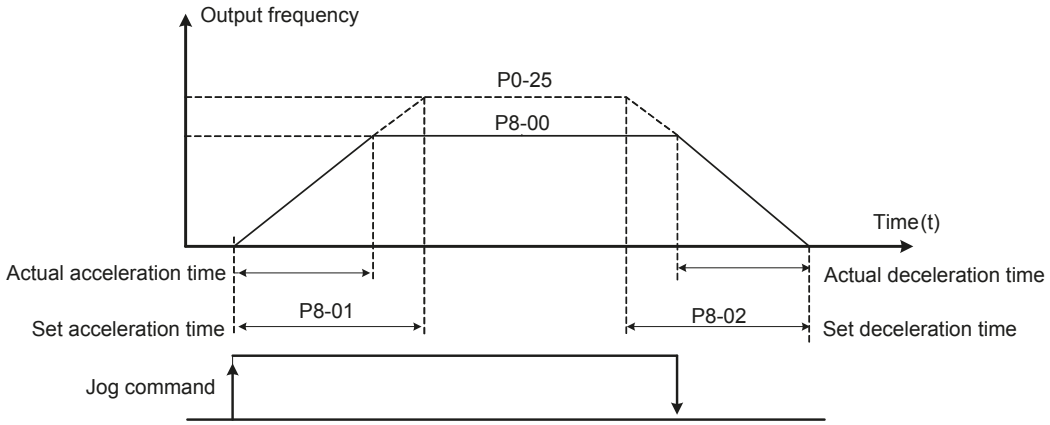


Figure 6-56 Schematic diagram of jog operation

Table 6-13 Parameter settings for jog operation with the operation panel

Steps	Forward jog	Reverse jog
1	Set P7-01 = 3 to allocate the MF.K key with forward jog.	Set P7-01 = 4 to allocate the MF.K key with reverse jog. Set P8-13 = 0 to allow reverse running.
2	Set P0-02 = 0 to select operation panel as command source.	Set P0-02 = 0 to select operation panel as command source.
3	Set P8-00, P8-01 and P8-02 properly.	Set P8-00, P8-01 and P8-02 properly.
4	In stop status, press down the MF.K key. The drive starts to jog in forward direction. After you release the MF.K key, the AC drive decelerates to stop.	In stop status, press down the MF.K key. The drive starts to jog in reverse direction. After you release the MF.K key, the AC drive decelerates to stop.

6.11.2 Jump Frequency, FWD/REV Switchover Dead-zone Time, Reverse Run Prohibited

1) Jump Frequency

The frequency jump function enables the AC drive to avoid mechanical resonance point of load. The drive can be set with two separate frequencies. If both are set to 0, the frequency jump function is disabled.

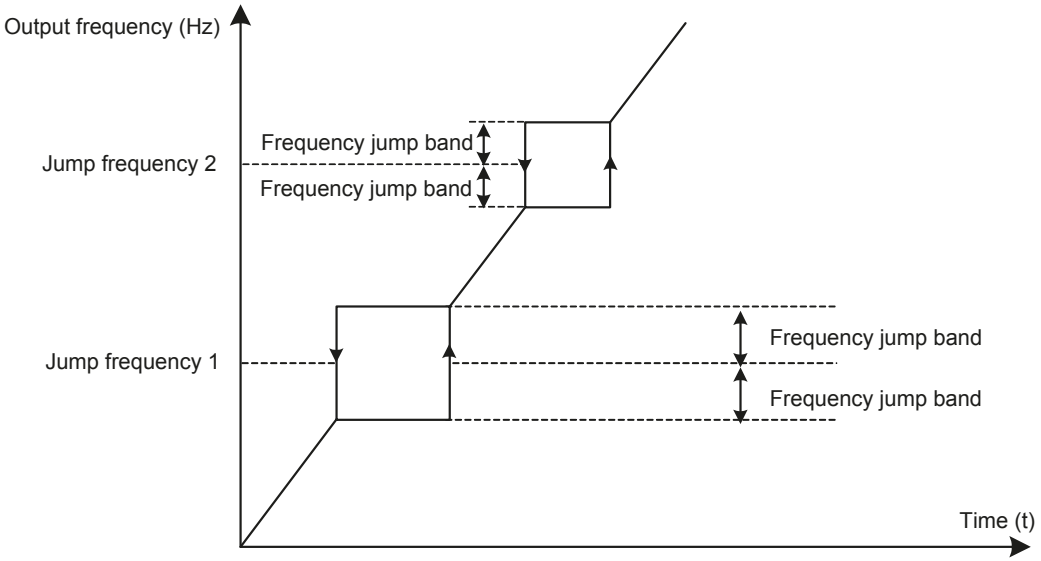


Figure 6-57 Jump frequency

In the figure above, during the acceleration process, the operating frequency accelerates to the jump frequency boundary, and the inverter will run at the current operating frequency for a period of time, and then the operating frequency will skip the jump frequency, and the jump amplitude is 2 times P8-11 (jump frequency amplitude);

During the deceleration, the operating frequency is slowed down to the jump frequency boundary, and the inverter runs at the current operating frequency for a period of time, and then the operating frequency skips the jump frequency by 2 times the jump frequency P8-11 (jump frequency amplitude).

parameter	define	default	range	description
P8-09	Frequency jump 1	0.00Hz	0.00 Hz to max. freq	-
P8-10	Frequency jump 2	0.00Hz	0.00 Hz to max. freq	-
P8-11	Frequency jump band	0.00Hz	0.00 Hz to max. freq	-
P8-22	Jump frequency function	0	0: Disabled 1: Enabled	jump frequency is valid or not during acc/dec process. When set to valid, during acceleration and deceleration, the running frequency reaches the jump frequency boundary, and the running frequency skips the jump frequency, and the jump amplitude is 2 times P8-11 (jump frequency amplitude). When set to invalid, during acceleration and deceleration, the operating frequency reaches the jumping frequency boundary, and the inverter will continue to run at the operating frequency.

2) FWD/REV Switchover Dead-zone Time

parameter	define	default	range	description
P8-12	Forward/Reverse run switch dead-zone time	0.0s	0.0s~3000.0s	Set transition time at 0Hz during forward and reverse transition of the inverter.

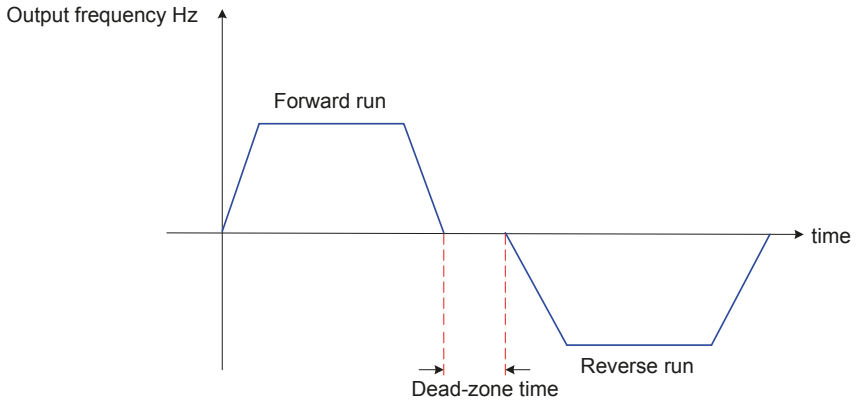


Figure 6-58 Forward/Reverse run switchover dead-zone time

3) Reverse Run Prohibited

parameter	define	default	range	description
P8-13	Reverse selection	0	0: Enabled 1: Disabled	-

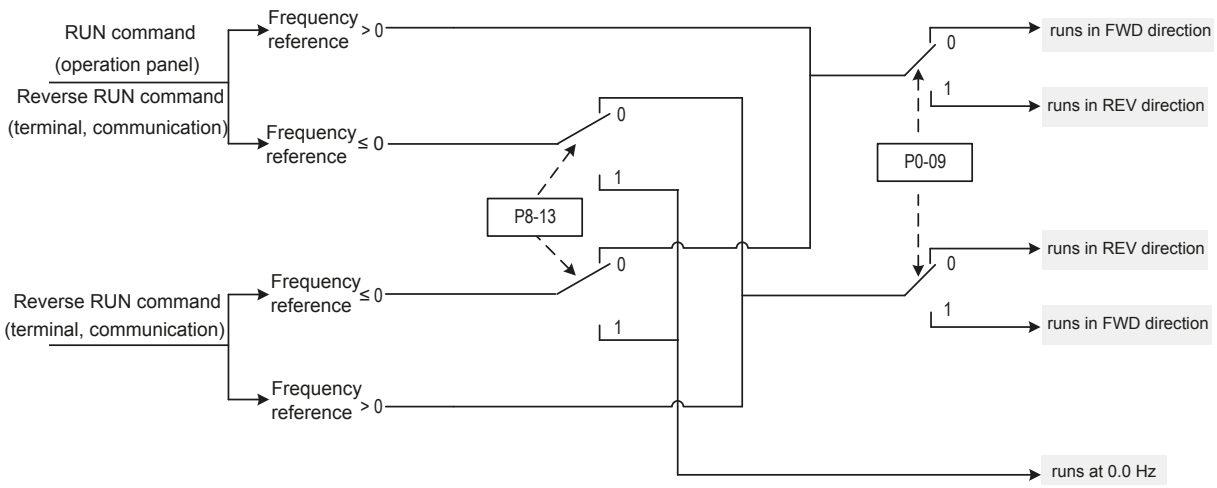


Figure 6-59 Control of reverse run

parameter	define	default	range	description
P0-09	Running direction	0	0: Run in the default direction (FWD/REV indicator off) 1: Run in the default reverse direction (FWD/REV indicator on)	-

By changing this parameter, the purpose of changing the motor steering can be realized without changing the motor wiring, and its function is equivalent to adjusting any two lines of the motor (U, V, W) to realize the conversion of the motor rotation direction.

NOTE

- After the parameters are initialized, the motor will return to its original state in the direction of operation. It is strictly forbidden to change the motor steering after the system is debugged.

6.11.3 User-defined parameter

PE-00~PE-29: This parameter group is a user-defined parameter group. The user can select the required parameters from all the parameters and summarize them into the FE group as user-customized parameters for easy viewing and changing operations. The FE group provides up to 30 user-defined parameters, if the display value of the FE group parameter is P0.00, it means that the user parameter is empty, when entering the user-defined parameter mode, the display parameter is defined by PE-00~PE-31, the order is the same as the PE group parameter, and the P0-00 is skipped; the A3 group parameter display value is U3-17, U3-16, wherein U3-17 is the PZD1 (inverter command word) of communication control, U3-16 PZD2 (Inverter Target Frequency) for communication control.

6.11.4 Frequency Detection (FDT)

This function sets detection values of output frequency and sets hysteresis level for the frequency detection function.

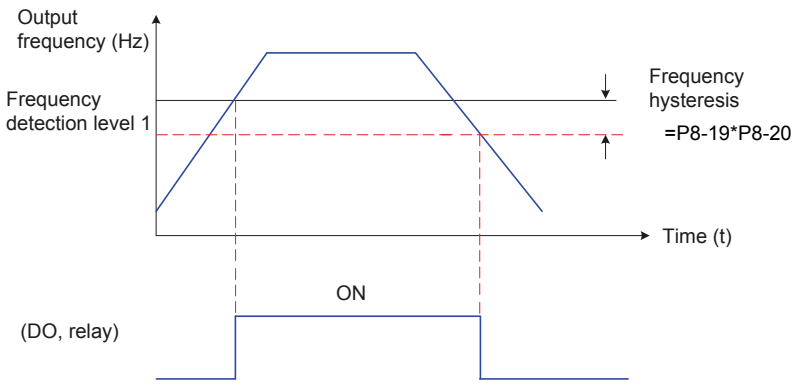


Figure 6-60 Frequency detection

parameter	define	default	range	description
P8-19	Frequency detection value 1	50.00Hz	0.00 Hz to max. frequency	When the operating frequency is higher than the frequency detection value, the DO terminal outputs an effective signal; When the operating frequency is lower than the frequency detection value minus the frequency check hysteresis value, the DO terminal outputs an invalid signal.
P8-20	Frequency detection hysteresis 1	5.0%	0.0% to 100.0%	The percentage of frequency lag value is based on the frequency detection value P8-19.
P8-28	Frequency detection value 2	50.00Hz	0.00 Hz to max. frequency	-
P8-29	Frequency detection hysteresis 2	5.0%	0.0% to 100.0%	-

6.11.5 Frequency Reaches Detection Amplitude

This function sets the detection width of the frequency reference.

Figure 6-64 Frequency reached detection width

parameter	define	default	range	description
P8-21	Detection width of target frequency reached	0.00%	0.0% to 100.0%	The percentage base is the maximum frequency. When the operating frequency of the inverter is within the range of the set frequency ± the maximum frequency * P8-21 (frequency detection amplitude), the DO terminal outputs a valid signal.

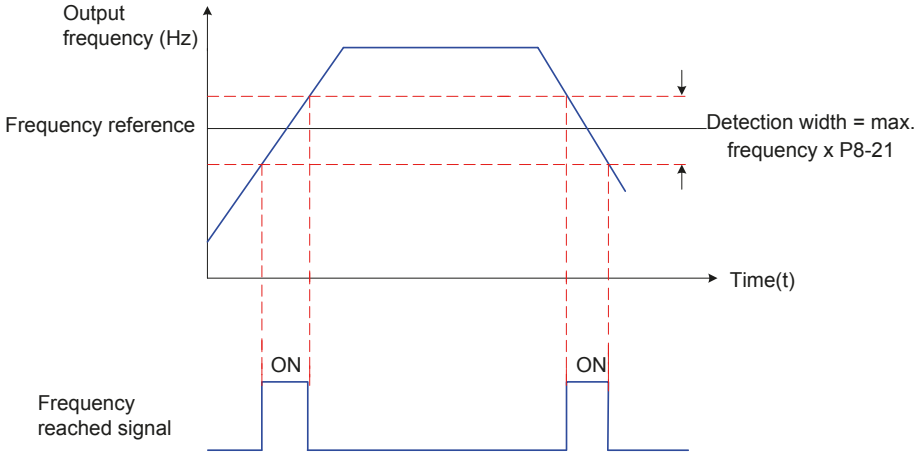


Figure 6-61 Frequency reached detection width

6.11.6 Switching Frequency of Acc/ Dec Time

During the operation of the inverter, different acceleration and deceleration times are selected according to the operating frequency range. That is, this function is only effective when the motor is selected as Motor 1 (P0-24 Motor Parameter Group Selection is set to 0) and the DI terminal function is not set to 16 (acceleration and deceleration time selection terminal 1) or 17 (acceleration and deceleration time selection terminal 2).

parameter	define	default	range	description
P8-25	Switchover frequency of acceleration time 1 and acceleration time 2	0.00 Hz	0.00 Hz to max. frequency	-
P8-26	Switchover frequency of deceleration time 1 and deceleration time 2	0.00 Hz	0.00 Hz to max. frequency	-

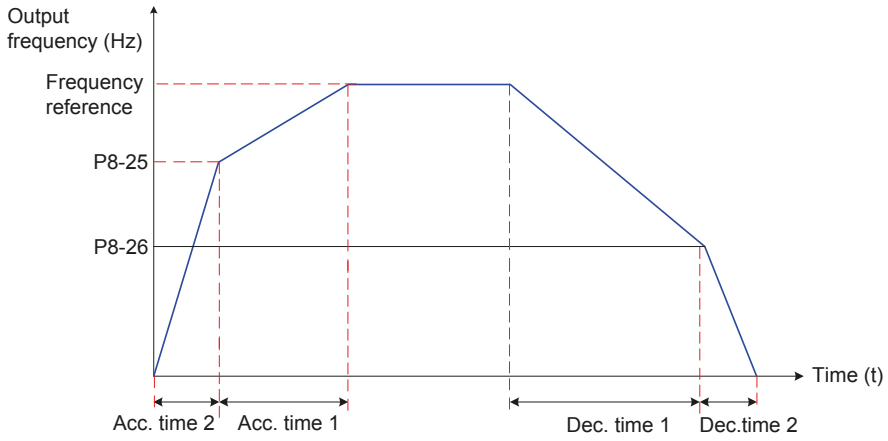


Figure 6-62 Acceleration and deceleration time switching

In acceleration process, if running freq. is less than P8-25, select Acceleration Time 2, and if running freq. is greater than P8-25, select Acceleration Time 1.

In deceleration process, if running freq. is greater than P8-26, select Deceleration Time 1, and if running freq. is less than P8-26, select Deceleration Time 2

6.11.7 Arbitrary Arrival Frequency Detection Value

parameter	define	default	range	description
P8-30	Detection of frequency 1	50.00Hz	0.00 Hz to max. frequency	When inverter is running, it is at any level arrival frequency check value± arbitrary arrival frequency rate the DO when the amplitude range is detected output a valid signal
P8-31	Detection width of frequency 1	0.0%	0.0% to 100.0% (max. freq)	
P8-32	Detection of frequency 2	50.00Hz	0.00 Hz to max. frequency	-
P8-33	Detection width of frequency 2	0.0%	0.0% to 100.0% (max. freq)	-

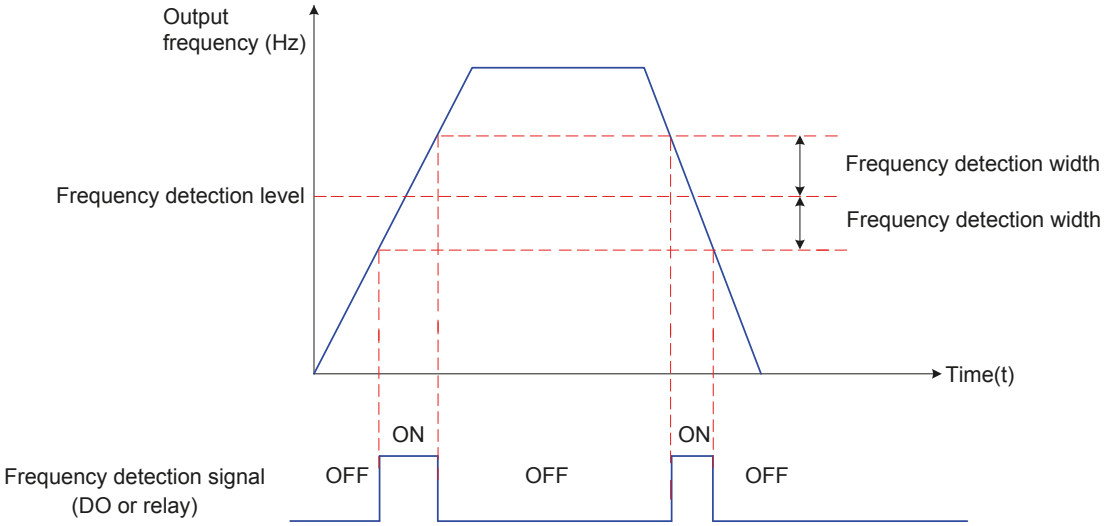


Figure 6-63 Arbitrary arrival frequency detection

6.11.8 Zero-current detection

parameter	define	default	range	description
P8-34	Zero current detection level	5.0%	0.0% to 300.0% (rated motor current)	When the output current of the inverter is less than or equal to the zero-current detection level P8-34 and the duration exceeds the zero-current detection delay time P8-35, the DO terminal outputs a valid signal
P8-35	Zero current detection delay	0.10s	0.00s to 600.00s	

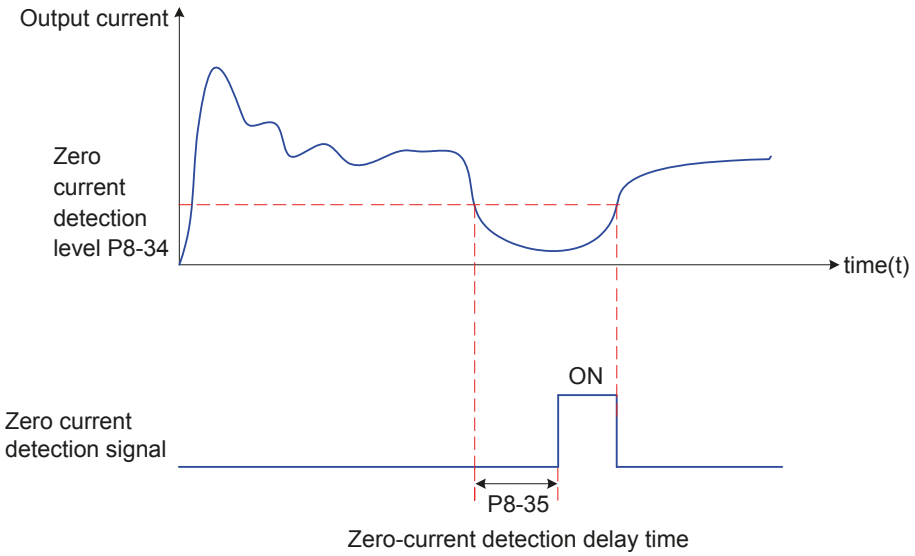


Figure 6-64 Zero current detection

6.11.9 Output Current Overrun

parameter	define	default	range	description
P8-36	Output current exceeds the limit value	200.0%	0.0% (no detection); 0.1%~300.0% (Motor rated current)	When the output current of the inverter is greater than the output current exceeding value P8-36, and the duration exceeds the software overcurrent point detection delay time P8-37, the DO terminal outputs a valid signal.
P8-37	Output current exceeds detection delay time	0.00s	0.00s~600.00s	-

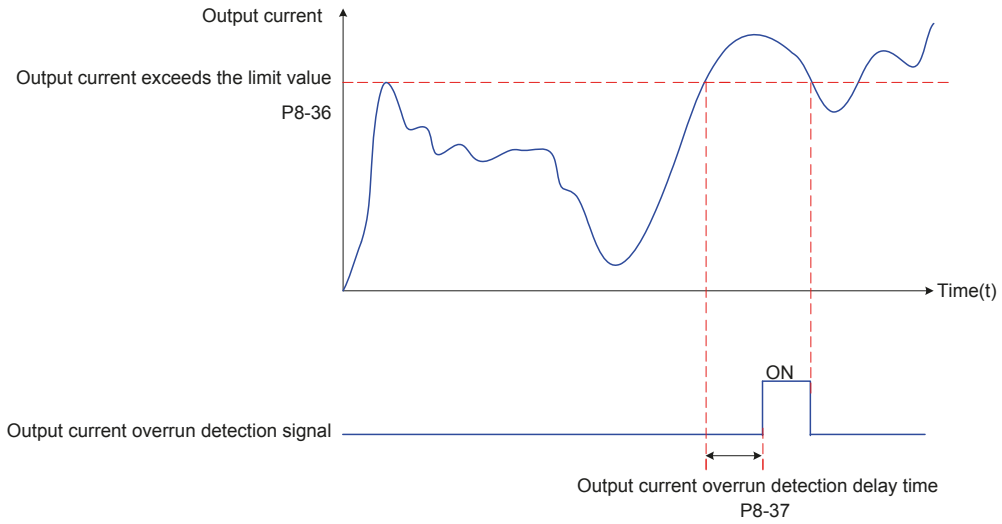


Figure 6-65 Detection of output current overrun

6.11.10 Arbitrary Arrival Current

parameter	define	default	range	description
P8-38	Detection level of current 1	100.0%	0.0% to 300.0% (rated motor current)	When output current of inverter is within the range of (arbitrary arrival current 1± arbitrary arrival current 1 width) * motor rated current, the DO terminal outputs a valid signal
P8-39	Detection width of current 1	0.0%	0.0% to 300.0% (rated motor current)	
P8-40	Detection level of current 2	100.0%	0.0% to 300.0% (rated motor current)	-
P8-41	Detection width of current 2	0.0%	0.0% to 300.0% (rated motor current)	-

The YD580E provides two sets of arbitrary arrival current and detection width parameters, Figure 6-69 is a schematic diagram.

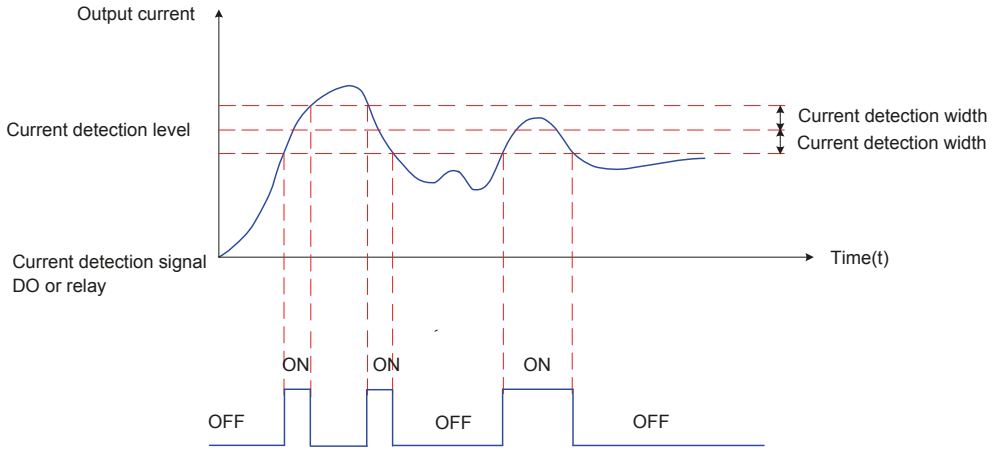


Figure 6-66 Current detection

6.11.11 Timer

Inverter timer operation function. Every time the inverter is started, the clock starts from 0, and the remaining running time of the timer can be checked through the U0-20.

parameter	define	default	range	description
P8-42	Timer function	0	0: Disabled 1: Enabled	Inverter timed operation function. Every time the inverter is started, the clock starts from 0, and the remaining running time of the timer can be checked through the U0-20.
P8-43	Running time setting channel	0	0: Set by P8-44 1: AI1 2: AI2 3: AI3	When set to 1, timer running time = (AI1 voltage/10V)* P8-44. The analog input range is 100% corresponding to P8-44
P8-44	Running time	0.0	0.0 to 6500.0 min	The timer is set by P8-43 and P8-44

1) Power-on arrival time

parameter	define	default	range	description
P8-16	Set cumulative power-on arrival time	0h	0h~65000h	When the cumulative power-on time (P7-13) reaches the power-on time set by P8-16, the DO terminal of the inverter outputs a valid signal

2) Running arrival time

parameter	define	default	range	description
P8-17	Set cumulative Running arrival time	0h	0h~65000h	Used to set the operating hours of inverter. When the cumulative running time of the inverter (P7-09) exceeds the set cumulative power-on arrival time (P8-17), the DO terminal outputs a valid signal.

6.11.12 AI1 Upper/Lower Limit of Volt-Protection

parameter	define	default	range	description
P8-45	AI1 input voltage lower limit	3.10 V	0.00V~P8-46	When value of analog input AI1 is greater than P8-46, or the input of AI1 is less than P8-45, the DO terminal of the inverter outputs a valid signal of "AI1 input overrun", which is used to indicate whether the input voltage of AI1 is within the set range
P8-46	AI1 input voltage upper limit	6.80 V	P8-45~11.00V	

6.11.13 Module Temperature

parameter	define	default	range	description
P8-47	IGBT temperature threshold	75°C	0°C to 100°C	When the temperature of the inverter radiator reaches the set value of P8-47, the DO terminal outputs a valid signal.

6.11.14 Cooling Fan

parameter	define	default	range	description
P8-48	Cooling fan working mode	0	0: Working during drive running	Set 0: When inverter is running, the fan will run, and when inverter is in the shutdown state, if the radiator temperature is higher than 40 degrees, the fan will run, and when the radiator temperature is lower than 40 degrees, the fan will not run.
			1: Working continuously	Set 1: Fan runs all the time after powering on.

6.11.15 Sleep and wake-up

Used to implement sleep and wake-up functions in water supply applications. In general, set the wake-up frequency (P8-49) to be greater than or equal to the sleep frequency (P8-51). If both the wake-up frequency and the hibernation frequency are 0.00Hz, the hibernation and wake-up functions are invalid.

When the PID is being calculated, the sleep function is enabled, if you want the PID to continue the calculation, PA-28 (PID stop calculation) is set to 1 (stop calculation), if you want the PID to stop the calculation, PA-28 (PID stop calculation) is set to 0 (stop no calculation).

parameter	define	default	range	description
P8-49	Wakeup frequency	0.00Hz	Hibernating freq(P8-51) to max.freq(P0-10)	If inverter is in a sleep state and the run command is valid, the inverter will start after the set frequency is greater than or equal to (P8-49) wake-up frequency and the wake-up delay time (P8-50) has passed
P8-50	Wakeup delay time	0.0s	0.0s to 6500.0s	
P8-51	Hibernating frequency	0.00Hz	0.00 Hz to wakeup frequency (P8-49)	During the operation of the inverter, when the set frequency is less than or equal to the P8-51 sleep frequency, after the P8-52 delay time, the inverter enters the sleep state and stops freely.
P8-52	Hibernating delay time	0.0s	0.0s to 6500.0s	

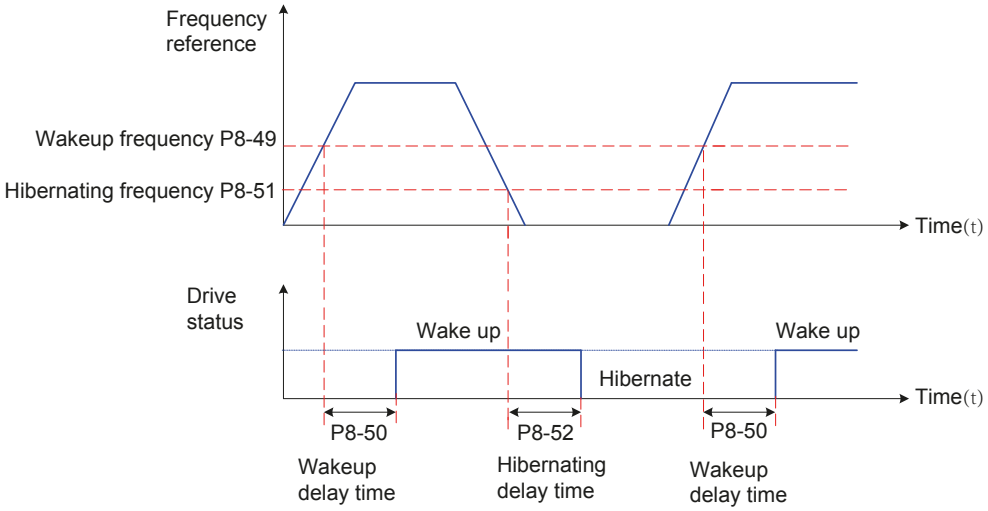


Figure 6-67 Sleep and wake-up settings

6.11.16 The time of this operation is

parameter	define	default	range	description
P8-53	Running time threshold this time	0.0Min	0.0Min~6500.0Min	When running time of this start reaches the set value of P8-53, DO terminal of the inverter outputs a valid signal. Valid only for this time, the time of the previous run is not accumulated

6.11.17 Output Power Correction

parameter	define	default	range	description
P8-54	Output power correction coefficient	100.0%	0.0%~200.0%	When output power (U0-05) does not correspond to the expected value, the output power can be linearly corrected by this value

6.11.18 Emergency stop and deceleration time

parameter	define	default	range	description
P8-55	Emergency stop and deceleration time	MODEL	0~6553.5	P8-55 as emergency stop deceleration time, the terminal emergency stop function decelerates according to the set dec. time

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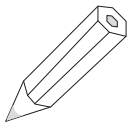

Chapter 7 Fault Diagnosis and Countermeasures

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Chapter 7 Fault Diagnosis and Countermeasures

7.1 Safety Precautions

Safety Precautions

Danger

- It is strictly forbidden to wire when the power is on, and be sure to keep all circuit breakers in the OFF state. Otherwise, there will be an electric shock of the danger.

Warning

- Please ensure that the inverter is grounded in accordance with local regulations. Otherwise, there is a risk of electric shock or fire.
- Do not disassemble the shell or touch the internal circuit after the inverter is energized. Otherwise, there is a risk of electric shock.
- Fault inspection must be carried out by professionals, and non-professionals are strictly forbidden to inspect, maintain and repair the inverter. Otherwise it would
  There is a risk of electric shock or fire.
- When installing the inverter in a closed cabinet or enclosure box, please use a cooling fan or cooling air conditioner to fully cool it to make the inverter the inlet air temperature of the frequency converter is kept below 50°C. Failure to do so can result in overheating or fire.
- Tighten all screws according to the specified torque. Failure to do so may pose a risk of fire or electric shock.
- Please confirm that the input voltage of the product is within the rated voltage range of the nameplate, otherwise there will be a risk of electric shock or fire.
- Do not place flammable and explosive materials near the inverter.

Note

- When installing the inverter, cover the upper part of the inverter with cloth or paper to prevent metal shaving, oil, and water from entering the hole during drilling into the inside of the inverter. If foreign objects get inside the inverter, it may cause the inverter to malfunction.
- When you are finished with work, remove the cloth or paper. If it continues to be covered, it will make the ventilation worse, causing the inverter to be different fever is common.
- When operating the inverter, please follow the steps specified in the ESD prevention measures, otherwise the inverter will be damaged due to static electricity ministry of circuits.

7.2 Adjustment guide before the inverter trial operation

1) Sensorless Vector Control Mode (P0-01=0 Factory Default)

This control mode controls the speed and torque of the motor in applications where the motor does not have encoder speed feedback. In this control mode, it is necessary to self-learn the motor parameters and complete the automatic tuning of the motor parameters.

Problems & Failures	Countermeasures
Overload or overcurrent fault is reported during motor start-up	● Motor parameters (P1-01~P1-05) are set according to the motor nameplate. ● Carry out motor parameter tuning (P1-37), and it is best to carry out dynamic and complete tuning of the motor when conditions permit.
Torque or speed of 5Hz or less, slow response, motor vibration	● To improve the response of torque and speed, it is necessary to strengthen the proportional adjustment of the speed loop (P2-00 increases the set value in units of 10) or reduce the integration time of the speed loop (P2-01 decreases in units of 0.05); ● If there is vibration, you need to weaken the P2-00 and increase the value of the P2-01 parameter.
Torque or speed of 5Hz or more, slow response, motor vibration	● To improve the response of torque and speed, it is necessary to strengthen the proportional adjustment of the speed loop (P2-03 increases the setting value in units of 10) or reduce the integration time of the speed loop (P2-04 decreases in units of 0.05); ● If there is vibration, you need to weaken P2-03 and increase the parameter value of P2-04.
Low speed accuracy	● When the deviation of the motor load speed is too large, it is necessary to increase the vector slip compensation gain (P2-06), which is increased or decreased by 10%.
Speed fluctuates greatly	● When there is abnormal fluctuation in motor speed, the speed filtering time (P2-07) can be increased appropriately in units of 0.001s.
The motor is noisy	● Increase the load frequency value (P0-15) appropriately, and increase it in units of 1.0KHz (Note: the leakage current of the carrier frequency motor will increase if it is increased)
The motor torque is insufficient or the output is insufficient	● Whether the upper torque limit is limited, increase the upper torque limit in speed mode (P2-10), and increase the torque command in torque mode

2) Closed-loop vector control mode (P0-01=1)

This mode is used in the application of encoder speed feedback of the motor, and the number of encoder lines, encoder type and signal direction need to be correctly set to complete the automatic tuning of motor parameters.

Problems & Failures	Countermeasures
Over-current or overload fault at starting	● Set the number of encoder wires, type, and encoder direction correctly
Over-current or overload fault during motor rotation	● Motor parameters (P1-01~P1-05) are set according to the motor nameplate. ● Motor parameter tuning (P1-37), preferably dynamic and complete tuning of the motor.
Torque or speed of 5Hz or less, slow response, motor vibration	● To improve the response of torque and speed, it is necessary to strengthen the proportional adjustment of the speed loop (P2-00 increases the setting value in units of 10) or reduce the integration time of the speed loop (P2-01 decreases in units of 0.05); ● If vibration occurs, the P2-00、P2-01 parameter values need to be attenuated.
Torque or speed of 5Hz or more, slow response, motor vibration	● To improve the response of torque and speed, it is necessary to strengthen the proportional adjustment of the speed loop (P2-03 increases the setting value in units of 10) or reduce the integration time of the speed loop (P2-04 decreases in units of 0.05); ● If vibration occurs, the P2-03 and P2-04 parameter values need to be attenuated.
Speed fluctuates greatly	● When there is abnormal fluctuation in the speed of the motor, the speed filtering time (P2-07) can be increased appropriately in units of 0.001s.

Problems & Failures	Countermeasures
The motor is noisy	● Increase the load frequency value (P0-15) appropriately, and increase it in units of 1.0KHz (Note: the leakage current of the carrier frequency motor will increase if it is increased)
The motor torque is insufficient or the output is insufficient	● Whether the upper torque limit is limited, increase the upper torque limit in speed mode (P2-10), and increase the torque command in torque mode

3) V/F control mode (P0-01=2)

This mode is used in applications where the motor does not have encoder speed feedback, and is not sensitive to motor parameters, and only needs to correctly set the rated voltage and rated frequency values of the motor.

Problems & Failures	Countermeasures
The motor oscillates during operation	● Increase the oscillation suppression parameter (P3-11) in increments of 10 (maximum adjustment to 100);
Start reports over-current	● Reduced torque lift (P3-01), adjusted in 0.5% increments;
The current is too high in operation	● Correctly set the rated voltage (P1-02) and rated frequency (P1-04) of the motor; ● Reduced torque lift (P3-01), adjusted in 0.5% increments;
The motor is noisy	● Increase the load frequency value (P0-15) appropriately, and increase it in units of 1.0KHz (Note: the leakage current of the carrier frequency motor will increase if it is increased)
Sudden overload or deceleration alarm overvoltage	● Confirm that the over-voltage stall enable (P3-23) is set to the enable state, and increase the over-voltage stall gain (P3-24/P3-25, factory 30) in increments of 10 (the maximum is adjusted to 100); ● Reduce the over-voltage stall operating voltage (P3-22 factory 770V), decrease in 10V units (minimum adjustment to 700V);
Sudden overload or deceleration alarm overvoltage	● Increase the gain of excess loss velocity (P3-20 factory 20) in units of 10 (the maximum is adjusted to 100); ● Reduce the over-velocity operation current (150% of P3-18 factory), and reduce it in units of 10% (the minimum adjustment is 50%);

7.3 Alarm and fault display of frequency converter

When the inverter detects an abnormality, the output will be cut off, and the fault indicator TUNE/TC will flash at the same time, and the contact of the inverter fault relay will be activated at the same time. The inverter operation panel will display fault codes such as " Err02 ", etc., the fault type corresponding to the fault code and common solutions See the table below for details. The list in the table is for reference only, please do not repair or transform without authorization, if you cannot eliminate the fault, please seek technical support from our company or product agent.

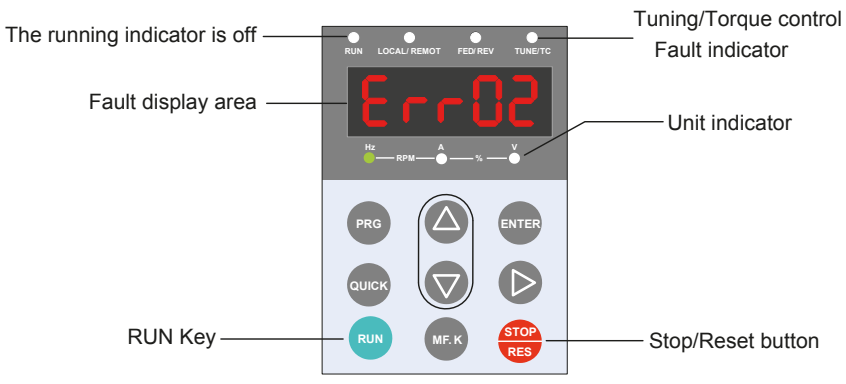
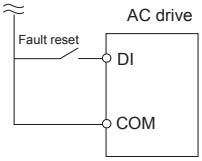
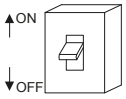
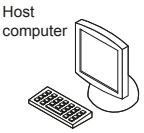


Figure 7-1 Schematic diagram of the interface

7.4 Restarting method of inverter after failure occurs

Stage	Solution	Remark
After the fault occurs	Check operating panel for detailed information of recent three faults, such as fault type and frequency,current, bus voltage, DI/DO state, accumulative power-on time and accumulative running time at occurrence of the faults.	It can be viewed from P9-14~P9-44
Before the fault is reset	Find and remove cause of the fault. Then follow steps below to reset the fault.	Please refer to "7.5 Fault Alarm and Countermeasures" for processing
Fault resetting method	1）Fault resetting through a DI terminal. Allocate a DI terminal with function 9 “Fault reset (RESET)” by setting of P4-00~P4-09 to 9.	
	2）Fault resetting via operating panel. Confirm that P7-02 = 1 (default value). Then press the STOP/RES key on operating panel.	Press red STOP/RES key on panel
	3）Automatic resetting Disconnect the power supply. Until the fault code disappears, connect the power supply again.	
	4） Fault resetting via host computer Confirm that P0-02 = 2 and write "7" (fault reset) to communication address 2000H.【note】	

【note】 For details, please refer to "Appendix C Newsletter".

7.5 Fault alarm and countermeasures

Troubleshoot the fault according to the following table. If the fault cannot be eliminated, contact the agent or Inovance

Fault Name	Panel Display	Cause	Possible Solution
Over-current during acceleration	Err02	Ground fault or short circuit exists in the output circuit.	● Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC or FVC but motor auto-tuning is not performed.	● Set motor parameters according to motor nameplate and perform motor auto-tuning.
		Acceleration time is too short.	● Increase acceleration time.
		The over-current stall prevention parameter are set improperly.	● Ensure that current limit is enabled (P3-19=1). ●The setting of current limit level (P3-18) is too large . Adjust it between 120% and 150%. ● The setting of the current limit gain (P3-20) is too small. Adjust it between 20 and 40.
		Customized torque boost or V/F curve is not appropriate.	● Adjust the customized torque boost or V/F curve.
		The spinning motor is started.	● Enable the catching a spinning motor function or start the motor after it stops.
		Drive suffers external interference.	● View historical fault records. If the current value is far from the over-current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.
Over-current during deceleration	Err03	Ground fault or short circuit exists in the output circuit.	● Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC or FVC but motor auto-tuning is not performed.	● Set motor parameters according to motor nameplate and perform motor auto-tuning.
		Deceleration time is too short.	● Increase deceleration time.
		The over-current stall prevention parameter are set improperly.	● Ensure that current limit is enabled (P3-19=1). ● The setting of current limit level (P3-18) is too large. Adjust it between 120% and 150%. ● The setting of the current limit gain (P3-20) is too small. Adjust it between 20 and 40.
		Braking unit and braking resistor are not installed.	● Install braking unit and braking resistor
		Drive suffers external interference.	● View historical fault records. If the current value is far from the over-current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.
Over-current at constant speed	Err04	Ground fault or short circuit exists in the output circuit.	● Check whether short-circuit occurs on the motor, motor cable or contactor.
		Control mode is SVC or FVC but motor auto-tuning is not performed.	● Set motor parameters according to motor nameplate and perform motor auto-tuning.
		The over-current stall prevention parameters are set improperly.	● Ensure that current limit is enabled (P3-19=1). ● The setting of current limit level (P3-18) is too large. Adjust it between 120% and 150%. ● The setting of current limit gain (P3-20) is too small. Adjust it between 20 and 40.
		Drive power class is small.	● If output current exceeds rated motor current or rated output current of the AC drive during stable running, replace a drive of larger power class.
		Drive suffers external interference.	● View historical fault records. If the current value is far from the over-current level, find interference source. If external interference does not exist, it is the drive board or hall device problem.

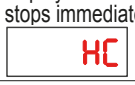
Fault Name	Panel Display	Cause	Possible Solution
Over-voltage during acceleration	Err05	Input voltage is too high.	● Adjust input voltage to normal range.
		An external force drives motor during acceleration.	● Cancel the external force or install a braking resistor.
		The over-voltage stall prevention parameters are set improperly.	● Ensure voltage limit function is enabled (P3-23=1). ● The setting of voltage limit (P3-22) is too large. Adjust it between 700 V and 770 V. ● The setting of frequency gain for voltage limit (P3-24) is too small. Adjust it between 30 and 50.
		Braking unit and braking resistor are not installed.	● Install braking unit and braking resistor.
		Acceleration time is too short.	● Increase acceleration time.
Over-voltage during deceleration	Err06	The over-voltage stall prevention parameters are set improperly	● Ensure voltage limit function is enabled (P3-23=1). ● The setting of voltage limit (P3-22) is too large. Adjust it between 700 V and 770 V. ● The setting of frequency gain for voltage limit (P3-24) is too small. Adjust it between 30 and 50.
		An external force drives motor during deceleration.	● Cancel the external force or install braking resistor.
		Deceleration time is too short.	● Increase deceleration time.
		Braking unit and braking resistor are not installed.	● Install braking unit and braking resistor.
Over-voltage at constant speed	Err07	The overvoltage stall prevention parameters are set improperly.	● Ensure voltage limit function is enabled (P3-23=1). ● The setting of voltage limit (P3-22) is too large. Adjust it between 700 V and 770 V. ● The setting of frequency gain for voltage limit (P3-24) is too small. Adjust it between 30 and 50. ● The setting of frequency rise threshold during voltage limit (P3-26) is too small. Adjust it between 5 Hz and 20 Hz.
		An external force drives motor during running.	● Cancel the external force or install a braking resistor
Pre-charge resistor fault	Err08	Bus voltage fluctuates around undervoltage threshold continuously	● Contact the agent or yolico.
Under-voltage	Err09	Instantaneous power failure occurs	● Enable the power dip ride through function (P9-59 ≠ 0).
		The AC drive's input voltage is not within the permissible range.	● Adjust the voltage to normal range.
		The bus voltage is abnormal.	● Contact the agent or yolico.
		The rectifier bridge, the buffer resistor, the drive board or the control board are abnormal.	● Contact the agent or yolico.
Drive overload	Err 10	Load is too heavy or locked-rotor occurs on motor	● Reduce load or check motor and mechanical condition
		The AC drive power class is small.	● Replace a drive of larger power class.
Motor overload	Err 11	P9-01 (Motor overload protection gain) is set improperly.	● Set P9-01 correctly.
		Load is too heavy or locked-rotor occurs on motor	● Reduce load or check motor and mechanical condition
Input phase loss	Err 12	Input phase loss occurs	● Eliminate faults in external circuitry.
		Drive board, lightning protection board, control board, or rectifier bridge is abnormal.	● Contact the agent or yolico.
Output phase loss	Err 13	Motor winding is damaged.	● Replace motor is winding is damaged.
		Cable connecting drive and motor is abnormal.	● Correct wiring.
		Drive's 3-phase output are unbalanced when motor is running.	● Check the motor 3-phase winding is normal.
		Drive board or IGBT is abnormal.	● Contact the agent or yolico.

Fault Name	Panel Display	Cause	Possible Solution
IGBT over-heat	Err 14	Ambient temperature is too high.	● Lower the ambient temperature.
		Ventilation is clogged.	● Lower the ambient temperature.
		Fan is damaged.	● Replace the cooling fan.
		Thermally sensitive resistor of IGBT is damaged.	● Replace the damaged thermally sensitive resistor.
		Drive IGBT is damaged.	● Replace the AC Drive IGBT.
External fault	Err 15	External fault signal is input via DI.	● Confirm mechanical condition allows restart (P8-18)and reset the operation.
		External fault signal is input via virtual I/O.	● Confirm that the virtual I/O parameters in group A1 are set correctly and reset the operation.
Communication fault	Err 16	Host computer is in abnormal state.	● Check the cable of host computer.
		Communication cable is abnormal	● Check the communication cables.
		P0-28 of extend comm.card is set wrong	● Set P0-28 of extension comm.card correctly.
		Group PD are set improperly	● Set communication parameters in group PD properly
		After all the preceding checkings are done but the fault still exists, restore the default settings.	
Contactor fault	Err 17	Drive board are abnormal.	● Replace drive board or power supply board.
		Contactor is abnormal	● Replace contactor.
		Lightning protection board is abnormal.	● Replace the lightning protection board
Current detection fault	Err 18	The hall is abnormal.	● Replace the hall .
		The drive board is abnormal	● Replace the drive board.
Motor auto-tuning fault	Err 19	Motor parameters are not set according to nameplate.	● Set motor parameters correctly according to nameplate
		Motor auto-tuning times out.	● Check the cable connecting AC drive and motor.
		The encoder is abnormal.	● Check P1-27 is set correctly. ● Check signal lines of encoder are connected correctly and securely.
Encoder fault	Err20	Encoder is not matched	● Set the type of encoder correctly
		Encoder wiring is incorrect	● Check the PG card power supply and phase sequence
		Encoder is damaged	● Replace encoder
		PG card is abnormal	● Replace PG card
EEPROM read-write fault	Err21	EEPROM chip is damaged	● Replace the main control board
Short circuit to ground	Err23	Motor is short circuited to the ground	● Replace cable or motor
Accumulative running time reached	Err26	Accumulative running time reaches the setting value	● Clear the record through parameter initialization
User-defined fault 1	Err27	User-defined fault 1 is input via DI.	● Reset the operation
		User-defined fault 1 is input via virtual I/O.	● Reset the operation
User-defined fault 2	Err28	User-defined fault 2 is input via DI.	● Reset the operation
		User-defined fault 2 is input via virtual I/O.	● Reset the operation
Accumulative power-on time reached	Err29	Accumulative power-on time reaches the setting value	● Clear the record through parameter initialization
Load loss	Err30	The output current of AC drive is smaller than P9-64 (load loss detection level).	● Check load is disconnected or the setting of P9-64 and P9-65 (load lost detection time) satisfies actual running condition.
PID feedback lost during running	Err31	PID feedback is smaller than the setting value of PA-26 (detection level of PID feedback loss).	● Check PID feedback or set PA-26 properly
Pulse-by-pulse current limit fault	Err40	Load is too heavy or locked-rotor occurs on motor	● Reduce load or check motor and mechanical condition
		The AC drive power class is small	● Replace a drive of larger power class

Fault Name	Panel Display	Cause	Possible Solution
Motor switchover fault during running	Err41	Motor switchover via terminal during running of the AC drive.	● Perform motor switchover after the AC drive stops
Speed error	Err42	Encoder parameter are wrong	● Set encoder parameters properly
		Motor auto-tuning is' nt performed	● Perform motor auto-tuning
		P9-69 and P9-70 are set incorrectly.	● Set P9-69 and P9-70 correctly based on the actual situation
Motor over-speed	Err43	Encoder parameter are wrong	● Set encoder parameters properly
		Motor auto-tuning is' nt performed	● Perform motor auto-tuning
		P9-67 and P9-68 are set incorrectly.	● Set P9-67 and P9-68 correctly based on the actual situation
Motor over-temperature.	Err45	Temper sensor cable loose	● Check cable connection of temperature sensor
		Motor temperature is too high	● Increase carrier.freq or take other cool the motor
Initial position angle identification fault.	Err51	Drive output phase loss	● Check whether the motor wiring is correct.
		Drive current detection fails or the hall is damaged.	● Check the hall.
		Motor inductance is too large.	● Set P9-75 to avoid this fault.
Master-slave controls slave fault	Err55	Check slaver.	● Troubleshoot according to the slave fault code
Braking unit overload	Err61	Resistance of braking resistor is too small	● Please refer to "Table 9-27 YD580E Inverter Brake Assembly Selection Table"
Short-circuit of braking circuit	Err62	Braking IGBT is abnormal	● Contact the agent or Inovance.
Counter electromotive force identification exception warning	A64	Related parameters are set incorrectly.	● Set related parameters correctly, the rated frequency and rotation speed in particular.
		P1-20 is set incorrectly.	● Check whether P1-20 is set to a too large or too small value
		Counter electromotive force identification exception during dynamic identification	● Check motor has no load during dynamic identification and motor rotates at 40% of the rated rotation speed.
		The motor is demagnetized.	● Check motor is demagnetized
		Counter electromotive force is too large or too small.	● If yes, press STOP to reset the warning and motor continues to run.
Short-circuit of braking circuit	Err67	Braking IGBT is abnormal	● Contact the agent or Yolico. ● If check Inverter is right, Set A9-05 = 0.

7.6 Common Faults and Handling Methods

Item	Panel Display	Cause	Possible Solution
1	no display while power-on	Main voltage is not input or too low	● Check input Voltage
		Power on drive board is faulty	● Check +10v/+24v of C/B is right.
		Wire between C/B、D/B or panel is break.	● Reseat the cable or pin header
		Pre-charge resistor of drive is damaged.	● Contact the agent or Yolico
		Control board or operating panel is faulty.	
		Rectifier bridge is damaged	
2	"HC" is displayed while power-on. HC	Wire between D/B and C/B is in poor contact	● Reseat the cable or pin header
		Related component on C/B are damaged	● Contact the agent or Yolico
		Motor or cable is short circuited to ground	
		The hall is damaged.	
		Mains voltage is too low.	
3	"Err23" is displayed at power-on. Err23	Motor or output cable is short circuited to ground.	● Measure insulation resistance of motor and cable
		The AC drive is damaged	● Contact the agent or Yolico

Item	Panel Display	Cause	Possible Solution
4	The display is normal while power-on. But after running, "HC" is displayed and the drive stops immediately. 	Cooling fan is damaged or locked-rotor occurs	● Replace the fan.
		Short circuit exists in wiring of control terminals	● Eliminate short circuit fault in control circuit wiring.
5	Err14 (IGBT overheat) is detected frequently.	Setting of carrier freq. is too high	● Reduce carrier frequency（P0-15）
		Fan is damaged, or ventilation is clogged	● Replace the fan or clean the ventilation
		Components inside the AC drive are damaged (thermistor or others).	● Contact the agent or Yolico
6	The motor does not rotate after the AC drive runs.	Wiring between drive and motor is incorrect	● Check wiring between drive and motor is normal
		Related drive and motor parameters are set improperly.	● Restore factory dafault and re-set following parameters properly: ● Encoder parameters，Motor ratings, such as rate motor frequency and rated motor speed ● Motor 1 control mode (P0-01) and command source (P0-02) ● selection P0-02 and P3-01 (torque boost) in V/F control under heavy-load start.
		Cable connection between drive board and control board is in poor contact.	● Re-connect wirings and ensure secure connection.
		The drive board is faulty	● Contact the agent or Yolico
7	DI terminals are disabled.	Related parameters are set incorrectly	● Check and set parameters in group P4 again.
		External signals are incorrect	● Re-connect external signal cables
		Jumper across OP and +24 V becomes loose.	● Re-confirm jumper bar across OP and +24 V.
		The control board is faulty	● Contact the agent or Yolico
8	Motor speed does not rise in FVC control.	Encoder is faulty.	● Replace encoder and re-confirm cable connection
		Encoder connection is incorrect or in poor contact.	● Reconnect the encoder to ensure in good contact
		PG card is faulty	● Replace the PG card
		Drive board is faulty	● Contact the agent or Yolico
9	Drive detects over-current and over-voltage frequently.	Motor parameters are set improperly	● Set motor parameter or auto-tuning again
		Acceleration/deceleration time is improper.	● Set proper acceleration/deceleration time.
		Load fluctuates.	● Contact the agent or Yolico
10	Err17 is detected upon power-on or running.	The pre-charge relay or contactor is not closed.	● Check whether the relay or contactor cable is loose. ● Check whether the relay or contactor is faulty. ● Check whether 24 V power supply of the contactor is faulty. ● Contact the agent or Yolico
11	Decelerating or stopping, the motor stops freely or no braking ability	Encoder disconnection or over-voltage stall protection takes effect	● When there is a speed sensor vector control mode (P0-01=1), please check the encoder wiring. ● If the braking resistor has been configured, select "Overvoltage Stall Enable" as "Invalid" (set P3-23=0) and turn off the overvoltage stall

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Chapter 8 Routine Maintenance and Maintenance

8.1 Routine Maintenance

Safety Information

WARNING

- Do not connect or disconnect wiring while the power is on.
- Disconnect all power and wait for several minutes. Do not touch any terminals before the capacitors have fully discharged.
- Do not modify or disconnect wiring, remove optional extension card or replace the cooling fan while the power is on.
- Make sure to connect the motor-side grounding terminal. Failure to comply may result in electric shock due to touching motor housing.
- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ e work.
- Installation, wiring, commissioning, repair & maintenance, and component ~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

CAUTION

- Do not run the AC drive with front cover removed.
- Drawings in the manual are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as ~~~~~~~~ and then perform operations in accordance with instructions.
- T~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
- Ensure that input voltage is within permissible range. Incorrect input voltage of main circuit may result in abnormal running.
- Keep combustible materials far away from the AC drive or mount the AC drive on incombustible surfaces such as a metal wall.
- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ pter. Ensure correct air outlet direction of the fan. Incorrect air direction will diminish the ~ ~~~~~
- Do not connect or disconnect motor while the drive is running. Failure to comply may result in electric shock and damage to the AC drive.
- Use shielded cables for control circuit wiring. Meanwhile, ground the shield to the grounding terminal reliably.
- Do not modify the drive circuitry. Failure to comply will damage the AC drive.
- Make sure to connect the output terminals of the AC drive and the motor terminals correctly.
- If it is necessary to change the motor rotation direction, exchange any two of UVW cables of the AC drive.
- Do not operate the AC drive that has been damaged. This is to prevent further damage to external equipments.

8.1.1 Routine inspection items

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

More frequent inspection will be required if it is used in harsh environments, such as:

- High ambient temperature
- Frequent starting and stopping
- Fluctuations in the AC power supply or load
- Excessive vibrations or shock loading
- Dust, metal dust, salt, sulfuric acid, chlorine atmospheres
- Poor storage conditions.

Check the following items daily to avoid deterioration in performance or product. Copy this checklist and sign the "checked" column after each inspection.

Inspection Item	Inspection Points	Solutions	Checked
Motor	Inspect whether abnormal oscillation or noise exists.	• Check mechanical connections. • Check power phases of the motor. • Tighten all loose screws.	
Fan	Inspect whether the cooling fan of the AC drive and the motor works abnormally.	• Check running of the drive-side cooling fan. • Check running of the motor-side cooling fan. • Check whether the cooling fan is clogged or dirty. • Check whether ambient temperature is within the permissible range.	
Installation environment	Inspect whether the cabinet and cable duct are abnormal.	• Check for input and output cables with insulation damaged. • Check for vibration of hanging bracket. • Check whether ground bars and terminals become loose or get corroded.	
Load	Inspect whether the drive output current exceeds the drive or motor rating for an extended period of time.	• Check for setting of motor parameters. • Check for excessive load. • Check for mechanical vibration (< 0.6 g on normal condition).	
Input voltage	Inspect whether the power voltage of the main and control circuits is within the allowed range.	• Adjust the input voltage to the permissible range. • Check whether start of heavy load exists.	

8.2 Periodic inspection

8.2.1 Periodic inspection items

Always keep the AC drive clean. Clear away dusts especially metal powder on the surface of the AC drive, to prevent dust from entering the drive. Clear oil dirt from the cooling fan of the AC drive.

WARNING

- Do not perform inspection work while the power is on.
- Disconnect all power and wait for several minutes. Do not touch any terminal before the capacitors have fully discharged.

Check the following items every day to avoid deterioration in performance or product. Copy this checklist and sign the "checked" column after each inspection.

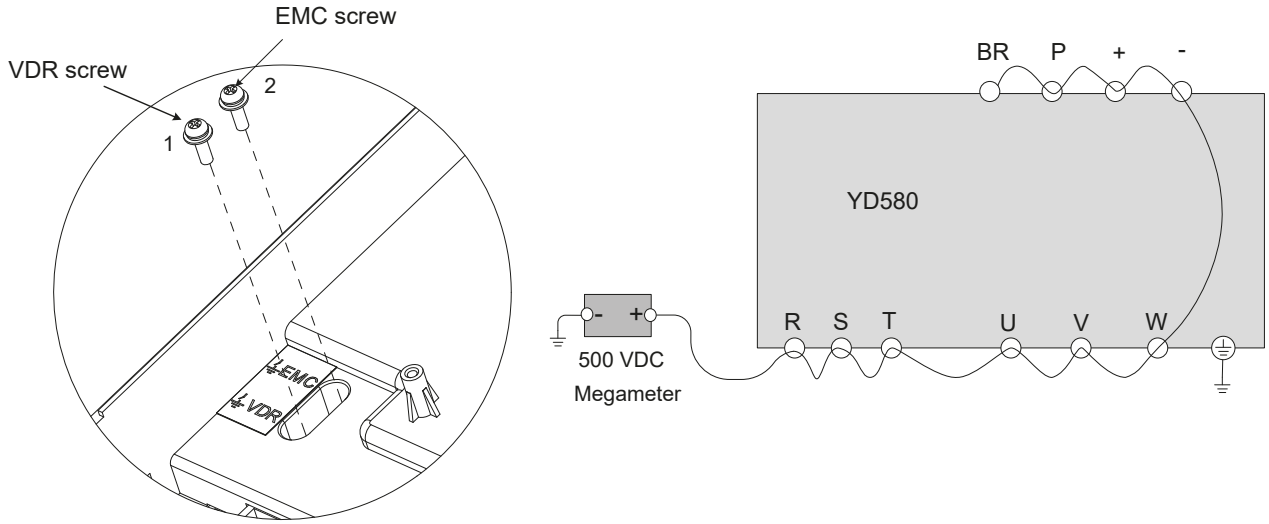
Inspection Item	Inspection Points	Solutions	Checked
General	Inspect for wastes, dirt and dust on the surface of the AC drive.	Use a vacuum cleaner to suck up wastes and dust to prevent direct touching. Wipe surface dirt gently with a soft cloth immersed in neutral detergent.	
Cables	Inspect power cables and connections for discoloration. Inspect wiring insulation for aging or wear.	Replace cracked cable. Replace damaged terminals.	
Peripheral devices such as relay and contactor	Inspect contactors and relays for excessive noise during operation. Inspect coils for signs of overheating such as melted or cracked insulation.	Check whether the coil voltage is normal. Replace abnormal peripheral device.	
Ventilation	Inspect whether ventilation and heatsink are clogged. Check whether the fan is damaged.	Clean ventilation. Replace the fan.	
Control circuit	Inspect for control components in poor contact. Inspect for loose terminal screws. Inspect for control cables with cracked insulation.	Clear away foreign matters on the surface of control cables and terminals. Replace damaged or corroded control cables.	

8.2.2 Insulation Test on Main Circuit

Note	• Before measuring insulation resistance with megameter (500 VDC megameter recommended), disconnect the main circuit from the AC drive. • Do not conduct the dielectric strength test. High voltage (> 500 V) test need not be performed again because it has been completed before delivery.

Figure 8-1 Test insulation on the main circuit

The measured insulation resistance must be greater than 5 MΩ. Before test, remove the VDR screw, as shown in the following position.



8.3 Lifetime of Fans and Electrolytic DC Bus Capacitors

■ 8.3.1 Number of Fans on the Drive

The lifetime of fans and electrolytic DC bus capacitors is related to the operating environment and maintenance status. Generally, the lifetime is shown as follows:

Component	Service Life	Possible Cause	Judging Criteria
Fan	≥ 5 years	● Bearing worn ● Blade aging	● Whether there is crack on the blade ● Whether there is abnormal vibration noise upon startup
Electrolytic DC bus capacitor	≥ 5 years	● Input power supply in poor quality ● High ambient temperature ● Frequent load jumping ● Electrolytic aging	● Whether there is liquid leakage. ● Whether the safe valve has projected. ● Measure the static capacitance. ● Measure the insulation resistance.

The standard service time indicates the service time when the AC drive is used on the following conditions:

- Ambient temperature: about 40°C on average yearly
- Load rate: below 80%
- Operating rate: below 24 hours per day

You can determine when to replace these parts according to the actual operating time.

■ 8.3.2 Number of Fans on the Drive

Model	Number of Fans
3-PH 380~480V，50/60Hz	
YD580ET4-0P7G/1P5B	1
YD580ET4-1P5G/2P2PB	1
YD580ET4-2P2G/3P7PB	1
YD580ET4-3P7G/5P5PB	1
YD580ET4-5P5G/7P5PB	1
YD580ET4-7P5G/11PB	1
YD580ET4-11G/15PB	2
YD580ET4-15G/18P5PB	2
YD580ET4-18P5G/22PB	1
YD580ET4-22G/37P(B)	1
YD580ET4-30G/37P(B)	1
YD580ET4-37G/45P(B)	1
YD580ET4-45G/55P(B)	1
YD580ET4-55G/75P(B)	1
YD580ET4-75G/90P(B)	2
YD580ET4-90G/110P	2
YD580ET4-110G/132P	2
YD580ET4-132G/160P	2
YD580ET4-160G/200P	2
YD580ET4-200G/220P	2
YD580ET4-220G/250P	2
YD580ET4-250G/280P	3
YD580ET4-280G/315P	3
YD580ET4-315G/355P	3
YD580ET4-355G/400P	3
YD580ET4-400G/450P	3
YD580ET4-450G/500P	3

8.3.3 Cooling Fan Replacement

1) Possible damage causes: bearing wear, blade aging.

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

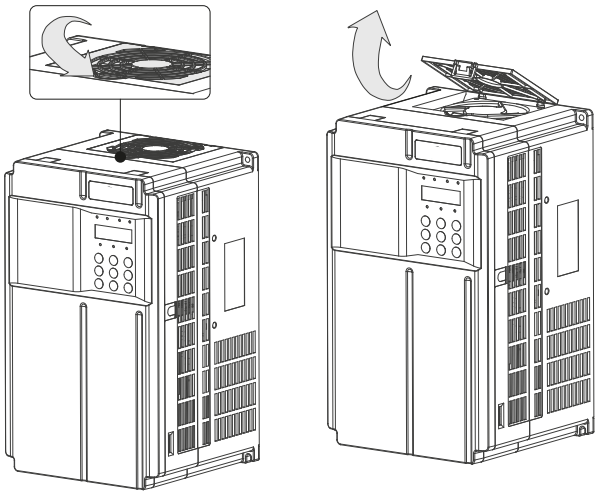
3) Fan Replacement Method:

After pressing the buckle of the plastic protective cover of the fan, pull it outward;
After replacing the fan, make sure the wind direction is blowing upwards and pay attention to the wind direction.

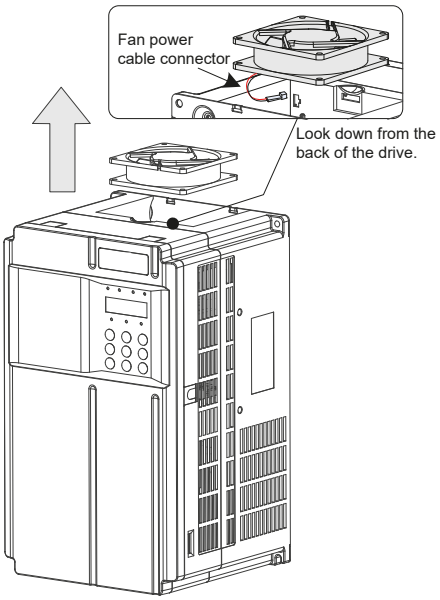
■ Removing and Installing the Fan of a Plastic Housing (YD580ET4-0P7G/1P5PB to YD580ET4-37G/45P(B)

Removal

1. Depress the fan cover hook and take the fan cover ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

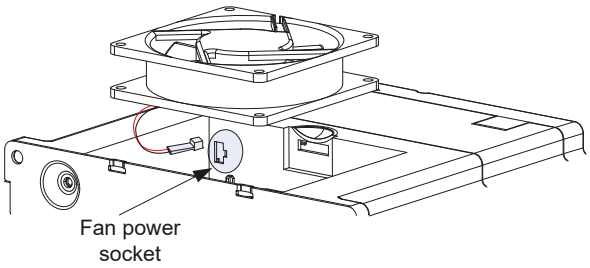


2. Pull the fan upward and disconnect the pluggable connector of power cable.

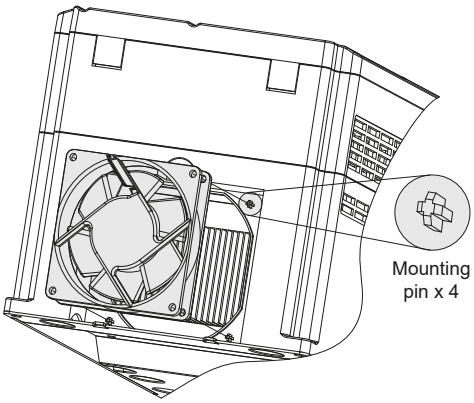


Installing

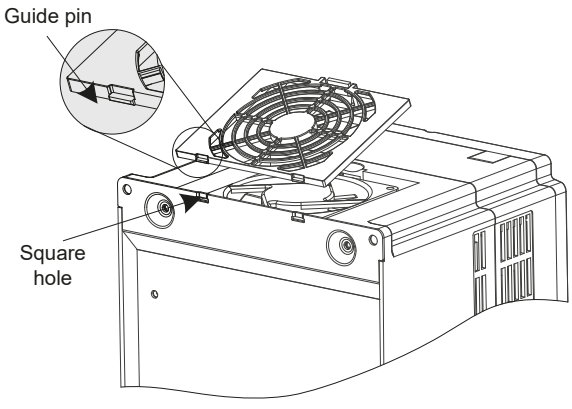
1. Plug in the fan power cable .



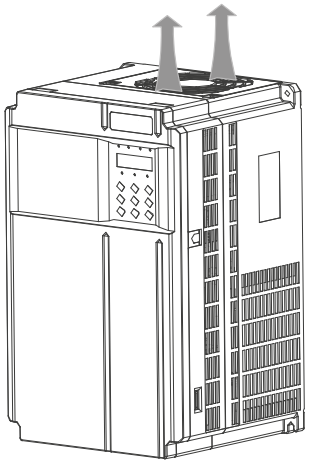
2. Install the fan into the drive and ensure that the mounting pins are aligned.



3. Insert the two guide pins into the square holes and then press in the hook.



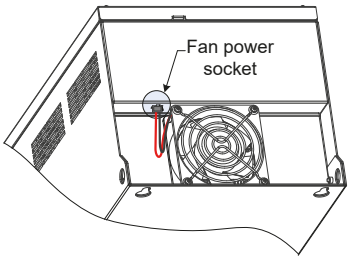
4. ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~



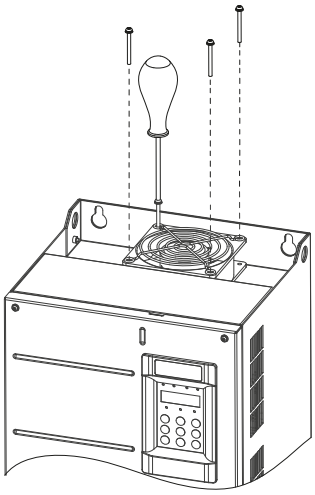
■ Removing and Installing the Fan of a Sheet Metal Housing (YD580ET4-45G/55P(B) to YD580ET4-160G/200P)

Removal

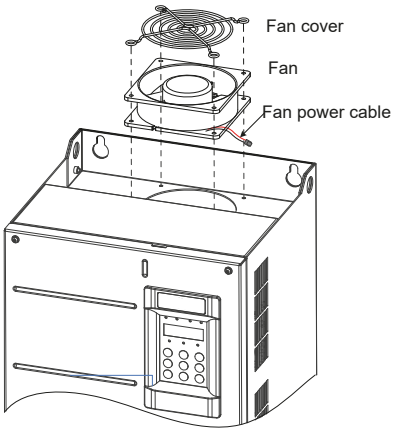
1. Disconnect the fan cab from the drive



2. Remove the four scre from the drive.



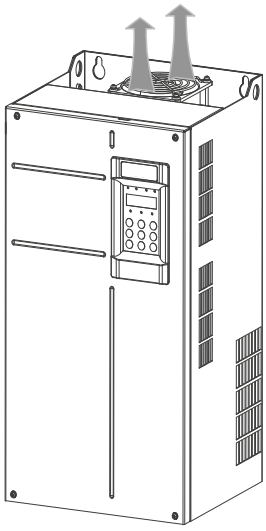
3. Remove the fan and fan cov from the drive.



Installing

1. Align the mounting holes of the cooling fan, fan cover and the drive.
2. Install the fan and fan cover on th AC drive.
3. ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Keep the air flow direction upward.

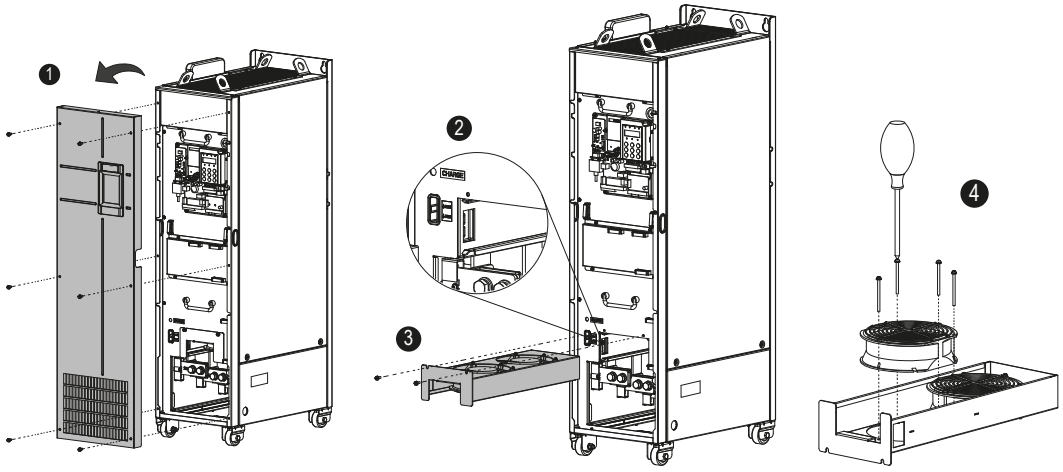


NOTE

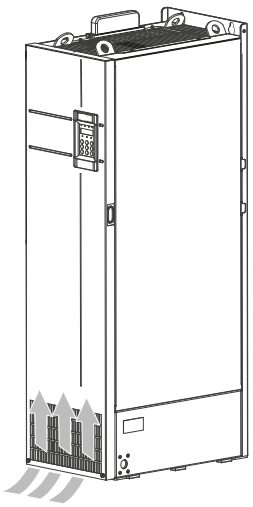
- The number and location of cooling fans vary slightly depending on the type of equipment, and the fan removal and installation method is the same.
- For YD580ET4-45G/55P(B) ～ YD580ET4-55G/75P(B)， there is a cooling fan on top of the device;
- For YD580ET4-75G/90P(B) ～ YD580ET4-110G/132P，there are two cooling fans on top of the device;
- For YD580ET4-132G/160P ～ YD580ET4-160G/200P ， there are two cooling fans at bottom of the device。

■ Removing and Installing the Fan of YD580ET4-200G/220P to YD580ET4-450G/500P

Removal
1. Disconnect the six screws and remove the front cov . 2. Disconnect the fan power cable connector from the drive. Each fan has a power cab connector. 3. Remove three screws from the fan box and draw the fan box out in the direction of arr . 4. Loosen four screws from each fan cover and remove the fa



Installing
1. Put the three fans into the fan box one by one and secure ˜ ˜˜˜˜˜˜˜˜˜˜ 2. Align the fan box to the rail and push it into the drive.



8.3.4 Filter electrolytic capacitors

1) Possible causes of damage: poor input power quality, high ambient temperature, frequent load jumps, and electrolyte aging.
2) Judgment criteria: whether there is liquid leakage, whether the safety valve has protruded, the measurement of electrostatic capacitance, and the measurement of insulation resistance.
3) Filter capacitor replacement: Due to the design of the filter capacitor to the internal components of the inverter, it is forbidden for the user to replace it by himself, please contact our company for replacement.

8.4 Storage of the inverter

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

1) When storing, try to put it in the original packaging of our company.
2) The whole machine is not allowed to be placed in humidity, high temperature, or outdoor exposure for a long time.
3) Long-term storage will lead to the deterioration of the electrolytic capacitor, it must be guaranteed to be energized once within 6 months, the energizing time is at least 5 hours, and the input voltage must be slowly raised to the rated value with a voltage regulator or consult the technical support of inverter professionals.

8.5 Warranty Instructions for Frequency Inverters

The free warranty covers only the inverter itself.

In the case of normal use, failure or damage, our company is responsible for 18 months warranty (from the date of delivery, subject to the barcode on the fuselage, if there is a contract agreement, in accordance with the agreement), more than 18 months, will be charged a reasonable maintenance fee.

Within 18 months, a repair fee shall be charged if the following occurs:

1) Damage to the machine caused by the user's failure to comply with the provisions in the manual;
2) Damage caused by fire, flood, voltage abnormality, etc.;
3) Damage caused when the inverter is used for non-normal functions;
4) The use of the inverter is beyond the specified specification range;
5) Force majeure (natural disasters, earthquakes, lightning strikes) and secondary damage caused by these reasons.

The service fee is calculated according to the manufacturer's unified standard, and if there is a contract, the contract is handled in accordance with the principle of priority.

For detailed warranty instructions, please refer to the Product Warranty Card.

Chapter 9 Specifications and Selection

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Chapter 9 Specifications and Selection

9.1 YD580E Specifications and Dimensions

9.1.1 Technical Specifications.

Table 9-1 YD580E inverter model and technical data (3-phase 380V~480V)

Item			specification												
YD580ET4-□G/□P(B)			0P7/1P5	1P5/2P2	2P2/3P0	3P0/3P7	3P7/5P5	5P5/7P5	7P5/11	11/15	15/18P5	18P5/22	22/30	30/37	37/45
Adaptation motor		(kW)	0.75/1.5	1.5/2.2	2.2/3.0	3.0/3.7	3.7/5.5	5.5/7.5	7.5/11	11/15	15/18.5	18.5/22	22/30	30/37	37/45
		(HP)	1/2	2/3	3/4	4/5	5/7.5	7.5/10	10/15	15/20	20/25	25/30	30/40	40/50	50/60
Input	Rated input current (A)		2.4/4.6	4.6/6.3	6.3/9.0	9.0/12	12/17	17/22	22/33	33/42	42/50	50/59	59/64	64/69	69/89
Output	Rated output current (A)		2.1/3.8	3.8/5.1	5.1/7.2	7.2/9.0	9.0/13	13/17	17/25	25/32	32/37	37/45	45/60	60/75	75/91
	Output Voltage		3-phase 380~480V（follow input voltage）												
	Max. output frequency		50 to 500 Hz												
	Carrier freq		0.8kHz~8.0kHz												
	Overload		G:150% for 60s P:120% for 60s												
power supply	Rated input voltage and frequency		AC：50/60Hz												
			3-phase 380~480VAC-15~+10%; (Actual 323~528VAC)												
			±5%												
	Power capacity(KVA)		2.8/5.0	5.0/6.7	6.7/9.5	9.5/12	12/18	18/23	23/34	34/43	43/45	45/54	54/58	58/63	63/81
Cooling	Thermal design power (kW)		0.046	0.068	0.081	0.138	0.109	0.201	0.24	0.355	0.454	0.478	0.551	0.694	0.815
	(CFM)		9	9	9	9	20	24	30	40	42	51.9	57.4	118.5	118.5
Overvoltage level			OVCIII												
Pollution level			PD2												
Ingress Protection			IP20												

Item		specification														
YD580ET4-□G/□P(B)		45/55	55/75	75/90	90/110	110/132	132/160	160/200	200/220	220/250	250/280	280/315	315/400	355/400	400/450	450/500
Adaptation motor	(kW)	45/55	55/75	75/90	90/110	110/132	132/160	160/200	200/220	220/250	250/280	280/315	315/400	355/400	400/450	450/500
	(HP)	60/75	75/100	100/120	120/150	150/180	180/215	215/265	265/300	300/330	330/375	375/420	420/475	475/530	530/600	600/670
Input	Rated input current (A)	89/106	106/139	139/164	164/196	196/240	240/287	287/365	365/410	410/441	441/495	495/565	565/617	617/687	687/782	782/838
Output	Rated output current (A)	91/112	112/150	150/176	176/210	210/253	253/304	304/377	377/426	426/465	465/520	520/585	585/650	650/725	725/820	820/900
	Output Voltage	3-phase 380~480V（follow input voltage）														
	Max. output frequency	50 to 500 Hz														
	Carrier freq	0.8kHz~8.0kHz														
		0.8kHz~6.0kHz														
	Overload	G:150% for 60s P:120% for 60s														
power supply	Rated input voltage and frequency	3-phase 380~480VAC-15~+10%; (Actual 323~528VAC)														
		50/60 Hz, ±5%														
	Power capacity (kVA)	81/97	97/127	127/150	150/179	179/220	220/263	263/334	334/375	375/404	404/453	453/517	517/565	565/629	629/716	716/952
Cooling	Thermal design power (kW)	1.01	1.21	1.57	1.81	2.14	2.85	3.56	4.15	4.55	5.06	5.33	5.69	6.31	6.91	7.54
	(CFM)	122.2	122.2	218.6	287.2	354.2	547	627	638.4	722.5	789.4	882	645	860	860	860
Overvoltage level		OVCIII														
Pollution level		PD2														
Ingress Protection		IP20							IP00							

Table 9-3 Technical specifications of YD580E

Item		Description	
Standard functions	Input frequency resolution	Digital setting: 0.01 Hz Analog setting: Max. frequency x 0.025%	
	Control mode	Sensorless vector control (SVC) Feedback vector control (FVC) Voltage/Frequency (V/F) control	
	Startup torque	0.25 Hz/150% (SVC)	0 Hz/180% (FVC)
	Speed range	1：200 （SVC）	1：1000 （FVC）
	Speed stability accuracy	±0.5%（SVC）	±0.02%（FVC）
	Torque control accuracy	FVC：±3%； SVC：5Hz above ±5%。	
	Torque boost	Customized boost 0.1 % to 30.0 %	
	V/F curve	Straight-line；Multi-point；Square；Complete and Half V/F separation	
	Ramp mode	Straight-line ramp、S-curve ramp Four separate acceleration/deceleration time settings in the range of 0s to 6500s.	
	DC injection braking	DC injection braking frequency: 0 Hz to max. frequency DC injection braking active time: 0.0s to 36.0s. Current level of DC injection braking: 0% to 100%.	
	Jog running	Frequency range of jog running: 0.00 to 50.00 Hz Acceleration/Deceleration time of jog running:0.0s to 6500.0s	
	Onboard multiple preset speeds	The system implements up to 16 speeds by using simple PLC function or by using digital input signals.	
	Onboard PID	The system implements the proportionalegral-derivative (PID) function in the closed-loop control.	
	Automatic voltage regulation (AVR)	The system maintains a constant output voltage automatically when the grid voltage changes through the permissible range.	
	Overvoltage and overcurrent stall control	The system limits the output current and voltage automatically during operation to prevent frequent or excessive trips.	
	Fast current limiting function.	Minimize overcurrent faults and protect the normal operation of the inverter.	
	Torque limit and control	The system limits the torque automatically to prevent frequent overcurrent tripping during operation.Torque control is applied in vector control.	
Individualized functions	Power dip ride-through	Load feedback energy compensates for any voltage reduction, allowing the drive to continue to operate for a short time during power dips.	
	Overcurrent fast prevention	The function helps to avoid frequent overcurrent faults.	
	Virtual I/O	Five groups of virtual digital input/outputs (DI/DO)support simple logic control.	
	Timing control	Time range: 0.0 to 6500.0 minutes	
	Dual-motor switchover	The drive have two groups of motor parameters and can control up to two motors.	
	Multiple field buses	Drive supports four field buses：Modbus、Profibus-DP、CANlink、CANopen。	
	Motor overheat protection	Option: The optional input/output (I/O) extension card allows AI3 to receive a signal from the motor temperature sensor input (PT100, PT1000) to implement motor overheat protection.	
	Multiple encoder types	Differential encoder、Open-collector encoder、UVW、Resolver etc	
	User programmable function	Option: The optional programming card supports secondary development	
	Advanced background software	Software in the drive allows users to configure some operating parameters, and provides a virtual oscilloscope display that shows system status.	

Item		Description
RUN	Command source	Panel、Terminal、communication and switching between different commands
	Main frequency reference setting channel	Supports up to 10 frequency reference setting channels and allows different methods of switching between frequency reference setting channels:Digital setting、Analog、 voltage reference、Analog current reference、Pulse reference、Communication reference
	Auxiliary frequency reference setting channel	Supports up to 10 auxiliary frequency sources
	Input terminals	Standard: Five digital input (DI) terminals, one of which supports up to 100 kHz high-speed pulse inputs. Two analog input (AI) terminals, one of which supports only 0 to10 V input, and the other supports 0 to 10 V and 4 to 20 mA current input. Expanded capacity: Five digital input (DI) terminals. One AI terminal that supports –10 to 10 V voltage input and PT100/PT1000 motor temperature sensor inputs.
	Output terminals	Standard: Single high-speed pulse output terminal (open-collector) for a square-wave Signal output in the frequency range 0 to 100 kHz Single digital output (DO) terminal Single relay output terminal Single analog output (AO) terminal that supports either a current output in the range 0 to 20 mA or a voltage output in the range 0 to 10 V. Expanded capacity: Single extra DO terminal Single extra relay output terminal Single extra AO terminal that supports either a current output in the range 0 to 20 mA or a voltage output in the range 0 to 10 V.
Display and operating panel	LED display	The 6-character LED display shows parameter values
	LCD display	Optional, Chinese/English prompt operation content
	Parameter copy	Fast reproduction of parameters is possible via the optional LCD operator panel
	Key locking and function selection	Implement partial or full locking of keys, and define the scope of action of some keys to prevent misoperation
Protections	Phase loss protection	Input phase loss protection、Output phase loss protection
	Instantaneous overcurrent protection	Stop when 250% of rated output current is exceeded
	Overvoltage protection	Stop when the DC bus voltage is above 820 V
	Undervoltage protection	Stop when the DC bus voltage is below 350 V
	Overheat protection	Protection triggered when the AC Drive bridge gets overheated
	Overload protection	Stop after running at 150% of rated current for 60 seconds (for YD580T450G, stop after running at 130% of rated current for 60 seconds)
	Overcurrent protection	Stop when 2.5 times of rated current of the AC drive is exceeded.
	Braking protection	Braking unit overload protection Braking resistor short-circuit protection
	Short-circuit protection	Output phase-to-phase short-circuit protection Output phase-to-ground short-circuit protection
Environment	Installation location	Install the AC Drive where it is indoors and protected from direct sunlight, dust, corrosive or combustible gases, oil smoke, vapour, ingress from water or any other liquid, and salt.
	Altitude	There is no need to derate below 1000m, derating 1% for every 100m above 1000m, and please contact the manufacturer for more than 3000m.(Note: The maximum altitude of 0.75~2.2kW drive is 2000m, if you need to use it above 2000m, please contact the manufacturer)
	Operation temperature	- 10°C ~ +40°C, the temperature over 40°C needs to be de-rated, the ambient temperature is de-rated by 1.5% for every 1°C increase, and the maximum ambient temperature is 50°C
	Humidity	Less than 95% RH non-condensing
	Vibration	Less than 5.9 m/s² (0.6 g).
	Storage temperature	－ 20°C ~ ＋ 60°C

9.1.2 Appearance and installation dimensions

◆ YD580ET4-0P7G/1P5PB ~ YD580ET4-160G/200P size

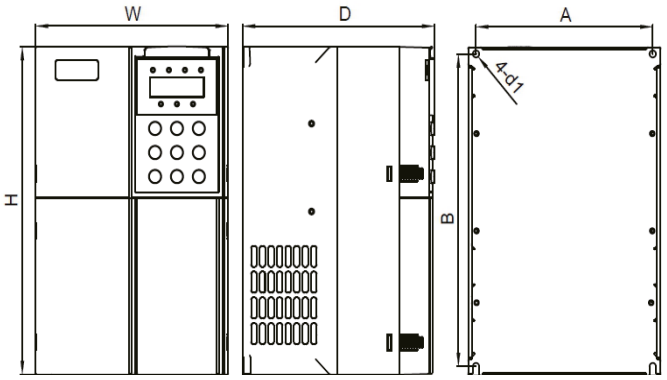

Figure 9-1 Schematic diagram of YD580ET4-0P7G/1P5PB ~ YD580ET4-22G/30PB exterior and installation dimensions

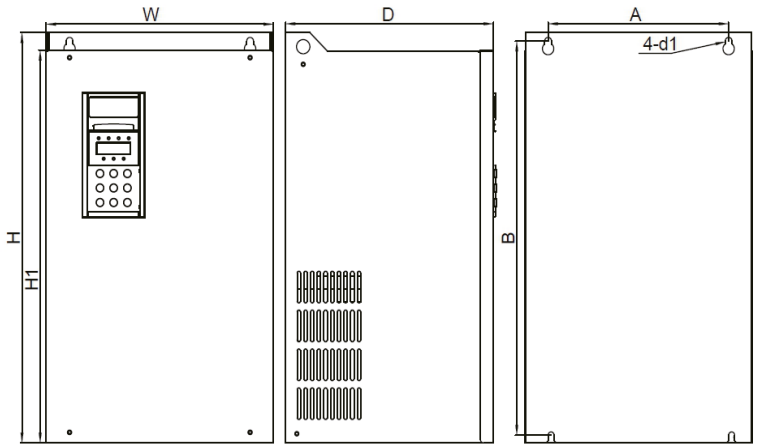

Figure 9-2 Schematic diagram of YD580ET4-30G/37P(B)~YD580ET4-160G/220P exterior and installation dimensions

Table 9-4 YD580ET4-0P7G/1P5PB~YD580ET4-160G/200P
Appearance and Mounting Hole Dimensions (3-phase 380V~480V)

Case	Model	Dimensions mm				Mounting hole mm		Holes mm	Weight kg
		W	H	H1	D	A	B	d1	
F1	YD580ET4-0P7G/1P5PB	123	200	/	172	119.4	189.4	φ5	2
	YD580ET4-1P5G/2P2B								
	YD580ET4-2P2G/3P0PB								
	YD580ET4-3P0G/3P7PB								
	YD580ET4-3P7G/5P5PB								
	YD580ET4-5P5G/7P5PB								
F2	YD580ET4-7P5G/11PB	140	250	/	178	129	239	φ6	3.3
	YD580ET4-11G/15PB								
F3	YD580ET4-15G/18P5PB	180	280	/	180	165.4	266.7	φ6	4.3
F4	YD580ET4-18P5G/22PB	225	360	/	235	206	341	φ6.5	9.1
	YD580ET4-22G/30PB								
F5	YD580ET4-30G/37P(B)	253	436	421	242	213	421	φ7	17.5
	YD580ET4-37G/45P(B)								
F6	YD580ET4-45G/55P(B)	302	540	527	285	245	522	φ10	35
	YD580ET4-55G/75P(B)								
F7	YD580ET4-75G/90P(B)	340	581	556	316	270	558	φ10	51.5
	YD580ET4-90G/110P								
	YD580ET4-110G/132P								
F8	YD580ET4-132G/160P	400	925	885	322	320	905	φ10	85
	YD580ET4-160G/200P								

◆ YD580ET4-200G/220P~YD580ET4-450G/500P machine size

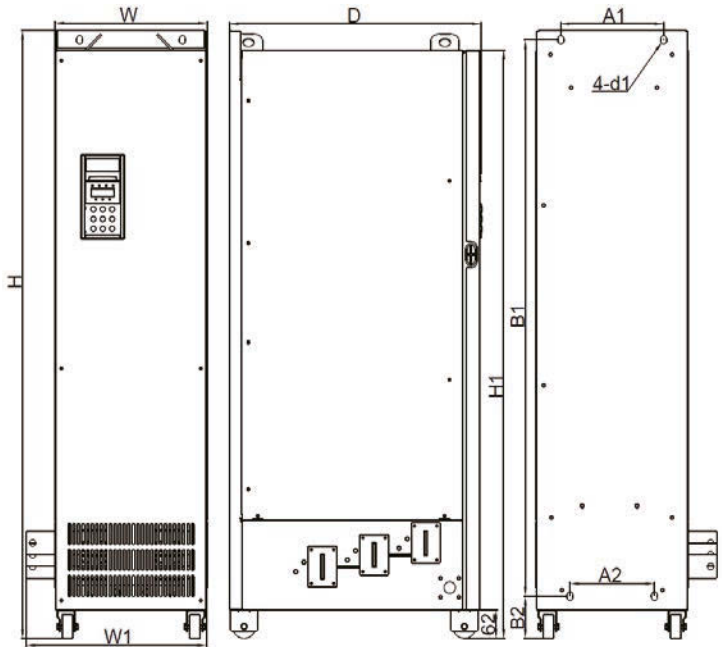

Figure 9-4 Schematic diagram of YD580ET4-200G/220P~YD580ET4-450G/500P exterior and installation dimensions Table 9-6 YD580ET4-200G/220P~YD580ET4-450G/500P Appearance and Mounting Hole Dimensions

Case	Model	Dimensions mm					Mounting holes mm				Holes mm	Weight kg
		W	W1	H	H1	D	A1	A2	B1	B2	d1	
F9	YD580ET4-200G/220P	302	364	1136	1091	507	240		1035	84	φ13	110
	YD580ET4-220G/250P											
F10	YD580ET4-250G/280P	333	394	1286	1245	552	225	185	1175	91	φ13	155
	YD580ET4-280G/315P											
F11	YD580ET4-315G/355P	345	402	1404	1355	545	240	185	1292	91	φ16	185
	YD580ET4-355G/400P											
	YD580ET4-400G/450P											
	YD580ET4-450G/500P											

◆ YD580ET4-200G/220P-L~YD580ET4-450G/500P-L machine size

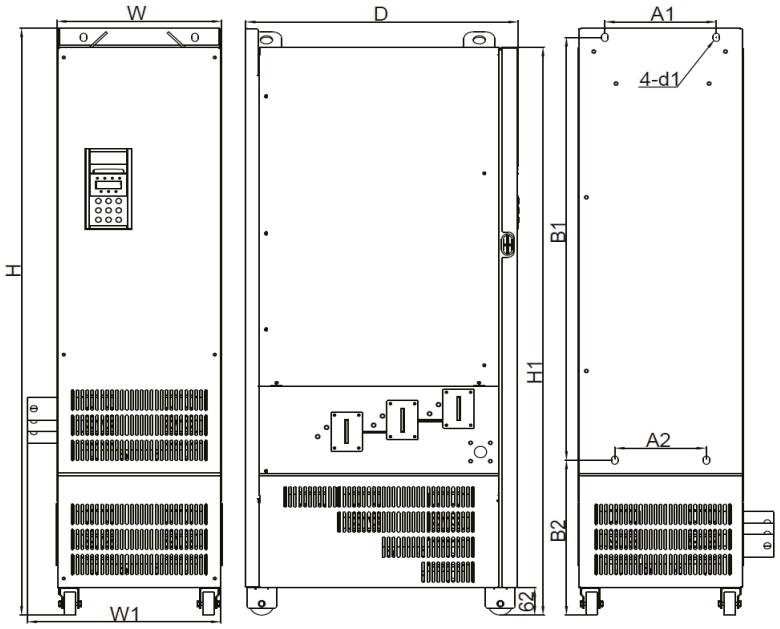

Figure 9-5 Schematic diagram of YD580ET4-200G/220P-L~YD580ET4-450G/500P-L exterior a nd installation dimensions

Table 9-7 Schematic diagram of YD580ET4-200G/220P-L~YD580ET4-450G/500P-L dimensions and installation dimensions (without reactor base)

Case	Model	Dimensions mm					Mounting holes mm				Holes mm	Weight kg
		W	W1	H	H1	D	A1	A2	B1	B2	d1	
F9-L	YD580T4-200G/220P-L	302	364	1474	1429	507	240		1035	422	φ13	160
	YD580T4-220G/250P-L											
F10-L	YD580T4-250G/280P-L	333	394	1624	1583	552	225	185	1175	429	φ13	215
	YD580T4-280G/315P-L											
F11-L	YD580T4-315G/355P-L	345	402	1732	1683	545	240	185	1292	419	φ16	245
	YD580T4-355G/400P-L											
	YD580T4-400G/450P-L											
	YD580T4-450G/500P-L											

9.2 About Multi-functional Extension Interfaces

The following table lists extension cards that are available for use with the drive.

Table 9-8 List of options

Name	Model	Function	Remark
I/O extension card 1	YD58IO1	Provides the following: ● Five extra DI terminals. ● Analog voltage input AI3 (with isolation) for connection to PT100 or PT1000. ● A relay output. ● A digital output. ● An analog output.	Available for all models.
I/O extension card 2	YD58IO2	Provides three extra DI terminals.	Available for all models.
Modbus communication card	YD58TX1	RS485 communication adapter with isolation	Available for all models.
CANlink communication card	YD58CAN1	CANlink communication adapter	Available for all models.
CANopen communication card	YD58CAN2	CANopen communication adapter	Available for all models.
Profibus-DP communication card	YD58DP2	Supports PROFIBUS-DP	Available for all models.
User programmable card	YD58PC1	User-programmable extension card,	Available for all models.
Differential encoder interface card	YD58PG1	Requires a 5 VDC power supply.	Available for all models.
Resolver interface card	YD58PG4	For use with a resolver that has an excitation frequency of 10 kHz. The card has a DB9 interface.	Available for all models.
Open-collector encoder interface card	YD58PG5	Open-collector encoder interface card. Requires a 15 VDC power supply.	Available for all models.
Open-collector encoder interface card	YD58PG5D	Open-collector encoder interface card with optional multiplying frequency division output. Requires a 15 VDC power supply.	Available for all models.
Differential encoder interface card	YD58PG6	Requires a 5 VDC power supply. The card has a DB9 interface.	Available for all models.
Differential encoder interface card	YD58PG6D	With optional multiplying frequency division output. Requires a 5 VDC power supply. The card has a DB9 interface.	Available for all models.
Multi-functional encoder card	YD58PGMD	Compatible of differential input, open-collector input, push-pull input Supports differential output and open-collector output	Available for all models.

9.8 Brake Component Selection Guide

■ 9.81 Selection of Resistance of Braking Resistor

The AC drive transfers regenerative energy generated during braking of motor to external braking resistor.

According to formula U x U/R = Pb:

- U refers to braking voltage at system stable braking.
- U value varies with the system. The 400 VAC power system usually selects 700 V braking voltage.
- Pb refers to braking power.

■ 9.82 Selection of Power of Braking Resistor

In theory, power of braking resistor is the same as braking power. But in consideration of de-rating, power of braking resistor is calculated from the following formula:

K × Pr = Pb × D

- K ranges from 15% to 30%.
- Pr refers to power of braking resistor.
- D refers to braking frequency (percentage of regenerative process to whole deceleration).

The following two formulas can be obtained:

K × Pr = Pb × D = (U × U)/(R × D)

Pr = (U × U × D)/(R × K)

The user can calculate braking resistor power. K is derating coefficient of braking resistor. Low K value can ensure that braking resistor does not get overheated. The K value can be increased appropriately on the condition of good dissipation and should not exceed 30%. Failure to comply may result in a fire due to overheating of braking resistor.

Braking frequency (D) is determined by application. Typical values of braking frequency in different applications are listed in the following table.

Application	Elevator	Winding & unwinding	Centrifuge	Occasional braking load	General Application
Braking Frequency	20% to 30%	20% to 30%	50% to 60%	5%	10%

■ 9.8.3 Selection Guidance

Table 9-39 YD580E Brake Component Selection Table（3-phase 380~480V）

Model	Adaptation motor kW	Brake unit		125% Brake torque (10% ED@10 S)		Note	Minimum resistance Ω
		Model	Num	Resistance specifications	Res Num		
YD580ET4-0P7G/1P5PB	0.75	Built-in standard		140W 800Ω	1	Model suffix +B	96
YD580ET4-1P5G/2P2B	1.5			300W 380Ω	1		96
YD580ET4-2P2G/3P0PB	2.2			440W 260Ω	1		64
YD580ET4-3P0G/3P7PB	3.0			440W 200Ω	1		64
YD580ET4-3P7G/5P5PB	3.7			740W 150Ω	1		32
YD580ET4-5P5G/7P5PB	5.5			1100W 100Ω	1		32
YD580ET4-7P5G/11PB	7.5			1500W 75Ω	1		32
YD580ET4-11G/15PB	11			2200W 50Ω	1		20
YD580ET4-15G/18P5PB	15			3000W 38Ω	1		20
YD580ET4-18P5G/22PB	18.5	Built-in options		4000W 32Ω	1		24
YD580ET4-22G/30PB	22			4500W 27Ω	1		24
YD580ET4-30G/37P(B)	30			6000W 20Ω	1		19.2
YD580ET4-37G/45P(B)	37			7000W 16Ω	1		14.8
YD580ET4-45G/55P(B)	45			9000W 13Ω	1		12.8
YD580ET4-45G/75P(B)	55			11000W 10.5Ω	1		9.6
YD580ET4-75G/90P(B)	75			15000W 7.7Ω	1		6.8

9.13 Installation dimensions of the external guide operation panel

9.13.1 YD58NKE External Referral Operation Panel

YD58NKE is an external operation panel adapted to YD580, which adopts LED display, and its operation mode is the same as that of the machine's own operation panel Exactly the same, due to its external characteristics, it is convenient for customers to debug, and its shape and installation dimensions are as follows:

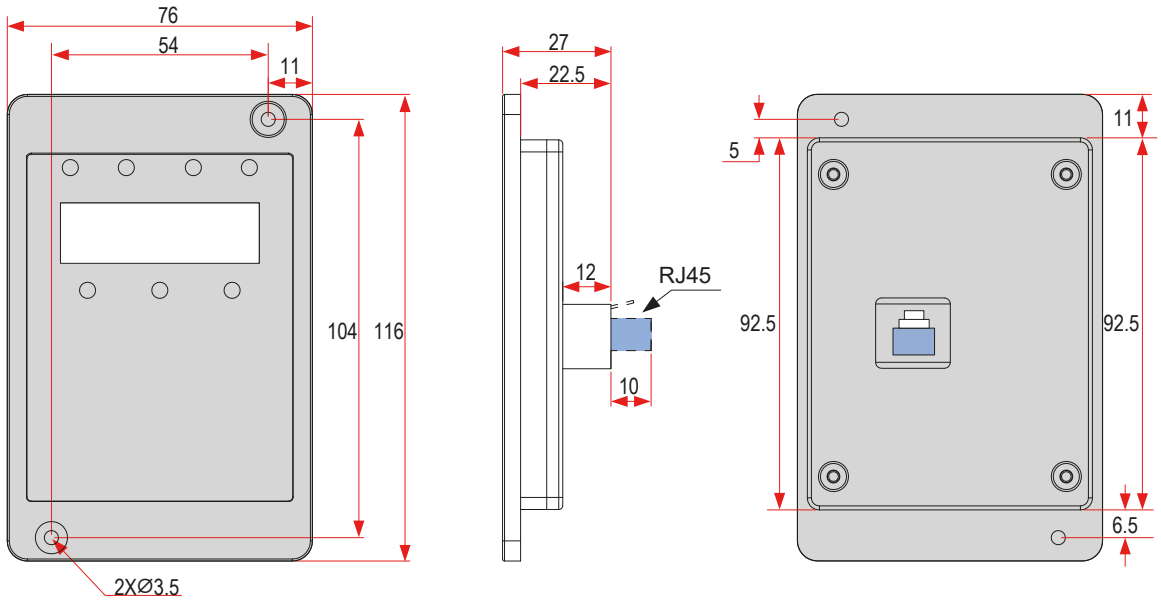

Figure 9-56 YD58NKE Dimensions of the external operation panel (unit: mm)

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Chapter 11 Matching Cards

YD580E series inverter can be connected to a rich external expansion card to support rich fieldbus, support rich encoder types, support user programmability to achieve secondary development and other functions. This chapter describes how to install and use each expansion card, please refer to the manual provided with the purchase for more details.

11.1 Installation and Function Description of the Expansion Card

11.1.1 Installation of Expansion Cards

YD580E series inverters are equipped with 3 I/O expansion cards, 1 PC programming card, 5 fieldbus cards (Modbus-RTU,Profibus-DP, CANlink, CANopen) and 5 PG cards, the installation position is shown in the figure below, and the cover plate needs to be removed during installation (See "3.1.5 Removal and Installation of Covers"). ...

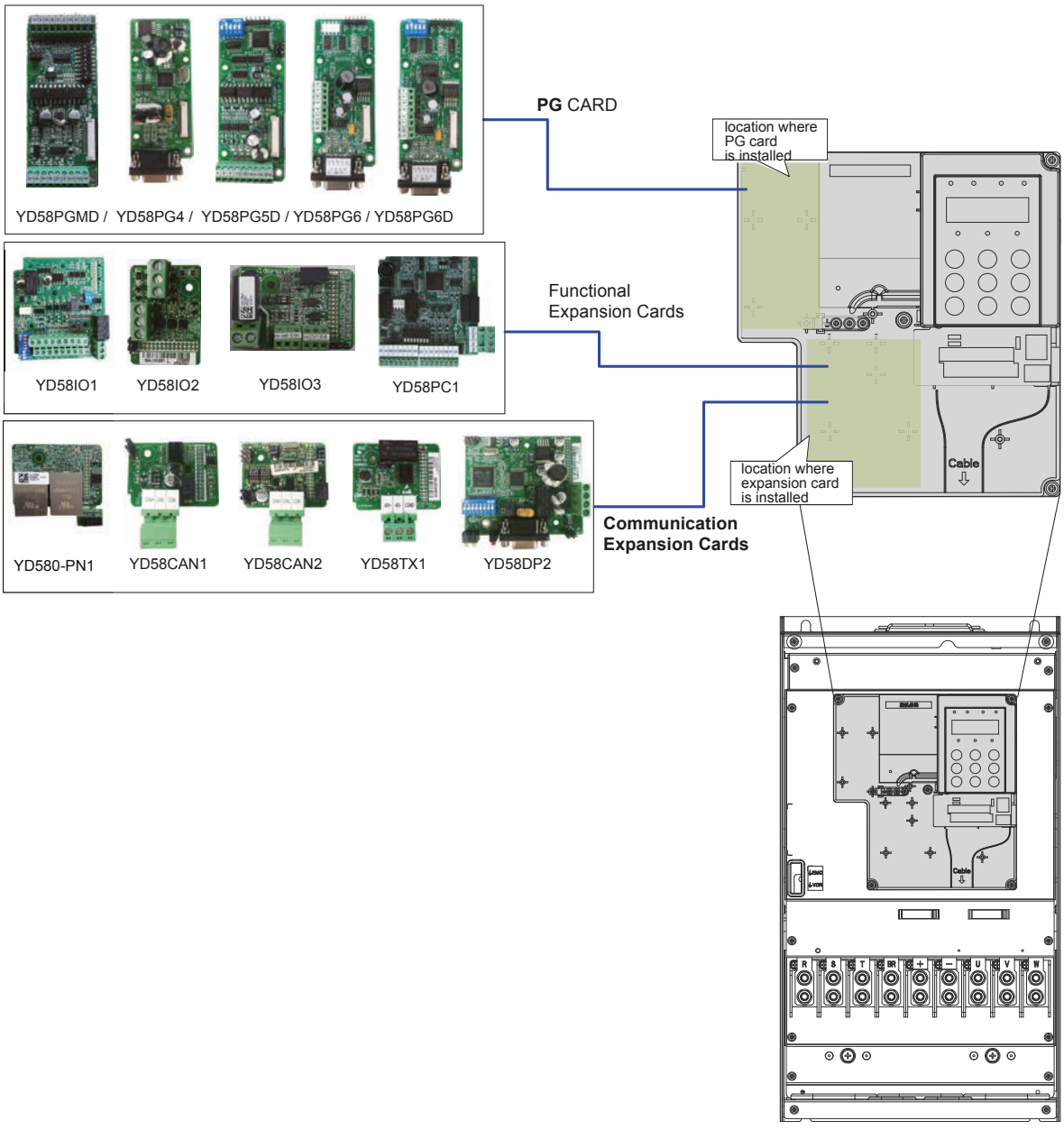


Figure 11-1 Mounting the expansion card

● The above picture shows the installation position of the expansion card on the YD580ET4-45G/55P(B)~YD580ET4-160G/200P model inverter, and the installation position on the inverter of different models is slightly different, please refer to the actual product.

11.1.2 Description of the Functions of the Expansion Card

Table 11-1 Functions of the expansion card

MODEL	NAME	Features & Specifications	Divider	Applicable Model
YD58IO1	I/O Expansion Card1	5 digital inputs and 1 analog voltage input can be added; AI3 is isolated ;PT100, PT1000; 1 relay output, 1 digital output, 1 analogy output with MODBUS/CANlink	-	15kW above
YD58IO2	I/O Expansion Card2	3 digital inputs can be added	-	All Model
YD58IO3	I/O Expansion Card3	3 digital inputs can be added; 1 RS485 signal isolation input; 1 normally open relay output	-	All Model
YD58PC1	Programmable multi-function expansion card	Support PLC Programming	-	15kW above
YD58CAN1	CANlink expansion card	Support CANlink	-	All Model
YD58CAN2	CANopen expansion card	Support CANopen	-	All Model
YD58TX1	RS-485 expansion card	Support MODBUS-RTU	-	All Model
YD58DP2	Profibus-DP expansion card	Support Profibus-DP	-	15kW above
YD580-PN1	Profinet expansion card	Support Profinet	-	All Model
YD58PG4	Resolver input PG card	Suitable for resolvers, excitation frequency 10kHz, DB9 interface	no divider	All Model
YD58PG5D	Open collector input PG card	Open collector encoder interface card for 15V power supply	2~62 even divider	All Model
YD58PG6	Differential input PG card	Differential rotary encoder interface card for 5V power supply, DB9 interface	1:1 divider	All Model
YD58PG6D	Differential input PG card	Differential rotary encoder interface card for 5V power supply, DB9 interface	2~62 even divider	All Model
YD58PGMD	Multi-function encoder card	Compatible with differential input, collector input, push-pull input; Support differential output, collector output;	0~63 divider	All Model

11.2 Use of Multifunction Expansion Cards

11.2.1 YD58IO1 Terminal distribution and function description

YD58IO1 expansion card is a multi-function I/O expansion card designed for YD580E series inverters, which can expand 5 DI, 1 AI, 1 DO, 1 AO and 1 relay output, and also has CAN and RS-485 communication interfaces, which can realize fieldbus control.

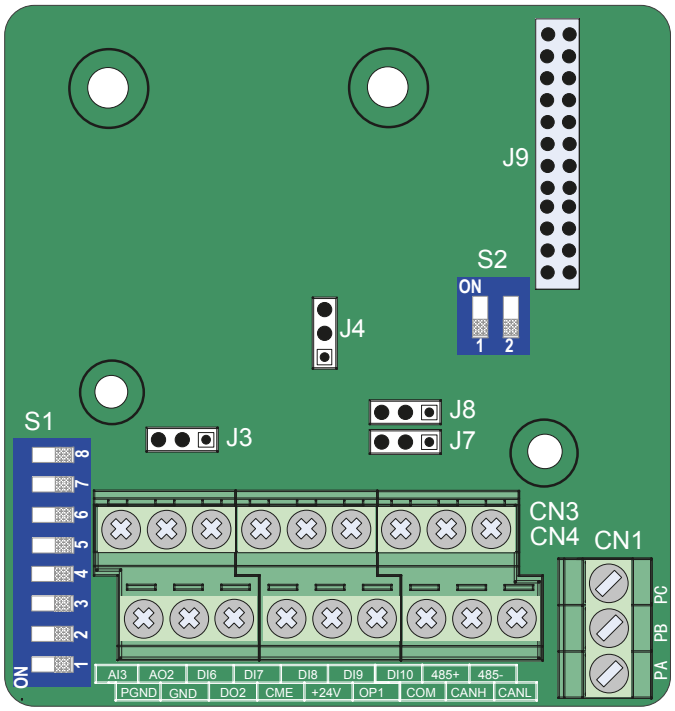
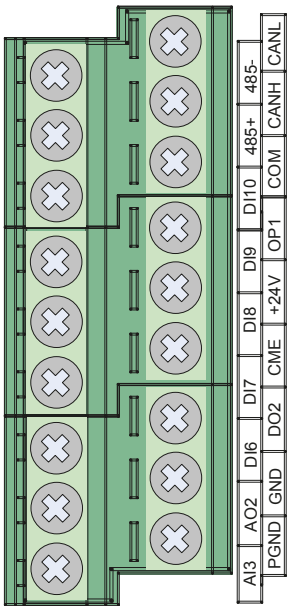
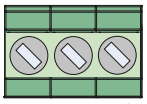


Figure 11-2 YD58IO1 Terminal distribution

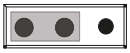
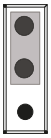
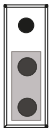
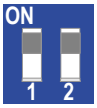
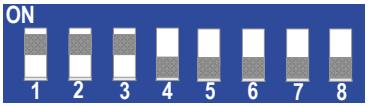
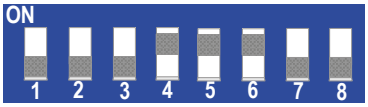
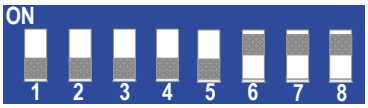
Table 11-2 YD58IO1 Terminal functions of the expansion card

Terminal identification		Name	Feature description	Terminal distribution
CN4	+24V/COM	External 24Vdc power supply	1. Provide +24V power supply to the outside, which is generally used as the working power supply of the digital input and output terminals and the power supply of external sensors 2. Maximum output current: 200mA	
	OP1	Digital input power terminals	1. OP1 and "+24V" have been connected with jumper J8 at the factory 2. When an external power supply is to be used, OP1 needs to be connected to an external power supply, and J8 must be removed.	
	DO2-CME	Digital output 2	1. Optocoupler isolation, bipolar open collector output 2. Output voltage range: 0V~24V 3. Output current range: 0mA~50mA Note: The digital output ground CME1 is internally isolated from the digital input ground COM, and by default the internal connection is via J7, when DO2 wants to be driven by an external power supply, J7 must be disconnected.	
	CANH/CANL/ COM	interface terminals	CANlink protocol communication input terminal, isolated input	
CN3	AI3-PGND	Analog input terminal 3	1. Optocoupler isolated input, differential voltage input and temperature detection resistor input can be accepted 2. Input voltage range: DC -10V~10V 3. PT100, PT1000 temperature sensor 4. Use the DIP switch S1 to determine the input mode, and multiple functions cannot be used at the same time	
	AO2-GND	Analog output 2	1. Specification of output voltage: 0V~10V 2. Specification of output current: 0mA~20mA 3. Impedance specification of output current: 0Ω~500Ω	
	DI6-OP1~ DI10-OP1	5 digital inputs	1. Optocoupler isolation, compatible with bipolar input 2. Input impedance: 2.4kΩ 3. Voltage range when level input: 9~30V	
	485+/485-/ COM	interface terminals	Input and Output terminals of the MODBUS-RTU are used to isolated	
CN1	PA- PB	N.C. terminal	Contact actuation capability: AC250V，3A，COSΦ=0.4 DC 30V，1A	
	PA- PC	N.O. terminal		

NOTE

● YD58IO1 RS485 communication terminal 485+/485-/COM and CANlink communication terminal are independent of CANH/CANL/COM and can be used at the same time

Table 11-3 YD58IO1 Expansion card jumpers

Identification	Name	Feature description	Terminal distribution
J3	AO2 output type sets the jumper	Voltage type 0V~10V	
		Current type: 0mA~20mA	
J4	CAN terminating the resistor setting jumper	Termination resistor matching	
		Non-termination resistor matching	
S2	RS485 terminating resistor selection	1 and 2 dial to ON for terminal resistor matching	
		1 and 2 are to OFF for non- terminal resistor matching	
S1	AI, PT100, PT1000 features choose	AI3: 1, 2, and 3 are dialed to ON	
		PT1000: 4, 5, 6 dial to ON	
		PT100: 6, 7, 8 dial to ON	

NOTE

● The jumper is set to take the top view of the expansion card with the main terminal as the bottom side as the viewing angle, and the jumper has a silk screen on the board, please use the silk screen as the standard.
● When the master-slave operation of the inverter uses CAN communication, and the inverter and the display screen use RS485 communication, the CAN and RS485 on the first and last inverter IO1 expansion cards need to match the termination resistor (matched by J4 and S2), and the intermediate inverter IO1
The jumper and DIP on the expansion card are kept in factory condition (factory default is no hopping). Wrong jumpers will cause unstable communication either
If communication fails, ERR16 (communication failure) or ERR55 (master-slave) failure will be reported.

11.2.2 YD58IO2 Terminal distribution and function description

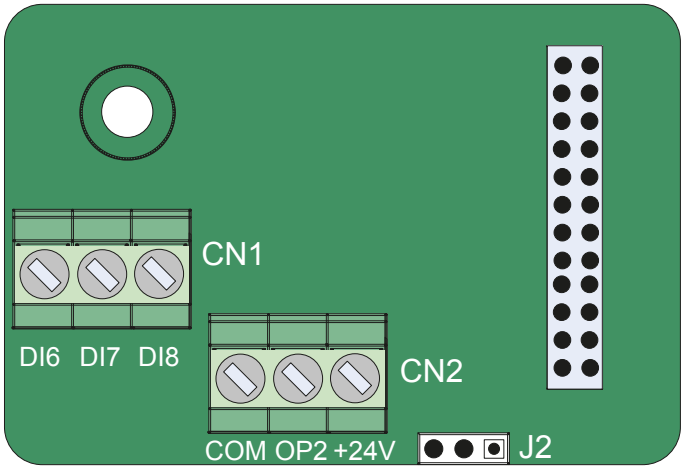


Figure 11-3 YD58IO2 Terminal distribution

Table 11-4 YD58IO2 expansion card terminal functions

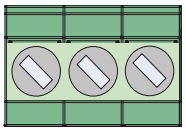
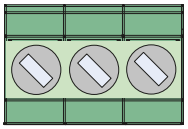
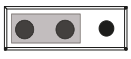
Identification		Name	Feature description	Terminal distribution
CN2	+24V/COM	Exte-24VDC power supply	1. Provide +24V power supply to the outside, which is generally used as the working power supply of the digital input and output terminals and the power supply of external sensors 2. Maximum output current: 200mA	 COM OP2 +24V
	OP2	Digital input power terminal	OP2 has no power connection from in factory and can be connected to an external +24V power supplyneeded	
CN1	DI6-OP2~ DI8-OP2	3 digital inputs	1. Optocoupler isolation, compatible with bipolar input 2. Input impedance: 3.3kΩ for DI6 and DI7, 2.4kΩ for DI8 3. Voltage range when level input: 9~30V 4. DI6, DI7 and DI8 are ordinary input terminals, and the input frequency < 100Hz	 DI6 DI7 DI8

Table 11-5 YD58IO2 Expansion card jumpers

Identification	Name	Feature description	Terminal distribution
J2	DI terminal source drain wiring method to set jumpers	DI terminal are drain-wired and OP2 is connected to 24V	
		DI terminal is source-wired and OP2 is connected to COM	

NOTE

● The jumper is set to take the top view of the expansion card with the main terminal as the bottom side as the viewing angle, and the jumper has a silk screen on the board, please use the silk screen as the standard.

11.2.3 YD58IO3 Terminal distribution and function description

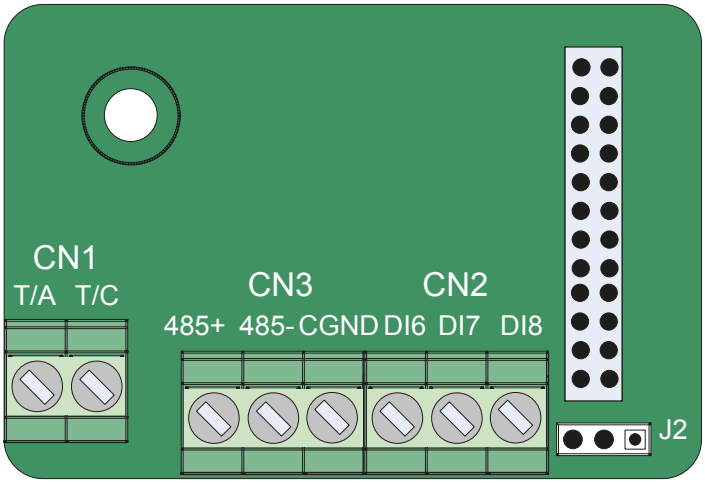


Figure 11-4 YD58IO3 Terminal distribution

Table 11-6 YD58IO3 Functions of expansion

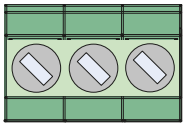
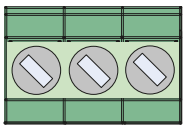
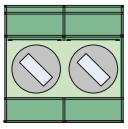
Identification		Name	Feature description	Terminal distribution
CN3	485+	RS485 signal Positive	Support MODBUS protocol to isolate inputs	485+ 485- CGND 
	485-	RS485 signal Negative		
	CGND	RS485 signal Ground		
CN2	DI6 ~ DI8	3 digital inputs	1. Optical lotus isolation, compatible with bipolar input, the maximum input frequency is 100Hz 2. Input impedance: 3.4kΩ 3. Voltage range when level input: 9~24V	DI6 DI7 DI8 
CN1	T/A ~ T/C	Normally Open terminals	Contact Drive Capability: 250VAC/5A, 30VDC/5A	T/A T/C 

Table 11-7 YD58IO3 Expansion card jumpers

Identification	Name	Description	Terminal distribution
J2	DI terminal source drain wiring method to set jumpers	DI terminal are drain-wired and OP is connected to 24V	
		DI terminal is source-wired and OP is connected to COM	

NOTE

● The jumper is set to take the top view of the expansion card with the main terminal as the bottom side as the viewing angle, and the jumper has a silk screen on the board, please use the silk screen as the standard.

11.2.4 YD58PC1 (Programmable Card) Terminal Distribution and Function Description

The YD58PC1 User Programmable Card is an expansion card with integrated PLC functionality. Users can make YD580E by installing the expansion card

The series inverters support PLC (User Programmable) function. The YD58PC1 card connects seamlessly to the drive.

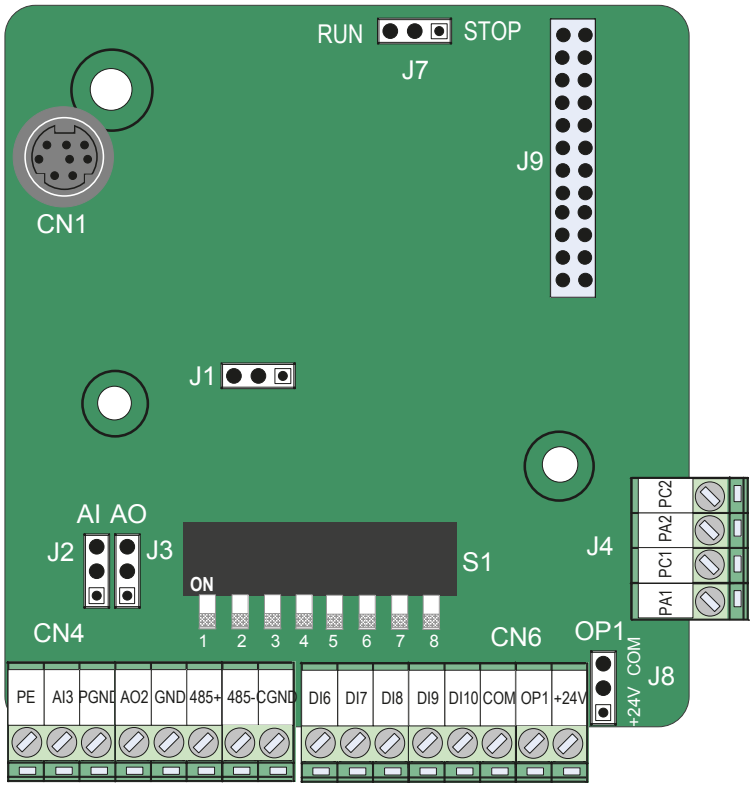
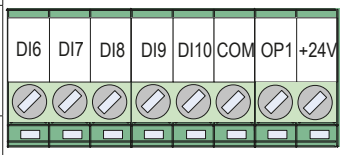


Figure 11-5 YD58PC1 Terminal distribution

Table 11-8 YD58PC1 Functions of expansion card terminals

Identification		Name	Description	Terminal distribution
CN6	+24V/COM	Ex-24Vdc power supply	1. Provide +24V power supply to the outside, generally used as digital input and output Terminal working power supply and external sensor power supply 2. Maximum output current: 200mA	
	OP1	Digital input power	1. At the factory, OP1 and "+24V" have been connected with jumper J8 2. When an external power supply is to be used, OP1 needs to be connected to an external power supply.And J8 must be removed.	
	DI6-OP1 ~ DI10-OP1	5 digital inputs	1. Optocoupler isolation, compatible with bipolar input 2. Input impedance: 2.4kΩ 3. Voltage range when level input: 9~30V	

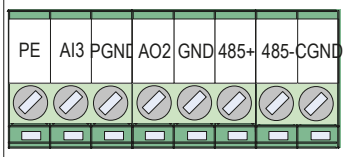
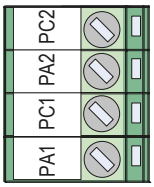
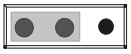
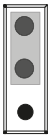
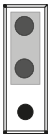
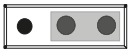
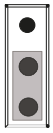
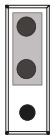
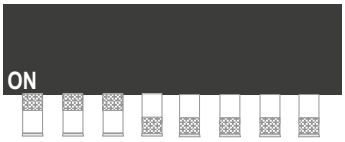
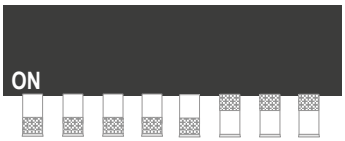
Identification		Name	Description	Terminal distribution
CN4	AO2-GND	Analog output 2	1. Specification of output voltage: 0V~10V 2. Specification of output current: 0mA~20mA	
	AI3-PGND	Analog input 3	1. Optocoupler isolated input, differential voltage input and current transmission can be accepted Inlet, temperature detection resistor input 2. Input voltage range: DC -10V~10V 3. Input current range: DC -20mA~20mA 4. PTC, PT100 temperature sensor 5. Use the DIP switch S1 to determine the input mode, and multiple functions cannot be used at the same time	
	485+/485-/ CGND	Communication interface terminal	The input and output signal terminals of the MODBUS-RTU protocol communication are used to isolate the inputs	
CN1	RS422	User program download port	User PLC program download	
J4	PA1- PC1	Relay 1 N.O.	Contact actuation capability: AC250V，3A，COSΦ=0.4。 DC 30V，1A	
	PA2- PC2	Relay 2 N.O.		

Table 11-9 YD58PC1 Expansion card jumpers

ID	Name	Description	Terminal distribution
J1	RS485 terminating resistor selection	Termination resistor match	
		No-termination resistor match	
J2	AI3 Input Selection - Voltage, Current	voltage	
		current	
J3	AO2 output type sets the jumper	Voltage type: 0 V~10V	
		Current type: 0mA~20mA	
J7	RUN/STOP selection	RUN	
		STOP	

ID	Name	Description	Terminal distribution
J8	OP1 connection method selection	DI terminals are drained and OP1 connected to 24V	
		DI terminals are sourced and OP1 connected to COM	
S1	AI, PT100, PTC function selection	AI3: 1, 2, and 3 are dialed to ON	
		PTC: 4, 5, 6 dial to ON	
		PT100: 6, 7, 8 dial to ON	

NOTE

● The setting of the jumper is to take the top view of the expansion card with the main terminal block as the bottom side as the viewing angle, and the jumper has a silk screen on the board, please take the silk screen as the standard.

11.2.5 Wiring and precautions

1) Please refer to "3.2 Wiring" for the connection and use of digital input and output terminals and analog input and output terminals.
2) For MODBUS, please refer to "11.3.3 RS-485 Expansion Card (YD58TX1) Terminal Distribution and Function Description" and "Appendix C Communication".
3) Please refer to "11.3.1 CANlink Expansion Card (YD58CAN1) Terminal Distribution and Function Description" for CAN communication.
4) When using CANlink or MODBUS communication, if the communication distance is long or there are many nodes, the inverter at the end will be the termination resistor should be switched on, CGND is the ground terminal block for CANlink or MODBUS communication.

11.3 Use of Communication Expansion Cards

11.3.1 CANlink Expansion Card (YD58CAN1) Terminal Distribution and Function Description

11.3.1.1 YD58CAN1 Terminal distribution and function description

YD58CAN1 communication card is an expansion card designed for YD580E series inverter for CAN communication network, which can allow the inverter to access the high-speed CAN and CANlink communication network to realize fieldbus control.

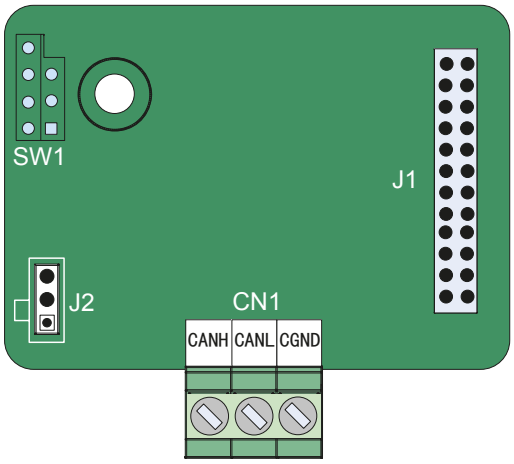


Figure 11-6 YD58CAN1 Terminal distribution

Table 11-10 YD58CAN1 Functions of expansion card terminals

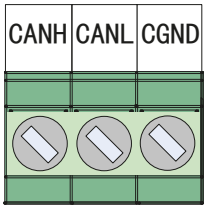
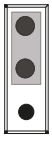
Identification		Name	Description	Terminal distribution
CN1	CANH	CAN positive input	Connect the CAN bus to the positive extreme	
	CANL	CAN negative input	Connect the CAN bus to the reverse extreme	
	CGND	Power Ground	A reference ground that connects all CAN nodes	

Table 11-11 YD58CAN1 Expansion card jumpers

Identification	Name	Description	Terminal distribution
J2	CAN terminal resistor setting jumper	Termination resistor matching	
		No termination resistor matching	

NOTE

● The setting of the jumper is to take the top view of the expansion card with the main terminal block as the bottom side as the viewing angle, and the jumper has a silk screen on the board, please Silk screen printing as the standard.

11.3.1.2 Instructions for use of the CANlink bus

1) CANlink connection

Figure 11-7 shows the topology of the CANlink bus connection, and the CAN bus is recommended to be connected with shielded twisted pairs.
CANL is connected with twisted pair cables; Only 120Ω termination matching resistors are connected at each end of the bus to prevent signal reflection; All nodes
The reference ground of the CAN signal is connected together; A maximum of 64 nodes can be connected, and the distance of each node's branch line should be less than 0.3M.

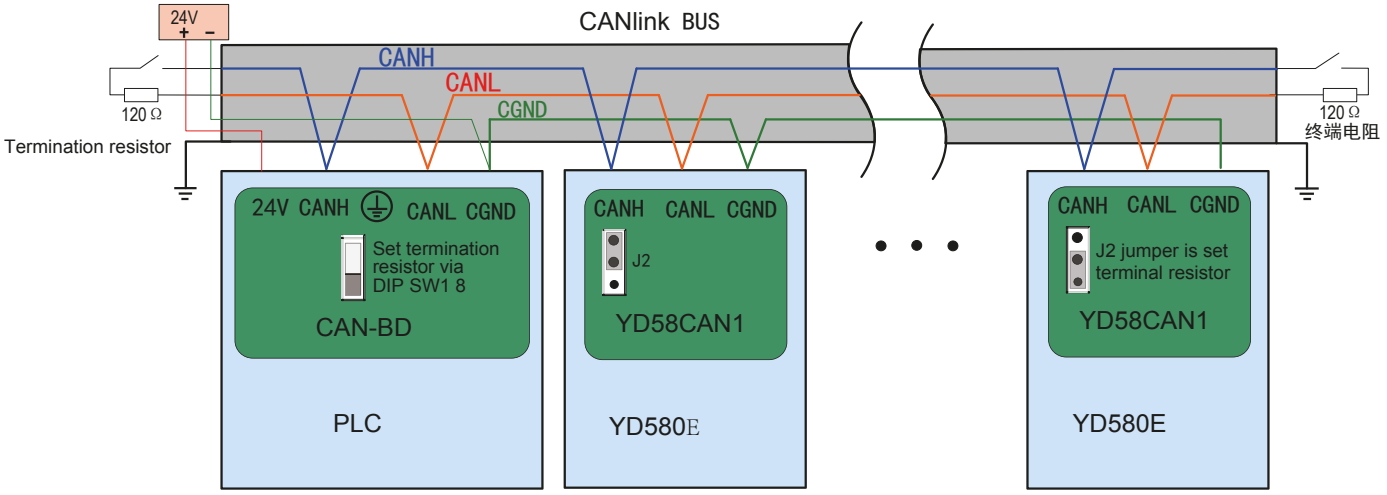
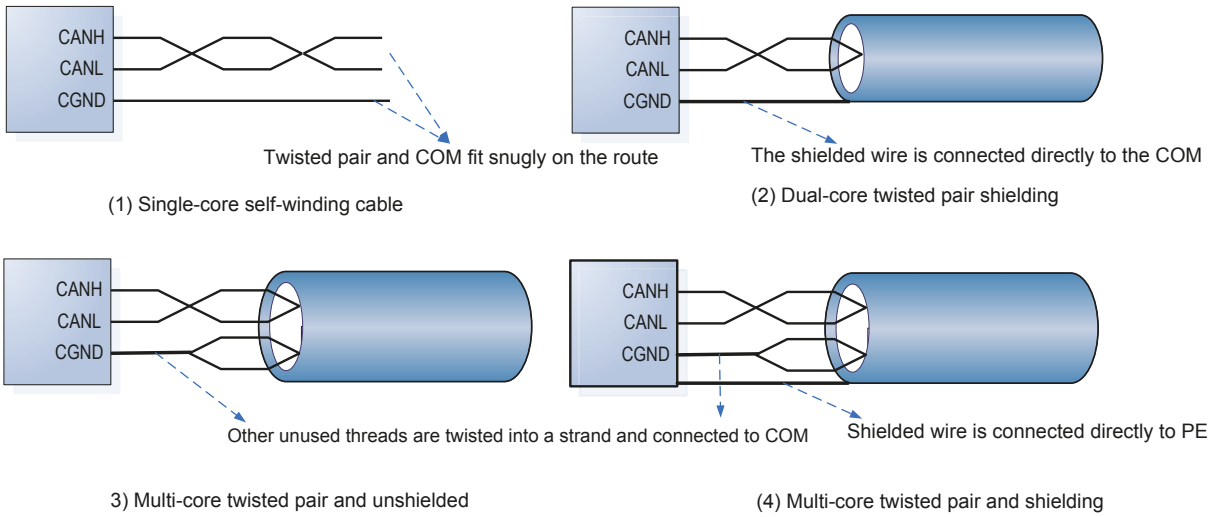


Figure 11-7 CANlink bus connection topology

Recommended use of different cables in the field:



2) CANlink transmission distance

The transmission distance of the CANlink bus is directly related to the baud rate and the communication cable, and the relationship between the maximum bus line length and the baud rate is as follows

The table shows:

NO	Transmission distance	speed	Number of nodes	Wire size
1	25m	1Mbps	64	0.205mm^2
2	95m	500kbps	64	0.34mm^2
3	560m	100kbps	64	0. 5mm^2
4	1100m	50kbps	64	0.75mm^2

NOTE

● For more information about CANlink Expansion Card (YD58CAN1), please refer to YD580E Series CAN Communication Expansion Card Manual.

11.3.2 CANopen Expansion Card (YD58CAN2) Terminal Distribution and Function Description

YD58CAN2 communication card is a special expansion card designed for YD580E series inverter for CAN communication network, which can allow the inverter to access the high-speed CAN communication network and realize fieldbus control. CANopen is an internationally accepted fieldbus standard, and devices that support this protocol can be connected to the CANopen network.

YD58CAN2 card supports 5 protocols, which are described below:

◆ Support Node Guard protocol, the master station can use this function to query the device status;

◆ Support Heartbeat protocol, the slave regularly reports the current status to the master;

◆ SDO only supports the accelerated transfer mechanism, each transmission of 1 parameter and 2 bytes;

◆ Support 3 TPDO, 3 RPDO;

◆ Support for emergency targets;

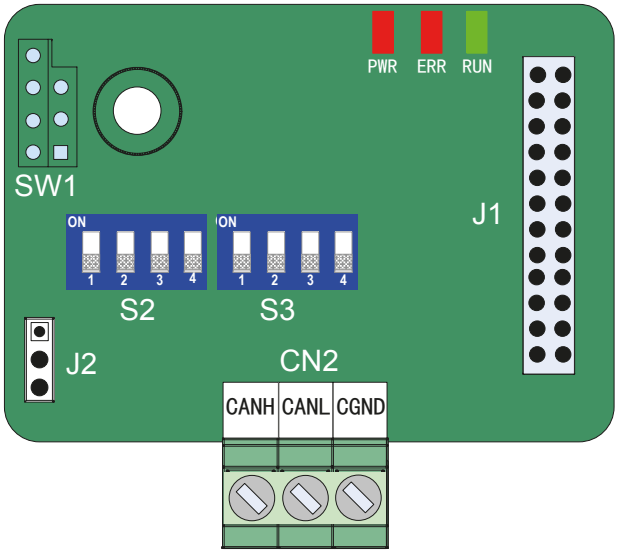


Figure 11-8 YD58CAN2 Terminal distribution

Table 11-12 YD58CAN2 Functions of expansion card terminals

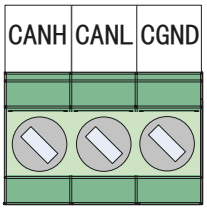
Identification		Name	Description	Terminal distribution
CN2	CANH	CAN positive input	Connect the CAN bus to the positive extreme	
	CANL	CAN negative input	Connect the CAN bus to the reverse extreme	
	CGND	Power Ground	A reference ground that connects all CAN nodes	

Table 11-13 YD58CAN2 Expansion card jumpers

Identification	Name	Description	Terminal distribution
J2	CAN terminal resistor setting jumper	Termination resistor matching	
		No termination resistor matching	

NOTE

● The setting of the jumper is to take the top view of the expansion card with the main terminal block as the bottom side as the viewing angle, and the jumper has a silk screen on the board, please take the silk screen as the standard

Table 11-14 YD58CAN2 DIP switch description of expansion cards

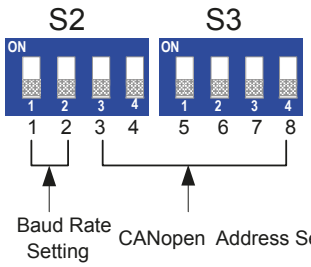
Baud Rate		Define	Addr Setting						Define	SWITCH
1	2		3	4	5	6	7	8		
0	0	125Kbps	0	0	0	0	0	0	KEEP	
			0	0	0	0	0	1	1	
0	1	250Kbps	0	0	0	0	1	0	2	
			0	0	0	0	1	1	3	
1	0	500Kbps	...						...	
			1	1	1	1	0	1	61	
1	1	1Mbps	1	1	1	1	1	0	62	
			1	1	1	1	1	1	63	

Table 11-15 YD58CAN2 Status indicator description

Indicator status	illustrate
PWR	The light is on: the power-on is normal
PWR	Lights off: The power-on is not normal, please check whether the installation is normal
ERR	The light is on: the internal inverter communication has timed out
ERR	Slow flashing: The CANopen emergency message inverter is faulty
ERR	Flash: CANopen address set incorrectly
RUN	Lights out: CANopen enters Stopped
RUN	Lights on: CANopen enters Opellatianar
RUN	Flash: CANopen enters Pre-Opellationar

NOTE

11.3.3 RS-485 Expansion Card (YD58TX1) Terminal Distribution and Function Description

11.3.3.1 YD58TX1 Terminal distribution and function description

YD58TX1 communication card is specially developed for YD580E series inverter to provide 485 communication function

The number is in line with international standards, and users can choose according to their needs to realize the functions of remote serial port control inverter operation and parameter setting.

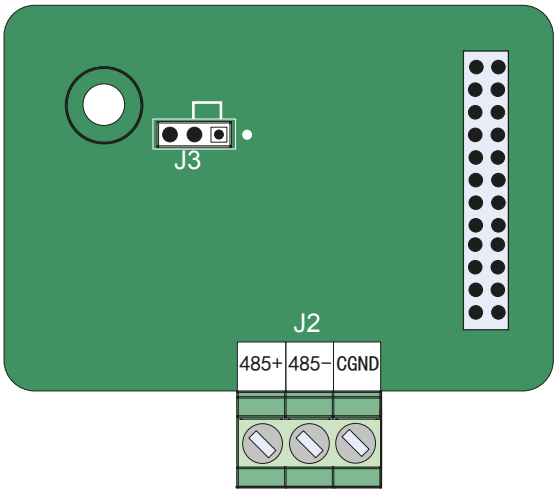


Figure 11-9 YD58TX1 Terminal distribution

Table 11-16 YD58TX1 Functions of expansion card terminals

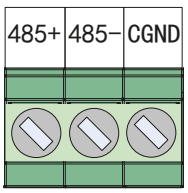
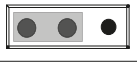
Identification		Name	Description	Terminal distribution
J2	485+	485 signal positive	485 input terminal, isolated input	
	485-	485 signal negative	485 input terminal, isolated input	
	CGND	485 signal ground	power supply is isolated	

Table 11-17 YD58TX1 Expansion card jumper description

Identification	Name	Description	Terminal distribution
J3	485 Termination Resistor Setup Jumper	Terminal resistor match	
		No-terminal resistor match	

NOTE

● The setting of the jumper is to take the top view of the expansion card with the main terminal block as the bottom side as the viewing angle, and the jumper has a silk screen on the board, please take the silk screen as the standard.

11.3.3.2 RS485 communication bus instructions

1) RS485 connection topology

The topology of RS485 bus connection is shown in C.5-2, 485 bus is recommended to use shielded twisted pair connection, 485+, 485- use twisted pair connection; Only 120Ω termination matching resistors are connected at each end of the bus to prevent signal reflection; The reference ground of all node 485 signals is connected together; A maximum of 128 nodes can be connected, and the distance of each node branch should be less than 3M.

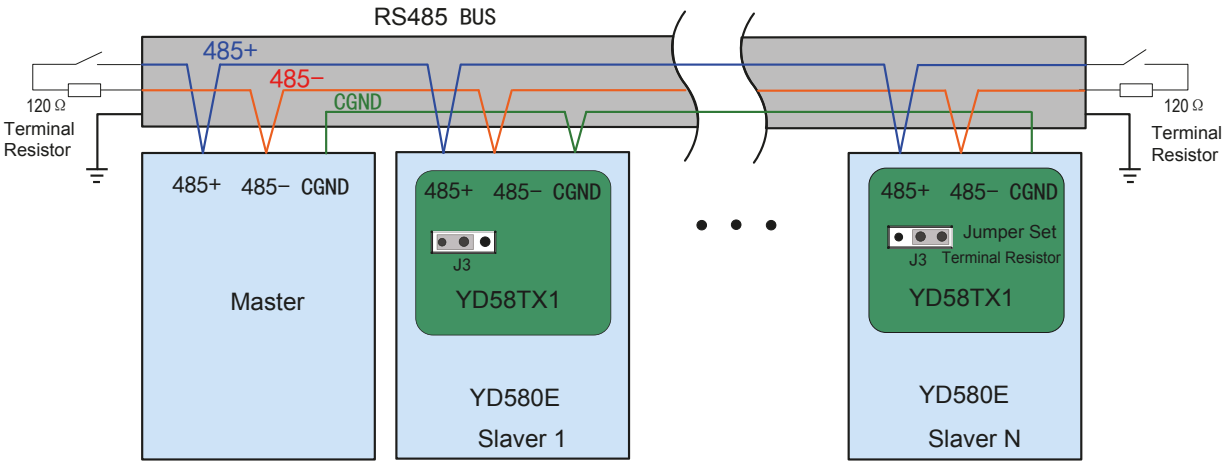


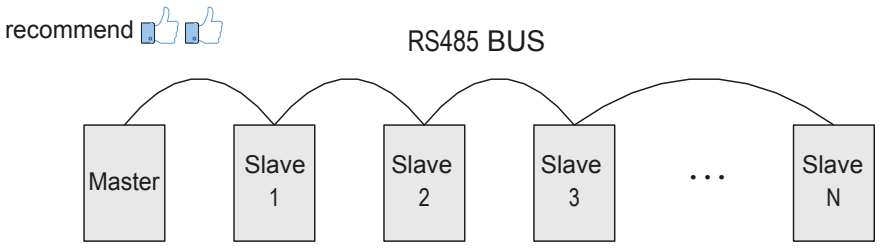
Figure 11-10 RS485 bus connection topology

2) Multi-node connection

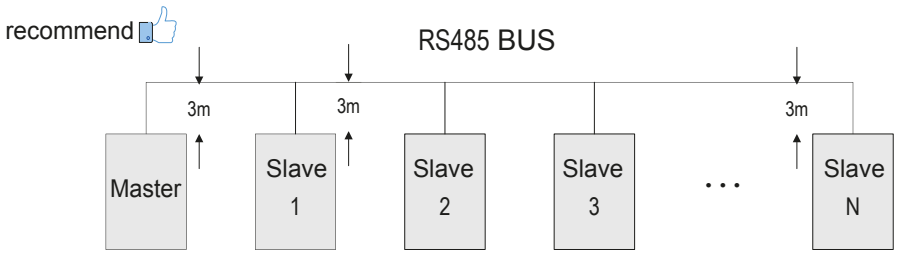
When the number of nodes is large, the 485 bus must be daisy-chained. If branch connections are required, the bus is divided between nodes

The shorter the length of the branch, the better, it is recommended not to exceed 3m, and resolutely put an end to star connections. The schematic diagram of the common bus structure is as follows:

◆ Daisy chain connection structure

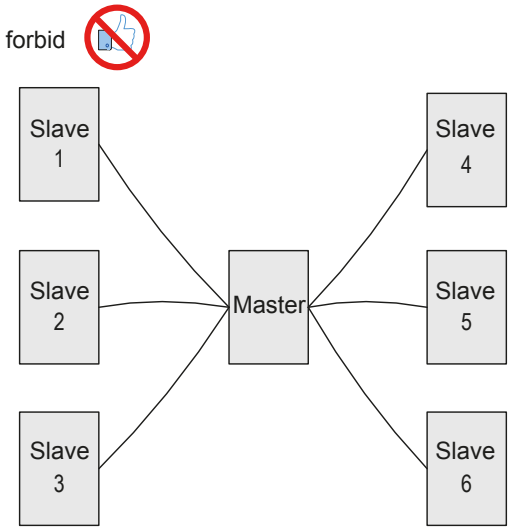


◆ Connected by branch lines



Note: Branch lines are recommended not to exceed 3m.

◆ Star wiring method (forbidden to use)

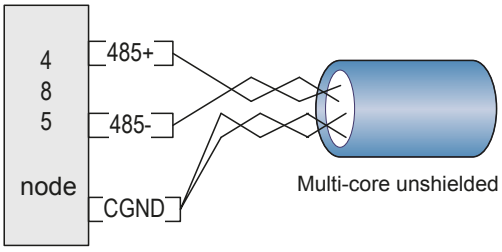


3) Terminal wiring method

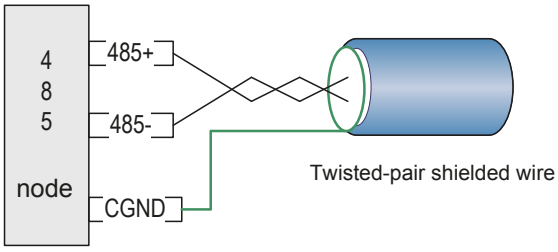
◆ A node that has a CGND terminal point on the port

YD58TX1 There are three connecting cables, which are connected to the 3 terminals of 485+, 485-, and CGND in turn. Check that the 485 bus in the field contains 3 cables and that the terminal blocks are not reversed or incorrectly connected. If you are using a shielded cable, it is especially important to note that the shield must also be connected to the CGND terminal, and it is forbidden to connect the shield to any other place (including the field chassis, equipment grounding terminal, etc.)

at any node or intermediate position, except for the CGND of the node.
Due to the attenuation effect of the cable, it is recommended to use AGW26 or thicker cables for cables with a connection length of more than 3m, and twisted pair cables are recommended for 485+ and 485- connection cables at all times.



a Multi-core unshielded wire

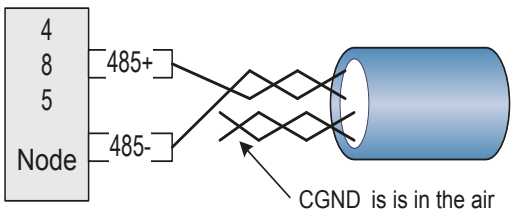


b Twisted-pair shielded wire

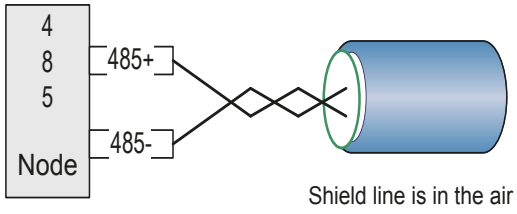
- Recommended Cable 1: For multi-core cables with twisted pair cables, one pair of twisted pair cables is used as the 485+ and 485- cables, and the other excess cables are screwed together as CGND cables.
- Recommended Cable 2: Shielded twisted pair cable with twisted pair as 485+ and 485- and shield as CGND.
- For the occasion of using shielded wire as the connecting cable, it is especially important to note that the shielding layer can only be connected to CGND, not to the ground on site.

◆ For some nodes that do not have CGND terminal points

For some nodes without CGND terminal points, it is not possible to simply connect the CGND or shield layer directly to the PE of the node It is handled as follows:



a Multi-core unshielded wire



b Twisted-pair shielded wire

• Solution 1: Find out if there is a reference ground shared with the 485 circuit on other ports of this node, if so, the CGND cable (shield) of the bus can be directly connected to this pin;

• Solution 2: Find the reference ground of the 485 circuit on the node board, and connect the lead to CGND or shielding;

• Solution 3: If you can't find the reference ground of the 485 circuit, as shown in the above figure, the CGND cable or shield is suspended.

At the same time, an additional ground wire is used to connect this node to the PE of other nodes.

4) Transmission distance and number of nodes

The maximum number of nodes and transmission distances supported by standard RS485 circuits at different rates are shown in the table below

NO	SPEED	Distance	Nodes	Wire Size
1	115.2kbps	100m	128	AWG26
2	19.2kbps	1000m	128	AWG26

Note: Please refer to Appendix C for the Modbus protocol.

11.3.4 Profibus-DP Expansion Card (YD58DP2) Terminal Distribution and Function Description

11.3.4.1 YD58DP2 Terminal distribution and function description

The card is installed on the YD580E inverter to improve the communication efficiency, facilitate the realization of the inverter networking function, make the inverter become the slave station of the fieldbus, and accept the control of the fieldbus master YD58DP2 The card can not only realize Profibus-DP communication, but also provide CANlink communication interface to realize CANlink communication function.

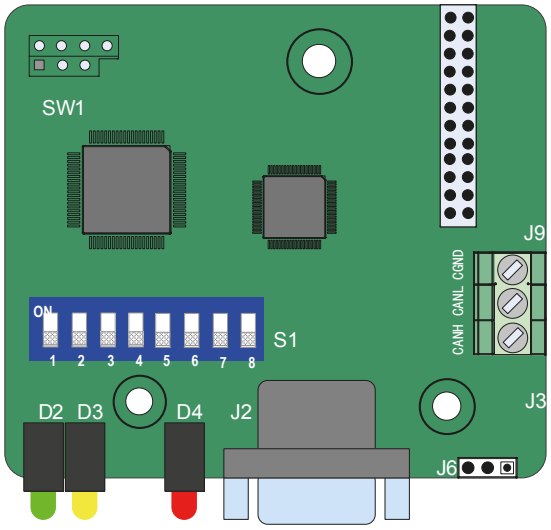


Figure 11-11 YD58DP2 Terminal distribution

Table 11-18 YD58DP2 Functions of expansion card terminals

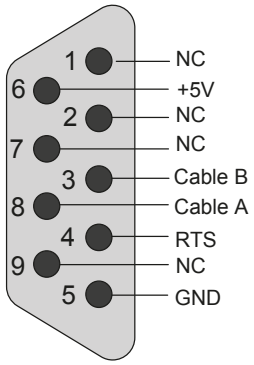
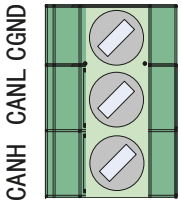
Identification	Pin number	Pin definition	Description	Distribution
J2 Profibus Terminal	1、2、7、9	NC	Internal suspension	
	3	Cable B	Positive of data cable	
	4	RTS	Request to send	
	5	GND	Isolate 5V Power Ground	
	6	+5V	Isolate 5V Power Supply	
	8	Cable A	Negative of data cable	
J3、J9 CANlink terminals	CANH	CAN positive input	Positive of data cable	
	CANL	CAN negative input	Negative of data cable	
	GND	Power Ground	Isolate 5V Power Ground	

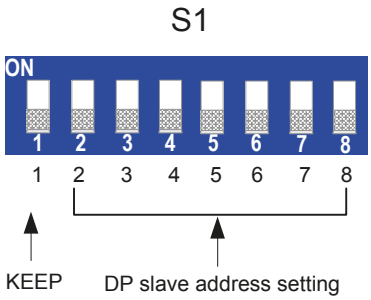
Table 11-19 Table 11-19 YD58DP2 Status indicator description

Light	state	illustrate
D4 Power indicator		Light on: the power-on is normal
		Lights off: The power-on is not normal, please check whether the installation is normal
D3 DP communicates with master indicator		Light on: It means that the DP card communicates normally with the Profibus master.
		Flashing: Indicates that the master is not running or that there is an error in the communication between the DP card and the Profibus master
		Lights off: It means that there is no communication between the DP card and the Profibus master (check the Profibus cable connection and station number);
D2 DP communication with Inverter indicator		Light on: it means that the DP card and the inverter communicate normally;
		Flashing: It means that there is interference in the communication between the DP card and the inverter, or the address of the expansion card is not within the range of 1~125;
		Lights off: Indicates that the DP card and the inverter are not communicating successfully (check whether the baud rate is set correctly).

Table 11-20 YD38DP2 Expansion card jumpers

Identification	Name	Description	Terminal distribution
J6	CANlink communication terminal resistor setting jumper	Termination resistor matching	
		Non-termination resistor matching	

Table 11-21 YD58DP2 Expansion card DIP switches

Profibus-DP communication slave address setting								Slave Address	DIP switch
1	2	3	4	5	6	7	8		
[Note]: When the dial code 1 is ON, it means that it is YD58DP1, and changing the tag needs to be re-powered on to take effect, and changing the dial-up code of the slave address does not need to be re-powered.	0	0	0	0	0	0	0	KEEP	
	0	0	0	0	0	0	1	1	
	0	0	0	0	0	1	0	2	
		0	0	0	0	1	1	3	
					...			...	
	1	1	1	1	1	0	1	123	
	1	1	1	1	1	1	0	124	
	1	1	1	1	1	1	1	125	

[Note]: When the dial code 1 is ON, it means that it is YD58DP1, and changing the tag needs to be re-powered on to take effect, and changing the dial-up code of the slave address does not need to be re-powered.

11.3.4.2 Instructions for use of the Profibus-DP communication bus

The schematic diagram of the wiring between the DP card and the Profibus master is shown in the figure below:

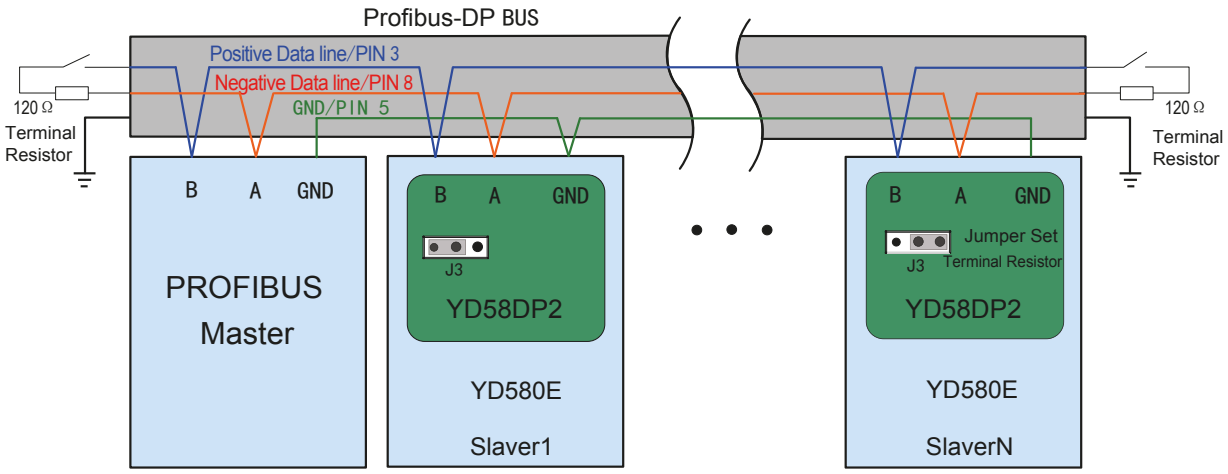


Figure 11-12 Schematic diagram of the connection between the YD58DP2 card and the Profibus master

In the Profibus bus terminal, it is necessary to access the terminal matching resistor, and the DIP code needs to be toggled according to the indication on the terminal block. PE rating of the system be sure to have a reliable grounding.

According to the different baud rate settings of the master station, the length of the communication wire between the DP card and the Profibus master station is also required, and the length of the communication data wire must be strictly limited in accordance with the SIEMENS DB9 wiring standard. The baud rate and wire length requirements are shown in the following table:

Transmission rate Kbps	Conductor A Max. length (m)	Conductor B Max. length (m)
9.6	1200	1200
19.2	1200	1200
187.5	600	600
500	200	200
1500	100	70
3000	100	Not supported
6000	100	Not supported
12000	100	Not supported

NOTE

● For more information about the Profibus-DP Expansion Card (YD58DP2), please refer to the introduction of the YD580E Series YD58DP2 Profibus Interface Card Manual.

11.3.5 Profinet Communication Expansion Card (YD580-PN1) Terminal Distribution and Function Description

The YD580PN card is a Profinet fieldbus adapter that complies with the internationally accepted Profinet Ethernet standard. The card is installed on the YD580E series inverter to improve the communication efficiency, facilitate the realization of the inverter networking function, and make the inverter become the slave station of the fieldbus and accept the control of the fieldbus master.

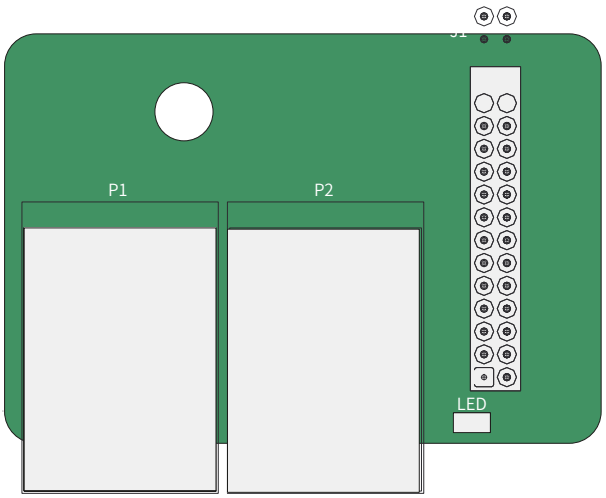


Figure 11-13 YD580PN Card terminal distribution

Table 11-22 YD580PN Card terminal functions

Identification	Name	Description
P1	Port 1	Terminal block, no direction, any one can be connected to the nearest PLC end. 485 communication input terminal, isolated input
P2	Port 2	
J1	Header plug	It is used to connect with the frequency converter

Table 11-23 YD580PN card indicator status

Identification	Name	Status description
LED	Power indicator	Power indicator Bright: The power-on is normal. No light: The power-on is not normal, please check whether the installation is correct.

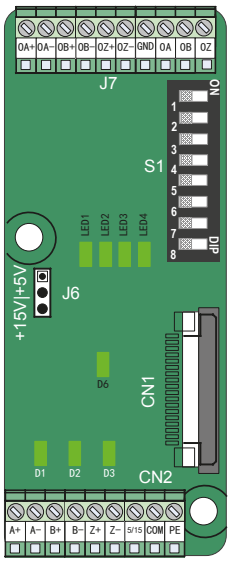
NOTE

● For more information about Profinet Expansion Card (YD580-PN1), please refer to the introduction of YD580E Series Profinet Expansion Card Manual

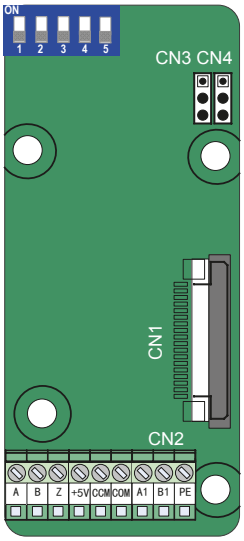
11.4 Use of Encoder Expansion Cards

11.4.1 Encoder Expansion Card Specifications

YD58PGMD



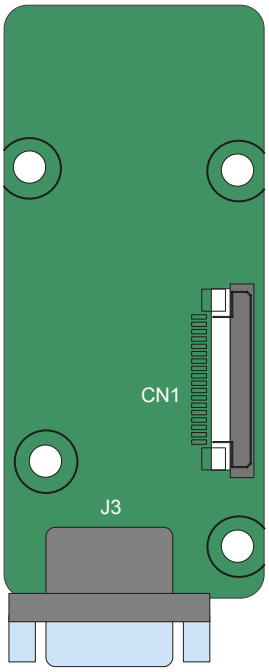
YD58PG5D



YD58PG5 Specification	
Encoder power supply	5V/200mA，15V/100mA
Input Max frequency	Differential: 500kHz, Collector:100kHz
Encoder interface type	Differential, Collector, Push-pull
Divider interface type	Differential, Collector
Wire gauges	16~26AWG specific wire gauge selection parameters
Terminal spacing	3.5mm
Terminal screws	Slotted screws
Terminal form	Diagonal terminal blocks
Divider Range	0~63

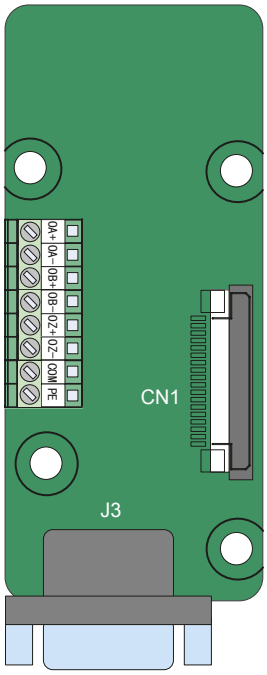
YD58PG5D Specification	
User interface	Diagonal terminal blocks
Terminal spacing	3.5mm
Terminal screws	Slotted screws
Unplugging	not
Wire gauges	16-26AWG
Input Max frequency	100kHz
Divider Range	2~62 even

YD58PG4



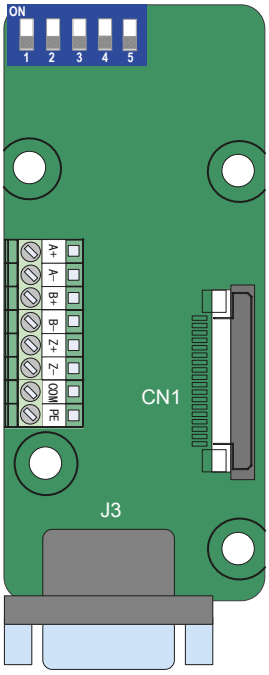
YD58PG4 Specification	
User interface J3	DB9 Socket
Unplugging	yes
Wire gauges	21AWG-26AWG
Resolution	12 bit
Excitation frequency	10kHz
VRMS	7V
VP-P	3.15±27%
Divider Range	Without Divider

YD58PG6



YD58PG6 Specification	
User interface J3	DB9 Socket
Unplugging	yes
Wire gauges	21AWG-26AWG
Input Max frequency	500kHz
Input differential signal amplitude	⩽ 7V
User interface J7、J8	Diagonal terminal blocks
Terminal spacing	3.5mm
Terminal screws	Slotted screws
Unplugging	not
Divider Frequency	500kHz
Divider Range	1：1

YD58PG6D



YD58PG6D Specification	
User interface J3	DB9 Socket
Unplugging	yes
Wire gauges	21AWG-26AWG
Input Max frequency	500kHz
Input differential signal amplitude	⩽ 7V
User interface J7、J8	Diagonal terminal blocks
Terminal spacing	3.5mm
Terminal screws	Slotted screws
Unplugging	not
Divider Frequency	500kHz
Divider Range	2~62 even

11.4.2 Multifunctional PG Card (YD58PGMD)

Table 11-24 YD58PGMD Terminal functions

Table 11-24 YD58PGMD Terminal functions

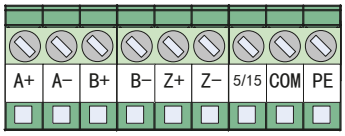
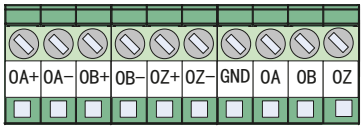
Identification		Description	Distribution
CN2	A+	The encoder outputs A positive	
	A-	The encoder outputs A negative	
	B+	The encoder outputs B positive	
	B-	The encoder outputs B negative	
	Z+	The encoder outputs Z positive	
	Z-	The encoder outputs Z negative	
	5V/15V	Encoder 5V/15V power supply	
	COM	Encoder power supply ground	
	PE	Shield terminals	
J7	OA+	Differential divider outputs A positive	
	OA-	Differential divider outputs A negative	
	OB+	Differential divider outputs B positive	
	OB-	Differential divider outputs B negative	
	OZ+	Differential divider outputs Z positive	
	OZ-	Differential divider outputs Z negative	
	GND	Divider output reference ground	
	OA	Collector divides frequency to output A	
	OB	Collector divides frequency to output B	
	OZ	Collector divides frequency to output Z	
CN1	18Pin FFC flexible cable interface, connect to J4 of the inverter control board		

Table 11-25 YD58PGMD DIP switches

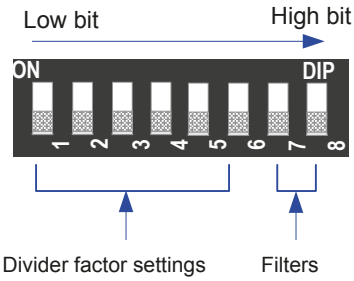
Filter		Define	Address settings						Value	Divider factor	DIP switch
8	7		6	5	4	3	2	1			
0	0	Non-adaptive filtering	0	0	0	0	0	0	KEEP	No Output	
			0	0	0	0	0	1	1	1-divider	
0	1	Adaptive filtering	0	0	0	0	1	0	2	2-divider	
			0	0	0	0	1	1	3	3-divider	
1	0	Fixed interlocks	...								
			1	1	1	1	0	1	61	61-divider	
1	1	Automatic interlocking	1	1	1	1	1	0	62	62-divider	
			1	1	1	1	1	1	63	63-divider	

Table 11-26 YD58PGMD Indicator status

Indicator	status	description
D1/D2/D3 Encoder input signal indicator Power indicator		Solid or flashing: The encoder has a signal input
		Light off: The encoder has no signal input
D6 Power Indicator		Light on: Norma
		Light off: The power supply is not connected
LED1 Encoder input signal quality Quantity indicator		Lights off: The input signal is normal, the speed is stable or there is no interference
		Lights on: The input signal is slightly unstable, usually when the motor accelerates or decelerates, or the encoder input signal is slightly disturbed
		Slow flashing: The input signal is moderately unstable, usually when the motor accelerates or decelerates, or the encoder input signal is moderately disturbed
		Fast flashing: The encoder input signal is severely unstable, usually when the motor accelerates and decelerates quickly or the encoder input signal is severely disturbed
LED2 PG Card Signal Processing Quality Indicator		Lights off: The PG card signal is normal, and the speed is stable or there is no interference
		The light is on: the PG card signal is slightly unstable, usually in the motor acceleration and deceleration or the PG card can not completely filter out the interference in the encoder input signal, but not much (less than 10 interference pulses per unit time)
		Slow flashing: The PG card signal is moderately unstable, usually in the motor acceleration and deceleration or the PG card is not able to completely filter out the interference in the encoder input signal, there is a certain number (less than 30 interference pulses that are not filtered out per unit time)
		Fast flashing: The PG card signal is seriously unstable, usually in the motor acceleration and deceleration or the PG card can not completely filter out the interference in the encoder input signal, there is a certain number (more than 30 interference pulses that are not filtered out per unit time)
LED3 Interlock status indicator		Light off: Disables the interlock function
		Lights on: Enable the interlock function
LED4 System working indicator		Light off: The system is not working or abnormal
		Flashing: The encoder cable is disconnected
		The light is on: The system is working normally

11.4.3 Resolver PG cards (YD58PG4)

Table 11-27 YD58PG4 Terminal functions

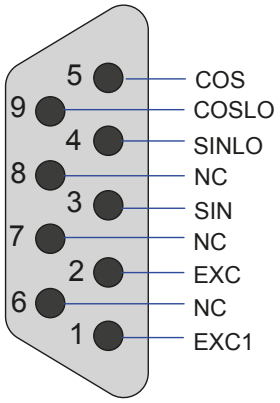
Identification	Pin number	Pin definition	Feature Description	Terminal distribution
J3	1	EXC1	Excitation negative	
	2	EXC	Excitation positive	
	3	SIN	Feedback SIN is positive	
	4	SINLO	Feedback SIN is negative	
	5	COS	Feedback COS is positive	
	6、7、8	NC	No-Connect Internet	
	9	COSLO	Feedback COS is negative	
CN1	18Pin FFC flexible cable interface, connected to J4 of inverter control panel.			

Table 11-28 YD58PG4 Indicator status

Fault indicator	YD58PG4 Fault status	Causes of failures and countermeasures
	normal	no
	The PLL is out of lock.	Generally, the phase lag of the selected resolver is too large
	Signal SIN/COS amplitude exceeds the upper limit.	Usually D6 flicker is caused by interference. Good grounding of the motor and connecting the grounding point on PG card to PE terminal of frequency converter can be effectively solved.
	Signal SIN/COS amplitude is too small	DB9 connector is not connected, wrongly connected or even disconnected. If it is found above situation does not occur, it is need to check resolver transformer matches YD58PG4.

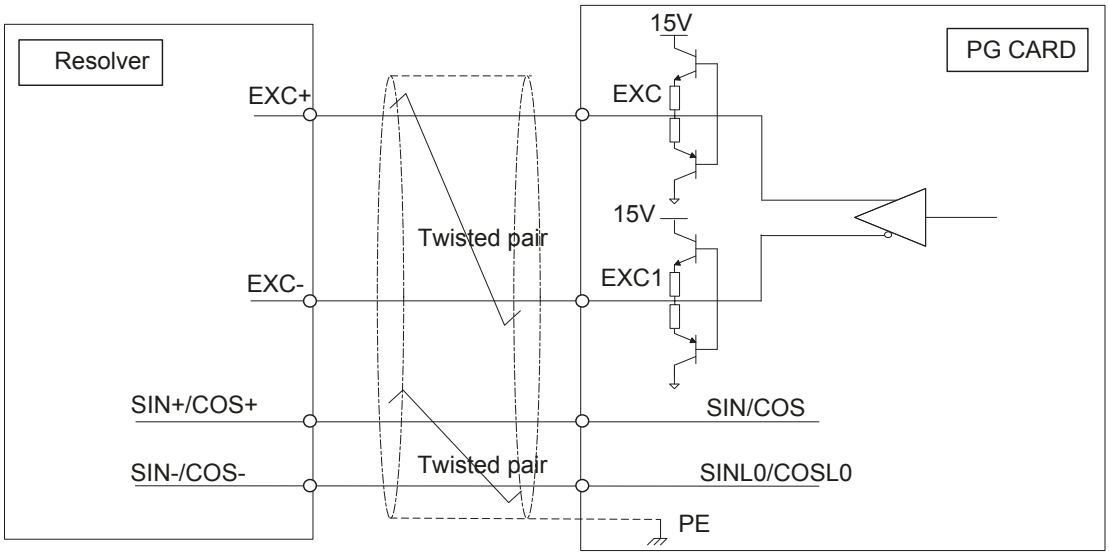


Figure 11-14 YD58PG4 Interface Circuit

NOTE

● The selection of resolver must meet the parameter requirements of YD58PG4, especially the input DC resistance of excitation must be greater than 17Ω (measured by multimeter), otherwise YD58PG4 will not work normally;
● In order to avoid the overload of YD58PG4 caused by selecting a resolver with too high pole number, it is recommended not to choose a resolver with pole number higher than 4 pairs of poles.

11.4.4 open collector input PG card (YD58PG5D)

Table 11-29 YD58PG5D Terminal Function Description

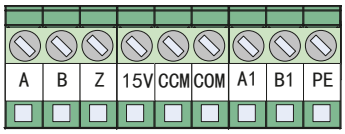
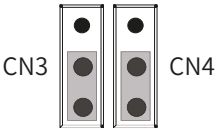
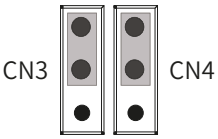
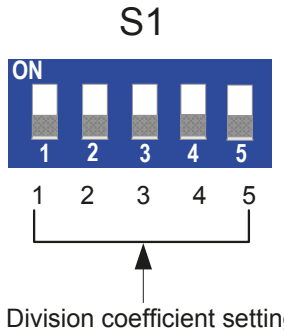
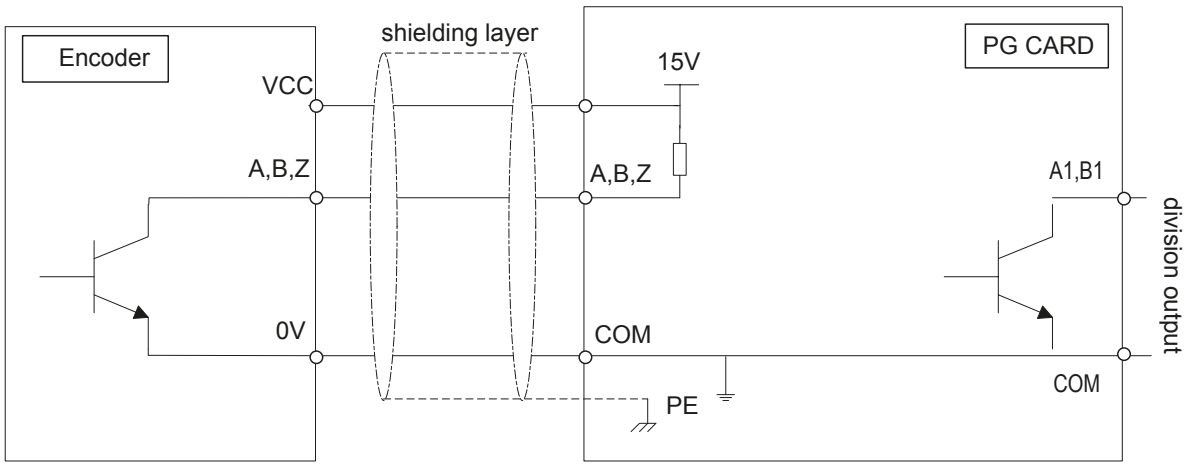
Identification		Feature Description	Terminal distribution
CN2	A	Encoder outputs A signal	
	B	Encoder outputs B signal	
	Z	Encoder outputs Z signal	
	15V	Provide external 15V/100mA power suppl	
	COM	Power ground and frequency division output ground.	
	COM	Power ground and frequency division output ground.	
	A1	PG card divider output A (OC output, 0V~24V, 0mA~50mA)	
	B1	PG card divider output B (OC output, 0V~24V, 0mA~50mA)	
	PE	Shielded terminal	
CN3 CN4	"Pulse+Direction" Function setting jumper	Support "pulse+direction" function The pulse signal is connected to phase A, and the direction signal is connected to phase B.	
		"Pulse+Direction" function is not supported (default setting).	
CN1	18Pin FFC flexible cable interface, connected to J4 of inverter control panel.		

Table 11-30 Table 11-28 YD58PG5D dip switch Description

Dip switch setting					Value	Divider factor	DIP switch
1	2	3	4	5			
0	0	0	0	0	0	No output	
0	0	0	0	1	1	No output	
0	0	0	1	0	2	Divide by 4	
0	0	0	1	1	3	Divide by 6	
…							
1	1	1	1	1	31	Divide by 62	



The encoder outputs A positive

Figure 11-15 YD58PG5D Interface Circuit

11.4.5 differential PG cards with frequency division output (YD58PG6, YD58PG6D)

Table 11-31 Function Description of YD58pg6 and YD58PG6D Terminals

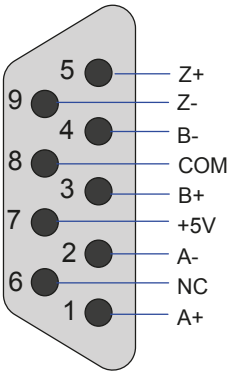
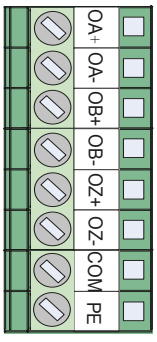
Identification	Pin number	Pin definition	Feature Description	Terminal distribution
J3	1	A+	The encoder outputs A positive	
	2	A-	The encoder outputs A negative	
	3	B+	The encoder outputs B positive	
	4	B-	The encoder outputs B negative	
	5	Z+	The encoder outputs Z positive	
	6	NULL	No-Connect Internet	
	7	+5V	Encoder 5V power supply	
	8	COM	Encoder 5V ground	
	9	Z-	The encoder outputs Z negative	
J7、J8	OA+		Division output A positive	
	OA-		Division output A negative	
	OB+		Division output B positive	
	OB-		Division output B negative	
	OZ+		Division output Z positive	
	OZ-		Division output Z negative	
	COM		Signal power supply ground	
	PE		Shielded terminal	
CN1	18Pin FFC flexible cable interface, connected to J4 of inverter control panel.			

Table 11-32 YD58PG6D Description of dip switch

Dip switch setting					Value	Divider factor	DIP switch
1	2	3	4	5			
0	0	0	0	0	0	No output	S1 ON 1 2 3 4 5 1 2 3 4 5 Division coefficient setting
0	0	0	0	1	1	No output	
0	0	0	1	0	2	4	
0	0	0	1	1	3	6	
…					…	…	
1	1	1	1	1	31	62	

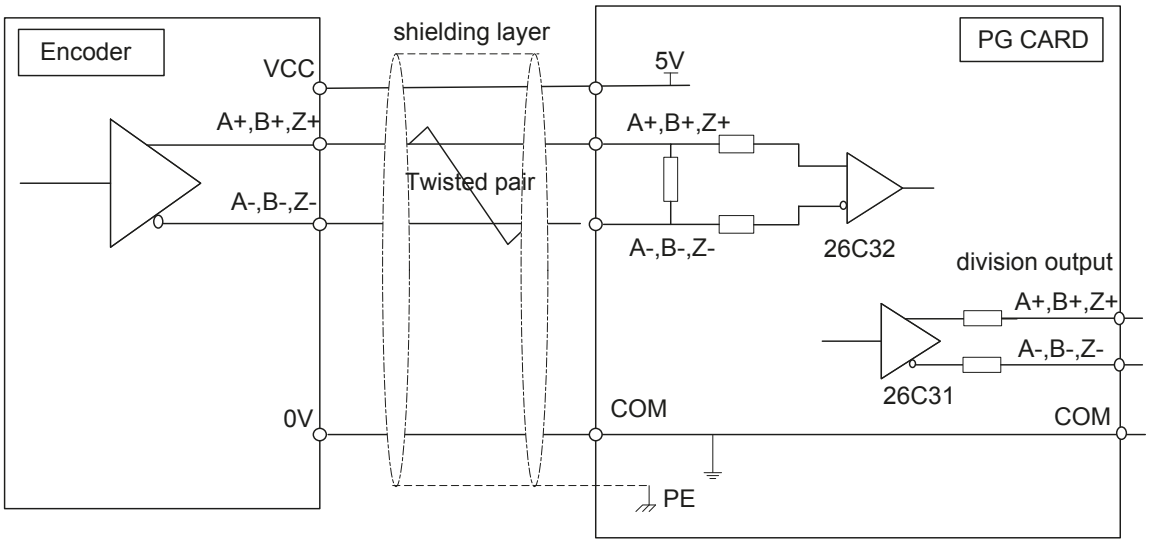
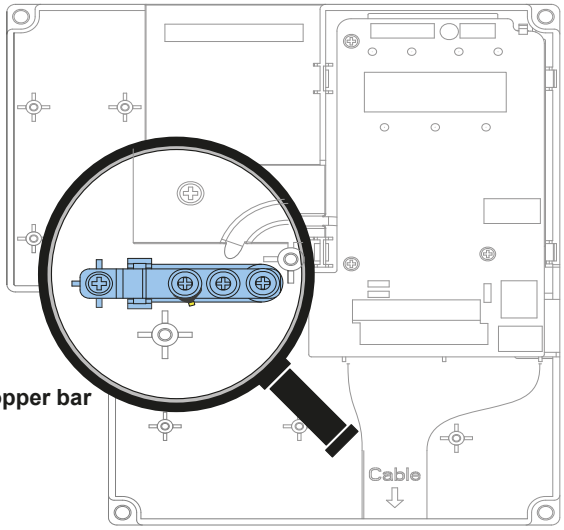


Figure 11-16 YD58PG6/YD58PG6D Interface Circuit

11.4.6 grounding instructions for shielding layer of PG card

On the premise that the software parameters of the frequency converter are set correctly, if the feedback speed or position of PG card is found to be unstable, it means that PG card is subject to electromagnetic interference. Connecting the shielding layer of the encoder signal line to the PE grounding point of the frequency converter can effectively suppress electromagnetic interference.



The inside of grounding copper bar is connected with PE.

YD580E is grounded structurally, and after the installation of PG card, it can realize the internal connection with the PE terminal of PG card. When wiring the encoder, only the shielding layer of the signal line needs to be led out and connected to the PE terminal on the PG card, so that the shielding layer of the signal line can be grounded.

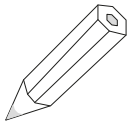
Installation instructions: Before installing the PG card, remove the screws at the enlarged part in the figure, align the other three fixing posts (located at the upper left of the enlarged part in the figure), and then fix the PG card with M3×8 screws one by one.

11.4.7 EMC guidance

1) During on-site installation and debugging, signal lines (such as encoder lines) and power lines need to be routed in different trunking, and it is forbidden to bundle the encoder lines and power lines together, otherwise the encoder interference problem will easily occur;
2) The motor shell must be connected to the grounding terminal (PE terminal) of the inverter, and the ground wire on the motor shell side must be well lapped, otherwise good grounding effect will not be achieved;
3) It is recommended to use twisted-pair shielded wire cables. For differential encoders, twisted-pair cables must be wired in differential pairs, and the shielding layer is connected to the inverter grounding terminal (PE terminal);
4) For some large equipment, the frequency converter is far away from the motor, and the motor cable is very long (> 10m), and the grounding effect will be worse due to the influence of cable inductance. At this time, the encoder shielding layer may not be connected to the frequency converter grounding terminal (PE terminal);
5) Whether there is interference in the input of YD58pgmd card can be judged by the status indicator light on PG card. For details, see the specific meaning of status indicator light in the above section.

Memo NO. _____

Date / /



Appendix B Parameter Table

When a non-zero value is set for PP-00, the user-defined password is used. In function parameter mode and function parameter editing mode, enter the password correctly. To remove password protection, set PP-00 to 0.

The user password protection is used to protect operation on the panel. If this protection has been enabled, when you finish reading or writing parameters through the keypad and exit, you need to enter the password to get access again. Reading and writing are allowed without the password during communication operation (except PP and PF groups).

Password protection is not applicable to user-defined parameters.

Groups P and A include standard function parameters. Group U includes the monitoring function parameters. The symbols in the parameter table are described as follows:

☆ : It is possible to modify the parameter with the drive in the stop and in the Run status.

★ : It is not possible to modify the parameter with the drive in the Run status.

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

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

B.1 Standard Parameter Table

Para. No.	Name	Setting Range	Default	Change
Group P0: Standard Parameters				
P0-00	G/P type display	1: G (constant torque load) 2: P (fan an bump)	Model dependent	●
P0-01	Motor 1 control mode	0: SVC 1: FVC 2: V/F	0	★
P0-02	Command source selection	0: Operating panel 1: Terminal 2. Serial communication	0	☆
P0-03	Main frequency reference setting channel selection	0: Digital setting (revised value is not cleared after power off) 1: Digital setting (revised value is cleared after power off) 2: AI1 3: AI2 4: AI3 5: Pulse setting (DI5) 6: Multi-reference 7: Simple PLC 8: PID reference 9: Communication setting	0	★
P0-04	Auxiliary frequency reference setting channel selection	Same to P0-03	0	★
P0-05	Base value of range of auxiliary frequency reference for Main and auxiliary calculation	0: Relative to maximum frequency 1: Relative to main frequency reference	0	☆
P0-06	Range of auxiliary frequency reference for main and auxiliary calculation	0% to 150%	100%	☆

Para. No.	Name	Setting Range	Default	Change
P0-07	Final Frequency reference setting selection	Units position: Frequency reference selection 0: Main frequency reference 1: Main and auxiliary calculation (based on tens position) 2: Switchover between main and auxiliary 3: Switchover between main and "main & auxiliary calculation" 4: Switchover between auxiliary and "main & auxiliary calculation" Tens position main and auxiliary calculation formula 0: Main + auxiliary 1: Main - auxiliary 2: Max. (main, auxiliary) 3: Min. (main, auxiliary)	00	☆
P0-08	Preset frequency	0.00 to max. frequency (P0-10)	50.00Hz	☆
P0-09	Running direction	0: Run in the default direction (FWD/REV indicator off) 1: Run in the direction reverse to the default direction (FWD/REV indicator on)	0	☆
P0-10	Max. frequency	5.00 Hz to 500.00 Hz	50.00Hz	★
P0-11	Setting channel of frequency upper limit	0: Set by P0-12 1: AI1 2: AI2 3: AI3 4: Pulse reference 5: Communication reference	0	★
P0-12	Frequency reference upper limit	Frequency lower limit (P0-14) to max. frequency (P0-10)	50.00Hz	☆
P0-13	Frequency reference upper limit offset	0.00 Hz to max. frequency (P0-10)	0.00Hz	☆
P0-14	Frequency reference lower limit	0.00 Hz to frequency upper limit (P0-12)	0.00Hz	☆
P0-15	Carrier frequency	2.0 to 8.0 kHz	Model dependent	☆
P0-16	Carrier frequency adjusted with temperature	0: Disabled 1: Enabled	0	☆
P0-17	Acceleration time 1	0.00s to 650.00s (P0-19 = 2) 0.0s to 6500.0s (P0-19 = 1) 0s to 65000s (P0-19 = 0)	Model dependent	☆
P0-18	Deceleration time 1	0.00s to 650.00s (P0-19 = 2) 0.0s to 6500.0s (P0-19 = 1) 0s to 65000s (P0-19 = 0)	Mode ldependent	☆
P0-19	Acceleration/Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	★
P0-21	Frequency offset of Auxiliary frequency setting channel for main and auxiliary calculation	0.00 Hz to max. frequency (P0-10)	0.00Hz	☆
P0-22	Frequency reference resolution	2: 0.01 Hz	2	★
P0-23	Retentive of digital setting frequency upon stop	0: Not retentive 1: Retentive	0	☆
P0-24	Motor parameter group selection	0: Motor parameter group 1 1: Motor parameter group 2	0	★
P0-25	Acceleration/Deceleration time base frequency	0: Maximum frequency (P0-10) 1: Frequency reference 2: 100 Hz	0	★

Para. No.	Name	Setting Range	Default	Change
P0-26	Base frequency for UP/ DOWN modification during running	0: Running frequency 1: Frequency reference	0	★
P0-27	Command source + frequency source	Units position: operating panel (keypad & display) + frequency reference setting channel 0: No function 1: Digital setting 2: AI1 3: AI2 4: AI3 5: Pulse reference (DI5) 6: Multi-reference 7: Simple PLC 8: PID reference 9: Serial communication Tens position: terminal I/O control + frequency reference setting channel Hundreds position: serial communication + frequency reference setting channel	0000	☆
P0-28	Serial port communication protocol	0: Modbus protocol 1: PROFIBUS-DP or CANopen protocol	0	★
Group P1: Motor 1 Parameters				
P1-00	Motor type selection	2: Permanent magnet synchronous motor	2	★
P1-01	Rated motor power	0.1 to 1000.0 kW	Model dependent	★
P1-02	Rated motor voltage	1 to 2000 V	Model dependent	★
P1-03	Rated motor current	0.01 to 655.35 A (AC drive power ≤ 55 kW) 0.1 to 6553.5 A (AC drive power > 55 kW)	Model dependent	★
P1-04	Rated motor frequency	0.01 Hz to max. frequency	Model dependent	★
P1-05	Rated motor speed	1 to 65535 RPM	Model dependent	★
P1-16	Stator resistance of synchronous motor	0.001 to 65.535 Ω (AC drive power ≤ 55 kW) 0.0001 to 6.5535 Ω (AC drive power > 55 kW)	Auto-tuning parameter	★
P1-17	D-axis inductance of synchronous motor	0.01 to 655.35 mH (AC drive power ≤ 55 kW) 0.001 to 65.535 mH (AC drive power > 55 kW)	Auto-tuning parameter	★
P1-18	Q-axis inductance of synchronous motor	0.01 to 655.35 mH (AC drive power ≤ 55 kW) 0.001 to 65.535 mH (AC drive power > 55 kW)	Auto-tuning parameter	★
P1-20	Counter electromotive force of synchronous motor	0.0V to 6553.5 V	Auto-tuning parameterr	★
P1-27	Encoder pulses per revolution	1 to 65535	1024	★
P1-28	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Resolver 4: Wire-saving UVW encoder	0	★
P1-30	A/B phase sequence of ABZ incremental encoder	0: Forward 1: Reserve	0	★
P1-31	Encoder installation angle	0.0 to 359.9°	0.0°	★
P1-32	UVW phase sequence of UVW encoder	0: Forward 1: Reserve	1	★

Para. No.	Name	Setting Range	Default	Change
P1-34	Number of pole pairs of resolver	1 to 65535	1	★
P1-36	Encoder wire-break fault detection time	0.0s: No detection 0.1s to 10.0s	0.0s	★
P1-37	Auto-tuning selection	00: No operation 1: Synchronous auto-tuning with load 2: Synchronous auto-tuning with no-load	00	★
Group P2: Vector Control Parameters of Motor 1				
P2-00	Speed loop proportional gain 1	1 to 100	20	☆
P2-01	Speed loop integral time 1	0.01s to 10.00s	0.50s	☆
P2-02	Switchover frequency 1	0.00 to P2-05	5.00Hz	☆
P2-03	Speed loop proportional gain 2	1 to 100	20	☆
P2-04	Speed loop integral time 2	0.01s to 10.00s	1.00s	☆
P2-05	Switchover frequency 2	P2-02 to maximum frequency	10.00 Hz	☆
P2-09	Torque limit source in speed control	0: P2-10 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Serial comms. 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) Full scale of 1-7 corresponds to P2-10.	0	☆
P2-10	Digital setting of torque limit in speed control	0.0% to 200.0%	150.0%	☆
P2-11	Torque limit source in speed control (regenerative)	0: P2-12 (electrical or regenerative) 1: AI 2: AI2 3: AI3 4: Pulse reference 5: Communication reference 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) 8: P2-12 Full scale of 1-7 corresponds to P2-12.	0	☆
P2-12	Digital setting of torque limit in speed control (regenerative) Digital setting (regenerative)	0.0% to 200.0%	150.0%	☆
P2-13	Excitation adjustment proportional gain	0 to 60000	2000	☆
P2-14	Excitation adjustment integral gain	0 to 60000	1300	☆
P2-15	Torque adjustment proportional gain	0 to 60000	2000	☆
P2-16	Torque adjustment integral gain	0 to 60000	1300	☆
P2-18	flux weakening mode of synchronous motor	0, 1, 2	1	★
P2-19	flux weakening gain of synchronous motor	1 to 50	5	☆

Para. No.	Name	Setting Range	Default	Change
P2-22	Regenerative power limit selection	0, 1	0	★
P2-23	Regenerative power limit	0% to 50%	5%	☆
P2-24	Initial position angle detection current of synchronous motor	80% to 180%	120%	☆
P2-25	Initial position angle detection of synchronous motor	0, 1, 2	0	☆
P2-27	Salient-pole rate adjustment gain of synchronous motor	50 to 500	100	☆
P2-28	MTPA control	0, 1	0	☆
P2-32	Z signal correction	0, 1	1	☆
P2-36	Low speed excitation current	30% to 80%	30%	☆
P2-37	Low speed frequency	0.8K to P0-15	1.5K	☆
P2-41	Synchronous motor electromechanical sensing current	30% to 120%	80%	☆
P2-43	Zero servo enabling	0 to 1	0	☆
P2-44	Switchover frequency	0.00 to P2-02	0.30Hz	☆
P2-45	Zero servo speed loop proportional gain	1 to 100	10	☆
P2-46	Zero servo speed loop integral time	0.01s to 10.00s	0.50s	☆
P2-49	No-auto-tuning mode	0, 1, 2	0	☆
P2-50	Online counter electromotive force calculation	0, 1	0	☆
Group P3: V/F Control Parameters				
P3-00	V/F curve setting	0: Linear V/F 1: Multi-point V/F 2: Square V/F 3: 1.2-power V/F 4: 1.4-power V/F 6: 1.6-power V/F 8: 1.8-power V/F 9: Reserved 10: V/F complete separation 11: V/F half separation	0	★
P3-01	Torque boost	0.0%: No torque boost 0.1 to 30.0 %	Model dependent	☆
P3-02	Cut-off frequency of torque boost	0.00 Hz to max. frequency	50.00Hz	★
P3-03	Multi-point V/F frequency 1	0.00 Hz to P3-05	0.00Hz	★
P3-04	Multi-point V/F voltage 1	0.0% to 100.0%	0.0%	★
P3-05	Multi-point V/F frequency 2	P3-03 to P3-07	0.00Hz	★
P3-06	Multi-point V/F voltage 2	0.0% to 100.0%	0.0%	★
P3-07	Multi-point V/F frequency 3	P3-05 to rated motor frequency P1-04, Hz	0.00Hz	★
P3-08	Multi-point V/F voltage 3	0.0% to 100.0%	0.0%	★
P3-10	V/F over-excitation gain	0 to 200	64	☆
P3-11	V/F oscillation suppression gain	0 to 100	40	☆

Para. No.	Name	Setting Range	Default	Change
P3-13	Voltage source for V/F separation	0: Set by P3-14 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Multi-reference 6: Simple PLC 7: PID reference 8: Serial comms. Note: 100.0% corresponds to the rated motor voltage	0	☆
P3-14	Digital setting of voltage for V/F separation	0 V to rated motor voltage	0V	☆
P3-15	Voltage rise time of V/F separation	0.0s to 1000.0s Note: It is the time used for the voltage increases from 0 V to the motor rated voltage.	0.0s	☆
P3-16	Voltage decline time of V/F separation	0.0s to 1000.0s Note: It is the time used for the voltage increases from 0 V to the motor rated voltage.	0.0s	☆
P3-17	Stop mode selection for V/F separation	0: Frequency and voltage declining to 0 independently 1: Frequency declining after voltage declines to 0	0	☆
P3-18	Current limit level	50% to 200%	150%	★
P3-19	Current limit selection	0: Disabled 1: Enabled	1 (Enabled)	★
P3-20	Current limit gain	0 to 100	20	☆
P3-21	Compensation factor of speed multiplying current limit	50% to 200%	50%	★
P3-22	Voltage limit	650.0 to 800.0 V	770.0V	★
P3-23	Voltage limit selection	0: Disabled 1: Enabled	1 (Enabled)	★
P3-24	Frequency gain for voltage limit	0 to 100	30	☆
P3-25	Voltage gain for voltage limit	0 to 100	30	☆
P3-26	Frequency rise threshold during voltage limit	0 to 50 Hz	5Hz	★

Para. No.	Name	Setting Range	Default	Change
Group P4: Input Terminals				
P4-00	DI1 function selection	0: No function 1: Forward RUN (FWD) 2: Reverse RUN (REV) (Note: F4-11 shall be set when F4-00 is set to 1 or 2.) 3: Three-wire control 4: Forward JOG (FJOG) 5: Reverse JOG (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Coast to stop 9: Fault reset (RESET) 10: RUN pause 11: External fault normally open (NO) input 12: Multi-reference terminal 1 13: Multi-reference terminal 2 14: Multi-reference terminal 3 15: Multi-reference terminal 4 16: Terminal 1 for acceleration/deceleration time selection 17: Terminal 2 for acceleration/deceleration time selection 18: Frequency source switchover 19: UP and DOWN setting clear (terminal, keypad) 20: Running command switchover terminal 1 21: Acceleration/Deceleration prohibited 22: PID pause 23: PLC status reset 24: Swing pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control prohibited 30: Pulse input (enabled only for DI5) 31: Reserved 32: Immediate DC injection braking 33: External fault normally closed (NC) input 34: Frequency modification enabled 35: PID action direction reverse 36: External STOP terminal 1 37: Running command switchover terminal 2 38: PID integral disabled 39: Switchover between main frequency source and preset frequency 40: Switchover between auxiliary frequency source and preset frequency 41: Motor terminal selection 42: Reserved 43: PID parameter switchover 44: User-defined fault 1 45: User-defined fault 2 46: Speed control/Torque control switchover 47: Emergency stop 48: External STOP terminal 2 49: Deceleration DC injection braking 50: Clear the current running time 51: Two-wire/Three-wire mode switchover 52: Reverse frequency forbidden 53-59: Reserved	1	★
P4-01	DI2 function selection		4	★
P4-02	DI3 function selection		9	★
P4-03	DI4 function selection		12	★
P4-04	DI5 function selection		13	★
P4-05	DI6 function selection		0	★
P4-06	DI7 function selection		0	★
P4-07	DI8 function selection		0	★
P4-08	DI9 function selection		0	★
P4-09	DI10 function selection		0	★

Para. No.	Name	Setting Range	Default	Change
P4-10	DI filter time	0.000s to 1.000s	0.010s	☆
P4-11	Terminal I/O control mode	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire control mode 1 3: Three-wire control mode 2	0	★
P4-12	Terminal UP/DOWN rate	0.001 to 65.535 Hz/s	1.00 Hz/s	☆
P4-13	AI curve 1 min. input	0.00 V to P4-15	0.00V	☆
P4-14	Corresponding percentage of AI curve 1 min. input	-100.0% to +100.0%	0.0%	☆
P4-15	AI curve 1 max. input	P4-13 to +10.00 V	10.00V	☆
P4-16	Corresponding percentage of AI curve 1 max. input	-100.0% to +100.0%	100.0%	☆
P4-17	AI1 filter time	0.00s to 10.00s	0.10s	☆
P4-18	AI curve 2 min. input	0.00 V to P4-20	0.00V	☆
P4-19	Corresponding percentage of AI curve 2 min. input	-100.0% to +100.0%	0.0%	☆
P4-20	AI curve 2 max. input	P4-18 to 10.00 V	10.00V	☆
P4-21	Corresponding percentage of AI curve 2 max. input	-100.0% to +100.0%	100.0%	☆
P4-22	AI2 filter time	0.00s to 10.00s	0.10s	☆
P4-23	AI3 curve min. input	-10.00 V to P4-25	-10.00V	☆
P4-24	Corresponding percentage of AI curve 3 min. input	-100.0% to +100.0%	-100.0%	☆
P4-25	AI curve 3 max. input	P4-23 to +10.00 V	10.00V	☆
P4-26	Corresponding percentage of AI curve 3 max. input	-100.0% to +100.0%	100.0%	☆
P4-27	AI3 filter time	0.00s to 10.00s	0.10s	☆
P4-28	Pulse min. input	0.00 kHz to P4-30	0.00kHz	☆
P4-29	Corresponding percentage of pulse min. input	-100.0% to 100.0%	0.0%	☆
P4-30	Pulse max. input	P4-28 to 100.00 kHz	50.00kHz	☆
P4-31	Corresponding percentage of pulse max. input	-100.0% to 100.0%	100.0%	☆
P4-32	Pulse filter time	0.00s to 10.00s	0.10s	☆
P4-33	AI curve selection	Units position: AI1 curve selection 1: Curve 1 (2 points, see P4-13 to P4-16) 2: Curve 2 (2 points, see P4-18 to P4-21) 3: Curve 3 (2 points, see P4-23 to P4-26) 4: Curve 4 (4 points, see A6-00 to A6-07) 5: Curve 5 (4 points, see A6-08 to A6-15) Tens position: AI2 curve selection Hundreds position: AI3 curve selection	321	☆
P4-34	Setting selection when AI less than min. input	Units position: AI1 0: Corresponding percentage of min. input 1: 0.0% Tens position: AI2 Hundreds position: AI3	000	☆
P4-35	DI1 delay	0.0s to 3600.0s	0.0s	★
P4-36	DI2 delay	0.0s to 3600.0s	0.0s	★

Para. No.	Name	Setting Range	Default	Change
P4-37	DI3 delay	0.0s to 3600.0s	0.0s	★
P4-38	DI active mode selection 1	0: High level active 1: Low level active Units position: DI1 active mode Tens position: DI2 active mode Hundreds position: DI3 active mode Thousand position: DI4 active mode Ten thousands position: DI5 active mode	00000	★
P4-39	DI active mode selection 2	0: High level active 1: Low level active Units position: DI6 active mode Tens position: DI7 active mode Hundreds position: DI8 active mode Thousand position: DI9 active mode Ten thousands position: DI10 active mode	00000	★
Group P5: Output Terminals				
P5-00	FM terminal output mode	0: Pulse output (FMP) 1: Digital output (FMR)	0	☆
P5-01	FMR function selection	0: No output 1: AC Drive running 2: Fault output (coast to stop) 3: Frequency-level detection FDT1 output 4: Frequency reached 5: Zero-speed running (no output at stop) 6: Motor overload pre-warning 7: AC drive overload pre-warning 8: Set count value reached 9: Designated count value reached 10: Length reached 11: PLC cycle completed 12: Accumulative running time reached 13: Frequency limited 14: Torque limited 15: Ready for RUN 16: AI1 > AI2 17: Frequency upper limit reached 18: Frequency lower limit reached (no output at stop) 19: Undervoltage status output 20: Communication setting 21: Reserved 22: Reserved 23: Zero-speed running 2 (having output at stop) 24: Accumulative power-on time reached 25: Frequency level detection FDT2 output 26: Frequency 1 reached 27: Frequency 2 reached 28: Current 1 reached 29: Current 2 reached 30: Timing duration reached 31: AI1 input limit exceeded 32: Load lost 33: Reverse running 34: Zero current status 35: IGBT temperature reached 36: Software current limit exceeded 37: Frequency lower limit reached (having output at stop) 38: Alarm output 39: Motor overheat warning 40: Current running time reached 41: Fault output (no output at undervoltage)	0	☆
P5-02	Control board relay function selection (T/A-T/B-T/C)		2	☆
P5-03	Extension card relay (P/A-P/B-P/C) function selection		0	☆
P5-04	DO1 function selection		1	☆
P5-05	Extension card DO2 function selection		4	☆

Para. No.	Name	Setting Range	Default	Change
P5-06	FMP function selection	0: Running frequency 1: Set frequency 2: Output current 3: Output torque (absolute value, proportion to motor torque)	0	☆
P5-07	AO1 function selection	4: Output power 5: Output voltage 6: Pulse input (100.0% corresponds to 100.0 kHz) 7: AI1 8: AI2	0	☆
P5-08	AO2 function selection	9: AI3 (extension card) 10: Length 11: Count value 12: Communication setting 13: Motor rotational speed 14: Output current (100.0% corresponds to1000.0 A) 15: Output voltage (100.0% corresponds to1000.0 V) 16: Output torque (actual value, proportion to motor torque)	1	☆
P5-09	Max. FMP output frequency	0.01kHz to 100.00kHz	50.00kHz	☆
P5-10	AO1 zero offset coefficient	-100.0% to +100.0%	0.0%	☆
P5-11	AO1 gain	-10.00 to +10.00	1.00	☆
P5-12	AO2 zero offset coefficient	-100.0% to +100.0%	0.0%	☆
P5-13	AO2 gain	-10.00 to +10.00	1.00	☆
P5-17	FMR output delay	0.0s to 3600.0s	0.0s	☆
P5-18	Relay 1 output delay	0.0s to 3600.0s	0.0s	☆
P5-19	Relay 2 output delay	0.0s to 3600.0s	0.0s	☆
P5-20	DO1 output delay	0.0s to 3600.0s	0.0s	☆
P5-21	DO2 output delay	0.0s to 3600.0s	0.0s	☆
P5-22	Active mode selection of DO output terminals	0: Positive logic active 1: Negative logic active Units position: FMR active mode Tens position: Relay1 active mode Hundreds position: Relay2 active mode Thousands position: DO1 active mode Ten thousands position: DO2 active mode	00000	☆
Group P6: Start/Stop Control				
P6-00	Start mode	0: Direct start	0	☆
P6-03	Start frequency	0.00Hz to 10.00Hz	0.00Hz	☆
P6-04	Start frequency holding time	0.0s to 100.0s	0.0s	★
P6-07	Acceleration/Deceleration mode	0: Linear acceleration/deceleration 1: Static S-curve acceleration/deceleration 2: Dynamic S-curve acceleration/deceleration	0	★
P6-08	Time proportion of S-curve start segment	0.0% to (100.0% - P6-09)	30.0%	★
P6-09	Time proportion of S-curve end segment	0.0% to (100.0% - P6-08)	30.0%	★
P6-10	Stop mode	0: Decelerate to stop; 1: Coast to stop	0	☆
P6-15	Braking use ratio	0% to 100%	100%	☆
Group P7: Keypad Operation and LED Display				
P7-00	LED default display check	0 to 1	0	☆

Para. No.	Name	Setting Range	Default	Change
P7-01	MF.K key function selection	0: MF.K key disabled 1: Switchover from remote control (terminal or communication) to keypad control 2: Switchover between forward rotation and reverse rotation 3: Forward jog 4: Reverse jog	0	★
P7-02	STOP/RESET key function	0: STOP/RESET key enabled only in keypad control 1: STOP/RESET key enabled in any operation mode	1	☆
P7-03	LED display running parameters 1	0000 to FFFF Bit00: Running frequency 1 (Hz) Bit01: Frequency reference (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI state (V) Bit08: DO state Bit09: AI1 voltage (V) Bit10: AI2 voltage (V) Bit11: AI3 voltage (V) Bit12: Count value Bit13: Length value Bit14: Load speed display Bit15: PID reference	1F	☆
P7-04	LED display running parameters 2	0000 to FFFF Bit00: PID feedback Bit01: PLC stage Bit02: Pulse reference (kHz) Bit03: Running frequency 2 (Hz) Bit04: Remaining running time Bit05: AI1 voltage before correction (V) Bit06: AI2 voltage before correction (V) Bit07: AI3 voltage before correction (V) Bit08: Motor speed Bit09: Current power-on time (H) Bit10: Current running time (Min) Bit11: Pulse reference (Hz) Bit12: Communication reference Bit13: Encoder feedback speed (Hz) Bit14: Main frequency X display (Hz) Bit15: Auxiliary frequency Y display (Hz)	0	☆
P7-05	LED display stop parameters	0000 to FFFF Bit00: Frequency reference (Hz) Bit01: Bus voltage (V) Bit02: DI state Bit03: DO state Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06:AI3 voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID reference Bit12: Pulse reference (kHz)	33	☆

Para. No.	Name	Setting Range	Default	Change
P7-06	Load speed display coefficient	0.0001 to 6.5000	1.0000	☆
P7-07	Heatsink temperature of AC Drive	-20°C to 120°C	-	●
P7-08	Product number	-	-	●
P7-09	Accumulative running time	0h to 65535 h	-	●
P7-10	Performance software version	-	-	●
P7-11	Function software version	-	-	●
P7-12	Number of decimal places for load speed display	Units position: Number of decimal places for U0-14 0: No decimal place 1: One decimal places 2: Two decimal places 3: Three decimal places Tens position: Number of decimal places of U0-19/U0-29 1: One decimal places 2: Two decimal places	21	☆
P7-13	Accumulative power-on time	0 to 65535 h	-	●
P7-14	Accumulative power consumption	0 to 65535 kWh	-	●
Group P8: Auxiliary Functions				
P8-00	Jog frequency reference	0.00 Hz to max. frequency	2.00Hz	☆
P8-01	Jog acceleration time	0.0s to 6500.0s	20.0s	☆
P8-02	Jog deceleration time	0.0s to 6500.0s	20.0s	☆
P8-03	Acceleration time 2	0.0s to 6500.0s	Model dependent	☆
P8-04	Deceleration time 2	0.0s to 6500.0s	Model dependent	☆
P8-05	Acceleration time 3	0.0s to 6500.0s	Model dependent	☆
P8-06	Deceleration time 3	0.0s to 6500.0s	Model dependent	☆
P8-07	Acceleration time 4	0.0s to 6500.0s	0.0s	☆
P8-08	Deceleration time 4	0.0s to 6500.0s	0.0s	☆
P8-09	Frequency jump 1	0.00 Hz to max. frequency	0.00Hz	☆
P8-10	Frequency jump 2	0.00 Hz to max. frequency	0.00Hz	☆
P8-11	Frequency jump band	0.00 Hz to max. frequency	0.00 Hz	☆
P8-12	Forward/Reverse run switchover dead-zone time	0.0s to 3000.0s	0.0s	☆
P8-13	Reverse RUN selection	0: Disabled 1: Enabled	0	☆
P8-14	Running mode when frequency reference lower than frequency lower limit	0: Run at frequency reference lower limit 1: Stop 2: Run at zero speed	0	☆
P8-15	Droop rate	0.00% to 100.00%	0.00%	☆
P8-16	Accumulative power-on time threshold	0 h to 65000 h	0h	☆
P8-17	Accumulative running time threshold	0 h to 65000 h	0h	☆
P8-18	Startup protection selection	0: Disabled 1: Enabled	0	☆
P8-19	Frequency detection value 1	0.00 Hz to max. frequency	50.00Hz	☆

Para. No.	Name	Setting Range	Default	Change
P8-20	Frequency detection hysteresis 1	0.0% to 100.0% (FDT1 level)	5.0%	☆
P8-21	Detection width of target frequency reached	0.0% to 100.0% (maximum frequency)	0.0%	☆
P8-22	Jump frequency function	0: Disabled 1: Enabled	0	☆
P8-25	Switchover frequency of accel time 1 and accel time 2	0.00 Hz to max. frequency	0.00Hz	☆
P8-26	Switchover frequency of deceleration time 1 and deceleration time 2	0.00 Hz to max. frequency	0.00Hz	☆
P8-27	Set highest priority to terminal JOG function	0: Disabled 1: Enabled	0	☆
P8-28	Frequency detection value 2	0.00 Hz to max. frequency	50.00Hz	☆
P8-29	Frequency detection hysteresis 2	0.0% to 100.0% (FDT2 level)	5.0%	☆
P8-30	Detection of frequency 1	0.00 Hz to max. frequency	50.00Hz	☆
P8-31	Detection width of frequency 1	0.0% to 100.0% (maximum frequency)	0.0%	☆
P8-32	Detection of frequency 2	0.00 Hz to max. frequency	50.00Hz	☆
P8-33	Detection width of frequency 2	0.0% to 100.0% (maximum frequency)	0.0%	☆
P8-34	Zero current detection level	0.0% to 300.0% 100.0% corresponds to rated motor current.	5.0%	☆
P8-35	Zero current detection delay	0.01s to 600.00s	0.10s	☆
P8-36	Output overcurrent threshold	0.0% (no detection) 0.1% to 300.0% (rated motor current)	200.0%	☆
P8-37	Output overcurrent detection delay	0.00s to 600.00s	0.00s	☆
P8-38	Detection level of current 1	0.0% to 300.0% (rated motor current)	100.0%	☆
P8-39	Detection width of current 1	0.0% to 300.0% (rated motor current)	0.0%	☆
P8-40	Detection level of current 2	0.0% to 300.0% (rated motor current)	100.0%	☆
P8-41	Detection width of current 2	0.0% to 300.0% (rated motor current)	0.0%	☆
P8-42	Timing function	0: Disabled 1: Enabled	0	★
P8-43	Running time setting channel	0: Set by P8-44 1: AI1 2: AI2 3: AI3 (100% of analog input corresponds to the value of P8-44)	0	★
P8-44	Running time	0.0 Min to 6500.0 Min	0.0 Min	★
P8-45	AI1 input voltage lower limit	0.00 V to P8-46	3.10V	☆
P8-46	AI1 input voltage upper limit	P8-45 to 10.00 V	6.80V	☆
P8-47	IGBT temperature threshold	0°C to 100°C	75°C	☆
P8-48	Cooling fan working mode	0: Working during drive running 1: Working continuously	0	☆
P8-49	Wakeup frequency	Hibernating frequency (P8-51) to max. frequency (P0-10)	0.00Hz	☆

Para. No.	Name	Setting Range	Default	Change
P8-50	Wakeup delay time	0.0s to 6500.0s	0.0s	☆
P8-51	Hibernating frequency	0.00 Hz to wakeup frequency (P8-49)	0.00Hz	☆
P8-52	Hibernating delay time	0.0s to 6500.0s	0.0s	☆
P8-53	Running time threshold this time	0.0 to 6500.0 min	0.0Min	☆
P8-54	Output power correction coefficient	0.00% to 200.0%	100.0%	☆
P8-57	Current correction coefficient	95% to 100%	100%	☆
Group P9: Fault and Protection				
P9-00	Motor overload protection	0: Disabled 1: Enabled	1	☆
P9-01	Motor overload protection gain	0.20 to 10.00	1.00	☆
P9-02	Motor overload pre-warning coefficient	50% to 100%	80%	☆
P9-03	Overvoltage protection gain	0 to 100	30	☆
P9-04	Overvoltage protection voltage	650 to 800 V	770V	☆
P9-07	Detection of short-circuit to ground upon power-on	Units position:Detection of short-circuit to ground upon power on 0: Disabled 1: Enabled Tens position: Detection of short-circuit to ground before running 0: Disabled 1: Enabled	01	☆
P9-08	Braking unit applied voltage	650 to 800 V	760V	★
P9-09	Auto reset times	0 to 20	0	☆
P9-10	Selection of DO action during auto reset	0: Not act 1: Act	0	☆
P9-11	Delay of auto reset	0.1s to 100.0s	1.0s	☆
P9-12	Input phase loss/pre-charge relay protection	Units position: Input phase loss protection Tens position: Pre-charge relay protection 0: Disabled 1: Enabled	11	☆
P9-13	Output phase loss protection	Units position: Output phase loss protection 0: Disabled 1: Enabled Tens position: Output phase loss protection before running 0: Disabled 1: Enabled	01	☆

Para. No.	Name	Setting Range	Default	Change
P9-14	1st fault type	0: No fault 1: Reserved 2: Overcurrent during acceleration 3: Overcurrent during deceleration 4: Overcurrent at constant speed 5: Overvoltage during acceleration 6: Overvoltage during deceleration 7: Overvoltage at constant speed 8: Buffer resistor overload 9: Undervoltage 10: AC drive overload 11: Motor overload 12: Power input phase loss	-	●
P9-15	2nd fault type	13: Power output phase loss 14: IGBT overheat 15: External fault 16: Communication fault 17: Contactor fault 18: Current detection fault 19: Motor auto-tuning fault 20: Encoder/PG card fault 21: Parameter read and write fault 22: AC drive hardware fault 23: Motor short circuited to ground 24: Reserved 25: Reserved	-	●
P9-16	3rd (latest) fault type	26: Accumulative running time reached 27: User-defined fault 1 28: User-defined fault 2 29: Accumulative power-on time reached 30: Load lost 31: PID feedback lost during running 40: Fast current limit timeout 41: Motor switchover error during running 42: Too large speed deviation 43: Motor over-speed 45: Motor overheat 51: Initial position error 55: Slave error in master-slave control	-	●
P9-17	Frequency upon 3rd fault	-	-	●
P9-18	Current upon 3rd fault	-	-	●
P9-19	Bus voltage upon 3rd fault	-	-	●
P9-20	DI state upon 3rd fault	-	-	●
P9-21	DO state upon 3rd fault	-	-	●
P9-22	AC drive state upon 3rd fault	-	-	●
P9-23	Power-on time upon 3rd fault	-	-	●

Para. No.	Name	Setting Range	Default	Change
P9-24	Running time upon 3rd fault	-	-	●
P9-25	Counter electromotive force upon 3rd (latest) fault	-	-	●
P9-27	Frequency upon 2nd fault	-	-	●
P9-28	Current upon 2nd fault	-	-	●
P9-29	Bus voltage upon 2nd fault	-	-	●
P9-30	DI state upon 2nd fault	-	-	●
P9-31	DO state upon 2nd fault	-	-	●
P9-32	AC drive state upon 2nd fault	-	-	●
P9-33	Power-on time upon 2nd fault	-	-	●
P9-34	Running time upon 2nd fault	-	-	●
P9-35	Counter electromotive force upon 2nd fault	-	-	●
P9-37	Frequency upon 1st fault	-	-	●
P9-38	Current upon 1st fault	-	-	●
P9-39	Bus voltage upon 1st fault	-	-	●
P9-40	DI state upon 1st fault	-	-	●
P9-41	DO state upon 1st fault	-	-	●
P9-42	AC drive state upon 1st fault	-	-	●
P9-43	Power-on time upon 1st fault	-	-	●
P9-44	Running time upon 1st fault	-	-	●
P9-45	Counter electromotive force upon 1st fault	-	-	●
P9-47	Fault protection action selection 1	Units position: Motor overload (Err11) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Tens position: Input phase loss (Err12) Hundreds position: Output phase loss (Err13) Thousands position: External fault (Err15) Ten thousands position: Communication fault (Err16)	00000	☆
P9-48	Fault protection action selection 2	Units position: Encoder fault (Err20) 0: Coast to stop Tens position: EEPROM read-write fault (Err21) 0: Coast to stop 1: Stop according to the stop mode Hundreds position: AC drive overload fault selection (Err10) 0: Coast to stop 1: De-rated running 2: De-rated running (only for air compressor) Thousands position: Motor overheat (Err45) Ten thousands position: Accumulative running time reached (Err26)	00000	☆

Para. No.	Name	Setting Range	Default	Change
P9-49	Fault protection action selection 3	Units position: User-defined fault 1 (Err27) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Tens position: User-defined fault 2 (Err28) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Hundreds position: Accumulative power-on time reached (Err29) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Thousands position: Load lost (Err30) 0: Coast to stop 1: Deceleration to stop 2: Continue to run at 7% of rated motor frequency and restore to the frequency reference if the load recovers Ten thousands position: PID feedback lost during drive running (Err31) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run	00000	☆
P9-50	Fault protection action selection 4	Units position: Too large speed feedback error (Err42) 0: Coast to stop 1: Stop according to the stop mode 2: Continue to run Tens position: Motor overspeed (Err43) Hundreds position: Initial position fault (Err51)	00000	☆
P9-54	Frequency selection for continuing to run upon fault	0: Current running frequency 1: Frequency reference 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency upon abnormality	0	☆
P9-55	Backup frequency upon fault	0.0% to 100.0% (100.0% corresponds to max. frequency (P0-10))	100.0%	☆
P9-56	Type of motor temperature sensor	0: No temperature sensor 1: PT100 2: PT1000	0	☆
P9-57	Motor overheat protection threshold	0°C to 200°C	110°C	☆
P9-58	Motor overheat pre-warning threshold	0°C to 200°C	90°C	☆
P9-59	Power dip ride-through function selection	0: Disabled 1: Bus voltage constant control 2: Decelerate to stop	0	★
P9-60	Threshold of power dip ride-through function disabled	80% to 100%	85%	★
P9-61	Judging time of bus voltage recovering from power dip	0.0s to 100.0s	0.5S	★
P9-62	Threshold of power dip ride-through function enabled	60% to 100%	80%	★

Para. No.	Name	Setting Range	Default	Change
P9-63	Load lost protection	0: Disabled 1: Enabled	0	☆
P9-64	Load lost detection level	0.0% to 100.0%	10.0%	☆
P9-65	Load lost detection time	0.0 to 60.0s	1.0s	☆
P9-67	Overspeed detection level	0.0% to 50.0% (max. frequency)	20.0%	☆
P9-68	Overspeed detection time	0.01 to 0.600s	0.010s	☆
P9-69	Detection level of speed error	0.0% to 50.0% (maximum frequency)	20.0%	☆
P9-70	Detection time of speed error	0.0s: Not detected 0.1 to 60.0s	5.0s	☆
P9-71	Power dip ride-through gain Kp	0 to 100	40	☆
P9-72	Power dip ride-through integral coefficient Ki	0 to 100	30	☆
P9-73	Deceleration time of power dip ride-through	0 to 300.0s	20.0s	★
P9-74	UVW encoder fault (Err20) enabling	0.1	1	☆
P9-75	Fault protection action selection 5	Units position: Initial position angle identification fault (51) 0: Continue to run 1: Coast to stop Tens position: With-load auto-tuning fault (19) 0: Continue to run 1: Coast to stop	11	☆
Group PA: PID Function				
PA-00	PID reference setting channel	0: Set by PA-01 1: AI1 2: AI2 3: AI3 4: Pulse reference (DI5) 5: Serial comms. 6: Multi-reference	0	☆
PA-01	PID digital setting	0.0% to 100.0%	50.0%	☆
PA-02	PID feedback setting channel	0: AI1 1: AI2 2: AI3 3: AI1-AI2 4: Pulse reference (DI5) 5: Serial comms. 6: AI1 + AI2 7: Max. (|AI1|, |AI2|) 8: Min. (|AI1|, |AI2|)	0	☆
PA-03	PID operation direction	0: Forward 1: Reverse	0	☆
PA-04	PID reference and feedback range	0 to 65535	1000	☆
PA-05	Proportional gain Kp1	0.0 to 1000.0	20.0	☆
PA-06	Integral time Ti1	0.01s to 10.00s	2.00s	☆
PA-07	Differential time Td1	0.000s to 10.000s	0.000s	☆
PA-08	PID output limit in reverse direction	0.00 Hz to maximum frequency	0.00Hz	★
PA-09	PID error limit	0.0% to 100.0%	0.0%	☆
PA-10	PID differential limit	0.00% to 100.00%	0.10%	☆
PA-11	PID reference change time	0.00 to 650.00s	0.00s	☆

Para. No.	Name	Setting Range	Default	Change
PA-12	PID feedback filter time	0.00 to 60.00s	0.00s	☆
PA-13	PID output filter time	0.00 to 60.00s	0.00s	☆
PA-14	Reserved	-	-	☆
PA-15	Proportional gain Kp2	0.0 to 1000.0	20.0	☆
PA-16	Integral time Ti2	0.01s to 10.00s	2.00s	☆
PA-17	Differential time Td2	0.000s to 10.000s	0.000s	☆
PA-18	PID parameter switchover condition	0: No switchover 1: Switchover through DI 2: Auto switchover based on PID error 3: Auto switchover based on running frequency	0	☆
PA-19	PID error 1 for auto switchover	0.0% to PA-20	20.0%	☆
PA-20	PID error 2 for auto switchover	PA-19 to 100.0%	80.0%	☆
PA-21	PID initial value	0.0% to 100.0%	0.0%	☆
PA-22	PID initial value active time	0.00 to 650.00s	0.00s	☆
PA-23	Reserved	-	-	-
PA-24	Reserved	-	-	-
PA-25	PID integral property	Units position: Integral separation 0: Disabled 1: Enabled Tens position: Whether to stop integral operation when the PID output reaches the limit 0: Continue integral operation 1: Stop integral operation	00	☆
PA-26	Detection level of PID feedback loss	0.0%: No detection 0.1% to 100.0%	0.0%	☆
PA-27	Detection time of PID feedback loss	0.0s to 20.0s	0.0s	☆
PA-28	Selection of PID operation at stop	0: Disabled 1: Enabled	0	☆
Group Pb: Wobble Function, Fixed Length and Count				
PB-00	Wobble setting mode	0: Relative to central frequency 1: Relative to the max. frequency	0	☆
PB-01	Wobble amplitude	0.0% to 100.0%	0.0%	☆
PB-02	Wobble step	0.0% to 50.0%	0.0%	☆
PB-03	Wobble cycle	0.1s to 3000.0s	10.0s	☆
PB-04	Triangular wave rising time coefficient	0.1% to 100.0%	50.0%	☆
PB-05	Set length	0 to 65535 m	1000 m	☆
PB-06	Actual length	0 to 65535 m	0m	☆
PB-07	Number of pulses per meter	0.1 to 6553.5	100.0	☆
PB-08	Set count value	1 to 65535	1000	☆
PB-09	Designated count value	1 to 65535	1000	☆
Group PC: Multi-Reference and Simple PLC Function				
PC-00	Reference 0	-100.0% to 100.0%	0.0%	☆
PC-01	Reference 1	-100.0% to 100.0%	0.0%	☆
PC-02	Reference 2	-100.0% to 100.0%	0.0%	☆
PC-03	Reference 3	-100.0% to 100.0%	0.0%	☆
PC-04	Reference 4	-100.0% to 100.0%	0.0%	☆
PC-05	Reference 5	-100.0% to 100.0%	0.0%	☆
PC-06	Reference 6	-100.0% to 100.0%	0.0%	☆

Para. No.	Name	Setting Range	Default	Change
PC-07	Reference 7	-100.0% to 100.0%	0.0%	☆
PC-08	Reference 8	-100.0% to 100.0%	0.0%	☆
PC-09	Reference 9	-100.0% to 100.0%	0.0%	☆
PC-10	Reference 10	-100.0% to 100.0%	0.0%	☆
PC-11	Reference 11	-100.0% to 100.0%	0.0%	☆
PC-12	Reference 12	-100.0% to 100.0%	0.0%	☆
PC-13	Reference 13	-100.0% to 100.0%	0.0%	☆
PC-14	Reference 14	-100.0% to 100.0%	0.0%	☆
PC-15	Reference 15	-100.0% to 100.0%	0.0%	☆
PC-16	Simple PLC running mode	0: Stop after running one cycle 1: Keep final values after running one cycle 2: Repeat after running one cycle	0	☆
PC-17	Simple PLC retentive selection	Unit position: Retentive at power down 0: Not retentive 1: Retentive Tens position: Retentive at stop 0: Not retentive at stop 1: Retentive at stop	00	☆
PC-18	Running time of simple PLC reference 0	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-19	Acceleration/deceleration time of simple PLC reference 0	0 to 3	0	☆
PC-20	Running time of simple PLC reference 1	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-21	Acceleration/deceleration time of simple PLC reference 1	0 to 3	0	☆
PC-22	Running time of simple PLC reference 2	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-23	Acceleration/deceleration time of simple PLC reference 2	0 to 3	0	☆
PC-24	Running time of simple PLC reference 3	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-25	Acceleration/deceleration time of simple PLC reference 3	0 to 3	0	☆
PC-26	Running time of simple PLC reference 4	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-27	Acceleration/deceleration time of simple PLC reference 4	0 to 3	0	☆
PC-28	Running time of simple PLC reference 5	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-29	Acceleration/deceleration time of simple PLC reference 5	0 to 3	0	☆
PC-30	Running time of simple PLC reference 6	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-31	Acceleration/deceleration time of simple PLC reference 6	0 to 3	0	☆
PC-32	Running time of simple PLC reference 7	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-33	Acceleration/deceleration time of simple PLC reference 7	0 to 3	0	☆

Para. No.	Name	Setting Range	Default	Change
PC-34	Running time of simple PLC reference 8	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-35	Acceleration/deceleration time of simple PLC reference 8	0 to 3	0	☆
PC-36	Running time of simple PLC reference 9	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-37	Acceleration/deceleration time of simple PLC reference 9	0 to 3	0	☆
PC-38	Running time of simple PLC reference 10	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-39	Acceleration/deceleration time of simple PLC reference 10	0 to 3	0	☆
PC-40	Running time of simple PLC reference 11	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-41	Acceleration/deceleration time of simple PLC reference 11	0 to 3	0	☆
PC-42	Running time of simple PLC reference 12	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-43	Acceleration/deceleration time of simple PLC reference 12	0 to 3	0	☆
PC-44	Running time of simple PLC reference 13	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-45	Acceleration/deceleration time of simple PLC reference 13	0 to 3	0	☆
PC-46	Running time of simple PLC reference 14	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-47	Acceleration/deceleration time of simple PLC reference 14	0 to 3	0	☆
PC-48	Running time of simple PLC reference 15	0.0s (h) to 6553.5s (h)	0.0s (h)	☆
PC-49	Acceleration/deceleration time of simple PLC reference 15	0 to 3	0	☆
PC-50	Time unit of simple PLC running	0: s (second) 1: h (hour)	0	☆
PC-51	Reference 0 source	0: Set by PC-00 1: AI1 2: AI2 3: AI3 4: Pulse reference 5: PID 6: Set by preset frequency (P0-08), modified through terminal UP/DOWN	0	☆

Para. No.	Name	Setting Range	Default	Change
Group FD: Communication				
PD-00	Baud rate	Units position (Modbus) 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Tens position (PROFIBUS-DP) 0: 115200BPs 1: 208300BPs 2: 256000BPs 3: 512000Bps Hundreds position: Reserved Thousands position: CANlink 0: 20 1: 50 2: 100 3: 125 4: 250 5: 500 6: 1M	5005	☆
PD-01	Modbus data format symbol	0: No check <8,N,2> 1: Even parity check <8,E,1> 2: Odd parity check <8,O,1> 3: No check, data format <8,N,1> (Valid for Modbus)	0	☆
PD-02	Local address	0: Broadcast address; 1 to 247 (Valid for Modbus, PROFIBUS-DP and CANlink)	1	☆
PD-03	Modbus response delay	0 to 20 ms (Valid for Modbus)	2	☆
PD-04	Serial port communication timeout	0.0: Disabled 0.1 to 60.0s (Valid for Modbus, PROFIBUS-DP and CANopen)	0.0	☆
PD-05	Modbus protocol selection and PROFIBUS-DP data frame	Units position: Modbus 0: Non-standard Modbus protocol 1: Standard Modbus protocol Tens position: PROFIBUS-DP 0: PPO1 format 1: PP02 format 2: PPO3 format 3: PPO5 format	30	☆
PD-06	Current resolution read by communication	0: 0.01 A (≤ 55 kW) 1: 0.1A	0	☆
PD-08	Profibus and CANopen communication timeout time	0.0 (Invalid) 0.1 to 60.0s	0	☆

Para. No.	Name	Setting Range	Default	Change
Group FE: User-Defined Parameters				
PE-00	User-defined parameter 0	P0-00 to PP-xx A0-00 to Ax-xx U0-00 to U0-xx U3-00 to U3-xx	U3-17	☆
PE-01	User-defined parameter 1		U3-18	☆
PE-02	User-defined parameter 2		F0.00	☆
PE-03	User-defined parameter 3		F0.00	☆
PE-04	User-defined parameter 4		F0.00	☆
PE-05	User-defined parameter 5		F0.00	☆
PE-06	User-defined parameter 6		F0.00	☆
PE-07	User-defined parameter 7		F0.00	☆
PE-08	User-defined parameter 8		F0.00	☆
PE-09	User-defined parameter 9		F0.00	☆
PE-10	User-defined parameter 10		F0.00	☆
PE-11	User-defined parameter 11		F0.00	☆
PE-12	User-defined parameter 12		F0.00	☆
PE-13	User-defined parameter 13		F0.00	☆
PE-14	User-defined parameter 14		F0.00	☆
PE-15	User-defined parameter 15		F0.00	☆
PE-16	User-defined parameter 16		F0.00	☆
PE-17	User-defined parameter 17		F0.00	☆
PE-18	User-defined parameter 18		F0.00	☆
PE-19	User-defined parameter 19		F0.00	☆
PE-20	User-defined parameter 20		U0-68	☆
PE-21	User-defined parameter 21		U0-69	☆
PE-22	User-defined parameter 22		F0.00	☆
PE-23	User-defined parameter 23		F0.00	☆
PE-24	User-defined parameter 24		F0.00	☆
PE-25	User-defined parameter 25		F0.00	☆
PE-26	User-defined parameter 26		F0.00	☆
PE-27	User-defined parameter 27	P0-00 to PP-xx A0-00 to Ax-xx U0-00 to U0-xx U3-00 to U3-xx	F0.00	☆
PE-28	User-defined parameter 28		F0.00	☆
PE-29	User-defined parameter 29		F0.00	☆
Group PP: Function Parameter Management				
PP-00	User password	0 to 65535	0	☆
PP-01	Parameter initialization	0: No operation 01: Restore factory parameters except motor parameters 02: Clear records 04: Back up current user parameters 501: Restore user backup parameters	0	★
PP-02	Parameter display property	Unit's digit: Group U is not displayed. 0: Not displayed 1: Displayed Ten's digit: Group A is displayed. 0: Not displayed 1: Displayed	11	★
PP-03	Selection of individualized parameter display	Units position: Selection of user-defined parameter display 0: Not displayed 1: Displayed Tens position: Selection of user-modified parameter display 0: Not displayed 1: Displayed	00	☆
PP-04	Selection of parameter modification	0: Disabled 1: Enabled	0	☆

Para. No.	Name	Setting Range	Default	Change
Group A0: Torque Control and Limit				
A0-00	Speed/Torque control selection	0: Speed control 1: Torque control	0	★
A0-01	Torque reference source in torque control	0: Set by A0-03 1: AI1 2: AI2 3: AI3 4: Pulse reference 5: Communication reference 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) Full scale of 1-7 corresponds to A0-03.	0	★
A0-03	Torque digital setting in torque control	-200.0% to 200.0%	150.0%	☆
A0-05	Forward max. frequency in torque control	0.00 Hz to max. frequency	50.00Hz	☆
A0-06	Reverse max. frequency in torque control	0.00 Hz to max. frequency	50.00Hz	☆
A0-07	Acceleration time in torque control	0.00s to 65000s	0.00s	☆
A0-08	Deceleration time in torque control	0.00s to 65000s	0.00s	☆
Group A1: Virtual DI/DO				
A1-00	VDI1 function selection	0 to 59	0	★
A1-01	VDI2 function selection	0 to 59	0	★
A1-02	VDI3 function selection	0 to 59	0	★
A1-03	VDI4 function selection	0 to 59	0	★
A1-04	VDI5 function selection	0 to 59	0	★
A1-05	VDI active state setting mode	Units position: VDI1 Tens position: VDI2 Hundreds position: VDI3 Thousands position: VDI4 Ten thousands position: VDI5 0: Decided by state of VDOx 1: Decided by A1-06	00000	★
A1-06	Selection of VDI active state	0: Disabled 1: Enabled Units position: VDI1 Tens position: VDI2 Hundreds position: VDI3 Thousands position: VDI4 Ten thousands position: VDI5	00000	★
A1-07	Function selection for AI1 used as DI	0 to 59	0	★
A1-08	Function selection for AI2 used as DI	0 to 59	0	★
A1-09	Function selection for AI3 used as DI	0 to 59	0	★
A1-10	Active state selection for AI used as DI	0: High level active 1: Low level active Units position: AI1 Tens position: AI2 Hundreds position: AI3	000	★

Para. No.	Name	Setting Range	Default	Change
A1-11	VDO1 function selection	0: Short with physical DIx internally 1 to 41: See physical DO selection in group P5	0	☆
A1-12	VDO2 function selection	0: Short with physical DIx internally 1 to 41: See physical DO selection in group P5	0	☆
A1-13	VDO3 function selection	0: Short with physical DIx internally 1 to 41: See physical DO selection in group P5	0	☆
A1-14	VDO4 function selection	0: Short with physical DIx internally 1 to 41: See physical DO selection in group P5	0	☆
A1-15	VDO5 function selection	0: Short with physical DIx internally 1 to 41: See physical DO selection in group P5	0	☆
A1-16	VDO1 output delay	0.0s to 3600.0s	0.0s	☆
A1-17	VDO2 output delay	0.0s to 3600.0s	0.0s	☆
A1-18	VDO3 output delay	0.0s to 3600.0s	0.0s	☆
A1-19	VDO4 output delay	0.0s to 3600.0s	0.0s	☆
A1-20	VDO5 output delay	0.0s to 3600.0s	0.0s	☆
A1-21	VDO active mode selection	0: Positive logic active 1: Negative logic active Units position: VDO1 Tens position: VDO2 Hundreds position: VDO3 Thousands position: VDO4 Ten thousands position: VDO5	00000	☆
Group A2: Motor 2 Parameters				
A2-00	Motor type selection	2: Permanent magnet synchronous motor	2	★
A2-01	Rated motor power	0.1 to 1000.0 kW	Model dependent	★
A2-02	Rated motor voltage	1 to 2000 V	Model dependent	★
A2-03	Rated motor current	0.01 to 655.35 A (AC drive power ≤ 55 kW) 0.1 to 6553.5 A (AC drive power > 55 kW)	Model dependent	★
A2-04	Rated motor frequency	0.01 Hz to max. frequency	Model dependent	★
A2-05	Rated motor speed	1 to 65535 RPM	Model dependent	★
A2-16	Stator resistance of synchronous motor	0.001 to 65.535 Ω (AC drive power ≤ 55 kW) 0.0001 to 6.5535 Ω (AC drive power > 55 kW)	Model dependent	★
A2-17	Synchronous D-axis inductance	0.01 to 6553.5 mH (AC drive power ≤ 55 kW) 0.001 to 655.35 mH (AC drive power > 55 kW)	Model dependent	★
A2-18	Q-axis inductance of synchronous motor	0.01 to 6553.5 mH (AC drive power ≤ 55 kW) 0.001 to 655.35 mH (AC drive power > 55 kW)	Model dependent	★
A2-20	Counter electromotive force coefficient of synchronous motor	0.1V to 6553.5 V	Model dependent	★
A2-27	Encoder pulses per revolution	1 to 65535	1024	★
A2-28	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Resolver 4: Wire-saving UVW encoder	0	★
A2-29	Speed feedback channel selection	0: Local PG card 1: Extension PG card 2: Pulse input (DI5)	0	★
A2-30	A/B phase sequence of ABZ incremental encoder	0: Forward 1: Reserve	0	★

Para. No.	Name	Setting Range	Default	Change
A2-31	Encoder installation angle	0.0 to 359.9°	0.0°	★
A2-32	UVW phase sequence of UVW encoder	0: Forward 1: Reserve	0	★
A2-34	Number of pole pairs of resolver	1 to 65535	1	★
A2-36	Encoder wire-break fault detection time	0.0s: No detection 0.1s to 10.0s	0.0	★
A2-37	Auto-tuning selection	00: No operation 11: Synchronous auto-tuning with load 12: Synchronous auto-tuning with no-load	0	★
A2-38	Speed loop proportional gain 1	1 to 100	20	☆
A2-39	Speed loop integral time 1	0.01s to 10.00s	0.50s	☆
A2-40	Switchover frequency 1	0.00 to A2-43	5.00Hz	☆
A2-41	Speed loop proportional gain 2	1 to 100	20	☆
A2-42	Speed loop integral time 2	0.01s to 10.00s	1.00s	☆
A2-43	Switchover frequency 2	A2-40 to maximum frequency	10.00 Hz	☆
A2-47	Torque limit source in speed control	0: Set by A2-48 1: AI1 2: AI2 3: AI3 4: Pulse reference 5: Communication reference 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) Full scale of 1-7 corresponds to A2-48.	0	☆
A2-48	Digital setting of torque limit in speed control	0.0% to 200.0%	150.0%	☆
A2-49	Torque limit source in speed control (regenerative)	0: Set by P2-10 1: AI1 2: AI2 3: AI3 4: Pulse setting 5: Communication setting 6: Min. (AI1, AI2) 7: Max. (AI1, AI2) 8: Set by F2-12 Full scale of 1-7 corresponds to P2-12.	0	☆
A2-50	Digital setting of torque limit in speed control (regenerative)	0.0% to 200.0%	150.0%	☆
A2-51	Excitation adjustment proportional gain	0 to 20000	2000	☆
A2-52	Excitation adjustment integral gain	0 to 20000	1300	☆
A2-53	Torque adjustment proportional gain	0 to 20000	2000	☆
A2-54	Torque adjustment integral gain	0 to 20000	1300	☆
A2-56	Flux weakening mode of synchronous motor	0,1, 2, 3	1	☆
A2-57	Flux weakening gain of synchronous motor	1 to 50	5	☆

Para. No.	Name	Setting Range	Default	Change
A2-60	Regenerative power limit selection	0,1	0	☆
A2-61	Motor 2 control mode	0: SVC 1: FVC 2: V/F	0	★
A2-62	Motor 2 acceleration/ deceleration time selection	0: Same to Motor 1 1: Acceleration/Deceleration time 1 2: Acceleration/Deceleration time 2 3: Acceleration/Deceleration time 3 4: Acceleration/Deceleration time 4	0	☆
A2-66	Regenerative power limit	0% to 50%	5%	☆
A2-67	Initial position angle detection current of synchronous motor	50% to 180%	80%	☆
A2-68	Initial position angle detection of synchronous motor	0, 1, 2	0	☆
A2-70	Salient-pole rate adjustment gain of synchronous motor	50 to 500	100	☆
A2-71	MTPA control	0,1	0	☆
A2-75	Z signal correction	0,1	1	☆
A2-79	Low speed excitation current	0 to 80%	30%	☆
A2-80	Low speed frequency	0.8K to P0-15	1.5K	☆
A2-81	SVC low frequency braking mode	0,1	0	☆
A2-82	SVC low frequency braking valid frequency	0 to 10.00 Hz	2.00Hz	☆
A2-83	SVC low frequency braking change step	0.0005 to 1.0000Hz	0.0010Hz	☆
A2-84	SVC low frequency braking current	0 to 80%	50%	☆
A2-85	Synchronous motor SVC speed tracking	0 to 1	0	☆
A2-86	Zero servo enabling	0 to 1	0	☆
A2-87	Switchover frequency	0.00 to P2-02	0.30Hz	☆
A2-88	Zero servo speed loop proportional gain	1 to 100	10	☆
A2-89	Zero servo speed loop integral time	0.01s to 10.00s	0.50s	☆
A2-90	Stop anti-reversion enabling	0 to 1	0	☆
A2-91	Stop angle	0.0° to 10.0°	0.8°	☆
Group A5: Control Optimization				
A5-00	DPWM switchover frequency upper limit	5.00Hz to max. frequency	8.00Hz	☆
A5-01	PWM modulation pattern	0: Asynchronous modulation 1: Synchronous modulation	0	☆
A5-02	Dead zone compensation mode selection	0: Disabled 1: Enabled (compensation mode 1)	1	☆
A5-03	Random PWM depth	0: Random PWM invalid 1 to 10: Random PWM	0	☆
A5-04	Overcurrent fast prevention	0: Disabled 1: Enabled	0	☆

Para. No.	Name	Setting Range	Default	Change
A5-05	Voltage over modulation coefficient	100% to 120%	110%	★
A5-06	Undervoltage threshold	120.0 to 1500.0 V	350.0V	☆
A5-08	Dead-zone time adjustment	100% to 200%	150%	★
A5-09	Overvoltage threshold	200.0V to 820.0V	820.0V	★
Group A6: AI Curve Setting				
A6-00	AI curve 4 min. input	-10.00 V to A6-02	0.00V	☆
A6-01	Corresponding percentage of AI curve 4 min. input	-100.0% to +100.0%	0.0%	☆
A6-02	AI curve 4 inflexion 1 input	A6-00 to A6-04	3.00V	☆
A6-03	Corresponding percentage of AI curve 4 inflexion 1 input	-100.0% to +100.0%	30.0%	☆
A6-04	AI curve 4 inflexion 2 input	A6-02 to A6-06	6.00V	☆
A6-05	Corresponding percentage of AI curve 4 inflexion 2 input	-100.0% to +100.0%	60.0%	☆
A6-06	AI curve 4 max. input	A6-04 to +10.00 V	10.00V	☆
A6-07	Corresponding percentage of AI curve 4 max. input	-100.0% to +100.0%	100.0%	☆
A6-08	AI curve 5 min. input	-10.00 V to A6-10	-10.00V	☆
A6-09	Corresponding percentage of AI curve 5 min. input	-100.0% to +100.0%	-100.0%	☆
A6-10	AI curve 5 inflexion 1 input	A6-08 to A6-12	-3.00V	☆
A6-11	Corresponding percentage of AI curve 5 inflexion 1 input	-100.0% to +100.0%	-30.0%	☆
A6-12	AI curve 5 inflexion 2 input	A6-10 to A6-14	3.00V	☆
A6-13	Corresponding percentage of AI curve 5 inflexion 2 input	-100.0% to +100.0%	30.0%	☆
A6-14	AI curve 5 max. input	A6-12 to 10.00 V	10.00V	☆
A6-15	Corresponding percentage of AI curve 5 max. input	-100.0% to +100.0%	100.0%	☆
A6-24	Jump point of AI1 input corresponding setting	-100.0% to 100.0%	0.0%	☆
A6-25	Jump amplitude of AI1 input corresponding setting	0.0% to 100.0%	0.5%	☆
A6-26	Jump point of AI2 input corresponding setting	-100.0% to 100.0%	0.0%	☆
A6-27	Jump amplitude of AI2 input corresponding setting	0.0% to 100.0%	0.5%	☆
A6-28	Jump point of AI3 input corresponding setting	-100.0% to 100.0%	0.0%	☆

Para. No.	Name	Setting Range	Default	Change
A6-29	Jump amplitude of AI3 input corresponding setting	0.0% to 100.0%	0.5%	☆
Group A7: User Programmable Card				
A7-00	User programmable function selection	0: Disabled 1: Enabled	0	★
A7-01	Control board output terminal control mode selection	0: AC drive control 1: User programmable card control Units position: FMR (FM used as digital output) Tens position: Relay (T/A-T/B-TC) Hundreds position: DO1 Thousands position: FMP (FM used as pulse control) Ten thousands position: AO1	0	★
A7-02	Programmable card AIAO function selection	0: AI3 (voltage input), AO2 (voltage output) 1: AI3 (voltage input), AO2 (current output) 2: AI3 (current input), AO2 (voltage output) 3: AI3 (current input), AO2 (current output) 4: AI3 (PTC input), AO2 (voltage output) 5: AI3 (PTC input), AO2 (current output) 6: AI3 (PT100 input), AO2 (voltage output) 7: AI3 (PT100 input), AO2 (current output)	0	★
A7-03	PLC program controls the FMP output	0.0% to 100.0%	0.0%	☆
A7-04	Selection of PLC program controlling the AO1 output	0.0% to 100.0%	0.0%	☆
A7-05	Selection of PLC program controlling digital output	In decimal Units position: FMR Tens position: Relay 1 Hundreds position: DO	000	☆
A7-06	Setting frequency reference through the user programmable card	-100.00% to 100.00%	0.0%	☆
A7-07	Setting torque reference through the user programmable card	-200.0% to 200.0%	0.0%	☆
A7-08	Setting running command through the user programmable card	0: No command 1: Forward run 2: Reverse run 3: Forward jog 4: Reverse jog 5: Coast to stop 6: Decelerate to stop 7: Fault reset	0	☆
A7-09	Setting torque reference through the user programmable card	0: No fault 80 to 89: User-defined fault code	0	☆
Group A8: Point-point Communication				
A8-00	Point-point communication	0: Disabled 1: Enabled	0	☆
A8-01	Master or slave selection	0: Master 1: Slave	0	☆

Para. No.	Name	Setting Range	Default	Change
A8-02	Selection of action of the slave in point-point communication	Units position: whether to follow master's command Tens position: whether to send fault information to master when a fault occurs Hundreds position: whether to alarm when it becomes off- line 0: No 1: Yes (Err16)	011	★
A8-03	The slave received data	0: Torque reference 1: Frequency reference	0	☆
A8-04	Zero offset of received data (torque)	-100.00% to 100.00%	0.00%	★
A8-05	Gain of received data (torque)	-10.00 to 100.00	1.00	★
A8-06	Point-point communication interruption detection time	0.0 to 10.0s	1.0s	☆
A8-07	Master data sending cycle in point-point communication	0.001 to 10.000s	0.001s	☆
A8-11	Window width	0.20 to 10.00 Hz	0.50Hz	☆
Group A9: Optimize Parameters				
A9-00	Inductance saturation factor	30 to 200	30	☆
A9-01	Fine-tuning of the inductor protection factor is enabled	0 to 1	0	☆
A9-02	PWM switch bus voltage ripple threshold	0 to 300V	0V	☆
A9-03	Bus voltage ripple threshold	0 to 80V	0V	☆
A9-04	PWM switch bus voltage ripple threshold count	0 to 100	0	☆
A9-05	Capacitor fault detection enabled	0 to 1	0	☆

Group AC: AI/AO Correction				
AC-00	AI1 measured voltage 1	-10.00V to 10.000V	Factory-corrected	☆
AC-01	AI1 displayed voltage 1	-10.00V to 10.000V		☆
AC-02	AI1 measured voltage 2	-10.00V to 10.000V		☆
AC-03	AI1 displayed voltage 2	-10.00V to 10.000V		☆
AC-04	AI2 measured voltage 1	-10.00V to 10.000V		☆
AC-05	AI2 displayed voltage 1	-10.00V to 10.000V		☆
AC-06	AI2 measured voltage 2	-10.00V to 10.000V		☆
AC-07	AI2 displayed voltage 2	-10.00V to 10.000V		☆
AC-08	AI3 measured voltage 1	-10.00V to 10.000V		☆
AC-09	AI3 displayed voltage 1	-10.00V to 10.000V		☆
AC-10	AI3 measured voltage 2	-10.00V to 10.000V		☆
AC-11	AI3 displayed voltage 2	-10.00V to 10.000V		☆
AC-12	AO1 target voltage 1	-10.00V to 10.000V		☆
AC-13	AO1 measured voltage 1	-10.00V to 10.000V		☆
AC-14	AO1 target voltage 2	-10.00V to 10.000V		☆
AC-15	AO1 measured voltage 2	-10.00V to 10.000V		☆

Para. No.	Name	Setting Range	Default	Change
AC-16	AO2 target voltage 1	-10.00V to 10.000V	Factory-corrected	☆
AC-17	AO2 measured voltage 1	-10.00V to 10.000V	Factory-corrected	☆
AC-18	AO2 target voltage 2	-10.00V to 10.000V	Factory-corrected	☆
AC-19	AO2 measured voltage 2	-10.00V to 10.000V	Factory-corrected	☆

B.2 Monitoring Parameters

Para. No.	Name	Minimum Unit	Communication Address
Group U0: Monitoring Parameters			
U0-00	Running frequency	0.01Hz	7000H
U0-01	Frequency reference	0.01Hz	7001H
U0-02	Bus voltage	0.1V	7002H
U0-03	Output voltage	1V	7003H
U0-04	Output current	0.01 A	7004H
U0-05	Output power	0.1 kW	7005H
U0-06	Output torque	0.1%	7006H
U0-07	DI state	1	7007H
U0-08	DO state	1	7008H
U0-09	AI1 voltage	0.01V	7009H
U0-10	AI2 voltage (V)/current (mA)	0.01 V/0.01 mA	700AH
U0-11	AI3 voltage	0.01V	700BH
U0-12	Count value	1	700CH
U0-13	length value	1	700DH
U0-14	Load speed display	1	700EH
U0-15	PID reference	1	700FH
U0-16	PID feedback	1	7010H
U0-17	PLC stage	1	7011H
U0-18	Pulse reference	0.01kHz	7012H
U0-19	Feedback speed	0.01Hz	7013H
U0-20	Remaining running time	0.1 Min	7014H
U0-21	AI1 voltage before correction	0.001V	7015H
U0-22	AI2 voltage (V)/ current (mA) before correction	0.001V/0.01 mA	7016H
U0-23	AI3 voltage before correction	0.001V	7017H
U0-24	Rotation speed	1 Rpm	7018H
U0-25	Current power-on time	1 Min	7019H
U0-26	Current running time	0.1 Min	701AH
U0-27	Pulse reference	1Hz	701BH
U0-28	Communication reference	0.01%	701CH
U0-29	Encoder feedback speed	0.01Hz	701DH
U0-30	Main frequency reference	0.01Hz	701EH
U0-31	Auxiliary frequency reference	0.01Hz	701FH
U0-32	Viewing any register address value	1	7020H
U0-34	Motor temperature	1℃	7022H
U0-35	Target torque	0.1%	7023H
U0-36	Resolver position	1	7024H
U0-37	Power factor angle	0.1°	7025H
U0-38	ABZ position	1	7026H
U0-39	Target voltage upon V/F separation	1V	7027H

Para. No.	Name	Minimum Unit	Communication Address
Group U0: Monitoring Parameters			
U0-40	Output voltage upon V/F separation	1V	7028H
U0-41	DI state display	1	7029H
U0-42	DO state display	1	702AH
U0-43	DI set for function state display 1 (function 01-40)	1	702BH
U0-44	DI set for function state display 2 (function 41-80)	1	702CH
U0-45	Fault information	1	702DH
U0-58	Phase Z counting	1	703AH
U0-59	Rated frequency	0.01%	703BH
U0-60	Running frequency	0.01%	703CH
U0-61	AC drive state	1	703DH
U0-62	Current fault code	1	703EH
U0-63	Sending value of point-point communication	0.01%	703FH
U0-64	Number of slaves	1	7040H
U0-65	Torque upper limit	0.1%	7041H
U0-66	Communication extension card type	100: CANOpen 200: PROFIBUs-DP 300: CANlink	7042H
U0-67	Communication extension card version	Display Range	-
U0-68	AC drive state on DP card	Bit0: AC drive running status Bit1: Running direction Bit2: Whether the drive has a fault Bit3: Target frequency reached Bit4 to Bit7: Reserved Bit8 to Bit15: Fault code	7043H
U0-69	Speed of transmitting DP/0.01 Hz	0.00 Hz to maximum frequency	7044H
U0-70	Motor speed of transmitting DP/RMP	0 to rated motor	7045H
U0-71	Communication card current display	Display Range	-
U0-72	Communication card faulty state	Display Range	-
U0-73	Motor SN	0: Motor 1 1: Motor 2	7046H
U0-74	Counter electromotive force	0.1V	704AH
U0-75	AC drive dormant state	0	704BH
U0-76	Low bits of accumulative power consumption	0.0 to 999.9	704CH
U0-77	High bits of accumulative power consumption	0 to 65535	704DH
U0-78	Linear speed	1 m/Min	704EH

Appendix C Definition of Communication Data Address and Modbus Communication Protocol

C.1 Definition of Communication Data Address

The drive supports four communication protocols (Modbus-RTU, CANopen, CANlink, and PROFIBUS-DP2). The host controller can implement control such as monitoring and parameter viewing and modification on the AC drive through their protocols.

The drive's communication data is classified into parameter data and non-parameter data. The non-parameter data includes running commands, running status, running parameters and alarm information.

C.1.1 Parameter Data

The parameter data provides important parameters of the AC drive. In addition to function parameter group P of YD580E, provides the function parameter group A.

The parameter data is described as below:

YD580E Parameter Data	Group P (read-write)	F0, P1, P2, P3, P4, P5, P6, P7, P8, P9, PA, PB, PC, PD, PE, and PF
	Group A (read-write)	A0, A1, A2, A3, A4, A5, A6, A7, A8, A9, AA, AB, AC, AD, AE, and AF

Communication addresses of parameter data are defined as follows:

1. Read parameters by communication

For groups P0 to PF and A0 to AF, the high 16 bits of the communication address indicate the group number and the low 16 bits indicate the parameter number in the group.

Example: Communication address of P0-16 is F010H, where F0H represents group P0 and 10H is the hexadecimal data format of serial number 16 in the group.

Communication address of AC-08 is AC08H, where ACH represents group AC and 08H is the hexadecimal data format of serial number 8 in the group.

2. Write parameters by communication

For groups P0 to PF, whether the high 16 bits in communication address are 00 to 0F or F0 to FF is decided by whether the high 16 bits are written to EEPROM. The low 16 bits indicate parameter number in the group.
Example:
F0-16:
If it needs not be written to EEPROM, communication address is 0010H.
If it needs to be written to EEPROM, communication address is F010H.
For groups A0 to AF, whether the high 16 bits in communication address are 40 to 0F or A0 to AF is decided by whether the high 16 bits are written to EEPROM. The low 16 bits indicate parameter number in the group.
Example:
AC-08:
If it needs not be written to EEPROM, communication address is 4C08H.
If it needs to be written to EEPROM, communication address is AC08H.

C.1.2 Non-parameter Data

YD580E Non-parameter Data	Status data (read-only)	Group U (monitoring parameters), AC drive fault information and AC drive running status
	Control parameters (write-only)	Control commands, communication setting values, DO control, AO1 control, AO2 control, high-speed pulse (FMP) output control and parameter initialization

1. Status Data

Status data includes group U (monitoring parameters), AC drive fault description and AC drive running status.

Group U (monitoring parameters):

For details about Group U, see Appendix C of this user guide. The communication address is as follows:

The high 16 bits in communication address of U0 to UF is 70 to 7F and the low 16 bits indicate the parameter number in the group. For example, the communication address of U0-11 is 700BH.

AC drive fault description:

Communication address of the drive fault information is 8000H. You can obtain current fault codes by using host controller to read the address. For fault codes, see definition of P9-14 in Appendix C of this user guide

AC drive running status:

When the drive running status is read through communication, the communication address is 3000H. You can obtain current running status information of the AC drive by reading the address. The running status is defined in the following table.

Communication Address of AC Drive's Running Status	Status Definition
3000H	1: Forward run
	2: Reverse run
	3: Stop

2. Control Parameters

The control parameters include control command, communication setting values, DO control, AO1 control, AO2 control, high-speed pulse (FMP) output control and parameter initialization.

■ Control commands

When P0-02 (command source selection) is set to 2 (communication control), you can implement control such as start/stop of the AC drive by using communication address. The control commands are defined in the following table.

Control Command Communication Address	Status Definition
2000H	1: Forward run
	2: Reverse run
	3: Forward jog
	4: Reverse jog
	5: Coast to stop
	6: Decelerate to stop
	7: Fault reset

■ Communication reference

Communication setting values include data set through communication such as frequency reference, torque limit, V/F separation voltage, PID reference and PID feedback. Communication address is 1000H. When the communication address is set in the host controller, the data range is -10000−10000 and corresponding relative set value range is -100.00% to 100.00%.

■ DO control

When a DO terminal is set for function 20 (communication control), host controller can implement control on DO terminals of the drive through the communication address. Control on DO terminals of the drive is defined as follows:

Communication Address of Drive Running Status	Command Content
2001H	BIT0: DO1 output control BIT1: DO2 output control BIT2: Relay1 output control BIT3: Relay2 output control BIT4: FMR output control BIT5: VDO1 BIT6: VDO2 BIT7: VDO3 BIT8: VDO4 BIT9: VDO5

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

When AO1, AO2 and FMP are set to function 12 (communication control), host controller can implement control on AO and high-speed pulse outputs by means of communication addresses. The definition is provided in the following table.

Communication Address of AO1, AO2 and FMP Output		Command Content
AO1	2002H	0 to 7FFF indicates 0% to 100%.
AO2	2003H	
FMP	2004H	

■ Parameter initialization

This function is required when you need to perform parameter initialization on the drive by using the host controller.

If PP-00 (User password) is set to a non-zero value, pass password verification first. The host controller performs parameter initialization within 30s after password verification is successful.

Communication address of password verification through communication is 1F00H. Directly write correct user password to this address to perform password verification.

Communication address of parameter initialization by means of communication is 1F01H, defined in the following table.

Communication Address of Parameter Initialization	Status Definition
1F01H	1: Restore default settings
	2: Clear records
	4: Restore user backup parameters
	501: Back up current user parameters

C.2 Modbus Communication Protocol

The drive provides RS485 communication interface and supports Modbus-RTU slave communication protocol so that the user can implement centralized control, such as setting running commands and parameters, and reading running status and fault information of the AC drive, by using a PC or PLC.

This protocol defines content and format of transmitted messages during serial communication, including master polling (or broadcasting) format and master coding method (parameter for the action, transmission data, and error check). The slave uses the same structure in response, including action confirmation, data returning and error check. If an error occurs when the slave receives a message, or the slave cannot complete the action required by the master, the slave returns a fault message as a response to the master.

C.2.1 Application

The AC drive is connected to a "single-master multi-slave" PC/PLC control network with RS485 bus.

C.2.2 Bus Structure

1. Interface mode

The RS485 extension card YD58TX1 must be inserted into the AC drive.

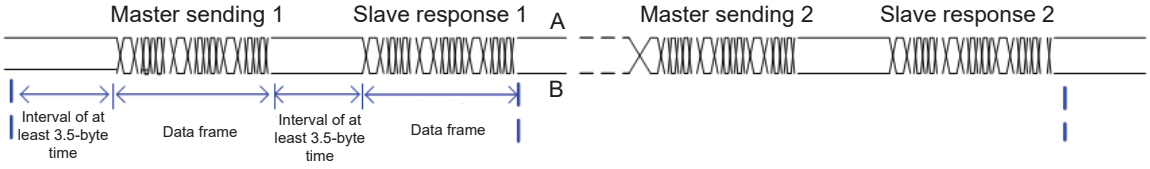
2. Topological structure

The system consists of a single master and multiple slaves. In the network, each communication device has a unique slave address. A device is the master (can be a PC, a PLC or an HMI) and initiates communication to perform parameter read or write operations on slaves. The other devices (slaves) provide data to respond to query or operations from the master. At the same moment, either the master or the slave transmits data and the other can only receives data.

The address range of the slaves is 1 to 247, and 0 is broadcast address. A slave address must be unique in the network.

3. Transmission mode

The asynchronous serial and half-duplex transmission mode is used. During asynchronous serial communication, data is sent frame by frame in the form of message. In Modbus-RTU protocol, an interval of at least 3.5-byte time marks the end of the previous message. A new message starts to be sent after this interval.

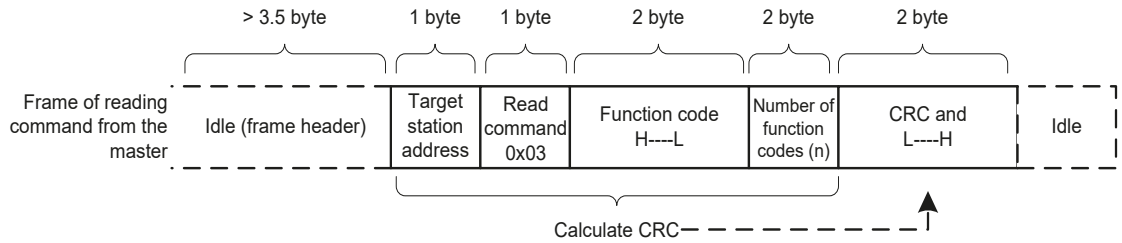


The communication protocol used by the drive is the Modbus-RTU slave communication protocol, which allows the drive to provide data to respond to "query/command" from the master or execute the action according to "query/command" from the master.

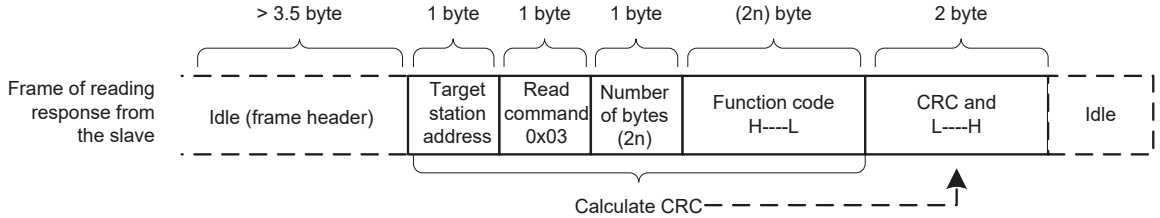
The master can be a PC, an industrial device, or a PLC. The master can communicate with a single slave or send broadcast messages to all slaves. When the master communicates with a single slave, the slave needs to return a message (response) to "query/command" from the master. For a broadcast message sent by the master, the slaves need not return a response.

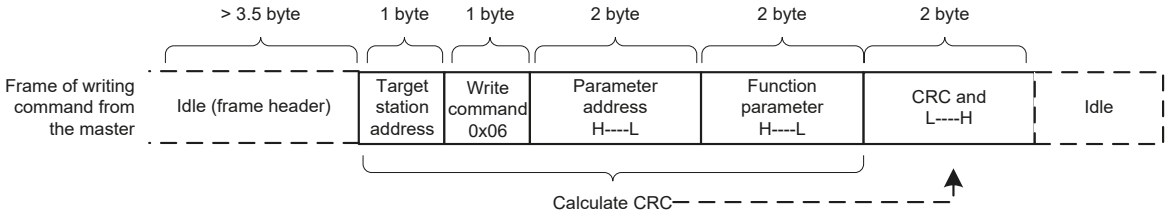
C.3 Data Format

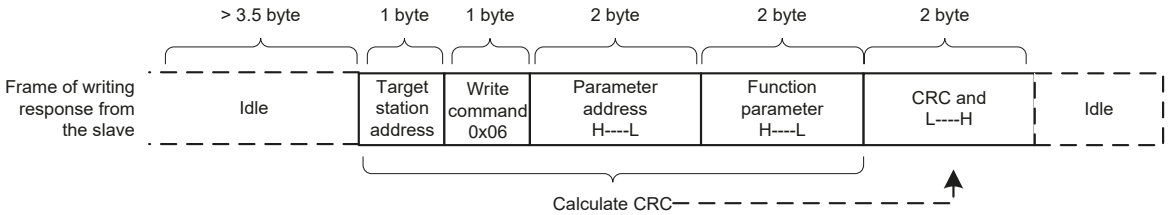
The Modbus-RTU protocol communication data format of the drive is as follows. The drive supports reading and writing of word-type parameters only. Reading command is 0x03 and writing command is 0x06. It does not support reading and writing of bytes or bits.



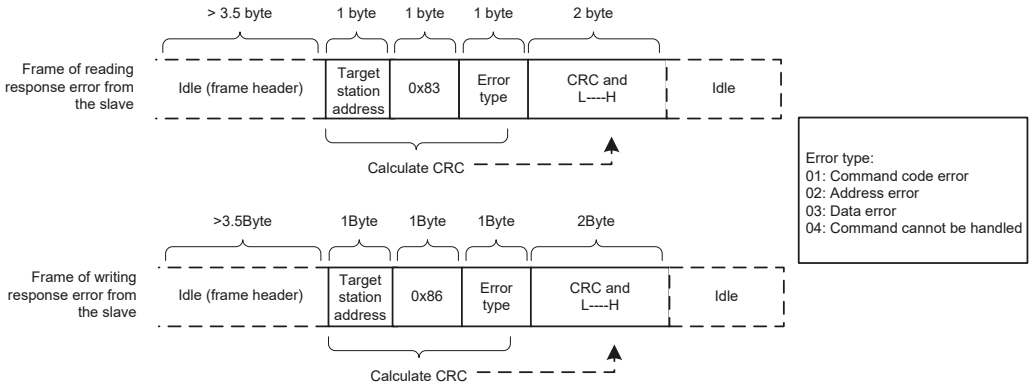
In theory, the host controller can read several consecutive parameters (n can reach up to 12) but the last parameter it reads must not jump to the next parameter group. Otherwise, an error occurs on response.







If the slave detects reading/writing failure caused by a communication frame error or by other reasons, an error frame will be returned.



The frame format is described in the following table.

Frame header (START)	Greater than the 3.5-byte transmission idle time
Slave address (ADR)	Communication address: 1 to 247 0: Broadcast address
Command code (CMD)	03: Read slave parameters; 06: Write slave parameters
Parameter address (H)	It is the internal parameter address of the AC drive, expressed in hexadecimal format. The parameters include functional parameters and non-functional parameters (running status and running command). During transmission, low-order bytes follow the high-order bytes.
Parameter address (L)	
Number of parameters (H)	It is the number of parameters read by this frame. If it is 1, it indicates that one parameter is read. During transmission, low-order bytes follow the high-order bytes. In the present protocol, only one parameter is read once, and this field is unavailable.
Number of parameters (L)	
Data (H)	It is the response data or data to be written. During transmission, low-order bytes follow the high-order bytes.
Data (L)	
CRC CHK low bytes	Detection value: CRC16 verification value During transmission, low-order bytes follow the high-order bytes. For calculation method, see CRC Check.
CRC CHK high bytes	
END	It is 3.5-byte transmission time.

CRC Check

In Modbus-RTU mode, a message includes a CRC-based error-check field. The CRC field checks content of the entire message. The CRC field is two bytes, containing a 16-bit binary value. The CRC field is calculated by the transmitting device, and then added to message. The receiving device recalculates a CRC value after receiving the message, and compares the calculated value with the CRC value in the received CRC field. The CRC is first stored to 0xFFFF. Then a procedure is invoked to process the successive 8-bit byte in the message and the value in the register. Only the eight bits in each character are used for the CRC. The start bit, stop bit and the parity bit do not apply to the CRC.During generation of the CRC, each eight-bit character is in exclusive-OR (XOR) with the content in the register. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB was a 1, the register then performs XOR with a preset value. If the LSB was a 0, no XOR is performed. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is in XOR with the register's current value, and the process repeats for eight more shifts as described above. The final value of the register, after all the bytes of the message have been applied, is the CRC value. The CRC is added to the message from the low-order byte followed by the high-order byte. The CRC simple function is as follows:

```
unsigned int crc_chk_value(unsigned char *data_value,unsigned char length)
{
                    unsigned int crc_value=0xFFFF;
                    int i;
                    while（length--)
        {
                            crc_value^=*data_value++;
                            for（i=0;i<8;i++)
          {
                                    If(crc_value&0x0001)

              {
                                            crc_value=(crc_value>>1)^0xa001;
                                     }
                                    else
                                     {
                                            crc_value=crc_value>>1;
                                     }
                            }
                    }
                    return(crc_value);
}
```

Definition of Communication Parameter Addresses

Function parameters can be read and written (except those which cannot be changed because they are only for the factory use or for monitoring).

C.4 Rules for Parameter Address Marking

Parameter group No. and parameter identifying No. are used to express parameter address.

High-order bytes: P0 to FF (groups F), A0 to AF (groups A), 70 to 7F (group U)

Low-order bytes: 00 to FF

For example, to read parameter P3-12, communication address of P3-12 is expressed as 0xF30C.

Note	• Group PF: They are factory parameters. The parameters cannot be read or changed. • Group U: These parameters can only be read.

Some parameters cannot be modified when the AC drive is running. Some parameter cannot be modified regardless of status of the AC drive. In addition, pay attention to setting range, unit and description of parameters when modifying them.

Parameter Group	Visited Address	Parameter Address in RAM
P0 to PE	0xF000 to 0xFEFF	0x0000 to 0x0EFF
A0 to AC	0xA000 to 0xACFF	0x4000 to 0x4CFF
U0	0x7000 to 0x70FF	

Note	• Frequent storage to the EEPROM reduces its service life. Therefore, in communication mode, users can change values of certain parameters in RAM rather than storing the setting.

For groups P parameters, users only need to change high order F of the parameter address to 0.

For groups A parameters, users only need to change high order A of the parameter address to 4.

The parameter addresses are expressed as follows:

High-order bytes: 00 to 0F (groups P), 40 to 4F (groups A)

Low-order bytes: 00 to FF

For example,

if P3-12 is not stored into EEPROM, the address is expressed as 030C;

if A0-05 is not stored into EEPROM, the address is expressed as 4005;

This address can only be marked as RAM. It is an invalid address when being read.

Stop/RUN Parameters

Parameter Address	Description	Parameter Address	Description
1000H	Communication setting value (Decimal): -10000 to 10000	1010H	PID reference
1001H	Running frequency	1011H	PID feedback
1002H	Bus voltage	1012H	PLC process
1003H	Output voltage	1013H	Pulse input frequency, unit: 0.01 kHz
1004H	Output current	1014H	Feedback speed, unit 0.1Hz
1005H	Output power	1015H	Remaining running time
1006H	Output torque	1016H	AI1 voltage before correction
1007H	Running speed	1017H	AI2 voltage before correction
1008H	DI input indication	1018H	AI3 voltage before correction
1009H	DO output indication	1019H	Linear speed
100AH	AI1 voltage	101AH	Current power-on time
100BH	AI2 voltage	101BH	Current running time
100CH	AI3 voltage	101CH	Pulse input frequency, unit: 1Hz
100DH	Counting value input	101DH	Communication reference
100EH	Length value input	101EH	Actual feedback speed
100FH	Load speed	101FH	Main frequency X display
–	–	1020H	Auxiliary frequency Y display

Note

- Communication setting value indicates percentage: 10000 corresponds to 100.00%, and -10000 corresponds to -100.00%.
- With regard to frequency, communication reference is a percentage of P0-10 (maximum frequency). With regard to torque, communication reference is a percentage of P2-10 and A2-48 (corresponding to motor 1 and motor 2, respectively).

Control command input to AC drive (write-only):

Command Word Address	Status Definition
2000H	0001: Forward run
	0002: Reverse run
	0003: Forward jog
	0004: Reverse jog
	0005: Coast to stop
	0006: Decelerate to stop
	0007: Fault reset

Read AC drive state (read-only):

Command Word Address	Command Word Function
3000H	0001: Forward run
	0002: Reverse run
	0003: Stop

Parameter lock password check: If the actual password is returned, it indicates that password check is passed. ("0000H" is returned when password is set to 0 (no password)).

Password Address	Password Content
1F00H	*****

DO terminal control (write-only)

Command Address	Command Content
2001H	BIT0: DO1 output control BIT1: DO2 output control BIT2: Relay1 output control BIT3: Relay2 output control BIT4: FMR output control BIT5: VDO1 BIT6: VDO2 BIT7: VDO3 BIT8: VDO4 BIT9: VDO5

AO1 control (write-only)

Command Address	Command Content
2002H	0 to 7FFF indicates 0% to 100%.

AO2 control (write-only)

Command Address	Command Content
2003H	0 to 7FFF indicates 0% to 100%.

Pulse output control (write-only)

Command Address	Command Content
2004H	0 to 7FFF indicates 0% to 100%.

AC drive fault description:

AC Drive Fault Address	AC Drive Fault Information	
8000H	0000: No fault 0001: Reserved 0002: Overcurrent during acceleration 0003: Overcurrent during deceleration 0004: Overcurrent at constant speed 0005: Overvoltage during acceleration 0006: Overvoltage during deceleration 0007: Overvoltage at constant speed 0008: Buffer resistor overload 0009: Undervoltage 000A: AC drive overload 000B: Motor overload 000C: Power input phase loss 000D: Power output phase loss 000E: IGBT overheat 000F: External fault 0010: Communication fault 0011: Contactor fault 0012: Current detection fault 0013: Motor auto-tuning fault 0014: Encoder/PG card fault	0015: Parameter read and write fault 0016: AC drive hardware fault 0017: Motor short circuited to ground 0018: Reserved 0019: Reserved 001A: Accumulative running time reached 001B: User-defined fault 1 001C: User-defined fault 2 001D: Accumulative power-on time reached 001E: Load lost 001F: PID feedback lost during running 0028: Fast current limit timeout 0029: Motor switchover error during running 002A: Too large speed deviation 002B: Motor over-speed 002D: Motor overheat 005A: Incorrect setting of PPR of the encoder 005B: Not connecting the encoder 005C: Initial position error 005E: Speed feedback error

C.5 Group PD Communication Parameter Description

Pd-00	Baud rate	Default	5005
	Setting Range	Units position (Modubs)	
		0: 300 bps	5: 9600 bps
		1: 600 bps	6: 19200 bps
		2: 1200bps	7: 38400 bps
		3: 2400 bps	8: 57600 bps
		4: 4800 bps	9: 115200 bps

This parameter is used to set transmission speed between host controller and AC drive. Note that baud rate of host controller must be the same as that of AC drive. Otherwise, communication shall fail. The higher baud rate is, the faster communication will be.

Pd-01	Data format	Default	0
	Setting Range	0: No check <8,N,2>	
		1: Even parity check <8,E,1>	
		2: Odd parity check <8,O,1>	
		3: No check, data format <8,N,1>	

Note that data format of host controller must be the same as that of AC drive. Otherwise, communication shall fail.

Pd-02	Local address	Default	1
	Setting Range	1 to 247 0: Broadcast address	

When local address is set to 0 (that is, broadcast address), host controller broadcast is enabled.

This address is unique (except broadcast address), which is basis for point-to-point communication between host controller and AC drive.

Pd-03	Response delay	Default	2 ms
	Setting Range	0 to 20 ms	

This parameter sets interval between AC drive completing receiving data and AC drive sending data to host controller. If response delay is shorter than system processing time, system processing time shall prevail. If response delay is longer than system processing time, system sends data to host controller only after response delay is up.

Pd-04	Communication timeout	Default	0.0s
	Setting Range	0.0s (invalid) 0.1s to 60.0s	

When this parameter is set to 0.0s, system does not detect communication timeout.

When AC drive does not receive communication signal within time set in this parameter, it detects communication timeout fault (Err16). Generally, this parameter is set to 0.0s. In applications with continuous communication, you can use this parameter to monitor communication status.

Pd-05	Communication Protocol Selection	Default	0
	Setting Range	0: Non-standard Modbus protocol 1: Standard Modbus protocol	

When Pd-05 = 1, standard Modbus protocol is used. For details, see C.3

When Pd-05 = 0, an additional byte is returned by the slave computer during read. For other read or write operations, the number of bytes returned is the same in both standard and non-standard protocols.

Pd-06	Current resolution read by communication	Default	0
	Setting Range	0: 0.01A 1: 0.1A	

This parameter is used to set unit of output current read by communication.

Innovation Harmony Honesty Progmatic

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Yolico

YD580E系列

多功能矢量变频器手册

220V级 三相 0.4~220kW

380V级 三相 0.75~630kW

Ver 1.0

前 言

YD580E系列变频器是一款通用高性能电流矢量变频器，主要用于控制和调节三相交流同步电机的速度和转矩，是YD580E系列的技术升级产品。YD580E采用高性能的矢量控制技术，低速高转矩输出，具有良好的动态特性、超强的过载能力，具备用户可编程功能及后台软件监控、通讯总线功能，支持多种编码器类型，组合功能丰富强大，性能稳定。可用于纺织、造纸、拉丝、机床、包装、食品、风机、水泵及各种自动化生产设备的驱动。

产品外观图

初次使用

对于初次使用本产品的用户，应先认真阅读本手册。若对一些功能及性能方面有所疑惑，请咨询我公司的技术支持人员，以获得帮助，对正确使用本产品有利。

符合标准

相关认证指令与标准如下表所示，是否获得相关认证资质以产品铭牌标识为准。

认证名称	指令名称		标准
CE 认证	EMC 指令	2014/30/EU	EN 61800-3
	LVD 指令	2014/35/EU	EN 61800-5-1
	RoHS 指令	2011/65/EU	EN 50581

- 在正确安装和正确使用的条件下，满足 IEC/EN 61800-3 标准要求，或GB/T 12668.1 2002 详细请参照外围设备连接及常见 EMC 问题整改部分。

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安全注意事项

安全声明

- 在安装、操作、维护产品时，请先阅读并遵守本安全注意事项。
- 为保障人身和设备安全，在安装、操作和维护产品时，请遵循产品上标识及手册中说明的所有安全注意事项。
- 手册中的“注意”、“警告”和“危险”事项，并不代表所应遵守的所有安全事项，只作为所有安全注意事项的补充。
- 本产品应在符合设计规格要求的环境下使用，否则可能造成故障，因未遵守相关规定引发的功能异常或部件损坏等不在产品质量保证范围之内、
- 因违规操作产品引发的人身安全事故、财产损失等，我司将不承担任何法律责任。

安全等级定义

危 险	“危险”表示如果不按规定操作，则导致死亡或严重身体伤害。
警 告	“警告”表示如果不按规定操作，则可能导致死亡或严重身体伤害。
注 意	“注意”如果不按规定操作，则可能导致轻微身体伤害或设备损坏。

安全注意事项

开箱验收

注 意

- 开箱前请检查产品的外包装是否完好，有无破损、浸湿、受潮、变形等情况。
- 请按照层次顺序打开包装，严禁猛烈敲打！
- 开箱时请检查产品和产品附件表面有无残损、锈蚀、碰伤等情况。
- 开箱后请仔细对照装箱单，查验产品及产品附件数量、资料是否齐全

警 告

- 开箱时发现产品及产品附件有损伤、锈蚀、使用过的迹象等问题，请勿安装！
- 开箱时发现产品内部进水、部件缺少或有部件损坏时，请勿安装！
- 请仔细对照装箱单，发现装箱单与产品名称不符时，请勿安装！

储存与运输时

注 意

- 请按照产品的储存与运输条件进行储存与运输，储存温度、湿度满足要求。
- 避免在水溅雨淋、阳光直射、强电场、强磁场、强烈振动等场所储存与运输。
- 避免产品储存时间超过 3 个月，储存时间过长时，请进行更严密的防护和必要的检验。
- 请将产品进行严格包装后再进行车辆运输，长途运输时必须使用封闭的箱体。
- 严禁将本产品与可能对本产品构成影响或损害的设备或物品一起混装运输。

警 告

- 请务必使用专业的装卸载设备搬运大型或重型设备与产品！
- 徒手搬运产品时，请务必抓牢产品壳体，避免产品部件掉落，否则有导致受伤的危险！
- 搬运产品时请务必轻抬轻放，随时注意脚下物体，防止绊倒或坠落，否则有导致受伤或产品损坏的危险！
- 设备被起重工具吊起时，设备下方禁止人员站立或停留。

安装时

警 告

- 安装前请务必仔细阅读产品使用说明书和安全注意事项！
- 严禁改装本产品！
- 严禁拧动产品零部件及元器件的固定螺栓和红色标记的螺栓！
- 请勿在强电场或强电磁波干扰的场所安装本产品！
- 本产品安装在柜体或终端设备中时，柜体或终端设备需要提供相应的防火外壳、电气防护外壳和机械防护外壳等防护装置，防护等级应符合相关 IEC 标准和当地法律法规要求。

危 险

- 严禁非专业人员进行产品安装、接线、保养维护、检查或部件更换！
- 本产品的安装、接线、维护、检查或部件更换等，只有受到过电气设备相关培训，具有充分电气知识的专业人员才能进行。
- 安装人员必须熟悉产品安装要求和相关技术资料。
- 在需要安装变压器等强电磁波干扰的设备时，请安装屏蔽保护装置，避免本产品出现误动作！

接线时

危 险

- 严禁非专业人员进行设备安装、接线、保养维护、检查或部件更换！
- 请勿在电源接通的状态下进行接线作业，否则会有触电的危险。
- 接线前，请切断所有设备的电源。切断电源后设备内部电容有残余电压，请至少等待 10 分钟再进行接线等操作。
- 请务必保证设备和产品的良好接地，否则会有电击危险。
- 请遵守静电防止措施（ESD）规定的步骤，并佩戴静电手环进行接线等操作，避免损坏设备或产品内部的电路。

警 告

- 严禁将输入电源连接到设备或产品的输出端，否则会引起设备损坏，甚至引发火灾。
- 驱动设备与电机连接时，请务必保证驱动器与电机端子相序准确一致，避免造成电机反向旋转。
- 接线时使用到的线缆必须符合相应的线径和屏蔽等要求，使用屏蔽线缆的屏蔽层需要单端可靠接地！
- 接线完成后，请确保设备和产品内部没有掉落的螺钉或裸露线缆。

上电时

危 险

- 上电前，请确认设备和产品安装完好，接线牢固，电机装置允许重新起动。
- 上电前，请确认电源符合设备要求，避免造成设备损坏或引发火灾！
- 上电时，设备或产品的机械装置可能会突然动作，请注意远离机械装置。
- 上电后，请勿打开对设备柜门或产品防护盖板，否则有触电危险！
- 严禁在通电状态下触摸设备的任何接线端子，否则有触电危险！
- 严禁在通电状态下拆卸设备和产品的任何装置或零部件，否则有触电危险！

运行时

危 险

- 严禁在运行状态下触摸设备的任何接线端子，否则有触电危险！
- 严禁在运行状态下拆卸设备和产品的任何装置或零部件，否则有触电危险！
- 严禁触摸设备外壳、风扇或电阻等以试探温度，否则可能引起灼伤！
- 严禁非专业技术人员在运行中检测信号，否则可能引起人身伤害或设备损坏！

警 告

- 运行中，避免其他物品或金属物体等掉入设备中，否则引起设备损坏！
- 请勿使用接触器通断的方法来控制设备启停，否则引起设备损坏！

保养时

危 险

- 严禁非专业人员进行设备安装、接线、保养维护、检查或部件更换！
- 严禁在通电状态下进行设备保养，否则有触电危险！
- 切断所有设备的电源后，请至少等待 10 分钟再进行设备保养等操作。

警 告

- 请按照设备维护和保养要求对设备和产品进行日常和定期检查与保养，并做好保养记录。

维修时

危 险

- 严禁非专业人员进行设备安装、接线、保养维护、检查或部件更换！
- 严禁在通电状态下进行设备维修，否则有触电危险！
- 切断所有设备的电源后，请至少等待 10 分钟再进行设备检查、维修等操作。

警 告

- 请按照产品保修协议进行设备报修。
- 设备出现故障或损坏时，由专业人员按照维修指导对设备和产品进行故障排除和维修，并做好维修记录。
- 请按照产品易损件更换指导进行更换。
- 请勿继续使用已经损坏的机器，否则会造成更大程度的损坏。
- 更换设备后，请务必重新进行设备接线检查与参数设置。

报废时

警 告

- 请按照国家有关规定与标准进行设备、产品的报废，以免造成财产损失或人员伤亡！
- 报废的设备与产品请按照工业废弃物处理标准进行处理回收，避免污染环境。

安全标识

为了保证设备安全操作和维护，请务必遵守粘贴在设备和产品上的安全标识，请勿损坏、损伤或剥下安全标识。安全标识说明如下：

安全标识	内容说明
	◆ 安装、运行前请务必阅读使用说明书，否则会有电击危险！ ◆ 在通电状态下和切断电源 10 分钟以内，请勿拆下盖板！ ◆ 进行维护、检查及接线时，请在切断输入侧和输出侧电源后，等待 10 分钟，待电源指示灯彻底熄灭后开始作业。

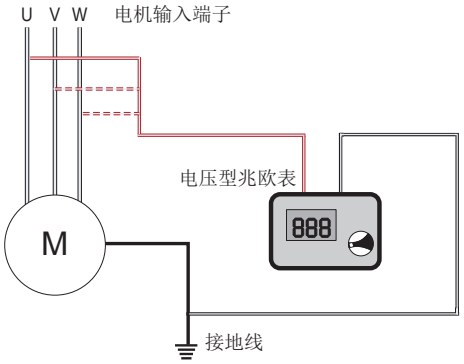
注意事项

1） 漏电保护器 RCD 要求

设备在运行中会产生大漏电流流过保护接地导体，请在电源的一次侧安装 B 型漏电保护器（RCD）。在选择漏电保护器（RCD）时应考虑设备启动和运行时可能出现的瞬态和稳态对地漏电流，选择具有抑制高次谐波措施的专用 RCD，或者 300mA 的通用 RCD（$I_{\Delta n}$ 为保护导体电流的 2 ～ 4 倍）。

2） 电机绝缘检查

电机在首次使用、长时间放置后的再使用之前及定期检查时，应做电机绝缘检查，防止因电机绕组的绝缘失效而损坏变频器。绝缘检查时一定要将电机连线从变频器分开，建议采用 500V 电压型兆欧表，应保证测得绝缘电阻不小于 5MΩ。



3） 电机的热保护

若选用电机与变频器额定容量不匹配时，特别是变频器额定功率大于电机额定功率时，务必调整变频器内电机保护相关参数值或在电机前加装热继电器以对电机保护。

4） 工频以上运行

本变频器提供 0Hz~500Hz 的输出频率。若客户需在 50Hz 以上运行时，请考虑机械装置的承受力。

5） 机械装置的振动

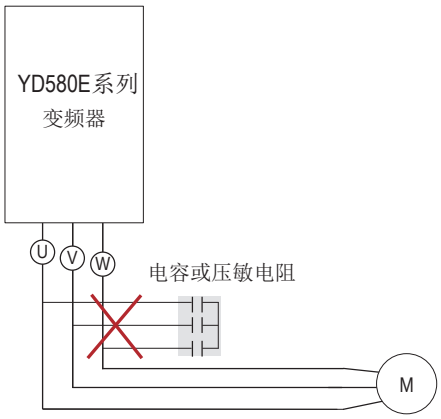
变频器在一些输出频率处，可能会遇到负载装置的机械共振点，可通过设置变频器内跳跃频率参数来避开。

6） 关于电动机发热及噪声

因变频器输出电压是 PWM 波，含有一定的谐波，因此电机的温升、噪声和振动同工频运行相比会略有增加。

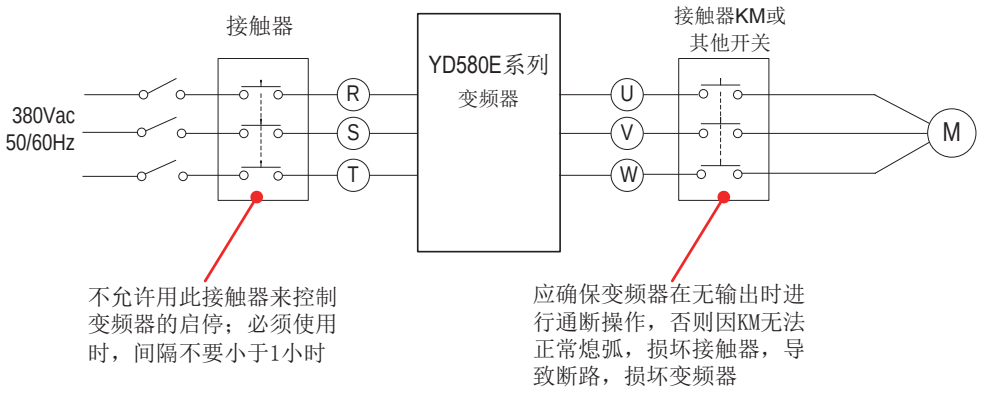
7） 输出侧有压敏器件或改善功率因数的电容的情况

变频器输出 PWM 波，请勿在输出侧安装有改善功率因数的电容或防雷用压敏电阻等，易引发变频器瞬间过电流甚至损坏变频器。



8） 变频器输入、输出端所用接触器等开关器件

若在电源和变频器输入端之间加装接触器，则不允许用此接触器来控制变频器的启停。一定需要用该接触器控制变频器启停时，间隔不要小于 1 小时。频繁的充放电易降低变频器内电容器的使用寿命。若输出端和电机之间装有接触器等开关器件，应确保变频器在无输出时进行通断操作，否则易造成变频器内模块损坏。



9） 额定电压值以外的使用

不适合在手册所规定的允许工作电压范围之外使用变频器，易造成变频器内器件损坏。如果需要，请使用相应的升压或降压装置对电源进行变压处理后输入到变频器。

10） 三相输入改成两相输入

不可将 YD580E 系列中三相变频器改为两相使用。否则将导致故障或变频器损坏。

11） 浪涌抑制器

变频器内部装有压敏电阻，可以抑制变频器周围的感性负载开、关时产生的浪涌电压。当周围的感性负载产生的浪涌电压能量较大时，请务必在感性负载上使用浪涌抑制器或同时使用二极管。

NOTE

- 请勿将浪涌抑制器连接到变频器的输出侧。

12） 海拔高度与降额使用

在海拔高度超过 1000m 的地区，由于空气稀薄造成变频器的散热效果变差，有必要降额使用（高度每升高 100m，降额 1%，最高使用海拔 3000m；超过 40℃时，需按温度每升高 1℃降额 1.5% 使用，最高使用温度 50℃）。此情况请向我公司进行技术咨询。

13） 一些特殊用法

如果客户在使用时需用到本手册所提供的建议接线图以外的方法时，如共直流母线等，请向我公司咨询。

14） 变频器的报废时注意

主回路的电解电容和印制板上电解电容焚烧时可能发生爆炸。塑胶件焚烧时会产生有毒气体。请作为工业垃圾进行处理。

15） 关于适配电机

- 标准适配电机为四极鼠笼式异步感应电机。若非上述电机，请一定按电机额定电流选配变频器；
- 非变频电机的冷却风扇与转子轴是同轴连接，转速降低时风扇冷却效果降低，因此，电机出现过热的场合应加装强排气扇或更换为变频电机；
- 变频器已经内置适配电机标准参数，根据实际情况有必要进行电机参数辨识或修改缺省值以尽量符合实际值，否则会影响运行效果及保护性能；
- 变极电机的额定电流与标准电机不同，请确认电机的最大电流，选择相应的变频器。请务必在电机停止后进行极数切换。
- 由于电缆或电机内部出现短路会造成变频器报警，甚至炸机。因此，请首先对初始安装的电机及电缆进行绝缘短路测试，日常维护中也需经常进行此测试。注意，做这种测试时务必将变频器与被测试部分全部断开。
- 电机的速度控制范围因润滑方式和生产厂家而异。
- 在速度控制范围以外运行电机时，请向电机生产厂家咨询。

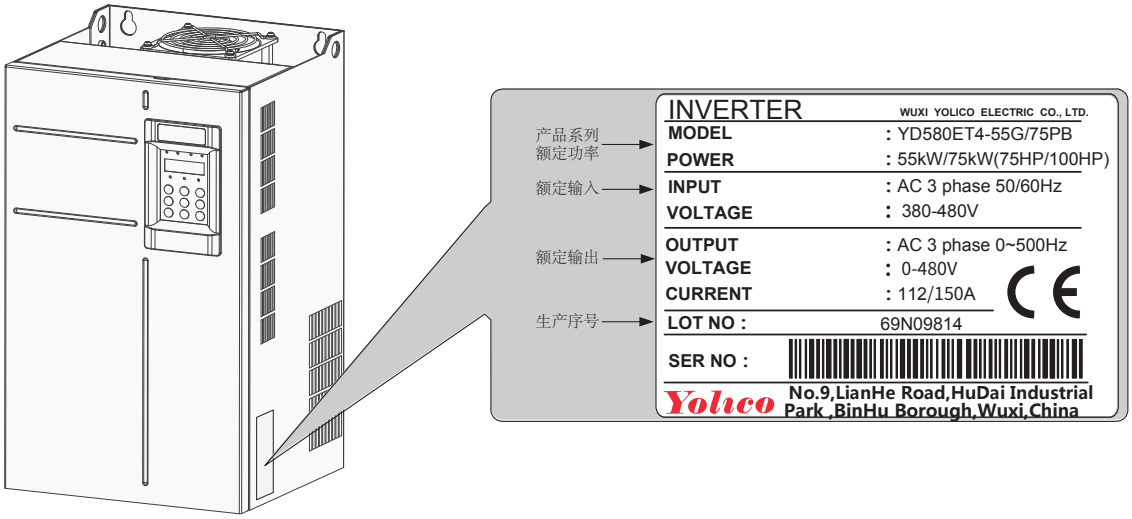
第一章　产品信息

安全注意事项

注意

- 请勿抓住前盖板或端子外罩搬运变频器。如果仅抓住前盖板，则会使主体掉落，有砸伤的危险；
- 操作变频器时，请遵守静电防止措施（ESD）规定的步骤。否则会因静电而损坏变频器内部的回路。

1.1 铭牌及型号



YD580E T4- 18P5G / 22P B

标识	产品名称
YD580E	变频器同步系列

标识	电压等级
T4-	三相380-480V

标识	G型功率等级
0P7	0.75kW
1P5	1.5kW
...	...
450	450kW

标识	负载类型
G	150%*60秒 通用

标识	尾缀说明
空	无
-L	含输出交流电抗器
-T	含直流电抗器
-A	含辅助配电柜

标识	制动单元
空	无
B	含制动单元

标识	负载类型
P	120%*60秒 风机泵

标识	P型功率等级
1P5	1.5kW
2P2	2.2kW
...	...
500	500kW

图 1-1 产品命名与铭牌标识

第二章　系统连接

安全注意事项

危险

- 严禁在电源接通的状态下进行接线，否则会有触电的危险！
- 请务必将断路器保持在 OFF 状态。

警告

- 将变频器安装在封闭的柜内或机壳箱内时，请用冷却风扇或冷却空调等充分冷却，以使变频器进气温度保持在 50℃ 以下，否则可能导致过热或火灾！

注意

- 进行安装作业时，请用布或纸等遮住变频器的上部，以防止钻孔时的金属屑、油、水等进入变频器内部。如果异物进入变频器内部，可能导致变频器故障；作业结束后，请拿掉这些布或纸，如果继续盖在上面，则会使通风效果变差，导致变频器异常发热！
- 在使用变频器时，请遵守静电防止措施（ESD）规定的步骤，否则会因静电而损坏变频器！
- 用变频器驱动时和用商用电源驱动时的转矩特性不同，请确认要连接的机械的负载转矩特性。
- 请勿在拆下外壳的状态下吊起变频器，否则可能导致变频器的电路板或端子排损坏！

2.1 YD580E 系统连接图

使用YD580E系列变频器控制异步电机构成控制系统时，需要在变频器的输入输出侧安装各类电气元件保证系统的安全稳定。三相 380V~480V 0.75kW 及以上功率的产品系统构成如下图所示：

图 2-1 YD580E 系列系统构成

NOTE

- 上图仅作为 YD580E 变频系统连接示意图，外围设备选型参见第 9 章《规格与选型》。

2.2 YD580E 系统构成说明

表 2-1 YD580E 变频系统外围电气元件的使用说明

配件名称	安装位置	功能说明
断路器	电源与变频器输入侧之间	短路断路器：在下游设备过流时切断电源，防止发生事故
		漏电保护断路器：变频器工作时可能会产生高频漏电流，为防止触电事故以及诱发电火灾，请根据现场情况选择安装适合的漏电保护断路器。
保险丝	电源与变频器输入侧之间	防止因短路而发生事故，保护后级半导体器件
(电磁) 接触器	断路器与变频器输入侧之间	变频器通断电操作，应避免通过接触器对变频器进行频繁上下电操作 (间隔时间不低于一小时) 或进行直接启动操作。
输入电抗器	变频器输入侧	提高输入侧的功率因数； 有效消除输入侧的高次谐波，防止因电压波形畸变造成其它设备损坏； 消除电源相间不平衡而引起的输入电流不平衡。
EMC 滤波器	变频器输入侧	减少变频器对外的传导及辐射干扰； 降低从电源端流向变频器的传导干扰，提高变频器的抗干扰能力。
直流电抗器	YD580E 系列变频器 30kW以上标配直流电抗器；18.5~22kW 可选配直流电抗器	提高输入侧的功率因数； 提高变频器整机效率和热稳定性； 有效消除输入侧高次谐波对变频器的影响，减少对外传导和辐射干扰。
制动电阻	变频器主回路端子（+）、BR 之间	带 B 机型请选配使用制动电阻； 电机在减速时通过制动电阻消耗再生能量。
制动单元	变频器主回路端子（+）、（-）之间	全系列不带 B 机型请选用制动单元以及推荐制 动电阻； 电机在减速时通过制动电阻消耗再生能量。
输出电抗器	在变频器输出侧和电机之间，靠近变频器安装	变频器输出侧一般含较多高次谐波。当电机与变频器距离较远时，因线路中有较大的分布电容。其中某次谐波可能在回路中产生谐振，带来两方面影响： a) 破坏电机绝缘性能，长时间会损坏电机。 b) 产生较大漏电流，引起变频器频繁保护。 一般变频器和电机距离超过 100m，建议加装输出交流电抗器。
dv/dt 电抗器	在变频器输出侧靠近变频器安装	可选的 dv/dt 电抗器可以保护电机绝缘和减少轴承电流。
输出磁环	在变频器输出侧靠近变频器安装	输出磁环主要用来减少轴承电流。
电机	变频器输出侧	请按照推荐选择适配电机。
外引键盘	外引键盘接口	外引 LED 键盘 ，LCD 键盘

NOTE

- 不要在变频器输出侧安装电容器或浪涌抑制器，否则将会导致变频器的故障或电容和浪涌抑制器的损坏。
- 变频器的输入 / 输出 (主回路) 包含有谐波成分，可能干扰变频器附近的通讯设备。可安装抗干扰滤波器，使干扰降至最小。

第三章　安装与接线

3.1 安装

3.1.1 安装环境

1） 环境温度：周围环境温度对变频器寿命有很大影响，不允许变频器的运行环境温度超过允许温度范围 （-10℃～ 50℃）。

2） 将变频器装于阻燃物体的表面，周围要有足够空间散热。变频器工作时易产生大量热量。并用螺丝垂直安装在安装支座上。

3） 请安装在不易振动的地方。振动应不大于 0.6G。特别注意远离冲床等设备。

4） 避免装于阳光直射、潮湿、有水珠的地方。

5） 避免装于空气中有腐蚀性、易燃性、易爆性气体的场所。

6） 避免装在有油污、粉尘的场所。

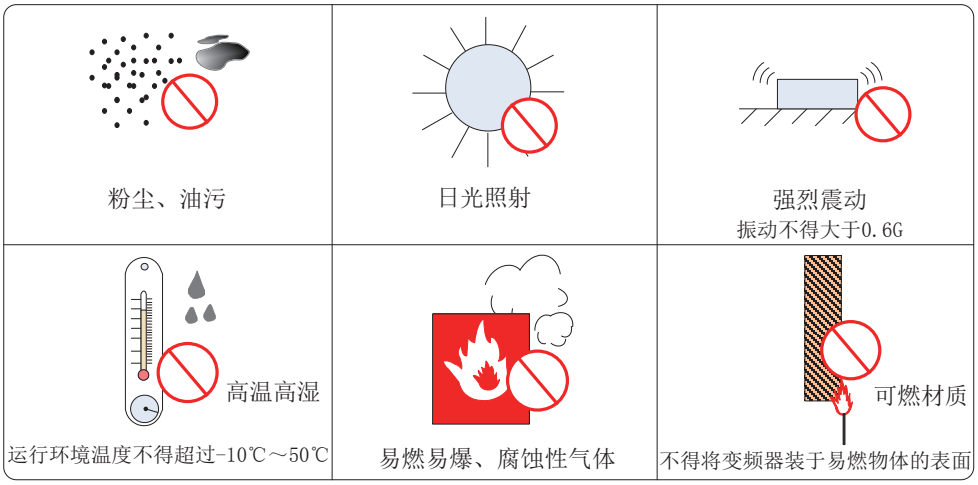


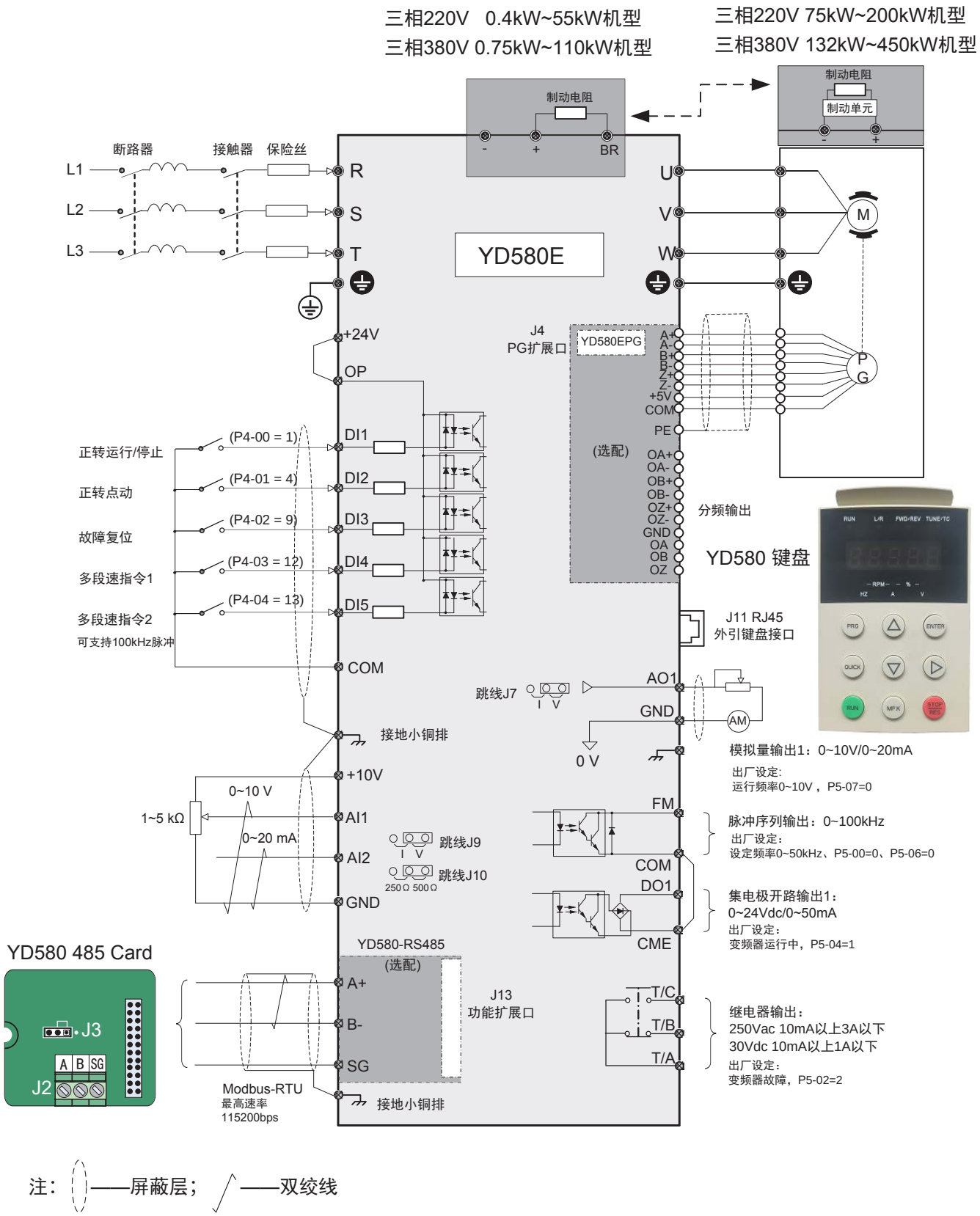
图 3-1 安装环境要求

7） YD580E系列产品为机柜内安装产品，需要安装在最终系统中使用，最终系统应提供相应的防火外壳、电气防护外壳和机械防护外壳等，并符合当地法律法规和相关 IEC 标准要求。

3.2 接线

3.2.1 标准接线图

三相380V 0.75kW ~ 450kW 机型
三相220V　0.4kW ~ 200kW 机型



注：（）——屏蔽层；／——双绞线

图 3-26 三相 380V~480V 典型接线图

3.2.2 主回路端子功能说明及注意事项

1）　YD580E 系列变频器主回路端子

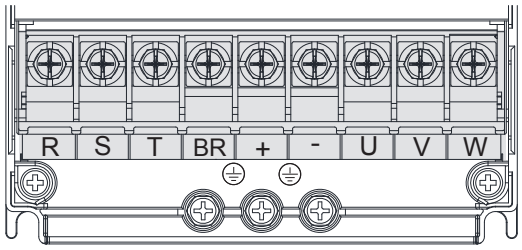


图 3-27

YD580TE4-0P7G/1P5PB ~ YD580ET4-22G/30PB
YD580ET2-0P4GB ~ YD580ET2-11GB

主回路端子分布图

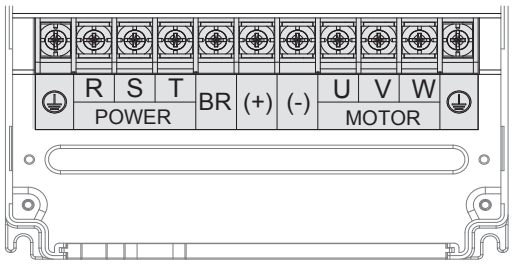
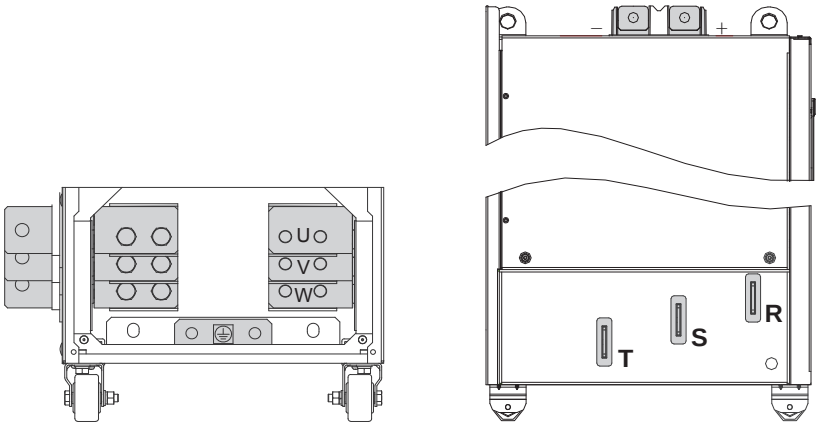


图 3-28

YD580ET4-30G(B)(-T) ~ YD580ET4-160G/200P-T
YD580ET2-15G(B)-T ~ YD580ET2-75G-T

主回路端子分布图



（正视图）　　（侧视图）

图 3-29

YD580ET4-200G/250P-T ~ YD580ET4-450G-T
YD580ET2-90G-T ~ YD580ET2-200G-T

主回路端子分布图

主回路端子分布 图表3-3　变频器主回路端子说明

端子标记	端子名称	功能说明
R、S、T	三相电源输入端子	交流输入三相电源连接点
（+）、（-）	直流母线正、负端子	共直流母线输入点
（+）、BR	制动电阻连接端子	制动电阻连接点
U、V、W	变频器输出端子	连接三相电动机
⏚	接地端子（PE）	保护接地

3.2.3 控制回路端子分布

◆ 控制回路端子布置

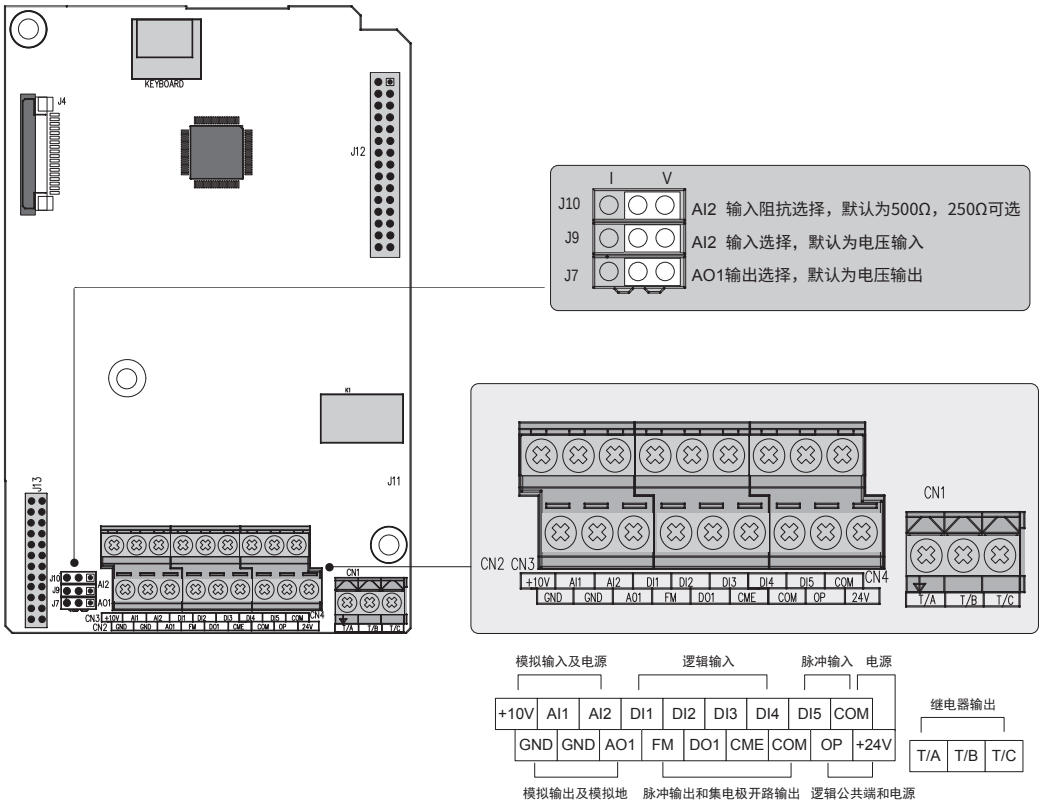


图 3-57 控制回路端子布置图

表 3-17 YD580E 变频器控制端子功能说明

类别	端子符号	端子名称	功能说明
电源	+10V-GND	外接＋ 10V 电源	向外提供 +10V 电源，最大输出电流：10mA 一般用作外接电位器工作电源，电位器阻值范围： 1kΩ~5kΩ
	+24V-COM	外接＋ 24V 电源	向外提供 +24V 电源，一般用作数字输入输出端子工作电源和外接传感器电源 最大输出电流：200mA 【注 1】
	OP	外部电源输入端子	出厂默认与＋ 24V 连接 当利用外部信号驱动 DI1~DI5 时，OP 需与外部电源连接，且与＋ 24V 电源端子断开
模拟输入	AI1-GND	模拟量输入端子 1	输入电压范围：DC 0V~10V 输入阻抗：22kΩ
	AI2-GND	模拟量输入端子 2	输入范围：0Vdc~10Vdc/0mA~20mA，由控制板上的 J9 跳线选择决定。 输入阻抗：电压输入时 22kΩ，电流输入时通过 J10 跳线可选阻抗为 500Ω 或者 250Ω。【注 2】
模拟输出	AO1-GND	模拟输出 1	由控制板上的 J7 跳线选择决定电压或电流输出。 输出电压范围：0V~10V 输出电流范围：0mA~20mA

类别	端子符号	端子名称	功能说明
数字输入	DI1- OP	数字输入 1	光藕隔离，兼容双极性输入 输入阻抗：1.39kΩ 有效电平输入时电压范围： 9V~30V
	DI2- OP	数字输入 2	
	DI3- OP	数字输入 3	
	DI4- OP	数字输入 4	
	DI5- OP	高速脉冲输入端子	除有 DI1~DI4 的特点外，还可作为高速脉冲输入通道。 最高输入频率：100kHz 输入阻抗：1.03kΩ
数字输出	DO1-CME	数字输出 1	光藕隔离，双极性开路集电极输出 输出电压范围：0V~24V 输出电流范围：0mA~50mA 注意：数字输出地 CME 与数字输入地 COM 是内部隔离的，但出厂时 CME 与 COM 已经外部短接（此时 DO1 默认为＋ 24V 驱动）。当 DO1 想用外部电源驱动时，必须断开 CME 与 COM 的外部短接。
	FM- COM	高速脉冲输出	受参数 H2-01“FM 端子输出方式选择”约束； 当作为高速脉冲输出，最高频率到 100kHz； 当作为集电极开路输出，与 DO1 规格一样。
继电器输出	T/A-T/B	常闭端子	触点驱动能力： 250Vac，3A，COSØ=0.4 30Vdc，1A
	T/A-T/C	常开端子	
辅助接口	J13	功能扩展卡接口	28 芯端子，与可选卡（I/O 扩展卡、PLC 卡、各种总线卡等选配卡）的接口
	J4	PG 卡接口	可选择：OC、差分、旋变等编码器接口
	J11	外引键盘接口	外引键盘
跳线【注 3】	J7	AO1 输出选择	电压、电流输出可选，默认为电压输出
	J9	AI2 输入选择	电压、电流输入可选，默认为电压输入
	J10	AI2 输入阻抗选择	500Ω、250Ω 可选，默认为 500Ω

NOTE

- 【注 1】在环境温度大于 23°C时，用户需按照“环境温度每升高 1°C，输出电流降低 1.8mA”进行降额使用；40°C环境温度时最大输出电流为 170mA，当用户将 OP 与 24V 短接时，DI 端子的电流也须考虑在内。
- 【注 2】请用户根据信号源带载能力选择 500Ω 或者 250Ω 阻抗，选择的依据是信号源的最大输出电压，例如使用 500Ω 阻抗，需保证信号源最大输出电压不小于 10V，才能保证 AI2 能够测量到 20mA 的电流。
- 【注 3】跳线 J7、J9 与 J10 在控制板上的位置如图 3-57 所示。

3.2.7 控制回路端子接线说明

◆ 控制回路的电缆选型

所有的控制电缆必须采用屏蔽电缆。不同模拟信号应该使用单独的屏蔽线。数字信号线推荐使用屏蔽双绞线。

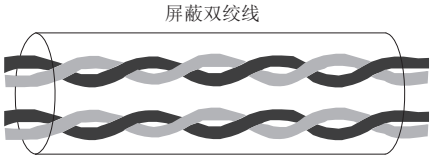


图 3-58 屏蔽双绞线示意

◆ 控制回路的布线要求

电机电缆应远离所有控制电缆敷设。

推荐电机电缆、输入电源线和控制回路电缆不在同一走线槽中。避免电机电缆与控制回路长距离并行走线，耦合产生的电磁干扰。

当控制回路与驱动线必须交叉时，交叉角度应为 90 度。

推荐的电缆布线图：

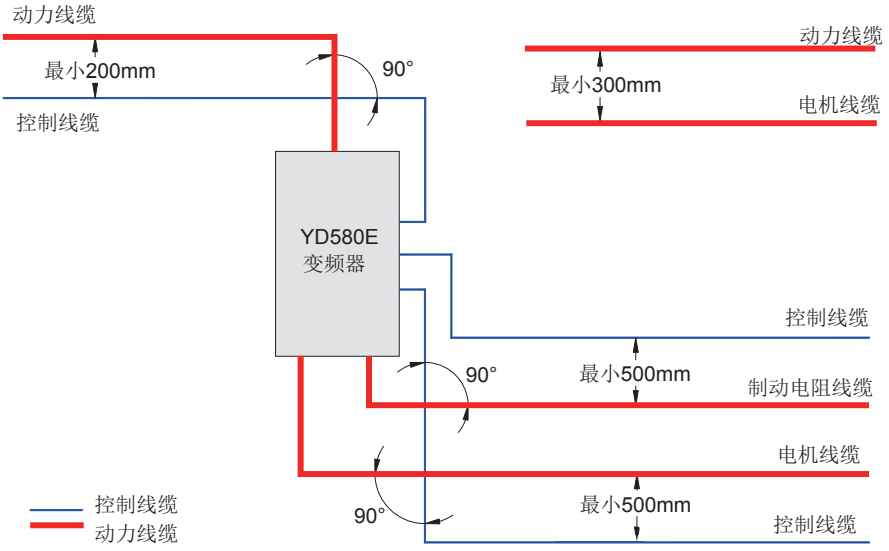


图 3-59 电缆布线图

◆ 模拟量输入端子 AI1

因微弱的模拟电压信号特别容易受到外部干扰，所以一般需要用屏蔽电缆，而且配线距离尽量短，不要超过 20m，如图 3-60。在某些模拟信号受到严重干扰的场合，模拟信号源侧需加滤波电容器或铁氧体磁芯，如图 3-62。

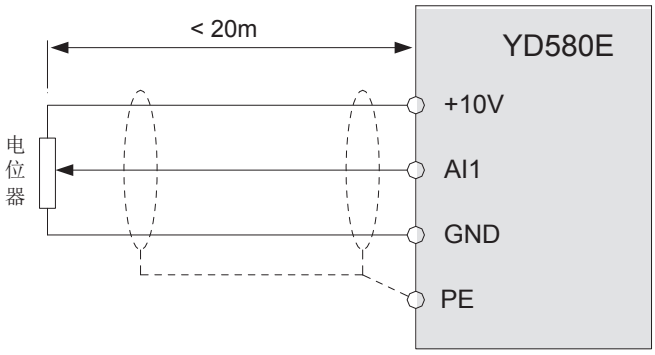


图 3-60 模拟量输入端子接线示意图

模拟量端子的屏蔽层要在变频器侧将屏蔽层引出线接 PE。

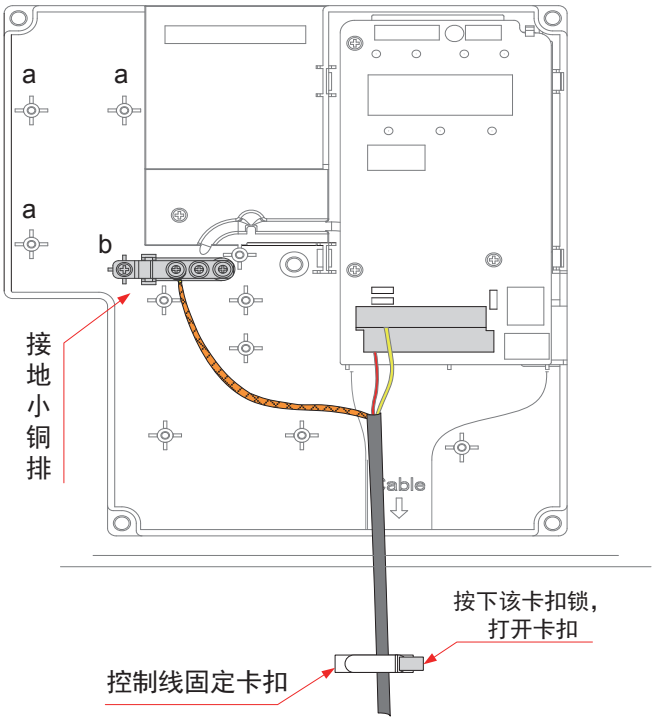


图 3-61 模拟量端子的屏蔽层接地示意图

◆ 模拟量输入端子 AI2

当 AI2 采用电压信号输入时，接线说明同 AI1；

当 AI2 选以电流信号输入时，AI2 为电流流入方向，GND 为电流流出方向，同时 J9 跳线跳到 “I” 侧。

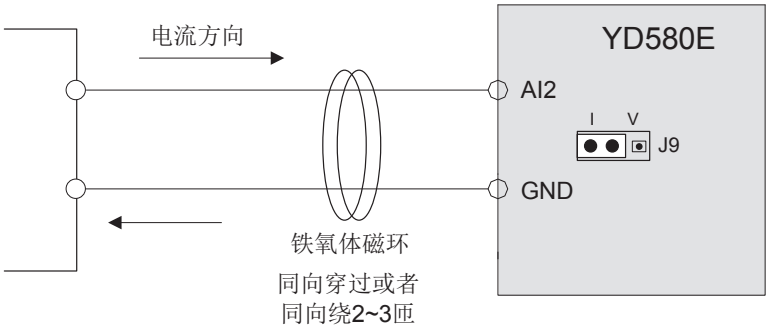


图 3-62 模拟量 AI2 输入端子处理接线图

◆ 数字量输入端子 DI1-DI5

1） 漏型接线方式

● 漏型接线方式

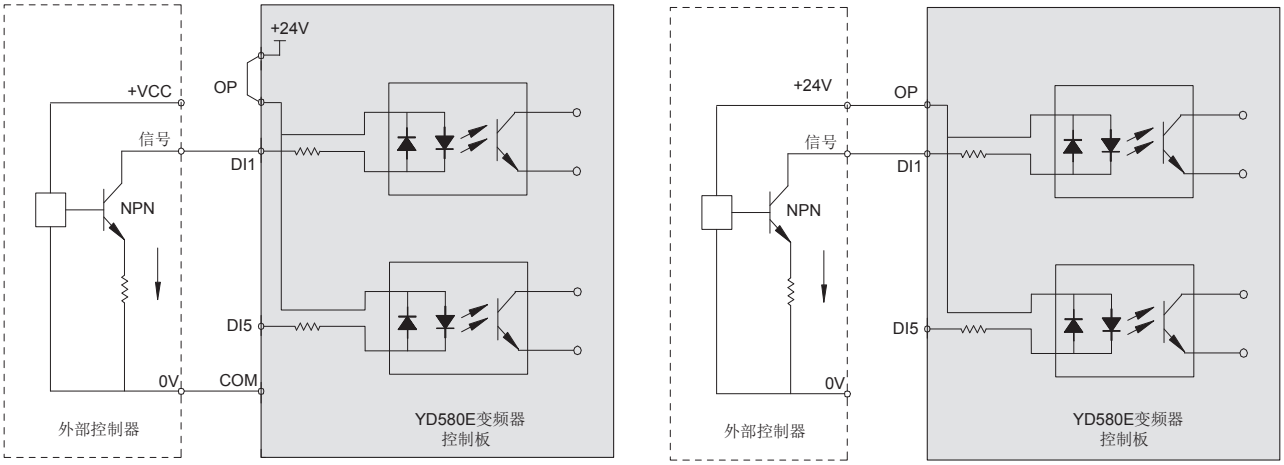


图 3-63 漏型接线方式

使用变频器内部 24V 电源是一种最常用的接线方式，将变频器 OP 与 24V 端子短接，将变频器 COM 端子与外部控制器的 0V 连接。

如果使用外部 24V 电源，必须把 +24V 与 OP 间的短接片去掉，把外部电源的 24V 正极接在 OP 端子，外部电源 0V 经控制器控制触点后接到相应的 DI 端子。

注意

- 此种接线方式下，不同变频器的 DI 端子不能并接使用，否则可能引起 DI 的误动作；若需 DI 端子并接（不同变频器之间），则需在 DI 端子处串接二极管（阳极接 DI）使用，二极管需满足：IF >40mA、VR>40V，如图 3-64。

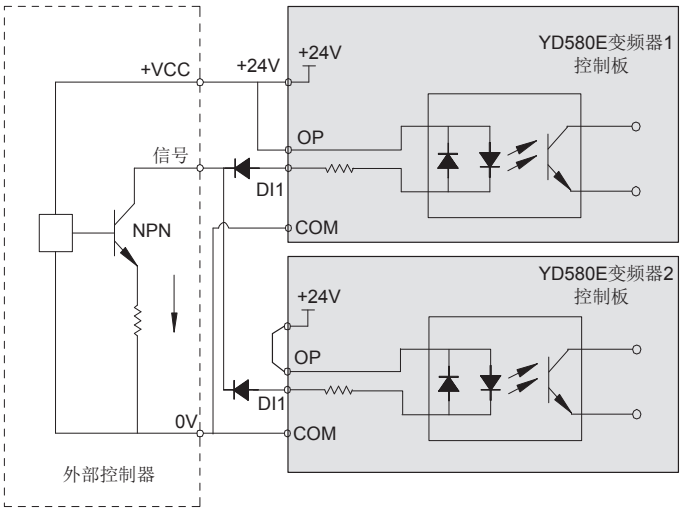
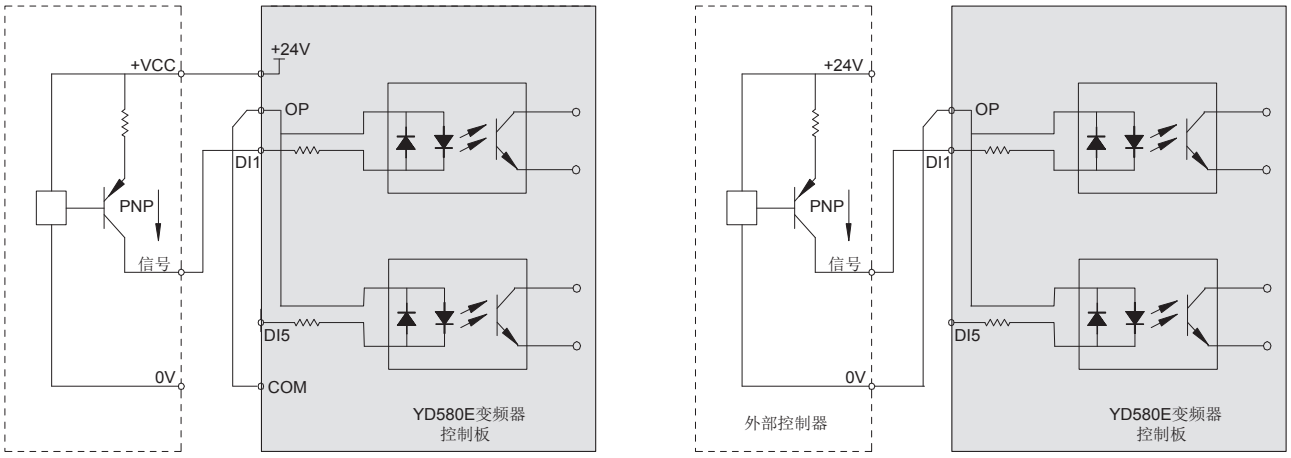


图 3-64 多台变频器 DI 端子并接漏型接线方式

2） 源型接线方式

● 源型接线方式



使用变频器内部24V电源的源型接法　　使用外部24V电源的源型接法

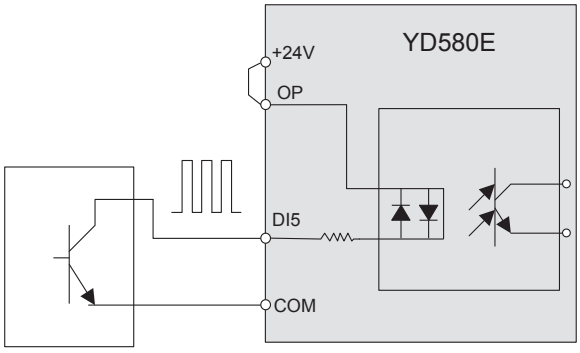
图 3-65 源型接线方式

如果使用变频器内部 24V 电源，必须把 +24V 与 OP 之间的短路片去掉，将 OP 与 COM 连在一起，把 +24V 与外部控制器的公共端接在一起，。

如果使用外部电源，必须去掉 +24V 与 OP 之间的短接片，把 OP 与外部电源的 0V 接在一起，外部电源 24V 正极经外部控制器控制触点后接入 DI 相应端子。

3） 高速输入端子端子 DI5 说明

DI5 作为高速脉冲输入时，允许的最大频率为 100kHz。



脉冲输出装置

图 3-66 高速脉冲输入

◆ 数字输出端子 DO

当数字输出端子需要驱动继电器时，应在继电器线圈两边加装吸收二极管。否则易造成直流 24V 电源损坏。驱动能力不大于 50mA。

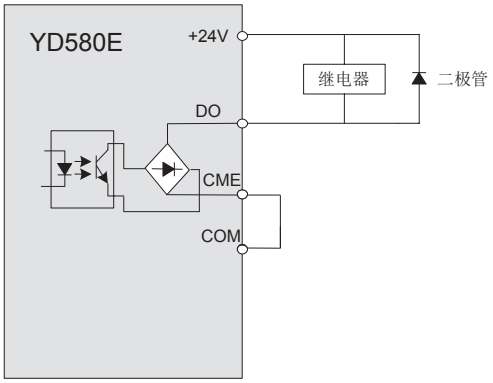


图 3-67 数字输出端子接线示意图

注意

- 一定要正确安装吸收二极管的极性。如图 3-67。否则当数字输出端子有输出时，马上会将直流 24V 电源烧坏。
- 数字输出地 CME 与数字输入地 COM 是内部隔离的，但出厂时 CME 与 COM 已经外部短接（此时 DO1 默认为＋ 24V 驱动）。当 DO1 想用外部电源驱动时，必须断开 CME 与 COM 的外部短接。

◆ 高速数字出端子 FM

当 FM 端子为 FMP 连续脉冲输出时，最高输出频率为 100kHz。

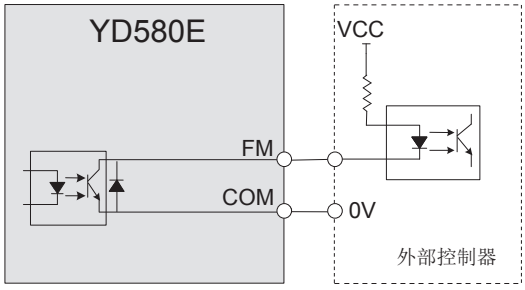


图 3-68 高速数字输出端子接线示意图

◆ 继电器输出端子

电感性负载（继电器、接触器和电机）在电流切断时都会引起电压尖峰。在继电器触点采用压敏电阻进行防护，并在电感性负载上装吸收电路，如压敏电阻、RC 吸收电路、二极管等，保证在关断时的干扰最小。

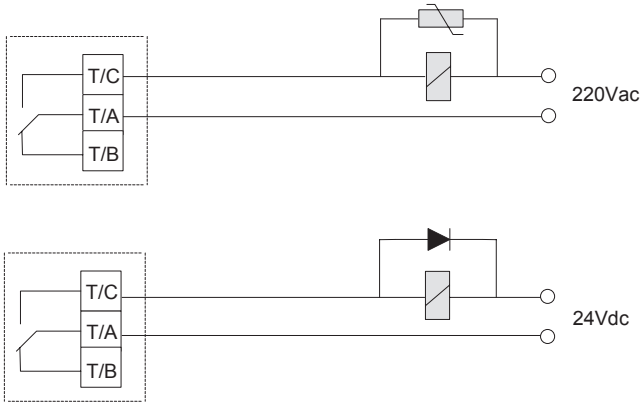


图 3-69 继电器输出端子抗干扰处理

第四章　面板操作

4.1 面板操作说明

YD580E 系列变频器可通过 LED 操作面板或 LCD 操作面板进行参数操作、状态监控与控制。除变频器自带的 LED 操作面板外，用户还可选配 LED 操作面板（YKEY059）或 LCD 操作面板（YKEY060）实现面板外引。

参见“4.2 LED 操作面板介绍”；通过选配 LCD 操作面板，可实现参数拷贝、上下载等功能。键盘详细使用介绍请参见“4.3 LCD 操作面板介绍”。

4.2 LED 操作面板介绍

用操作面板，可对变频器进行参数设定 / 修改、工作状态监控、运行控制（起动、停止）等操作。操作面板的外观和操作键名称如下图所示：

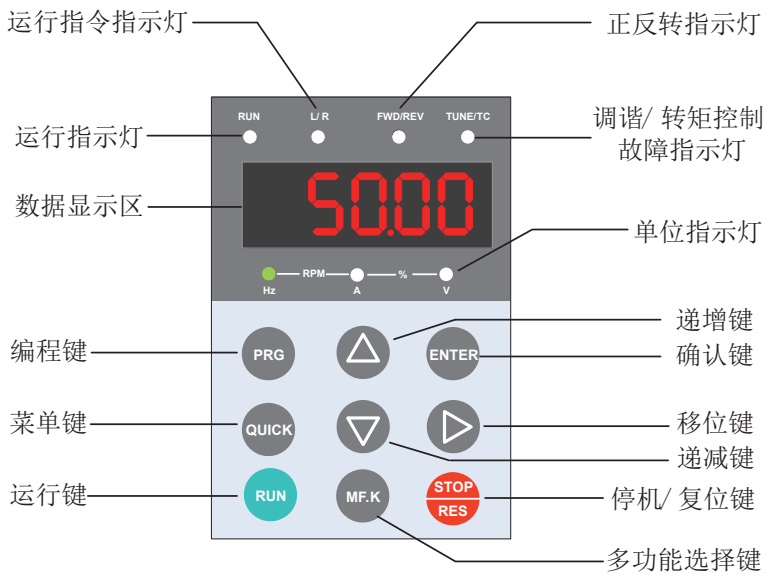
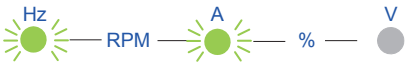


图 4-1 操作面板示意图

4.2.1 功能指示灯

下表中 表示灯亮； 表示灯灭。 表示闪烁

表 4-1 操作面板指示灯说明

指示灯状态		状态说明
RUN 运行指示灯		灯灭：停机
		灯亮：运行
L/R 运行指令指示灯		灯灭：面板控制
		灯亮：端子控制
		闪烁：通讯控制
FWD/REV 正反转指示灯		灯灭：正转运行
		灯亮：反转运行
TUNE/TC 调谐 / 转矩控制 / 故障指示灯		灯灭：正常运行
		灯亮：转矩控制模式
		慢闪：调谐状态 （1 次 / 秒）
		快闪：故障状态（4 次 / 秒）
		频率单位 Hz
		电流单位 A
		电压单位 V
		转速单位 RMP
		百分数 %

4.2.2 LED 显示区

操作面板上共有 5 位 LED 显示，可以显示设定频率、输出频率，各种监视数据以及报警代码等。

表 4-2 实际对应与 LED 显示对应表

LED 显示	实际对应	LED 显示	实际对应	LED 显示	实际对应	LED 显示	实际对应
0	0	6	6	C	C	n	N
1	1	7	7	c	c	P	P
2	2	8	8	d	D	r	R
3	3	9	9	E	E	t	T
4	4	A	A	F	F	U	U
5	5、S	b	B	L	L	u	u

4.2.3 键盘按钮功能

表 4-3 键盘按键功能表

按键	按键名称	按键功能
PRG	编程键	一级菜单进入或退出。
ENTER	确认键	逐级进入菜单画面、设定参数确认。
△	递增键	数据或参数的递增。
▽	递减键	数据或参数的递减。
▷	移位键	在停机显示界面和运行显示界面下，可循环选择显示参数； 在修改参数时，可以选择参数的修改位。
RUN	运行键	在“操作面板”启停控制方式下，用于运行操作。
STOP RES	停止 / 复位	运行状态时，按此键可以停止运行操作，此特性受参数 P7-02 制约； 故障报警状态时，可用来复位操作。
MF.K	多功能选择键	根据 P7-01 的设定值，在选择的功能之间切换。详细操作方法见 4.3 中“多功能按键操作”
QUICK	菜单模式选择键	根据 PP-03 中值切换不同的菜单模式（默认为一种菜单模式）。

4.2.4 参数查看、修改方法

YD580E 变频器的操作面板采用三级菜单结构进行参数设置等操作。三级菜单分别为：

功能参数组（一级菜单） → 参数（二级菜单） → 参数设定值（三级菜单）

进入每一级菜单之后，当显示位闪烁时，可以按△键、▽键、▷键进行修改。操作流程如图 4-2 所示。

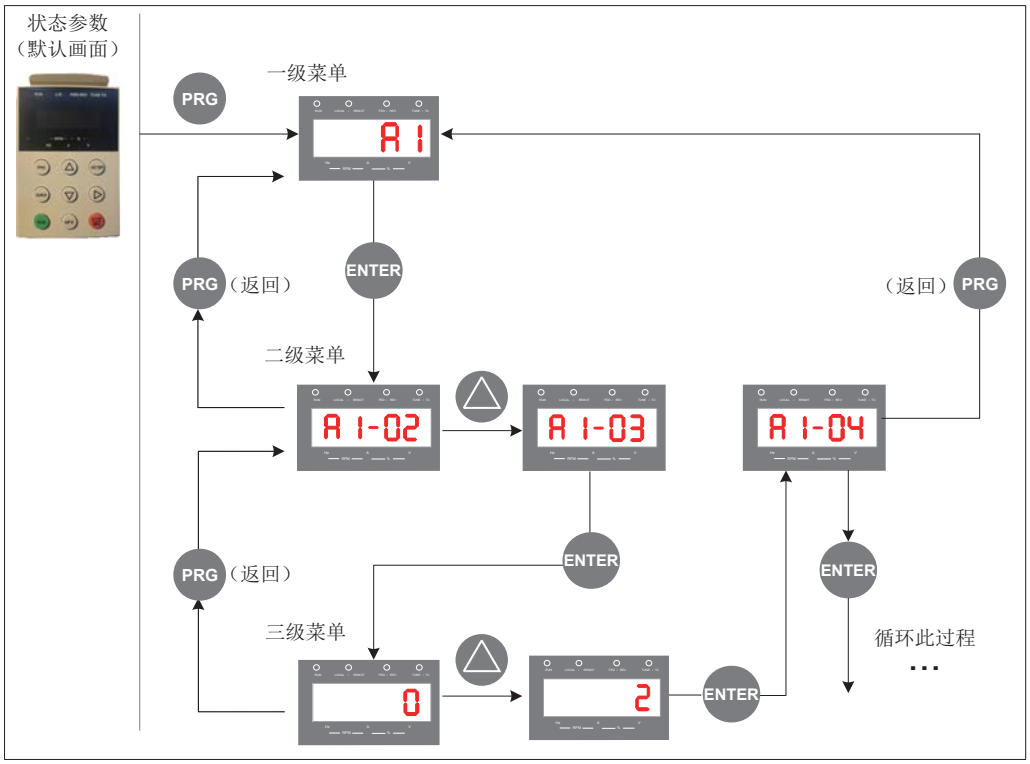


图 4-2 三级菜单操作流程图

举例

将参数 PC-01 从 0000.0% 更改设定为 0050.0% 的示例。

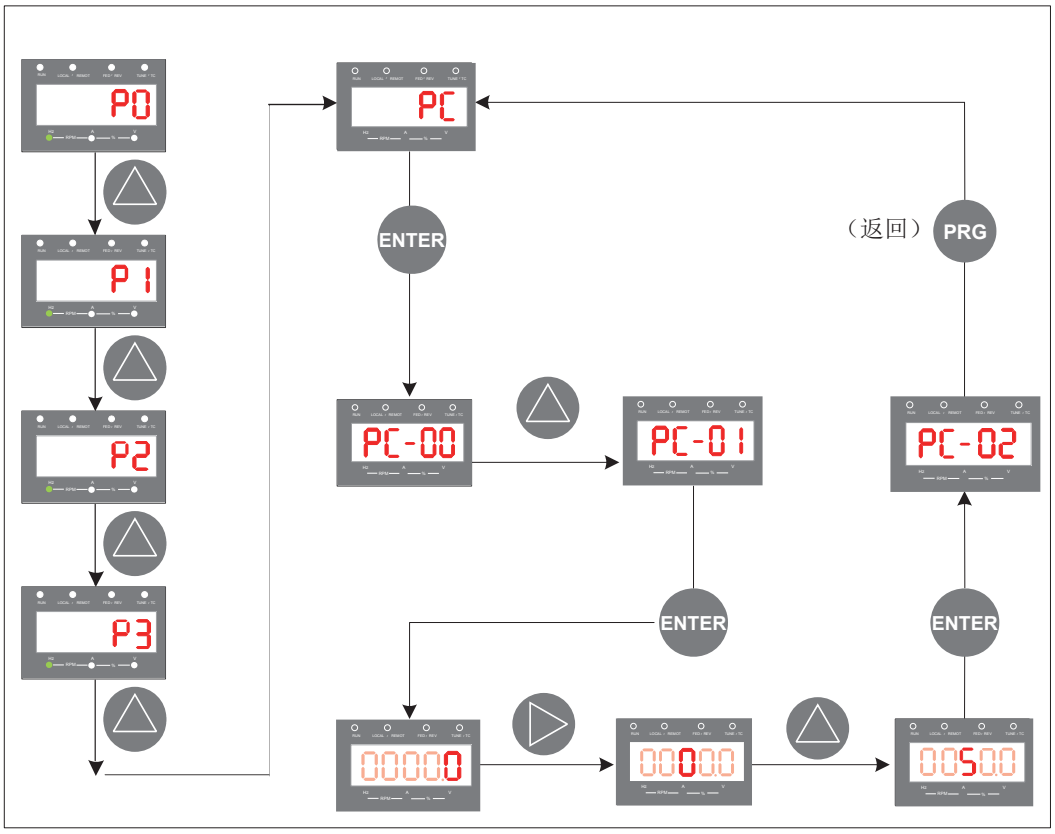


图 4-3 参数修改示意图

a） 在三级菜单操作时，可按 PRG 键或 ENTER 键返回二级菜单。两者的区别是：

按 ENTER 键将设定参数保存后返回二级菜单，并自动转移到下一个参数；按 PRG 键是放弃当前的参数修改，直接返回当前参数序号的二级菜单。

b）在第三级菜单状态下，若参数没有闪烁位，表示该参数不能修改，可能原因有：

（1）该参数为不可修改参数，如变频器类型、实际检测参数、运行记录参数等。

（2）该参数在运行状态下不可修改，需停机后才能进行修改。

4.2.5 参数组成

表 4-4 参数组成

参数组	功能描述	说明
P0 ～ PP	基本参数	运行指令、频率指令、电机参数、控制方式、AI/AO 特性校正、优化控制等参数。
A0 ～ AC	进阶参数	
U0	监视参数组	变频器基本监视参数的显示。

在用操作面板查看参数之前，要先设置参数 PP-02（功能参数组显示选择），确保要查看的参数组是在显示状态。查看参数组号的方式如下图：

参数	功能定义	出厂值	设定范围	参数说明
PP-02	功能参数组显示选择	11	个位：U 组显示选择 十位：A 组显示选择 0：不显示； 1：显示	用于 A 组、U 组参数是否显示的控制。

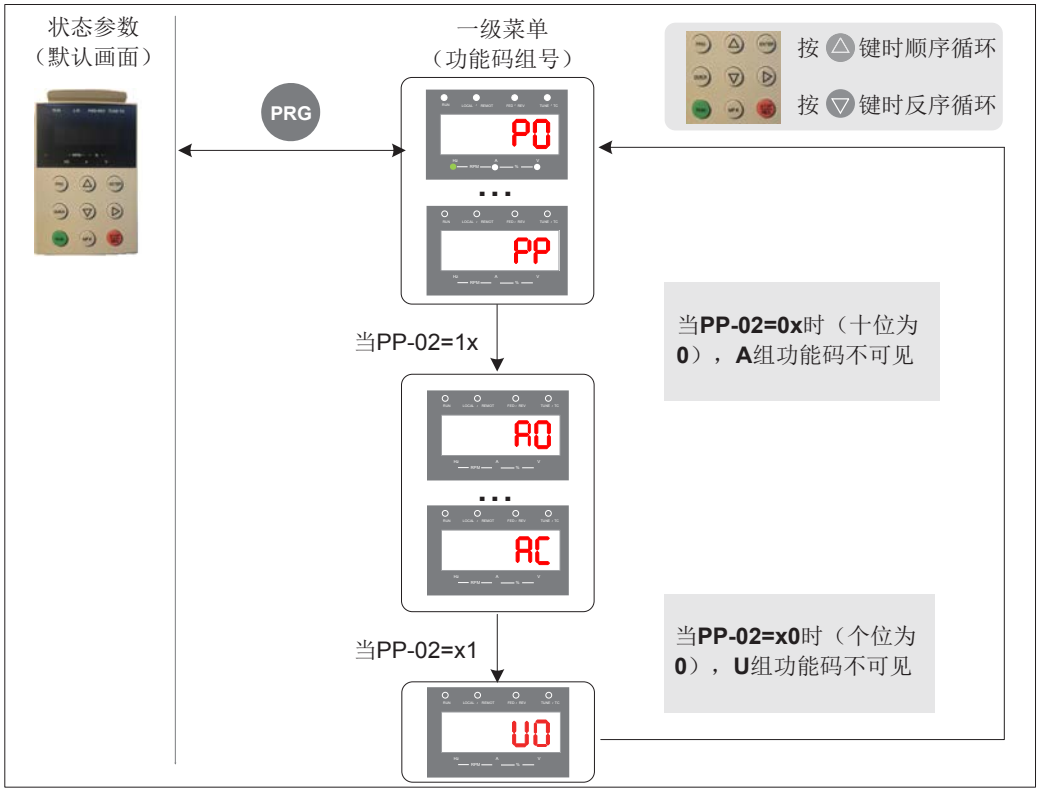


图 4-4 参数组号查看方法示意图

4.2.6 参数查阅

YD580E 系列变频器的参数较多，一共提供三种参数查阅方式。默认为基本查看方式（可查看所有的参数组），通过参数设置（PP-03）还可以提供两种快速查阅参数的方法，以方便用户快速查找 。

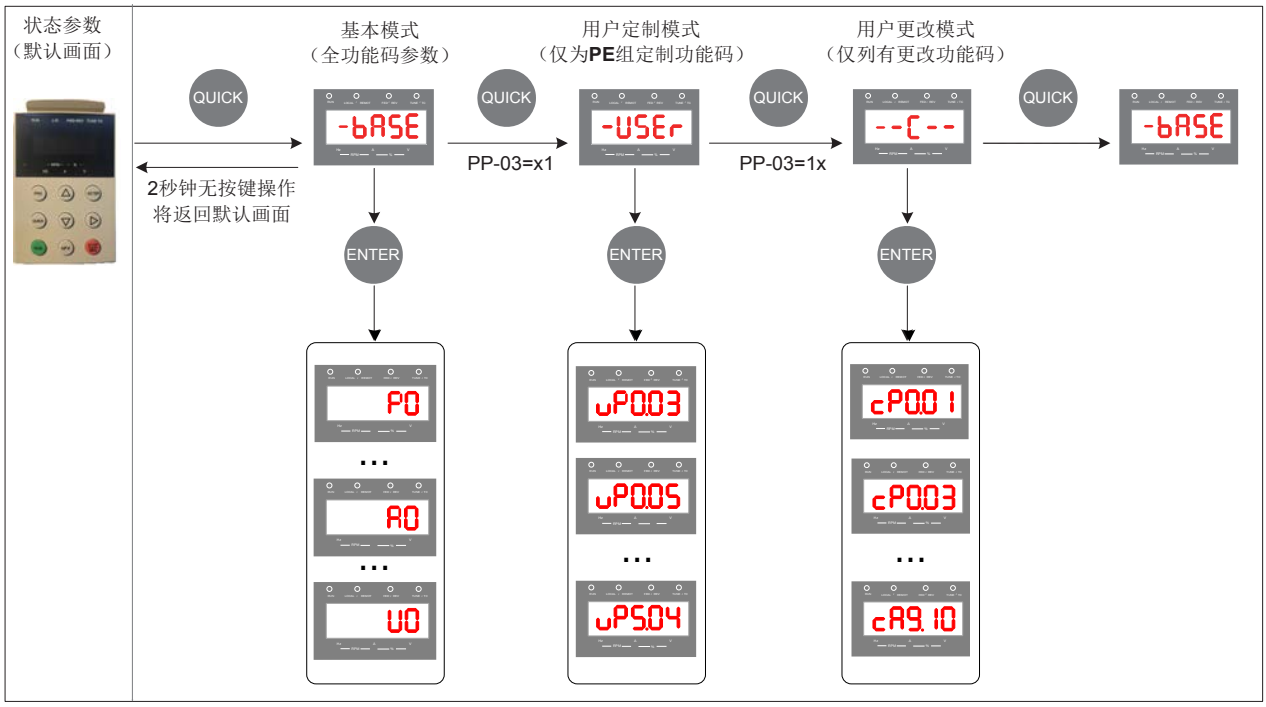
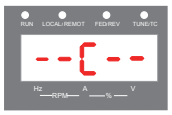


图 4-5 参数参数查阅方法示意图

上图中，用户定制模式菜单中，参数的显示形式如“uP3.02”，表示功能参数 P3-02，在用户定制菜单中修改参数与在普通编程状态下修改相应的参数操作方法是一样的。

提供的三种参数查阅方式，各参数显示方式和显示编码为：

参数显示方式	显示	说明
用户定制参数方式		查看用户自定义的参数
用户更改参数方式		查看与出厂值不同的参数
功能参数方式		查看所有的参数

1） 基本查阅方法

基本参数组即变频器的全部参数，可以按照 4.2 小节介绍的操作方式查询或修改。三种参数显示模式通过面板上的 QUICK 键进行切换，进入各组参数之后的查阅或修改方法，与 4.2 小节中通过键盘操作的方法相同。

2） 快速查阅方法

如果要显示用户自定义组和用户更改参数组，需要将参数 PP-03 设置为11

参数	功能定义	出厂值	设定范围	参数说明
PP-03	功能参数组显示选择	00	个位：-USEr 组显示选择 0：不显示；1：显示 十位：--C-- 组显示选择 0：不显示；1：显示	决定用户自定义组、用户更改参数组是否显示。

◆ 查阅用户自定义参数组

在面板上按 QUICK 键，进入“用户自定义参数”模式 -USEr，查看用户自定义的参数。

用户自定义参数方法：用户通过设置 PE 组（PE-00 ～ PE-29）的参数，自定义常用的参数，最多可以自定义 30 个，PE 组默认有 16 个自定义参数（PE-00 ～ PE-15），用户也可以根据自己的具体需要对默认的这些参数进行修改。如果A3组的某个参数设置为uP0.00，则表示未制定自定义参数。

表 4-5 用户定制菜单常用参数

参数	自定义参数	名称	参数	自定义参数	名称
PE-00	P0-01	控制方式	PE-01	P0-02	运行指令选择
PE-02	P0-03	主频率指令输入选择	PE-03	P0-07	频率源叠加选择
PE-04	P0-08	预置频率	PE-05	P0-17	加速时间
PE-06	P0-18	减速时间	PE-07	P3-00	V/F 曲线设定
PE-08	P3-01	转矩提升	PE-09	P4-00	DI1 端子功能选择
PE-10	P4-01	DI2 端子功能选择	PE-11	P4-02	DI3 端子功能选择
PE-12	P5-04	DO1 输出选择	PE-13	P5-07	AO1 输出选择
PE-14	P6-00	启动方式	PE-15	P6-10	停机方式

◆ 查阅用户已更改的参数

在面板上按 QUICK 键，进入“用户更改参数”模式 --C--，查看与出厂值不同的参数。

此模式下便于用户快速访问修改的参数。在用户已更改参数组中，列出了已经被用户修改过的参数，即当前的设定值与出厂值不同。这些参数是由变频器自动生成的列表。

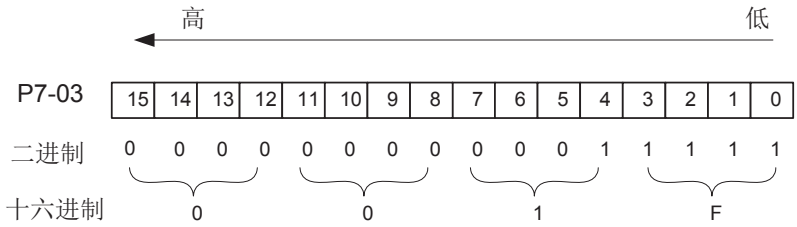
3） 状态参数的查询

在停机或运行状态下，用操作面板上的键，切换参数 P7-03、P7-04、P7-05 的每一字节，可以显示多个状态参数。

1. 根据参数 P7-03（运行显示参数 1）中的每一字节与上述参数的对应关系，将对应的位设置为 1。

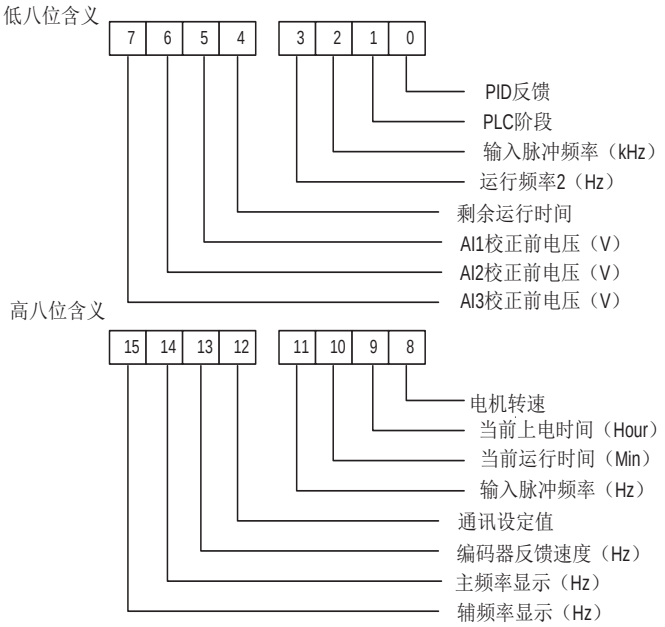
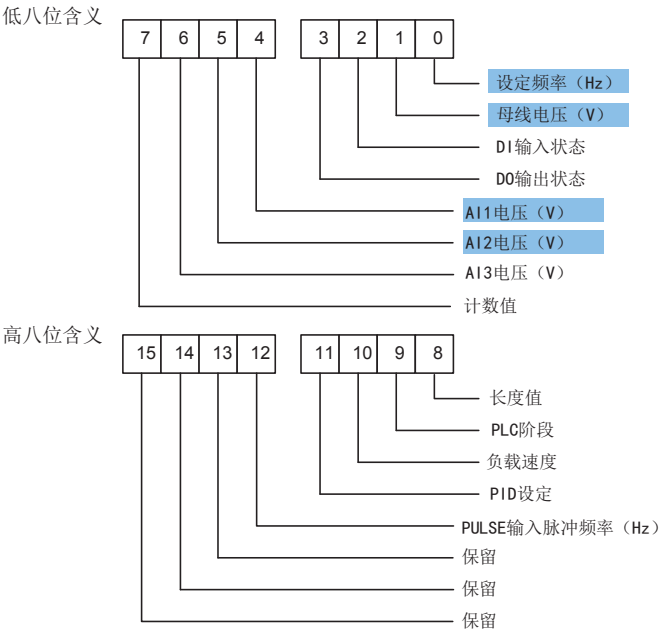
2. 将此二进制数转为十六进制后设置到 P7-03 中。键盘设定值，显示为 P.001F。

3. 用操作面板上的键，切换参数 P7-03的每一字节，即可查看相关参数的值。设定如下图所示:



其他状态参数的查看方法，同 P7-03 的方法。状态参数在 P7-03、P7-04、P7-05 的每一字节的对应关系如下：

参数	功能定义	出厂值	设定范围	参数说明
P7-03	运行显示参数 1	1F	0000 ～ FFFF	在运行中若需要显示以下各参数时，将其相对应的位置设为 1，将此二进制数转为十六进制后设于 P7-03。 低八位含义 7 6 5 4　3 2 1 0 运行频率（Hz） 设定频率（Hz） 母线电压（V） 输出电压（V） 输出电流（A） 输出功率（kW） 输出转矩（%） DI输出状态 高八位含义 15 14 13 12　11 10 9 8 DO输出状态 AI1电压（V） AI2电压（V） AI3电压（V） 计数值 长度值 负载速度显示 PID设定 注：带底纹部分为默认出厂显示。

<table>
<tr><th>参数</th><th>功能定义</th><th>出厂值</th><th>设定范围</th><th>参数说明</th></tr>
<tr><td>P7-04</td><td>运行显示参数 2</td><td>33</td><td>0000 ～ FFFF</td><td>在运行中若需要显示以下各参数时，将其相对应的位置设为 1，将此二进制数转为十六进制后设于 P7-04。
 
</td></tr>
<tr><td>P7-05</td><td>停机显示参数</td><td>0</td><td>0000 ～ FFFF</td><td>在停机时若需要显示以下各参数，将其相对应的位置设为 1，将此二进制数转为十六进制后设于 P7-05。
 

注：带底纹部分为默认出厂显示。</td></tr>
</table>

NOTE

● 变频器断电后再上电，显示的参数默认为变频器掉电前选择的参数。

4.2.7 多功能按键操作

操作面板上面的 MF.K 键为多功能键，可以通过参数P7-01（ MF.K 键功能选择）设置 MF.K 键的功能。在停机或者运行状态都可以通过此键对运行指令或者变频器的旋转方向进行切换，或者实现正反转的点动。

参数	功能定义	出厂值	设定范围	参数说明
P7-01	MF.K 功能选择	0	0： MF.K 键无效	此键无功能
			1：操作面板与端子切换或者操作面板与通讯切换	P0-02 设置为 0（操作面板），按下 MF.K 键后无效果； P0-02 设置为 1（端子），通过 MF.K 键可实现端子与操作面板之间的切换； P0-02 设置为 2（通讯），通过 MF.K 键可实现通讯与操作面板之间的切换；
			2：正反转切换	通过 MF.K 键切换频率指令的方向。该功能只在命令源 运行指令为操作面板时有效。
			3：正转点动	通过键盘 MF.K 键实现正转点动（FJOG）。该功能只在命令源 运行指令为操作面板时有效。
			4：反转点动	通过键盘 MF.K 键实现反转点动（RJOG）该功能只在命令源运行指令为操作面板时有效。

4.3 LCD 操作面板介绍

YKEY060 是适配于 YD580E 的外引操作面板（选配件），采用 LCD 液晶显示，支持参数拷贝与下载功能，用户通过该面板可方便的更改参数， 提供中文显示，使用起来更加简易和方便。

1） 外观及界面：

图 4-6 YKEY060 外观示意图

2） 键盘安装尺寸

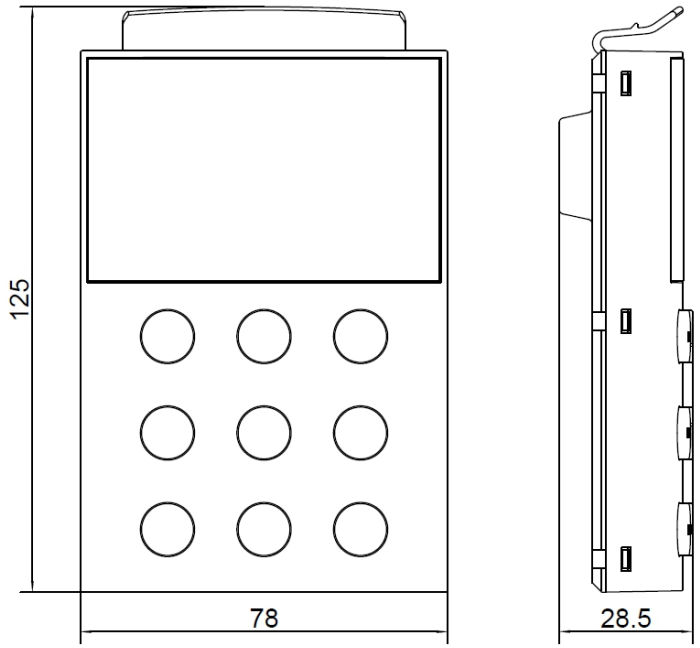


图 4-7 YKEY060 外引操作面板尺寸

第五章　基本操作与试运行

本章介绍变频器的基本调试步骤，主要包括变频器的频率指令设置、启动和停机的控制，根据本章内容可以实现变频器控制电机的试运行。

5.1 快速调试指南

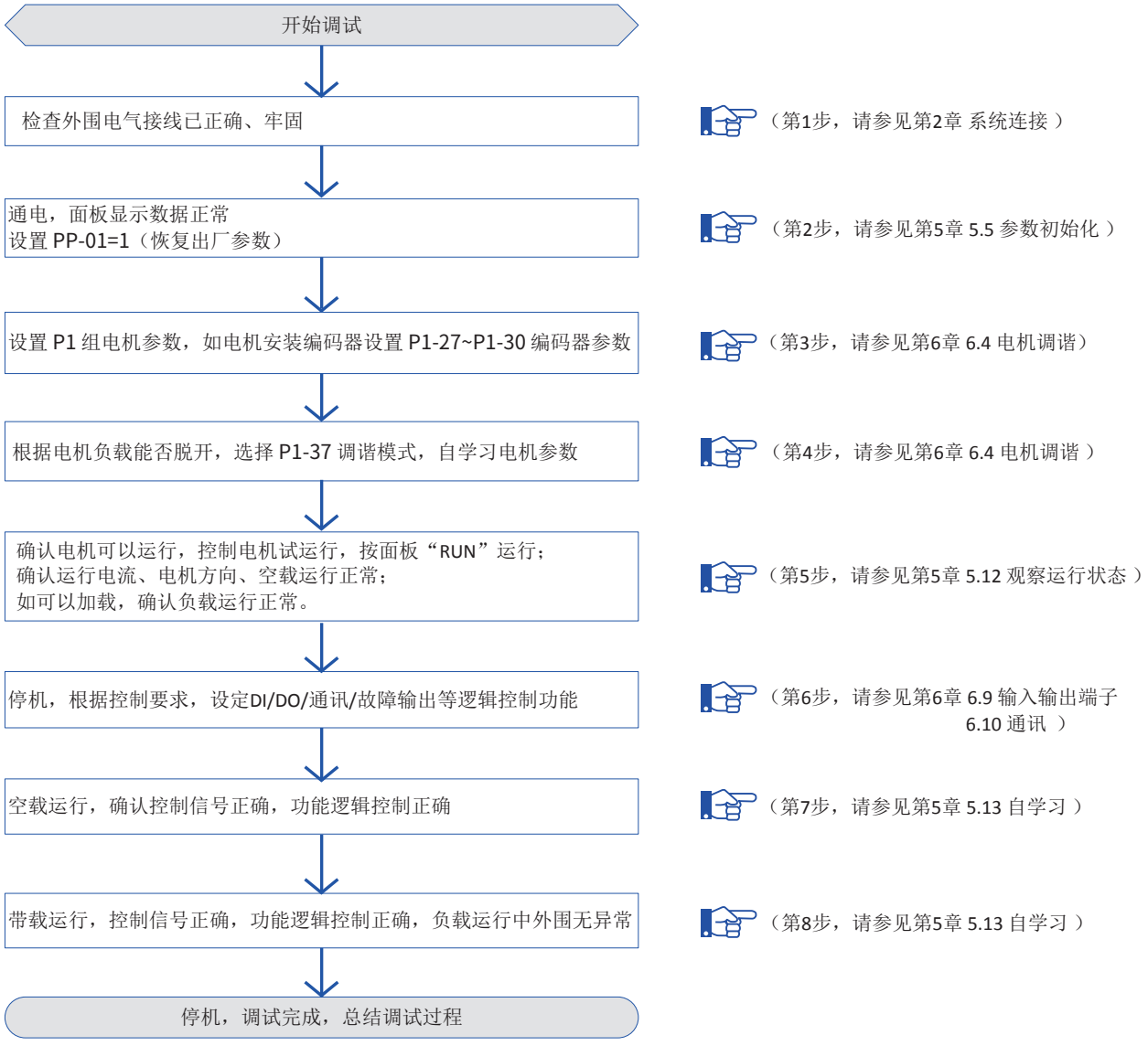


图 5-1 快速调试步骤指南

5.2 变频器调试总流程图

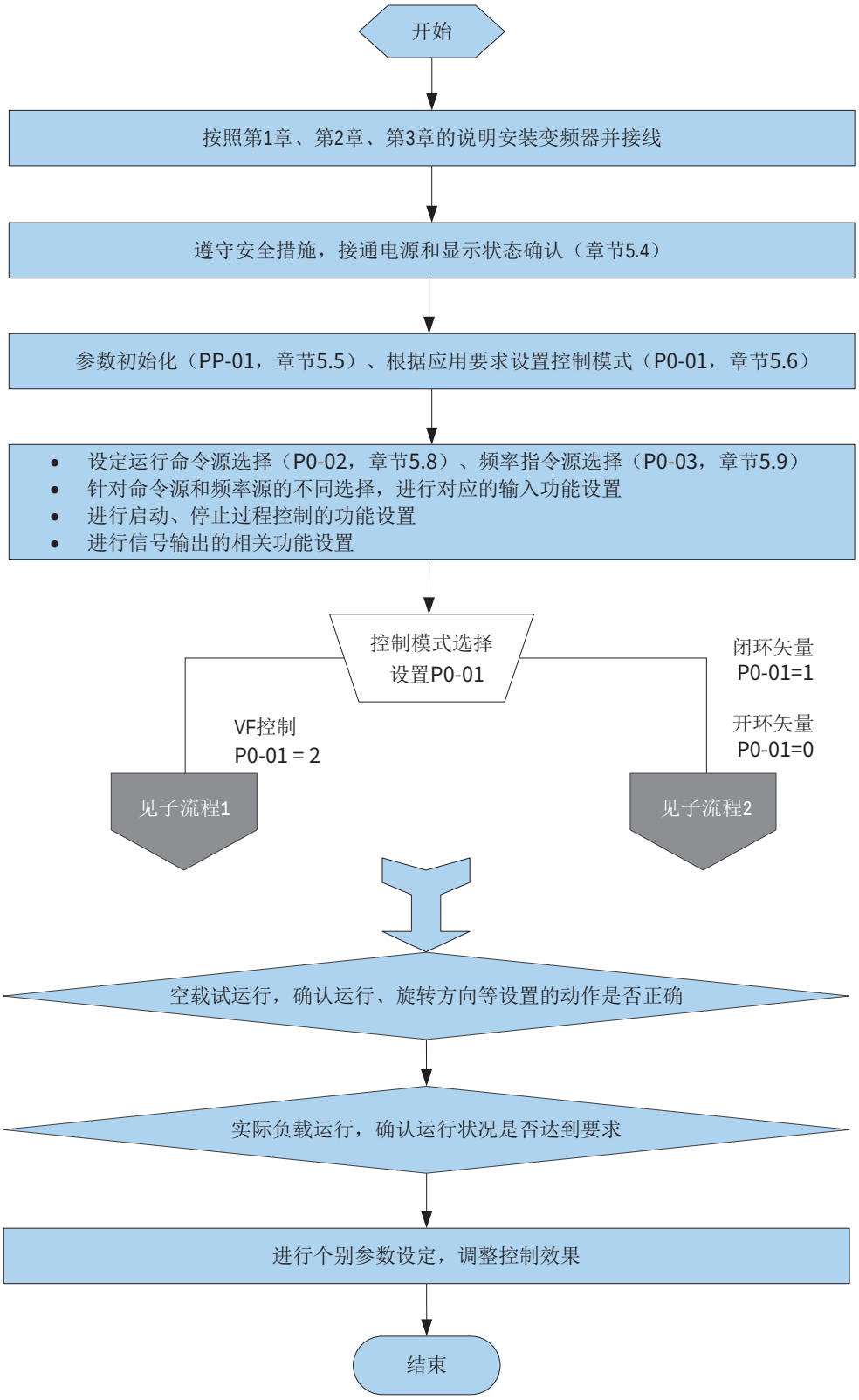


图 5-2 变频器调试总流程图

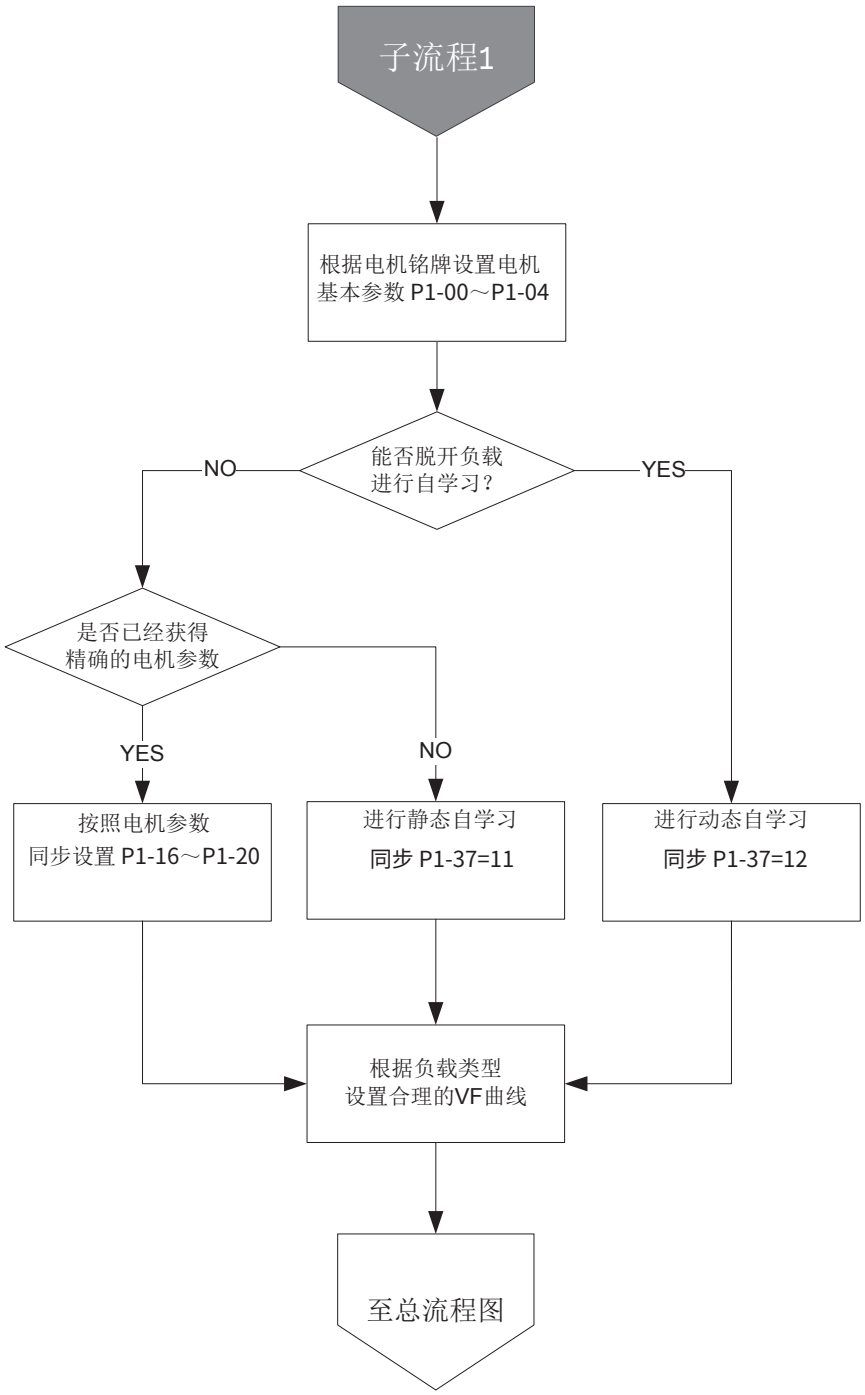


图 5-3 变频器调试子流程图 1（V/F 控制）

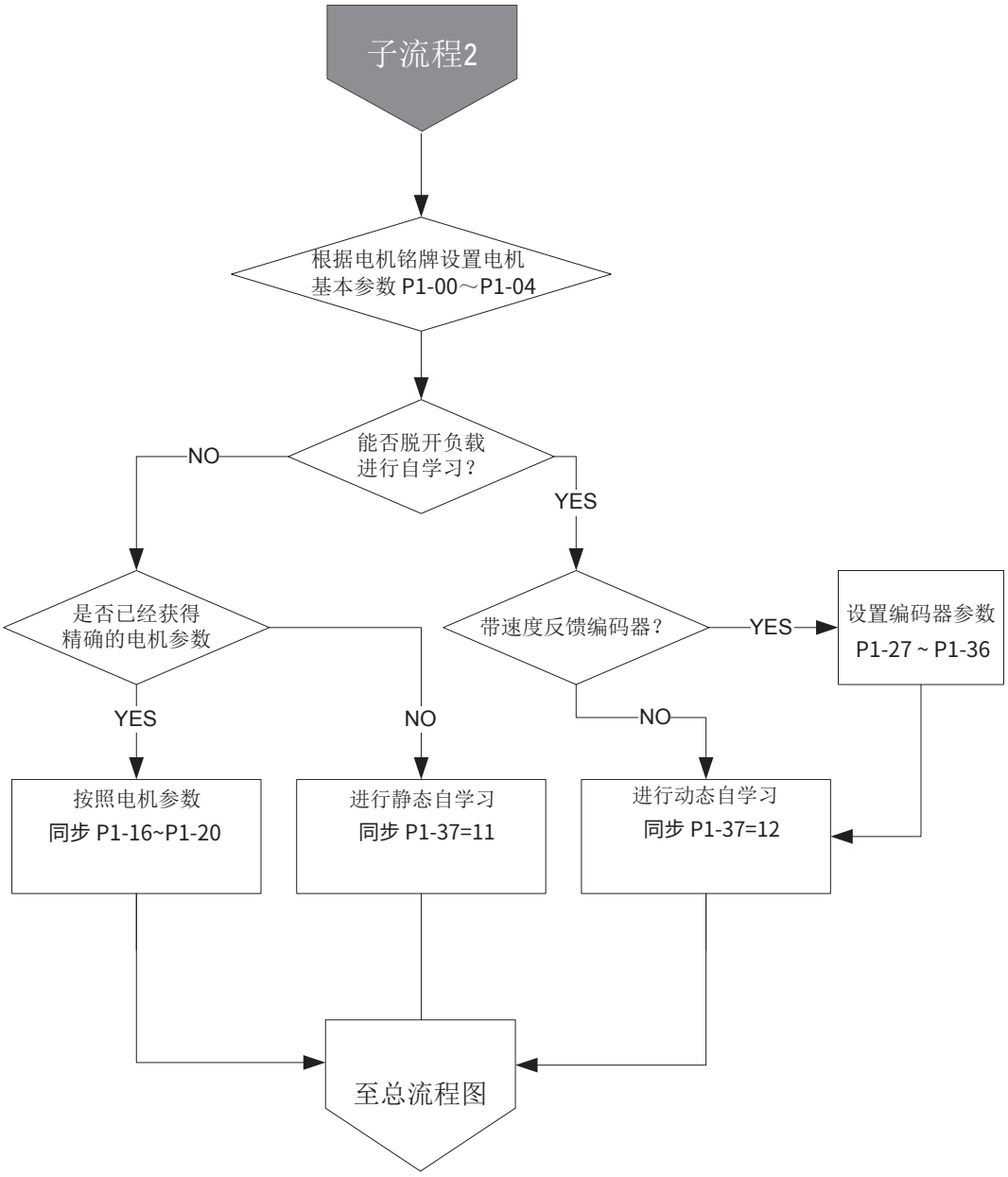


图 5-4 变频器调试子流程图 2（矢量控制）

5.3 接通电源前确认事项

务必确认以下项目后，再接通电源。

项目	内容
电源电压的确认	请确认电源电压是否正确 AC380V~480V 50/60Hz。
	请对电源输入端子（R/S/T）可靠接线。
	确认变频器和电机正确接地。
变频器输出端子和电机端子的连接确认	确认变频器输出端子（U/V/W）和电机端子的连接是否牢固。
和变频器控制回路端子的连接确认	请确认变频器的控制回路端子和其他控制装置的连接是否牢靠。
变频器控制端子的状态确认	请确认变频器控制回路端子是否都处于 OFF 状态（变频器不运行状态）。
负载确认	请确认电机是否为空载状态，未与机械系统连接。

5.4 接通电源后显示状态确认

接通电源后，正常状态下的操作器显示如下所示。

状态	显示	说明
正常时		出厂默认显示为数字设定 50.00Hz
故障时		故障时变频器处停机状态，显示故障类型

5.5 参数初始化

可将变频器的设定恢复到出厂设定，初始化后，PP-01 自动归零。

PP-01	参数初始化		出厂值	0
	设定范围	0	无操作	
		1	恢复出厂参数，不包括电机参数	
		2	清除记录信息	
		4	备份用户当前参数	
		501	恢复用户备份参数	

1：恢复出厂设定值，不包括电机参数

设置 PP-01 为 1 后，变频器功能参数大部分都恢复为厂家出厂参数，但是电机参数、频率指令小数点（P0-22）、故障记录信息、累计运行时间（P7-09）、累计上电时间（P7-13）、累计耗电量（P7-14）、逆变器模块散热器温度（P7-07）不恢复。

2：清除记录信息

清除变频器故障记录信息、累计运行时间（P7-09）、累计上电时间（P7-13）、累计耗电量（P7-14）。

4：备份用户当前参数

备份当前用户所设置的参数。将当前所有功能参数的设置值备份下来。

以方便客户在参数调整错乱后恢 复。

501：恢复用户备份参数

恢复之前备份的用户参数，即恢复通过设置 PP-01 为 4 所备份参数。

5.6 电机控制方式选择依据

参数	说明	应用场合
P0-01：选择电机控制方式	设置为 0：无速度传感器矢量控制（SVC）	指开环矢量控制，适用于通常的高性能控制场合，一台变频器只能驱动一台电机。如机床、离心机、拉丝机、注塑机等负载。
	设置为 1：有速度传感器矢量控制（FVC）	指闭环矢量控制，电机端必须加装编码器，变频器必须选配与编码器同类型的 PG 卡。适用于高精度的速度控制或转矩控制的场合。一台变频器只能驱动一台电机。如高速造纸机械、起重机械、电梯等负载。
	设置为 2：V/F 控制（速度开环控制）	适用于对负载要求不高，或一台变频器拖动多台电机的场合，如风机、泵类负载。可用于一台变频器拖动多台电机的场合。

5.7 频率指令选择

P0-03	主频率指令选择		出厂值	0
	设定范围	0	数字设定（预置频率 P0-08，UP/DOWN 可修改，掉电不记忆）	
		1	数字设定（预置频率 P0-08，UP/DOWN 可修改，掉电记忆）	
		2	AI1	
		3	AI2	
		4	AI3	
		5	脉冲设定 (DI5)	
		6	多段指令	
		7	PLC	
		8	PID	
		9	通讯给定	

5.7.1 操作面板数字设定

1） 设置 P0-03 = 0：数字设定（掉电不记忆）

设定频率初始值为 P0-08 “预置频率”的值。可通过键盘的▲键与▼ 键（或多功能输入端子的 UP、DOWN）来改变变频器的设定频率值。变频器掉电后并再次上电时，设定频率值恢复为 P0-08 “数字设定预置频率”值。

2） 设置 P0-03 = 1：数字设定（掉电记忆）

变频器掉电后并再次上电时，设定频率为上次掉电时刻的设定频率，通过键盘▲、▼ 键或者端子 UP、DOWN 的修正量被记忆。

5.7.2 模拟量输入（AI）

YD580E 控制板提供 2 个模拟量输入端子（AI1，AI2），选件 I/O 扩展卡可提供另外 1 个模拟量 输入端子（AI3）。

表 5-1 模拟量（AI）端子特性说明

端子	名称	类型	输入范围	输入阻抗
AI1-GND【1】	控制板模拟量输入端子 1	电压型	DC 0V~10V	22kΩ
AI2-GND【1】	控制板模拟量输入端子 2	电压型【2】	DC 0V~10V	22kΩ
		电流型【2】	0mA~20mA	通过 J10 阻抗 500Ω 或者 250Ω 可调
AI3-GND	IO 扩展卡模拟量输入端子	电压型	DC -10V~10V	-

【1】端子接线请参考“第 3 章 图 3-19”；

【2】通过控制板上的 J9 跳线可以选择 AI2 是电压型输入还是电流型输入。

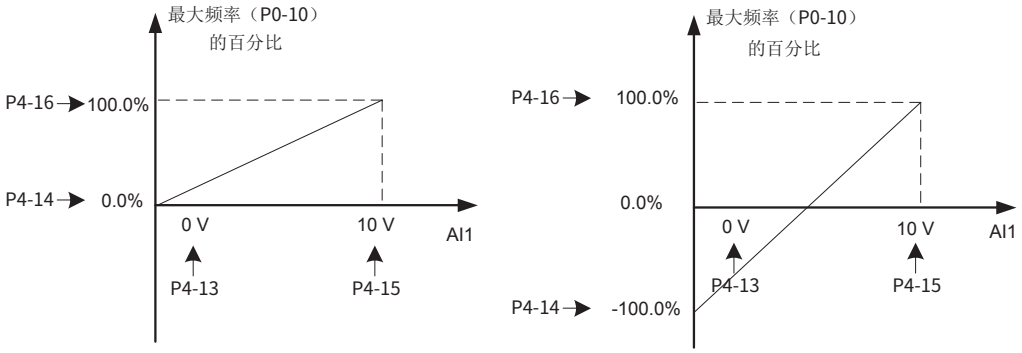
表 5-2 模拟量（AI）作为频率指令时的设置步骤

设置步骤	相关参数	说明	
AI 端子选择： 根据端子特性选择频率指令的 AI 输入端子	P0-03	P0-03 = 2	选择使用 AI1
		P0-03 = 3	选择使用 AI2
		P0-03 = 4	选择使用 AI3
AI 电压【1】与频率对应曲线选择： 分别选择 5 种曲线中的任意一个	P4-33	一般使用默认值 P4-33 = 321， AI1 使用曲线 1，AI2 使用曲线 2， AI3 使用曲线 3。	
AI 电压【1】与频率对应曲线设定： 设定 AI 电压的输入与设定量的对应关系	P4-13 ～ P4-16【2】	曲线 1 设置	典型设置曲线【3】
	P4-18 ～ P4-21	曲线 2 设置	典型设置曲线【4】
	P4-23 ～ P4-27	曲线 3 设置	典型设置曲线【5】
	A6-00 ～ A6-07	曲线 4 设置	参见 6.2.3 章节相关说明
	A6-08 ～ A6-15	曲线 5 设置	
	P4-34	AI 低于最小输入设定选择【2】	
	P0-10	AI 作为频率给定时，电压 / 电流输入对应设定的 100.0%，是相对最大频率 P0-10。	
AI 滤波时间	P4-17	默认 0.1s，根据快速响应要求及现场信号的干扰设置该参数，需要快速响应的应减小该参数，现场干扰大的应增大该滤波时间。	

【1】电流型的模拟量输入曲线设置时， 1mA 电流相当于 0.5V 电压，即 20mA 对应于 10V。

【2】当模拟量输入的电压大于所设定的“最大输入”（P4-15）时，则模拟量电压按照“最大输入”计算；同理，当模拟输入电压小于所设定的“最小输入”（P4-13）时，则根据“AI 低于最小输入设定选择” (P4-34) 的设置，以最小输入或者 0.0% 计算。

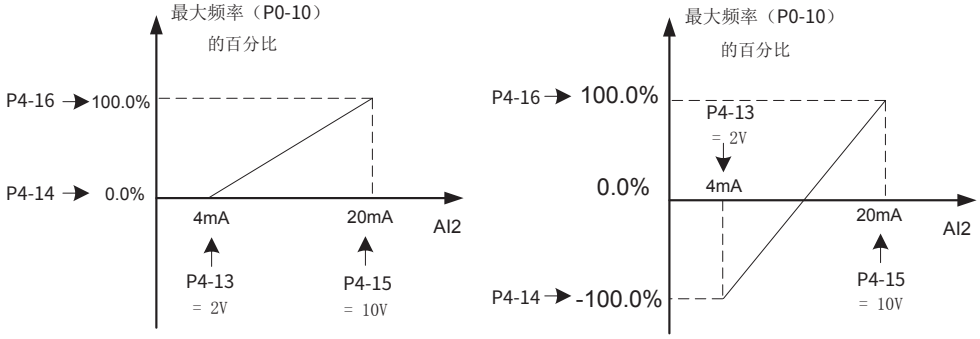
【3】AI1 的典型设置曲线如下图所示。



频率给定没有负值时的设置（默认设置）　　频率给定有负值的设置

图 5-5 AI1 的典型设置曲线

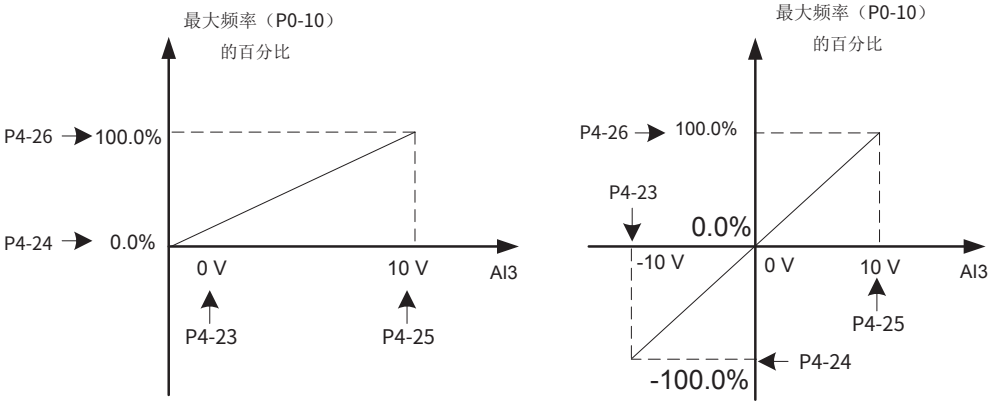
【4】AI2 用作电压输入时典型设置曲线与 AI1 一致，用作电流型时，一般设置 4 ～ 20mA 对应 0 ～ 50Hz 或者 -50 ～ 50Hz。



频率给定没有负值时的设置　　频率给定有负值的设置

图 5-6 AI2 的典型设置曲线

【5】AI3 的典型设置曲线如下图所示，两种设置方式在 0V ～ 10V 之间的对应关系完全一致，但是在输入负电压时，左图所示的设置方法会限制电压到 0V（最小电压 P4-24）。



频率给定没有负值时的设置（默认设置）　　频率给定有负值的设置

图 5-7 AI3 的典型设置曲线

5.7.3 数字脉冲输入（DI5）

频率给定通过端子 DI5 高速脉冲来给定。

脉冲给定信号规格：电压范围 9V ～ 30V、频率范围 0kHz ～ 100kHz。

表 5-3 数字脉冲输入（DI5）作为频率指令的设置步骤

设置步骤	相关参数	说明
选择数字脉冲输入（DI5）作为频率指令	P0-03 P4-04	设 置 P0-03 = 5，将主频率指令选择为“脉冲设定（DI5）” 设 置 P4-04 = 30，将 D15 端子功能选择为“脉冲频率输入”
设置脉冲频率与设定频率的对应关系曲线	P4-28 ～ P4-31	典型设置曲线【1】
	P0-10	数字脉冲作为频率给定时，对应设定的 100.0%，是相对最大频率 P0-10。
设置设定频率的滤波时间	P4-32	设定频率的滤波时间

【1】数字脉冲输入作为频率指令时典型的设置曲线如下图所示：

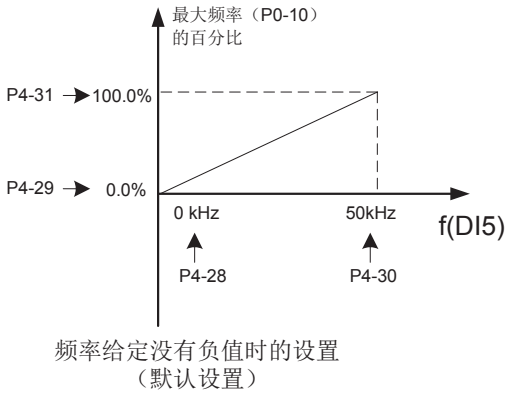


图 5-8 DI5 作为频率指令时典型设置曲线

5.7.4 主频率通讯给定

YD580E 安装通讯卡（选配）可实现 4 种上位机通讯方式：Modbus、Proibus-DP、CANopen 和 CANlink。可通过 P0-28设置不同的通讯方式，详见如下表，其中 CANlink 始终有效，无需设置。选配卡具体内容详见“第十一章 选配卡”，用户可根据需要自行选择。

设置步骤	相关参数	说明	
频率指令选择通讯给定	P0-03	P0-03=9	
选择通讯方式	P0-28	使用 MODBUS 通讯	P0-28 = 0
		使用 Profibus-DP 通讯	P0-28 = 1
		使用 CANopen 通讯	
CANlink 始终有效，无需设置。各通讯方式的相关参数设置请参见《第 6 章 6.10 通讯》			

5.7.5 多段速指令

选择多段指令运行方式时，需要通过数字量输入 DI 端子的不同状态组合，对应不同的设定频率值。

表 5-4 多段速作为频率指令时的设置步骤

设置步骤	相关参数	说明	
选择多段速指令作为频率指令	P0-03	P0-03= 6	
确定需要多段速的段数	无	最多可支持 16 段速，需要运用 4 个 DI 端子。多段速的段数与 DI 端子数的对应关系为： 2 段速：1 个 DI 端子 K1 3-4 段速：2 个 DI 端子 K1、K2 5-8 段速：3 个 DI 端子 K1、K2、K3 9-16 段速：4 个 DI 端子 K1、K2、K3、K4	
设置 DI 端子为多段速功能	P4-00 ～ P4-09	多段指令端子 K1	设置为 12
		多段指令端子 K2	设置为 13
		多段指令端子 K3	设置为 14
		多段指令端子 K4	设置为 15
设置各多段速对应的频率【注】	PC-00 ～ PC-15	各段速度对应的频率设置，以百分比设置，100% 对应最大频率 P0-10。	
	P0-10	当频率指令选择为多段速时，参数 PC-00~PC-15 的 100.0%，对应最大频率 P0-10。	

【注】 4 个多段指令端子，可以组合为 16 种状态，这 16 个状态对应 16 个指令设定值。具体如下表所示：

表 5-5 多段速指令功能的端子组合说明

K4	K3	K2	K1	指令设定	对应最大频率百分比
OFF	OFF	OFF	OFF	多段指令 0	PC-00
OFF	OFF	OFF	ON	多段指令 1	PC-01
OFF	OFF	ON	OFF	多段指令 2	PC-02
OFF	OFF	ON	ON	多段指令 3	PC-03
OFF	ON	OFF	OFF	多段指令 4	PC-04
OFF	ON	OFF	ON	多段指令 5	PC-05
OFF	ON	ON	OFF	多段指令 6	PC-06
OFF	ON	ON	ON	多段指令 7	PC-07
ON	OFF	OFF	OFF	多段指令 8	PC-08
ON	OFF	OFF	ON	多段指令 9	PC-09
ON	OFF	ON	OFF	多段指令 10	PC-10
ON	OFF	ON	ON	多段指令 11	PC-11
ON	ON	OFF	OFF	多段指令 12	PC-12
ON	ON	OFF	ON	多段指令 13	PC-13
ON	ON	ON	OFF	多段指令 14	PC-14
ON	ON	ON	ON	多段指令 15	PC-15

5.8 启动和停机命令

P0-02	命令指令选择		出厂值	0
	设定范围	0	操作面板（LED 灭）	
		1	端子（LED 亮）	
		2	通讯（LED 闪烁）	

选择变频器控制命令的输入通道。变频器控制命令包括：启动、停机、正转、反转、点动等。

0：操作面板命令通道（“LOCAL/REMOT”灯灭）；

由操作面板上的 RUN、STOP/RES 按键进行运行命令控制。

1：端子命令通道（“LOCAL/REMOT”灯亮）；

由多功能输入端子功能 FWD、REV、JOGF、JOGR 等，进行运行命令控制。

2：通讯命令通道（“LOCAL/REMOT”灯闪烁）

5.8.1 操作面板启停

由操作面板上的 RUN、STOP/RES 按键进行运行命令控制，操作器上的“LOCAL/REMOT”为灯灭状态。按键说明请参考“第 4 章 面板操作”。

5.8.2 端子启停（DI）

P4-11	端子命令方式		出厂值	0
	设定范围	0	两线式 1	
		1	两线式 2	
		2	三线式 1	
		3	三线式 2	

该参数定义了通过外部端子控制变频器运行的四种不同方式。

为方便说明，下面任意选取 DI1 ～ DI10 的多功能输入端子中的 DI1、DI2、DI3 三个端子作为外部端子。即通过设定 P4-00 ～ P4-02 的值来选择 DI1、DI2、DI3 三个端子的功能，详细功能定义见 P4-00 ～ P4-09 的设定范围。

0：两线式模式 1：此模式为最常使用的两线模式。由端子 DI1、DI2 来决定电机的正、反转运行。

参数设定如下：

参数	名称	设定值	功能描述
P4-11	端子命令方式	0	两线式 1
P4-00	DI1 端子功能选择	1	正转运行 (FWD)
P4-01	DI2 端子功能选择	2	反转运行 (REV)

K1	K2	运行命令
1	0	正转
0	1	反转
1	1	停止
0	0	停止

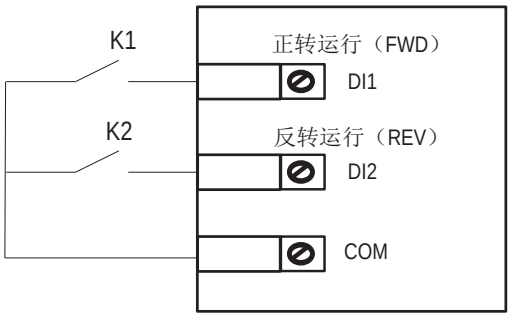


图 5-9 两线式模式 1

如上图所示，该控制模式下，K1 闭合，变频器正转运行。K2 闭合反转，K1、K2 同时闭合或者断开，变频器停止运转。

1：两线式模式 2：用此模式时 DI1 端子功能为运行使能端子，而 DI2 端子功能确定运行方向。

参数设定如下：

参数	名称	设定值	功能描述
P4-11	端子命令方式	1	两线式 2
P4-00	DI1 端子功能选择	1	运行使能
P4-01	DI2 端子功能选择	2	正反运行方向

K1	K2	运行命令
1	0	正转
1	1	反转
0	0	停止
0	1	停止

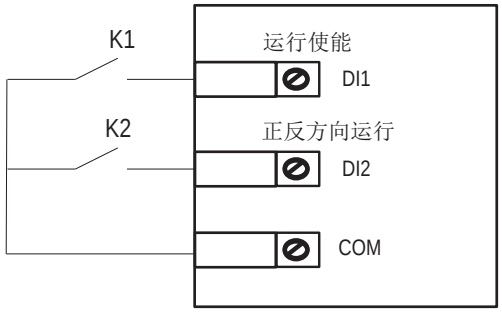


图 5-10 两线式模式 2

如上图所示，该控制模式在 K1 闭合状态下，K2 断开变频器正转，K2 闭合变频器反转；K1 断开，变频器停止运转。

2：三线式控制模式 1：此模式 DI3 为使能端子，方向分别由 DI1、DI2 控制。

参数设定如下：

参数	名称	设定值	功能描述
P4-11	端子命令方式	2	三线式 1
P4-00	DI1 端子功能选择	1	正转运行 (FWD)
P4-01	DI2 端子功能选择	2	反转运行 (REV)
P4-02	DI3 端子功能选择	3	三线式运行控制

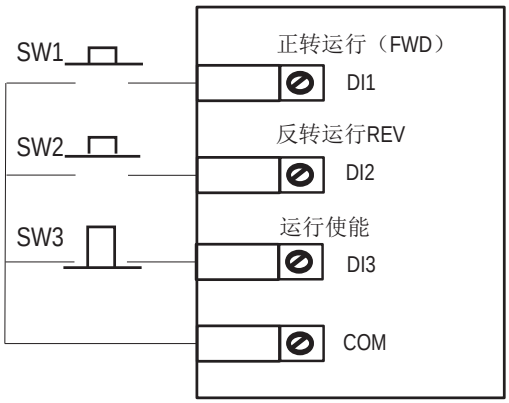


图 5-11 三线式控制模式 1

如上图所示，该控制模式在 SW3 按钮闭合状态下，按下 SW1 按钮变频器正转，按下 SW2 按钮变频器反转，SW3 按钮断开瞬间变频器停机。正常启动和运行中，必需保持 SW3 按钮闭合状态，SW1、SW2 按钮的命令则在闭合动作沿即生效，变频器的运行状态以该 3 个按钮最后的按键动作为准。

3: 三线式控制模式 2: 此模式的 DI3 为使能端子，运行命令由 DI1 来给出，方向由 DI2 的状态来决定。

参数设定如下：

参数	名称	设定值	功能描述
P4-11	端子命令方式	3	三线式 2
P4-00	DI1 端子功能选择	1	运行使能
P4-01	DI2 端子功能选择	2	正反运行方向
P4-02	DI3 端子功能选择	3	三线式运行控制

K	运行方向
0	正转
1	反转

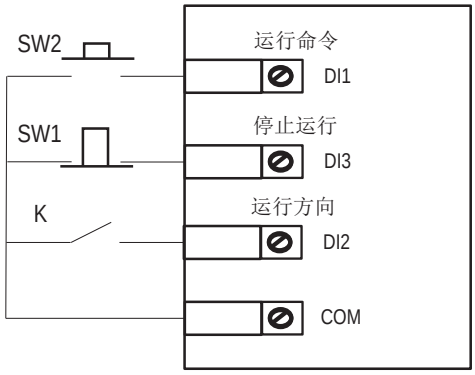


图 5-12 三线式控制模式 2

如上图所示，该控制模式在 SW1 按钮闭合状态下，按下 SW2 按钮变频器运行，K 断开变频器正转，K 闭合变频器反转；SW1 按钮断开瞬间变频器停机。正常启动和运行中，必需保持 SW1 按钮闭合状态，SW2 按钮的命令则在闭合动作沿即生效。

5.8.3 通讯启停

通讯启停是指运行命令由上位机通过通讯方式给出，YD580E需要安装通讯卡（选配）可实现与上位机通讯。通过 P0-28 设置不同的通讯方式，详见如下表，其中 CANlink 始终有效，无需设置。选配卡具体内容详见第 11 章《选配卡》，用户可根据需要自行选择。

设置步骤	相关参数	说明	
频率指令选择通讯给定	P0-02	P0-02 = 2	
选择通讯方式	P0-28	使用 MODBUS 通讯	P0-28 = 0
		使用 Profibus-DP 通讯	P0-28 = 1
		使用 CANopen 通讯	P0-28 = 1
CANlink 始终有效，无需设置。各通讯方式的相关参数设置请参见《第 6 章 6.10 通讯》			

5.9 启动过程设置

5.9.1 启动方式选择

P6-00	启动方式		出厂值	0
	设定范围	0	直接启动	

0：直接启动

若启动直流制动时间设置为 0，则变频器从启动频率开始运行。若启动直流制动时间不为 0，则先直流制动，然后再从启动频率开始运行。适用小惯性负载，在启动时电机可能有转动的场合。

适用于大多数小惯性负载，启动过程频率曲线如下图。其启动前的“直流制动”功能适用于电梯、起重型负载的驱动；“启动频率”适用于需要启动力矩冲击启动的设备驱动，如水泥搅拌机设备。

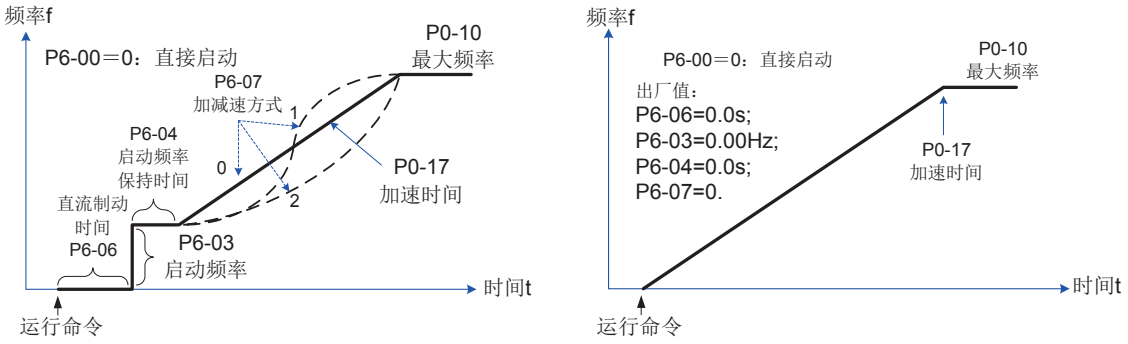


图 5-13 直接启动方式

5.9.2 启动频率

P6-03	启动频率	出厂值	0.00Hz
	设定范围	0.00Hz ～ 10.00Hz	
P6-04	启动频率保持时间	出厂值	0.0s
	设定范围	0.0s ～ 100.0s	

为保证启动时的电机转矩，请设定合适的启动频率。为使电机启动时充分建立磁通，需要启动频率保持一定时间。

启动频率 P6-03 不受下限频率限制。但是设定目标频率小于启动频率时，变频器不启动，处于待机状态。

启动频率保持时间不包含在加速时间内，但包含在简易 PLC 的运行时间里。

5.10 停机过程设置

变频器的停机模式有 2 种，分别为减速停车、自由停车，由参数 P6-10 选择。可以选择在停机结束段是否使用直流制动功能。

5.10.1 停机方式选择

P6-10	停机方式	出厂值	0
	设定范围	0	减速停车
		1	自由停车

0：减速停车

停机命令有效后，变频器按照减速时间降低输出频率，频率降为 0 后停机。

1：自由停车

停机命令有效后，变频器立即终止输出，此时电机按照机械惯性自由停车。

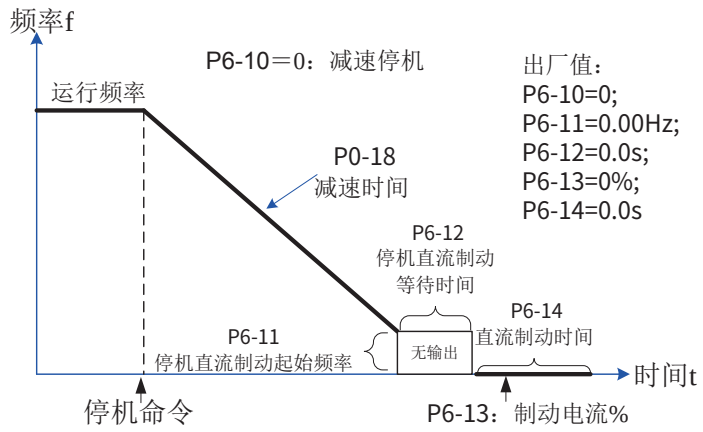


图 5-16 减速停车

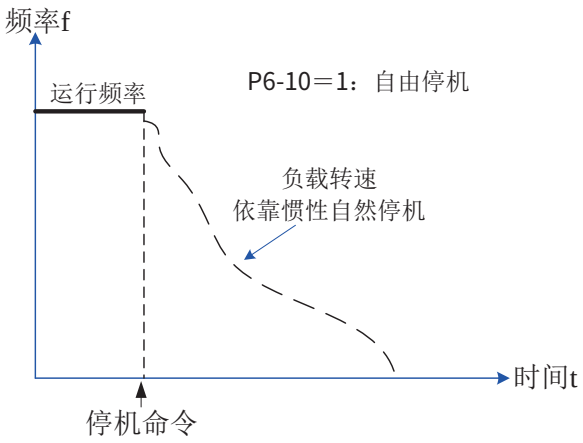


图 5-17 自由停车

5.10.2 停机直流制动

参数	功能定义	出厂值	设定范围	参数说明
P6-11	停机直流制动起始频率	0.00Hz	0.00Hz~ 最大频率	减速停机过程中，当运行频率降低到到该频率时，开始直流制动过程。
P6-12	停机直流制动等待时间	0.0s	0.0s~ 100.0s	在运行频率降低到停机直流制动起始频率后，变频器先停止输出一段时间，然后再开始直流制动过程。用于防止在较高速度时开始直流制动可能引起的过流等故障。
P6-13	停机直流制动电流	50%	0%~ 100%	停车直流制动电流，相对基值有两种情形。 1) 当电机额定电流小于或等于变频器额定电流的 80% 时，是相对电机额定电流为百分比基值。 2) 当电机额定电流大于变频器额定电流的 80% 时，是相对 80% 的变频器额定电流为百分比基值。
P6-14	停机直流制动时间	0.0s	0.0s~ 100.0s	直流制动量保持的时间。此值为 0 则直流制动过程被取消。

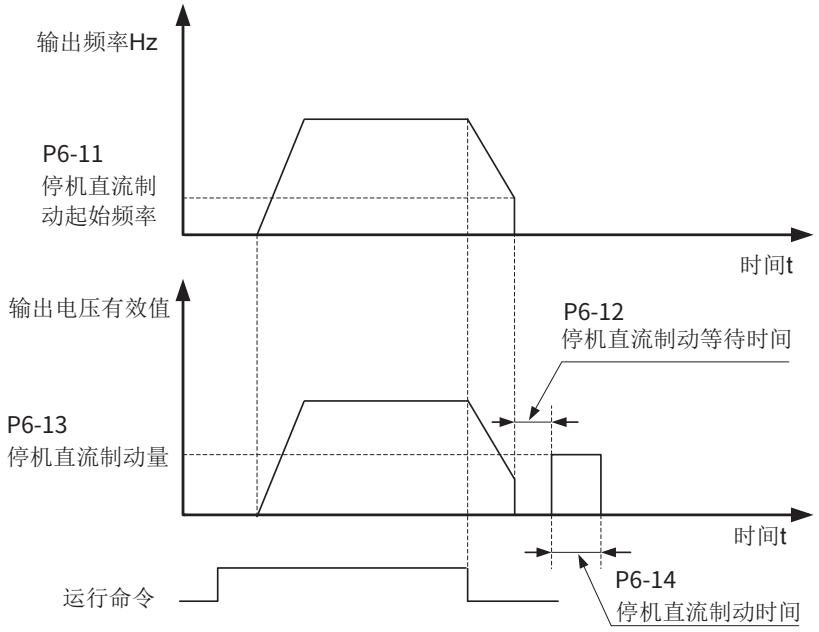


图 5-18 停机直流制动过程示意图

5.11 加减速时间设置

P0-17	加速时间 1	出厂值	机型确定
	设定范围	0.00s ～ 650.00s（P0-19=2） 0.0s ～ 6500.0s（P0-19=1） 0s ～ 65000s（P0-19=0）	
P0-18	减速时间 1	出厂值	机型确定
	设定范围	0.00s ～ 650.00s（P0-19=2） 0.0s ～ 6500.0s（P0-19=1） 0s ～ 65000s（P0-19=0）	
P0-25	加减速时间基准频率	出厂值	0
	设定范围	0	最大频率（P0-10）
		1	设定频率
		2	100Hz

加速时间指变频器从零频，加速到加减速基准频率 (P0-25 确定) 所需时间，见图 5-19 中的 t1。

减速时间指变频器从加减速基准频率 (P0-25 确定)，减速到零频所需时间，见图 5-19 中的 t2。

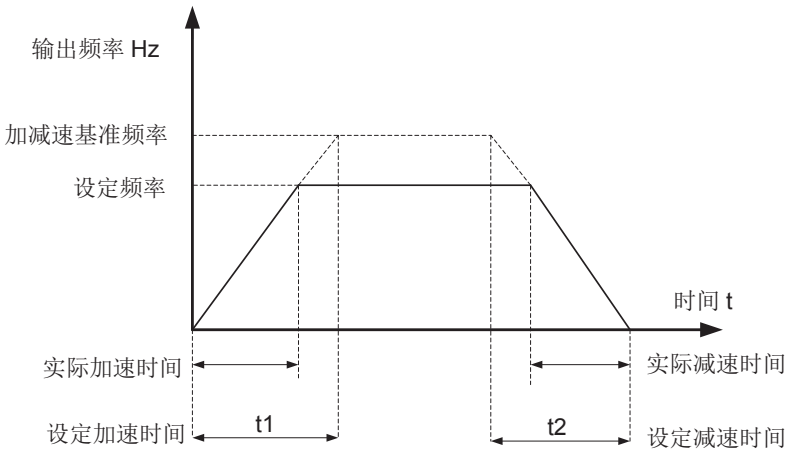


图 5-19 加减速时间示意图

YD580E 提供 4 组加减速时间，用户可利用数字量输入端子 DI 切换选择（端子功能 16、17）， 四组加减速时间通过如下参数设置：

第一组：P0-17、P0-18；

第二组：P8-03、P8-04；

第三组：P8-05、P8-06；

第四组：P8-07、P8-08。

P0-19	加减速时间单位		出厂值	1
	设定范围	0	1 秒	
		1	0.1 秒	
		2	0.01 秒	

为满足各类现场的需求，YD580E 提供 3 种加减速时间单位，分别为 1 秒、0.1 秒和 0.01 秒。

NOTE

- 修改该功能参数时，4 组加减速时间所显示小数点位数会变化，所对应的加减速时间也发生变化，应用过程中要特别留意。

5.12 观察运行状态

5.12.1 数字量输出 DO

控制板自带 3 路 DO 输出，分别为 FM、DO1、TA/TB/TC，其中 FM、DO1 为晶体管型输出，可驱动 24Vdc 低压信号回路，TA/TB/TC 则为继电器输出，可驱动 250Vac 控制回路。

通过外接扩展卡可以扩展 2 路输出，分别为 DO2、PA/PB/PC，其中 DO2 为晶体管输出，PA/PB/PC 为继电器输出。

通过设置功能参数 P5-01 到 P5-04 的值可以定义各路 DO 输出功能，可以用于指示变频器的各种工作状态、各种告警，共有约 40 个功能设定，以便用户实现特定的自动控制要求。具体设定值请参考“6.9.2 数字输出端子功能（DO）”详细说明。

端口名称	对应参数	输出特性说明
FM-COM	P5-00=0 时，P5-06	晶体管，可输出高频脉冲 10Hz ～ 100kHz；驱动能力：24Vdc， 50mA
	P5-00=1 时，P5-01	晶体管；驱动能力：24Vdc， 50mA
TA-TB-TC	P5-02	继电器；驱动能力：250Vac，3A
PA-PB-PC	P5-03	扩展卡 , 继电器；驱动能力：250Vac，3A
DO1-CME	P5-04	晶体管；驱动能力：24Vdc，50mA
DO2-CME	P5-05	扩展卡 , 晶体管；驱动能力：24Vdc，50mA

当 P5-00=0 时，FM 端口为高速脉冲输出工作模式，以输出脉冲的频率来指示内部运行参数的数值，读数越大，输出脉冲频率越高，100%读数时，对应 P5-09 中设定的 FMP 输出最大频率。至于所要指示内部参数的属性，由 P5-06 参数定义。

5.12.2 模拟量输出 AO

变频器共支持 2 路 AO 输出，其中 AO1 为控制板自带，AO2 需要外接扩展。AO1、AO2 可用于模拟量方式指示内部运行参数，所指示的参数属性可通过参数 P5-07、P5-08 来选择。

端口	输入信号特性
AO1-GND	J7 短接“V”标识位置，可输出 0 ～ 10Vdc 信号
	J7 短接“I”标识位置，可输出 0 ～ 20mA 电流信号
AO2-GND	该端口在扩展板提供，可输出 0 ～ 10Vdc 信号

P5-10	AO1 零偏系数	出厂值	0.0%
	设定范围	-100.0% ～ +100.0%	
P5-11	AO1 增益	出厂值	1.00
	设定范围	-10.00 ～ +10.00	
P5-12	扩展卡 AO2 零偏系数	出厂值	0.00%
	设定范围	-100.0% ～ +100.0%	
P5-13	扩展卡 AO2 增益	出厂值	1.00
	设定范围	-10.00 ～ +10.00	

上述参数可以用于自定义所需要的 AO 输出曲线。

若零偏用“b”表示，增益用 k 表示，实际输出用 Y 表示，标准输出用 X 表示，则实际输出为：

Y=kX ＋ b。

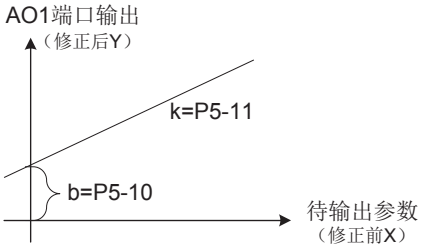


图 5-20 AO 信号修正特性曲线

其中，AO1、AO2 的零偏系数 100% 对应 10V（或者 20mA），标准输出是指在无零偏及增益修正下，输出 0V ～ 10V（或者 0mA ～ 20mA）对应模拟输出表示的量。

例如，若模拟输出内容为运行频率，希望频率为 0Hz 时，修正后输出 8V，频率为 40Hz 时，修正后输出 4V。则 AO1 增益（P5-11）应该设为 -0.5，AO1 零偏系数（P5-10）应该设为 80%。

5.13 自学习

让变频器获得被控电机内部电气参数的方法有：空载调谐、带载调谐等方式。

调谐方式	适用情况	调谐效果
空载动态调谐 P1-37 = 12	电机与应用系统方便脱离的场合	最佳
带载动态调谐 P1-37 = 12	电机与应用系统不方便脱离的场合，但可以带着负载一起运行。负载的摩擦力较小，恒速运行时接近空载。	摩擦力越小，效果越好

电机参数自动调谐步骤如下：

以下以默认电机 1 的参数调谐方法为例进行讲解，电机 2 的调谐方法与之相同，只是参数号要作针对性的改变。

第一步：如果是电机可和负载完全脱开，在断电的情况下，从机械上将电机与负载部分脱离，让电机能空载自由转动。

第二步：上电后，首先将变频器命令指令（P0-02）选择为操作面板命令通道。

第三步：准确输入电机的铭牌参数（如 P1-00 ～ P1-05），请按电机实际参数输入下面的参数（根据当前电机选择）：

电机选择	参　数
电机 1	P1-00：电机类型选择　P1-01：电机额定功率 P1-02：电机额定电压　P1-03：电机额定电流 P1-04：电机额定频率　P1-05：电机额定转速
电机 2	A2-00 ～ A2-05: 与上述定义相同

如有编码器，输入编码器参数（P1-27、P1-28、P1-30）。
第四步：如果是同步电机，则 P1-37（调谐选择，电机 2 则对应为 A2-37 参数）请选择 12（同步机空载调谐），按 ENTER 键确认，此时，键盘显示 TUNE，如下图所示：

然后按键盘面板上 RUN 键，变频器会驱动电机加减速、正反转运行，运行指示灯点亮，调谐运行持续时间约 2 分钟，当上述显示信息消失，退回正常参数显示状态，表示调谐完成。

经过该完整调谐，变频器会自动算出电机的下列参数：

同步电机选择	参　数
电机 1	P1-16：同步电机定子电阻　P1-17：同步电机D轴电感 P1-18：同步电机Q轴感抗　P1-20：同步电机反电动势
电机 2	A2-16 ～ A2-20：定义同上

如果电机不可和负载完全脱开，则 P1-37（电机 2 为 A2-37）请选择 11（同步机带载调谐 ），然后按键盘面板上 RUN 键，开始电机参数的调谐操作。

第六章 参数说明

6.1 运行指令设定方法

运行指令用于控制变频器的启动、停止、正转、反转、点动运行等。运行指令有 3 种方式，分别是操作面板、端子、通讯。设定参数 P0-02，选择运行指令的输入方式。

参数	功能定义	出厂值	设定范围	参数说明
P0-02	运行指令选择	0	0	操作面板
			1	端子
			2	通讯

1） 通过“操作面板”设定运行指令

设置参数 P0-02=0，用操作面板上的 RUN 键、STOP RES 键进行变频器的运行命令控制。按下键盘上 RUN 键，变频器即开始运行（RUN 指示灯点亮）；在变频器运行的状态下，按下键盘上 STOP RES 键，变频器即停止运行（RUN 指示灯熄灭）。关于“操作面板”详细操作，请参照“第 4 章 面板使用”。

2） 通过“端子”设定运行指令

设置参数 P0-02=1，用端子控制变频器的启动、停止。

设定参数 P4-11=0/1/2/3，设置端子命令的控制方式。端子的命令方式有四种，分别是两线式 1、两线式 2、三线式 1、三线式 2。

参数	功能定义	出厂值	设定范围	参数说明
P4-11	端子命令方式	0	0：两线式 1 1：两线式 2 2：三线式 1 3：三线式 2	通过外部端子控制变频器运行的四种不同方式

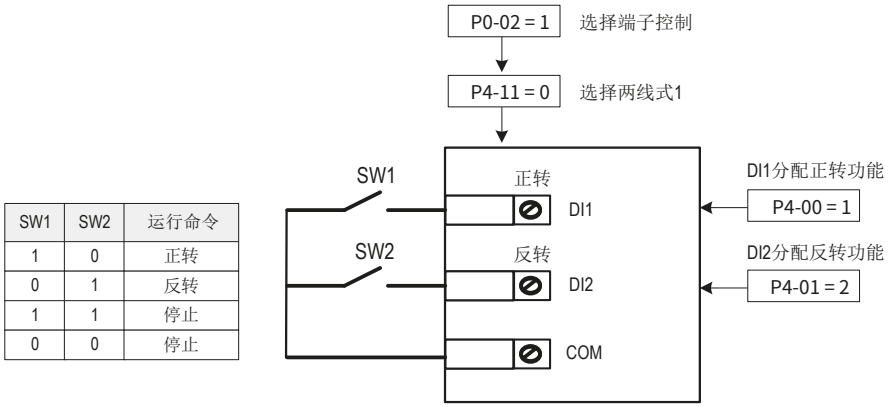
可以任意选取 DI1~DI10 的多功能输入端子作为外部输入端子。即通过设定 P4-00~P4-09 的值来选择 DI1~ DI10 输入端子的功能，详细功能定义参考“附录 A或B 功能参数表”中 P4-00（DI1）~ P4-09（DI10）端子功能选择。

- 两线式 1：P4-11 = 0 此模式为最常使用的两线模式。

  例如， DI1 端子分配正转运行功能，DI2 端子分配反转运行功能。将正转运行开关接 DI1 端子、反转运行开关接 DI2 端子。

相关参数	名称	设定值	功能描述
P4-11	端子命令方式	0	两线式 1
P4-00	DI1 端子功能选择	1	正转运行 (FWD)
P4-01	DI2 端子功能选择	2	反转运行 (REV)

当控制开关 SW1 闭合，SW2 断开时电机正转；当控制开关 SW1 断开，SW2 闭合时电机反转；SW1 和 SW2 都断开或者均闭合时，电机不运行。如下图所示：



SW1	SW2	运行命令
1	0	正转
0	1	反转
1	1	停止
0	0	停止

图 6-1 两线式模式 1 接线和参数设置示意图

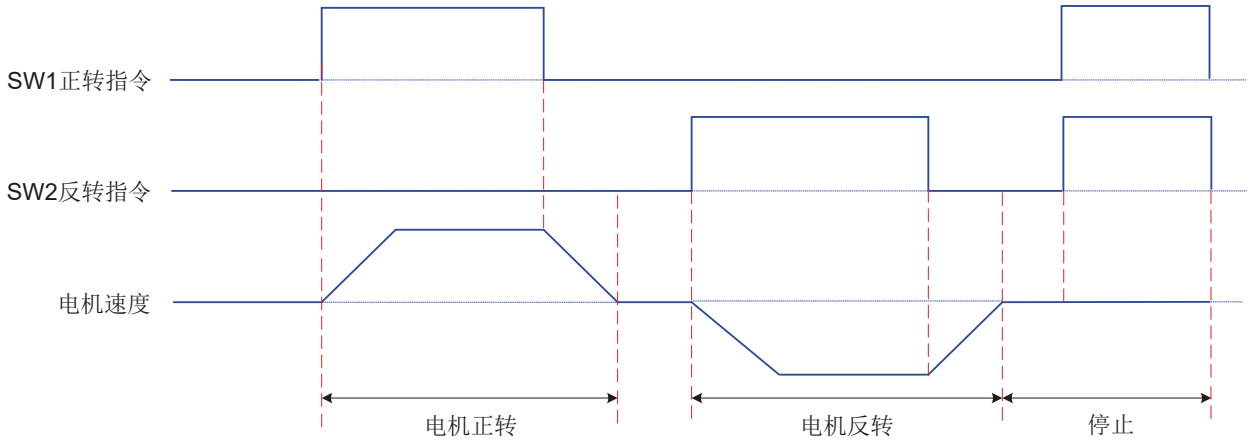


图 6-2 两线模式 1 时序图（正常情况）

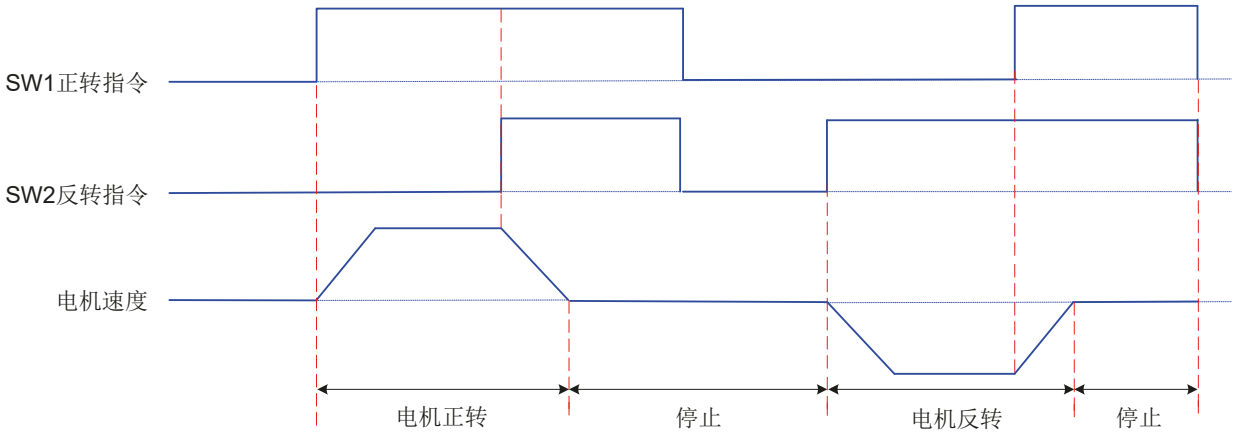


图 6-3 两线模式 1 时序图（异常情况）

● 两线式 2：P4-11 = 1

例如，DI1 端子分配运行命令功能，DI2 端子分配正反运行方向功能，使用与设置参数的方法如下表:

相关参数	名称	设定值	功能描述
P4-11	端子命令方式	1	两线式 2
P4-00	DI1 端子功能选择	1	运行命令
P4-01	DI2 端子功能选择	2	正反运行方向

当控制开关 SW1 闭合时，运行使能。SW2 断开时电机正转；SW2 闭合时电机反转。SW1 断开时，SW2 断开或者闭合电机都不运行。如下图所示：

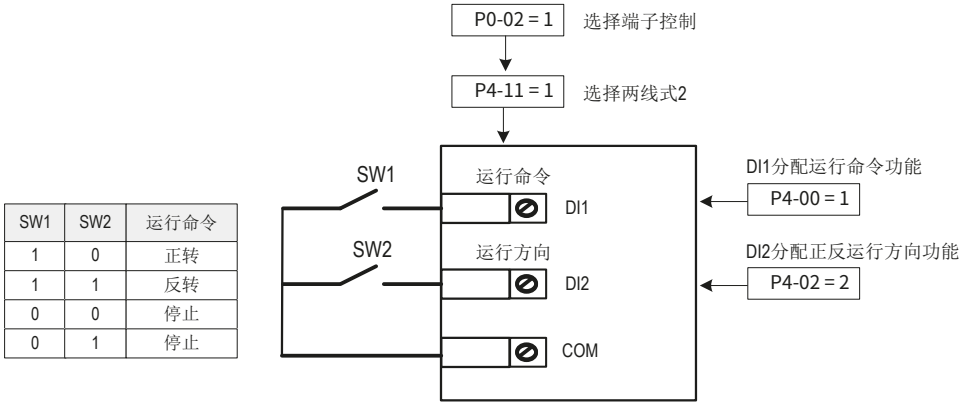


图 6-4 两线式模式 2 接线和参数设置示意图

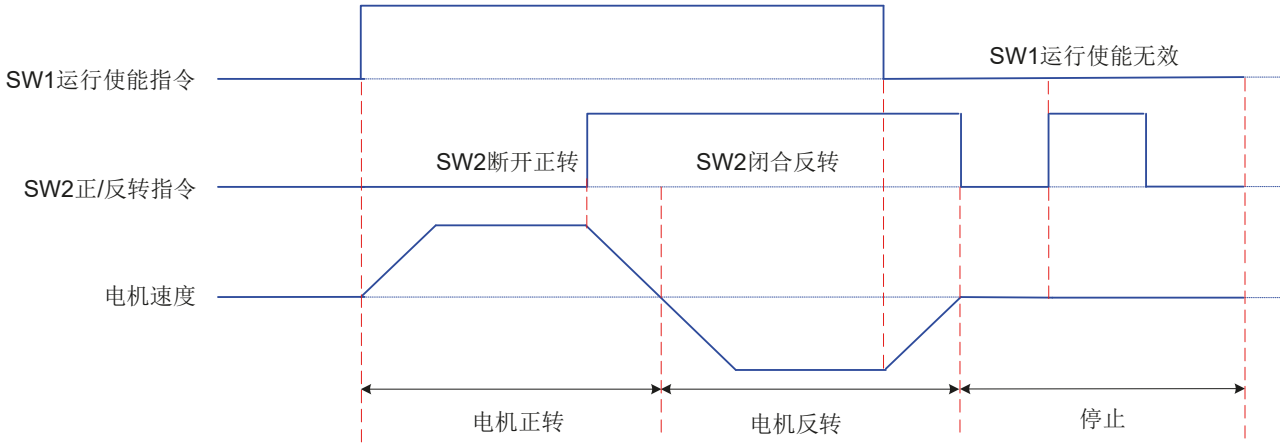


图 6-5 两线模式 2 时序图

● 三线式 1：P4-11 = 2

例如，DI3 端子分配三线式运行控制功能，DI1 端子分配正转运行功能，DI2 端子分配反转运行功能。该控制模式要求变频器用按键作为变频器起停开关，将启停按钮接 DI3 端子、正转运行按钮接 DI1 端子，反转运行按钮接 DI2 端子。使用与设置参数的方法如下表：

相关参数	名称	设定值	功能描述
P4-11	端子命令方式	2	三线式 1
P4-00	DI1 端子功能选择	1	正转运行 (FWD)
P4-01	DI2 端子功能选择	2	反转运行 (REV)
P4-02	DI3 端子功能选择	3	三线式运行控制

SW3 为常闭按钮，SW1、SW2 为常开按钮。当 SW3 按钮闭合时，按下 SW1 按钮变频器正转，按下 SW2 按钮变频器反转，SW3 按钮断开瞬间变频器停机。正常启动和运行中，必需保持 SW3 按钮闭合状态，SW1、SW2 按钮的命令则在闭合动作沿立即生效。

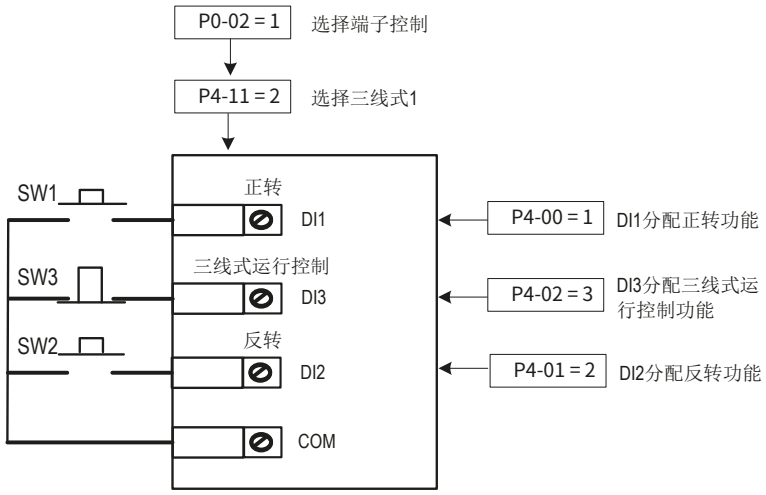


图 6-6 三线式模式 1 接线和参数设置示意图

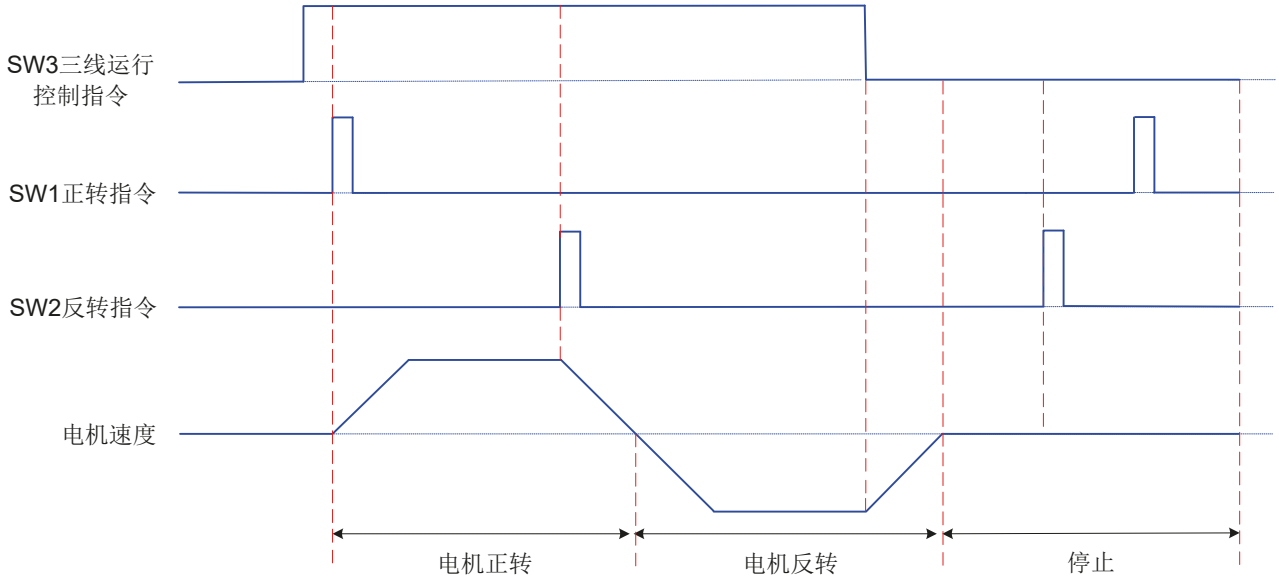


图 6-7 三线模式 1 时序图

● 三线式 2： P4-11 = 3

例如，DI3 端子分配三线式运行控制功能，DI1 端子分配运行命令功能，DI2 端子分配正 / 反运行方向功能。将启停按钮接 DI3 端子，运行使能接 DI1 端子；正 / 反转运行按钮接 DI2 端子。参数设定如下：

相关参数	名称	设定值	功能描述
P4-11	端子命令方式	3	三线式 2
P4-00	DI1 端子功能选择	1	运行命令
P4-01	DI2 端子功能选择	2	正 / 反运行方向
P4-02	DI3 端子功能选择	3	三线式运行控制

当 SW3 按钮闭合时，且按下 SW1 按钮变频器运行，如果 SW2 是断开状态，变频器正转，如果 SW2 是闭合状态，变频器反转。SW3 按钮断开瞬间变频器停机。正常的启动和运行过程中，必须保持 SW3 按钮是闭合状态，SW1 按钮的命令在闭合动作沿生效。

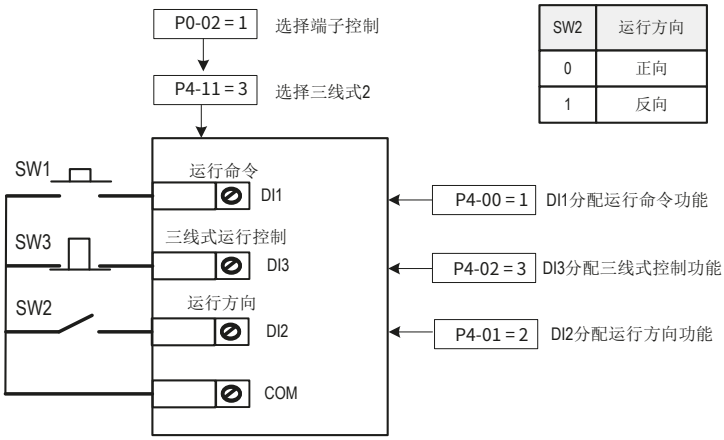


图 6-8 三线式模式 2 接线和参数设置示意图

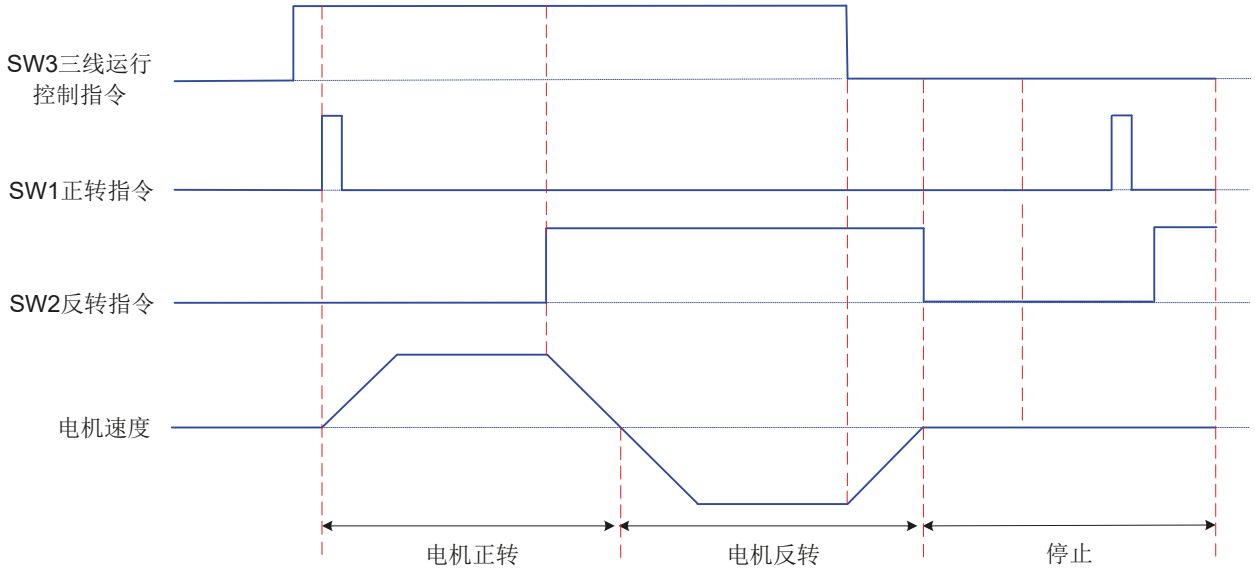


图 6-9 三线模式 2 时序图

3） 通过“通讯”设定运行指令

设置参数 P0-02=2，用通讯给定运行命令（操作面板“LOCAL/REMOT”灯闪烁）。可以实现对变频器的启动、停止等相关命令控制。

YD580E 支持 4 种上位机通讯方式：Modbus、Profibus-DP、CANopen、CANlink，这 4 种通讯不能同时使用。使用通讯时必须安装通讯卡，YD580E 的 4

种通讯卡都是选配的，用户根据需要自 行选择，如果通讯协议为 Modbus、Profibus-DP 或 CANopen，需要根据 P0-28 选择相应的串口 通讯协议。CANlink 协议始终有效。

参数	功能定义	出厂值	设定范围
P0-28	串口通讯协议选择	0	0：MODBUS 协议 1：Profibus-DP 协议或 CANOpen 协议

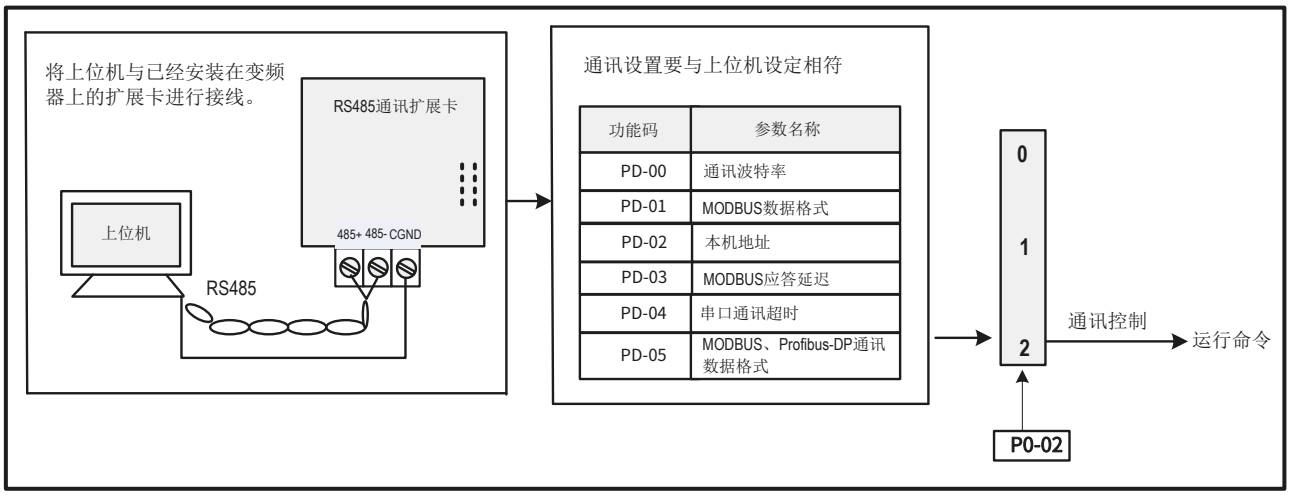


图 6-10 用通讯设定运行指令示意图

用通讯方式给定运行指令时，上位机要给变频器发送写命令。下面以 Modobus 协议为例说明用通讯给定运行指令的过程。例如，利用通讯方式让变频器反转运行时，发送写命令为 01 06 20 00 00 02 03 CB 。每一字节代表的含义如下：变频器地址：01H（可以设置）；写命令：06H；控制命令通讯地址：2000H；控制命令：02H（反转运行）；CRC 校验：03CBH。（其他通讯地址和控制命令可参考“附录 C：通讯数据地址定义与 Modbus 通讯协议）

主机命令信息		从机回应信息	
ADDR	01H	ADDR	01H
CMD	06H	CMD	06H
参数地址高位	20H	参数地址高位	20H
参数地址低位	00H	参数地址低位	00H
数据内容高位	00H	数据内容高位	00H
数据内容低位	02H	数据内容低位	02H
CRC 高位	03H	CRC 高位	03H
CRC 低位	CBH	CRC 低位	CBH

6.2 频率指令输入方法

频率指令的输入方法有四种，即选择主频率指令、选择辅助频率指令、选择主辅频率指令叠加、和选择命令源绑定主频率指令。

6.2.1 选择主频率指令的输入方法

设定参数 P0-03，选择主频率指令的输入。
变频器的主频率指令共有 10 种，
分别为数字设定 (掉电不记忆)、
数字设定 (掉电记忆)、
AI1、AI2、AI3 等模拟量输入、
脉冲输入、
多段指令、
简易 PLC、
PID、
通讯给定。

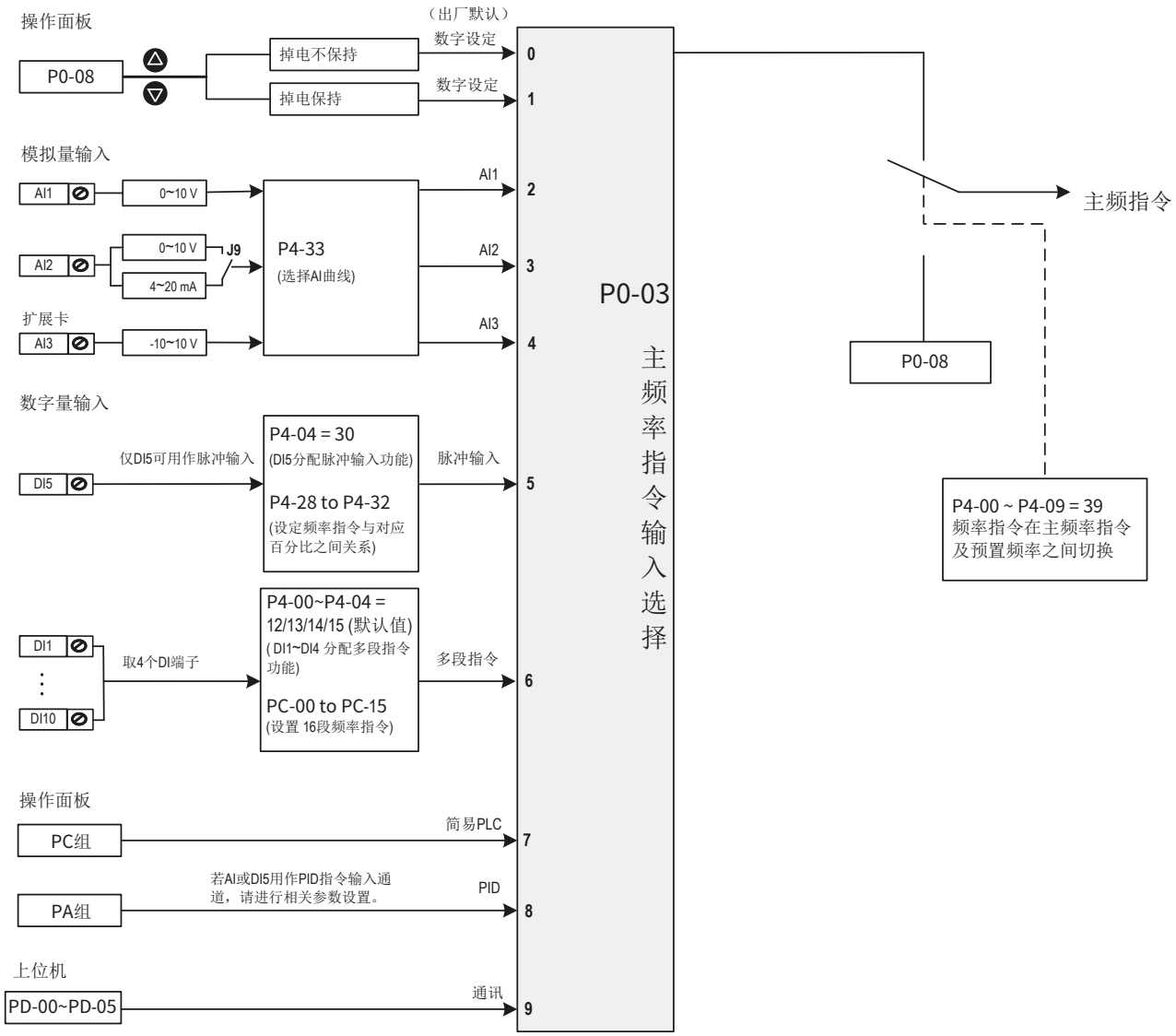


图 6-11 主频率指令选择示意图

参数	功能定义	出厂值	设定范围	参数说明
P0-03	主频率指令输入选择	0	0	数字设定（掉电不记忆）
			1	数字设定（掉电记忆）
			2	AI1
			3	AI2
			4	AI3
			5	脉冲设定（DI5）
			6	多段指令
			7	简易 PLC
			8	PID
			9	通讯给定

6.2.2 通过“操作面板”设定主频率（数字设定）

用操作面板设定主频率有两种情况：

- P0-03=0（掉电不记忆），即在变频器停机后或掉电后重新上电，设定频率值恢复为“预置频率”（P0-08）设定值。预置频率（P0-08）的设置方法，通过键盘 △ 键和 ▽ 键（或多功能输入端子的 UP/DOWN ）来修改变频器的设定频率值。

- P0-03=1（掉电记忆），即变频器在掉电后并再次上电时，设定频率为上次掉电时刻的频率设定值。

参数	功能定义	出厂值	设定范围
P0-08	预置频率	50.00Hz	0.00Hz~ 最大频率（P0-10）
P0-10	最大频率	50.00Hz	0.00Hz~500.00HZ

NOTE

- 与参数 P0-23“数字设定频率停机记忆选择”区分，P0-23 用于选择在变频器停机时，频率的修正量是被记忆还是被清零。P0-23 与停机有关，与掉电记忆无关。

- P0-23=0“不记忆”，用面板设置 P0-08“预置频率”，再通过键盘的 △ 键和 ▽ 键或者端子 UP、DOWN 进行频率的修正，变频器停机后，频率的修正值被清零。

- P0-23=1“记忆”，用面板设置了 P0-08“预置频率”，再通过键盘的 △ 键和 ▽ 键或者端子 UP、DOWN 进行频率的修正，变频器停机后，频率的修正值被保留。

例如，P0-28“预置频率”设置为 40Hz，通过键盘的 △ 键将预置频率调整到 45Hz。如果 P0-23 设置为 0（不记忆），变频器停机后的目标频率恢复为 40Hz（P0-08“预置频率”对应的值）；如果 P0-23 设置为 1（记忆），变频器停机后的目标频率仍然为 45Hz。

参数	功能定义	出厂值	设定范围
P0-23	数值设定频率停机记忆选择	0	0：不记忆 1：记忆

6.2.3 通过“模拟量”设定主频率

通过模拟量输入设定主频率，有 AI1、AI2、AI3 三种 AI 端子可选择。其中，

P0-03=2：AI1 端子输入设定主频率；

P0-03=3：AI2 端子输入设定主频率；

P0-03=4：AI3 端子输入设定主频率。

AI 端子作为频率源的给定，每个 AI 端子可以选择 5 种不同的 AI 曲线。因此先介绍 AI 曲线的设定方法，然后再介绍 AI 端子如何选择相应的 AI 曲线，设置步骤如下：

设置步骤	相关参数	说明	
（步骤 1）AI 曲线设定方法： 设定 AI 电压 / 电流的输入与设定量的对应关系	P4-13 ~ P4-16	曲线 1 设置	常用
	P4-18 ~ P4-21	曲线 2 设置	常用
	P4-23 ~ P4-27	曲线 3 设置	常用
	A6-00 ~ A6-07	曲线 4 设置	
	A6-08 ~ A6-15	曲线 5 设置	
	P4-34	AI 低于最小输入设定选择（AI 作为频率给定时，电压 / 电流输入对应设定的 100.0%，是相对最大频率 P0-10。）	
(步骤 2) AI 端子选择 AI 曲线方法： AI 端子选择曲线及滤波时间设定	P4-33	AI 曲线选择（AI 端子可以选择任何一条 AI 曲线。一般使用默认值 P4-33 = 321，AI1 选择曲线 1，AI2 选择曲线 2， AI3 选择曲线 3。）	
	P4-17、P4-22、P4-27	AI1 ~ AI3 滤波时间	
（步骤 3) AI 端子作为频率源设定: 根据端子特性选择频率指令的 AI 输入端子	P0-03（主频率指令输 入选择）	P0-03 = 2	选择使用 AI1
		P0-03 = 3	选择使用 AI2，可通过控制板上跳线帽 J9 选择电压输入或电流输入
		P0-03 = 4	选择使用 AI3

● AI 曲线设定方法

AI 曲线一共有 5 种，其中曲线 1、曲线 2、曲线 3 均为 2 点式曲线，相关参数为 P4-13~P4-27。而曲线4与曲线5均为4点式曲线，相关参数在A6 组。AI 曲线的设置，实际是设置模拟量输入电压（或模拟量输入电流）与其代表的设定值之间的关系。

AI曲线的设置，实际是设置模拟量输入电压（或模拟量输入电流）与其代表的设定值之间的关系。以 AI 曲线 1 的设置方法为例，相关参数为 P4-13 ~ P4-16，图 6-12 对应 AI 曲线 1 的出厂默认值，详细的参数及说明如下表所示：

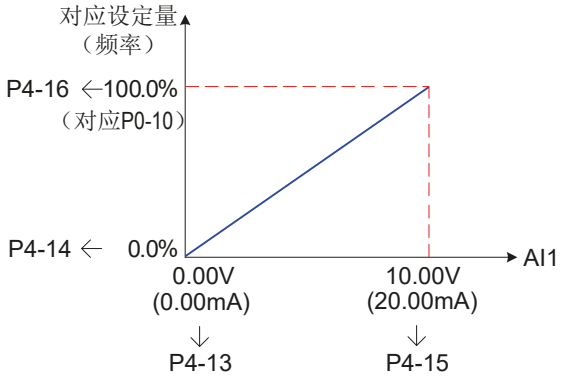


图 6-12 AI 曲线 1 设定

参数	功能定义	出厂值	设定范围	参数说明
P4-13	AI 曲线 1 最小输入	0.00V	0.00V~P4-15	当模拟输入电压小于所设定的“最小输入”（P4-13）时，则根据“AI 低于最小输入设定选择”（P4-34）的设置，以最小输入或者 0.0% 计算。
P4-14	AI 曲线 1 最小输入对应设定	0.0%	-100.00%~100.0%	
P4-15	AI 曲线 1 最大输入	10.00V	P4-13~10.00V	当模拟输入电压大于所设定的“最大输入”（P4-15）时，则模拟量电压以“最大输入”计算。
P4-16	AI 曲线 1 最大输入对应设定	100.0%	-100.00%~100.0%	

NOTE

● AI 作为频率给定时，电压或电流输入对应设定的 100.0%，是指相对“最大频率 P0-10”的百分比。当模拟输入为电流输入时，1mA 电流相当于 0.5V 电压，0~20mA 相当于 0~10V 电压。

● 曲线 2 与曲线 3 的设置方法，与曲线 1 的设置方法相同。曲线 2 的相关参数为 P4-18~P4-21，曲线 3 的相关参数为 P4-23~P4-26。如图 6-13 所示对应 AI 曲线 2 的设定。

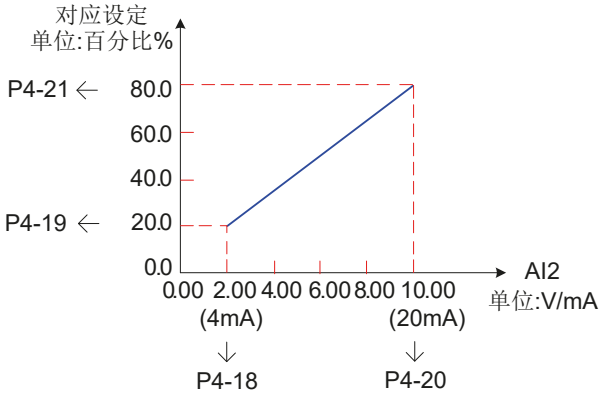


图 6-13 AI 曲线 2 设定

参数	功能定义	出厂值	设定范围	参数说明
P4-18	AI 曲线 2 最小输入	0.00V	0.00V~P4-20	-
P4-19	AI 曲线 2 最小输入对应设定	0.0%	-100.00%~100.0%	-
P4-20	AI 曲线 2 最大输入	10.00V	P4-18~10.00	-
P4-21	AI 曲线 2 最大输入对应设定	100.0%	-100.00%~100.0%	-
P4-23	AI 曲线 3 最小输入	-10V	-10.00V~P4-25	-
P4-24	AI 曲线 3 最小输入对应设定	0.0%	-100.00%~100.0%	-
P4-25	AI 曲线 3 最大输入	10.00V	P4-23~10.00V	-
P4-26	AI 曲线 3 最大输入对应设定	100.0%	-100.00%~100.0%	-

曲线 4 和曲线 5 的功能与曲线 1~ 曲线 3 类似，但是曲线 1~ 曲线 3 为直线，而曲线 4 和曲线 5 为4 点曲线 , 可以实现更为灵活的对应关系。图 6-14 为曲线 4~ 曲线 5 的示意图。

NOTE

● 曲线 4 与曲线 5 设置时，曲线的最小输入电压、拐点 1 电压、拐点 2 电压、最大电压必须依次增大。

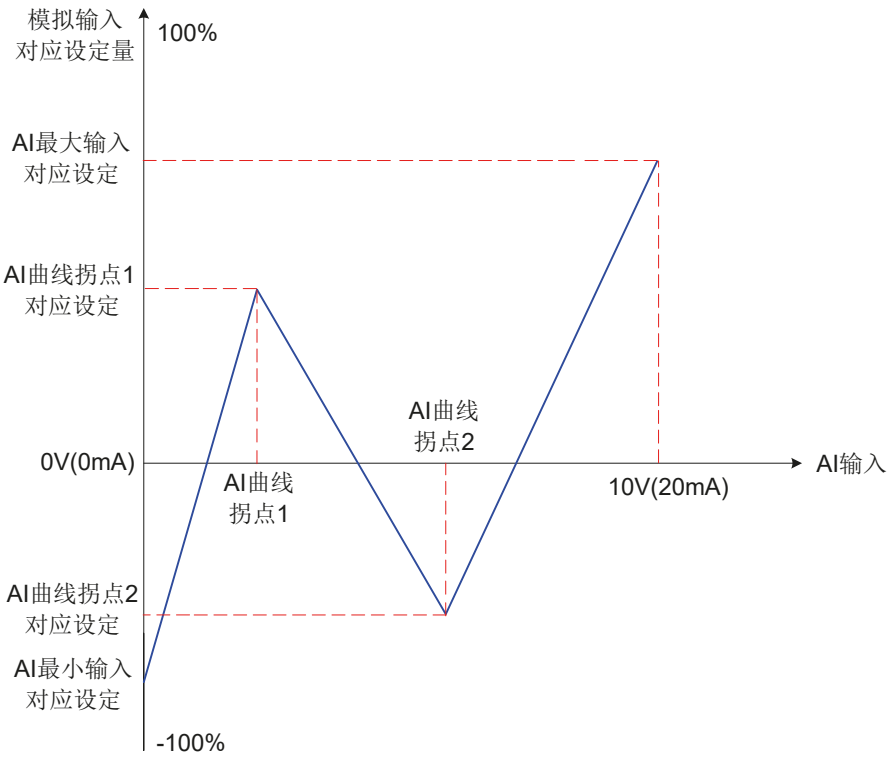


图 6-14 曲线 4 和曲线 5 示意图

参数	功能定义	出厂值	设定范围	参数说明
A6-00	AI 曲线 4 最小输入	0.00V	-10.00V~A6-02	-
A6-01	AI 曲线 4 最小输入对应设定	0.0%	-100.00%~100.0%	-
A6-02	AI 曲线 4 拐点 1 输入	3.00V	A6-00~A6-04	-
A6-03	AI 曲线 4 拐点 1 输入对应设定	30.0%	-100.0%~100.0%	-
A6-04	AI 曲线 4 拐点 2 输入	6.00V	A6-02~A6-06	-
A6-05	AI 曲线 4 拐点 2 输入对应设定	60.0%	-100.0%~100.0%	-
A6-06	AI 曲线 4 最大输入	10.00V	A6-04~10.00V	-
A6-07	AI 曲线 4 最大输入对应设定	100.0%	-100.0%~100.0%	-
A6-08	AI 曲线 5 最小输入	-10.00V	-10.00V~A6-10	-
A6-09	AI 曲线 5 最小输入对应设定	-100.0%	-100.0%~100.0%	-
A6-10	AI 曲线 5 拐点 1 输入	-3.00V	A6-08~A6-12	-
A6-11	AI 曲线 5 拐点 1 输入对应设定	30.0%	-100.0%~100.0%	-
A6-12	AI 曲线 5 拐点 2 输入	3.00V	A6-10~A6-14	-
A6-13	AI 曲线 5 拐点 2 输入对应设定	30.0%	100.0%~100.0%	-
A6-14	AI 曲线 5 最大输入	10.00V	A6-12~10.00V	-
A6-15	AI 曲线 5 最大输入对应设定	100.0%	-100.0%~100.0%	-

● AI 端子选择 AI 曲线的方法

模拟量输入端子 AI1、AI2、AI3 对应的设定曲线，是由参数 P4-33 的个位、十位、百位分别选择的，3 个模拟量输入端子可以分别选择 5 种曲线中的任意一个。

参数	功能定义	出厂值	设定范围	参数说明
P4-33	AI 曲线选择	321	个位：AI1 曲线选择 1：曲线1（2点，见 P4-13~P4-16） 2：曲线2（2点，见 P4-18~P4-21） 3：曲线3（2点，见 P4-23~P4-26） 4：曲线4（4点，见 A6-00~A6-07） 5：曲线5（4点，见 A6-08~A6-15） 十位：AI2 曲线选择（1~5，同上） 百位：AI3 曲线选择（1~5，同上）	P4-33=321， 则表示 AI1端子选择了曲线 1， AI2端子选择了曲线 2， AI3端子选择了曲线 3。 AI3 出厂值为 -10~10V。
P4-17	AI1 滤波时间	0.10s	0.00s~10.00s	设置 AI 输入端子的软件滤波时间
P4-22	AI2 滤波时间	0.10s	0.00s~10.00s	
P4-27	AI3 滤波时间	0.10s	0.00s~10.00s	

AI 输入滤波时间越大，抗干扰能力越强，但调节响应变慢；滤波时间越小，调节响应越快，但抗干扰能力变弱。当现场模拟量容易被干扰时，需加大滤波时间，以使检测的模拟量趋于稳定，但是滤波时间越大则对模拟量检测的响应速度变慢，如何设置需要根据实际应用情况权衡。

● AI 端子作为主频率的设定方法

YD580E 控制板提供 2 个模拟量输入端子 AI1 和 AI2，选件 I/O 扩展卡可提供另外 1 个模拟量输入端 子 AI3。AI1 端子为 0~10V 的电压型输入。 AI2 端子可以是 0~10V 的电压型输入，或者是

0mA~20mA 电流输入，可通过控制板上 J9 跳线选择（具体操作方法可参照“第三章　安装与接线”）。AI3 端子为 -10V~10V 的双极电压信号输入。下面分别介绍每个 AI

端子作为主频率的设定方法。

例如，AI1 端子选择了曲线 1（P4-33 个位设置为 1），AI1 电压型输入端子作为频率源时，需要达到 2V~10V 对应 10 Hz~40Hz，参数设定方法如图：

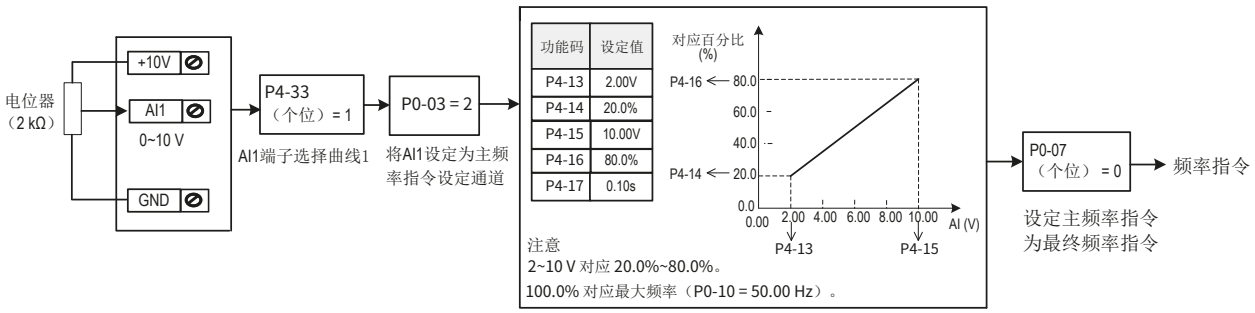


图 6-15 AI1 电压型输入给定主频率参数设置

AI2 端子可以作为模拟电压输入（0V~10V）也可作为模拟电流输入（0mA~20mA）。

当 AI2 通道为模拟电流输入时，如果输入电流为 0mA ~ 20mA，则对应输入电压 0V ~ 10V。如果输入电流为 4mA ~ 20mA，则 4mA 对应于 2V，20mA 对应于 10V。

例如，AI2 端子选择了曲线 2（P4-33 十位设置为 2），AI2 电流型输入端子作为频率源时，需要达到 4mA~20mA 对应 0 Hz~50Hz，参数设定方法如图：

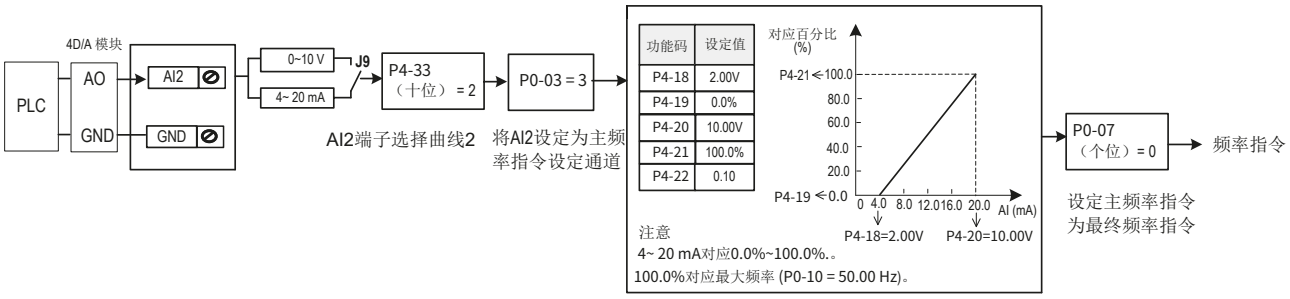


图 6-16 AI2 电流输入给定主频率参数设置

例如，AI3 端子选择了曲线 3（P4-33 百位设置为 3），AI3 电压型输入端子作为频率源（2V~10V对应 10 Hz~50Hz）的参数设定方法如图：

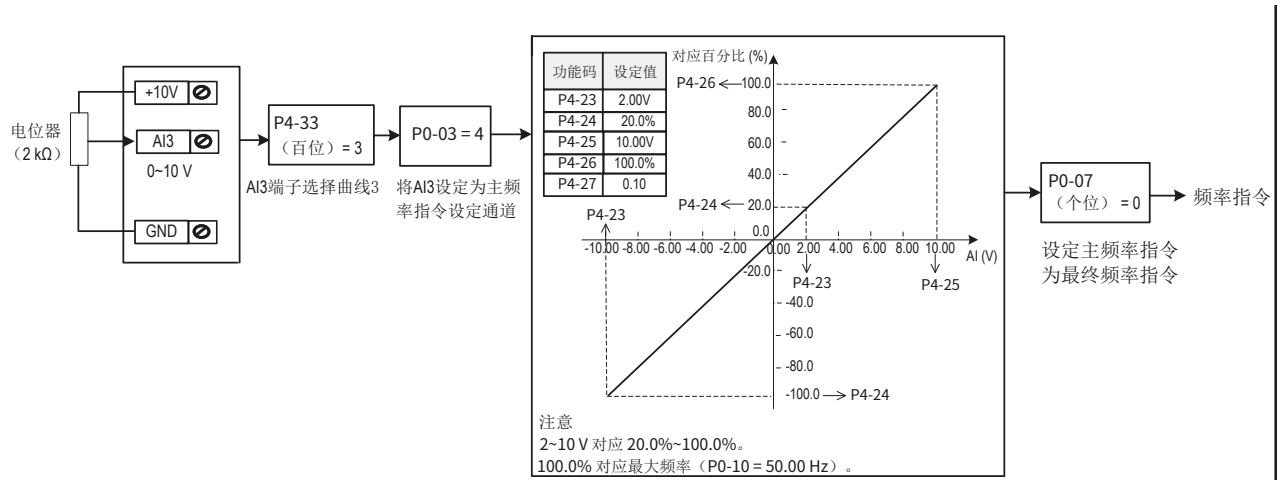


图 6-17 AI3 电压型输入给定主频率参数设置

6.2.4 通过“脉冲”设定主频率

设定参数 P0-03=5，选择了输入脉冲作为主频率。当主频率为“脉冲给定（DI5）”时，脉冲给定只能从多功能输入端子 DI5 输入。脉冲给定信号规格：电压范围 9V~30V、频率范围 0kHz~100kHz。

NOTE

- 主频率为“脉冲设定（DI5）”功能与 FM 端子（P5-00）的“FMP 脉冲输出”功能不能同时使用。

参数	功能定义	出厂值	设定范围	参数说明
P4-28	脉冲输入最小频率	0.00kHz	0.00kHz~P4-30	
P4-29	脉冲输入最小频率对应设定	0.0%	-100.0%~100.0%	相对最大频率 P0-10 的百分比
P4-30	脉冲输入最大频率	50.00kHz	P4-28~100.00kHz	
P4-31	脉冲输入最大频率对应设定	100.0%	-100.0%~100.0%	相对最大频率 P0-10 的百分比
P4-32	脉冲输入滤波时间	0.10s	0.00s~10.00s	

DI5 端子输入脉冲频率与对应设定的关系，通过 P4-28~P4-31 进行设置。该对应关系为两点的直线对应关系，脉冲输入所对应设定的 100.0%，是指相对最大频率 P0-10 的百分比。具体设置如下图:

参数	名称	设定值	功能描述
P4-04	DI5 端子功能选择	30	脉冲频率输入（仅对 DI5 有效）
P0-07	频率指令叠加选择	00	主频率指令

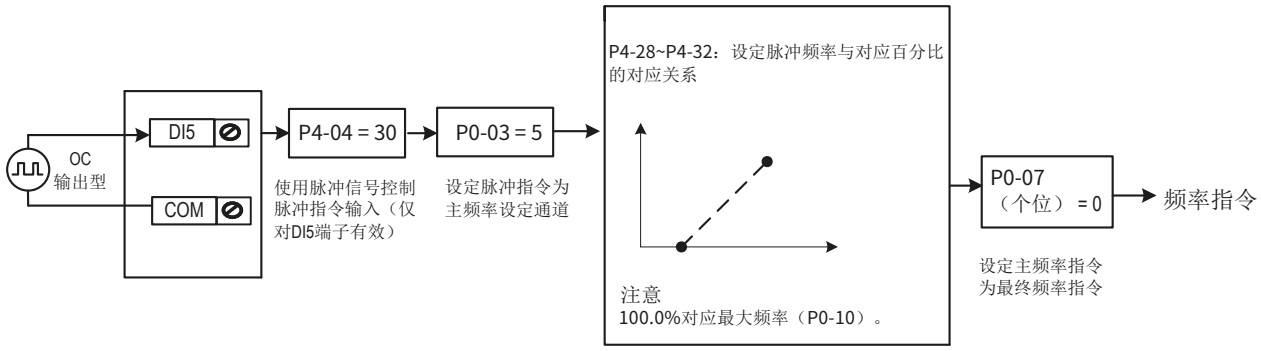


图 6-18 脉冲输入给定主频率参数设置

6.2.5 通过“多段指令”设定主频率

设定参数 P0-03=6，选择了多段指令作为主频率。适合不需要连续调整变频器运行频率，只需使用若干个频率值的应用场合。
YD580E 最多可以设定 16 段运行频率，可用 4 个 DI 端子输入信号的组合来选择。也允许少于 4 个DI 端子进行多段频率给定的情况，对于缺少的设置位，一直按状态 0 计算。

多段速的段数与DI端子数的对应关系：

2 段速：1 个 DI 端子 K1；
3-4 段速：2 个 DI 端子 K1、K2；
5-8 段速：3 个 DI 端子 K1、K2、K3；
9-16 段速：4 个 DI 端子 K1、K2、K3、K4。

所需的多段频率 通过 PC 的多段频率表来设定，参数如下：

参数	功能定义	出厂值	设定范围	参数说明
PC-00	多段指令 0	0.0%	-100.0%~100.0%	多段指令的量纲为相对值，是相对最大频率的百分比。 参数的正负决定了运行方向，若为负值则表示变频器反方向运行。 加减速时间分别默认为 P0-17，P0-18。
PC-01	多段指令 1	0.0%	-100.0%~100.0%	
PC-02	多段指令 2	0.0%	-100.0%~100.0%	
PC-03	多段指令 3	0.0%	-100.0%~100.0%	
PC-04	多段指令 4	0.0%	-100.0%~100.0%	
PC-05	多段指令 5	0.0%	-100.0%~100.0%	
PC-06	多段指令 6	0.0%	-100.0%~100.0%	
PC-07	多段指令 7	0.0%	-100.0%~100.0%	
PC-08	多段指令 8	0.0%	-100.0%~100.0%	
PC-09	多段指令 9	0.0%	-100.0%~100.0%	
PC-10	多段指令 10	0.0%	-100.0%~100.0%	
PC-11	多段指令 11	0.0%	-100.0%~100.0%	
PC-12	多段指令 12	0.0%	-100.0%~100.0%	
PC-13	多段指令 13	0.0%	-100.0%~100.0%	
PC-14	多段指令 14	0.0%	-100.0%~100.0%	
PC-15	多段指令 15	0.0%	-100.0%~100.0%	
PC-51	多段指令 0 给定方式	0	0~6	0：参数 PC-00 给定 1：AI1 2：AI2 3：AI3 4：脉冲 5：PID 6：预置频率（P0-08）给定，UP/DOWN 可修改

主频率指令为多段指令时，要将 DI 端子功能选择设置为 12~15 的功能值，即指定了多段频率指令输入端子。

参数	名称	设定值	功能描述
P4-01	DI2 端子功能选择	12	多段指令端子 1
P4-03	DI4 端子功能选择	13	多段指令端子 2
P4-06	DI7 端子功能选择	14	多段指令端子 3
P4-07	DI8 端子功能选择	15	多段指令端子 4

下图中，选择了DI2、DI4、DI7、DI8作为多段频率指定的信号输入端，并由之依次组成4位二进制数，按状态组合值，选择多段频率。当 (DI2、DI4、DI7、DI8)=(0、0、1、0) 时，形成的状态组合数为2，就会选择 PC-02 参数所设定的频率值（挑选的方法详见表 6-1）。由（PC-02）*（P0-10）自动计算得到目标运行频率。详细设定情况如下图所示：

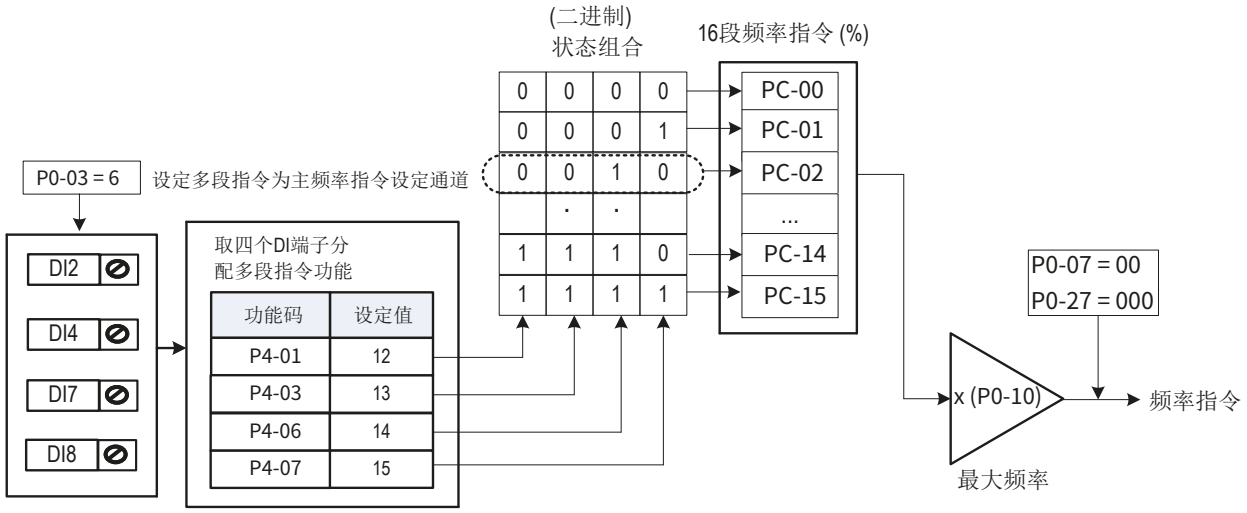


图 6-19 多段速模式的设置

4 个多段指令端子，可以组合为 16 种状态，这 16 各状态对应 16 个指令设定值。具体如表下表所示:

表 6-1 多段指令功能说明

K4	K3	K2	K1	指令设定	对应参数
OFF	OFF	OFF	OFF	多段指令 0	PC-00（PC-51=0）
OFF	OFF	OFF	ON	多段指令 1	PC-01
OFF	OFF	ON	OFF	多段指令 2	PC-02
OFF	OFF	ON	ON	多段指令 3	PC-03
OFF	ON	OFF	OFF	多段指令 4	PC-04
OFF	ON	OFF	ON	多段指令 5	PC-05
OFF	ON	ON	OFF	多段指令 6	PC-06
OFF	ON	ON	ON	多段指令 7	PC-07
ON	OFF	OFF	OFF	多段指令 8	PC-08
ON	OFF	OFF	ON	多段指令 9	PC-09
ON	OFF	ON	OFF	多段指令 10	PC-10
ON	OFF	ON	ON	多段指令 11	PC-11
ON	ON	OFF	OFF	多段指令 12	PC-12
ON	ON	OFF	ON	多段指令 13	PC-13
ON	ON	ON	OFF	多段指令 14	PC-14
ON	ON	ON	ON	多段指令 15	PC-15

NOTE

- 多段指令除了可以作为主频率指令之外，多指令还可作为 V/F 分离的电压源（详见“6.5.1 V/F 曲线的设定”P3-13 详细说明）、作为过程 PID 的设定源（详见“6.2.1 选择主频率指令的输入方法”PA-00 详细说明）。

6.2.6 通过“简易 PLC”设定主频率

设定参数 P0-03=7，选择了简易 PLC 作为主频率。
简易 PLC 作为主频率时，需要设置参数 PC-00~PC-15（设置方法详见 6.2.5 小节），PC-18~PC-49 设置每一段的运行时间和加减速时间。参数详见下表：

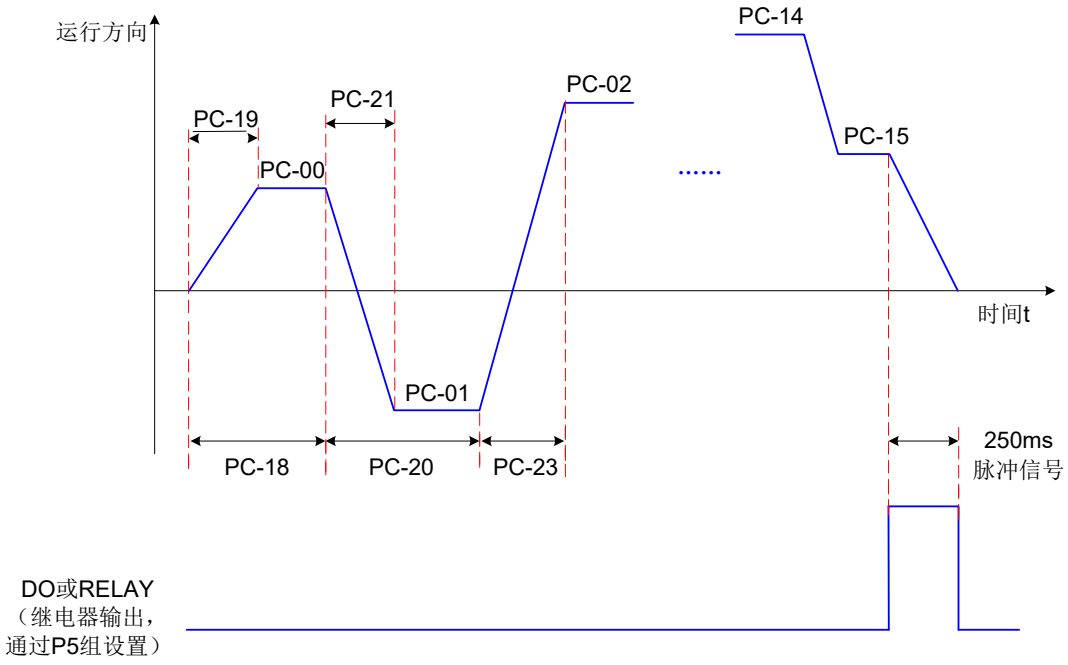


图 6-20 简易 PLC 作为主频率示意图

参数	功能定义	出厂值	设定范围	参数说明
PC-18	简易 PLC 第 0 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-19	简易 PLC 第 0 段加减速时间选择	0	0~3	-
PC-20	简易 PLC 第 1 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-21	简易 PLC 第 1 段加减速时间选择	0	0~3	-
PC-22	简易 PLC 第 2 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-23	简易 PLC 第 2 段加减速时间选择	0	0~3	-
PC-24	简易 PLC 第 3 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-25	简易 PLC 第 3 段加减速时间选择	0	0~3	-
PC-26	简易 PLC 第 4 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-27	简易 PLC 第 4 段加减速时间选择	0	0~3	-
PC-28	简易 PLC 第 5 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-29	简易 PLC 第 5 段加减速时间选择	0	0~3	-
PC-30	简易 PLC 第 6 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-31	简易 PLC 第 6 段加减速时间选择	0	0~3	-
PC-32	简易 PLC 第 7 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-33	简易 PLC 第 7 段加减速时间选择	0	0~3	-
PC-34	简易 PLC 第 8 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-35	简易 PLC 第 8 段加减速时间选择	0	0~3	-

参数	功能定义	出厂值	设定范围	参数说明
PC-36	简易 PLC 第 9 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-37	简易 PLC 第 9 段加减速时间选择	0	0~3	-
PC-38	简易 PLC 第 10 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-39	简易 PLC 第 10 段加减速时间选择	0	0~3	-
PC-40	简易 PLC 第 11 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-41	简易 PLC 第 11 段加减速时间选择	0	0~3	-
PC-42	简易 PLC 第 12 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-43	简易 PLC 第 12 段加减速时间选择	0	0~3	-
PC-44	简易 PLC 第 13 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-45	简易 PLC 第 13 段加减速时间选择	0	0~3	-
PC-46	简易 PLC 第 14 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-47	简易 PLC 第 14 段加减速时间选择	0	0~3	-
PC-48	简易 PLC 第 15 段运行时间	0.0s(h)	0.0s(h)~6553.5s(h)	-
PC-49	简易 PLC 第 15 段加减速时间选择	0	0~3	-
PC-50	简易 PLC 运行时间单位	0	0：s（秒）；1：h（小时）	-

简易 PLC 作为主频率时，通过设置 PC-16 来选择简易 PLC 的运行方式，通过设置 PC-17 来选择在掉电或者停机之后，是否记忆掉电前 PLC 的运行阶段及运行频率。详细参数如下：

参数	功能定义	出厂值	设定范围	参数说明
PC-16	简易 PLC 运行方式	0	0：单次运行结束停机	变频器完成一个单循环后自动停机，需要再次给出运行命令才能启动。
			1：单次运行结束保持终值	变频器完成一个单循环后自动保持最后一段的运行频率和方向，停机重新启动后，从 PLC 初始状态开始运行。
			2：一直循环	变频器完成一个循环后自动开始进行下一个循环，直到有停机命令时才停机。
PC-17	简易 PLC 掉电记忆选择	00	个位：掉电记忆选择 0：掉电不记忆 1：掉电记忆	每次上电都重新开始 PLC 过程。
				记忆掉电前 PLC 的运行阶段及运行频率，下次上电时从记忆阶段继续运行
			十位：停机记忆选择 0：停机不记忆 1：停机记忆	每次启动都重新开始 PLC 过程。
				停机时记录前一次 PLC 的运行阶段及运行频率，下次运行时从记忆阶段继续运行。
PC-50	简易 PLC 运行时间单位	0	0：s（秒）；1：h（小时）	设定 PLC 运行的时间单位。
PC-51	多段指令 0 给定方式	0	0：参数 PC-00 给定 1：AI1 2：AI2 3：AI3 4：脉冲 5：PID 6：预置频率（P0-08）给定，UP/DOWN 可修改	-

<补充>简易 PLC 功能除了作为主频率之外，还可以作为 V/F 分离的电压源。（详见 “6.5.1 V/F 曲线的设定” P3-13 详细说明 "）

6.2.7 通过“PID”设定主频率

设定参数 P0-03=8，选择了 PID 作为主频率。

PID 控制是过程控制的一种常用方法，通过对被控量的反馈信号与目标信号的差量进行比例、积分、微分运算，通过调整变频器的输出频率，构成闭环系统，使被控量稳定在目标值。 选择 PID 控制的输出作为运行频率，一般用于现场的工艺闭环控制，例如恒压力闭环控制、恒张力闭环控制等场合。

- 比例增益 Kp：PID 的输出与输入的偏差一旦产生，PID 会调节控制输出，使被控量朝着减小偏差的方向变化，偏差减小的速度取决于比例系数 Kp，Kp 越大偏差减小的越快，但是很容易引起振荡，尤其是在迟滞环节比较大的情况下，Kp 减小，发生振荡的可能性减小但是调节速度变慢。（比例增益为 100.0 表示当 PID 反馈量和给定量的偏差为 100.0% 时，PID 调节器对输出频率指令的调节幅度为最大频率。）
- 积分时间 Ti：决定 PID 调节器积分调节的强度。积分时间越短调节强度越大。（积分时间是指当 PID 反馈量和给定量的偏差为 100.0% 时，积分调节器经过该时间连续调整，调整量达到最大频率。）
- 微分时间 Td：决定 PID 调节器对偏差变化率调节的强度。微分时间越长调节强度越大。（微分时间是指当反馈量在该时间内变化 100.0%，微分调节器的调整量为最大频率。）

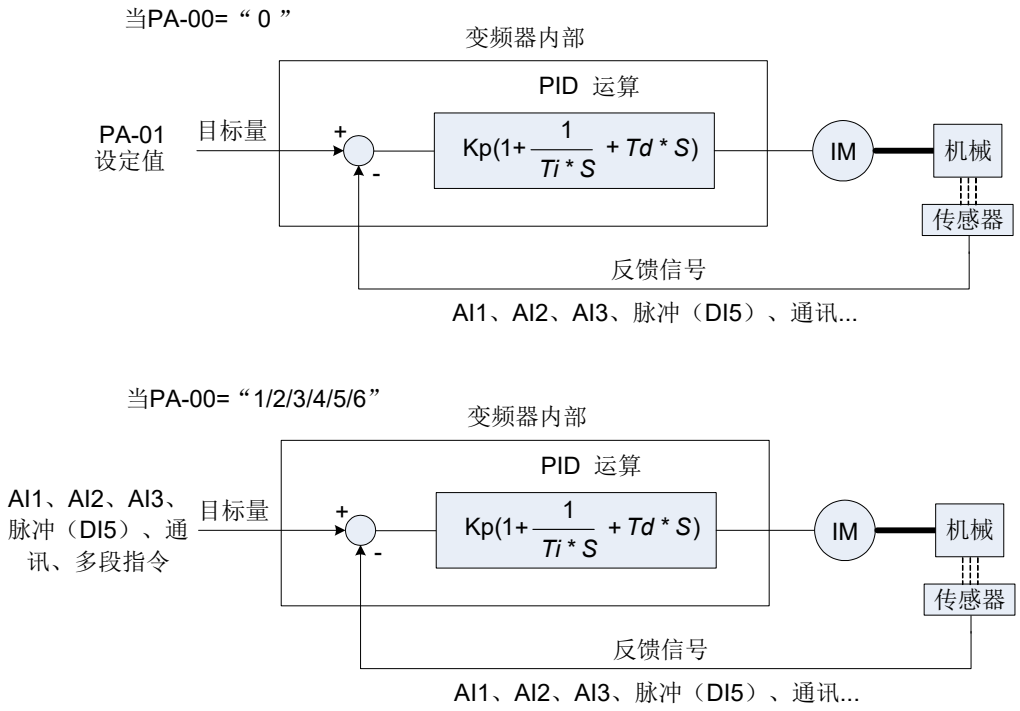


图 6-21 过程 PID 控制原理框图

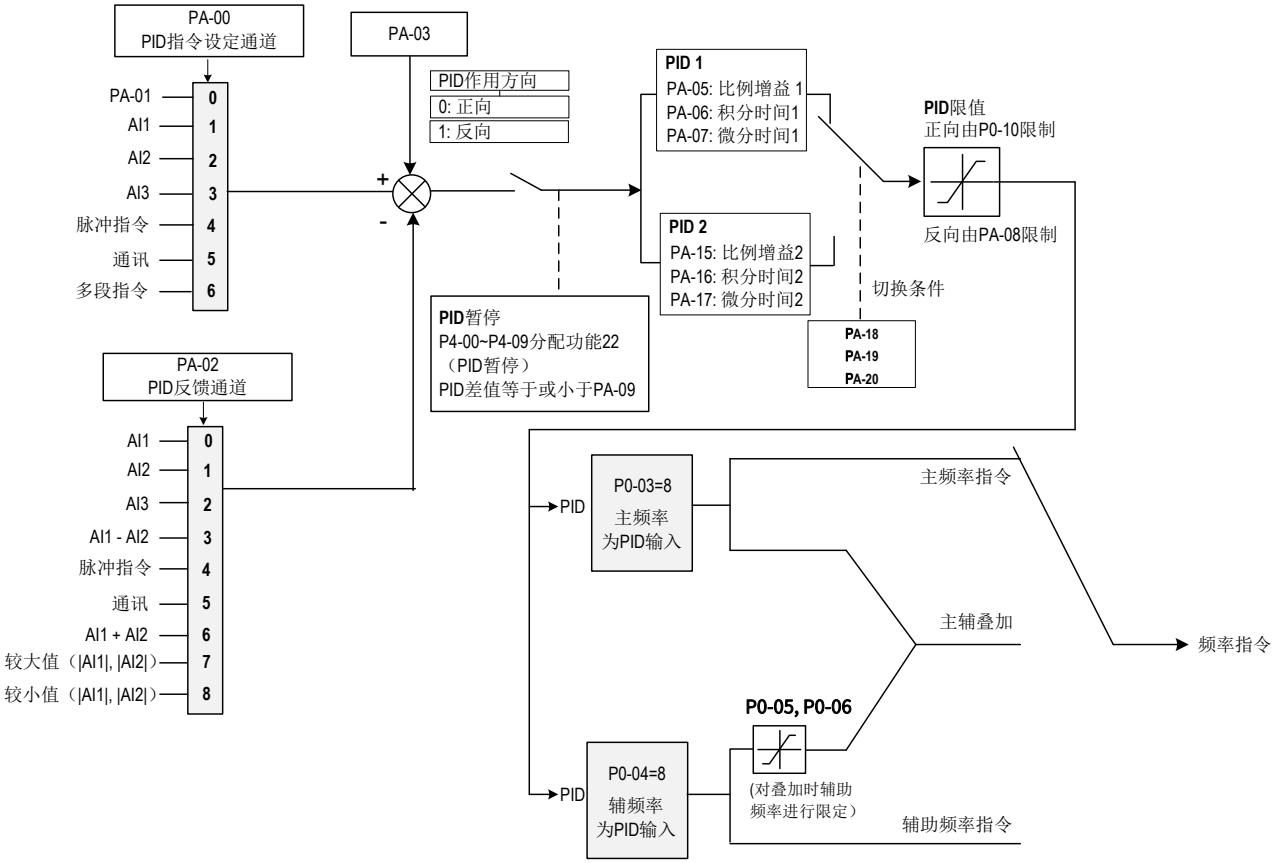


图 6-22 过程 PID 控制参数设置框图

参数	功能定义	出厂值	设定范围	参数说明
PA-00	PID 给定源	0	0：PA-01 1：AI1 2：AI2 3：AI3 4：脉冲设定（DI5） 5：通讯 6：多段指令	用于选择 PID 的目标量给定通道。PID 的设定目标量为相对值，设定的 100% 对应于被控系统的反馈信号的 100%。注意：PA-00 选择 6(多段速) 时，PC-51 (多段指令 0 给定方式) 不能选择 5 (PID 给定）。
PA-01	PID 数值给定	50.0%	0.0%~100.0%	当 PA-00 设定为 0 时，需设定此参数。此参数 100% 对应反馈量的最大值
PA-02	PID 反馈源	0	0：AI1 1：AI2 2：AI3 3：AI1 - AI2 4：脉冲设定（DI5） 5：通讯 6：AI1 + AI2 7：MAX(|AI1|,|AI2|) 8：MIN (|AI1|,|AI2|)	用于选择 PID 的反馈通道
PA-03	PID 作用方向	0	0：正作用	如果反馈信号小于 PID 的给定信号，变频器输出频率上升。
			1：反作用	如果反馈信号小于 PID 的给定信号，变频器输出频率下降。
PA-04	PID 给定反馈量程	1000	0~65535	无量纲单位，仅用于当前显示 PID 给定和反馈量。例如：该参数值设定为 1000，PID 给定（0%~100%）和反馈量（0~1000）线性对应。

参数	功能定义	出厂值	设定范围	参数说明
PA-05	比例增益 KP1	20.0	0.0~1000.0	大多数系统使用 PI 调节即可
PA-06	积分时间 TI1	2.00s	0.01s~10.00s	
PA-07	微分时间 TD1	0.000s	0.000s~10.000s	
PA-08	PID 反转截止频率	0.00Hz	0.00~ 最大频率	当频率源为纯 PID 时，PID 反向截止频率为当前 PID 输出最小值；当频率源为主 +PID 时，FA-08 对主 +PID 整体进行作用，输出“主 +PID”运算后的频率最小值。
PA-09	PID 偏差极限	0.0%	0.0%~100.0%	有助于兼顾系统输出的精度和稳定度
PA-10	PID 微分限幅	0.10%	0.00%~100.0%	PID 调节器中，微分很容易造成系统振荡，为此，一般把 PID 微分作用限制在一个较小范围，PA-10 是用来设置 PID 微分输出的范围。
PA-11	PID 给定变化时间	0.00s	0.00s~650.00s	指 PID 给定值由 0.0% 变化到 100.0% 所需时间。
PA-12	PID 反馈滤波时间	0.00s	0.00s~60.00s	对 PID 反馈量进行滤波，该滤波有利于降低反馈量被干扰的影响，但是会带来过程闭环系统的响应性能下降。
PA-13	PID 输出滤波时间	0.00s	0.00s~60.00s	对 PID 输出频率进行滤波，该滤波会减弱变频器输出频率的突变，但是会带来过程闭环系统的响应性能下降。
PA-15	比例增益 KP2	20.0	0.0~1000.0	用于两组 PID 参数切换的，可以通过 DI 端子切换，也可以根据 PID 的偏差自动切换。 参数 PA-15~PA-17 的设置方式，与参数 PA-05~PA-07 类似。
PA-16	积分时间 TI2	2.00s	0.01s~10.00s	
PA-17	微分时间 TD2	0.000s	0.000s~10.000s	
PA-18	PID 参数切换条件	0	0：不切换	-
			1：通过 DI 端子切换	DI 端子功能选择要设置为 43（PID 参数切换端子），当该 端子无效时选择参数组 1（PA-05~PA-07）。 端子有效时选择参数组 2（PA-15~PA-17）。
			2：根据偏差自动切换	给定与反馈之间偏差绝对值小于 PID 切换偏差 1（PA-19），PID 选择参数组 1。 给定与反馈之间偏差绝对值大于 PID 切换偏差 2（PA-20），PID 选择参数组 2。 给定与反馈之间偏差处于切换偏差 1 和切换偏差 2 之间时，PID 参数为两组 PID 参数线性插补值，如图 6-23 所示。
			3：根据运行频率自动切换	选择为根据运行频率自动切换时，变频器运行在 0—最大频率之间时，PID 参数为两组 PID 参数线性插补值。
PA-19	PID 参数切换偏差 1	20.0%	0.00~PA-20	此参数 100% 对应给定与反馈的最大偏差值，PA-18=2 时生效。
PA-20	PID 参数切换偏差 2	80.0%	PA-19~100.0%	
PA-21	PID 初值	0.0%	0.0%~100.0%	变频器启动时，PID 输出 PID 初值（PA-21），和PID 初值保持时间后（PA-22），PID 才开始闭环调节运算。图 6-21 为 PID 初值的功能示意图。
PA-22	PID 初值保持时间	0.00s	0.00s~650.00s	-
PA-25	PID 积分属性	00	个位：积分分离 0：无效 1：有效	积分分离无效时，无论多功能数字 DI 是否有效，积分分离都无效。 积分分离有效，当 DI 端子积分暂停（功能 22）有效时，PID 积分停止运算，此时仅 PID 比例和微分作用有效。
			十位：输出到限值后是否停止积分 0：继续积分 1：停止积分	在 PID 运算输出到达最大值或最小值后，可以选择是否停止积分作用。若选停止积分，此时 PID 积分停止计算，有助于降低 PID 的超调量。

参数	功能定义	出厂值	设定范围	参数说明
PA-26	PID 反馈丢失检测值	0.0%	0.0%：不判断反馈丢失；0.1%~100.0%	-
PA-27	PID 反馈丢失检测时间	0.0s	0.0s~20.0s	用来判断 PID 反馈是否丢失。 当 PID 反馈量小于反馈丢失检测值（PA-26），且持续时间超过 PID 反馈丢失检测时间（PA-27）后，变频器故障报警 Err31。
PA-28	PID 停机运算	0	0：停机不运算 1：停机运算	用于选择 PID 停机状态下，PID 是否继续运算。 一般应用场合，在停机状态下 PID 应该停止运算。

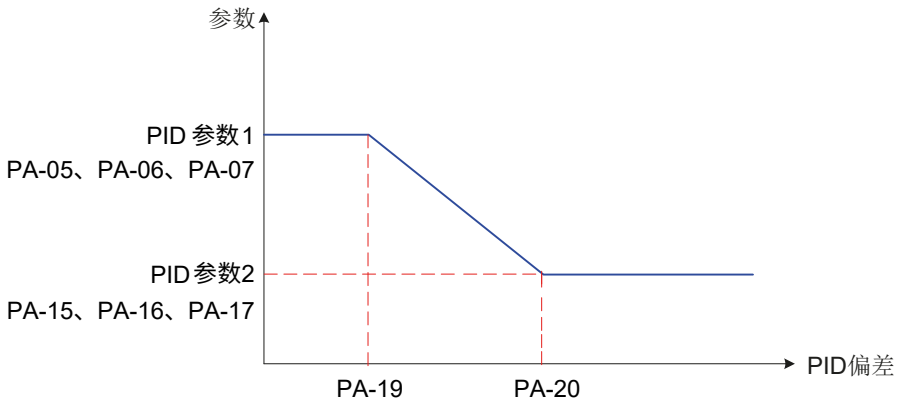


图 6-23 PID 参数切换

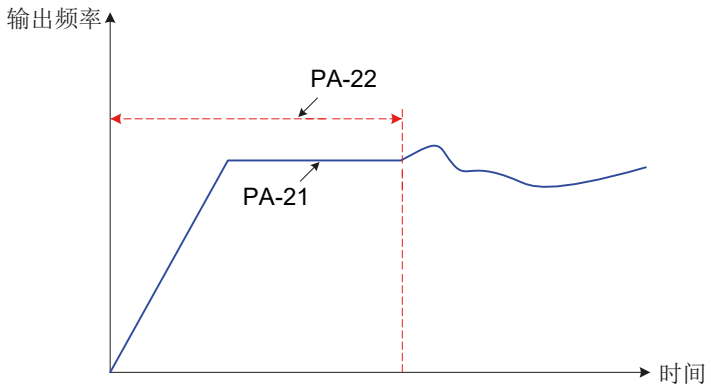


图 6-24 PID 初值功能示意图

NOTE

对于 PID 为主频率时的频率输出的上下限和范围，作如下说明（如：频率源为纯 PID 或为主 +PID）

- 反转截止频率为 0 或者禁止反转时（即如下三种任意一种）

  ① PA-08=0，P8-13=0； ② PA-08=0，P8-13=1； ③ PA-08 ≠ 0，P8-13=1

  输出上限：上限频率

  输出下限：下限频率

  输出范围：下限频率 ~ 上限频率（即 P0-14~P0-12）

- 反转截止频率不为 0 且不禁止反转时 (即 PA-08 ≠ 0，P8-13=0)

  输出上限：上限频率 输出下限：- 反转截止频率

  输出范围：- 反转截止频率 ~ 上限频率（即 -PA-08~P0-12）

6.2.8 通过“通讯”设定主频率

设定参数 P0-03=9，选择了通讯作为主频率。

YD580E 支持 4 种上位机通讯方式：Modbus、Proibus-DP、CANopen、CANlink，这 4 种通讯不能同时使用。使用通讯时必须安装通讯卡，YD580E 的

4种通讯卡都是选配的，用户根据需要自 行选择，如果通讯协议为 Modbus、Proibus-DP 或 CANopen，需要根据 P0-28 选择相应的串 口通讯协议。CANlink 协议始终有效。

参数	功能定义	出厂值	设定范围
P0-28	串口通讯协议选择	0	0：Modbus 协议 1：Profibus-DP 协议或 CANOpen 协议

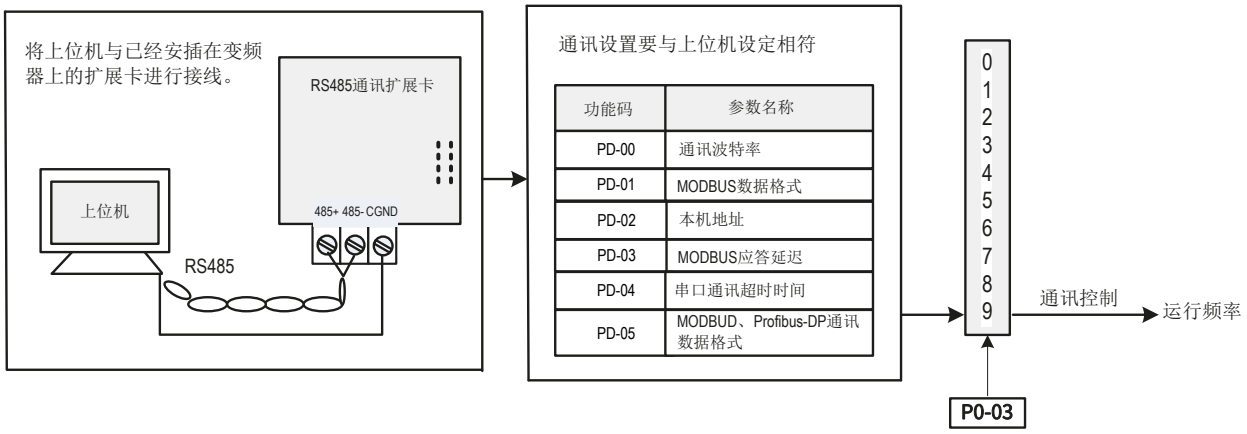


图 6-25 通讯作为主频率相关参数设置

用通讯方式给定频率时，上位机要给变频器发送写命令。下面以 Modobus 协议为例说明用通讯给定主频率的过程。例如，利用通讯给定方式设置频率为 10000 时，发送写命令为 01 06 10 00 27 10 97 36 。每一字节代表的含义如下 , 变频器地址：01H（可以设置），写命令：06H，给定频率的地址 :1000H，目标频率值：2710H（转换为十进制为 10000）；CRC 校验：9736H。同理，利用通讯给定方式设置频率为 -10000 时，发送写命令为 01 06 10 00 D8 F0 D7 4E 。其中，D8F0 为 -10000 转换为十六进制取低四位。

NOTE

- 通讯方式给定频率的范围为 -10000 ~ +10000（十进制），对应的频率范围为 -100.00%~ +100.00% （-100.00% 对应负最大频率，+100.00% 对应最大频率）。假设 P0-10“最大频率”设为 50Hz，如果写命令中写入的频率值 2710H，转换 10 进制为 10000。那么实际写入的频率值为 50*100%=50Hz。

主机命令信息		从机回应信息	
ADDR	01H	ADDR	01H
CMD	06H	CMD	06H
参数地址高位	10H	参数地址高位	10H
参数地址低位	00H	参数地址低位	00H
数据内容高位	27H	数据内容高位	27H
数据内容低位	10H	数据内容低位	10H
CRC 高位	97H	CRC 高位	97H
CRC 低位	36H	CRC 低位	36H

6.2.9 选择辅助频率指令的输入方法

设定参数 P0-04，选择辅频率指令的输入。变频器的辅助频率指令共有 10 种，分别为数字设定 (掉电不记忆)、数字设定 (掉电记忆)、AI1、AI2、AI3、脉冲输入、多段指令、简易 PLC、PID、通讯给定。如图所示：

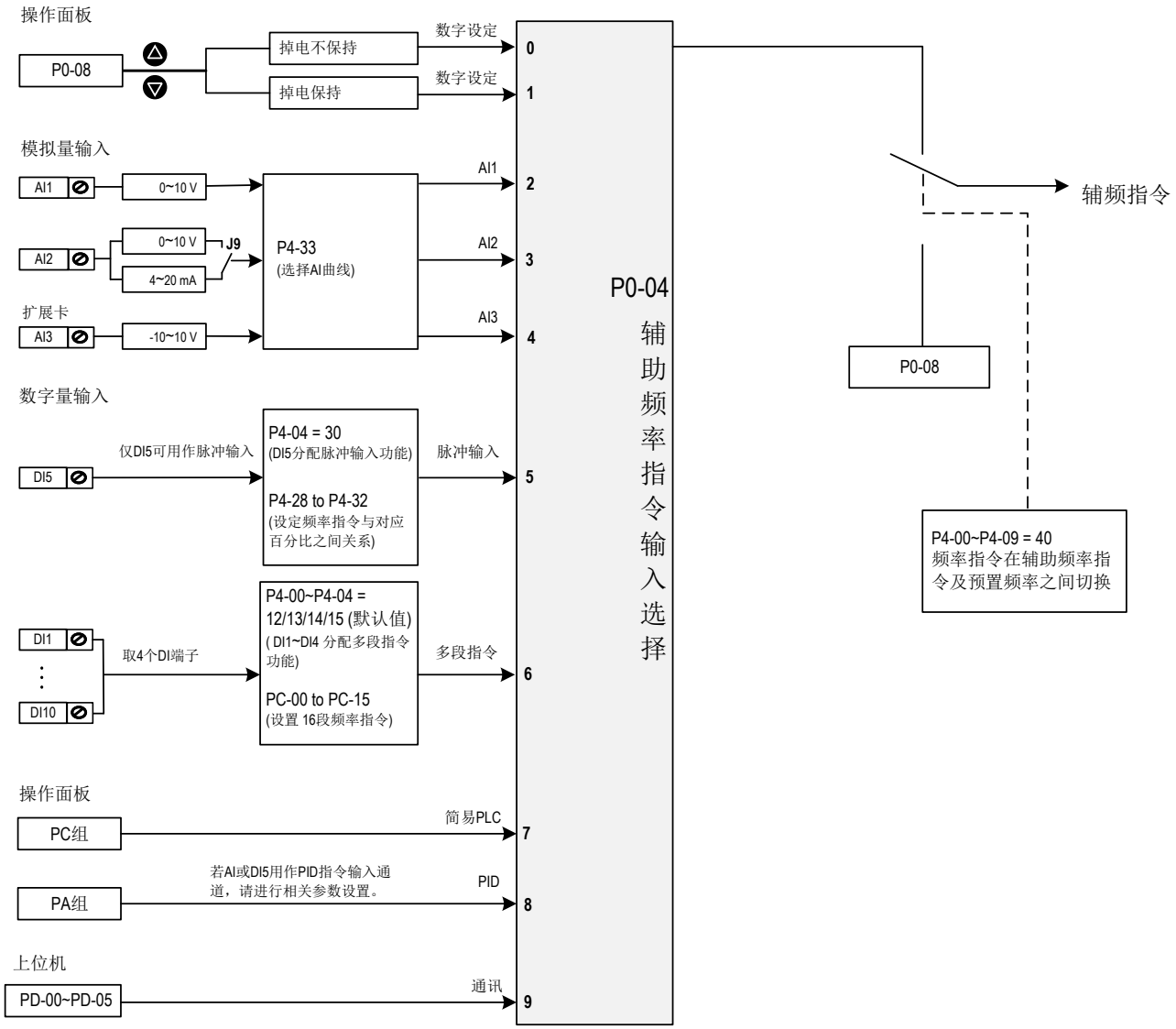


图 6-26 辅助频率给定来源选择示意图

参数	功能定义	出厂值	设定范围	参数说明
P0-04	辅助频率指令输入选择	0	0	操作面板（数字设定，掉电不记忆）
			1	操作面板（数字设定，掉电记忆）
			2	AI1
			3	AI2
			4	AI3
			5	脉冲设定（DI5）
			6	多段指令
			7	简易 PLC
			8	PID
			9	通讯给定

辅助频率指令在作为独立的频率给定通道时，其用法与主频率指令相同，使用方法可以参考 6.2.10 小节相关说明。当辅助频率指令用作叠加给定（即主频率指令和辅助频率指令的复合实现频率给定）时，其使用方法可以参考 6.2.11 小节相关说明。

6.2.10 选择主、辅频率叠加指令的输入方法

主、辅频率指令叠加选择，即通过主频率指令和辅助频率指令的复合实现频率给定。通过设定参数 P0-07 设定目标频率与主、辅频率指令的关系。共有以下四种关系：

1、主频率指令：主频率指令直接作为目标频率给定

2、辅助频率指令：辅助频率指令直接作为目标频率给定

3、主辅运算：主辅运算有 4 种情况，分别为主频率 + 辅助频率、主频率 - 辅助频率、主频率和辅助频率中较大值、主频率和辅助频率较小值

4、频率切换：上述 3 种频率，通过 DI 端子选择或切换。此时 DI 端子的功能选择要设置为18（频率指令切换）。

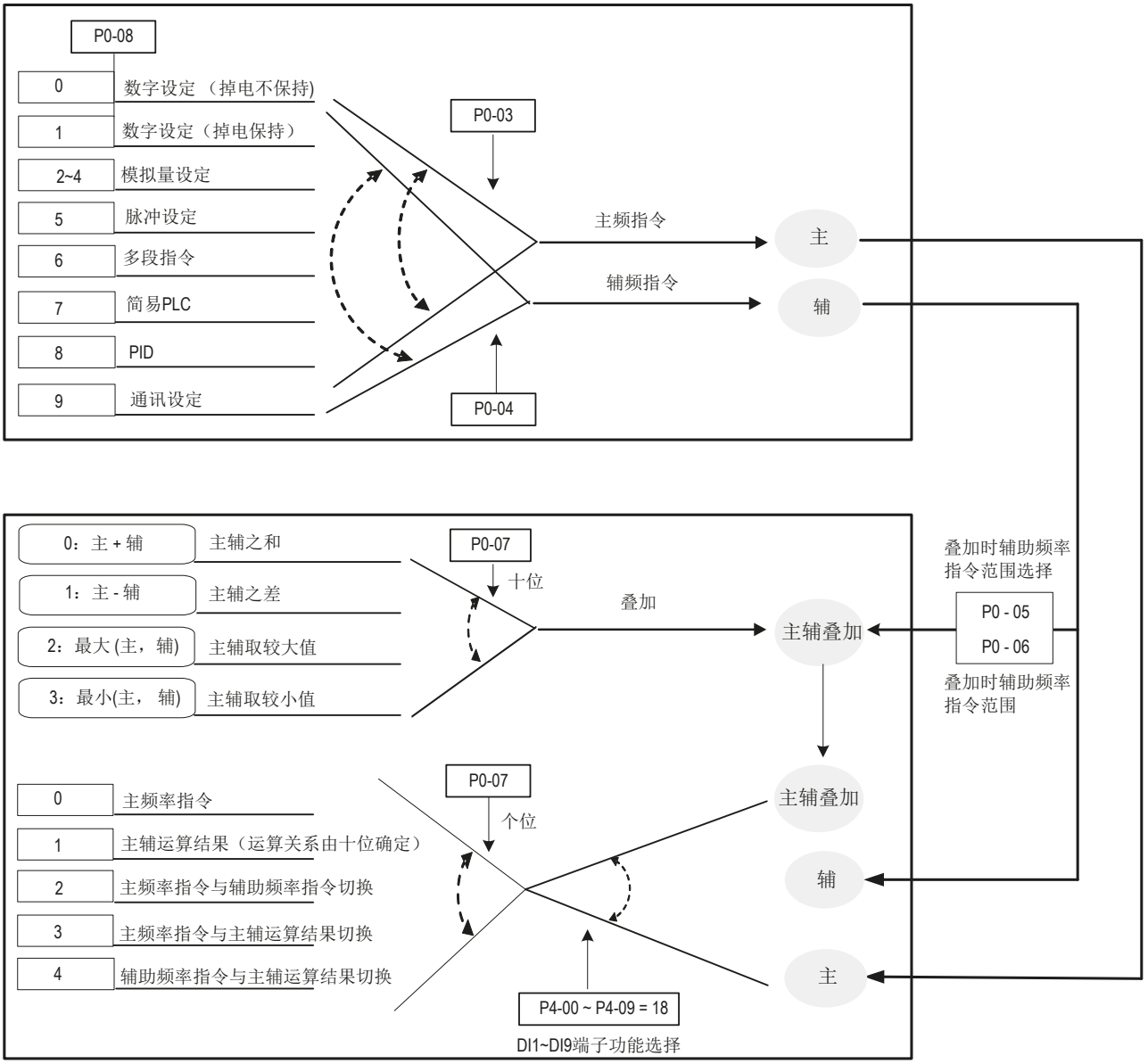


图 6-27 频率指令为主辅助频率指令叠加给定示意图

参数	功能定义	出厂值	设定范围
P0-07	频率指令叠加选择	00	个位：频率指令选择 0：主频率指令 1：主辅运算结果（运算关系由十位确定） 2：主频率指令与辅助频率指令切换 3：主频率指令与主辅运算结果切换 4：辅助频率指令与主辅运算结果切换 十位：频率指令主辅运算关系 0：主 + 辅 1：主 - 辅 2：二者最大值 3：二者最小值
P0-05	叠加时辅助频率指令范围选择	0	0：相对于最大频率 1：相对于主频率指令
P0-06	叠加时辅助频率指令范围	100%	0%~150%

- 当主频率指令和辅助频率指令复合实现频率给定时，需要注意：
- 1、 当辅助频率指令为数字给定时，预置频率（P0-08）不起作用，用户通过键盘 △键和▽键（或多功能输入端的子的 UP、DOWN）进行的频率调整，直接在主给定频率的基础上调整。
- 2、 当辅助频率指令为模拟输入给定（AI1、AI2、AI3）或脉冲输入给定时，输入设定的 100% 对应辅助频率范围，可通过 P0-05 和 P0-06 进行设置。
- 3、辅助频率指令选择与主频率指令选择，不能设置为同一个通道，即 P0-03 与 P0-04 不要设置为相同的值，否则容易引起混乱。
- 4、主、辅频率指令的叠加功能，可以用于有速度闭环控制的场合，例如以主频率通道为主，利用辅频率通道进行自动微调，配合外部 DI 端子信号的切换，可以达到所需的闭环控制目的。

6.2.11 运行指令绑定主频率指令

通过设置 P0-27，变频器的 3 种运行指令可以设定各自的频率指令，如下图所示。运行命令通道与主频率给定通道可以任意捆绑，同步切换。该功能定义了 3 种运行命令通道和 9 种频率给定通道之间的捆绑组合。当指定的命令通道（P0-02）设置了频率绑定通道（P0-27 对应位）后，此时P0-03 均不起作用，而是由 P0-27 指定的频率给定通道确定。

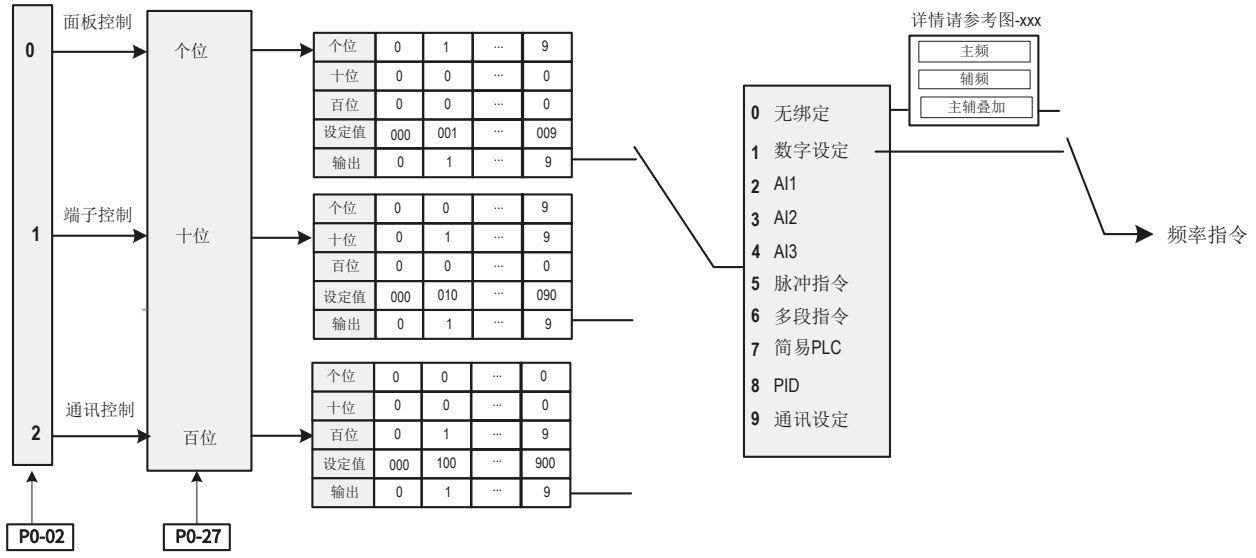


图 6-28 运行指令绑定主频率指令图

参数	功能定义	出厂值	设定范围
P0-27	运行指令捆绑主频率指令选择	000	个位：操作面板绑定频率指令选择 0：无捆绑 1：数字设定 2：AI1 3：AI2 4：AI3 5：脉冲设定（DI5） 6：多段速 7：PLC 8：PID 9：通讯设定 十位：端子命令绑定主频率指令选择 百位：通讯命令绑定主频率指令选择

6.2.12 频率指令极限（频率设定）

上限频率：限制最高频率，如果不允许电机在某个频率以上运行；

下限频率：限制最低频率，如果不允许电机在某个频率以下运行；

最大频率：限制最高输出频率；

上限频率选择：用于选择上限频率的给定通道；

上限频率偏置：用于设定上限频率的偏移量。

参数	功能定义	出厂值	设定范围
P0-10	最大频率	50.00 Hz	50.00Hz~500.00Hz
P0-11	上限频率指令选择	0	0：P0-12 设定 1：AI1 2：AI2 3：AI3 4：脉冲设定（DI5） 5：通讯给定
P0-12	上限频率	50.00Hz	下限频率（P0-14）~ 最大频率（P0-10）
P0-13	上限频率偏置	0.00Hz	0.00Hz~ 最大频率 P0-10
P0-14	下限频率	0.00Hz	0.00Hz~ 上限频率

6.2.13 低于下限频率动作设定

设定频率低于下限频率运行动作：如果运行频率低于下限频率时，要选择变频器的运行状态，设置参数 P8-14。

零速运行：变频器处于运行状态，输出频率为 0，操作面板 RUN 灯亮。

停机：变频器不运行，操作面板 RUN 灯灭。

参数	功能定义	出厂值	设定范围	参数说明
P8-14	设定频率低于下限频率运行动作	0	0： 以下限频率运行	如果运行频率低于下限频率，则变频器将以下限频率运行
			1： 停机	如果运行频率低于设置的下限频率，则变频器将停机
			2： 零速运行	如果运行频率低于下限频率，则变频器以零速运行

6.3 启停方法

本小节主要介绍变频器的启动和停止方法。

6.3.1 启动方法

参数	功能定义	出厂值	设定范围	参数说明
P6-00	启动方式	0	0： 直接启动	
P6-03	启动频率	0.00Hz	0.00Hz~10.00Hz	给定频率小于启动频率时，变频器不启动，处于待机状态。
P6-04	启动频率保持时间	0.0s	0.0s~ 100.0s	正反转切换过程中，本参数不起作用。 启动频率保持时间不包含在加速时间内，但包含在简易 PLC 的运行时间里。
P6-05	启动直流制动电流 / 预励磁电流	0%	0%~ 100%	直流制动电流越大，制动力越大，100%对应电机额定电流（电流上限为变频器额定电流的 80%）。
P6-06	启动直流制动时间 / 预励磁时间	0.0s	0.0s~ 100.0s	启动直流制动只在启动方式为直接启动时有效。

1） 直接启动

设置参数 P6-00=0，变频器为直接启动，适用于大多数负载，如图 6-29。启动前加“启动频率”适用于电梯、起重等提升类负载场合，如图 6-30。启动前加“直流制动”适用于在启动时电机可能有转动的场合，如图 6-31。

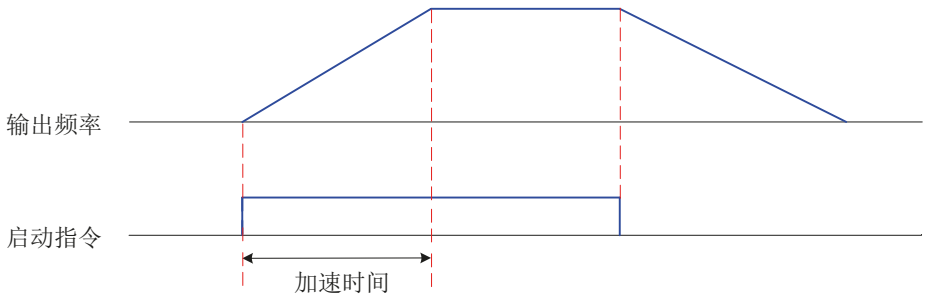


图 6-29 直接启动时序图

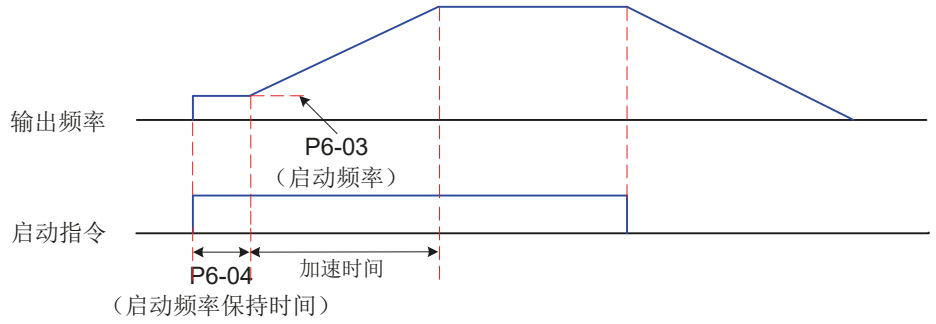


图 6-30 带启动频率的启动时序图

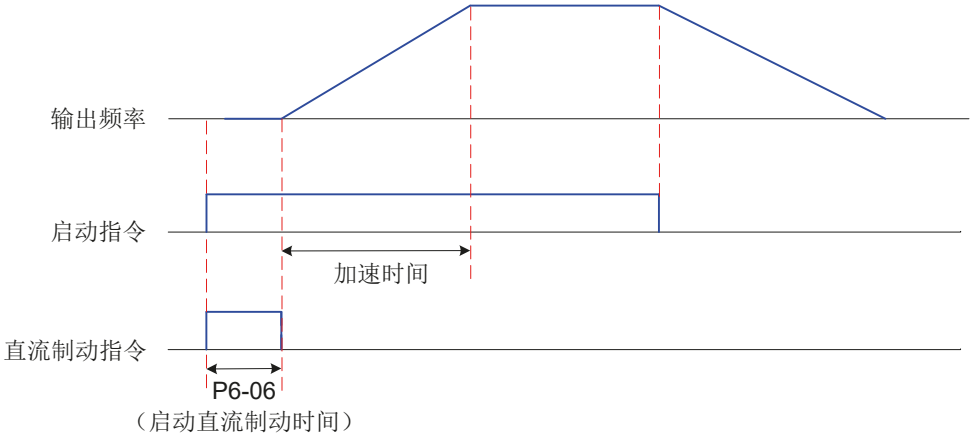


图 6-31 带直流制动的启动时序图

2） 转速跟踪再启动

设定 P6-00=1，变频器为转速跟踪再启动（变频器先对电机的转速和方向进行判断，再以跟踪到的电机频率启动）适用于大惯性机械负载的驱动，若变频器启动运行时，负载电机仍在靠惯性运转，采取转速跟踪再启动，可以避免启动过流的情况发生。该启动方式只在矢量控制模式下有效。启动过程频率曲线如下图：

6.3.2 停止方式

变频器的停止方法有两种，分别是减速停车和自由停车。设定参数 P6-10 选择变频器的停止方法。

参数	功能定义	出厂值	设定范围	参数说明
P6-10	停机方式	0	0： 减速停车 1： 自由停车	
P6-11	停机直流制动起始频率	0.00Hz	0.00Hz~ 最大频率	减速停机过程中，当运行频率降低到到该频率时，开始直流制动过程。
P6-12	停机直流制动等待时间	0.0s	0.0s~ 100.0s	在运行频率降低到停机直流制动起始频率后，变频器先停止输出一段时间，然后再开始直流制动过程。
P6-13	停机直流制动电流	0%	0%~ 100%	直流制动电流越大，制动力越大，100% 对应电机额定电流（电流上限为变频器额定电流的 80%）
P6-14	停机直流制动时间	0.0s	0.0s~ 100.0s	直流制动时间为 0 时直流制动过程被取消。

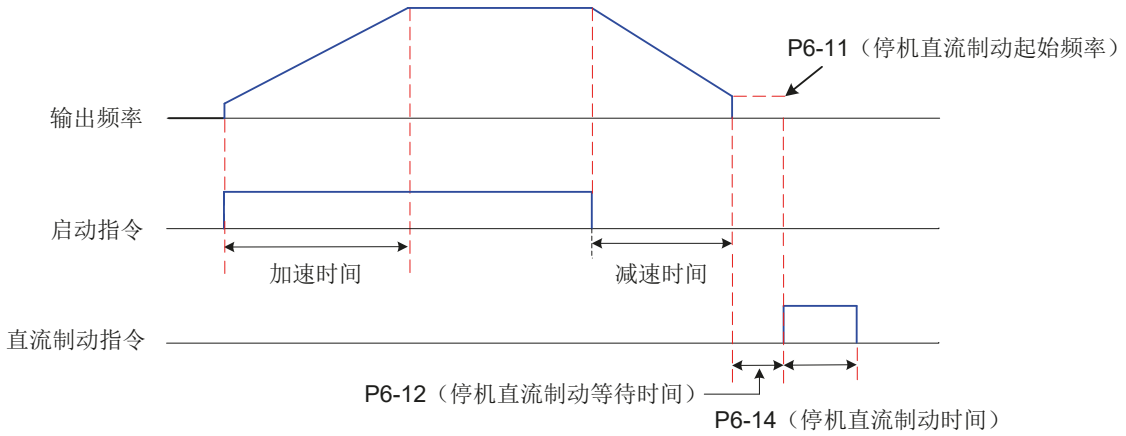


图 6-33 停机直流制动时序图

1） 减速停车

设定 P6-10=0，变频器减速停车。（停机命令有效后，变频器按照减速时间降低输出频率，频率降为 0 后停机。）

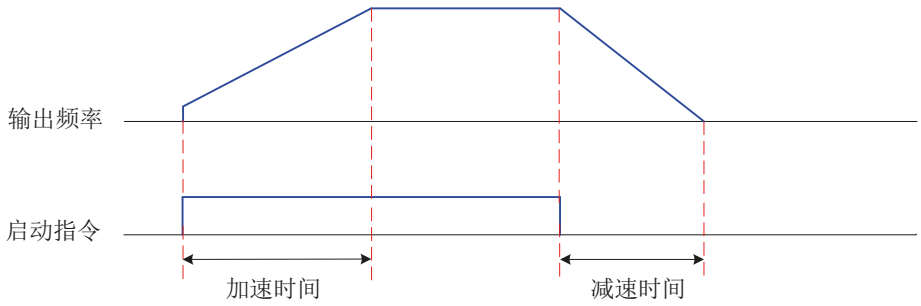


图 6-34 减速停车时序图

2） 自由停车

设定 P6-10=1，变频器为自由停车。（停机命令有效后，变频器立即终止输出，此时电机按照机械惯性自由停车。）

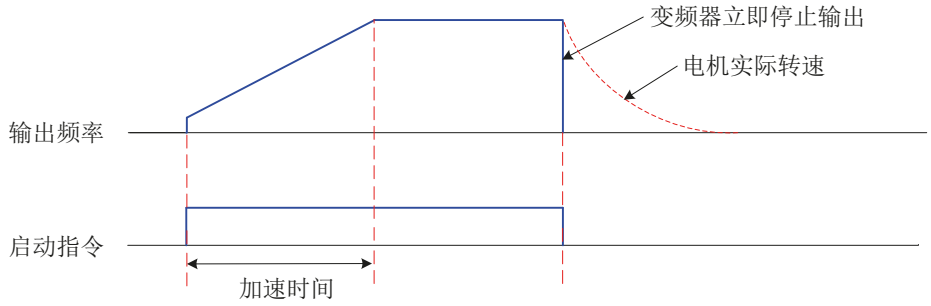


图 6-35 自由停车时序图

6.3.3 加减速时间和曲线设定

加速时间指变频器从零频，加速到加减速基准频率（P0-25）所需时间；减速时间指变频器从“加减速基准频率 (P0-25) 减速到零频所需时间。

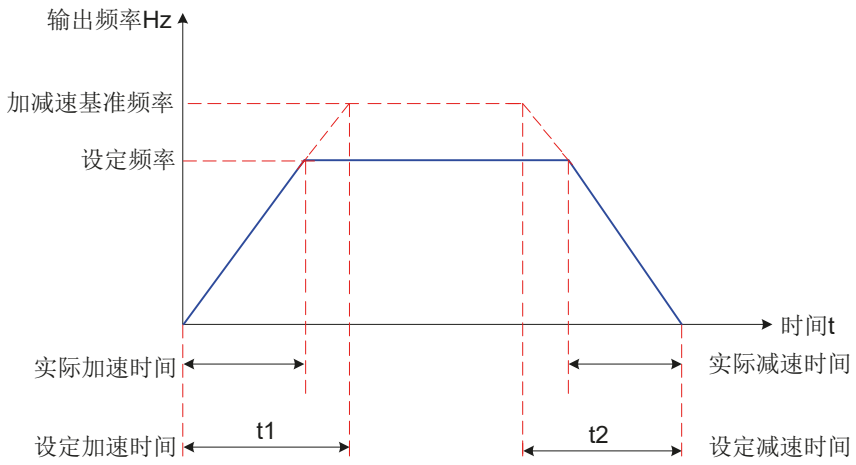


图 6-36 加减速时间示意图

YD580E 提供 4 组加减速时间，可利用数字输入端子 DI 切换选择。
例如，选择 DI7 和 DI8，作为输入切换端子。

参数	名称	设定值	功能描述
P4-06	DI7 端子功能选择	16	加减速时间选择端子 1
P4-07	DI8 端子功能选择	17	加减速时间选择端子 2

DI8 端子状态	DI7 端子状态	对应加减速时间选择
OFF	OFF	第一组：P0-17、P0-18
OFF	ON	第二组：P8-03、P8-04
ON	OFF	第三组：P8-05、P8-06
ON	ON	第四组：P8-07、P8-08

表 6-2 通过 DI 端子选择加减速时间

参数	功能定义	出厂值	设定范围	参数说明
P0-17	加速时间 1	机型确定	0s~65000s	P0-19=0
			0.0s~6500.0s	P0-19=1
			0.00s~650.00s	P0-19=2
P0-18	减速时间 1	机型确定	0s~65000s	P0-19=0
			0.0s~6500.0s	P0-19=1
			0.00s~650.00s	P0-19=2
P8-03	加速时间 2	机型确定	设定范围同 P0-17	-
P8-04	减速时间 2	机型确定	设定范围同 P0-18	-
P8-05	加速时间 3	机型确定	设定范围同 P0-17	-
P8-06	减速时间 3	机型确定	设定范围同 P0-18	-
P8-07	加速时间 4	0.0s	设定范围同 P0-17	-
P8-08	减速时间 4	0.0s	设定范围同 P0-18	-
P0-19	加减速时间单位	1	0：1 秒 1：0.1 秒 2：0.01 秒	修改此参数时，4 组加减速时间所显示小数点位数会变化。
P0-25	加减速时间基准频率	0	0：最大频率 1：设定频率 2：100Hz	-
P6-07	加减速方式	0	0：直线加减速	选择变频器在启、停动过程中频率变化的方式。 0：输出频率按照直线递增或递减。 1、2: 在目标频率实时动态变化的情况下，输出频率按照 S 曲线实时递增或递减。适用在舒适感要求较高及实时响应快速的场合。
			1、2：动态 S 曲线加减速	
P6-08	S 曲线开始段时间比例	30.0%	0.0%~（100.0%-P6-09）	参数P6-08 和 P6-09 要 满 足： P6-08 + P6-09 ≤ 100.0%。
P6-09	S 曲线结束段时间比例	30.0%	0.0%~（100.0%-P6-08）	-

6.4 电机调谐

电机调谐：变频器获得被控电机参数的过程。

同步电机谐调的方法有：空载动态调谐、带载静态调谐、手动输入电机参数等方式。

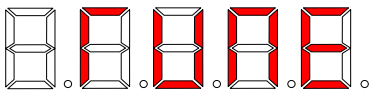
参数	功能定义	出厂值	设定范围	参数说明
P1-37	同步电机调谐选择	0	00：无操作	不调谐
			11：同步机带载静态调谐	只辨识部分电机参数定子电阻、转子电阻、漏感
			12：同步机空载动态调谐	辨识所有电机参数，FVC 控制方式下需要确认编码器参数（P1-27 ~ P1-36）
			手动输入参数	输入同步电机本身参数（P1-16 ~ P1-20）

几种调谐方式的调谐效果比较如下表：

调谐方式	适用情况	调谐效果
静止部分参数调谐	电机与负载很难脱离，且不允许动态调谐运行的场合	一般
动态完整调谐	电机与应用系统方便脱离的场合	最佳
静止完整调谐或手动输入电机参数	电机与负载很难脱离，且不允许动态完整调谐运行的场合	较好

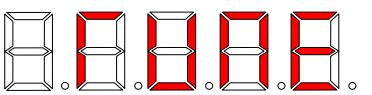
以下用电机 1 的参数（P0-24 设置为 0，电机参数组 1）为例介绍电机调谐的方法。如果要对电机2 进行调谐，首先将 P0-24 设置为 1（电机参数组 2），电机 2 的调谐方法与电机 1 类似，相关参数参考 A2 组。

1） 同步机的静止部分参数调谐方法

步骤	过程
步骤 1	上电后，将变频器运行指令选择为操作面板（P0-02 设置为 0）
步骤 2	准确输入电机的铭牌参数（P1-00~P1-05）
步骤 3	参数 P1-37 设置为 11（同步机静止部分参数调谐），按 ENTER 键确认，键盘显示 
步骤 4	按操作面板上 RUN 键。电机不旋转，但是变频器会使电机通电。运行指示灯亮。当上述显示信息消失，退回正常参数显示状态，表示调谐完成。经过该调谐，同步电机变频器会自动算出 P1-16~ P1-18 的值。

2） 同步机的动态完整调谐方法

使用有恒定输出特性的电机和有高精度用途，请在分离负载状态下，实施动态完整调谐，调谐效 果最佳。

步骤	过程
步骤 1	上电后，将变频器运行指令选择为操作面板（P0-02 设置为 0）；
步骤 2	准确输入电机的铭牌参数（P1-00~P1-05）；
步骤 3	输入编码器参数”（P1-27、P1-28、P1-30）；
步骤 4	参数 P1-37 设置为 12（同步机动态完整调谐），按 ENTER 键确认，键盘显示： 
步骤 5	按操作面板上 RUN 键。变频器会驱动电机加减速、正 / 反转运行，运行指示灯亮，调谐运行持续一段时间。当上述显示信息消失，退回正常参数显示状态，表示调谐完成。 经过该完整调谐，同步机变频器会自动算出 P1-16~ P1-20 及 P1-30 的值。

- 电机调谐除了上述的三种方式外，还可以手动输入电机参数。
- 电机调谐可以通过操作面板给运行指令外，还可以通过通讯指令进行电机调谐。通过设置 P0-02 选择运行指令。
- Modbus、Profibus 和 CANopen 的 PKW 区支持通讯调谐，PZD 区不支持通讯调谐。通讯调谐操作方法：先给 P1-37/A2-37 写入调谐参数，然后再写入运行命令。

参数	功能定义	出厂值	设定范围	参数说明
P1-00	电机类型选择	0	0	普通异步电机
			1	变频异步电机
P1-01	电机额定功率	机型确定	0.1kW~1000.0kW	P1-00~P1-05 为电机铭牌参数。 在采用 V/F、SVC、FVC 控制时，为了获得更好的控制性能，需要进行电机参数调谐，而调谐结果的准确性，与正确设置电机铭牌参数密切相关。
P1-02	电机额定电压	机型确定	1V~2000V	
P1-03	电机额定电流	机型确定	0.01A~655.35A(变频器功率≤ 55kW) 0.1A~6553.5A(变频器功率 >55kW)	
P1-04	电机额定频率	机型确定	0.01Hz~ 最大频率	
P1-05	电机额定转速	机型确定	1rpm~65535rpm	
P1-16	同步电机定子电阻	机型确定	0.001Ω~65.535Ω(变频器功率≤ 55kW) 0.0001Ω~6.5535Ω(变频器功率 >55kW)	P1-16~P1-20 是同步电机的参数，可通过电机调谐获得。其中，同步机静止部分参数调谐只能获得P1-16~P1-18三个参数，同步机动态完整调谐可以获得P1-16~P1-20外，还可以获得编码器相序P1-30。 若现场不对电机调谐，可以根据电机厂家提供的参数，输入上述相应参数。
P1-17	同步电机D轴电感	机型确定	0.01mH~655.35mH(变频器功率≤ 55kW) 0.001mH~65.535mH(变频器功率 >55kW)	
P1-18	同步电机Q轴电感	机型确定	0.01mH~655.35mH(变频器功率≤ 55kW) 0.001mH~65.535mH(变频器功率 >55kW)	
P1-20	同步电机反电动势	机型确定	0.0V~6553.5V	

参数	功能定义	出厂值	设定范围	参数说明
P1-27	编码器线数	1024	1~65535	设定编码器每转脉冲数。 在有速度传感器矢量控制方式下（FVC），必须正确设置编码器脉冲数，否则电机运行不正常。
P1-28	编码器类型	0	0：ABZ 增量编码器 2：旋转变压器	要根据实际情况正确设置P1-28，否则变频器可能运行不正常。
P1-30	ABZ 增量编码器 AB 相序	0	0：正向 1：反向	0：电机正转时 A 相超前（电机反转时 B 相超前） 1：电机正转时 B 相超前（电机反转时 A 相超前）
P1-34	旋转变压器极对数	1	1~65535	在使用旋转变压器时，必须正确设置极对数参数。
P1-36	速度反馈 PG 断线检测时间	0.0s	0.0s：不动作 0.1s~10.0s	用于设置编码器断线故障的检测时间，当设置为0.0s时,变频器不检测编码器断线故障。 当变频器检测到有断线故障，并且持续时间超过P1-36 设置时间后，变频器报警 Err20。

6.5 控制性能

6.5.1 V/F 曲线的设定

1） 直线型 V/F、多点 V/F 设定

参数	功能定义	出厂值	设定范围	参数说明
P3-00	V/F 曲线设定	0	0、2~9：直线 V/F 1：多点 V/F 10：V/F 完全分离模式 11：V/F 半分离模式	-
P3-01	转矩提升	机型确定	0.0%~30.0%	-
P3-02	转矩提升截止频率	50.00Hz	0.00Hz~ 最大频率	-
P3-03	多点 V/F 频率点 1	0.00Hz	0.00Hz~P3-05	-
P3-04	多点 V/F 电压点 1	0.0%	0.0%~100.0%	
P3-05	多点 V/F 频率点 2	0.00Hz	P3-03~P3-07	
P3-06	多点 V/F 电压点 2	0.0%	0.0%~100.0%	
P3-07	多点 V/F 频率点 3	0.00Hz	P3-05~ 电机额定频率 (P1-04)	
P3-08	多点 V/F 电压点 3	0.0%	0.0%~100.0%	

● 通用恒转矩直线 V/F 曲线

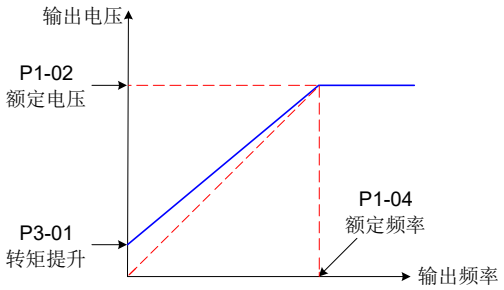


图 6-37 通用恒转矩直线 V/F 曲线

在额定频率以下，输出电压与频率成线性变化，适用于大惯量风机加速、冲床、离心机、水泵等一般机械传动应用场合。

● 自定义多点 V/F 曲线

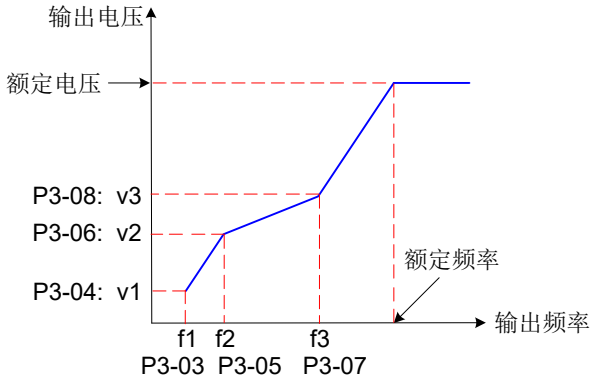


图 6-38 自定义多点 V/F 曲线

P3-03 ~ P3-08 六个参数定义多点 V/F 曲线，频率点设置范围为 0.00Hz ~ 电机额定频率，电压点设置范围为 0.0% ~ 100%，对应 0V ~ 电机额定电压，多点 V/F 曲线的设定值通常根据电机的负载特性来设定。务必如下设定：P3-03 ≤ P3-05 ≤ P3-07。为了保证设置无误，本变频器对频率点 P3-03、 P3-05 和 P3-07 上下限的关系进行了约束，设置时先设置 P3-07，再设置 P3-05，最后设置 P3-03；

2） V/F 分离曲线设定

参数	功能定义	出厂值	设定范围	参数说明
P3-13	V/F 分离的电压源	0	0：数字设定（P3-14） 1：AI1 2：AI2 3：AI3 4：PULSE 脉冲设定（DI5） 5：多段指令 6：简易 PLC 7：PID 8：通讯给定 注：100.0% 对应电机额定电压	-
P3-14	V/F 分离的电压数字设定	0V	0V~ 电机额定电压	V/F 半分离模式下，输出电压为此设定值的 2 倍
P3-15	V/F 分离的电压加速时间	0.0s	0.0s~1000.0s 注：表示 0V 变化到电机额定电压的时间	V/F 半分离模式下此参数不起作用，电压加速时间与 P0-17 一致

参数	功能定义	出厂值	设定范围	参数说明
P3-16	V/F 分离的电压减速时间	0.0s	0.0s~1000.0s 注：表示 0V 变化到电机额定电压的时间	V/F 半分离模式下此参数不起作用，电压减速时间与 P0-18 一致
P3-17	V/F 分离停机方式选择	0	0：频率 / 电压独立减至 0 1：电压减为 0 后频率再减	-

V/F 分离的电压加速时间指输出电压从 0 加速到电机额定电压所需时间，见图中的 t1。

V/F 分离的电压减速时间指输出电压从电机额定电压减速到 0 所需时间，见图中的 t2。

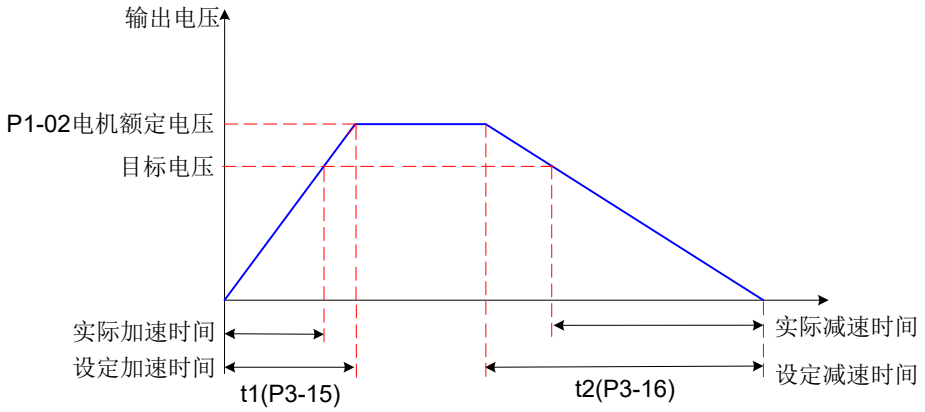


图 6-39 V/F 分离示意图

6.5.2 变频器输出电流（转矩）限制

在加速、恒速、减速过程中，如果电流超过过流失速动作电流（出厂值 150%，表示变频器额定电流的 1.5 倍），过流失速将起作用，输出频率开始降低，直到电流回到过流失速点以下后，频率才开始向上加速到目标频率，实际加速时间自动拉长，如果实际加速时间不能满足要求，可以适当增加“P3-18 过流失速动作电流”。

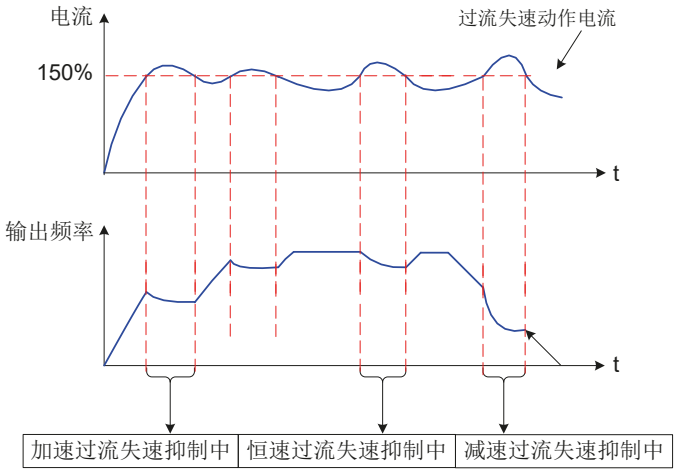


图 6-40 过流失速动作示意图

参数	功能定义	出厂值	设定范围	参数说明
P3-18	过流失速动作电流	150%	50%~200%	启动过流失速抑制动作的电流。

P3-19	过流失速抑制	1	0，1	0：无效；1：有效
P3-20	过流失速抑制增益	20	0~100	如果电流超过过流失速电流点，过流失速抑制将起作用，实际加速时间自动拉长。
P3-21	倍速过流失速动作电流补偿系数	50%	50%~200%	降低高速过流失速动作电流，补偿系数为 50% 时无效，弱磁区动作电流对应 P3-18 推荐设定值 100%。

在高频区域，电机驱动电流较小，相对于额定频率以下，同样的失速电流，电机的速度跌落很大，为了改善电机的运行特性，可以降低额定频率以上的失速动作电流，在一些离心机等运行频率较高、要求几倍弱磁且负载惯量较大的场合，这种方法对加速性能有很好的效果，可有效防止电机失速。

超过额定频率的过流失速动作电流 = (fs/fn) * k * LimitCur;

fs 为运行频率，
fn 为电机额定频率，
k 为 P3-21“倍速过流失速动作电流补偿系数”，
LimitCur 为 P3-18“过流失速动作电流”；

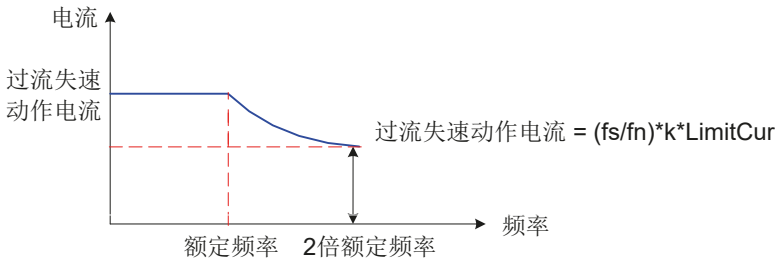


图 6-41 倍速过流失速动作示意图

NOTE

- 大功率电机，载波频率在 2kHz 以下，由于脉动电流的增加导致逐波限流响应先于过流失速防止动作启动，而产生转矩不足，这种情况下，请降低过流失速动作电流。

6.5.3 变频器过压失速抑制

如果母线电压超过过压失速动作电压(P3-22)，表示机电系统已经处于发电状态（电机转速 > 输出频率），过压失速将起作用，调节输出频率，实际减速时间将自动拉长，避免跳闸保护，如果实际减速时间不能满足要求，可以适当增加过励磁增益。

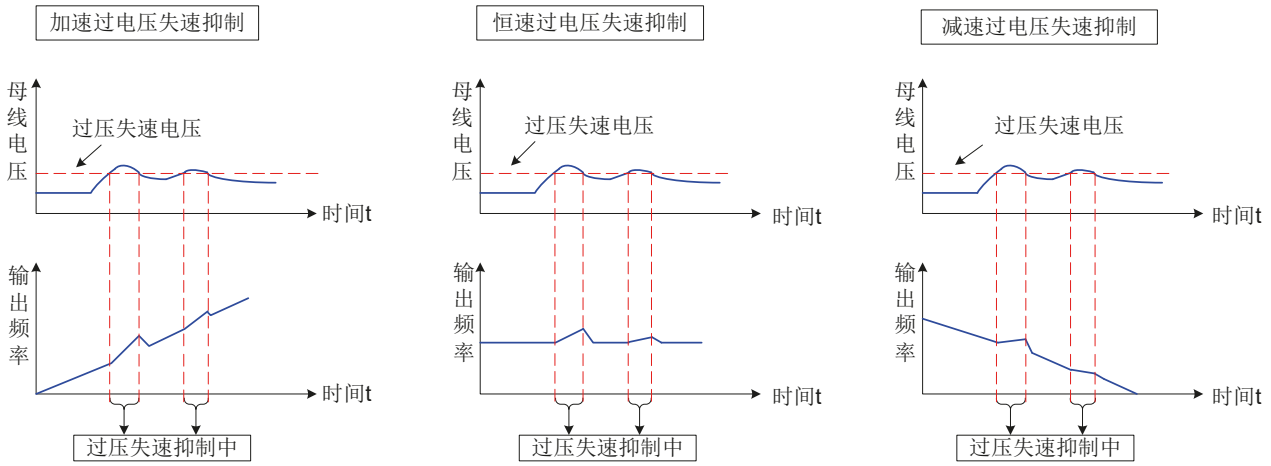


图 6-42 过压失速动作示意图

参数	功能定义	出厂值	设定范围	参数说明
P3-22	过压失速动作电压	770.0V	650.0V~800.0V	P3-22 的功能作用等同于 P9-04。
P3-23	过压失速抑制	1	0，1	0: 无效; 1: 有效（默认过压失速增益有效）
P3-24	过压失速频率增益	30	0~100	增大 P3-24 会改善母线电压的控制效果，但是输出频率会产生波动，如果输出频率波动较大，可以适当减少 P3-24。P3-24 的功能作用等同于 P9-03。 增大 P3-25 可以减少母线电压的超调量。
P3-25	过压失速电压增益	30	0~100	
P3-26	过压失速最大上升频率限制	5Hz	0~50Hz	过压抑制最大上升频率限制
P9-08	制动单元动作起始电压	760V	650V~800V	-
P3-10	V/F 过励磁增益	64	0~200	过励磁增益越大，抑制效果越强。
P3-11	V/F 振荡抑制增益	40	0~100	-
P9-03	过压失速增益	30	0~100	功能等同于 P3-24，将会跟随 P3-24 一起变化。
P9-04	过压失速保护电压	770V	650V~800V	功能等同于 P3-22，将会跟随 P3-22 一起变化。

使用制动电阻或加装制动单元或者使用能量回馈单元时请注意：

- 请设定 P3-10“过励磁增益”值为“0”，否则有可能引起运行中电流过大问题。
- 请设定 P3-23“过压失速使能”值为“0”，否则有可能引起减速时间延长问题。

6.5.4 提高 V/F 运行性能

1） 如何缩短 V/F 控制方式下的实际加速时间?

现象	措施
加速过程如果发现电机实际加速时间，远远大于设定加速时间，可以采取以下措施：	目标频率小于 2 倍额定频率，加速过程发现实际加速时间满足不了要求时，可以加大 P3-18“过流失速动作电流”，每次调整 10%，P3-18“过流失速动作电流”设定值超过 170%，容易引起“变频器过载故障 EER10”或“快速限流故障 EER40”。
	如果目标频率为 3 倍或 4 倍额定频率以上，在急加速过程，很可能会出现电机失速现象（变频器输出频率已经达到目标频率，但电机实际转速一直停留中速段的某一转速，但电机实际速度一直停留在较低频率，或者加速时间过长），此时可以调节 P3-21“倍速过流失速动作电流补偿系数”设定值为 100%。

2） 如何缩短 V/F 控制方式下的实际减速时间?

现象	措施
减速过程如果发现电机实际减速时间，远远大于设定减速时间，可以采取以下措施：	如果无加装制动电阻或回馈单元，请增加P3-10“V/F过励磁增益”设定值，每次调整量“±20”。增加 P3-10“V/F 过励磁增益”设定值后，如果引起电机振荡过压故障，请减小“过压失速抑制电压增益”设定值。
	如果变频器加装了制动电阻或能量回馈单元，且变频器输入电压等级为 360~420V，请调整 P9-08“制动单元动作起始电压”设定值为 690V，调整 P3-10“V/F 过励磁增益”设定值为 0。
	使用停机直流制动，推荐设定值： P6-11（停机直流制动启始频率） 0.5Hz； P6-13（停机直流制动电流） 50%； P6-14（停机直流制动时间） 1s；

3） 如何限制 V/F 控制方式下的输出电流，及极端冲击负载情况下如何防止过流故障?

现象	措施
为了更好的保护电机，控制电机电流上限，可以采取以下措施调整变频器输出电流上限：	“变频器输出电流上限”可以通过调整 P3-18“过流失速动作电流”来控制，“变频器输出电流上限”＝变频器额定电流 X“过流失速动作电流”（出厂值 150%）。建议“变频器输出电流上限”最小不应小于电机额定电流，推荐值为电机额定电流的 1.5 倍。
	急加速、急减速、或者冲击性负载类型时有可能引起 “过流故障”或者“快速限流故障 EER40”，请增加 P3-20“过流失速抑制增益”设定值，每次调整量为“±10”，调整得过大有可能引起电流振荡。

4） 如何限制 V/F 控制方式下的母线电压，防止过压故障?

现象	措施
在一些恒速发电负载（如典型的油田抽油机），冲击性突加突卸负载（如典型的大功率冲床），运行过程极易引起过电压故障，为了避免引起过压故障，如果出厂参数仍然会出现过压故障，可以采取以下措施：	恒速间歇性发电负载：请降低 P3-22“过压失速动作电压”设定值（出厂值 770V），非特定要求限制母线电压上限值，建议调整成 720V 左右，如果仍然发生过压故障，请调整 P3-24“过压失速最大上升频率限制”设定值为 10Hz 或 20Hz（如油田抽油机这种周期性发电时间较长的负载）。
	冲击性突加突卸负载发生压故障时，请降低 P3-22“过压失速动作电压”设定值，建议调整成 720V 左右。
	大惯量急减速负载：如果变频器加装了制动电阻，且变频器输入电压等级为 360~420V，请调整 P9-08“制动单元动作起始电压”设定值为 690V，调整 P3-10“V/F 过励磁增益”设定值为 0。如果仍然过压，请降低 P3-22“过压失速动作电压”设定值，建议调整成 740V 左右。

6.5.5 速度环

参数	功能定义	出厂值	设定范围	参数说明
P2-00	速度环比例增益 1	30	1~100	-
P2-01	速度环积分时间 1	0.50s	0.01s~10.00s	-
P2-02	切换频率 1	5.00Hz	0.00~P2-05	-
P2-03	速度环比例增益 2	20	1~100	-
P2-04	速度环积分时间 2	1.00s	0.01s~10.00s	-
P2-05	切换频率 2	10.00Hz	P2-02~ 最大频率	-

速度环 PI 参数分低速和高速两组，
运行频率小于“切换频率 1”（P2-02）时，速度环 PI 调节参数为 P2-00 和 P2-01。
运行频率大于“切换频率 2”（P2-05）时，速度环 PI 调节参数为 P2-03 和 P3-04。
切换频率 1（P2-02）和切换频率 2（P2-05）之间的速度环 PI 参数，为两组 PI 参数线性切换，
如下图所示：

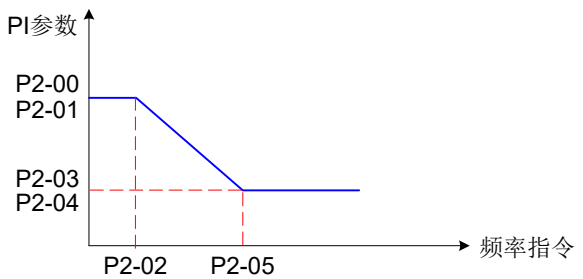


图 6-43 速度环 PI 参数示意图

通过设定速度调节器的比例系数和积分时间，可以调节矢量控制的速度动态响应特性。

增加比例增益，减小积分时间，均可加快速度环的动态响应。但是比例增益过大或积分时间过小均可能使系统产生振荡。

建议调节方法为：如果出厂参数不能满足要求，则在出厂值参数基础上进行微调，先增大比例增益，保证系统不振荡；然后减小积分时间，使系统既有较快的响应特性，超调又较小。

- 如 PI 参数设置不当，可能会导致速度超调过大。甚至在超调回落时产生过电压故障。

6.5.6 矢量控制转差调节

参数	功能定义	出厂值	设定范围	参数说明
P2-06	矢量控制转差增益	100%	50%~200%	转差调节参数，改善控制性能

对矢量控制（P0-01=0，1），此参数可调节电机的稳速精度，例如电机运行频率低于变频器输出频率时，可增大该参数。

对有速度传感器矢量控制（P0-01=1），此参数可以调节同样负载下变频器的输出电流大小，如在大功率变频器中，若带载能力较弱时，可逐渐调小此参数。注意：一般情况下，无需调节此参数。

6.5.7 SVC 速度反馈稳定性

参数	功能定义	出厂值	设定范围	参数说明
P2-07	SVC 速度反馈滤波时间	0.015s	0.000s~0.100s	-

SVC 速度反馈滤波时间只有当 P0-01=0 时生效，加大 P2-07 可以改善电机稳定性，但动态响应变弱，反之则动态响应加强，但太小会引起电机震荡。一般情况下无需调整。

6.5.8 转矩上限

在矢量控制（FVC 或 SVC）下，有两种控制方式：速度控制和转矩控制（A0-00），两种控制方式的转矩上限不同，分两组参数进行设置。

1） 速度控制转矩上限设定

参数	功能定义	出厂值	设定范围	参数说明
P2-09	速度控制方式下转矩上限指令选择	0	0：参数 P2-10 设定 1：AI1 2：AI2 3：AI3 4：PULSE 脉冲设定 5：通讯给定 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) 1-7 选项的满量程对应 P2-10	-
P2-10	速度控制方式下转矩上限数字设定	150.0%	0.0%~200.0%	电动状态下的转矩上限，以变频器额定电流为基值
P2-11	速度控制方式下转矩上限指令选择（发电）	0	0：参数 P2-10 设定（不区分电动和发电） 1：AI1 2：AI2 3：AI3 4：PULSE 脉冲设定 5：通讯给定 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) 8：参数 P2-12 设定 1-7 选项的满量程对应 P2-12	-
P2-12	速度控制方式下转矩上限数字设定（发电）	150.0%	0.0%~200.0%	发电状态下的转矩上限，以变频器额定电流为基值

- 速度控制模式下，转矩上限源有 8 种设定方式。其中电动状态时，转矩上限源由 P2-09 进行选择，在发电状态时，转矩上限源选择由 P2-11 确定。

- 速度控制模式下，若 P2-11 设为 1~8，转矩上限区分电动状态和发电状态，其中电动状态转矩上限满量程由 P2-10 设定，发电状态转矩上限满量程由 P2-12 设定，示意图如下所示:

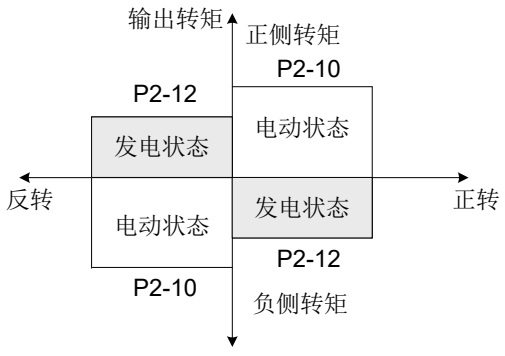


图 6-44 速度控制转矩上限示意图

参数	功能定义	出厂值	设定范围	参数说明
P2-22	发电功率限制使能	0	0：无效 1：有效	-
P2-23	发电功率上限	机型确定	0.0~200.0%	-

- 针对凸轮负载、快速加减速、负载突卸等应用场合，且未使用制动电阻时，可以通过使能发电功率限制，有效减小电机制动过程中母线电压过冲，避免过压故障的发生。发电功率上限 P2-23 为电机额定功率的百分比，当使能发电功率限制后依然发生过压时，请将 P2-23 向下调整。

2） 转矩控制转矩上限说明

参数	功能定义	出厂值	设定范围	参数说明
A0-00	速度 / 转矩控制方式选择	0	0：速度控制 1：转矩控制	-
A0-01	转矩控制方式下转矩设定选择	0	0：数字设定 1(A0-03) 1：AI1 2：AI2 3：AI3 4：PULSE 脉冲设定 5：通讯给定 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) （1-7 选项的满量程，对应 A0-03 数字设定）	-
A0-03	转矩控制方式下转矩数字设定	150.0%	-200.0%~200.0%	-
A0-05	转矩控制正向最大频率	50.00Hz	0.00Hz~ 最大频率	-
A0-06	转矩控制反向最大频率	50.00Hz	0.00Hz~ 最大频率	-
A0-07	转矩加速时间	0.00s	0.00s~65000s	-
A0-08	转矩减速时间	0.00s	0.00s~65000s	-

- 速度 / 转矩控制方式选择（A0-00）

速度 / 转矩控制方式由 A0-00 进行设定。

YD580E 的多功能数字 DI 端子，具备两个与转矩控制相关的功能：转矩控制禁止（功能 29）、速度控制 / 转矩控制切换（功能 46）。这两个端子要跟 A0-00 配合使用，实现速度与转矩控制的切换。

当速度控制 / 转矩控制切换端子（功能 46）无效时，控制方式由 A0-00 确定，若速度控制 / 转矩控制切换有效，则控制方式相当于 A0-00 的值取反。

无论如何，当转矩控制禁止端子有效时，变频器固定为速度控制方式。

● 转矩控制转矩指令设定（A0-01、A0-03）

A0-01 用于选择转矩设定指令，共有 8 种转矩设定方式。

转矩设定采用相对值，100.0% 对应变频器额定转矩（可通过 U0-74 查看变频器输出转矩，100% 对应变频器额定转矩；U0-06 查看电机输出转矩，100% 对应电机额定转矩）。设定范围 -200.0%~200.0%，表明变频器最大转矩为 2 倍变频器额定转矩。

当转矩给定值为正时，变频器正向运行。

当转矩给定值为负时，变频器反向运行。

● 转矩控制频率上限设定（A0-05、A0-06）

转矩控制时，频率上限的加减速时间在 P8-07（加速）/ P8-08（减速）设定。
用于设置转矩控制方式下，变频器的正向或反向最大运行频率。

当变频器转矩控制时，如果负载转矩小于电机输出转矩，则电机转速会不断上升，为防止机械系统出现飞车等事故，必须限制转矩控制时的电机最高转速（A0-05/A0-06）。

如果需要实现动态连续更改转矩控制最大频率，可以采用控制上限频率的方式实现。

● 转矩控制转矩加减速时间设定（A0-07、A0-08）

转矩控制方式下，电机输出转矩与负载转矩的差值，决定电机及负载的速度变化率，所以，电机转速有可能快速变化，造成噪音或机械应力过大等问题。通过设置转矩控制加减速时间，可以使电机转速平缓变化，转矩加减速时间对应转矩从 0 增加到 A0-03 的时间。

在小转矩启动的转矩控制中，不建议设置转矩加减速时间；需要转矩快速响应的场合，设置转矩控制加减速时间为 0.00s。

例如：两个电机硬连接拖动同一负载，为确保负荷均匀分配，设置一台变频器为主机，采用速度控制方式，另一台变频器为从机并采用转矩控制，主机的实际输出转矩作为从机的转矩指令，此时从机的转矩需要快速跟随主机，那么从机的转矩控制加减速时间为 0.00s。

6.5.9 电流环参数说明

参数	功能定义	出厂值	设定范围	参数说明
P2-13	励磁调节比例增益	2000	0~60000	电机参数调谐时自动获得
P2-14	励磁调节积分增益	1300	0~60000	
P2-15	转矩调节比例增益	2000	0~60000	
P2-16	转矩调节积分增益	1300	0~60000	

矢量控制电流环 PI 调节参数分为励磁和转矩两组，该参数在异步机完整调谐后会自动获得，一般不需要修改。

需要提醒的是，电流环的积分调节器，不是采用积分时间作为量纲，而是直接设置积分增益。电流环 PI 增益设置过大，可能导致整个控制环路振荡，故当电流振荡或者转矩波动较大时，可以手动减小此处的 PI 比例增益或者积分增益。

6.5.10 提高弱磁区性能

参数	功能定义	出厂值	设定范围	参数说明
A5-05	最大输出电压系数	105%	100%~110%	最大输出电压系数表示变频器最大输出电压的提升能力。 加大A5-05可以提高电机弱磁区的最大带载能力，但是电机电流纹波增加，会加重电机发热量；反之电机弱磁区的最大带载能力会下降，但是电机电流纹波减少，会减轻电机发热量。一般无需调节。
P2-21	弱磁区最大转矩系数	100%	50%~200%	该参数只有当电机运行在额定频率以上时才会生效。 当电机需要急加速运行至2倍电机额定频率以上且出现实际加速时间较长时，适当减少P2-21；当电机运行在2倍额定频率加载后速度跌落较大时，适当增加P2-21，一般无需更改。

6.5.11 FVC 运行及性能提升

1） 有速度传感器矢量控制简单设定步骤

- 速度控制简单设定步骤

表 6-3 有速度传感器速度控制模式简单设定步骤

设置步骤	相关参数	说明
确认变频器接线无误	-	在调谐过程中，若报Err19号故障，请检查变频器接线是否有误，以及检查电机参数是否设置正确。
设定电机参数	P1-01、P1-02、P1-03、P1-04、P1-05	
设定编码器类型及线数	P1-27、P1-28	若报Err20号故障，请检查编码器及PG卡是否异常。
选择控制方法	P0-01	-
电机参数调谐	P1-37	异步机动态完整调谐需执行一段时间，需等待调谐完成后再进行下一步操作。尽量选择异步机动态完整调谐（P1-37为2），在异步机动态完整调谐时尽量脱开负载，电机会运行到高速。在不允许脱开负载的场合（如起重等），选择静态电机参数完整调谐（P1-37=3）
设置相应运行指令和频率指令	P0-02、P0-03	-
试运行	A0-00=0	-

● 转矩控制简单设定步骤

表 6-4 有速度传感器转矩控制模式简单设定步骤

设置步骤	相关参数	说明
确认变频器接线无误	-	在调谐过程中，若报 Err19 号故障，请检查变频器接线是否有误，以及检查电机参数是否设置正确。
设定电机参数	P1-01、P1-02、P1-03、P1-04、P1-05	
设定编码器类型及线数	P1-27、P1-28	若报 Err20 号故障，请检查编码器及 PG 卡是否异常。
选择控制方法	P0-01	-
电机参数调谐	P1-37	异步机动态完整调谐需执行一段时间，需等待调谐完成后再进行下一步操作。尽量选择异步机动态完整调谐（P1-37 为 2），在异步机动态完整调谐时尽量脱开负载，电机会运行到高速。在不允许脱开负载的场合（如起重等），选择静态电机参数完整调谐（P1-37=3）
设置相应运行指令	P0-02	-
设置转矩控制参数	A0-00、A0-01、A0-03、A0-05、A0-06、A0-07、A0-08	-
试运行	-	-

2) FVC 环路设置

● 速度环环路设置

· 电机运行额定频率以下发生振荡或发出异响，则速度环设置过强，需减小速度环参数（即减小 P2-00、P2-03 数值，增大 P2-01、P2-04 数值）。

· 在急加速时，若系统的速度超调较大，需增大速度环 Kp（即增大 P2-00，P2-03 数值），减小速度环 Ki（增大 P2-01，P2-04 数值）。

· 在收放卷场合，由于卷径会发生变化且卷径和速度成反比，因此保证系统的动态响应性，在大卷径时需增大速度环增益（即增大低速段速度环增益，增大 P2-00，减小 P2-1)。

· 在极低速运行场合（如铣床 0.01Hz 运行加工），要保证运行平滑性，需增大速度环增益，特别是增大速度环积分增益（增大 P2-00，减小 P2-01）。

NOTE

● 在编码器反馈较差场合，速度环不能设置太强，影响系统动态响应性。需先考虑改善编码器反馈信号（如电机动力线与编码器信号线分开，确认系统接地是否良好），否则降低速度环参数会降低系统的动态响应性，影响系统工作效果。

● 电流环环路设置

电流环环路参数在异步机完整调谐后会自动获得，一般不需要修改。但在以下情况下可以进行微调。

· 电机 FVC 运行有振荡或发出异响，减小速度环参数后仍有轻微振荡或异响，可以适当降低电流环参数（即减小 P2-13，P2-14，P2-15, P2-16）。

· 系统要求超调较小，速度环参数设置不能太小，若此时电机 FVC 运行有振荡或发出异响，可以适当降低电流环参数（即减小 P2-13，P2-14，P2-15, P2-16）。

● 解决 FVC 运行到高速有异常问题

在一些高速（如 200Hz 以上）运行场合，会出现 FVC 运行振荡或运行异常问题。此时，先用 V/F 运行相同频率，查看反馈频率（U0-29）是否和设定频率一致，若相差较大（如 4Hz 以上），则由编码器信号失真（不正交或占空比异常）及 PG 卡滤波导致，需以下处理：

- 更换编码器，检查编码器是否损坏或安装有问题，以及此编码器品牌是否能支持此脉冲频率。
- 更换 PG 卡（如 PGMD 卡），防止高速运行时编码器信号失真情况下，PG 卡滤波较大导致接收信号有问题。

● 改善 FVC 控制方式下的加减速时间

在急加减速场合，实际加减速时间比设定加减速时间要大，若需减小加减速时间，可以进行以下改善措施：

- 减小电机加速时间，可以增大 FVC 控制的转矩上限（P2-10 可以适当增加，最大到 180%）。需注意：增加转矩上限可以改善电机加速时间，但转矩上限放大会使电机电流增大，更容易报过载等故障。
- 可选配合适的制动电阻，减小减速时间。

● 限制 FVC 控制方式下的母线电压，防止过压故障

在一些大惯量或急减速场合，在减速过程中，系统容易报过压故障。（改善措施和 V/F 一致，共用参数）。

6.5.12 辅助控制参数

参数	功能定义	出厂值	设定范围	参数说明
A5-00	DPWM 切换上限频率	8.00Hz	5.00Hz~ 最大频率	调整参数 A5-00 到最大频率可以减少电机噪音:注1
A5-01	PWM 调制方式	0	0：异步调制 1：同步调制	当载波频率除以运行频率小于 10 时，会引起输出电流振荡或电流谐波较大，此时可以调整成“同步调制”达到减少电流谐波的效果。:注2
A5-03	随机 PWM 深度	0	0：随机 PWM 无效 1~10：PWM 载频随机深度	“0”表示随机 PWM 无效； 如果电机噪音较大，可以调整设定值（每次增加 1），来改善电机噪音。

注1：变频器有CPWM和DPWM两种PWM调制发波方式，运行频率大于A5-00切换频率时，为DPWM调制；运行频率小于A5-00切换频率时，为CPWM调制。DPWM调制可提高变频器效率，CPWM调制可减小电机噪声。调整参数A5-00到最大频率可以减少电机噪音。

注2：当载波频率除以运行频率的值小于10时，会引起输出电流振荡或电流谐波较大，此时可以调整成“同步调制”，达到减少电流谐波的效果。

0：异步调制。指载波频率和信号波频率不同步的调制方式。通常保持载波频率不变，当信号波频率发生变化时，载波比也会随之变化。

1：同步调制。指载波频率和信号波频率保持同步的调制方式。载波频率和信号频率同时发生变化，而载波比保持不变。所以在一个周期内形成横的SPWM脉冲的个数是固定的，等效正弦波对称性较好。

6.6 保护功能

本小节介绍保护变频器和电机的相关功能。

6.6.1 启动保护

变频器的安全保护功能。若 P8-18 设置为 1 时，可以对以下两种情况进行保护。

情况 1：如果变频器上电时运行命令有效（例如端子运行命令上电前为闭合状态），则变频器不响应运行命令，必须先将运行命令撤除一次，运行命令再次有效后变频器才响应。

情况 2：如果变频器故障复位时运行命令有效，变频器也不响应运行命令，必须先将运行命令撤除才能消除运行保护状态。

参数	功能定义	出厂值	设定范围	参数说明
P8-18	启动保护选择	0	0：不保护 1：保护	设置为 1，可以防止在不知情的状况下，发生上电时或者故障复位时，电机响应运行命令而造成的危险。

6.6.2 电机过载保护设定

参数	功能定义	出厂值	设定范围	参数说明
P9-00	电机过载保护选择	1	0：禁止	无电机过载保护功能，建议此时电机前加热继电器；
			1：允许	变频器根据电机过载保护的反时限曲线，判断电机是否过载。
P9-01	电机过载保护增益	1.00	0.20~10.00	如果需要对电机过载电流和时间进行调整，请设置 P9-01。
P9-02	电机过载预警系数	80%	50%~100%	预警系数用于确定，在电机过载保护前多大程度进行预警。该值越大则预警提前量越小。

为了对不同的负载电机进行有效保护，需要根据电机过载能力对电机过载保护增益进行设置。电机过载保护为反时限曲线，电机过载保护曲线如下图所示：

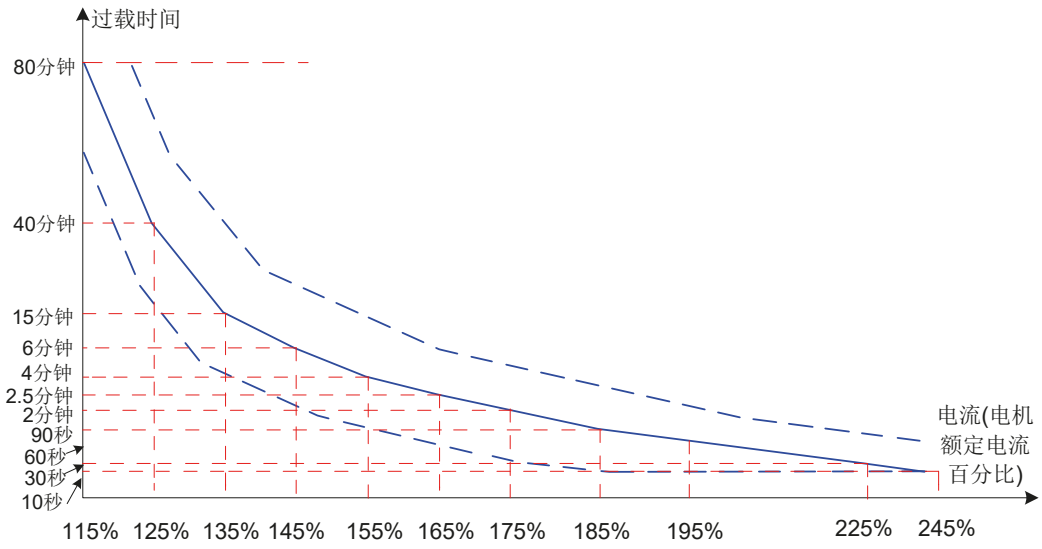


图 6-45 电机过载保护反时限曲线示意图

在电机运行电流到达 175% 倍电机额定电流条件下，持续运行 2 分钟后报电机过载（Err11）；

在电机运行电流到达 115% 倍电机额定电流条件下，持续运行 80 分钟后报电机过载（**Err11**）。

举例：假设电机额定电流 100A

如果 P9-01 设定成 1.00，那么根据上图所示，当电机运行电流达到 100A 的 125%（125A）时，持续 40 分钟后，变频器报“电机过载故障（Err11）”；

如果 P9-01设定成 1.20，那么根据上图所示，当电机运行电流达到 100A 的 125%（125A）时，持续 40*1.2=48 分钟后，变频器报“电机过载故障（Err11）”；

注意：最长 80 分钟过载，最短时间 10 秒过载。

电机过载保护调整举例：需要电机在 150% 电机电流的情况下运行 2 分钟报过载

通过电机过载曲线图得知，150%(I) 的电流位于 145%(I1) 和 155%(I2) 的电流区间内，145% 的电流 6 分钟（T1）过载，155% 的电流 4 分钟（T2）过载，则可以得出默认设置下 150% 的电机额定电流 5 分钟过载。计算方法如下：

T = T1 + (T2 - T1)*(I – I1)/(I2 –I1) = 4 + (6 - 4)*(150% – 145%)/(155% –145%) = 5（分钟）

从而可以得出需要电机在 150% 电机电流情况下 2 分钟报过载，则需要设置的“电机过载保护增益”为 P9-01 = 2 ÷ 5 = 0.4

注意：用户需要根据电机的实际过载能力，正确设置 P9-01 的值，该参数设置过大容易发生电机过热损坏而变频器未及时报警保护的危险！

- 电机过载预警系数表示：当电机过载检测水平达到该参数设定值时，多功能输出端子 DO 或故障继电器（RELAY）输出“电机过载预报警信号”，该参数是根据电机在某过载点下持续运行而不报过载故障的时间百分比计算。

例如：当电机过载保护增益设置为 1.00，电机过载预警系数设置为 80% 时，如果电机电流达到 145% 的额定电机电流下持续运行 4.8 分钟（80%×6 分钟）时，多功能输出端子 DO 或故障继电器 RELAY 输出电机过载预警信号。

- 电机过载预警功能用于在电机过载故障保护前，通过 DO 给控制系统一个预警信号。该预警系数用于确定，在电机过载保护前多大程度进行预警。该值越大则预警提前量越小。当变频器输出电流累积量，大于过载时间（电机过载保护反时限曲线的 Y 值）与“电机过载预警系数（P9-02）”乘积后，变频器多功能数字 DO 输出“电机过载预报警”有效信号。特殊情况下，当电机过载预警系数 P9-02 设置为 100% 时，预警提前量为 0，此时预报警和过载保护同时发生。

6.6.3 缺相保护设定

参数	功能定义	出厂值	设定范围	参数说明
P9-12	输入缺相 \ 接触器吸合保护选择	11	个位：输入缺相保护选择 0：禁止 1：允许 十位：接触器吸合保护选择 0：禁止 1：允许	选择是否对输入缺相或接触器吸合进行保护。
P9-13	输出缺相保护选择	01	个位：输出缺相保护选择 0：禁止 1：允许 十位：运行前输出缺相保护选择 0：禁止 1：允许	个位：选择是否对输出缺相的进行保护，如果选择 0 而实际发生输出缺相时不会报故障，此时实际电流比面板显示的电流大一些，存在风险，谨慎使用。 十位：运行中输出缺相检测大概需要几秒钟的时间，对于缺相后启动存在风险或低频运行的场合，使能该功能，可以快速检测出启动时是否存在输出缺相，但对启动时间有严格要求的场合建议不要使能该功能。

6.6.4 故障复位

- 欠压故障（Err09）在母线电压恢复正常时会自动复位，且不包含在故障自动复位次数之内；
- 对地短路故障（Err23）不能自动或者手动复位，只能通过变频器完全断电，再次上电后才能复位；
- 到达故障自动复位次数后，再执行故障动作保护选择。

参数	功能定义	出厂值	设定范围	参数说明
P9-09	故障自动复位次数	0	0 ~20	当变频器选择故障自动复位时，用来设定可自动复位的次数。超过此次数后，变频器保持故障状态。
P9-10	故障自动复位期间故障 DO 动作选择	1	0：不动作 1：动作	如果变频器设置了故障自动复位功能，则在故障自动复位期间，故障 DO（DO 端子功能选择为 2）是否动作，可以通过 P9-10 设置。
P9-11	故障自动复位等待时间	1.0s	0.1s ~100.0s	从变频器故障报警，到故障自动复位之间的等待时间。

6.6.5 故障动作保护选择

参数	功能定义	出厂值	设定范围	参数说明
P9-47	故障保护动作选择 1	00000	个位：电机过载（Err11） 0：自由停车 1：按停机方式停机 2：继续运行 十位：输入缺相（Err12）（同个位） 百位：输出缺相（Err13）（同个位） 千位：外部故障（Err15）（同个位） 万位：通信异常（Err16）（同个位）	-
P9-48	故障保护动作选择 2	00000	个位：编码器故障（Err20） 0：自由停车 1：切换为 V/F，按停机方式停机 2：切换为 V/F，继续运行 十位：参数读写异常（Err21） 0：自由停车 1：按停机方式停机 百位：变频器过载故障动作选择（Err10） 0：自由停机 1：降额运行 千位：电机过热（Err45） 万位：运行时间到达（Err26）（同千位）	百位用于选择变频器发生过载时的故障动作选择，当设置为 0 时，变频器过载时将报过载故障，同时封锁输出；当设置为 1 时，变频器即将过载时将自动降低输出电流至变频器额定电流附近，避免过载故障的发生，但可能会发生运行速度降低或堵转。 对于提升类负载请将该参数设置为 0。

参数	功能定义	出厂值	设定范围	参数说明
P9-49	故障保护动作选择 3	00000	个位：用户自定义故障 1（Err27） 0：自由停车 1：按停机方式停机 2：继续运行 十位：用户自定义故障 2（Err12）（同个位） 百位：上电时间到达（Err29）（同个位） 千位：掉载（Err30） 0：自由停车 1：按停机方式停机 2: 直接跳至电机额定频率的 7% 继续运行，不掉载则自动恢复到设定频率运行 万位: 运行时 PID 反馈丢失（Err31）（同个位）	-
P9-50	故障保护动作选择 4	00000	个位：速度偏差过大（Err42） 0：自由停车 1：按停机方式停机 2：继续运行 十位：电机超速度（Err43）（同个位） 百位：初始位置错误（Err51）（同个位） 千位：速度反馈错误（Err52）（同个位） 万位：保留	-
P9-54	故障时继续运行频率选择	0	0：以当前的运行频率运行 1：以设定频率运行 2：以上限频率运行 3：以下限频率运行 4：以异常备用频率运行	当变频器运行过程中产生故障，且该故障的处理方式设置为继续运行时，变频器显示 A**，并以 P9-54 确定的频率运行
P9-55	异常备用频率	100.0%	0.0~100.0%（100.0% 对应最大频率）	

6.6.6 电机过热保护选择

参数	功能定义	出厂值	设定范围	参数说明
P9-56	电机温度传感器类型	0	0：无温度传感器 1：PT100 2：PT1000	电机温度传感器信号需接 YD58IO 扩展卡上的 AI3、PGND 端。 支持 PT100 和 PT1000 两种电机温度传感器，使用时必须正确设置传感器类型。 电机温度值在 U0-34 中显示。
P9-57	电机过热保护阀值	110°C	0°C ~200°C	当电机温度超过电机过热保护阈值 P9-57 时，变频器故障报警（Err45），并根据所选择故障保护动作方式 (P9-48) 处理。
P9-58	电机过热预报警阀值	90°C	0°C ~200°C	当电机温度超过电机过热预报警阈值 P9-58 时，选择 39# 功能（电机过热预报警）的DO 端子输出有效信号。

6.6.7 瞬时停电连续运行（瞬停不停）

瞬停不停功能使得系统在短时停电时能持续运行。系统发生停电时，变频器使电机处于发电状态，使母线电压维持在“瞬停不停动作判断电压”左右，防止变频器因输入电压过低导致欠压故障而停机。如下图所示：

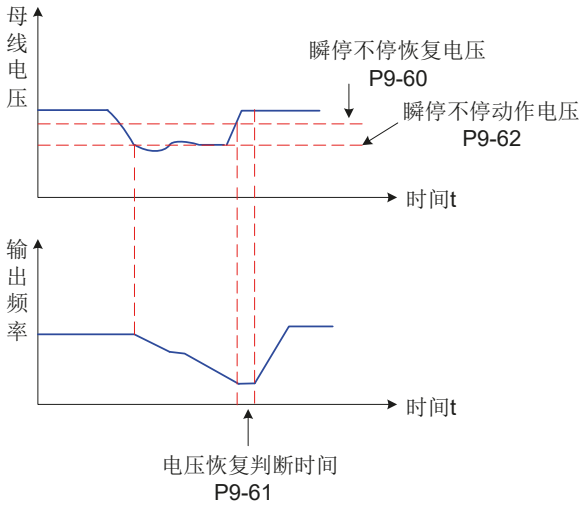


图 6-46 瞬停不停过程示意图

参数	功能定义	出厂值	设定范围	参数说明
P9-59	瞬停不停功能选择	0	0：无效 1：母线电压恒定控制 2：减速停机	风机水泵、离心机等大惯量场合建议使用“母线电压恒定控制”模式，纺织行业建议使用“减速停机”模式。
P9-60	瞬停不停恢复电压	85%	80%~100%	（380V 等级）100% 对应 540V
P9-61	瞬停不停电压恢复判断时间	0.5s	0.0~100.0s	只对“母线电压恒定控制（P9-59=1）”有效
P9-62	瞬停不停动作电压	80%	60%~100%	（380V 等级）100% 对应 540V
P9-71	瞬停不停增益 Kp	0~100	40	只对“母线电压恒定控制（P9-59=1）”有效如果瞬停不停过程容易欠压请加大 Kp 和 Ki
P9-72	瞬停不停积分系数 Ki	0~100	30	
P9-73	瞬停不停动作减速时间	0~300.0s	20.0s	只对“减速停机（P9-59=2）”模式有效

NOTE

- “母线电压恒定控制”模式时，当电网恢复供电时，变频器输出频率会按加速时间恢复到目标频率;
- “减速停机”模式时，当电网恢复供电时，变频器继续减速到 0Hz 停机，直到变频器再次发出启动命令变频器才会启动。

6.6.8 掉载保护

参数	功能定义	出厂值	设定范围	参数说明
P9-63	掉载保护选择	0	0: 无效 1: 有效	如果掉载保护功能有效，则当变频器输出电流小于掉载检测水平 P9-64，且持续时间大于掉载检测时间 P9-65 时，变频器执行掉载保护动作（掉载动作可由P9-49选择，默认自由停车）。在掉载保护期间，如果负载恢复，则变频器自动恢复为按设定频率运行。
P9-64	掉载检测水平	10.0%	0.0%~100.0%	
P9-65	掉载检测时间	1.0s	0.0~60.0s	

6.6.9 过速保护

此功能只在变频器运行在有速度传感器矢量控制时 (P0-01=1) 有效。

参数	功能定义	出厂值	设定范围	参数说明
P9-67	过速度检测值	20.0%	0.0%~50.0%（最大频率）	当变频器检测到电机的实际转速超过最大频率 (P0-10)，超出值大于过速度检测值 P9-67，且持续时间大于过速度检测时间 P9-68时，变频器故障报警 Err43，并根据故障保护动作方式 (P9-50) 处理。 当 P9-68 设置为 0.0s 时，取消过速度故障检测。
P9-68	过速度检测时间	1.0s	0.0s~60.0s	

6.6.10 速度偏差过大保护

此功能只在变频器运行在有速度传感器矢量控制时有效。

参数	功能定义	出厂值	设定范围	参数说明
P9-69	速度偏差过大检测值	20.0%	0.0%~50.0%（最大频率）	当变频器检测到电机的实际转速与设定频率出现偏差，偏差量大于速度偏差过大检测值 P9-69，且持续时间大于速度偏差过大检测时间 P9-70 时，变频器故障报警 Err42，并根据故障保护动作方式（P9-50）处理。 当 P9-70 设置为 0.0s 时，取消速度偏差过大故障检测。
P9-70	速度偏差过大检测时间	5.0s	0.0s~60.0s	

6.6.11 欠压点、过压点设定、快速限流保护

参数	功能定义	出厂值	设定范围	参数说明
A5-06	欠压点设置	350V	210~420V	当母线电压超出 A5-06/A5-09 的设定值时，变频器故障报警（Err09/Err05~07）
A5-09	过压点设置	820V	650V~820V	
A5-04	快速限流使能	1	0：不使能　1：使能	在起重等提升场合建议关闭此功能。

6.7 监视

监视功能是在变频器的 LED 显示区域上显示变频器的状态。查看监视参数的方法有两种：

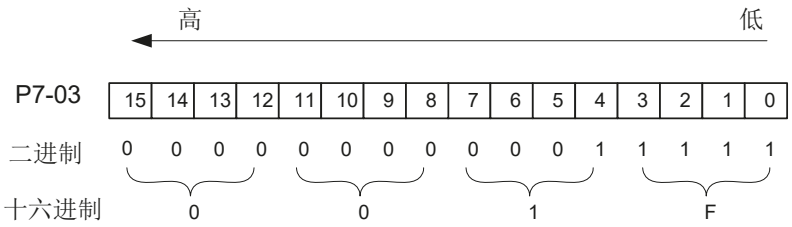
1） 在停机或运行状态下，用操作面板上的▷键，切换参数 P7-03、P7-04、P7-05 的每一字节，可以显示多个状态参数。

运行状态下有 32 个运行状态参数，由参数 P7-03（运行显示参数 1）和 P7-04（运行显示参数 2）按二进制的位选择每位的对应参数是否显示。停机状态下有 13 个停机状态参数，由参数P7-05（停机显示参数）按二进制的位选择每位的对应参数是否显示。

例如：要通过面板监视运行状态下的参数：（运行频率、母线电压、输出电压、输出电流、输出功率、 PID 设定）。

- 根据参数 P7-03（运行显示参数 1）中的每一字节与上述参数的对应关系，将对应的位设置为 1。
- 将此二进制数转为十六进制后设置到 P7-03中。（二进制转换十六进制方法请参见下文）

- 用操作面板上的 切换参数 P7-03 的每一字节，即可查看相关参数的值。设定如下图所示：



其他监视参数的查看方法，同 P7-03 的方法。监视参数在 P7-03、P7-04、P7-05 的每一字节的对应关系如下：

参数	功能定义	出厂值	设定范围	参数说明
P7-03	运行显示参数1	1F	0000~FFFF	在运行中若需要显示以下各参数时，将其相对应的位置设为 1，将此二进制数转为十六进制后设于 P7-03。 低八位含义 7 6 5 4 3 2 1 0 运行频率（Hz） 设定频率（Hz） 母线电压（V） 输出电压（V） 输出电流（A） 输出功率（kW） 输出转矩（%） DI输出状态 高八位含义 15 14 13 12 11 10 9 8 DO输出状态 AI1电压（V） AI2电压（V） AI3电压（V） 计数值 长度值 负载速度显示 PID设定 注：带底纹部分为默认出厂显示。
P7-04	运行显示参数2	00	0000~FFFF	在运行中若需要显示以下各参数时，将其相对应的位置设为 1，将此二进制数转为十六进制后设于 P7-04。 低八位含义 7 6 5 4 3 2 1 0 PID反馈 PLC阶段 输入脉冲频率（kHz） 运行频率2（Hz） 剩余运行时间 AI1校正前电压（V） AI2校正前电压（V） AI3校正前电压（V） 高八位含义 15 14 13 12 11 10 9 8 电机转速 当前上电时间（Hour） 当前运行时间（Min） 输入脉冲频率（Hz） 通讯设定值 编码器反馈速度（Hz） 主频率显示（Hz） 辅频率显示（Hz）

参数	功能定义	出厂值	设定范围	参数说明
P7-05	停机显示参数	33	0000~FFFF	在停机时若需要显示以下各参数，将其相对应的位置设为 1，将此二进制数转为十六进制后设于 P7-05。 低八位含义 7 6 5 4 3 2 1 0 设定频率（Hz） 母线电压（V） DI输入状态 DO输出状态 AI1电压（V） AI2电压（V） AI3电压（V） 计数值 高八位含义 15 14 13 12 11 10 9 8 长度值 PLC阶段 负载速度 PID设定 PULSE输入脉冲频率（Hz） 保留 保留 保留 注：带底纹部分为默认出厂显示。

- 变频器断电后再上电，显示的参数默认为变频器掉电前选择的参数。
- P7-03、P7-04、P7-05 中每一字节对应的监视参数，不完全对应 U0 组的每一个监视参数。如果要监视的参数在 P7-03、P7-04、P7-05 中不存在，需要用方法 2 利用操作面板在 U0 组查找监视参数。

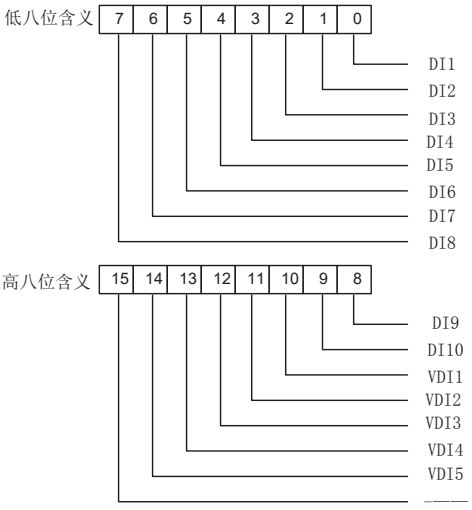
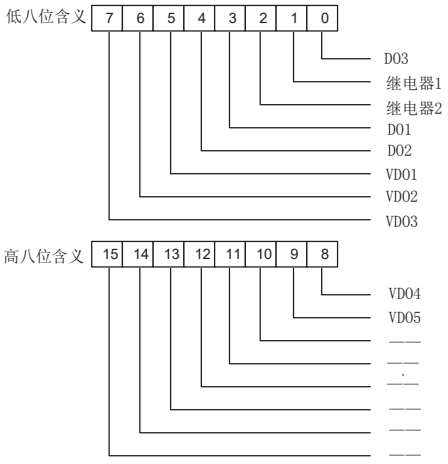
二进制转换成十六进制方法：

· 二进制数从右往左每四位对应一位十六进制数。如果最高位不满四位用 0 补上。再把分好的每四位二进制分别转换成十进制，0000~1111 对应十进制的 0~ 15，对应十六进制的 0~F。根据十进制和十六进制的对应关系，将十进制转换成对应的十六进制。（对应关系见下表）

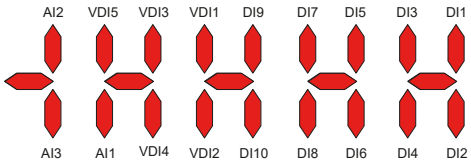
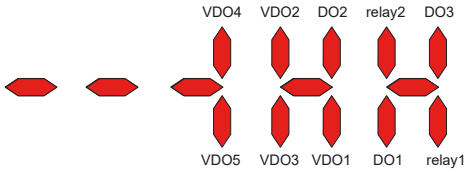
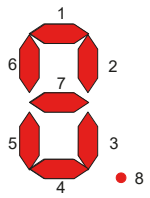
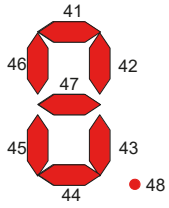
例如，011 1101 1111 1001 可以分为 0011 1101 1111 1001 ，查找下表后得到十六进制数3DF9。

二进制	1111	1110	1101	1100	1011	1010	1001	1000	0111	0110	0101	0100	0011	0010	0001	0000
十进制	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
十六进制	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0

2） 直接用操作面板进入U0 组参数，查看监视参数。（面板的操作方法可参考“第 4章 面板使用”），以下所示的监视参数，仅仅是可读的。

参数	功能定义	最小单位	监控范围	参数说明
U0-00	运行频率 (Hz)	0.01Hz	0.00~500.00Hz	显示变频器的运行频率的绝对值。
U0-01	设定频率 (Hz)	0.01Hz	0.00~500.00Hz	显示变频器的设定频率的绝对值。
U0-02	母线电压 (V)	0.1V	0.0V~3000.0V	显示变频器母线电压值
U0-03	输出电压 (V)	1V	0V~1140V	显示运行时变频器输出电压值。
U0-04	输出电流 (A)	0.01A	0.00A~655.35A (变频器功率≤ 55kW) 0.0A~6553.5A (变频器功率 >55kW)	显示运行时变频器输出电流值。
U0-05	输出功率 (kW)	0.1kW	0~32767	显示运行时变频器输出功率值
U0-06	输出转矩 (%)	0.1%	-200.0%~200.0%	显示运行时变频器输出转矩值。百分比基数是电机额定转矩
U0-07	DI 输入状态	1	0x0000~0x7FFF	显示当前 DI 端子输入状态值。转化为二进制数据后，每个 bit 位对应一个 DI 输入信号。1 表示输入为高电平，0 表示输入为低电平。每个 bit 位和输入端子对应关系如下： 
U0-08	DO 输出状态	1	0x0000~0x03FF	显示当前 DO 端子输出状态值。转化为二进制数据后，每个 bit 位对应一个 DO 输出信号。1 表示输出高电平，0 表示输出低电平。每个 bit 位和输出端子对应关系如下： 
U0-09	AI1 电压 (V)	0.01V	0.00V~10.57V	
U0-10	AI2 电压（V）/ 电流（mA）	0.01V /0.01mA	0.00V~10.57V 0.00mA~20.00mA	可通过控制板上跳线帽 J9 选择电压输入或电流输入
U0-11	AI3 电压 (V)	0.01V	0.00V~10.57V	-

参数	功能定义	最小单位	监控范围	参数说明
U0-12	计数值	1	1~65535	计数功能中显示计数值
U0-13	长度值	1	1~65535	定长功能中显示长度值
U0-14	负载转速显示	由P7-12个位决定	0~ 电机额定转速	显示负载转速
U0-15	PID 设定	1	0~65535	PID 设定 = PID 设定(百分比)*PA-04(PID给定反馈量程)
U0-16	PID 反馈	1	0~65535	PID 反馈 = PID 反馈(百分比)*PA-04(PID给定反馈量程)
U0-17	PLC 阶段	1	0~15	一共 16 段速
U0-18	输入脉冲频率 (Hz)	0.01kHz	0.00kHz~100.00kHz	显示 DI5 高速脉冲采样频率
U0-19	反馈速度 (Hz)	0.01Hz	-500.0Hz~500.0Hz (P7-12 十位为 1)	参数 P7-12 十位（负载速度显示小数点位数）设定为 1 时，U0-19 小数点个数为 1 时，显示范围为 -500.0Hz~500.0Hz。
			-320.00Hz~320.00Hz (P7-12 十位为 2)	参数 P7-12 十位设定为 2 时， U0-19 小数点个数为 2 时， 显示范围为 -320.00Hz~320.00Hz；
U0-20	剩余运行时间	0.1Min	0.0~6500.0Min	显示定时运行时，剩余运行时间。
U0-21	AI1 校正前电压	0.001V	0.000V~10.570V	显示模拟输入采样电压 / 电流的实际值。 实际使用的电压 / 电流经过了线性校正，使采样电压 / 电流与实际输入电压 / 电流偏差更小。实际使用的校正电压 / 电流见 U0-09、U0-10、U0-11。
U0-22	AI2 校正前电压（V）/ 电流（mA）	0.001V /0.01mA	0.000V~10.570V 0.000mA~20.000mA	
U0-23	AI3 校正前电压	0.001V	-10.570V~10.570V	
U0-24	电机转速	1RPM	0~ 电机额定转速	显示电机当前运行转速
U0-25	当前上电时间	1Min	0Min~65000Min	-
U0-26	当前运行时间	0.1Min	0.0Min~6500.0Min	-
U0-27	输入脉冲频率	1Hz	0~65535Hz	显示 DI5 高速脉冲采样频率，与 U0-18 为同一数据，但是显示的单位不同。
U0-28	通讯设定值	0.01%	-100.00%~100.00%	显示通过通讯地址 0x1000 写入的数据。百分比基数根据地址 0x1000 的设定值作用决定。
U0-29	编码器反馈速度	0.01Hz	-320.00Hz~320.00Hz (P7-12 十位为 2)	显示由编码器实际测得的电机运行频率。 P7-12十位（负载速度显示小数点位数）设定为 2 时，U0-29 小数点个数为 2， 显示范围为 -320.00Hz~320.00Hz；
			-500.0Hz~500.0Hz (P7-12 十位为 1)	P7-12 十位设定为 1 时，U0-29 小数点个数为 1，显示范围为 -500.0Hz~500.0Hz。
U0-30	主频率显示	0.01Hz	0.00Hz~500.00Hz	显示主频率设定值
U0-31	辅助频率显示	0.01Hz	0.00Hz~500.00Hz	显示辅助频率设定值。
U0-34	电机温度值	1°C	0°C ~200°C	显示通过 AI3 采样的电机温度值。 电机温度检测见 P9-56（电机温度传感器类型）介绍。
U0-35	目标转矩（%）	0.1%	-200.0%~200.0%	显示当前转矩上限设定值，百分比基数为电机额定转矩
U0-36	旋变位置	1	0~4095	显示旋变当前位置信号
U0-37	功率因素角度	0.1°	——	显示当前运行的功率因素角度

参数	功能定义	最小单位	监控范围	参数说明
U0-38	ABZ 位置	1	0~65535	显示当前 ABZ 或 UVW 编码器 AB 相脉冲计数。 该值为 4 倍频后的脉冲个数，如显示为 4000，则编码器实际走过的脉冲个数为 4000/4=1000 当编码器正转时该值自增，当编码器反转时该值自减，自增到 65535 时从 0 重新开始计数，自减到 0 时从 65535 重新开始计数。 查看该值可以判断编码器安装是否正常。
U0-39	V/F 分离目标电压	1V	0V~ 电机额定电压	显示运行在 V/F 分离状态时，目标输出电压
U0-40	V/F 分离输出电压	1V	0V~ 电机额定电压	显示运行在 V/F 分离状态时，当前实际输出电压。
U0-41	DI 输入状态直观显示	1	——	DI 端子状态显示：亮为高电平；灭为低电平 AI 状态详见 6.9.5 小节。 
U0-42	DO 输出状态直观显示	1	——	DO 端子状态显示：亮为高电平；灭为低电平 
U0-43	DI功能状态直观显示 1 （功能 01-40）	1	——	显示端子功能 1~40 是否有效。键盘共有 5 个数码管，数码管从右到左分别代表功能 1~8、9~16、17~24、25~32、33~40。每个数码管可代表 8 个功能选择，数码管定义如图： DI 端子功能显示：亮为高电平；灭为低电平 
U0-44	DI功能状态直观显示 2 （功能 41-80）	1	——	显示端子功能 41~59 是否有效。键盘共有 5 个数码管，数码管从右到左分别代表功能 41~48、49~56、57~59。每个数码管可代表 8 个功能选择，数码管定义如图： DI 端子功能显示：亮为高电平；灭为低电平 
U0-45	故障信息	1	0~51	显示驱动部分的故障编码。

参数	功能定义	最小单位	监控范围	参数说明
U0-58	Z 信号计数器	1	0~65535	显示当前 ABZ 或 UVW 编码器 Z 相脉冲计数。 当编码器每正转或反转一圈，对应该值加 1 或减 1，查看该值可以检测编码器安装是否正常。
U0-59	设定频率（%）	0.01%	-100.00%~100.00%	显示当前设定频率，百分比基数是变频器最大频率 (P0-10)。
U0-60	运行频率（%）	0.01%	-100.00%~100.00%	显示当前运行频率，百分比基数是变频器最大频率 (P0-10)。
U0-61	变频器状态	1	Bit1 Bit0	0：停机；1：正转；2：反转
			Bit3 Bit2	0：恒速；1：加速；2：减速
			Bit4	0：母线电压正常；1：欠压
U0-62	当前故障编码	1	0~99	显示当前故障编码，2 表示 Err02
U0-63	点对点主机通讯发送转矩值	0.01%	-100.0%~100.0%	显示点对点通讯有效时主机发送转矩的数据值，百分比基数为电机额定转矩。
U0-64	从站的个数	1	0~63	显示主站可以查看的在线从站个数。
U0-65	转矩上限	0.1%	-200.0%~200.0%	显示当前给定转矩上限，百分比基数是电机额定转矩。
U0-76	累计用电量低位	0.1 度	0.0~999.9	耗电量最大可记录到 65535999.9 度，足够全功率范围使用 10 年以上，精度为 0.1 度，由 U0-76,U0-77 两个参数组合显示，U0-76显示低位，U0-77 显示高位，换算关系如下： 累计用电量 =u0-77*10000 + u0-76。 小功率及确保不溢出情况，兼容老客户读取累计用电量 P7-14，大功率机器客户可直接读取 U0-77，U0-76 的值。
U0-77	累计用电量高位	1 度	0~65535	

6.8 工艺功能

本小节主要介绍定长控制、计数这两种常用的工艺功能。

6.8.1 定长控制功能

YD580E 带有定长控制功能，长度脉冲只能使用 DI5 端子采集，要将 DI5 端子功能选择设置为27 （长度计数输入）。

参数	功能定义	出厂值	设定范围	参数说明
Pb-05	设定长度	1000m	0m~65535m	-
Pb-06	实际长度	0m	0m~65535m	实际长度为监视值 实际长度 (Pb-06) = 端子采样的脉冲个数 / 每米脉冲数 (Pb-07)
Pb-07	每米脉冲数	100.0	0.1~6553.5	-

下图中，实际长度为监视值，实际长度 (Pb-06) = 端子采样的脉冲个数 / 每米脉冲数（Pb-07）。
当实际长度（Pb-06）大于设定长度（Pb-05）时，继电器或 DO 输出端子“长度到达”ON 信号（功能选择为 10）。
定长控制过程中，可以通过多功能 DI 端子，进行长度复位操作（DI 功能设置为28）。具体设置如下图

参数	名称	设定值	功能描述
P4-04	DI5 端子功能选择	27	长度计数输入
P4-00~P4-09 (任选其中一个)	DI1~DI10 端子功能选择 (任选其中一个)	28	长度复位
P5-01~P5-05 (任选其中一个)	端子输出功能选择（任选其中一个）	10	长度到达

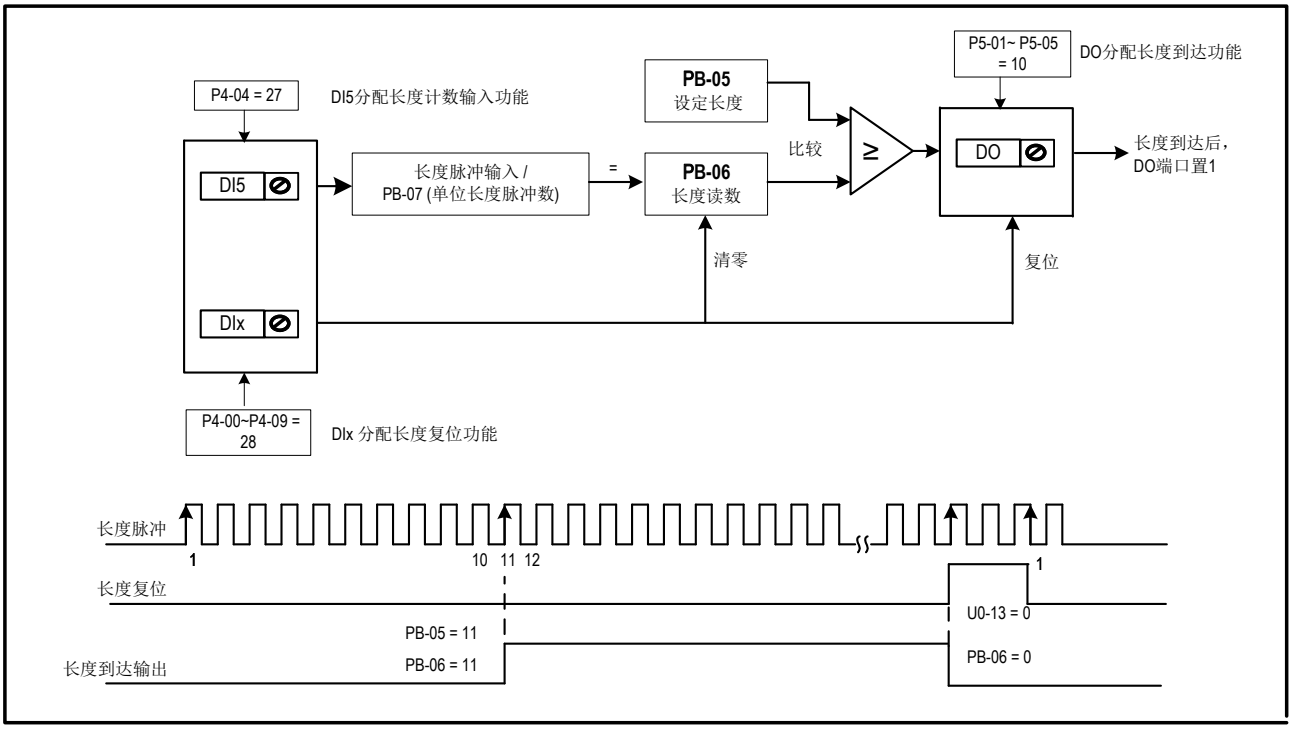


图 6-47 定长功能示意图

定长控制模式下不能识别方向，只能根据脉冲个数计算长度。

将长度到达的继电器（RELAY）输出 T/A-T/B 输出信号反馈到变频器停机输入端子，可做成自动停机系统。

6.8.2 计数功能

计数值需要通过 DI 端子采集（在脉冲频率较高时，必须使用 DI5 端口），DI 端子功能设置为 25（计数器输入）。

参数	功能定义	出厂值	设定范围	参数说明
Pb-08	设定计数值	1000	1~65535	-
Pb-09	指定计数值	1000	1~65535	指定计数值 Pb-09 不应大于设定计数值 Pb-08

下图中，计数值需要通过 DI 端子采集，要将 DI 端子功能设置为 25（计数器输入）。如果计数值到达设定计数值（Pb-08）时，多功能数字 DO 输出“设定计数值到达”ON 信号；如果计数值到达指定计数值（Pb-09）时，多功能数字 DO 输出“指定计数值到达”ON 信号。

参数	名称	设定值	功能描述
P4-00~P4-09（任选其中一个）	DI1~DI10 端子功能选择（任选其中一个）	25	计数器输入
P4-00~P4-09（任选其中一个）	DI1~DI10 端子功能选择（任选其中一个）	26	计数复位
P5-01~P5-05（任选其中一个）	端子输出功能选择（任选其中一个）	8	设定计数值到达
P5-01~P5-05（任选其中一个）	端子输出功能选择（任选其中一个）	9	指定计数值到达

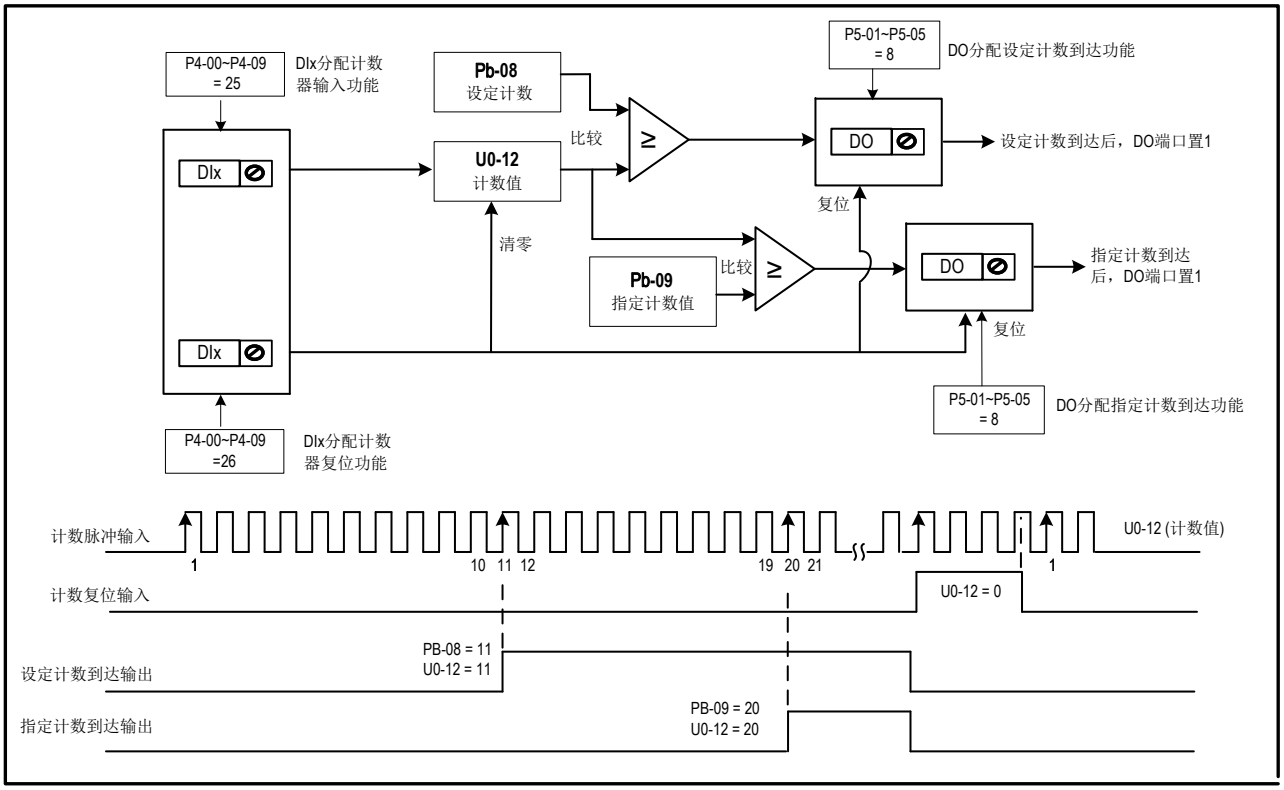


图 6-48 计数功能示意图

在脉冲频率较高时，必须使用 DI5 端口；
“设定计数到达”与“指定计数到达”的 DO 端口不能重复使用；
在变频器 RUN/STOP 状态下，计数器都会一直计数，直到“设定计数值”到达时才停止计数；
计数值可以掉电保持；
将计数到达 DO 输出信号反馈到变频器停机输入端子，可做成自动停机系统。

6.8.3 第二电机参数

YD580E 变频器支持两组电机参数切换，电机 1 参数对应 P1 组参数；电机 2 对应 A2 组参数。 第一电机和第二电机参数切换有两种方法：

1） 通过设置参数 P0-24（电机参数组选择）选择当前有效电机参数组。

参数	功能定义	出厂值	设定范围	参数说明
P0-24	电机参数组选择	0	0：电机参数组 1	选择电机参数组 1
			1：电机参数组 2	选择电机参数组 2

2） 通过 DI 端子功能选择当前有效电机参数组

DI1~DI10（P4-00~P4-09），任意选择其中一个 DI 端子，将功能设置为 41（电机选择端子 1）。
如果 DI 端子无效，则选择了电机参数组 1；如果 DI 端子有效，则选择了电机参数组 2。

参数	名称	设定值	功能描述
P4-00~P4-09	DI1~DI10 端子功能选择	41	电机选择端子 1

如果 P4-00~P4-09 其中任意一个 DI 端子设置为 41，那么 DI 端子优先决定了选择哪组电机，此时电机选择与参数 P0-24 无关。
只有当 P4-00~P4-09 所有 DI 端子都**都没有**设置为 41，此时电机参数选择才由 P0-24（电机参数组选择）决定。
两组电机参数在运行过程中，不允许切换。如果需要进行电机切换操作，请在变频器停机后再进行。否则变频器报故障 Err41。

3） 电机 2 参数如下：

参数	功能定义	出厂值	设定范围	参数说明
A2-00	电机类型选择	0	0	普通异步电机
			1	变频异步电机
		2	2	永磁同步电机
A2-01	电机额定功率	机型确定	0.1kW~1000.0kW	A2-01~ A2-05为电机铭牌参数。 在采用V/F控制或矢量控制时，为了获得更好的控制性能，需要进行电机参数调谐，而调节结果的准确性，与正确设置电机铭牌参数密切相关。
A2-02	电机额定电压	机型确定	1V~2000V	
A2-03	电机额定电流	机型确定	0.01A~655.35A(变频器功率≤ 55kW) 0.1A~6553.5A(变频器功率 >55kW)	
A2-04	电机额定频率	机型确定	0.01Hz~ 最大频率	
A2-05	电机额定转速	机型确定	1rpm~65535rpm	
A2-06	异步电机定子电阻	机型确定	0.001Ω~65.535Ω(变频器功率≤ 55kW) 0.0001Ω~6.5535Ω(变频器功率 >55kW)	A2-06~A2-10 是异步电机的参数，可通过电机调谐获得。其中，静止调谐 1 只能获得 A2-06~A2-08 三个参数，动态调谐可以获得 A2-06~A2-10 外，还可以获得编码器相序 A2-30。 若现场不对电机调谐，可以根据电机厂家提供的参数，输入上述相应参数。
A2-07	异步电机转子电阻	机型确定	0.001Ω~65.535Ω(变频器功率≤ 55kW) 0.0001Ω~6.5535Ω(变频器功率 >55kW)	
A2-08	异步电机漏感抗	机型确定	0.01mH~655.35mH(变频器功率≤ 55kW) 0.001mH~65.535mH(变频器功率 >55kW)	
A2-09	异步电机互感抗	机型确定	0.1mH~6553.5mH(变频器功率≤ 55kW) 0.01mH~655.35mH(变频器功率 >55kW)	
A2-10	异步电机空载电流	机型确定	0.01A~P1-03(变频器功率≤ 55kW) 0.1A~P1-03(变频器功率 >55kW)	
A2-27	编码器线数	1024	1~65535	设定编码器每转脉冲数。 在有速度传感器矢量控制方式下（FVC），必须正确设置编码器脉冲数，否则电机运行不正常。
A2-28	编码器类型	0	0：ABZ 增量编码器 2：旋转变压器	根据实际情况正确设置 A2-28，否则变频器可能运行不正常。
A2-30	ABZ 增量编码器 AB 相序	0	0：正向 1：反向	0：电机正转时 A 相超前（电机反转时 B 相超前） 1：电机正转时 B 相超前（电机反转时 A 相超前）
A2-31	编码器安装角	0.0°	0.0° ~359.9°	-
A2-34	旋转变压器极对数	1	1~65535	在使用旋转变压器时，必须正确设置极对数参数。
A2-36	速度反馈 PG 断线检测时间	0.0s	0.0s：不动作 0.1s~10.0s	用于设置编码器断线故障的检测时间，当设置为 0.0s 时，变频器不检测编码器断线故障。 当变频器检测到有断线故障，并且持续时间超过 A2-36 设置时间后，变频器报警 Err20。
A2-37	异步电机调谐选择	0	0：无操作	-
			1：异步机静止部分参数调谐	只辨识部分电机参数定子电阻、转子电阻、漏感
			2：异步机动态完整调谐	辨识所有电机参数
			3：异步机静止完整调谐	辨识所有电机参数

参数	功能定义	出厂值	设定范围	参数说明
A2-16	同步电机定子电阻	机型确定	0.001Ω~65.535Ω(变频器功率≤ 55kW) 0.0001Ω~6.5535Ω(变频器功率 >55kW)	A2-16~A2-20 是同步电机的参数，可通过电机调谐获得。 其中，静止调谐 11 只能获得 A2-16~A2-18 三个参数，动态调谐可以获得 A2-16~A2-20 外，还可以获得编码器相序 A2-30。 若现场不对电机调谐，可以根据电机厂家提供的参数，输入上述相应参数。
A2-17	同步 D 轴感抗	机型确定	0.01~655.35mH(变频器功率 ≤ 55kW) 0.001~65.535mH(变频器功率 >55kW	
A2-18	同步 Q 轴感抗	机型确定	0.01~655.35mH(变频器功率≤ 55kW) 0.001~65.535mH(变频器功率 >55kW)	
A2-20	同步电机 反电动势电压	机型确定	0.1V~6553.5V	

参数	功能定义	出厂值	设定范围	参数说明
A2-37	同步电机 调谐选择	0	00： 无操作	不调谐
			11：同步机带载静态调谐	只辨识部分电机参数定子电阻、转子电阻、漏感
			12：同步机空载动态调谐	辨识所有电机参数，FVC 控制方式下需要确认编码器参数（A2-27 ~ A2-36）
			手动输入参数	输入同步电机本身参数（A2-16 ~ A2-20）

NOTE

- 注：电机 2 其他参数请参见“附录 A或B 功能参数表”，具体使用与“P2 组 第一电机矢量控制参数” 一致，即 A2-38~A2-61 和 P2-00~P2-23 功能使用一致，使用前请予以参考。

6.8.4 用户可编程多功能卡功能

用户可编程多功能卡 (YD58PC) 接入到变频器，可简单快捷地实现 PLC 编程对变频器的控制，以适应各类工艺需求。该卡具体使用方法，其功能需要配合变频器 A7 组参数使用来实现。

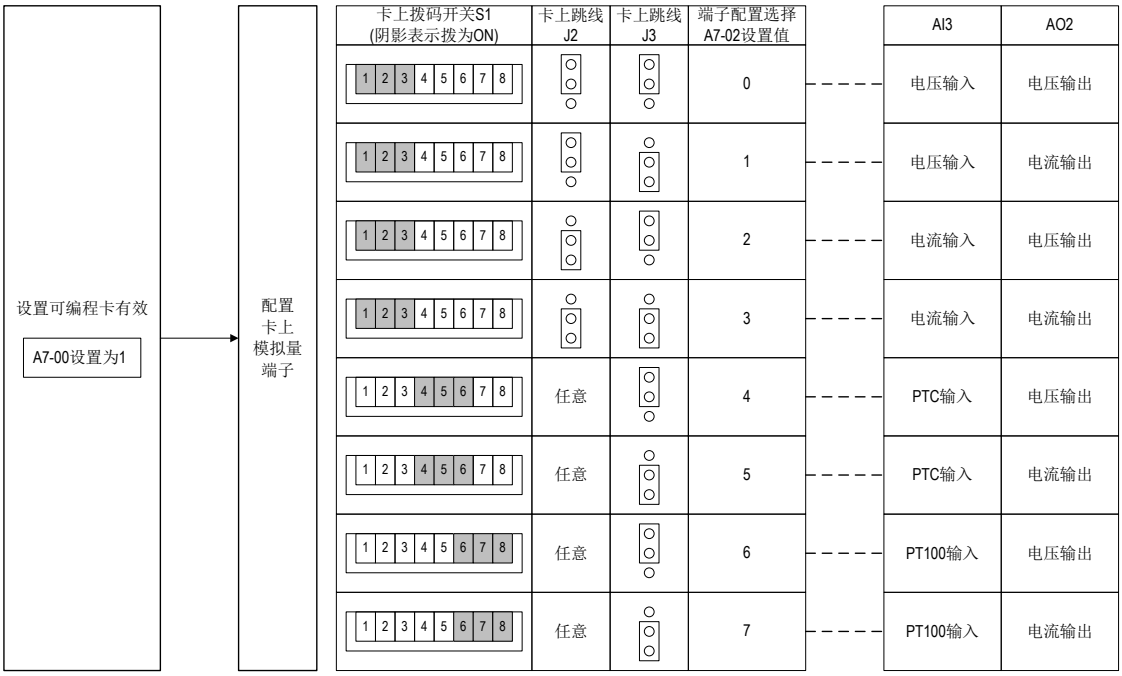


图 6-49 用户可编程卡使用示意图 1

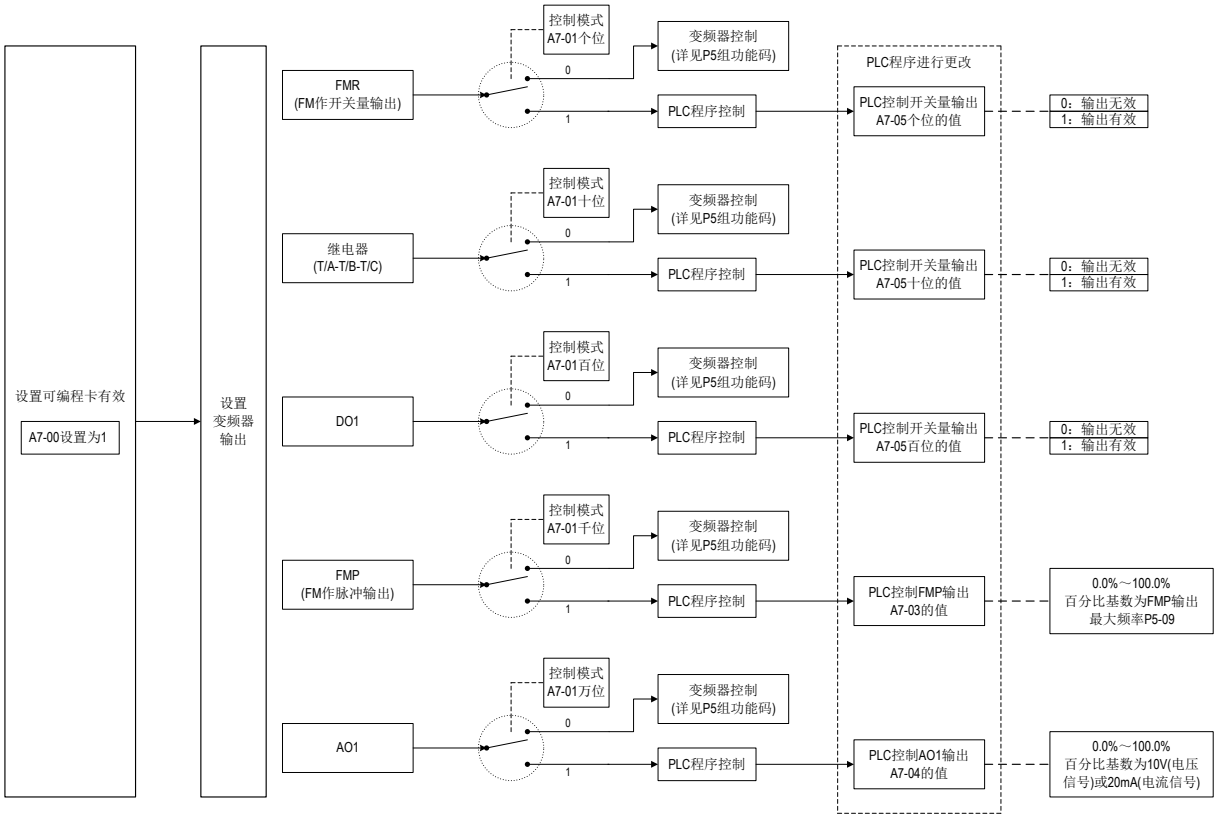


图 6-50 用户可编程多功能卡使用示意图 2

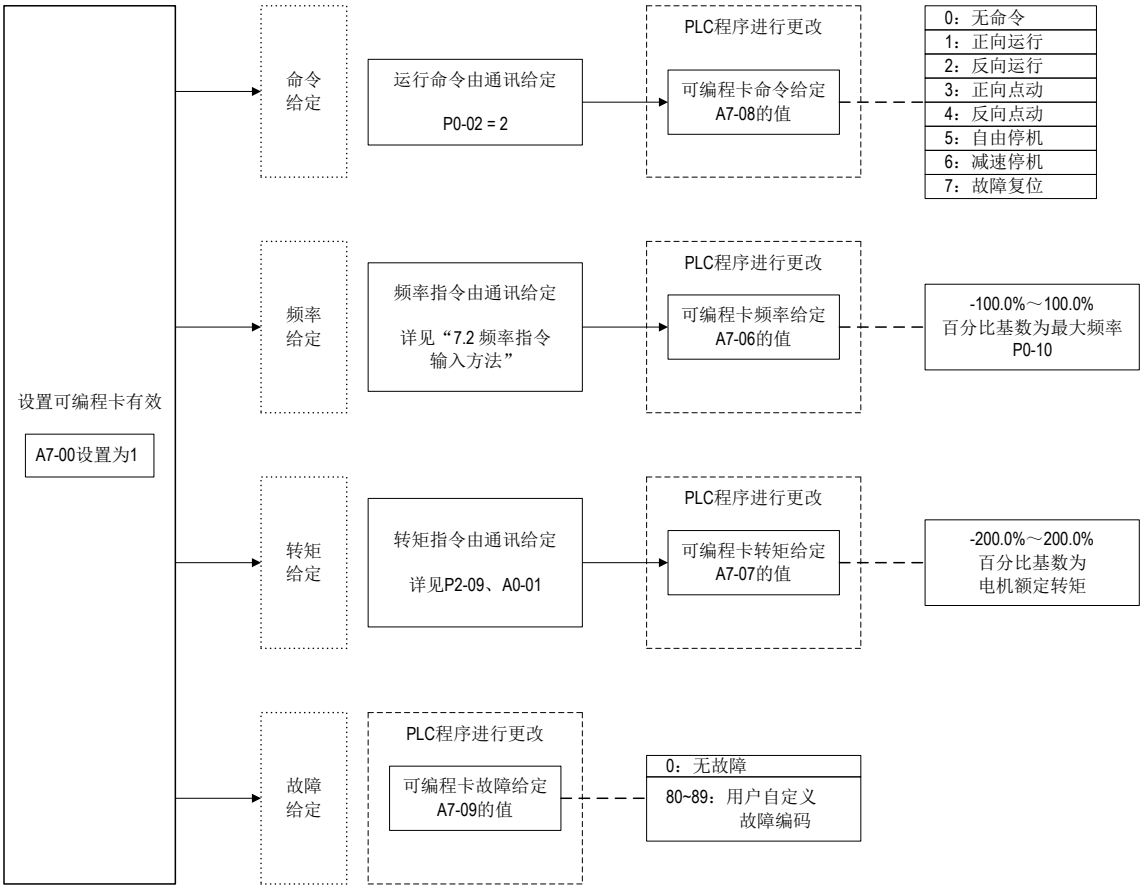


图 6-51 用户可编程多功能卡使用示意图 3

1） 设置可编程多功能卡有效与否

参数	功能定义	出厂值	设定范围	参数说明
A7-00	用户可编程功能选择	0	0：无效	关闭对可编程卡的接口
			1：有效	开启对可编程卡的接口

2） 配置可编程多功能卡扩展模拟量输入 / 输出端子

可编程卡上扩展有一个模拟量输入端子 AI3、一个模拟量输出端子 AO2。需要设置可编程卡上的拨码开关 S1、跳线 J2 和 J3，再设置 A7-02 与之对应；此两方面设置须一致，否则信号收发数据将会产生异常。具体设置方法，详见《YD58PC 可编程多功能扩展卡用户手册》。

参数	功能定义	出厂值	设定范围	参数说明		
A7-02	可编程卡扩展 AI/AO 端子配置选择	0	0~7		AI3	AO2
				0	电压输入	电压输出
				1	电压输入	电流输出
				2	电流输入	电压输出
				3	电流输入	电流输出
				4	PTC 输入	电压输出
				5	PTC 输入	电流输出
				6	PT100 输入	电压输出
				7	PT100 输入	电流输出

3） 设置变频器输出信号

可编程卡设置为有效 (A7-00=1) 时，通过参数 A7-01 设置变频器输出端子 (FMR、继电器、DO1、FMP、AO1) 的控制来源。当其中一个输出端子的控制来源设置为“PLC 程序控制”时，该端子的实际输出由对应参数 (A7-03/A7-04/A7-05) 中的值来决定。用户可通过 PLC 程序来改变对应参数 (A7-03/A7-04/A7-05) 中的值，进而实现对输出端子的控制。

参数	功能定义	出厂值	设定范围	参数说明
A7-01	控制板输出端子控制模式选择	00000	00000~11111	个位：FMR(FM 作开关量输出) 0：变频器控制 1：PLC 程序控制 十位：继电器 (T/A-T/B-T/C) 0：变频器控制 1：PLC 程序控制 百位：DO1 0：变频器控制 1：PLC 程序控制 千位：FMP(FM 作脉冲输出) 0：变频器控制 1：PLC 程序控制 万位：AO1 0：变频器控制 1：PLC 程序控制
A7-03	FMP 输出	0.0%	0.0%~100.0%	当 FMP 设置为 PLC 程序控制 (A7-01 千位 =1) 时，通过改变 A7-03 的值可以控制 FMP 的输出，其百分比基数为 FMP 输出最大频率 P5-09。
A7-04	AO1 输出	0.0%	0.0%~100.0%	当 AO1 设置为 PLC 程序控制 (A7-01 万位 =1) 时，通过改变 A7-04 的值控制 AO1 输出，其百分比基数为 10V(电压信号) 或 20mA(电流信号)。

参数	功能定义	出厂值	设定范围	参数说明
A7-05	开关量输出	000	000~111	当开关量输出 (FMR/ 继电器 /DO1) 设置为 PLC 程序控制 (A7-01 个位 / 十位 / 百位 =1) 时，通过改变 A7-05 的值控制开关量输出状态。
				个位：FMR 0：无效 1：有效 十位：继电器 0：无效 1：有效 百位：DO1 0：无效 1：有效

4） 命令给定

可编程卡设置为有效 (A7-00=1)，且运行指令是由通讯方式给定 (PP-02=2)，此时变频器的运行由参数 A7-08 的值来控制。用户 PLC 程序通过操作对应的 D 元件来改变参数 A7-08 的值，进而实现对变频器运行的控制。

参数	功能定义	出厂值	设定范围	参数说明
A7-08	可编程卡命令给定	0	0~7	0：无命令
				1：正向运行
				2：反向运行
				3：正向点动
				4：反向点动
				5：自由停机
				6：减速停机
				7：故障复位

5） 频率给定

可编程卡设置为有效 (A7-00=1)，且频率指令是由通讯方式给定，此时变频器的设定频率由参数 A7-06 的值来决定。用户 PLC 程序通过操作对应的 D 元件来改变参数 A7-06 的值，进而实现对变频器设定频率的控制。

参数	功能定义	出厂值	设定范围	参数说明
A7-06	可编程卡频率给定	0.00%	- 100.00%~100.00	百分比基数为最大频率 P0-10

6） 转矩给定

可编程卡设置为有效 (A7-00=1)，且转矩指令是由通讯方式给定，此时变频器的设定转矩由参数 A7-07 的值来决定。用户 PLC 程序通过操作对应的 D 元件来改变参数 A7-07 的值，进而实现对变频器设定转矩的控制。

参数	功能定义	出厂值	设定范围	参数说明
A7-07	可编程卡转矩给定	0.0%	- 200.0%~200.0	百分比基数为电机额定转矩

7） 故障给定

可编程卡设置为有效 (A7-00=1) 时，用户 PLC 程序通过操作对应的 D 元件来改变参数 A7-09 的值，当改写的值在 80~89 的范围内，使变频器产生相对应的用户自定义故障 Err80~Err89。

参数	功能定义	出厂值	设定范围	参数说明
A7-09	可编程卡故障给定	0	0：无故障 80~89：用户自定义故障编码	注意：当写入 A7-09 的值超出 80~89 的范围时，将不会起任何作用。

6.8.5 主从控制

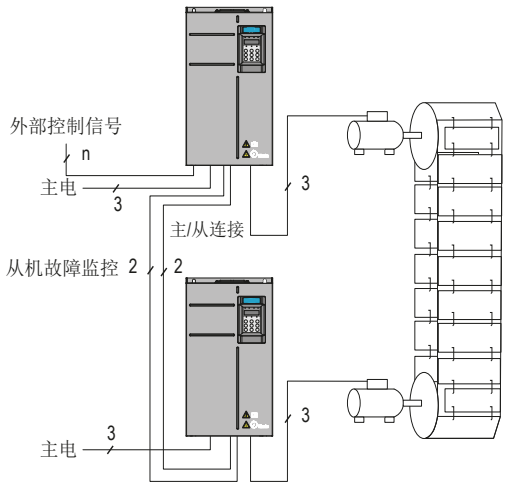
主从控制功能是为多传动应用而设计的，其中系统由若干个变频器驱动，同时电机轴通过齿轮、链条或传送带等相互耦合在一起。通过主从控制，负载可以均匀地分配在传动单元之间。外部控制信号只与主机连接。主机通过串行通讯链路来控制从机。

主机是典型的速度控制，其它传动单元跟随主机的转矩或速度给定。一般情况下：

· 当主机和从机的电机轴通过齿轮、链条等进行刚性连接时，从机应该采用转矩控制模式，以使传动单元之间不存在速度差异。（请参见图 6-52）

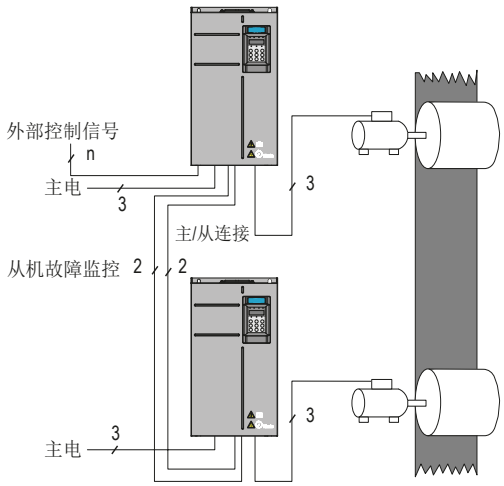
· 当主机和从机的电机轴采用柔性连接时，从机应该采用速度控制模式，因为传动单元之间允许存在微小的速度差异。当主机和从机都为速度控制时，一般要使用下垂率。（请参见图 6-52）

❑ 速度控制的主机
从机跟随主机的转矩给定信号



主从刚性连接示意

❑ 速度控制的主机
从机跟随主机的速度给定信号



主从柔性连接示意

图 6-52 主从连接示意图

为了避免控制上的冲突，所有传动单元（连接到同一个机械设备上）应该只通过主机来接收外部控制信号。一般规则：

· 将所有的外部控制信号只连接到主机上。

· 不要用键盘或现场总线系统来控制从机。

1） 接线

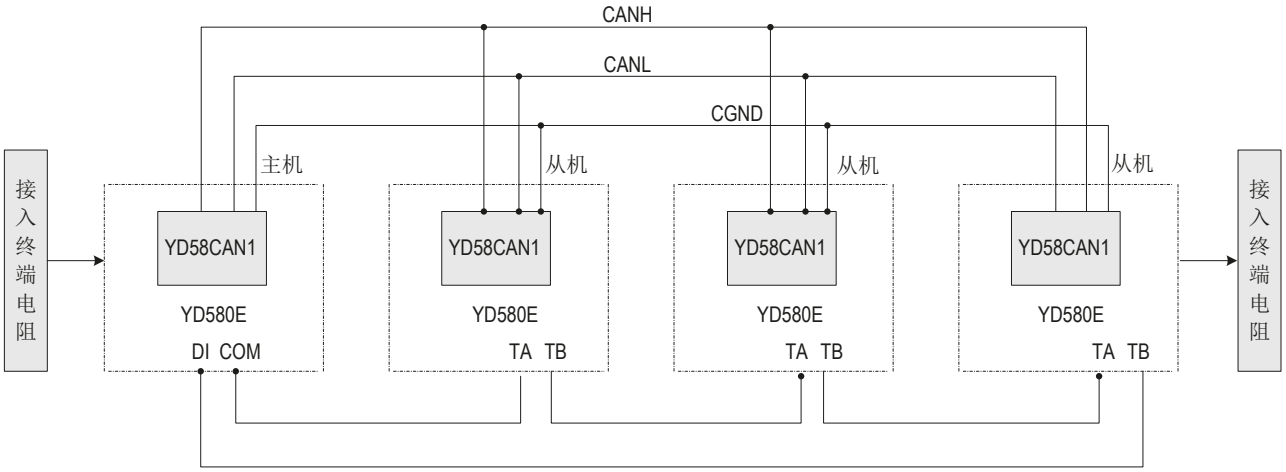


图 6-53 主从连接示意图

① 继电器作为从机故障反馈

② 从机故障时，从机（可选 A8-02 十位 =1）通过通讯向主机发送故障信息。

以上两种方式（选一种即可），从机出现故障停机时，主机都会停止运行。

2） 参数设置

- 刚性连接

· 主机：速度控制（A0-00=0）

参数	名称	设定范围	设置值	是否需调整
PD-00	通讯波特率	0000~6009	千位设置值 主机、从机一样	否
A8-00	点对点通讯有效选择	0~1	1	否
A8-01	主从选择	0~1	0	否
P0-10	最大频率	5.00~500.00Hz	50.00Hz（主从一致）	否
P2-10	转矩上限	0.0~200.0%	130.0%	是

· 从机：转矩控制（A0-00=1，转矩控制模式时，请不要设置启动频率，否则将导致启动冲击电流较大）

参数	名称	设定范围	设置值	是否需调整
PD-00	通讯波特率	0000~6009	千位设置值 主机、从机一样	否
A8-00	点对点通讯有效选择	0~1	1	否
A8-01	主从选择	0~1	1	否

参数	名称	设定范围	设置值	是否需调整
A8-02	从机命令跟随主从信息交互	个位：从机命令跟随 0：从机不跟随主机运行命令运行 1：从机跟随主机运行命令运行 十位：从机故障信息传输 0：从机故障信息不传输 1：从机故障信息传输 百位：主机显示从机掉线 0：从机掉线主机不报故障 1：从机掉线主机报故障（Err16）	个位：1 十位：1	否
A8-03	从机接收数据作用选择	0：运行频率 1：目标频率	0	否
A8-11	视窗	0.20~10.00Hz	0.50Hz	是
P0-10	最大频率	5.00~500.00Hz	50.00Hz（主从一致）	否
P8-07	加速时间 4 (转矩控制频率加速时间)	0.0~6500.0s	0.0s	否
P8-08	减速时间 4 (转矩控制频率减速时间)	0.0~6500.0s	0.0s	否
P0-02	运行指令选择	0~2	2	否
A0-00	速度 / 转矩控制方式选择	0~1	1	否
A0-01	转矩给定选择	0~7	0	否
A0-03	转矩数字设定	-200.0~200.0%	130.0%	和主机 P2-10 一致
A0-07	转矩加速时间	0.00~650.00s	0.00s	否
A0-08	转矩减速时间	0.00~650.00s	0.00s	否

- 主从控制时，适当减小从机的 A8-11，可以改善启动平滑性，但要大于 0.20Hz，同时若系统加减速时间较短，属于急加速急减速请适当加大 A8-11，A8-11 越大视窗生效越弱。

建议 A8-11 初始值设置为电机额定滑差的一半。电机额定滑差的计算：

电机极对数 =（60 * 电机额定频率）/ 电机额定转速，对其取整

电机同步转速 =（60 * 电机额定频率）/ 电机极对数

电机额定滑差 =（电机同步转速 - 电机额定转速）/ 电机同步转速 * 电机额定频率

● 柔性连接

· 主机：速度控制（A0-00=0）

参数	名称	设定范围	设置值	是否需调整
PD-00	通讯波特率	0000~6009	千位设置值 主机、从机一样	否
A8-00	点对点通讯有效选择	0~1	1	否
A8-01	主从选择	0~1	0	否
P0-10	最大频率	5.00~500.00Hz	50.00Hz（主从一致）	否
P8-15	下垂控制	0.00~10.00Hz	1.00Hz	是
P0-17	加速时间 1	0.0~6500.0s	主机、从机一样	否
P0-18	减速时间 1	0.0~6500.0s	主机、从机一样	否

· 从机：速度控制（A0-00=1）

参数	名称	设定范围	设置值	是否需调整
PD-00	通讯波特率	0000~6009	千位设置值 主机、从机一样	否
A8-00	点对点通讯有效选择	0~1	1	否
A8-01	主从选择	0~1	1	否
A8-02	个位： 0：不跟主机命令 1：跟随主机命令 十位： 0：不发故障信息 1：发送故障信息	0~11	个位：1 十位：1	否
A8-03	从机接收数据作用选择	0：运行频率 1：目标频率	0	否
P0-02	运行指令选择	0~2	2	否
P0-03	主频率指令选择	0~9	9	否
P0-10	最大频率	5.00~500.00Hz	50.00Hz（主从一致）	否
P0-17	加速时间 1	0.0~6500.0s	主机、从机一样	否
P0-18	减速时间 1	0.0~6500.0s	主机、从机一样	否
P8-15	下垂控制	0.00~10.00Hz	1.00Hz	是
A0-00	速度 / 转矩控制方式选择	0~1	0	否

● 下垂控制 P8-15：

下垂控制允许主机站和从机站之间存在微小的速度差，进而可以避免它们之间的冲突。该参数的默认值是 0.00Hz 。只有当主机和从机都采用速度控制模式时，才需要调整下垂率，对每个传动过程而言，合适的下垂率需要在实践中逐渐寻找，建议不要将 P8-15 设置太大，否则负载较大时，稳态速度将会有明显下降。主机和从机都必须设置 P8-15 。

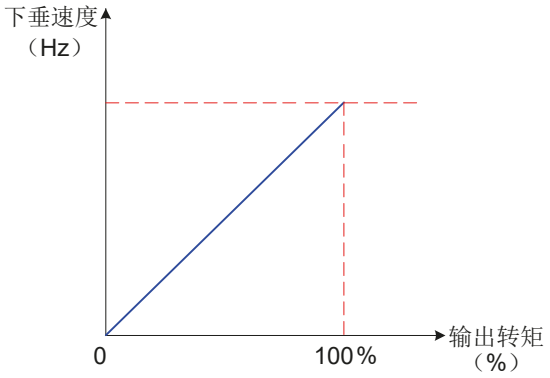


图 6-54 下垂速度与输出转矩关系示意下垂速

度 = 同步频率 * 输出转矩 *（P8-15 / 10）

比如：P8-15 = 1.00，同步频率 50Hz，输出转矩 50%，则：

变频器实际频率 = 50Hz – 50Hz *（50%）*（1.00 / 10）= 47.5Hz

参数	功能定义	出厂值	设定范围	参数说明
A8-00	点对点通讯有效选择	0	0：无效 1：有效	-
A8-01	主从选择	0	0：主机 1：从机	选择变频器为主机还是从机。 点对点通讯时，需要设定 CANlink 通讯波特率（PD-00）；通讯地址则根据当前为主机或从机内部自动分配，无需专门设置。
A8-02	主从信息交互	011	个位：从机命令跟随 0：从机不跟随主机运行命令运行 1：从机跟随主机运行命令运行 十位：从机故障信息传输 0：从机故障信息不传输（此时主机仍可运行） 1：从机故障信息传输（当从机发生任何故障，主机报 Err55 提示从机发生故障） 百位：主机显示从机掉线（掉线：先连上再断开，一直没连上不属于掉线） 0：从机掉线主机不报故障 1: 从机掉线主机报故障（Err16）	注：在与从机连接发生异常的情况下，主机没有运行时不报故障，运行时报故障（Err16）。 当主从控制的从机且 P0-02 设定为 2（通讯控制）时，如果 A8-02 个位设定为 1，则从机跟随主机的运行命令一起运行 / 停机。 A8-02 十位设置为 1，从机故障时，向主机发送故障信息； A8-02 百位设置为 1，从站掉站时报警。
A8-03	从机接收数据作用选择	0	0：运行频率 1：目标频率	0：主机传递给从机频率为主机的运行频率，如果 P8-15 下垂率不为 0，那么主机传递给从机频率为下垂控制频率，这种情况应用在下垂控制或者速度同步控制中（即从机为速度模式）；在负荷分配控制中（即从机为转矩模式），主机传递给从机为主机的运行频率，此时应确保 P8-15 的值为 0。 1：主机传递给从机为主机的目标频率。
A8-04	接收数据零偏	0.00%	-100.00%~100.00%	对接收数据进行修正，用于用户自定义主机和从机之间指令的关系。 A0-00=0 时，A8-04、A8-05 对频率指令修正； A0-00=1 时，A8-04、A8-05 对转矩指令修正。 A8-04 和 A8-05 的计算方法请参考 6.9.6 小节。
A8-05	接收数据增益	1.00	-10.00~100.00	

参数	功能定义	出厂值	设定范围	参数说明
A8-06	点对点通讯中断检测时间	1.0s	0.0s~10.0s	设置点对点通讯的主机或从机通讯中断检测时间，设置为 0 表示不检测。
A8-07	点对点通讯主机数据发送周期	0.001s	0.001s~10.000s	-
A8-11	视窗	0.50Hz	0.20Hz~10.00Hz	用来保证从机的速度在视窗范围内与主机同步。 适当减小从机的 A8-11，可以改善启动平滑性；急加速急减速场合请适当加大 A8-11，A8-11 越大视窗生效越弱。

6.9 输入输出端子

本小节主要介绍数字输入端子 DI、数字输出端子 DO、虚拟 DI、虚拟 DO、模拟量输入端子 AI、模拟量输出端子的功能。

6.9.1 数字输入端子功能（DI）

YD580E 系列变频器标配 5 个多功能数字输入端子（其中 DI5 可以用作高速脉冲输入端子）。若系统需要增加数字输入端子，则可选配“IO 扩展卡”或者“可编程多功能扩展卡”，“IO 扩展卡”有 3 个 DI 输入端子（DI6~DI8），“可编程多功能扩展卡”有 5 个 DI 输入端子（DI6~DI10），每个 DI 端子都可以选择任意一个 DI 端子功能。

参数	功能定义	出厂值	设定范围	参数说明
P4-00	DI1 端子功能选择	1	0~52	详见下表
P4-01	DI2 端子功能选择	4		
P4-02	DI3 端子功能选择	9		
P4-03	DI4 端子功能选择	12		
P4-04	DI5 端子功能选择	13		
P4-05	DI6 端子功能选择	0		
P4-06	DI7 端子功能选择	0		
P4-07	DI8 端子功能选择	0		
P4-08	DI9 端子功能选择	0		
P4-09	DI10 端子功能选择	0		
P4-35	DI1 延迟时间	0.0s	0.0s~3600.0s	设置 DI 端子状态发生变化时，变频器对该变化进行的延时时间。 目前仅 DI1、DI2、DI3 有设置延迟时间的功能。
P4-36	DI2 延迟时间	0.0s	0.0s~3600.0s	
P4-37	DI3 延迟时间	0.0s	0.0s~3600.0s	
P4-38	DI 端子有效模式选择 1	00000	个位：DI1 端子有效状态设定 0：高电平有效 1：低电平有效 十位：DI2 端子有效状态设定（0~1，同上） 百位：DI3 端子有效状态设定（0~1，同上） 千位：DI4 端子有效状态设定（0~1，同上） 万位：DI5 端子有效状态设定（0~1，同上）	选择高电平有效时，相应的 DI 端子与 COM 连通时有效，断开无效。 选择低电平有效时，相应的 DI 端子与 COM 连通时无效，断开有效。

参数	功能定义	出厂值	设定范围	参数说明
P4-39	DI 端子有效模式选择 2	00000	个位：DI6 端子有效状态设定 0：高电平有效 1：低电平有效 十位：DI7 端子有效状态设定（0~1，同上） 百位：DI8 端子有效状态设定（0~1，同上） 千位：DI9 端子有效状态设定（0~1，同上） 万位：DI10 端子有效状态设定（0~1，同上）	同 P4-38

● DI 端子功能选择详细说明如下：

设定值	功能	详细说明
0	无功能	可将不使用的端子设定为“无功能”，以防止误动作。
1	正向运行（FWD）或运行命令	两线式 1（P4-11=0）时为正向运行；两线式 2（P4-11=1）时为运行命令。
2	反向运行（REV）或正反运行方向	三线式 1（P4-11=2）时为反向运行；两线式 2（P4-11=3）时为正反运行方向。
3	三线式运行控制	确定变频器运行方式是三线控制模式。 如果要通过端子设定运行指令，参数 P4-11（端子命令方式）设置为 2（三线式 1）或者 3（三线式 2），端子功能要设置为此功能。
4	正转点动（FJOG）	变频器的运行方式为正转点动运行。 点动运行频率、点动加减速时间参见“6.11.1 点动运行”参数 P8-00、P8-01、P8-02 的说明。
5	反转点动（RJOG）	变频器的运行方式为反转点动运行。 点动运行频率、点动加减速时间参见“6.11.1 点动运行”参数 P8-00、P8-01、P8-02 的说明。
6	端子 UP	通过端子给定频率时修改频率的递增指令。端子有效相当于一直按着△键，端子无效相当于松开△键。
7	端子 DOWN	通过端子给定频率时修改频率的递减指令。端子有效相当于一直按着▽键，端子无效相当于松开▽键。
8	自由停车	变频器停机，电机根据惯性停车。
9	故障复位（RESET）	对变频器的故障进行复位，与键盘上的 STOP RES 键功能相同。用此功能可实现远距离故障复位。
10	运行暂停	变频器减速停车，端子有效时，所有运行参数均被记忆（如 PLC 参数、摆频参数、PID 参数）端子无效后，变频器恢复之前所记忆的运行状态。
11	外部故障常开输入	当外部信号送给变频器后，变频器报出故障 Err15。
12	多段指令端子 1	可通过这四个端子的 16 种状态，实现 16 段速度或者 16 种其他指令的设定。详细内容见表 6-1 多段指令功能说明。
13	多段指令端子 2	
14	多段指令端子 3	
15	多段指令端子 4	
16	加减速时间选择端子 1	通过两个端子的 4 种状态，实现 4 种加减速时间的选择，详细内容见表 6-2 “通过 DI 端子选择加减速时间”。
17	加减速时间选择端子 2	
18	频率指令切换	用来切换选择不同的频率指令输入方法。 根据 P0-07（频率指令叠加选择）的设置，实现在两种频率指令的切换。
19	UP/DOWN 设定清零（端子、键盘）	当通过面板设定主频率时，端子选择此功能可清除通过键盘上△键、▽键或者端子功能 UP/DOWN（6 或 7）所改变的频率值，使给定频率恢复到 P0-08 设定的值。
20	控制命令切换端子 1	当通过端子设定运行指令时（P0-02=1），端子选择此功能可以进行端子控制与键盘控制的切换。 当通过通讯设定运行指令时（P0-02=2），端子选择此功能可以进行通讯控制与键盘控制的切换。

设定值	功能	详细说明
21	加减速禁止	变频器维持当前运行频率（停机命令除外），不受外部输入频率变化的影响。
22	PID 暂停	PID 暂时失效，变频器维持当前的输出频率，不再进行频率源的 PID 调节。
23	简易 PLC 状态复位	使变频器恢复到简易 PLC 的初始状态。
24	摆频暂停	在摆频工艺功能中，端子选择此功能使摆频功能暂停（变频器以中心频率输出）。
25	记数器输入	在计数工艺功能中， 端子选择此功能输入计数脉冲。
26	计数器复位	在计数工艺功能中，端子选择此功能对计数器状态进行清零处理。
27	长度计数输入	在定长工艺功能中，端子选择此功能输入长度计数。
28	长度复位	在定长工艺功能中使用此端子功能，使长度清零。
29	转矩控制禁止	转矩控制模式下，转矩控制到速度控制切换。端子无效后，恢复到转矩控制模式。
30	脉冲频率输入（仅对 DI5 有效）	当 DI5 作为脉冲输入的端子时，DI5 端子必须选择此功能。
31	保留	保留
32	立即直流制动	变频器直接切换到直流制动状态。
33	外部故障常闭输入	当外部信号送给变频器后，变频器报出故障 Err15。
34	频率修改使能	如果端子有效，允许修改频率，如果端子无效，禁止修改频率。
35	PID 作用方向取反	PID 作用方向与 PA-03（PID 作用方向）设定的方向相反。
36	外部停车端子 1	“运行指令选择”为操作面板时（P0-02=0），使变频器停机，相当于键盘上 STOP 键的功能。
37	控制命令切换端子 2	用于在端子和通讯设定运行指令之间的切换。 如果用端子控制运行命令，则选择此功能的端子有效时系统切换为通讯控制；如果用通讯控制运行命令，则选择此功能的端子有效时系统切换为端子控制；
38	PID 积分暂停	PID 的积分调节功能暂停，但 PID 的比例调节和微分调节功能仍然有效。
39	主频率与预置频率切换	主频率切换成预置频率 (P0-08)；
40	辅频率与预置频率切换	辅频率切换成预置频率 (P0-08)。
41	电机端子选择功能	选择电机参数。端子有效时选择电机 2；端子无效时选择电机 1。
42	保留	保留
43	PID 参数切换	当 PID 参数切换条件选择（PA-18）设置为 1（通过端子切换），端子无效时，PID参数使用 PA-05~PA-07；端子有效时则使用 PA-15~PA-17；
44	用户自定义故障 1	变频器报警 Err27，变频器会根据 P9-49（故障保护动作选择）的设定值进行处理。
45	用户自定义故障 2	变频器报警 Err28，变频器会根据 P9-49（故障保护动作选择）的设定值进行处理。
46	速度控制 / 转矩控制切换	变频器在转矩控制与速度控制模式之间切换。 A0-00(速度 / 转矩控制方式) 设置为 0，端子有效时，控制方式为转矩模式；端子无效时，控制方式为速度模式。 A0-00(速度 / 转矩控制方式) 设置为 1，端子有效时，控制方式为速度模式；端子无效时，控制方式为转矩模式。
47	紧急停车	系系统处于紧急状态时，变频器按照 P8-55 端子急停减 速时间减速，V/F 模式急停减速时间为 0s 时按照最小单位时间进行减速。该输入端子无须持续处于闭合状态，即使处于闭合状态的时间仅仅为一瞬间，也会紧急停止。与一般的减速时间不同，在经过紧急停止减速时间后断开紧急停车输入端子，如果此时变频器端子运行信号仍处于闭合状态，变频器也不会启动，需先断开运行端子后再次输入端子运行指令，变频器才会重新起动。
48	外部停车端子 2	在任何运行指令方式下（面板控制、端子控制、通讯控制），变频器减速停车。此时减速时间固定为减速时间 4（P8-08）。
49	减速直流制动	变频器先减速到停机直流制动起始频率（P6-11），然后进入直流制动状态。
50	本次运行时间清零	变频器本次运行计时时间被清零。 如果本次运行时间小于 P8-53（本次运行到达时间）的设定值（大于 0），在此过程中端子有效，本次运行计时清零。 如本次运行时间大于P8-53的设定值（大于0），此时端子有效，本运行计时不清零。

设定值	功能	详细说明
51	两线式 / 三线式切换	用于在两线式和三线式控制之间进行切换。 如果 P4-11 设为 0（两线式 1），则该功能的端子有效时，切换为三线式 1。 如果 P4-11 设为 1（两线式 2），则该功能的端子有效时，切换为三线式 2。 如果 P4-11 设为 2（三线式 1），则该功能的端子有效时，切换为两线式 1。 如果 P4-11 设为 3（三线式 2），则该功能的端子有效时，切换为两线式 2。
52	反向频率禁止	端子有效时，即使设定了反向频率，但变频器实际设定频率被限定为 0。 与反向频率禁止（P8-13）功能相同。

6.9.2 数字输出端子功能（DO）

YD580E 系列变频器标配，1 个多功能数字量输出端子，1 个多功能继电器输出端子，1 个 FM 端子。 如果上述输出端子不能满足现场应用，则可选配“IO 扩展卡”（扩展卡的输出端子个数请参考“第 十一章 选配卡”），例如 YD58IO 多功能 IO 扩展卡包含 1 个多功能继电器输出端子（继电器 2）， 1 个多功能数字量输出端子（DO2）。

参数	功能定义	出厂值	设定范围	参数说明
P5-00	FM 端子输出模式选择	0	0：脉冲输出（FMP） 1：开关量输出（FMR）	FM 端子是可编程的复用端子，可作为高速脉冲输出端子（FMP），也可以作为集电极开路的开关量输出端子（FMR）。 作为脉冲输出 FMP 时，输出脉冲的最高频率为 100kHz，FMP 相关功能参见 P5-06 说明。
P5-01	FMR 功能选择（集电极开路输出端子）	0	0~41	用于选择 5 个数字输出的功能，其中（T/A-T/B-T/C） 和（P/A-P/B-P/C）分别为控制板与扩展卡上的继电器。
P5-02	控制板继电器输出功能选择（T/A-T/B-T/C）	2		
P5-03	扩展卡继电器输出功能选择（P/A-P/B-P/C）	0		
P5-04	DO1 输出功能选择	1		
P5-05	扩展卡 DO2 输出功能选择	4		
P5-17	FMR 输出延迟时间	0.0s	0.0s~3600.0s	-
P5-18	RELAY1 输出延迟时间	0.0s	0.0s~3600.0s	-
P5-19	RELAY2 输出延迟时间	0.0s	0.0s~3600.0s	-
P5-20	DO1 输出延迟时间	0.0s	0.0s~3600.0s	-
P5-21	DO2 输出延迟时间	0.0s	0.0s~3600.0s	-
P5-22	DO 输出端子有效状态选择	00000	个位：FMR 有效状态选择 0：正逻辑 1：反逻辑 十位：RELAY1 有效状态 0：正逻辑 1：反逻辑 百位：RELAY2 端子有效 0：正逻辑 1：反逻辑 千位：DO1 端子有效状态 0：正逻辑 1：反逻辑 万位：DO2 端子有效状态 0：正逻辑 1：反逻辑	0：正逻辑（等效常开接点） “有效状态”：DO 端子和 COM/CME 端子内部连通。 “无效状态”：DO 端子和 COM/CME 端子断开。 1：反逻辑（等效常闭接点） “有效状态”：DO 端子和 COM/CME 端子断开。 “无效状态”：DO 端子和 COM/CME 端子内部连通。

● 输出端子功能选择详细说明：

设定值	功能	说明
0	无输出	输出端子无任何功能
1	变频器运行中	变频器正处于运行状态，有输出频率（可以为零），此时输出“有效”信号。
2	故障输出 (为自由停机的故障)	当变频器故障停机时，输出”有效”信号。
3	频率水平检测 1	当运行频率高于频率检测值时，DO 输出“有效”信号，当运行频率低于检测值减去 FDT 滞后值（P8-19 设定值与 P8-20 的乘积），DO 输出“有效”信号取消。P8-19、P8-20 的详细说明参考“附录 A或B 功能参数表”。
4	频率到达	变频器的运行频率，处于目标频率一定范围内（目标频率 ±P8-21 的设定值与最大频率的乘积），DO 输出”有效”信号。
5	零速运行中（停机时不输出）	变频器运行且输出频率为 0 时，输出”有效”信号。在变频器处于停机状态时，该信号“无效”。
6	电机过载预报警	电机过载保护动作之前，根据过载预警系数（P9-02）进行判断，在超过预报警阈值后输出”有效”信号。（预报警阈值的计算参照 6.6 保护功能）
7	变频器过载预报警	在变频器过载保护发生前 10s，输出”有效”信号。
8	设定计数值到达	在计数功能中，当计数值达到 PB-08 所设定的值时，输出”有效”信号。
9	指定计数值到达	在计数功能中，当计数值达到 PB-09 所设定的值时，输出”有效”信号。 当计数值达到 PB-09 所设定的值时，输出”有效”信号。计数功能参考 6.8.3 小节说明。
10	长度到达	在定长功能中，当检测的实际长度超过 PB-05 所设定的长度时，输出”有效”信号。
11	简易 PLC 循环完成	当简易 PLC 运行完成一个循环后，输出一个宽度为 250ms 的脉冲信号。
12	累计运行时间到达	变频器累计运行时间超过 P8-17（设定累计上电到达时间）所设定时间时，输出”有效”信号。
13	频率限定中	当设定频率超出上限频率或者下限频率，且变频器输出频率达到上限频率或者下限频率时，输出”有效”信号。
14	转矩限定中	变频器在速度控制模式下，当输出转矩达到转矩限定值时，输出”有效”信号。
15	运行准备就绪	变频器上电后，处于无异常状态时，输出”有效”信号。
16	AI1>AI2	当模拟量输入 AI1 的值大于 AI2 的输入值时，输出”有效”信号。
17	上限频率到达	当运行频率到达上限频率（P0-12）时，输出”有效”信号。
18	下限频率到达（停机时不输出）	当 P8-14（给定频率低于下限频率运行模式）设置为 1（停机）时，无论运行频率是否到达下限频率，都输出”无效”信号。 当 P8-14（给定频率低于下限频率运行模式）设置为 0（以下限频率运行）或者 2（零速运行）时，且运行频率到达下限频率时，输出”有效”信号。
19	欠压状态	变频器处于欠压状态时，输出”有效”信号。
20	通讯设定	端子“有效”或者“无效”状态由通讯地址 0x2001 的设定值控制。
21	保留	保留
22	保留	保留
23	零速运行中 2（停机时也输出）	变频器运行且输出频率为 0 时，输出”有效”信号。在变频器处于停机状态时，该信号也为”有效”。
24	累计上电时间到达	变频器累计上电时间 (P7-13) 超过 P8-16 (设定累计上电到达时间) 所设定时间时，输出”有效”信号。
25	频率水平检测 2	当运行频率高于频率检测值时，DO 输出”有效”信号，当运行频率低于检测值减去频率检测滞后值（P8-28 设定值与 P8-29 的乘积），DO 输出”有效”信号取消。 P8-28、P8-29 的详细说明参考“附录 A或B 功能参数表”。
26	频率 1 到达	变频器的运行频率，处于 P8-30 (任意到达频率检测值 1) 频率检出范围内，DO 输出”有效”信号。 频率检出范围：P8-30-P8-31×P0-10（最大频率）~P8-30+P8-31×P0-10
27	频率 2 到达	变频器的运行频率，处于 P8-32 (任意到达频率检测值 2) 频率检出范围内，DO 输出”有效”信号。 频率检出范围：P8-32-P8-33×P0-10（最大频率到）~P8-32+P8-33×P0-10。
28	电流 1 到达	变频器的输出电流，处于 P8-38（任意到达电流 1）电流的范围内，DO 输出”有效”信号。电流检出范围 = P8-38-P8-39×P1-03（电机额定电流）~P8-38+P8-39×P1-03。
29	电流 2 到达	变频器的输出电流，处于 P8-40（任意到达电流 2）电流的范围内，DO 输出”有效”信号。电流检出范围 = P8-40-P8-41×P1-03（电机额定电流）~P8-40+P8-41×P1-03。

设定值	功能	说明
30	定时到达	当定时功能选择（P8-42）有效时，变频器本次运行时间达到所设置的定时时间后，输出”有效”信号。定时时间由 P8-43 和 P8-44 设置。
31	AI1 输入超限	当模拟量输入 AI1 的值大于 P8-46(AI1 输入保护上限) 或小于 P8-45(AI1 输入保护下限) 时，输出”有效”信号。
32	掉载中	变频器处于掉载状态时，输出”有效”信号。
33	反向运行中	变频器处于反向运行时，输出”有效”信号。
34	零电流状态	变频器的输出电流，处于零电流的范围内，且持续时间超过 P8-35（零电流检测延迟时间）后，DO 输出”有效”信号。 零电流检出范围 =0~ P8-34×P1-03。
35	模块温度到达	逆变模块散热器温度（P7-07）达到所设置的模块温度到达值（P8-47）时，输出”有效”信号。
36	输出电流超限	变频器的输出电流，大于 P8-36（输出电流超限值），且持续时间超过 P8-37（输出电流超限检测延迟时间）后，DO 输出”有效”信号。
37	下限频率到达 (停机也输出)	当运行频率到达下限频率（P0-14）时，输出”有效”信号。在停机状态时，也输出”有效”信号。
38	告警	当变频器发生故障，且该故障保护动作选择为继续运行时，DO 端子输出”有效”信号。故障保护动作选择可以参照 P9-47~P9-50。
39	电机过温	当电机温度达到 P9-58（电机过热预报警阈值）时，输出”有效”信号。（电机温度可通过 U0-34 查看）
40	本次运行时间到达	变频器本次开始运行时间超过 P8-53（本次运行到达时间设定）所设定的时间时，输出”有效”信号。
41	故障（为自由停机的故障且欠压不输出）	当变频器发生故障时（除了欠压故障之外），DO 输出”有效”信号。

6.9.3 虚拟数字输入端子功能（VDI）

虚拟数字量输入功能，与控制板 DI 输入功能相似，可以作为多功能数字量输入使用。

下面举例说明虚拟 VDI 的使用方法。

例 1: 当虚拟 VDI 端子有效状态设置模式（A1-05），设置为 00000 时（选择 VDO 状态决定 VDI 状态），要完成如下功能：“如果 AI1 输入超出上下限时，需要变频器故障报警并停机”。可以采用如下设置方法：

步骤	参数设置
1	设置 VDI1 的功能为“用户自定义故障 1”（A1-00=44）
2	设置 VDI1 端子有效状态模式为由 VDO1 确定（A1-05=00000）
3	设置 VDO1 输出功能为“AI1 输入超出上下限”（A1-11=31）

设置完上述步骤后，当 AI1 输入超出上下限时，则 VDO1 输出为 ON 状态，此时 VDI1 输入端子状态有效，变频器 VDI1 接收到用户自定义故障 1，变频器会故障报警 Err27 并停机。

例 2: 当虚拟 VDI 端子有效状态设置模式（A1-05），设置为 11111 时（选择参数 A1-06 设定 VDI 状态），要完成如下功能：“当变频器上电后，需要变频器自动进入运行状态”，可以采用如下设置方法：

步骤	参数设置
1	设置 VDI1 的功能为“正转运行”（A1-00=1）
2	设置 VDI1 端子有效状态模式为由参数设置（A1-05= 11111）
3	设置 VDI1 端子状态为有效（A1-06=11111）
4	设置命令源为“端子控制”（P0-02=1）
5	设置启动保护选择为“不保护”（P8-18=0）

设置完上述步骤后，如果变频器上电完成初始化后，检测到 VDI1 为有效，且此端子对应正转运行，相当于变频器接收到一个端子正转运行命令，变频器随即开始正转运行。

参数	功能定义	出厂值	设定范围	参数说明
A1-00	虚拟 VDI1 端子功能选择	0	0~59	虚拟 VDI1~VDI5 可以作为多功能数字量输入使用，功能 0~52 与普通 DI 设置相同，53~59 保留。详细设置请参考 6.9.1 小节 P4-00~P4-09 的介绍。
A1-01	虚拟 VDI2 端子功能选择	0	0~59	
A1-02	虚拟 VDI3 端子功能选择	0	0~59	
A1-03	虚拟 VDI4 端子功能选择	0	0~59	
A1-04	虚拟 VDI5 端子功能选择	0	0~59	
A1-05	虚拟 VDI 端子有效状态设置模式	00000	个位：虚拟 VDI1 0：由虚拟 VDOx 的状态决定 VDI是否有效 1：由参数 A1-06 设定 VDI 是否有效 十位：虚拟 VDI2（0~1，同上） 百位：虚拟 VDI3（0~1，同上） 千位：虚拟 VDI4（0~1，同上） 万位：虚拟 VDI5（0~1，同上）	虚拟 VDI 的状态可以有两种设定方式，并通过 A1-05 来选择。 设置为 0：VDI 是否为有效状态，取决于 VDO 输出为有效或无效，且 VDIx 唯一绑定 VDOx（x 为 1~5）。 设置为 1：通过参数 A1-06 的二进制位，分别确定虚拟输入端子的状态。
A1-06	虚拟 VDI 端子状态设置	00000	个位：虚拟 VDI1 十位：虚拟 VDI2 百位：虚拟 VDI3 千位：虚拟 VDI4 万位：虚拟 VDI5 0：无效 1：有效	-

6.9.4 虚拟数字输出端子功能（VDO）

虚拟数字量输出功能，与控制板 DO 输出功能相似，可用于与虚拟数字量输入 VDIx 配合，实现一些简单的逻辑控制。

VDO 与 VDI 可以配合使用，用来实现灵活的控制方式，使用方法参考 6.9.3 虚拟 VDI 小节的举例。

参数	功能定义	出厂值	设定范围	参数说明
A1-11	虚拟 VDO1 输出功能选择	0	0：与物理 DIx 内部短接 1~41：见 P5 组物理 DO 输出选择	当虚拟 VDOx 输出功能选择为 0 时，VDO1~VDO5 的输出状态由控制板上的 DI1~DI5 输入状态确定，此时 VDOx 与 DIx 一一对应。 当虚拟 VDOx 输出功能选择为非 0 时，VDOx 的功能设置及使用方法，与P5 组 DO 输出相关参数相同，请参考 6.9.6 小节中 P5 组相关参数说明。
A1-12	虚拟 VDO2 输出功能选择	0	0：与物理 DIx 内部短接 1~41：见 P5 组物理 DO 输出选择	
A1-13	虚拟 VDO3 输出功能选择	0	0：与物理 DIx 内部短接 1~41：见 P5 组物理 DO 输出选择	
A1-14	虚拟 VDO4 输出功能选择	0	0：与物理 DIx 内部短接 1~41：见 P5 组物理 DO 输出选择	
A1-15	虚拟 VDO5 输出功能选择	0	0：与物理 DIx 内部短接 1~41：见 P5 组物理 DO 输出选择	
A1-16	VDO1 输出延迟时间	0.0s	0.0s~3600.0s	-

参数	功能定义	出厂值	设定范围	参数说明
A1-17	VDO2 输出延迟时间	0.0s	0.0s~3600.0s	-
A1-18	VDO3 输出延迟时间	0.0s	0.0s~3600.0s	-
A1-19	VDO4 输出延迟时间	0.0s	0.0s~3600.0s	-
A1-20	VDO5 输出延迟时间	0.0s	0.0s~3600.0s	-
A1-21	VDO 输出端子有效状选择	00000	个位：VDO1 十位：VDO2 百位：VDO3 千位：VDO4 万位：VDO5 0：正逻辑 1：反逻辑	正逻辑：端子无效输出 0；端子有效输出 1； 反逻辑：端子无效输出 1；端子有效输出 0；

6.9.5 模拟量输入端子

YD580E 系列变频器标配 2 个模拟量多功能输入端子。如果模拟量输入端子不能满足现场应用，则可选配“IO 扩展卡”（扩展卡的模拟量输入端子个数请参考“第十一章 选配卡”），例如 YD58IPC 包含 1 个模拟量输入端子 AI3。

以下参数用于将 AI 当做 DI 使用（AI 的更多功能请参见“6.2.3 通过“模拟量”设定主频率”）。当 AI 作为 DI 使用时，如果 AI 输入电压大于 7V 时，AI 端子状态为高电平；如果 AI 输入电压低于 3V 时，AI 端子状态为低电平；当 AI 输入电压在 3V~7V 之间为滞环。图 6-56 说明了 AI 输入电压与相应 DI 状态的关系：

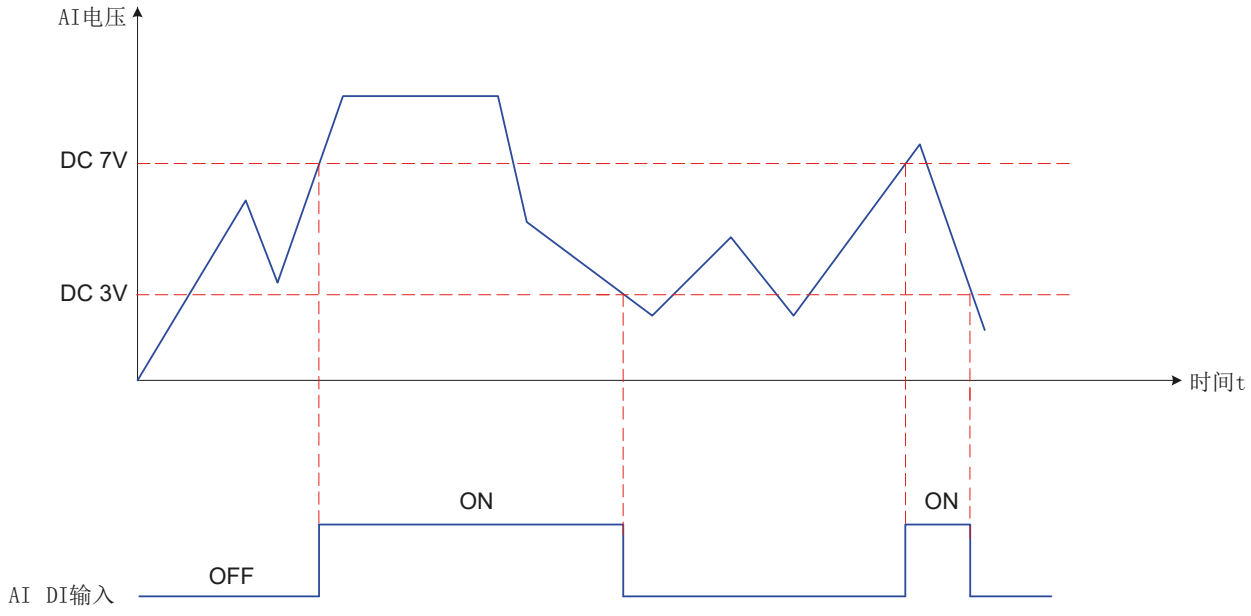


图 6-55 AI 输入电压与 DI 状态的关系图

参数	功能定义	出厂值	设定范围	参数说明
A1-07	AI1 端子作为 DI 时的功能选择	0	0~59	AI 作为 DI 时的功能设置，功能 0~52 与普通 DI 设置相同，53~59 保留。具体请参考 6.9.1 小节 P4 组相关DI 设置的说明。
A1-08	AI2 端子作为 DI 时的功能选择	0	0~59	
A1-09	AI3 端子作为 DI 时的功能选择	0	0~59	
A1-10	AI 作为 DI 时有效模式选择	000	个位：AI1 0：高电平有效 1：低电平有效 十位：AI2（0~1，同个位） 百位：AI3（0~1，同个位）	AI 端子为高电平时，A1-10 对应位的值设置为 0 时，此时认为 AI 端子有效，A1-10 设置为 1 时，此时认为 AI 端子无效； AI 端子为低电平时，A1-10 对应位的值设置为 0 时，此时认为 AI 端子无效，A1-10 设置为 1 时，此时认为 AI 端子有效。

6.9.6 模拟量、脉冲输出端子

YD580E系列变频器标配 1 个模拟量输出端子 AO1。如果模拟量输出端子不能满足现场应用，则可选配“IO 扩展卡”（扩展卡的模拟量输出端子个数请参见“第 11 章 选配卡”），例如YD58IO 包含 1 个模拟量输出端子 AO2。

以下参数一般用于修正模拟输出的零漂及输出幅值的偏差。也可以用于自定义所需要的 AO 输出曲线。

参数	功能定义	出厂值	设定范围	参数说明
P5-00	FM 端子输出模式选择	0	0：脉冲输出（FMP） 1：开关量输出（FMR）	FM 端子是可编程的复用端子，可作为高速脉冲输出端子（FMP），也可以作为集电极开路的开关量输出端子（FMR）。 作为脉冲输出 FMP 时，输出脉冲的最高频率为 100kHz，FMP 相关功能参见 P5-06 说明。
P5-06	FMP 输出功能选择（脉冲输出端子）	0	0~16	详细见下表 6-5。
P5-07	AO1 输出功能选择	0	0~16	
P5-08	AO2 输出功能选择	1	0~16	
P5-09	FMP 输出最大频率	50.00kHz	0.01kHz~100.00kHz	当 FM 端子选择作为脉冲输出时，该参数用于选择输出脉冲的最大频率值。
P5-10	AO1 零偏系数	0.0%	-100.0%~+100.0%	AO1 零偏系数的 100% 对应 10V 或者 20mA。 零偏 = 零偏系数 ×10v(或者 20mA)
P5-11	AO1 增益	1.00	-10.00~+10.00	-
P5-12	AO2 零偏系数	0.00%	-100.0%~+100.0%	AO2 零偏系数的 100% 对应 10V 或者 20mA
P5-13	AO2 增益	1.00	-10.00~+10.00	-

AO（模拟量输出）0~10V 对应 0%~100%，当 AO2 输出功能为 1（频率设定）时，如果变频器设定频率为最大频率的 50%，则 AO2 的输出电压为 50%×10 V= 5V。

FM（脉冲输出） 0~100kHz 对应 0%~100%，当 FM 输出功能为 1（频率设定）时，如果变频器设定频率为最大频率的 50%，P5-09 设定为 100kHz，则 FM 端子的输出频率为 50%×100kHz = 50kHz。

表 6-5 脉冲或者模拟量输出的功能与范围对应关系表

设定值	功能定义	功能范围
0	运行频率	0~ 最大输出频率
1	设定频率	0~ 最大输出频率
2	输出电流	0~2 倍电机额定电流
3	电机输出转矩 （绝对值，相对电机额定转矩的百分比）	0~2 倍电机额定转矩
4	输出功率	0~2 倍额定功率
5	输出电压	0~1.2 倍变频器额定电压
6	脉冲输入（100% 对应 100.00kHz）	0.01kHz~100.00kHz
7	AI1	0V~10V
8	AI2	0V~10V（或者 0~20mA）
9	AI3	0V~10V
10	长度	0~ 最大设定长度
11	计数值	0~ 最大计数值
12	通讯设定	0.0%~100.0%
13	电机转速	0~ 最大输出频率对应的转速
14	输出电流	0.0A~1000.0A
15	母线电压	0.0V~1000.0V
16	电机输出转矩（实际值，相对电机的百分比）	-2 倍电机额定转矩 ~2 倍电机额定转矩

● AO 零偏系数（P5-10 或者 P5-12）和 AO 增益的（P5-11 或者 P5-10）计算方法如下：

例如，若模拟输出内容为运行频率，
希望频率为0Hz（X1）时，修正后输出8V（Y1），
频率为 40Hz（X2） 时，修正后输出 4V（Y2）。
增益计算公式为：

$$K = \frac{(Y1-Y2)*Xmax}{(X1-X2)*Ymax}$$

零偏系数计算公式为：

$$b = \frac{(X1*Y2)-(X2*Y1)}{(X1-X2)*Ymax} \times 100\%$$

通过查表 6-6 和表 6-7 可知，Xmax 为最大输出频率 50Hz（假设最大频率 P0-10 为 50Hz）；Ymax 为电压，值为 10V。

$$K = \frac{(8-4)\times 50}{(0-40)\times 10} = -0.5\text{（增益）}$$

$$b = \frac{(0\times 4-40\times 8)}{(0-40)\times 10} \times 100\% = 80\%\text{（零偏系数）}$$

故 AO1 增益（P5-11）应该设为－ 0.5，AO1 零偏系数（P5-10）应该设为 80%。

表 6-6 模拟量输出信号类型与其对应的最大值（Ymax）关系表：

输出信号类型	输出信号对应的最大值（Ymax）
电压	10V
电流	20mA

表 6-7 模拟输出内容与其对应的最大值（Xmax）关系表

模拟输出内容	模拟输出内容对应的最大值（Xmax）
运行频率	最大输出频率
设定频率	最大输出频率
输出电流	2 倍电机额定电流
输出转矩 (绝对值)	2 倍电机额定转矩
输出功率	2 倍额定功率
输出电压	1.2 倍变频器额定电压
脉冲输入	100.00kHz
AI1	10V
AI2	10V 或者 20mA
AI3	10V
长度	最大设定长度
计数值	最大计数值
通讯设定	100.0%
电机转速	最大输出频率对应的转速
输出电流	1000.0A
输出电压	1000.0V
输出转矩 (实际值)	相对 2 倍电机额定转矩

6.10 通讯

YD580E 系列变频器支持 Modbus、CANopen、CANlink（始终有效）、Proibus-DP 四种通讯协议。

上位机通过这些通讯协议可以实现对变频器的控制、监视及参数的修改查看操作。在变频器通讯之前要保证相关通讯参数设置正确，否则可能无法通讯。

参数	功能定义	出厂值	设定范围	参数说明
P0-28	串口通讯协议选择	0	0：Modbus 协议 1：Proibus-DP 协议或 CANopen协议	CANLink 协议始终有效
PD-00	通讯波特率	5005	个位：Modbus 波特率 0：300bps 1：600bps 2：1200bps 3：2400bps 4：4800bps 5：9600bps 6：19200bps 7：38400bps 8：57600bps 9：115200bps 十位：Profibus-DP 0：115200bps 1：208300bps 2：256000bps 3：512000bps 百位：保留 千位：CANLink 波特率 0：20Kbps 1：50Kbps 2：100Kbps 3：125Kbps 4：250Kbps 5：500Kbps 6：1Mbps	此参数用来设定上位机与变频器之间的数据传输速率。波特率越大，通讯速度越快。 注意，上位机与变频器设定的波特率必须一致，否则，通讯无法进行。
PD-01	MODBUS 数据格式	0	0：无校验：数据格式 <8，N，2> 1：偶检验：数据格式 <8，E，1> 2：奇校验：数据格式 <8，O，1> 3：无校验：数据格式 <8，N，1>	上位机与变频器设定的数据格式必须一致，否则，通讯无法进行。
PD-02	本机地址	1	1~247，0 为广播地址	当本机地址设定为 0 时，即为广播地址，实现上位机广播功能。 本机地址具有唯一性（除广播地址外），是实现上位机与变频器点对点通讯的基础。
PD-03	MODBUS 应答延迟	2	0~20ms	变频器数据接受结束到向上位机发送数据的中间间隔时间。 如果应答延时小于系统处理时间，则应答延时以系统处理时间为准； 如果应答延时大于系统处理时间，则系统处理完数据后，要延迟等待，直到到达应答延迟时间，才往上位机发送数据。
PD-04	串口通讯超时时间	0.0	0.0s（无效） 0.1~60.0s	当设置为 0.0s，通讯超时时间无效。通常情况下，都将其设置成无效。在连续通讯的系统中，此参数可以监视通讯状况。 设置成有效值时，如果本次通讯与下一次通讯的间隔时间超出 PD-04（通讯超时时间），系统将报通讯故障错误（Err16）。

参数	功能定义	出厂值	设定范围	参数说明
PD-05	MODBUS、Profibus-DP 通讯数据格式	30	个位：Modbus 0：非标准的 Modbus 协议 1：标准的 Modbus 协议 十位：Profibus-DP 0：PPO1 格式 1：PPO2 格式 2：PPO3 格式 3：PPO5 格式	个位： 0：读命令时，从机返回字节数比标准的 Modbus 协议多一个字节。 1：选择标准的 Modbus 协议。 具体说明请参见《YD580E 系列 YD58DP Proibus 接口卡说明书》
PD-06	通讯读取电流分辨率	0	0：0.01A（≤ 55kW 时有效） 1：0.1A	用来确定通讯读取输出电流时，电流值的输出单位。
PD-08	扩展卡（Profibus、CANopen）中断检测时间	0	0.0s：无效 0.1~ 60.0s	-

NOTE

- PD-06=0 只对变频器功率≤ 55kW 时有效（小功率电流显示为两位小数），通讯读取电流时可通过选择该参数确定电流值输出单位。目的是客户上位机编程读取电流时可统一按一位小数计算，不需要考虑变频器大小功率存在电流小数点不一致的转换。

6.10.1 读写参数

1） 读取参数

对于 P0~PF、A0~AF 组参数数据，其通讯地址高八位是功能组编号，低八位是参数在功能组中的序号转换为十六进制的数，但参数P群组以十六进制F表示,参数A群组还是以十六进制A表示。例如：

参数 P0-16，其通讯地址为 F010H，其中 F0H 代表 P0 组参数，10H 代表参数在功能组中序号为 16 转换为十六进制数后的值；

参数 AC-08，其通讯地址为 AC08H，其中 ACH 代表 AC 组参数，08H 代表参数在功能组中序号 8 转换为十六进制数后的值。

上位机要读取参数时，要给变频器发送读命令。下面以标准 Modobus 协议为例说明上位机读取变频器数据时的通讯过程。

例如，要读取参数 P0-10（最大频率），发送读命令为 01 03 F0 0A 01 DE D7 。每一字节代表的含义如下：变频器地址：01H（可以设置）；读命令：03H；参数 P0-10 地址：F0 0AH；参数个数：01H；CRC 校验：DE D7H。（读取其他参数的方法与上述相同）

表 6-8 上位机读取变频器数据

主机读取命令帧		从机应答帧	
地址	01H	地址	01H
读命令	03H	读命令	03H
P0-10 地址	F0H	字节数	02H
	0AH	参数内容	13H
参数个数高位	00H		88H
参数个数低位	01H	CRC 高位	B5H
CRC 高位	97H	CRC 低位	12H
CRC 低位	08H	-	-

2） 写入参数

对于 P0~PF 组参数，其通讯地址高八位，根据是否写入 EEPROM，区分为 00~0F 或 P0~FF，低八位是参数在功能组中的序号转换为十六进制的数，例如：写功能参数 P0-16，不需要写入 EEPROM 时，其通讯地址为 0010H；需要写入 EEPROM 时，其通讯地址为 F010H。

对于 A0~AF 组参数数据，其通讯地址高八位，根据是否需要写入 EEPROM，区分为 40~4F 或 A0~AF，低八位是参数在功能组中的序号转换为十六进制的数，例如：写功能参数 AC-08，不需要写入 EEPROM 时，其通讯地址为 4C08H；需要写入 EEPROM 时，其通讯地址为 AC08H。

例如，要给参数 AC-16（AO2 目标电压 1）写入 2（不写 EEPROM），发送写入命令为：

01 06 4C 10 00 02 1F 5E

每一字节代表的含义如下：变频器地址：01H（可以设置）；写入命令：06H；参数 AC-16 地址：4C 10H；写入值：0002H；CRC 校验：1F 5EH。（给其他参数写入数据的方法与上述相同）

主机写入命令帧		从机应答帧	
ADDR	01H	ADDR	01H
CMD	06H	CMD	06H
参数地址高位	4CH	参数地址高位	4CH
参数地址低位	10H	参数地址低位	10H
写入数据高位	00H	写入数据高位	00H
写入数据高位	02H	写入数据高位	02H
CRC 高位	1FH	CRC 高位	1FH
CRC 低位	5EH	CRC 低位	5EH

6.10.2 读取状态参数

状态参数包括，U 组监视参数、变频器故障描述、变频器运行状态。

- U 组监视参数地址定义如下：U0~UF，其通讯地址高八位为 70~7F，低八位为监视参数在组中的序号转换成十六进制数据的值，例如：U0-11，其通讯地址为 700BH。
- 通讯读取变频器故障描述时，通讯地址固定为 8000H，上位机通过读取该地址数据，可以获取当前变频器故障代码，故障代码描述见“附录 C 功能参数表”中 P9-14 参数定义。
- 通讯读取变频器运行状态时，通讯地址固定为 3000H，上位机通过读取该地址数据，可以获取当前变频器运行状态信息，读取状态字定义如下：1：正转运行；2：反转运行；3：停机。

下面以 CANopen 协议为例说明上位机读取变频器运行状态时的通讯过程。

首先，串口通讯协议选择（P0-28）设置为 1 表示 Profibus-DP 协议或 CANopen 协议。假设，变频器从站 Node-ID 设备地址拨码设定是“0x05”（该地址可以修改，修改范围为 1~63），读取的状态为 1：正转运行。则主站发送报文和从站响应报文如下表所示：

1） 读操作主站发送报文

报文标识 (Hex)	RTR	数据 (Hex)
0x605	0	40 30 00 00 00 00 00 00

其中，0x605= 0x600+ 0x05（设备地址拨码）

2） 读操作变频器响应报文

报文标识 (Hex)	RTR	数据 (Hex)
0x585	0	4B 30 00 00 01 00 00 00

其中，0x585= 0x580+ 0x05（设备地址拨码）。发送报文和响应报文中其他数据的详细说明如下表:

主站读取发送报文		从站响应报文	
报文标识	605H	报文标识	585H
RTR	0（二进制）	RTR	0（二进制）
读命令	40H	读命令返回	4B
通讯地址高位	30H	通讯地址高位	30H
映射地址	00H	映射地址	00H
通讯地址低位	00H	通讯地址低位	00H
保留	00H	数据低字节	01H
保留	00H	数据高字节	00H
保留	00H	数据 3	00H
保留	00H	数据 4	00H

如果需要利用 CANopen 协议读取监视参数、变频器故障描述、其他变频器运行状态，具体的报文组织方法参考读操作发送报文格式和读操作返回报文格式。

表 6-9 读操作发送报文格式

CAN	CANopen 数据	说明
11 位 ID	0x600+Node-ID	Node-ID 设备地址拨码设定
RTR	0	远程帧标志“0”
DATA0	命令码（0x40）	0x40 读命令
DATA1	索引低字节	参数组（P0 组“0xF0”）
DATA2	索引高字节	映射地址
DATA3	子索引	参数编号（02“0x02”）
DATA4	数据 1	保留
DATA5	数据 2	保留
DATA6	数据 3	保留
DATA7	数据 4	保留

表 6-10 读操作返回报文格式

CAN	CANopen 数据	说明
11 位 ID	0x580+Node-ID	Node-ID 设备地址拨码设定
RTR	0	远程帧标志“0”
DATA0	命令码返回	正确“0x4B”出错“0x80”
DATA1	索引低字节	参数组（P0 组“0xF0”）
DATA2	索引高字节	映射地址
DATA3	子索引	参数编号（02“0x02”）
DATA4	数据 1	数据低字节
DATA5	数据 2	数据高字节
DATA6	数据 3	正确“0”
DATA7	数据 4	出错：SDO 操作失败错误码

6.10.3 控制命令

P0-02(运行指令选择) 设置为 2（通讯控制）时，上位机选择利用通讯设定运行指令，可以实现对变频器的正、反转、启停等控制。控制命令通讯地址和命令功能定义如下：

控制命令通讯地址	命令功能
2000H	1：正转运行
	2：反转运行
	3：正转点动
	4：反转点动
	5：自由停机
	6：减速停机
	7：故障复位

下面以 CANLink协议为例说明上位机要给变频器写入控制命令的通讯过程。在写入控制命令之前，需要设置通讯速率和本机地址。（使用其他协议类型写入数据时请根据通讯类型参考《YD580E系列YD58DP Proibus接口卡说明书》、《YD580E系列CAN-OPEN通讯扩展卡说明书》、本手册“附录 B 通讯数据地址定义与 Modbus 通讯协议”）

设置步骤	相关参数	说明
设定通讯速率	PD-00（通讯波特率）	PD-00 的千位选择 CANlink 波特率。 从站与主站设定的波特率必须一致，否则通讯无法进行。
设定本机地址	PD-02（本机地址）	CANlink 站地址 1~63

假设，CANlink 主站地址是“0x01”，变频器从站地址是“0x02”（可以设置，数据范围是 1~63）。写入的控制命令为反转点动，控制命令的通讯地址为 0x2000。则写操作主站发送报文和写操作从站响应报文如下表所示：

1） 写操作主站发送报文

报文标识 (Hex)	数据长度	数据 (Hex)
0x11050201	4	00 04 20 00

2） 写操作变频器发送响应报文

报文标识 (Hex)	数据长度	数据 (Hex)
0x10050102	4	00 04 20 00

主站写入控制命令的发送报文和从站响应的报文详细说明如下表所示：

主站写入发送报文			从站响应报文		
报文标识 11050201H	仲裁标志	1000（二进制）	报文标识 10050102H	仲裁标志	1000（二进制）
	问答标志	1（二进制）		问答标志	0（二进制）
	命令码	05H		命令码	05H
	目标地址	02H		目标地址	01H
	源地址	01H		源地址	02H
数据长度		4（十进制）	数据长度		4（十进制）
写数据高字节		00H	写数据高字节		00H
写数据低字节		04H	写数据低字节		04H
写地址高字节		20H	写地址高字节		20H
写地址低字节		00H	写地址低字节		00H

如果需要利用 CANlink 协议给变频器写入其他控制命令，从而实现对变频器的控制。详细的报文组织方式可以参考下表，写操作 CANlink 帧和写操作返回 CANlink 帧。

表 6-11 写操作 CANlink 帧

CAN	CANlink	说明
IDbit28~25	仲裁标志	命令帧仲裁标志固定 1000
IDbit24	问答标志	问答标志，“1”问帧
IDbit23~16	命令码	写寄存器命令“0x05”
IDbit15~8	目标地址	CANlink 目标站地址
IDbit7~0	源地址	CANlink 本站地址
DATA1	数据	写数据高字节
DATA2	数据	写数据低字节
DATA3	数据	写地址高字节
DATA4	数据	写地址低字节

表 6-12 写操作返回 CANlink 帧

CAN	CANlink	说明
IDbit28~25	仲裁标志	命令帧仲裁标志固定 1000
IDbit24	问答标志	问答标志，“0”答帧
IDbit23~16	命令码	写寄存器命令“0x05”
IDbit15~8	目标地址	CANlink 目标站地址
IDbit7~0	源地址	CANlink 本站地址
DATA1	数据	写数据高字节
DATA2	数据	写数据低字节
DATA3	地址	写地址高字节
DATA4	地址	写地址低字节

6.10.4 设定频率、转矩

如果主频率、转矩上限、V/F 分离电压、PID 给定、PID 反馈等选择为“通讯给定”时，要通过通讯地址 1000H，写入频率、转矩等值。上位机可以设定的数据范围为 -10000~10000，对应相对给定值的 -100.00%~100.00%。

例如，变频器的主频率选择（P0-03）设置为通讯给定，上位机要写入频率时，要给变频器发送写命令。下面以 Modobus 协议为例说明过程。利用通讯给定方式设置频率为 8000 时，发送写命令为 01 06 10 00 1F 40 84 CA

每一字节代表的含义如下，变频器地址：01H（可以设置），写命令：06H，给定频率的地址：1000H，目标频率值：1F40H（转换为十进制为 8000）；CRC 校验：84CAH。同理，利用通讯给定方式设置转矩为 -8000 时，发送写命令为

01 06 10 00 E0 C0 C4 9A 。其中，E0C0 为 -8000 转换为十六进制取低四位。

注意：通讯方式给定频率的范围为 -10000 ~ +10000（十进制），对应的频率范围为 -100.00%~+100.00% （-100.00% 对应负最大频率，0.00 对应最小频率，+100.00% 对应最大频率）。假设 P0-10“最大频率”设为 50Hz，如果写命令中写入的频率值 1F40H，转换 10 进制为 8000。那么实际写入的频率值为 50*80.00%=40Hz。

主机命令信息		从机回应信息	
ADDR	01H	ADDR	01H
CMD	06H	CMD	06H
参数地址高位	10H	参数地址高位	10H
参数地址低位	00H	参数地址低位	00H
数据内容高位	1FH	数据内容高位	1FH
数据内容低位	40H	数据内容低位	40H
CRC 高位	84H	CRC 高位	84H
CRC 低位	CAH	CRC 低位	CAH

6.10.5 控制数字输出（DO、RELAY、FMR）

当数字输出端子功能选择为 20 时（通讯控制），上位机利用通讯方式，实现对变频器数字输出端子的控制。数字输出端子控制通讯地址和命令内容定义如下：

数字输出端子控制通讯地址	命令内容
2001H	BIT0：DO1 输出控制 BIT1：DO2 输出控制 BIT2：RELAY1 输出控制 BIT3：RELAY2 输出控制 BIT4：FMR 输出控制 BIT5：VDO1 BIT6：VDO2 BIT7：VDO3 BIT8：VDO4 BIT9：VDO5

6.10.6 控制模拟量输出、高速脉冲输出（AO、FMP）

当模拟量输出 AO1（P5-07）、AO2（P5-08），FMP 输出（P5-06）输出功能选择为 12 时（通讯设定），上位机利用通讯方式，可以实现对变频器模拟量、高速脉冲输出的控制。控制通讯地址和命令内容定义如下：

输出控制通讯地址		命令内容
AO1	2002H	0~7FFF 表示 0% ~100%
AO2	2003H	
FMP	2004H	

- 利用通讯方式给变频器写命令的数据是经过校正后输出。

6.10.7 初始化参数

当需要通过上位机实现对变频器的参数初始化操作时，需要使用该功能。在通讯恢复出厂值操作时，无论用户密码为 0 还是非 0，均需要进行用户密码校验，校验通过后，在 30 秒内，上位机进行参数初始化操作。用户密码校验的通讯地址为 1F00H，直接将正确的用户密码写入该地址，则可以完成密码校验。数据内容定义如下：

参数初始化通讯地址	命令功能
1F01H	1：恢复出厂参数
	2：清楚记录信息
	4：恢复用户备份参数
	501：备份用户当前参数

6.11 辅助功能

6.11.1 点动运行

在有些应用场合需要变频器短暂低速运行，便于测试设备的状况，此时采用点动运行。点动运行时，启动方式固定为直接启动方式（P6-00=0），停机方式固定为减速停机（P6-10=0）。

参数	功能定义	出厂值	设定范围	参数说明
P0-25	加减速时间基准频率	0	0：最大频率 P0-10 1：设定频率 2：100Hz	-
P8-00	点动运行频率	2.00Hz	0.00Hz~ 最大频率	-
P8-01	点动加速时间	20.0s	0.0s~6500.0s	点动加速时间指变频器从零频，加速到“加减速基准频率 P0-25”所需时间
P8-02	点动减速时间	20.0s	0.0s~6500.0s	点动减速时间指变频器从“加减速基准频率 (P0-25 确定)”减速到零频所需时间。
P8-27	端子点动优先	0	0：无效；1：有效	设置是否端子点动功能的优先级最高。 P8-27 设置为 1 时，在运行过程中任意一个 DI 端子功能（P4-00~P4-09）设置为 4（正转点动）或者 5（反转点动）时，点动运行状态立即生效。

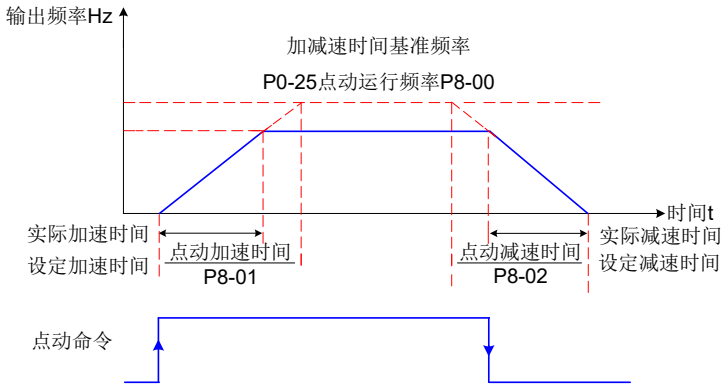


图 6-56 点动运行示意图

表 6-13 用操作面板点动运行的参数设置

步骤	点动正转	点动反转
1	MF.K 键功能选择 P7-01 设置为 3（点动正转）	MF.K 键功能选择 P7-01 设置为 4（点动反转） 反向频率禁止 P8-13 设置为 0，即允许反转运行。
2	运行指令选择 P0-02 设置为 0（操作面板）	运行指令选择 P0-02 设置为 0（操作面板）
3	设置点动运行频率 P8-00、点动加速时间 P8-01、点动减速时间 P8-02	设置点动运行频率 P8-00、点动加速时间 P8-01、点动减速时间 P8-02
4	在变频器停机状态下，按下 MF.K 键，变频器开始点动正转运行，放开 MF.K 键，变频器即减速停机。	在变频器停机状态下，按下 MF.K 键，变频器开始点动反转运行，放开 MF.K 键，变频器即减速停机。

6.11.2 跳频、正反转死区时间、反向频率禁止

1） 跳跃频率设置

通过设置跳跃频率，可以使变频器避开负载的机械共振点。YD580E 可设置两个跳跃频率点，若将两个跳跃频率均设为 0，则跳跃频率功能取消。

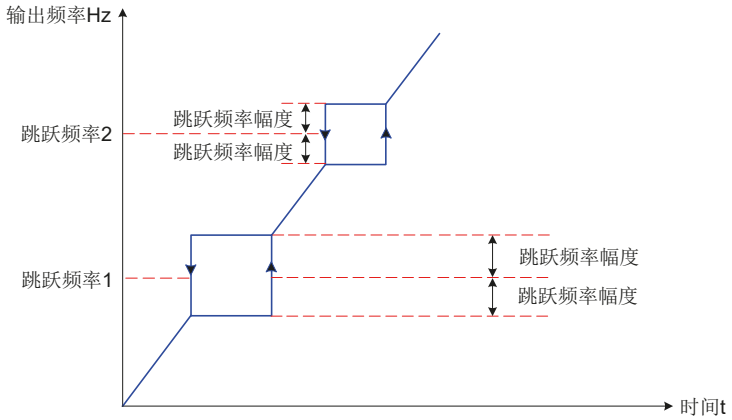


图 6-57 跳跃频率示意图

上图中，在加速过程中，运行频率加速到跳跃频率边界，变频器会以当前的运行频率运行一段时间，然后运行频率会跳过跳跃频率，跳跃幅度为 2 倍的 P8-11（跳跃频率幅度）；

在减速过程中，运行频率减速到跳跃频率边界，变频器会以当前的运行频率运行一段时间，然后运行频率会跳过跳跃频率，跳跃幅度为 2 倍的 P8-11（跳跃频率幅度）。

参数	功能定义	出厂值	设定范围	参数说明
P8-09	跳跃频率 1	0.00Hz	0.00Hz~ 最大频率	-
P8-10	跳跃频率 2	0.00Hz	0.00Hz~ 最大频率	-
P8-11	跳跃频率幅度	0.00Hz	0.00Hz~ 最大频率	-
P8-22	加减速过程中跳频是否有效	0	0：无效 1：有效	设置加减速过程中，跳跃频率是否有效。 设为有效时，在加减速过程中，运行频率到达跳跃频率边界，运行频率会跳过跳跃频率，跳跃幅度为 2 倍的 P8-11（跳跃频率幅度）。 设为无效时，在加减速过程中，运行频率到达跳跃频率边界，变频器会以运行频率继续运行。

2） 正反转死区时间

参数	功能定义	出厂值	设定范围	参数说明
P8-12	正反转死区时间	0.0s	0.0s~3000.0s	设定变频器正反转过渡过程中，在输出 0Hz 处的过渡时间。

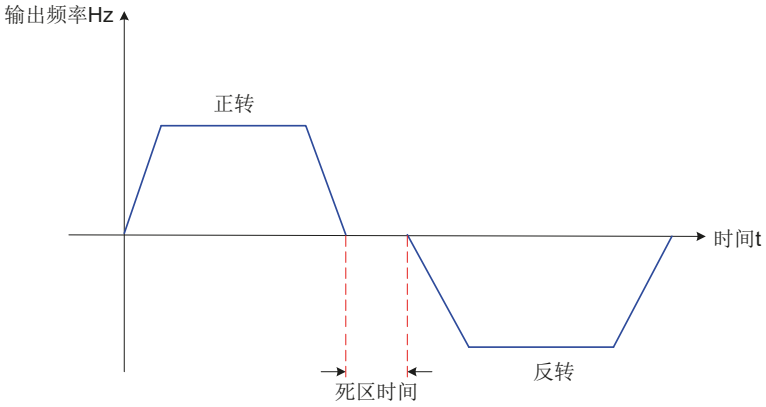


图 6-58 正反转死区时间示意图

3） 反向频率禁止

参数	功能定义	出厂值	设定范围	参数说明
P8-13	反向频率禁止	0	0：无效 1：有效	-

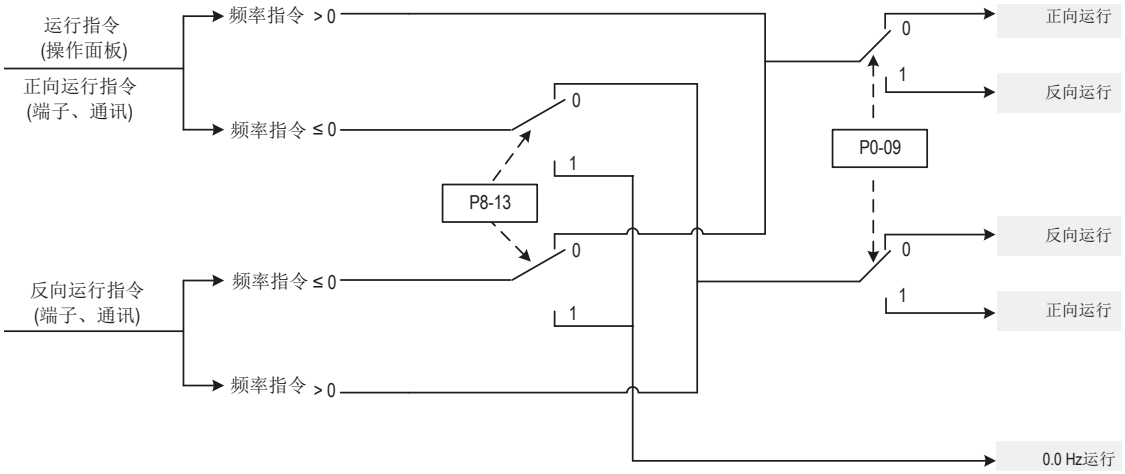


图 6-59 反向频率禁止示意图

参数	功能定义	出厂值	设定范围	参数说明
P0-09	运行方向选择	0	0：默认方向运行 1：与默认方向相反方向运行	-

通过更改该参数，可以不改变电机接线而实现改变电机转向的目的，其作用相当于调整电机（U、 V、W）任意两条线实现电机旋转方向的转换。

NOTE

- 参数初始化后电机运行方向会恢复原来的状态。对于系统调试好后严禁更改电机转向的场合慎用。

6.11.3 用户定制参数

PE-00~PE-29：此组参数是用户定制参数组。用户可以在所有参数中，选择所需要的参数汇总到 PE 组，作为用户定制参数，以方便查看和更改等操作。

PE 组最多提供 30 个用户定制参数，PE 组参数显示值为 P0.00 的，则表示该用户参数为空，进入用户定制参数模式时，显示参数由 PE-00~PE-31 定义，顺序与 PE 组参数一致，为 P0-00 则跳过；PE 组参数显示值为 U3-17、U3-16 的，其中 U3-17 为通讯控制的 PZD1（变频器命令字），U3-16 为通讯控制的 PZD2（变频器目标频率）。

6.11.4 频率检测（FDT）

用于设定输出频率的检测值，及输出动作解除的滞后值。滞后值仅在减速过程中有效，加速过程中的检测不滞后。图 6-60 为频率检测功能的示意图。

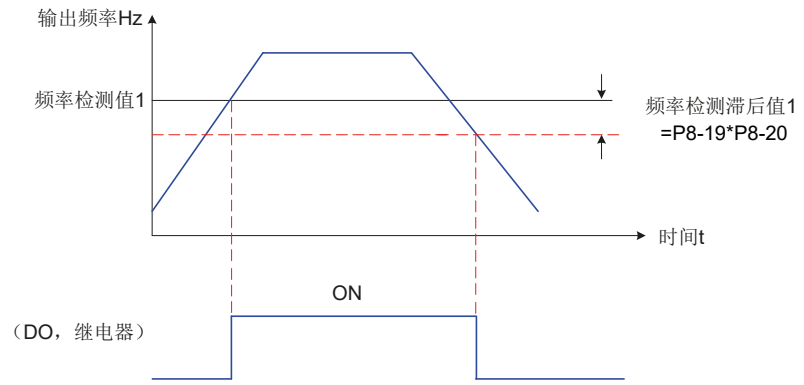


图 6-60 频率检测示意图

参数	功能定义	出厂值	设定范围	参数说明
P8-19	频率检测值 1	50.00Hz	0.00Hz~ 最大频率（P0-04）	当运行频率高于频率检测值时，DO 端子输出有效信号； 当运行频率低于频率检测值减去频率检查滞后值时，DO 端子输出无效信号。
P8-20	频率检测滞后率 1	5.0%	0.0%~100.0%（FDT1 电平）	频率滞后值百分比基数为频率检测值 P8-19。
P8-28	频率检测值 2	50.00Hz	0.00Hz~ 最大频率	-
P8-29	频率检测滞后率 2	5.0%	0.0%~100.0%（FDT2 电平）	-

6.11.5 频率到达检出幅度

用于设定频率到达的检测范围，图 6-64 为频率到达的示意图：

参数	功能定义	出厂值	设定范围	参数说明
P8-21	频率到达检出幅度	0.00%	0.00~100%(最大频率)	百分比基数是最大频率。 变频器的运行频率处于设定频率 ±最大频率 *P8-21（频率检测幅度）范围内时，DO 端子输出有效信号。

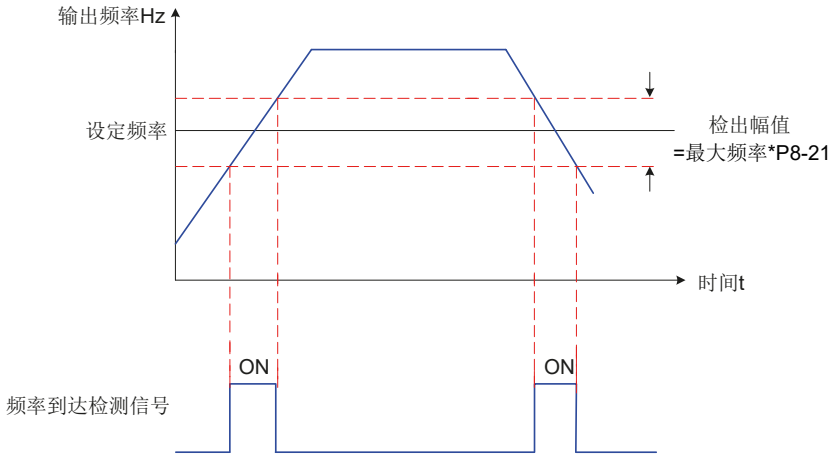


图 6-61 频率到达检出幅值时序图

6.11.6 加减速时间切换频率点

用于在变频器运行过程中，根据运行频率范围自行选择不同加减速时间。即当电机选择为电机 1（P0-24 电机参数组选择设置为 0），且 DI 端子功能没有设置为 16（加减速时间选择端子 1）或者 17（加减速时间选择端子 2）时该功能才有效。

参数	功能定义	出厂值	设定范围	参数说明
P8-25	加速时间 1 与加速时间 2 切换频率点	0.00Hz	0.00Hz~ 最大频率	-
P8-26	减速时间 1 与减速时间 2 切换频率点	0.00Hz	0.00Hz~ 最大频率	-

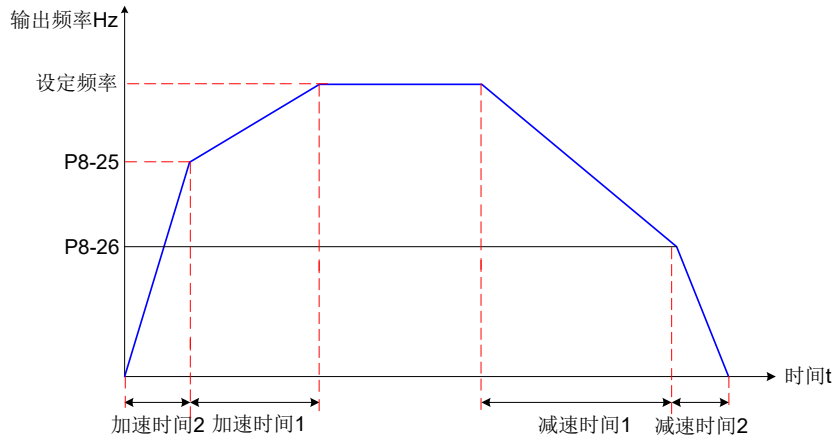


图 6-62 加减速时间切换示意图

如上图所示，

在加速过程中，如果运行频率小于 P8-25 则选择加速时间 2；如果运行频率大于P8-25 则选择加速时间 1。

在减速过程中，如果运行频率大于 P8-26 则选择减速时间 1，如果运行频率小于P8-26 则选择减速时间 2。

6.11.7 任意到达频率检测值

参数	功能定义	出厂值	设定范围	参数说明
P8-30	任意到达频率检测值 1	50.00Hz	0.00Hz~ 最大频率	当变频器的运行频率，处于任意到达频率检查值 ± 任意到达频率检出幅度范围内时，DO 端子输出有效信号。
P8-31	任意到达频率检出幅度 1	0.0%	0.0%~100.0%（最大频率）	
P8-32	任意到达频率检测值 2	50.00Hz	0.00Hz~ 最大频率	-
P8-33	任意到达频率检出幅度 2	0.0%	0.0%~100.0%（最大频率）	-

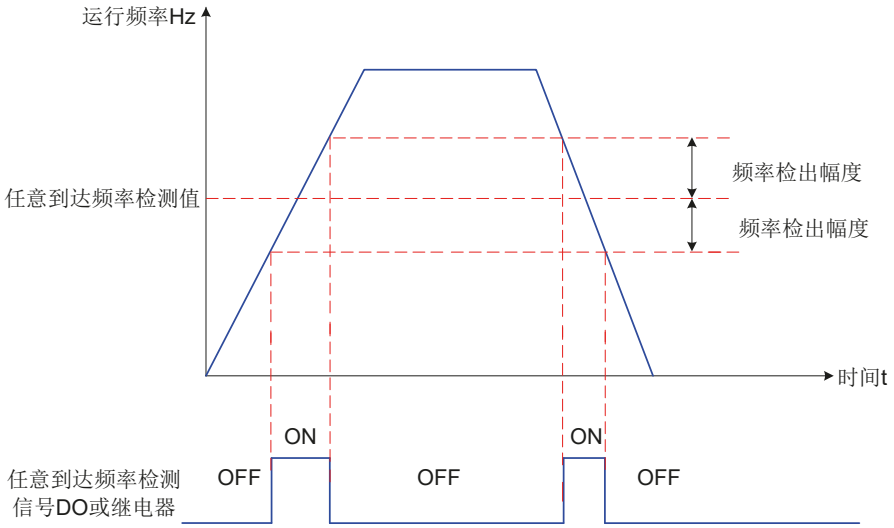


图 6-63 任意到达频率检测示意图

6.11.8 零电流检测

参数	功能定义	出厂值	设定范围	参数说明
P8-34	零电流检测水平	5.0%	0.0%~300.0%（电机额定电流）	当变频器的输出电流，小于或等于零电流检测水平 P8-34，且持续时间超过零电流检测延迟时间 P8-35，DO 端子输出有效信号。
P8-35	零电流检测延迟时间	0.10s	0.00s~600.00s	

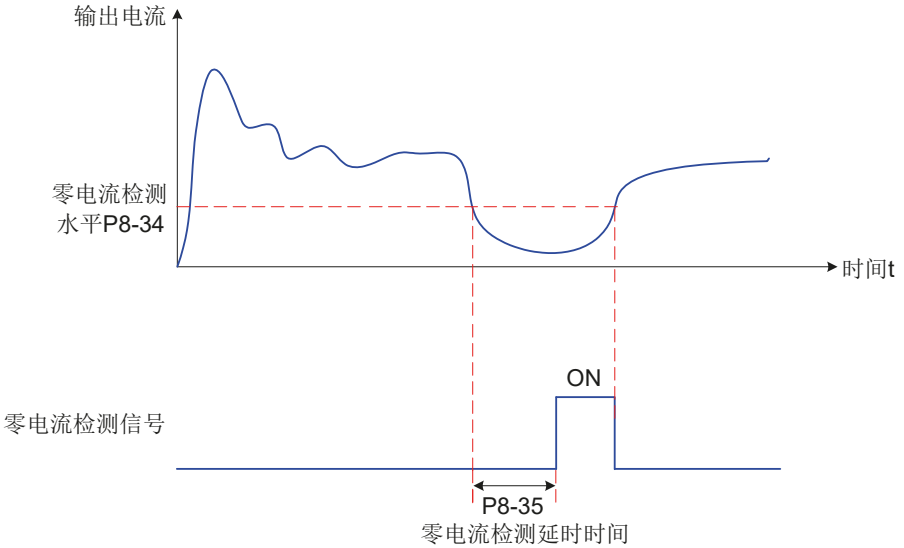


图 6-64 零电流检测示意图

6.11.9 输出电流超限

参数	功能定义	出厂值	设定范围	参数说明
P8-36	输出电流超限值	200.0%	0.0%（不检测）； 0.1%~300.0%（电机额定电流）	当变频器的输出电流大于输出电流超限值P8-36，且持续时间超过软件过流点检测延迟时间 P8-37， DO 端子输出有效信号。
P8-37	输出电流超限检测延迟时间	0.00s	0.00s~600.00s	-

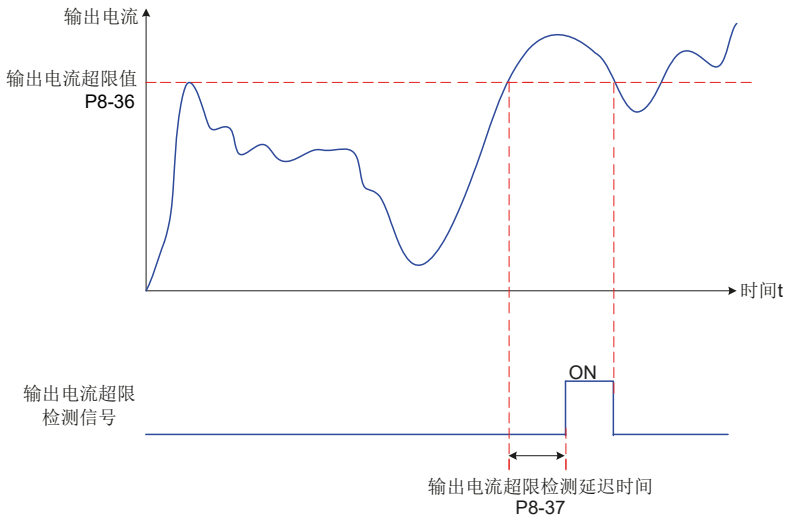


图 6-65 输出电流超限检测示意图

6.11.10 任意到达电流

参数	功能定义	出厂值	设定范围	参数说明
P8-38	任意到达电流 1	100.0%	0.0%~300.0%（电机额定电流）	当变频器的输出电流，在（任意到达电流 1± 任意到达电流 1 宽度）* 电机额定电流范围内时，DO 端子输出有效信号。
P8-39	任意到达电流 1 幅度	0.0%	0.0%~300.0%（电机额定电流）	
P8-40	任意到达电流 2	100.0%	0.0%~300.0%（电机额定电流）	-
P8-41	任意到达电流 2 幅度	0.0%	0.0%~300.0%（电机额定电流）	-

YD580E 提供两组任意到达电流及检出宽度参数，图 6-69 为功能示意图。

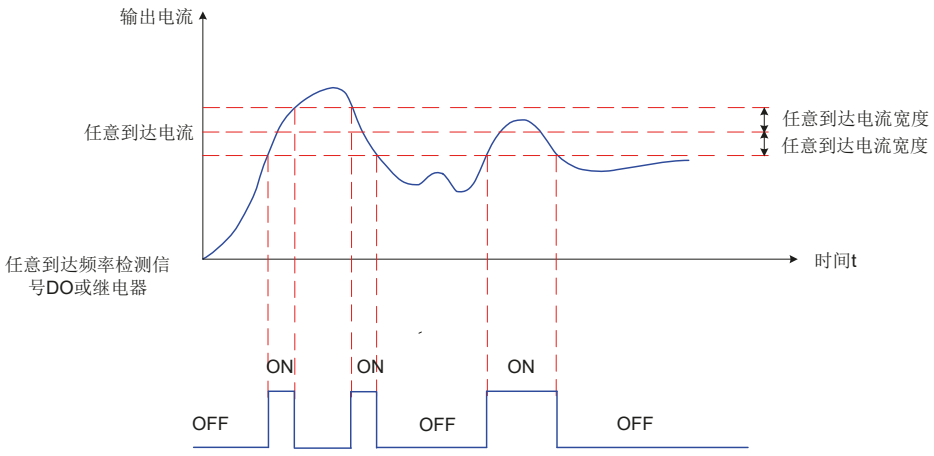


图 6-66 任意到达电流时序图

6.11.11 定时功能

变频器定时运行功能。变频器每次启动时，都从 0 开始计时，定时剩余运行时间可通过 U0-20 查看。

参数	功能定义	出厂值	设定范围	参数说明
P8-42	定时功能选择	0	0：无效 1：有效	定时功能选择（P8-42）设置为 1（有效），变频器启动时开始计时，到达定时运行时间（P8-44）后，变频器自动停机，同时 DO端子输出有效信号。
P8-43	定时运行时间选择	0	0：P8-44 设定 1：AI1 2：AI2 3：AI3	设置为1时， 定时运行时间=(AI1电压 /10V)* P8-44。 模拟输入量程 100% 对应 P8-44
P8-44	定时运行时间	0.0Min	0.0Min~6500.0Min	定时运行时间由 P8-43、P8-44 设置

1） 上电到达时间

参数	功能定义	出厂值	设定范围	参数说明
P8-16	设定累计上电到达时间	0h	0h~65000h	当累计上电时间（P7-13）到达 P8-16 所设定的上电时间，变频器 DO 端子输出有效信号。

2） 运行到达时间

参数	功能定义	出厂值	设定范围	参数说明
P8-17	设定累计运行到达时间	0h	0h~65000h	用于设置变频器的运行时间。 变频器累计运行时间（P7-09）超过设定累计上电到达时间（P8-17）时，DO 端子输出有效信号。

6.11.12 AI1 电压保护上下限

参数	功能定义	出厂值	设定范围	参数说明
P8-45	AI1 输入电压保护值下限	3.10V	0.00V~P8-46	当模拟量输入 AI1 的值大于 P8-46，或AI1 输入小于 P8-45 时，变频器 DO 端子输出“AI1 输入超限”有效信号，用于指示 AI1 的输入电压是否在设定范围内。
P8-46	AI1 输入电压保护值上限	6.80V	P8-45~10.00V	

6.11.13 模块温度

参数	功能定义	出厂值	设定范围	参数说明
P8-47	模块温度到达	75°C	0°C ~100°C	逆变器散热器温度达到 P8-47 的设定值时，DO 端子输出有效信号。

6.11.14 散热风扇

参数	功能定义	出厂值	设定范围	参数说明
P8-48	散热风扇控制	0	0：运行时风扇运转	设置为 0：当变频器在运行状态时，风扇运转；当变频器在停机状态时，如果散热器温度高于 40 度则风扇运转，散热器温度低于 40 度则风扇不运转。
			1：风扇一直运转	设置为 1：风扇在上电后一直运转。

6.11.15 休眠与唤醒

用于实现供水应用中的休眠和唤醒功能。一般情况下，请设置唤醒频率（P8-49）大于等于休眠频率（P8-51）。如果唤醒频率和休眠频率均为 0.00Hz，则休眠和唤醒功能无效。

当 PID 正在运算时，启用了休眠功能，如果想让 PID 继续运算，PA-28（PID 停机运算）设置为 1（停机运算）；如果让 PID 停止运算，PA-28（PID 停机运算）设置为 0（停机不运算）。

参数	功能定义	出厂值	设定范围	参数说明
P8-49	唤醒频率	0.00Hz	休眠频率（P8-51）~最大频率（P0-10）	若变频器处于休眠状态，且当前运行命令有效，则当设定频率大于等于 P8-49（唤醒频率），经过唤醒延迟时间（P8-50）后，变频器直接启动。
P8-50	唤醒延迟时间	0.0s	0.0s~6500.0s	
P8-51	休眠频率	0.00Hz	0.00Hz~唤醒频率（P8-49）	变频器运行过程中，当设定频率小于等于 P8-51 休眠频率时，经过 P8-52 延迟时间后，变频器进入休眠状态，并自由停机。
P8-52	休眠延迟时间	0.0s	0.0s~6500.0s	

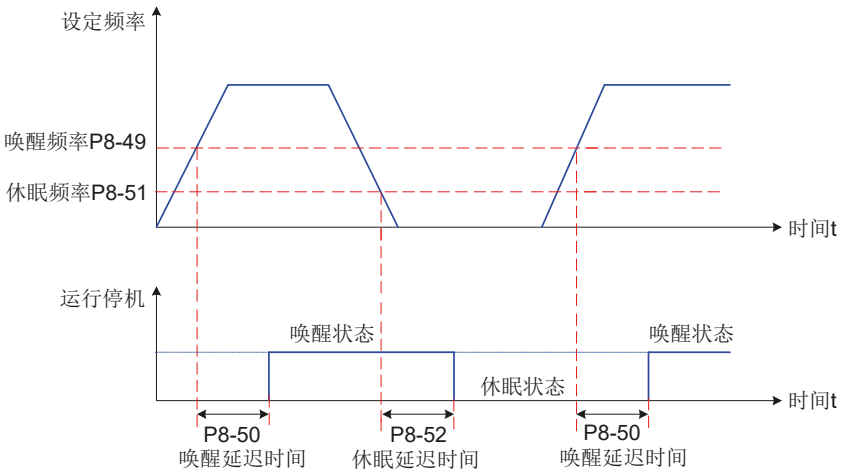


图 6-67 休眠与唤醒功能设置

6.11.16 本次运行达到时间

参数	功能定义	出厂值	设定范围	参数说明
P8-53	本次运行到达时间	0.0Min	0.0Min~6500.0Min	当本次启动的运行时间到达 P8-53 的设定值后，变频器 DO 端子输出有效信号。仅对本次有效，前一次运行时间不累加。

6.11.17 输出功率校正

参数	功能定义	出厂值	设定范围	参数说明
P8-54	输出功率校正系数	100.0%	0.0%~200.0%	当输出功率 (U0-05) 与期望值不对应时，可以通过该值对输出功率进行线性校正。

6.11.18 急停减速时间

参数	功能定义	出厂值	设定范围	参数说明
P8-55	急停减速时间	机型确定	0~6553.5	增加 P8-55 作为端子急停减速时间，端子急停功能按照设定减速时间减速，V/F 模式减速时间为 0s时按照最小单位时间进行减速。

第七章　故障诊断及对策

7.1 安全注意事项

安全注意事项

危险

- 严禁在电源接通的状态下进行接线，请务必将所有断路器保持在 OFF 状态。否则会有触电的危险。

警告

- 请保证变频器按照当地法规进行接地。否则会有触电危险或火灾危险。
- 变频器带电后请勿拆卸外壳或触摸内部电路。否则会有触电危险。
- 故障查检必须由专业人员进行，非专业人员严禁对变频器进行查检、维护、维修。否则会有触电危险或火灾危险。
- 将变频器安装在封闭的柜内或机壳箱内时，请用冷却风扇或冷却空调等充分冷却，以使变频器进气温度保持在 50℃以下。否则会导致过热或火灾。
- 请按规定扭矩锁紧所有螺钉。否则可能有火灾或触电危险。
- 请确认产品的输入电压在铭牌的额定电压范围内，否则会有触电或火灾危险。
- 变频器附近请勿放置易燃易爆物品。

注意

- 进行安装作业时，请用布或纸等遮住变频器的上部，以防止钻孔时的金属屑、油、水等进入变频器内部。如果异物进入变频器内部，可能导致变频器故障。
- 作业结束后，请拿掉这些布或纸。如果继续盖在上面，则会使通气性变差，导致变频器异常发热。
- 操作变频器时，请遵守静电防止措施（ESD）规定的步骤，否则会因静电而损坏变频器内部的电路。

7.2 变频器试运行前的调整指南

1） 开环矢量控制模式（P0-01=0 出厂默认值）

该控制模式是在电机没有编码器速度反馈的应用场合下，对电机的速度和转矩进行控制。该控制模式下需要对电机参数进行自学习，完成电机参数的自动整定。

问题与故障	处理对策
电机启动过程中报过载或过流故障	● 电机参数（P1-01~P1-05）按电机铭牌设定。 ● 进行电机参数调谐（P1-37），有条件的情况下最好进行电机动态完整调谐。
5Hz 以下转矩或速度响应慢、电机震动	● 改善转矩和速度的响应，需要加强速度环比例调节（P2-00 按 10 为单位增大设定值）或者降低速度环积分时间（P2-01 按 0.05 为单位降低）； ● 如果出现震动，需要减弱 P2-00、增大 P2-01 参数值。
5Hz 以上转矩或速度响应慢、电机震动。	● 改善转矩和速度的响应，需要加强速度环比例调节（P2-03 按 10 为单位增大设定值）或者降低速度环积分时间（P2-04 按 0.05 为单位降低）； ● 如果出现震动，需要减弱 P2-03、增大 P2-04 参数值。
速度精度低	● 当电机带载速度偏差过大时，需增大矢量转差补偿增益（P2-06），按 10% 为单位增减。
速度波动大	● 当电机速度有异常波动时，可适当增加速度滤波时间（P2-07），按 0.001s 为单位增加。
电机噪音大	● 适当增加载频频率值（P0-15），以 1.0KHz 为单位升高；（注意：升高载频电机漏电流会增大）
电机转矩不足或出力不够	● 转矩上限是否被限制，速度模式下提高转矩上限（P2-10）；转矩模式下增大转矩指令

2） 闭环矢量控制模式（P0-01=1）

该模式是在电机有编码器速度反馈应用场合下使用，需要正确设置编码器线数、编码器类型和信号方向，完成电机参数的自动整定。

问题与故障	处理对策
起动报过流或过载故障	● 正确设置编码器线数、类型、编码器方向
电机转动过程中报过载或过流故障	● 电机参数（P1-01~P1-05）按电机铭牌设定。 ● 进行电机参数调谐（P1-37），有条件的情况下最好进行电机动态完整调谐。
5Hz 以下转矩或速度响应慢、电机震动	● 改善转矩和速度的响应，需要加强速度环比例调节（P2-00 按 10 为单位增大设定值）或者降低速度环积分时间（P2-01 按 0.05 为单位降低）； ● 如果出现震动，需要减弱该 P2-00、P2-01 参数值。
5Hz 以上转矩或速度响应慢、电机震动。	● 改善转矩和速度的响应，需要加强速度环比例调节（P2-03 按 10 为单位增大设定值）或者降低速度环积分时间（P2-04 按 0.05 为单位降低）； ● 如果出现震动，需要减弱该 P2-03、P2-04 参数值。
速度波动大	● 当电机速度有异常波动时，可适当增加速度滤波时间（P2-07），按 0.001s 为单位增加。

问题与故障	处理对策
电机噪音大	● 适当增加载频频率值（P0-15），以 1.0kHz 为单位升高；（注意：升高载频电机漏电流会增大）
电机转矩不足或出力不够	● 转矩上限是否被限制，速度模式下提高转矩上限（P2-10）；转矩模式下增大转矩指令

3） V/F 控制模式 (P0-01=2)

该种模式是在电机没有编码器速度反馈的应用场合下使用，对电机参数不敏感，只需要正确设置电机的额定电压和额定频率值。

故障	处理对策
运行中电机震荡	● 增加震荡抑制参数（P3-11），以 10 为单位增加（最大调整到 100）；
大功率起动报过流	● 降低转矩提升（P3-01），以 0.5% 为单位调节；
运行中电流偏大	● 正确设置电机的额定电压（P1-02）、额定频率（P1-04）； ● 降低转矩提升（P3-01），以 0.5% 为单位调节；
电机噪音大	● 适当增加载频频率值（P0-15），以 1.0kHz 为单位升高；（注意：升高载频电机漏电流会增大）
突卸重载报过压、减速报过压	● 确认过压失速使能（P3-23）设定成使能状态；增大过压失速增益（P3-24/P3-25，出厂 30），以 10 为单位增大（最大调整到 100）； ● 减小过压失速动作电压（P3-22 出厂 770V），以 10V 为单位减小（最小调整到 700V）；
突加重载报过流、加速报过流	● 增大过流失速增益（P3-20 出厂 20），以 10 为单位增大（最大调整到 100）； ● 减小过流失速动作电流（P3-18 出厂 150%），以 10% 为单位减小（最小调整到 50%）；

7.3 变频器的警报及故障显示

变频器检出异常时，会切断输出，同时故障指示灯 TUNE/TC 会闪烁，同时变频器故障继电器接点动作。变频器操作面板会显示故障代码如“ Err02 ”等，故障代码对应的故障类型和常见解决方法详见下表。表格中列举仅作参考，请勿擅自修理、改造，若无法排除故障，请向我司或产品代理商寻求技术支持。

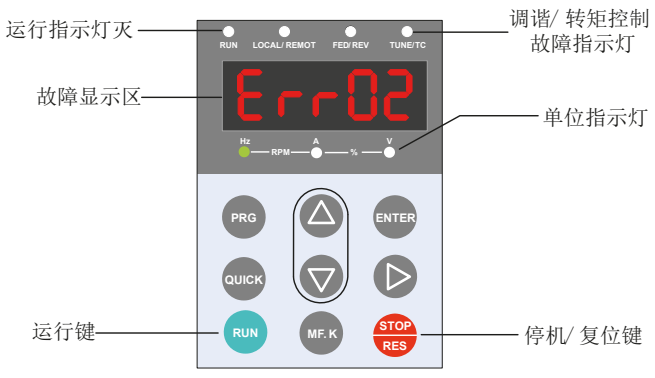
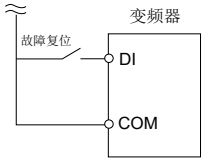
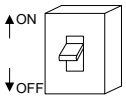


图 7-1 界面示意图

7.4 故障发生后变频器的再起动方法

阶段	措施	备注
故障时	通过操作面板显示查看最近三次的故障时刻、故障类型、故障时刻频率 / 电流 / 母线电压 / 输入输出端子状态 / 上电和运行时间	通过 P9-14~P9-44 可查看
故障复位前	从操作面板显示的故障类型上查找故障原因并解除故障，解除故障原因后再复位	请参考“7.5 故障报警及对策”进行处理
解除故障复位方法	1）将 DI 设定为功能 9（P4-00~P4-09=9 故障复位），复位功能端子有效。	
	2）确认 P7-02=1（出厂值），表示在任何操作方式下，STOP RES 键停机复位功能均有效	按面板红色停机复位键
	3）给变频器重新上电后自动复位 暂时将主回路电源切断，待操作面板上的显示消失后再次接通电源	
	4）使用通讯功能的可通过通讯方式复位。 在 P0-02=2（通讯控制）时，通过上位机对 2000H 通讯地址写入“7”（故障复位），可使变频器在故障清除后进行复位【注】	

【注】具体可参考“附录 C 通 讯”。

7.5 故障报警及对策

变频器使用过程中可能会遇到下列故障类型情况，请参考下述方法进行简单故障分析：

故障名称	操作面板显示	故障原因排查	故障处理对策
加速过电流		变频器输出回路存在接地或短路	● 排除外围故障，检测电机或者中断接触器是否发生短路
		控制方式为 FVC 或者 SVC 且没有进行参数辨识	● 按照电机铭牌设置电机参数，进行电机参数辨识
		急加速工况，加速时间设定太短	● 增大加速时间
		过流失速抑制设定不合适	● 确认过流失速抑制功能（P3-19）已经使能； ● 过流失速动作电流（P3-18）设定值太大，推荐在120% 到 150% 之内调整； ● 过流失速抑制增益（P3-20）设定太小，推荐在20到 40 之内调整；
		手动转矩提升或 V/F 曲线不合适	● 调整手动提升转矩或 V/F 曲线
		对正在旋转的电机进行启动	● 选择转速追踪启动或等电机停止后再启动
		受外部干扰	● 查看历史故障记录，若故障时电流值远未达到过流点值，需查找干扰源。若无其它干扰源则可能为驱动板或霍尔器件问题。
减速过电流		变频器输出回路存在接地或短路	● 排除外围故障，检测电机是否发生短路或断路
		控制方式为 FVC 或者 SVC 且没有进行参数辨识	● 按照电机铭牌设置电机参数，进行电机参数辨识
		急减速工况，减速时间设定太短	● 增大减速时间
		过流失速抑制设定不合适	● 确认过流失速抑制功能（P3-19）已经使能； ● 过流失速动作电流（P3-18）设定值太大，推荐在120% 到 150% 之内调整； ● 过流失速抑制增益（P3-20）设定太小，推荐在20到 40 之内调整；
		没有加装制动单元和制动电阻	● 加装制动单元及电阻
		受外部干扰	● 查看历史故障记录，若故障时电流值远未达到过流点值，需查找干扰源。若无其它干扰源则可能为驱动板或霍尔器件问题。
恒速过电流		变频器输出回路存在接地或短路	● 排除外围故障，检测电机是否发生短路或断路
		控制方式为 FVC 或者 SVC 且没有进行参数辨识	● 按照电机铭牌设置电机参数，进行电机参数辨识
		过流失速抑制设定不合适	● 确认过流失速抑制功能（P3-19）已经使能； ● 过流失速动作电流（P3-18）设定值太大，推荐在120% 到 150% 之内调整； ● 过流失速抑制增益（P3-20）设定太小，推荐在20到 40 之内调整；
		变频器选型偏小	● 在稳定运行状态下，若运行电流已超过电机额定电流或变频器额定输出电流值，请选用功率等级更大的变频器
		受外部干扰	● 查看历史故障记录，若故障时电流值远未达到过流点值，需查找干扰源。若无其它干扰源则可能为驱动板或霍尔器件问题。

故障名称	操作面板显示	故障原因排查	故障处理对策
加速过电压	Err05	输入电压偏高	● 将电压调至正常范围
		加速过程中存在外力拖动电机运行	● 取消此外动力或加装制动电阻
		过压抑制设定不合适	● 确认过压抑制功能（P3-23）已经使能； ● 过压抑制动作电压（P3-22）设定值太大，推荐在770V~700V 之内调整； ● 过压抑制增益（P3-24）设定太小，推荐在 30 到 50 之内调整；
		没有加装制动单元和制动电阻	● 加装制动单元及电阻
		加速时间过短	● 增大加速时间
减速过电压	Err06	过压抑制设定不合适	● 确认过压抑制功能（P3-23）已经使能； ● 过压抑制动作电压（P3-22）设定值太大，推荐在770V~700V 之内调整； ● 过压抑制增益（P3-24）设定太小，推荐在 30 到 50 之内调整；
		减速过程中存在外力拖动电机运行	● 取消此外动力或加装制动电阻
		减速时间过短	● 增大减速时间
		没有加装制动单元和制动电阻	● 加装制动单元及电阻
恒速过电压	Err07	过压抑制设定不合适	● 确认过压抑制功能（P3-23）已经使能； ● 过压抑制动作电压（P3-22）设定值太大，推荐在770V~700V 之内调整； ● 过压抑制频率增益（P3-24）设定太小，推荐在30到 50 之内调整； ● 过压抑制最大上升频率（P3-26）设定太小，推荐在 5~20Hz 之内调整；
		运行过程中存在外力拖动电机运行	● 取消此外动力或加装制动电阻
缓冲电源故障	Err08	母线电压在欠压点上下波动	● 寻求技术支持
欠压故障	Err09	瞬时停电	● 使能瞬停不停功能（P9-59），可以防止瞬时停电欠压故障
		变频器输入端电压不在规范要求的范围	● 调整电压到正常范围
		母线电压不正常	● 寻求技术支持
		整流桥、缓冲电阻、驱动板、控制板异常	● 寻求技术支持
变频器过载	Err 10	负载是否过大或发生电机堵转	● 减小负载并检查电机及机械情况
		变频器选型偏小	● 选用功率等级更大的变频器
电机过载	Err 11	电机保护参数 P9-01 设定是否合适	● 正确设定此参数
		负载是否过大或发生电机堵转	● 减小负载并检查电机及机械情况
输入缺相	Err 12	三相输入电源不正常	● 检查并排除外围线路中存在的问题
		驱动板、防雷板、主控板、整流桥异常	● 寻求技术支持
输出缺相	Err 13	电机故障	● 检测电机是否断路
		变频器到电机的引线不正常	● 排除外围故障
		电机运行时变频器三相输出不平衡	● 检查电机三相绕组是否正常并排除故障
		驱动板、IGBT 模块异常	● 寻求技术支持

故障名称	操作面板显示	故障原因排查	故障处理对策
模块过热	Err 14	环境温度过高	● 降低环境温度
		风道堵塞	● 清理风道
		风扇损坏	● 更换风扇
		模块热敏电阻损坏	● 寻求厂家服务
		逆变模块损坏	● 寻求厂家服务
外部设备故障	Err 15	通过多功能端子 DI 输入外部故障的信号	● 排查外围故障，确认机械允许重新启动（P8-18），复位运行
		通过虚拟 IO 功能输入外部故障的信号	● 确认 A1 组 虚拟 IO 组参数设置正确，复位运行
通讯故障	Err 16	上位机工作不正常	● 检查上位机接线
		通讯线不正常	● 检查通讯连接线
		通讯扩展卡 P0-28 设置不正确	● 正确设置通讯扩展卡类型
		通讯参数 PD 组设置不正确	● 正确设置通讯参数
		以上检测完成后故障仍无法排除，可尝试恢复出厂设置。	
接触器故障	Err 17	驱动板和电源异常	● 寻求厂家服务
		接触器异常	● 寻求厂家服务
		防雷板异常	● 寻求厂家服务
电流检测故障	Err 18	检查霍尔器件异常	● 寻求厂家服务
		驱动板异常	● 寻求厂家服务
电机调谐故障	Err 19	电机参数未按铭牌设置	● 根据铭牌正确设定电机参数
		参数辨识过程超时	● 检查变频器到电机引线
			● 检查编码器线数设置是否正确 P1-27、检查编码器的信号线连接是否正确、牢固
编码器故障	Err20	编码器型号不匹配	● 根据实际正确设定编码器类型
		编码器连线错误	● 检测 PG 卡电源及相序
		编码器损坏	● 更换编码器
		PG 卡异常	● 更换 PG 卡
EEPROM 读写故障	Err21	EEPROM 芯片损坏	● 寻求厂家服务
对地短路故障	Err23	电机对地短路	● 更换电缆或电机
累计运行时间到达故障	Err26	累计运行时间达到设定值	● 使用参数初始化功能清除记录信息
用户自定义故障 1	Err27	通过多功能端子 DI 输入用户自定义故障 1 的信号	● 复位运行
		通过虚拟 IO 功能输入用户自定义故障 1 的信号	● 复位运行
用户自定义故障 2	Err28	通过多功能端子 DI 输入用户自定义故障 2 的信号	● 复位运行
		通过虚拟 IO 功能输入用户自定义故障 2 的信号	● 复位运行
累计上电时间到达故障	Err29	累计上电时间达到设定值	● 使用参数初始化功能清除记录信息
掉载故障	Err30	变频器运行电流小于 P9-64	● 确认负载是否脱离或 P9-64、P9-65 参数设置是否符合实际运行工况
运行时 PID 反馈丢失故障	Err31	PID 反馈小于 PA-26 设定值	● 检查 PID 反馈信号或设置 PA-26 为一个合适值
逐波限流故障	Err40	负载是否过大或发生电机堵转	● 减小负载并检查电机及机械情况
		变频器选型偏小	● 选用功率等级更大的变频器

故障名称	操作面板显示	故障原因排查	故障处理对策
运行时切换电机故障	Err41	在变频器运行过程中通过端子更改当前电机选择	● 变频器停机后再进行电机切换操作
速度偏差过大故障	Err42	编码器参数设定不正确	● 正确设置编码器参数
		没有进行参数辨识	● 进行电机参数辨识
		速度偏差过大	● 根据实际情况合理设置检测参数 P9-69、P9-70
电机过速度故障	Err43	编码器参数设定不正确	● 正确设置编码器参数
		没有进行参数辨识	● 进行电机参数辨识
		电机过速度检测参数不合理	● 根据实际情况合理设置检测参数P9-67、P9-68
电机过温故障	Err45	温度传感器接线松动	● 检测温度传感器接线并排除故障
		电机温度过高	● 提高载频或采取其它散热措施对电机进行散热处理
初始位置角辨识故障	Err51	变频器输出缺相	● 检查电机线并排除故障
		变频器电流检测故障或霍尔损坏	● 检查霍尔并排除故障
		电机电感值太大	● 功能功能码 P9-75 屏蔽此故障
主从控制从机故障	Err55	从机发生故障，检查从机	● 按照从机故障码进行排查
制动单元过载	Err61	制动电阻值偏小	● 请参考“表 9-27 YD580E 变频器制动组件选型表”
制动回路短路	Err62	制动模块异常	● 寻求技术支持
反电动势辨识异常警告	A64	电机参数设置错误	● 正确设置电机参数尤其是额定频率和额定转速
		静态辨识时 P1-20 反电动势设置错误	● 检查 P1-20 设置是否太大或者太小并修改
		动态辨识时反电动势辨识异常	● 检查动态辨识时电机是否是完全空载，在辨识过程中电机是否旋转到电机额定速度的 40%，如果在辨识时由于电机接有负载未能旋转到电机额定速度的 40%，需要脱开负载再辨识一次
		电机出现了退磁现象	● 检查电机是否退磁
		电机反电动势确实偏大或者偏小	● 如果确认电机的反电动势偏大或者偏小可以按“STOP”键复位此警告，继续接下来的运行
电容漏液故障	Err67	电容存在漏液情况	● 检查电容情况，必要时更换电容、或驱动板。 ● 如确定机器正常误报，设置A9-05参数值为0。

7.6 常见故障及处理方法

序号	故障现象	可能原因	解决方法
1	上电无显示	电网电压没有或者过低	● 检查输入电源
		变频器驱动板上的开关电源故障	● 检查控制板上 24V 和 10V 输出电压是否正常
		控制板与驱动板、键盘之间连线断	● 重新拔插芯和排线
		变频器缓冲电阻损坏	● 寻求厂家服务
		控制板、键盘故障	
		整流桥损坏	
2	上电一直显示 HC HC	驱动板与控制板之间的连线接触不良	● 重新拔插芯和排线
		控制板上相关器件损坏	● 寻求厂家服务
		电机或者电机线有对地短路	
		霍尔故障	
		电网电压过低	
3	上电显示“Err23”报警 Err23	电机或者输出线对地短路	● 用摇表测量电机和输出线的绝缘
		变频器损坏	● 寻求厂家服务
4	上电变频器显示正常，运行后显示“HC”并马上停机 HC	风扇损坏或者堵转	● 更换风扇
		外围控制端子接线有短路	● 排除外部短路故障
5	频繁报 Err14（模块过热）故障 Err 14	载频设置太高	● 降低载频（P0-15）
		风扇损坏或者风道堵塞	● 更换风扇、清理风道
		变频器内部器件损坏（热敏电阻或其他）	● 寻求厂家服务
6	变频器运行后电机不转动	电机及电机线	● 重新确认变频器与电机之间连线正确
		变频器参数设置错误（电机参数）	● 恢复出厂参数，重新设置使用参数组； ● 检查编码器参数设置正确、电机额定参数设置正确，如电机额定频率、额定转速等； ● 检查 P0-01（控制方式）、P0-02（运行方式）、设置正确； ● V/F 模式下，重载起动下，调整 P3-01(转矩提升) 参 数 .
		驱动板与控制板连线接触不良	● 重新拔插连接线吗，确认接线牢固；
		驱动板故障	● 寻求厂家服务
7	DI 端子失效	参数设置错误	● 检查并重新设置 P4 组相关参数
		外部信号错误	● 重新接外部信号线
		OP 与 +24V 跳线松动	● 重新确认 OP 与 +24V 跳线，并确保紧固。
		控制板故障	● 寻求厂家服务
8	闭环矢量控制时，电机速度无法提升	编码器故障	● 更换码盘并重新确认接线
		编码器接错线或者接触不良	● 重新接线，确保接触良好
		PG 卡故障	● 更换 PG 卡
		驱动板故障	● 寻求厂家服务
9	变频器频繁报过流和过压故障。	电机参数设置不对	● 重新设置电机参数或者进行电机调谐
		加减速时间不合适	● 设置合适的加减速时间
		负载波动	● 寻求厂家服务
10	上电（或运行）报 Err17 Err 17	软启动接触器未吸合	● 检查接触器电缆是否松动 ● 检查接触器是否有故障 ● 检查接触器 24V 供电电源是否有故障 ● 寻求厂家服务(如机器正常，P9-12设置01)。
11	减速或减速停车时电机自由停车或无制动能力	编码器断线或过压失速保护生效	● 有速度传感器矢量控制模式下时（P0-01=1），请检查编码器接线 ● 如果已配置制动电阻，需将“过压失速使能”选择为“无效”（设置 P3-23=0），关闭过压失速

第八章　日常保养与维护

8.1 日常保养

安全注意事项

危险

- 请勿在电源接通条状态下进行操作接线，否则有触电危险！
- 进行检查前，请切断所有的设备电源，切断变频器输入电源后，因变频器内部直流电容上仍有残压，请至少等待几分钟待电源指示灯熄灭后方可操作，再次上电操作时，需要等待变频器规定的间隔上电时间；
- 在变频器上电后，请勿更改接线、拆下线缆、拆下选配卡和更换冷却风扇，否则有触电危险；
- 请务必将电机的接地端子接地，否则与电机外壳接触有触电危险；
- 非专业电气人员，请勿进行维护、保养和维修；
- 安装、接线、调试、修理、检查和元器件更换，请由熟悉变频器的安装、调试、维修、电气专业施工人员进行。

警告

- 请勿在拆下变频器外壳下，使变频器处于运行状态；
- 为说明产品细节部分，本说明书中的图解有时为拆下外罩和端盖状态，请务必在安装有规定的外罩下和安全遮盖物下遵照说明书运行变频器；
- 请按指定的拧固力紧固螺钉端子，防止连接松动导致电线连接处发热而引发火灾；
- 请勿接错主回路输入电压的范围，防止因输入变频器的额定电压超出变频器允许的范围，导致运行异常；
- 请勿使易燃物紧密接触变频器或将变频器安装易燃物体上。

注意

- 请遵照本说明书指示正确更换风扇。特别针对风扇出风口方向，如果方向错误，会导致冷却效果差，不能发挥冷却作用；
- 在变频器运行时，请勿拆装电机。否则会引起触电和变频器损坏；
- 对控制回路接线时，请使用屏蔽性电缆；
- 防止变频器异动作，同时将屏蔽层单端可靠接地。
- 请勿更改变频器回路，否则会引起变频器损坏；
- 请正确连接变频器输出回路端子同电机回路接线端子；
- 如果需要更改电机运行方向，请任意调换变频器输出端子；
- 请勿操作已损坏的变频器，以免波及变频器以外的设备器件损坏。

8.1.1 日常检查项目

由于环境的温度、湿度、粉尘及振动的影响，会导致变频器内部的器件老化，导致变频器潜在的故障发生或降低了变频器的使用寿命。因此，有必要对变频器实施日常和定期的保养及维护，特别是针对高温环境、频繁起停场合、存在交流电源和负载波动环境、存在大震动或冲击的环境、存在粉尘 / 盐酸类腐蚀性环境中应该缩短定期检查周期间隔。

为确保变频器功能正常和产品免受损坏，请每日对以下项目进行确认，请复印该检查确认表进行使用，每次确认后在确认栏上盖签“确认”章。

检查项目	检查内容	故障时对策	确认栏
电机	电机是否存在异常声音和振动现象	● 确认机械连接是否异常； ● 确认电机是否缺相； ● 确认电机固定螺丝是否牢固。	
风扇	变频器和电机冷却风扇使用异常	● 确认变频器冷却风扇是否运行； ● 确认电机侧冷却风扇是否异常； ● 确认通风通道是否堵塞； ● 确认环境温度是否在允许范围内。	
安装环境	电柜和线缆槽是否异常	● 确认变频器进出线缆是否有绝缘破损； ● 确认安装固定支架是否有震动； ● 确认铜排和连接线缆端子是否有松动和被腐蚀穿。	
负载	变频器运行电流是否超出变频器额定和电机额定一定时间	● 确认电机参数设置是否正确； ● 确认电机是否过载； ● 确认机械振动是否过大（正常情况＜ 0.6g）。	
输入电压	主回路和控制回路间电源电压是否	● 确认输入电压是否在允许范围内； ● 确认周围是否有大负载起动。	

8.2 定期检查

8.2.1 定期检查项目

请定期对运行中难以检查的地方检查， 应始终保持变频器处于清洁状态，有效清除变频器上表面积尘，防止积尘进入变频器内部，特别是金属粉尘，有效清除变频器散热风扇的油污。

危险

- 为防止触电，请勿在带电状态下进行检查作业，否则有触电危险。
- 检查前请切断所有设备的电源，并等待 10 分钟以上，以免变频器内部电容的残余电压造成危险。

检查项目	检查内容	故障时对策	检查栏
整机	表面是否有垃圾、污垢、粉尘堆积	● 确认变频器柜是否断电； ● 用吸尘器清除垃圾或粉尘，以免接触部件； ● 用软布浸入中性清洁剂轻轻擦去油污。	
线缆	动力线及连接处是否变色； 绝缘层是否老化或开裂。	● 更换已经开裂的线缆； ● 更换已经损坏的连接端子。	
电磁接触器外围	动作时是否吸合不牢或发出异响； 是否有短路、被水污、膨胀、破裂的外围器件	● 更换已异常的元器件。	
风道通风口	风道、散热片是否阻塞； 风扇是否损坏；	● 清扫风道； ● 更换风扇。	
控制回路	控制元器件是否有接触不良；端子螺丝是否松动；控制线缆是否有绝缘开裂。	● 清扫控制线路和连接端子表面异物； ● 更换已破损腐蚀的控制线缆。	

8.2.2 主回路绝缘测试

● 提醒：在用兆欧表（请用直流 500V 兆欧表）测量绝缘电阻时，要将主回路线与变频器脱开。不要用绝缘电阻表测试控制回路绝缘，请参考下图。（严禁进行高压（＞ 500V）测试，出厂时已完成）。

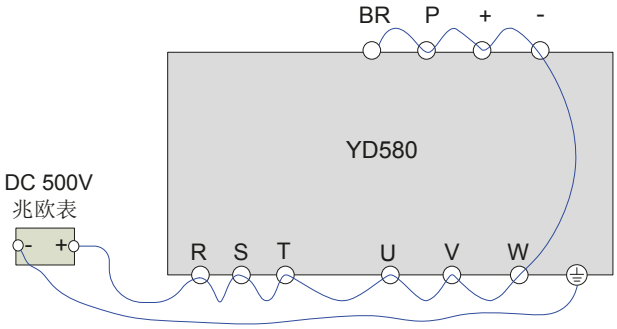


图 8-1 主回路绝缘测试示意图

要求测量结果大于 5 MΩ。

测试前需将压敏电阻螺钉卸下，断开压敏接入：

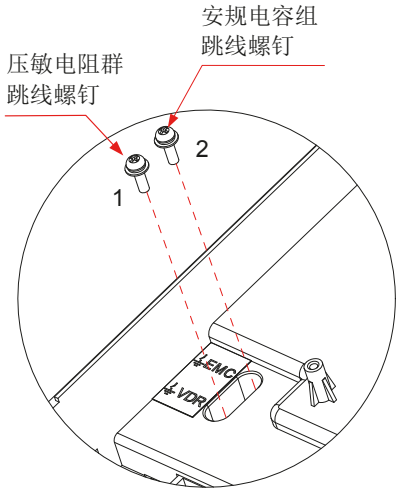


图 8-2 压敏电阻（VDR）、安规电容（EMC）对地跳线位置示意图

8.3 变频器易损件更换

8.3.1 易损件寿命

变频器易损件主要有冷却风扇和滤波用电解电容器，其寿命与使用的环境及保养状况密切相关。一般寿命时间为：

器件名称	寿命时间【注】
风扇	≥ 5 年
电解电容	≥ 5 年

【注】：寿命时间为在下列条件下使用时的时间，用户可以根据运行时间确定更换年限。

1） 环境温度：40°C
2） 负载率：80%
3） 运行率：24 小时 / 日

8.3.2 冷却风扇的使用数量

表 3-16 冷却风扇使用数量（三相 380V ~ 480V）

型号	冷却风扇
三相 380~480V，50/60Hz	
YD580ET4-0P7G/1P5B	1
YD580ET4-1P5G/2P2PB	1
YD580ET4-2P2G/3P7PB	1
YD580ET4-3P7G/5P5PB	1
YD580ET4-5P5G/7P5PB	1
YD580ET4-7P5G/11PB	1
YD580ET4-11G/15PB	2
YD580ET4-15G/18P5PB	2
YD580ET4-18P5G/22PB	1
YD580ET4-22G/37P(B)	1
YD580ET4-30G/37P(B)	1
YD580ET4-37G/45P(B)	1
YD580ET4-45G/55P(B)	1
YD580ET4-55G/75P(B)	1
YD580ET4-75G/90P(B)	2
YD580ET4-90G/110P	2
YD580ET4-110G/132P	2
YD580ET4-132G/160P	2
YD580ET4-160G/200P	2
YD580ET4-200G/220P	2
YD580ET4-220G/250P	2
YD580ET4-250G/280P	3
YD580ET4-280G/315P	3
YD580ET4-315G/355P	3
YD580ET4-355G/400P	3
YD580ET4-400G/450P	3
YD580ET4-450G/500P	3

8.3.3 冷却风扇更换

1） 可能损坏原因：轴承磨损、叶片老化。

2） 判别标准：风扇叶片等是否有裂缝，开机时声音是否有异常振动声，风叶是否运行异常。

3） 风扇更换方式：

按下风扇塑料防护罩卡扣后，向外拉取出；
更换风扇后，保证风向向上吹，注意风向。

第九章 规格与选型

9.1 YD580E 变频器技术规格与尺寸

9.1.1 技术规格

表 9-1 YD580E 变频器型号与技术数据（三相 380V~480V）

项目		规格												
YD580ET4-□G/□P(B)		0P7/1P5	1P5/2P2	2P2/3P0	3P0/3P7	3P7/5P5	5P5/7P5	7P5/11	11/15	15/18P5	18P5/22	22/30	30/37	37/45
适用电机容量	(kW)	0.75/1.5	1.5/2.2	2.2/3.0	3.0/3.7	3.7/5.5	5.5/7.5	7.5/11	11/15	15/18.5	18.5/22	22/30	30/37	37/45
	(HP)	1/2	2/3	3/4	4/5	5/7.5	7.5/10	10/15	15/20	20/25	25/30	30/40	40/50	50/60
输入	额定输入电流(A)	2.4/4.6	4.6/6.3	6.3/9.0	9.0/12	12/17	17/22	22/33	33/42	42/50	50/59	59/64	64/69	69/89
输出	额定输出电流(A)	2.1/3.8	3.8/5.1	5.1/7.2	7.2/9.0	9.0/13	13/17	17/25	25/32	32/37	37/45	45/60	60/75	75/91
	输出电压	三相 380~480V（跟随输入电压）												
	最高输出频率	500Hz（可通过参数更改）												
	载波频率	0.8kHz~8.0kHz（可根据负载特性，自动调整载波频率）												
	过载能力	G:150% 额定电流 60s P:120% 额定电流 60s												
电源	额定电压 额定频率	AC：三相 380~480V，50/60Hz												
	电压允许波动范围	-15~10%，实际允许范围：AC 323V~528V												
	频率允许波动范围	±5%												
	电源容量(kVA)	2.8/5.0	5.0/6.7	6.7/9.5	9.5/12	12/18	18/23	23/34	34/43	43/45	45/54	54/58	58/63	63/81
散热设计	发热功耗（kW）	0.046	0.068	0.081	0.138	0.109	0.201	0.24	0.355	0.454	0.478	0.551	0.694	0.815
	排风量（CFM）	9	9	9	9	20	24	30	40	42	51.9	57.4	118.5	118.5
过电压等级		OVCIII												
污染等级		PD2												
防护等级		IP20												

项目		规格													
YD580ET4-□G/□P(B)		45/55	55/75	75/90	90/110	110/132	132/160	160/200	200/220	220/250	250/280	280/315	315/400	355/400	400/450	450/500
适用电机容量	(kW)	45/55	55/75	75/90	90/110	110/132	132/160	160/200	200/220	220/250	250/280	280/315	315/400	355/400	400/450	450/500
	(HP)	60/75	75/100	100/120	120/150	150/180	180/215	215/265	265/300	300/330	330/375	375/420	420/475	475/530	530/600	600/670
输入	额定输入电流 (A)	89/106	106/139	139/164	164/196	196/240	240/287	287/365	365/410	410/441	441/495	495/565	565/617	617/687	687/782	782/838
输出	额定输出电流 (A)	91/112	112/150	150/176	176/210	210/253	253/304	304/377	377/426	426/465	465/520	520/585	585/650	650/725	725/820	820/900
	输出电压	三相 380~480V（跟随输入电压）														
	最高输出频率	500Hz（可通过参数更改）														
	载波频率	0.8kHz~8.0kHz				0.8kHz~6.0kHz										
		可根据负载特性，自动调整载波频率														
	过载能力	150% 额定电流 60s（其中 YD580T4-450G/500P 过载能力为：130% 额定电流 60s）														
电源	额定电压 额定频率	AC：三相 380~480V，50/60Hz														
	电压允许波动范围	-15~10%，实际允许范围：AC 323V~528V														
	频率允许波动范围	±5%														
	电源容量(kVA)	81/97	97/127	127/150	150/179	179/220	220/263	263/334	334/375	375/404	404/453	453/517	517/565	565/629	629/716	716/952
散热设计	发热功耗(kW)	1.01	1.21	1.57	1.81	2.14	2.85	3.56	4.15	4.55	5.06	5.33	5.69	6.31	6.91	7.54
	排风量(CFM)	122.2	122.2	218.6	287.2	354.2	547	627	638.4	722.5	789.4	882	645	860	860	860
过电压等级		OVCIII														
污染等级		PD2														
防护等级		IP20							IP00							

表 9-3(1) YD580E 系列变频器技术规格

项 目		技术规格	
基本功能	输入频率分辨率	数字设定：0.01Hz 模拟设定：最高频率 ×0.025%	
	控制方式	开环矢量控制（SVC） 闭环矢量控制（FVC） V/F 控制	
	启动转矩	0.25Hz/150% 开环矢量(SVC)	0Hz/180% 闭环矢量(FVC)
	调速范围	1：200 开环矢量(SVC)	1：1000 闭环矢量(FVC)
	稳速精度	±0.5% 开环矢量(SVC)	±0.02% 闭环矢量(FVC)
	转矩控制精度	±5%@5Hz以上 开环矢量(SVC)	±3% 闭环矢量(FVC)
	转矩提升	自动转矩提升；手动转矩提升 0.1%~30.0%。	
	V/F 曲线	五种方式：直线型；多点型；平方；完全V/F 分离；不完全V/F 分离。	
	加减速曲线	直线或 S 曲线加减速方式； 四种加减速时间，加减速时间范围 0.0~6500.0s。	
	直流制动	直流制动起始频率：0.00Hz~ 最大频率； 制动时间：0.0s~36.0s； 制动动作电流值：0.0%~100.0%。	
	点动控制	点动频率范围：0.00Hz~50.00Hz； 点动加减速时间 0.0s~6500.0s。	
	简易 PLC、多段速运行	通过内置 PLC 或控制端子实现最多 16 段速运行。	
	内置 PID	可方便实现过程控制闭环控制系统。	
	自动电压调整（AVR）	当电网电压变化时，能自动保持输出电压恒定。	
	过压过流失速控制	对运行期间电流电压自动限制，防止频繁过流过压跳闸。	
	快速限流功能	最大限度减小过流故障，保护变频器正常运行。	
	转矩限定与控制	“挖土机”特性，对运行期间转矩自动限制，防止频繁过流跳闸； 矢量控制模式可实现转矩控制。	
个性化功能	瞬停不停	瞬时停电时通过负载回馈能量补偿电压的降低，维持变频器短时间内继续运行。	
	快速限流	避免变频器频繁的出现过流故障。	
	虚拟 IO	五组虚拟 DIDO，可实现简易逻辑控制。	
	定时控制	定时控制功能：设定时间范围 0.0Min ～ 6500.0Min。	
	多电机切换	两组电机参数，可实现两个电机切换控制。	
	多线程总线支持	支持四种现场总线：Modbus、Profibus-DP、CANlink、CANopen。	
	电机过热保护	选配 IO 扩展卡 1，模拟量输入 AI3 可接受电机温度传感器输入（PT100、PT1000）。	
	多编码器支持	支持差分、开路集电极、UVW、旋转变压器等	
	用户可编程	选配用户可编程卡，可以实现二次开发。	
	强大的后台软件	支持变频器参数操作及虚拟示波器功能； 通过虚拟示波器可实现对变频器内部的状态监视。	

表 9-3(2) YD580E 系列变频器技术规格

项 目		技术规格
运行	运行指令	操作面板给定、控制端子给定、串行通讯口给定。可通过多种方式切换
	频率指令	10 种频率指令：数字给定、模拟电压给定、模拟电流给定、脉冲给定、串行口给定。可通过多种方式切换
	辅助频率指令	10 种辅助频率指令。可灵活实现辅助频率微调、频率合成
	输入端子	标准： ● 5 个 DI 端子，其中 1 个支持最高 100kHz 的高速脉冲输入 ● 2 个 AI 端子，1 个仅支持 0 ~ 10V 电压输入，1 个支持 0 ~ 10V 电压输入或 0 ~ 20mA 电流输入 扩展能力： ● 5 个 DI 端子 ● 1 个 AI 端子，支持 -10V ~ 10V 电压输入，且支持 PT100/PT1000
	输出端子	标准： ● 1 个高速脉冲输出端子（可选为开路集电极式）， ● 支持 0~100kHz 的方波信号输出 ● 1 个 DO 端子 ● 1 个继电器输出端子 ● 1 个 AO 端子，支持 0 ~ 20mA 电流输出或 0 ~ 10V 电压输出 扩展能力： ● 1 个 DO 端子 ● 1 个继电器输出端子 ● 1 个 AO 端子，支持 0 ~ 20mA 电流输出或 0 ~ 10V 电压输出
显示与键盘操作	LED 显示	显示参数
	LCD 显示	可选件，中 / 英文提示操作内容
	参数拷贝	可通过 LCD 操作面板选件实现参数的快速复制
	按键锁定和功能选择	实现按键的部分或全部锁定，定义部分按键的作用范围，以防止误操作
保护功能	缺相保护	输入缺相保护，输出缺相保护
	瞬间过电流保护	在额定输出电流的 250% 以上时停机
	过压保护	主回路直流电压在 820V 以上时停机
	欠压保护	主回路直流电压在 350V 以下时停机
	过热保护	逆变桥过热时会触发保护
	过载保护	150% 额定电流运行 60s 停机
	过流保护	超过变频器 2.5 倍额定电流停机保护
	制动保护	制动单元过载保护，制动电阻短路保护
	短路保护	输出相间短路保护，输出对地短路保护
环境	使用场所	室内，不受阳光直晒，无尘埃、腐蚀性气体、可燃性气体、油雾、水蒸汽、滴水或盐份等
	海拔高度	1000m 以下使用无需降额，1000m 以上每升高 100m 降额 1%，超过 3000m 请联系厂家 (注：0.75~2.2kW 驱动器最高使用海拔为 2000m，如需使用到海拔 2000m 以 上请联系厂家)
	环境温度	－ 10°C ~ ＋ 40°C，温度超过 40°C时需要降额使用，环境温度每升高 1°C降额 1.5%，最高使用环境温度为 50°C
	湿度	小于 95%RH，无凝露
	振动	小于 5.9m/s^2（0.6g）
	存储温度	－ 20°C ~ ＋ 60°C

9.1.2 外型与安装尺寸

◆ YD580ET4-0P7G/1P5PB ~ YD580ET4-160G/200P 整机尺寸

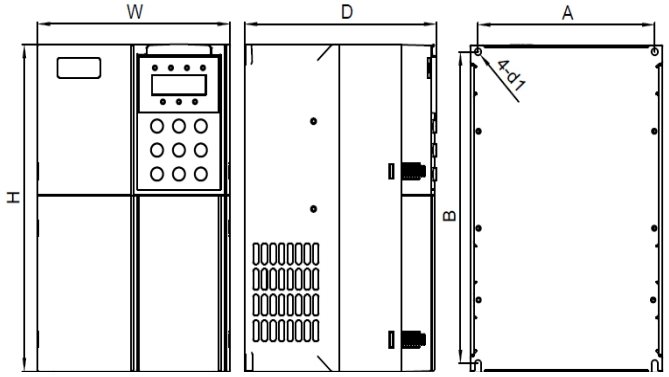


图 9-1 YD580ET4-0P7G/1P5PB ~ YD580ET4-22G/30PB 外型尺寸及安装尺寸示意图

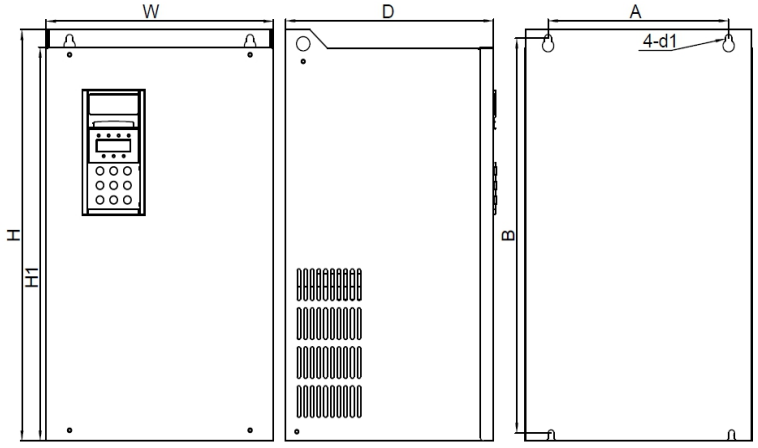


图 9-2 YD580ET4-30G/37P(B)~YD580ET4-160G/200P 外型尺寸及安装尺寸示意图

表9-6 YD580ET4-0P7G/1P5PB ~ YD580ET4-160G/200P-T 外型及安装孔位尺寸（三相380V~480V）

框号	变频器型号	外形尺寸 mm				安装孔位 mm		安装孔径 mm	重量 kg
		W	H	H1	D	A	B	d1	
F1	YD580ET4-0P7G/1P5PB	123	200	/	172	119.4	189.4	φ5	2
	YD580ET4-1P5G/2P2B								
	YD580ET4-2P2G/3P0PB								
	YD580ET4-3P0G/3P7PB								
	YD580ET4-3P7G/5P5PB								
	YD580ET4-5P5G/7P5PB								
F2	YD580ET4-7P5G/11PB	140	250	/	178	129	239	φ6	3.3
	YD580ET4-11G/15PB								
F3	YD580ET4-15G/18P5PB	180	280	/	180	165.4	266.7	φ6	4.3
F4	YD580ET4-18P5G/22PB	225	360	/	235	206	341	φ6.5	9.1
	YD580ET4-22G/30PB								
F5	YD580ET4-30G/37P(B)	253	436	421	242	213	421	φ7	17.5
	YD580ET4-37G/45P(B)								
F6	YD580ET4-45G/55P(B)	302	540	527	285	245	522	φ10	35
	YD580ET4-55G/75P(B)								
F7	YD580ET4-75G/90P(B)	340	581	556	316	270	558	φ10	51.5
	YD580ET4-90G/110P								
	YD580ET4-110G/132P								
F8	YD580ET4-132G/160P	400	925	885	322	320	905	φ10	85
	YD580ET4-160G/200P								

◆ YD580ET4-200G/220P~YD580ET4-450G/500P 整机尺寸

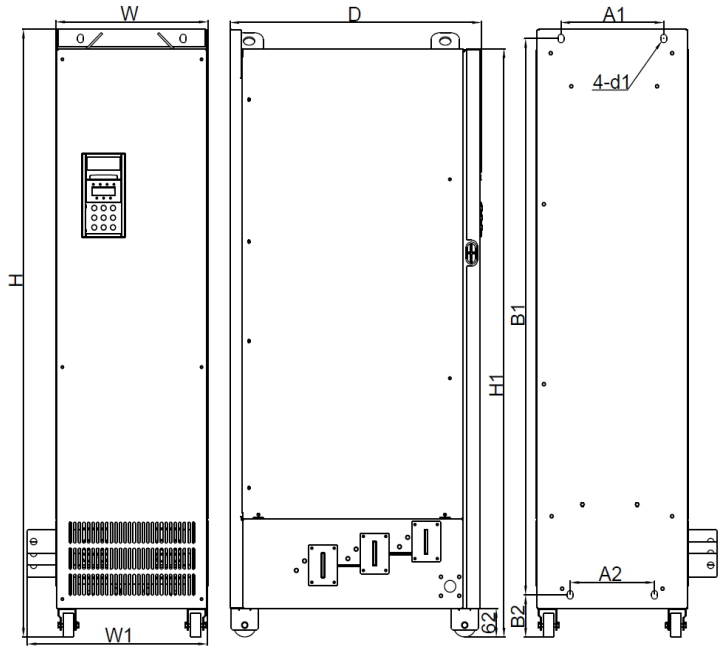


图 9-4 YD580ET4-200G/220P~YD580ET4-450G/500P 外型尺寸及安装尺寸示意图

表 9-6 YD580ET4-200G/220P ~ YD580ET4-450G/500P 外型及安装孔位尺寸

框号	变频器型号	外形尺寸 mm					安装孔位 mm				安装孔径 mm	重量 kg
		W	W1	H	H1	D	A1	A2	B1	B2	d1	
F9	YD580ET4-200G/220P	302	364	1136	1091	507	240		1035	84	φ13	110
	YD580ET4-220G/250P											
F10	YD580ET4-250G/280P	333	394	1286	1245	552	225	185	1175	91	φ13	155
	YD580ET4-280G/315P											
F11	YD580ET4-315G/355P	345	402	1404	1355	545	240	185	1292	91	φ16	185
	YD580ET4-355G/400P											
	YD580ET4-400G/450P											
	YD580ET4-450G/500P											

◆ YD580ET4-200G/220P-L~YD580ET4-450G/500P-L 整机尺寸

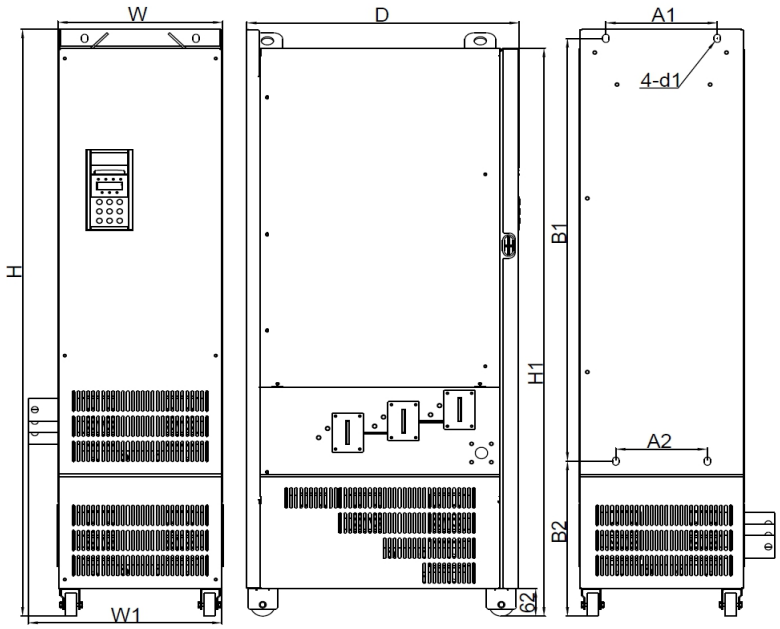


图 9-5 YD580ET4-200G/220P-L~YD580ET4-450G/500P-L 外型尺寸及安装尺寸示意图

表 9-7 YD580ET4-200G/220P-L~YD580ET4-450G/500P-L 外型尺寸及安装尺寸示意图（不带电抗器底座）

框号	变频器型号	外形尺寸 mm					安装孔位 mm				安装孔径 mm	重量 kg
		W	W1	H	H1	D	A1	A2	B1	B2	d1	
F9-L	YD580ET4-200G/220P-L	302	364	1474	1429	507	240		1035	422	φ13	160
	YD580ET4-220G/250P-L											
F10-L	YD580ET4-250G/280P-L	333	394	1624	1583	552	225	185	1175	429	φ13	215
	YD580ET4-280G/315P-L											
F11-L	YD580ET4-315G/355P-L	345	402	1732	1683	545	240	185	1292	419	φ16	245
	YD580ET4-355G/400P-L											
	YD580ET4-400G/450P-L											
	YD580ET4-450G/500P-L											

9.2 选配件一览表

外围选配件有制动单元、各功能扩展卡及外引操作器等，如下表所示。详细使用方法参见该配件的使用说明。若需以下选配件，请在订货时说明。

表 9-8 选配件一览表

名称	型号	功能	备注
I/O 扩展卡 1	YD580-IO1	可增加五个数字输入、一个模拟电压输入；AI3 为隔离模拟量；可接 PT100, PT1000；1 个继电器输出、1 个数字输出、1 个模拟量输出，带 MODBUS	适用于 15kW 及以上机型
I/O 扩展卡 2	YD580-IO2	可增加三个数字输入	全系列机型可用
I/O 扩展卡 3	YD580-IO3	可增加三个数字输入；一个 485 通讯信号隔离输入 ;1 个常开继电器输出	全系列机型可用
RS-485 通讯卡	YD580-RS485	带隔离的 MODBUS 通讯适配卡	全系列机型可用
CANlink 通信扩展卡	YD580-CAN1	CANlink 通讯适配卡	全系列机型可用
CANopen 通讯扩展卡	YD580-CAN2	CANopen 通讯适配卡	全系列机型可用
Profbus-DP 通讯卡	YD580-DP2	Profbus-DP 通讯卡	适用于 15kW 及以上机型
Profinet 通讯扩展卡	YD580-PN1	Profinet 通讯适配卡	全系列机型可用
用户可编程卡	YD580-PC1	用户可编程的扩展卡	适用于 15kW 及以上机型
差分编码器接口卡	YD580-PG1	差分旋转编码器接口卡，适配 5V 电源	全系列机型可用
旋转变压器接口卡	YD580-PG4	适用于旋转变压器，激励频率 10kHz, DB9 接口	全系列机型可用
开集电极编码器接口卡	YD580-PG5	开集电极编码器接口卡，带 1：1 分频输出，适配 15V 电源	全系列机型可用
开集电极编码器接口卡	YD580-PG5D	开集电极编码器接口卡，带可选多倍分频输出， 适配 15V 电源	全系列机型可用
差分编码器接口卡	YD580-PG6	差分旋转编码器接口卡，适配 5V 电源	全系列机型可用
差分编码器接口卡	YD580-PG6D	差分旋转编码器接口卡，带可选多倍分频输出，适配 5V 电源	全系列机型可用
YD58PGMD 新多功能编码器卡	YD580-PGMD	可以兼容差分输入、集电极输入、推挽输入，同时也支持差分输出、集电极输出，因此可以满足目前常见编码器、上位机 A/B 相输入多种接口形式	全系列机型可用
外引 LED 操作面板	YKEY059	通过 RJ45 接口外引 LED 显示和操作键盘	YD58 系列通用
外引 LCD 操作面板	YKEY060	外引 LCD 显示和操作面板	可参数拷贝与下载
YKEY059 键盘安装底座	YD580-BASE1	-	-

9.3 制动组件选型指导

9.3.1 制动电阻阻值的选择

制动时，电机的再生能量几乎全部消耗在制动电阻上。可根据公式计算制动电阻的阻值：

$$U \times U/R=Pb$$

U －系统稳定制动的制动电压（不同的系统 U 值不一样，YD580 系列变频器默认制动电压为760V，可通过 L8-09 调整）；

Pb －制动功率

9.3.2 制动电阻功率的选择

理论上制动电阻的功率和制动功率一致，但是考虑到降额为 K。可根据公式：

$$K \times Pr=Pb \times D$$

K- 取值 50% 左右

Pr －制动电阻的功率；

D －制动频度，即再生过程占整个工作过程的比例。

由以上两式可以得出：

$$K \times Pr=Pb \times D= U \times U/R \times D$$

$$Pr=(U \times U \times D)/(R \times K)$$

用户可以根据此式计算制动电阻功率。

K 值为制动电阻的降额系数，较低的 K 值可以保证制动电阻不会过热，用户在制动电阻散热良好的条件下可以适当增加 K 值，但是最好不要超过 50% ，否则会有因为电阻过热而引起火灾的风险

制动频度 D 需根据用户的实际使用场合来确定，表 9-11 是常见场合的典型值：

表 9-12 常见应用场合制动频度

常见应用场合	电梯	开卷和取卷	离心机	偶然制动负载	一般场合
制动频度取值	20% ~30%	20 ~30%	50%~60%	5%	10%

9.3.3 制动组件选型表

表 9-39 YD580E 变频器制动组件选型表（三相 380~480V）

变频器型号	适配电机 kW	制动单元		125% 制动转矩 (10% ED, 最大 10 秒)		备 注	最小制动电阻值 Ω
		型号	数量	推荐制动电阻规格	制动电阻数量		
YD580ET4-0P7G/1P5PB	0.75	内置标配		140W 800Ω	1	变频器型号后加“B”	96
YD580ET4-1P5G/2P2B	1.5			300W 380Ω	1		96
YD580ET4-2P2G/3P0PB	2.2			440W 260Ω	1		64
YD580ET4-3P0G/3P7PB	3.0			440W 200Ω	1		64
YD580ET4-3P7G/5P5PB	3.7			740W 150Ω	1		32
YD580ET4-5P5G/7P5PB	5.5			1100W 100Ω	1		32
YD580ET4-7P5G/11PB	7.5			1500W 75Ω	1		32
YD580ET4-11G/15PB	11			2200W 50Ω	1		20
YD580ET4-15G/18P5PB	15			3000W 38Ω	1		20
YD580ET4-18P5G/22PB	18.5	内置选配		4000W 32Ω	1		24
YD580ET4-22G/30PB	22			4500W 27Ω	1		24
YD580ET4-30G/37P(B)	30			6000W 20Ω	1		19.2
YD580ET4-37G/45P(B)	37			7000W 16Ω	1		14.8
YD580ET4-45G/55P(B)	45			9000W 13Ω	1		12.8
YD580ET4-45G/75P(B)	55			11000W 10.5Ω	1		9.6
YD580ET4-75G/90P(B)	75			15000W 7.7Ω	1		6.8

9.4 外引操作面板安装尺寸

9.4.1 YD58NKE 外引操作面板（料号：YCON3141）

YD58NKE 是适配于 YD580E 的外引操作面板，采用 LED 显示，其操作方式与机器自身操作面板完全相同，由于其外引特性，方便客户进行调试，其外形以及安装尺寸如下：

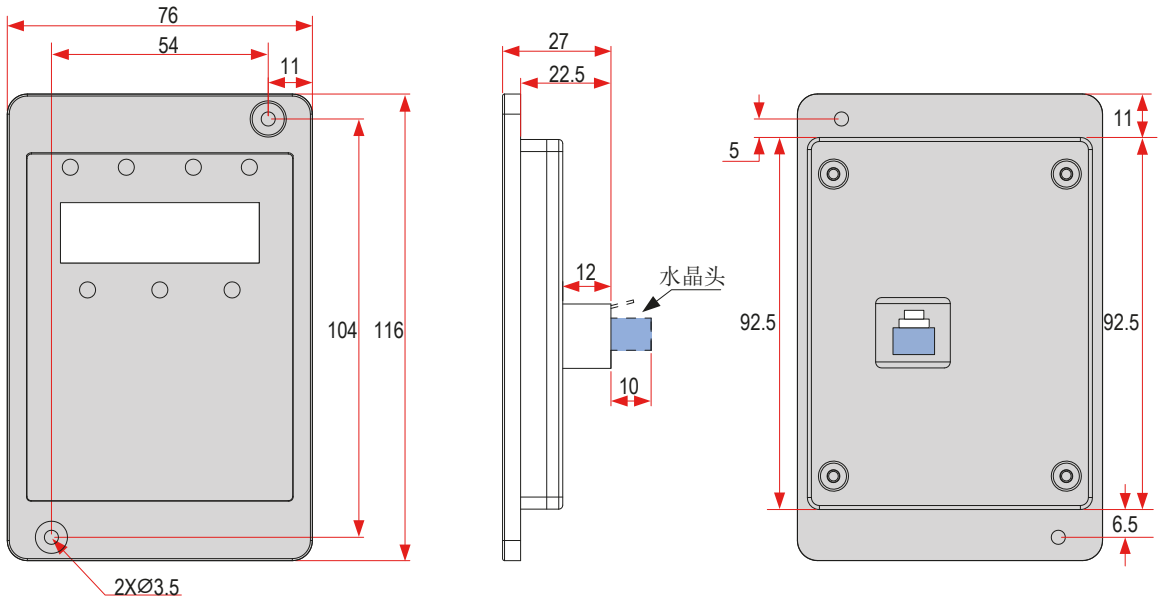


图 9-56 YD58NKE 外引操作面板尺寸（单位：mm）

第十章 选配卡

YD580E 系列变频器外接丰富的扩展卡可实现支持丰富的现场总线，支持丰富的编码器类型，支持用户可编程实现二次开发等功能。本章介绍各扩展卡的安装与使用，更加详细信息请参照购买时随机附送的说明书。

10.1 扩展卡的安装与功能说明

10.1.1 扩展卡的安装

YD580E 系列变频器配备有 3 个 I/O 扩展卡，1 个 PC 编程卡，5 个现场总线卡（Modbus-RTU、Profibus-DP、CANlink、CANopen）和 5 种 PG 卡，安装位置如下图所示，安装时需拆除盖板（参照“3.1.5 盖板的拆卸与安装”）。

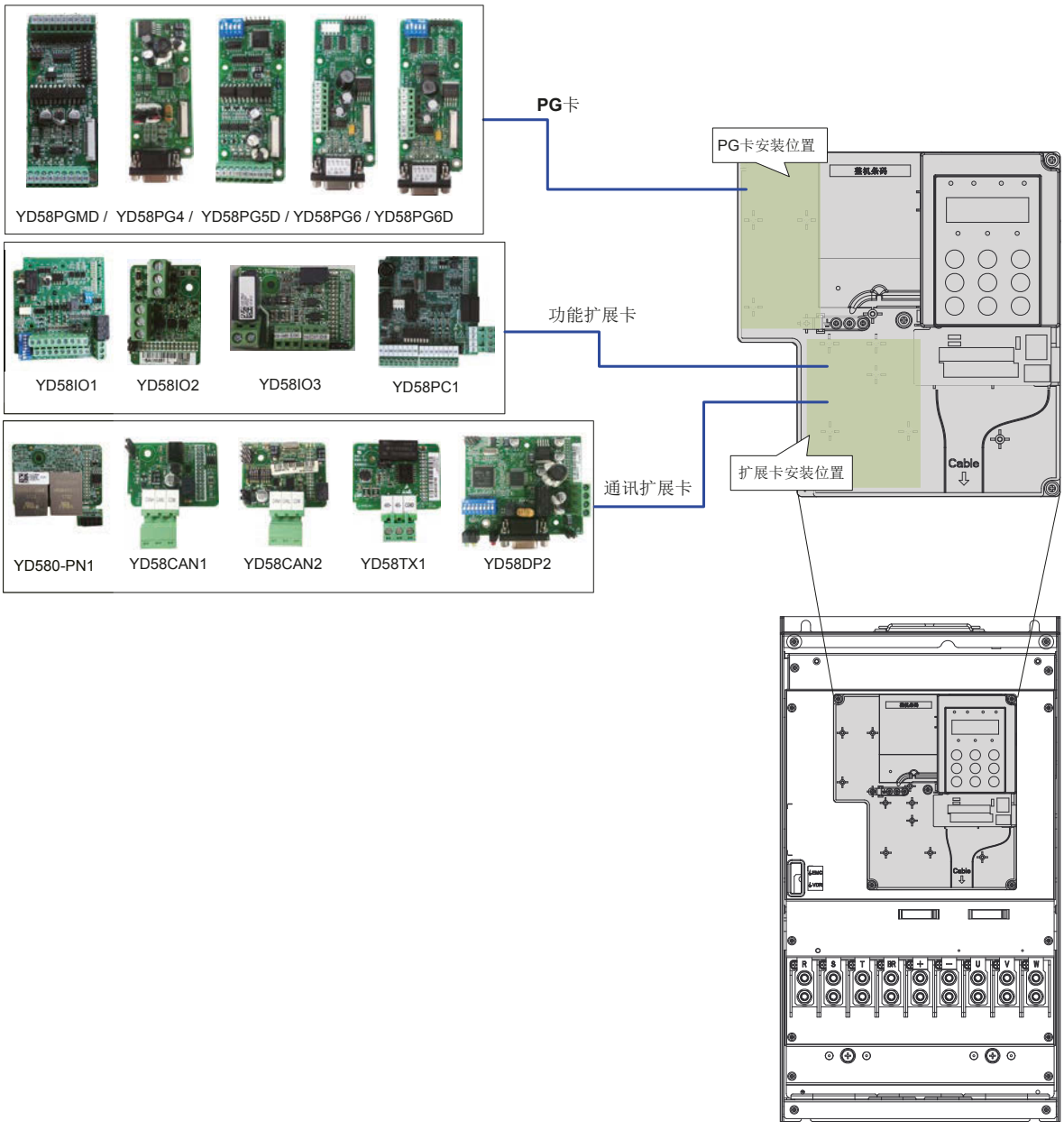


图 10-1 扩展卡的安装位置

- 上图为 YD580ET4-45G/55P(B)~ YD580ET4-160G/200P 型号变频器上扩展卡的安装位置，不同型号的变频器上安装位置略有差异，请以实物为准。

10.1.2 扩展卡的功能说明

表 10-1 扩展卡的功能说明

型号	名称	功能与规格	分频系数	适用机型
YD58IO1	I/O 扩展卡 1	可增加五个数字输入、一个模拟电压输入；AI3 为隔离模拟量；可接 PT100, PT1000；1 个继电器输出、1 个数字输出、1 个模拟量输出，带 MODBUS/CANlink	-	适用于 15kW 及以上机型
YD58IO2	I/O 扩展卡 2	可增加三个数字输入	-	全系列机型
YD58IO3	I/O 扩展卡 3	可增加三个数字输入； 一个 485 通讯信号隔离输入； 1 个常开继电器输出	-	全系列机型
YD58PC1	可编程多功能扩展卡	支持 PLC 编程，	-	适用于 15kW 及以上机型
YD58CAN1	CANlink 通信扩展卡	支持 CANlink	-	全系列机型
YD58CAN2	CANopen 通讯扩展卡	支持 CANopen	-	全系列机型
YD58TX1	RS-485 通讯扩展卡	支持 MODBUS-RTU	-	全系列机型
YD58DP2	Profibus-DP 通讯扩展卡	支持 Profibus-DP	-	适用于 15kW 及以上机型
YD580-PN1	Profinet 通讯扩展卡	Profinet 通讯适配卡	-	全系列机型可用
YD58PG4	旋转变压器输入 PG 卡	适用于旋转变压器， 激励频率 10kHz, DB9 接口	不带分频	全系列机型
YD58PG5D	开集电极输入 PG 卡	开集电极编码器接口卡， 适配 15V 电源	2~62 偶数分频	全系列机型
YD58PG6	差分输入 PG 卡	差分旋转编码器接口卡， 适配 5V 电源， DB9 接口	1:1 分频	全系列机型
YD58PG6D	差分输入 PG 卡	差分旋转编码器接口卡， 适配 5V 电源， DB9 接口	2~62 偶数分频	全系列机型
YD58PGMD	多功能编码器卡	兼容差分输入、集电极输入、推挽输入； 支持差分输出、集电极输出；	0~63 分频	全系列机型

10.2 多功能扩展卡的使用

10.2.1 YD58IO1 端子分布与功能说明

YD58IO1 扩展卡是设计用于 YD580E 系列变频器配套使用的多功能 I/O 扩展卡，可扩展 5 路 DI， 1 路 AI，1 路 DO ，1 路 AO 和 1 路继电器输出，还具有 CAN 和 RS-485 通讯接口，可实现现场总线控制。

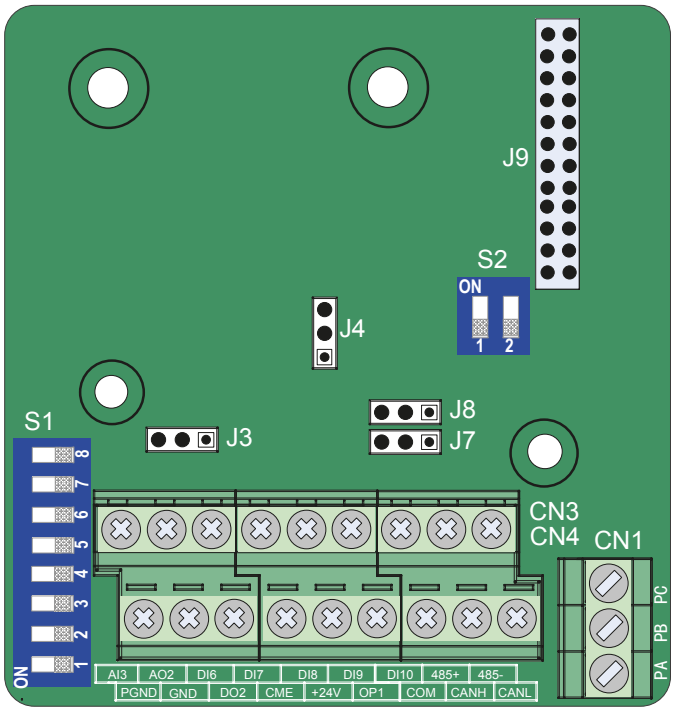
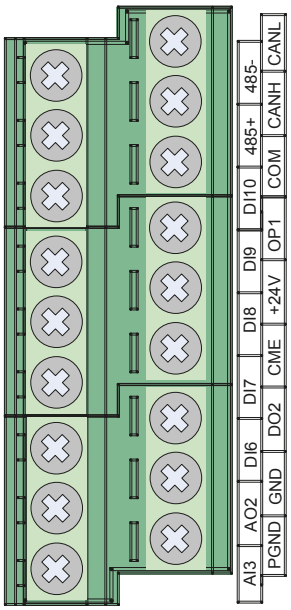
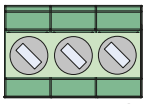


图 10-2 YD58IO1 端子分布示意图

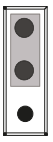
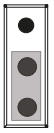
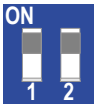
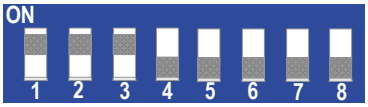
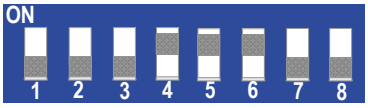
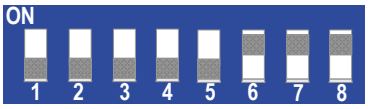
表 10-2 YD58IO1 扩展卡端子功能说明

端子标识		端子名称	功能说明	端子分布
CN4	+24V/COM	外接 24Vdc 电源	1、向外提供 +24V 电源，一般用作数字输入输出端子工作电源和外接传感器电源 2、最大输出电流：200mA	
	OP1	数字输入电源端子	1、出厂时 OP1 与 “+24V” 已用跳线 J8 连接 2、当要用外部电源时，OP1 需与外部电源连接，且必须把 J8 取掉。	
	DO2-CME	数字输出 2	1、光耦隔离，双极性开路集电极输出 2、输出电压范围：0V~24V 3、输出电流范围：0mA~50mA 注意：数字输出地 CME1 与数字输入地 COM 是内部隔离的，默认内部通过 J7 连接，当 DO2 想用外部电源驱动时，必须断开 J7。	
	CANH/CANL/COM	通讯接口端子	CANlink 协议通讯输入端子，隔离输入	
CN3	AI3-PGND	模拟量输入端子 3	1、光耦隔离输入，可接受差分电压输入和温度检测电阻输入 2、输入电压范围：DC -10V~10V 3、PT100，PT1000 温度传感器 4、用拨码开关 S1 决定输入方式，不能多种功能同时使用	
	AO2-GND	模拟输出 2	1、输出电压量的规格：0 V~10V 2、输出电流量的规格：0mA~20mA 3、输出电流量带阻抗规格：0Ω~500Ω	
	DI6-OP1~DI10-OP1	5 路数字输入	1、光耦隔离，兼容双极性输入 2、输入阻抗：2.4kΩ 3、电平输入时电压范围：9~30V	
	485+/485-/COM	通讯接口端子	MODBUS-RTU 协议通讯的输入、输出信号端子，隔离输入	
CN1	PA- PB	常闭端子	触点驱动能力： AC250V，3A，COSΦ=0.4。 DC 30V，1A	
	PA- PC	常开端子		

NOTE

- YD58I O1 的 RS485 通讯端子 485+/485-/COM 与 C ANlink 通讯端子与 CANH/CANL/COM 相互独立，可同时使用。

表 10-3 YD58IO1 扩展卡跳线说明

端子标识	端子名称	功能说明	跳线 / 拨码位置
J3	AO2 输出类型设置跳线	电压型 0 V~10V	
		电流型 0mA~20mA	
J4	CAN 终端匹配电阻设置跳线	进行终端电阻匹配	
		不进行终端电阻匹配	
S2	RS485 终端匹配电阻选择	1、2 拨为 ON 进行终端电阻匹配	
		1、2 拨为 OFF 不进行终端电阻匹配	
S1	AI、PT100、PT1000 功能选择	AI3：1、2、3 拨为 ON	
		PT1000：4、5、6 拨为 ON	
		PT100：6、7、8 拨为 ON	

NOTE

- 跳线的设置是将扩展卡以主接线端子为底侧时的俯视图为观察视角，另外跳线在板上有丝印，请以丝印为标准。
- 变频器主从运行使用 CAN 通信、变频器与显示屏使用 RS485 通讯时，第一台和最后一台变频器 IO1 扩展卡上的 CAN 及 RS485 均需匹配终端电阻（通过 J4 和 S2 进行匹配），中间变频器 IO1 扩展卡上的该跳线和拨码保持出厂状态（出厂默认为不跳）。跳线错误将会导致通讯不稳定或者不能通讯，报 ERR16（通讯故障）或者 ERR55（主从）故障。

10.2.2 YD58IO2 端子分布与功能说明

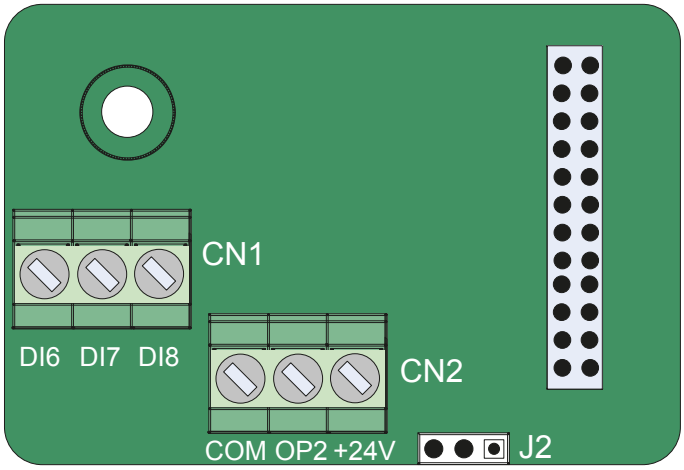


图 10-3 YD58IO2 端子分布示意图

表 10-4 YD58IO2 扩展卡端子功能

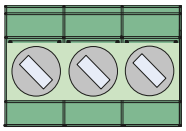
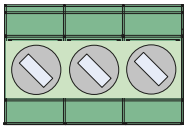
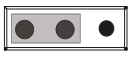
端子标识		端子名称	功能说明	端子分布
CN2	+24V/COM	外接 24Vdc 电源	1、向外提供 +24V 电源，一般用作数字输入输出端子工作电源和外接传感器电源 2、最大输出电流：200mA	 COM OP2 +24V
	OP2	数字输入电源端子	出厂时 OP2 无电源连接，可根据需要连接外部电源或 +24V 电源	
CN1	DI6-OP2~ DI8-OP2	3 路数字输入	1、光耦隔离，兼容双极性输入 2、输入阻抗：DI6、DI7 为 3.3kΩ，DI8 为 2.4kΩ 3、电平输入时电压范围：9~30V 4、DI6、DI7、DI8 为普通输入端子，输入频率 <100Hz	 DI6 DI7 DI8

表 11-5 YD58IO2 扩展卡跳线说明

端子标识	端子名称	功能说明	跳线 / 拨码位置
J2	DI 端子源漏型接线方式设置跳线	DI 端子采用漏极接线，OP2连接 24V	
		DI 端子采用源极接线，OP2连接 COM	

NOTE

- 跳线的设置是将扩展卡以主接线端子为底侧时的俯视图为观察视角，另外跳线在板上有丝印，请以丝印为标准。

10.2.3 YD58IO3 端子分布与功能说明

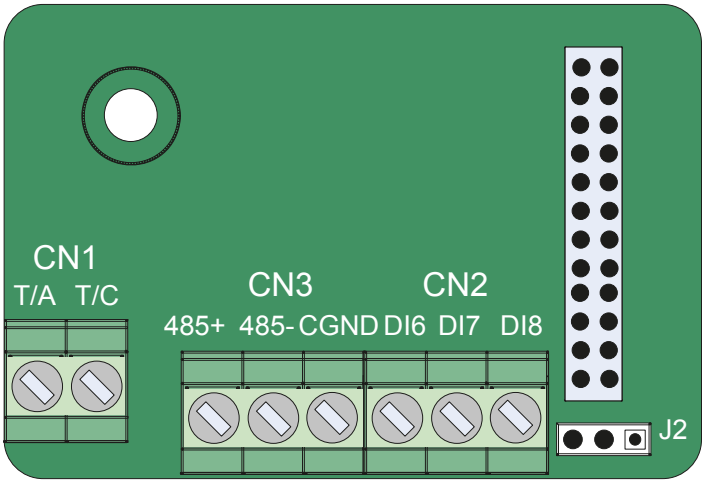


图 10-4 YD580IO3 端子分布示意图

表 10-6 YD580IO3 扩展卡端子功能

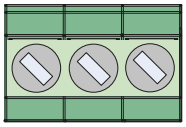
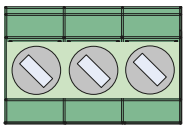
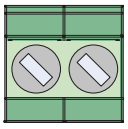
端子标识		端子名称	功能说明	端子分布
CN3	485+	485 通讯信号正端	支持 MODBUS 协议，隔离输入	485+ 485- CGND 
	485-	485 通讯信号负端		
	CGND	485 通讯信号地		
CN2	DI6 ~ DI8	3 路数字输入	1、光藕隔离，兼容双极性输入，最大输入频率为 100Hz 2、输入阻抗：3.4kΩ 3、电平输入时电压范围：9~24V	DI6 DI7 DI8 
CN1	T/A ~ T/C	常开端子	触点驱动能力： 250VAC/5A、 30VDC/5A	T/A T/C 

表 11-7 YD58IO3 扩展卡跳线说明

端子标识	端子名称	功能说明	跳线 / 拨码位置
J2	DI 端子源漏型接线方式设置跳线	DI 端子采用漏极接线，OP 连接 24V	
		DI 端子采用源极接线，OP 连接 COM	

NOTE

- 跳线的设置是将扩展卡以主接线端子为底侧时的俯视图为观察视角，另外跳线在板上有丝印，请以丝印为标准。

10.2.4 YD58PC1（可编程卡）端子分布与功能说明

YD58PC1 用户可编程卡是一款集成 PLC 功能的扩展卡。用户可以通过安装该扩展卡，使 YD580E系列变频器支持 PLC(用户可编程) 功能。YD58PC1 卡与变频器无缝连接。

该卡可访问变频器通用的参数，也可访问变频器内部的一些特殊变量。该卡还集成多路扩展 IO 和 RS-485通讯接口，使其比简单的 PLC+ 变频器的组合功能更强大。

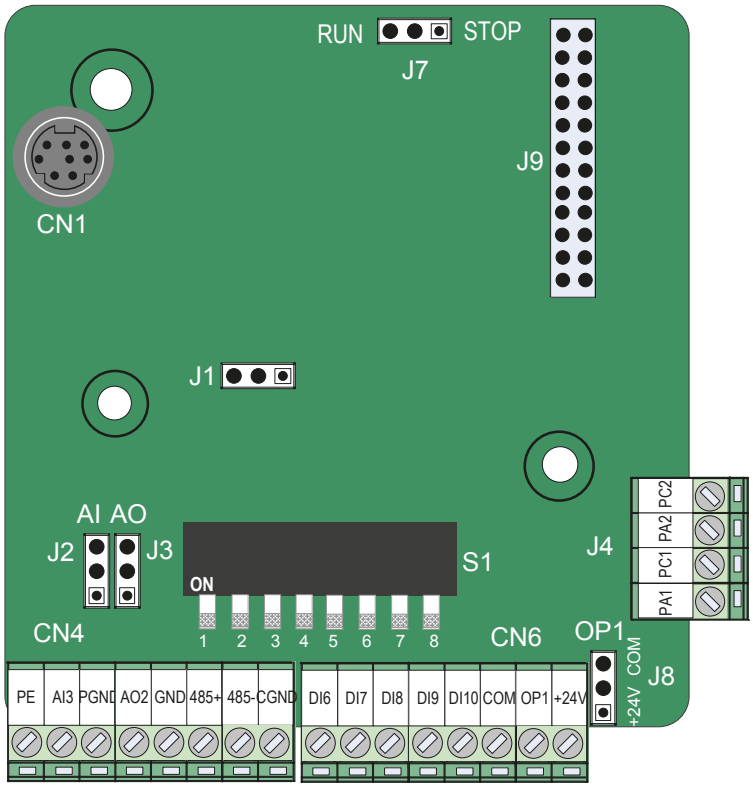
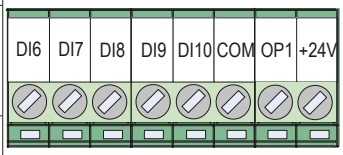


图 10-5 YD58PC1 端子分布示意图

表 10-8 YD58PC1

端子标识		端子名称	功能说明	端子分布
CN6	+24V/COM	外接 24Vdc 电源	1、向外提供 +24V 电源，一般用作数字输入输出端子工作电源和外接传感器电源 2、最大输出电流：200mA	
	OP1	数字输入电源端子	1、出厂时 OP1 与“+24V”已用跳线 J8 连接 2、当要用外部电源时，OP1 需与外部电源连接，且必须把 J8 取掉。	
	DI6-OP1 ~ DI10-OP1	5 路数字输入	1、光耦隔离，兼容双极性输入 2、输入阻抗：2.4kΩ 3、电平输入时电压范围：9~30V	

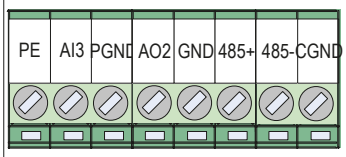
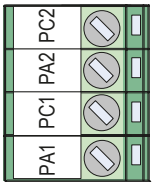
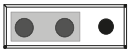
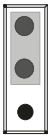
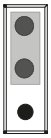
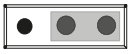
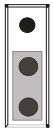
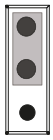
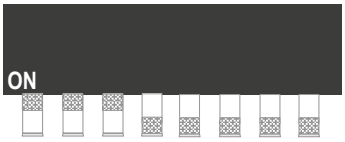
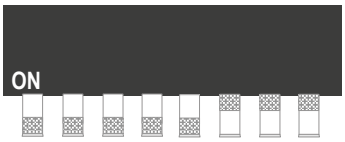
端子标识		端子名称	功能说明	端子分布
CN4	AO2-GND	模拟输出 2	1、输出电压量的规格：0V~10V 2、输出电流量的规格：0mA~20mA	
	AI3-PGND	模拟量输入端子3	1、光耦隔离输入，可接受差分电压输入、电流输入、温度检测电阻输入 2、输入电压范围：DC -10V~10V 3、输入电流范围：DC -20mA~20mA 4、PTC,PT100 温度传感器 5、用拨码开关 S1 决定输入方式，不能多种功能同时使用	
	485+/485-/CGND	通讯接口端子	MODBUS-RTU 协议通讯的输入、输出信号端子，隔离输入	
CN1	RS422	用户程序下载口	用户 PLC 程序下载	
J4	PA1- PC1	继电器 1 常开端子	触点驱动能力： AC250V，3A，COSΦ=0.4。 DC 30V，1A	
	PA2- PC2	继电器 2 常开端子		

表 10-9 YD58PC1 扩展卡跳线说明

端子标识	端子名称	功能说明	跳线 / 拨码位置
J1	RS485 终端匹配电阻选择	进行终端电阻匹配	
		不进行终端电阻匹配	
J2	AI3 输入选择 - 电压、电流	电压	
		电流	
J3	AO2 输出类型设置跳线	电压型 0 V~10V	
		电流型 0mA~20mA	
J7	RUN/STOP 选择	RUN	
		STOP	

端子标识	端子名称	功能说明	跳线 / 拨码位置
J8	OP1 连接方式选择	DI 端子采用漏极接线，OP1 连接 24V	
		DI 端子采用源极接线，OP1 连接 COM	
S1	AI、PT100、PTC 功能选择	AI3：1、2、3 拨为 ON	
		PTC：4、5、6 拨为 ON	
		PT100：6、7、8 拨为 ON	

NOTE

- 跳线的设置是将扩展卡以主接线端子为底侧时的俯视图为观察视角，另外跳线在板上有丝印，请以丝印为标准。

10.2.5 接线及注意事项

1) 关于数字输入、输出端子及模拟输入、输出端子的接与使用，请参考“3.2 接线”；
2) 关于 MODBUS 通讯请参考“11.3.3 RS-485 扩展卡（YD58TX1）端子分布与功能说明”与“附录B通讯”；
3) 关于 CAN 通讯使用请参考“11.3.1 CANlink 扩展卡（YD58CAN1）端子分布与功能说明”；
4) 在使用 CANlink 或 MODBUS 通讯时，如果通信距离较远或者节点较多时，末端的变频器则应接通终端电阻，CGND 是 CANlink 或 MODBUS 通讯的地线接线端子。

10.3 通讯扩展卡的使用

10.3.1 CANlink 扩展卡（YD58CAN1）端子分布与功能说明

10.3.1.1 YD58CAN1 端子分布与功能说明

YD58CAN1 通讯卡是设计用于 YD580E 系列变频器进行 CAN 通讯网络的扩展卡，可让变频器接入高速的 CAN、CANlink 通讯网络，实现现场总线的控制。

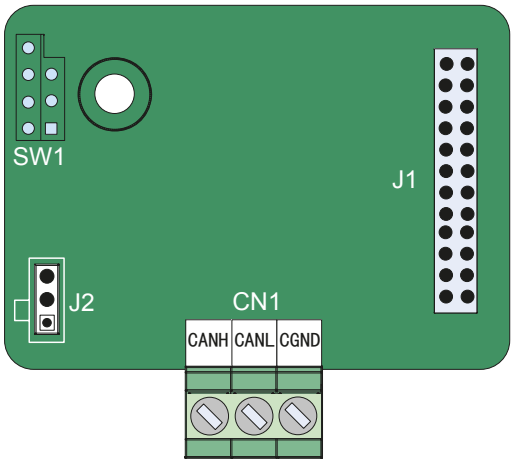


图 10-6 YD58CAN1 端子分布示意图

表 10-10 YD58CAN1 扩展卡端子功能说明

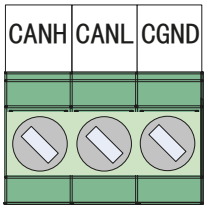
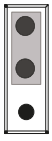
端子标识		端子名称	功能说明	端子分布
CN1	CANH	CAN 正输入	连接 CAN 总线正极端	
	CANL	CAN 负输入	连接 CAN 总线反极端	
	CGND	电源地	连接所有 CAN 节点的参考地	

表 10-11 YD58CAN1 扩展卡跳线说明

端子标识	端子名称	功能说明	跳线 / 拨码位置
J2	CAN 终端匹配电阻设置跳线	进行终端电阻匹配	
		不进行终端电阻匹配	

NOTE

- 跳线的设置是将扩展卡以主接线端子为底侧时的俯视图为观察视角，另外跳线在板上有丝印，请以丝印为标准。

10.3.1.2 CANlink 总线使用说明

1） CANlink 连接方式

CANlink 总线连接拓扑结构如图 10-7 所示，CAN 总线推荐使用带屏蔽双绞线连接，CANH、CANL 采用双绞线连接；只在总线两端分别连接 120Ω 终端匹配电阻防止信号反射；所有节点 CAN 信号的参考地连接在一起；最多连接 64 个节点，每个节点支线的距离要小于 0.3M。

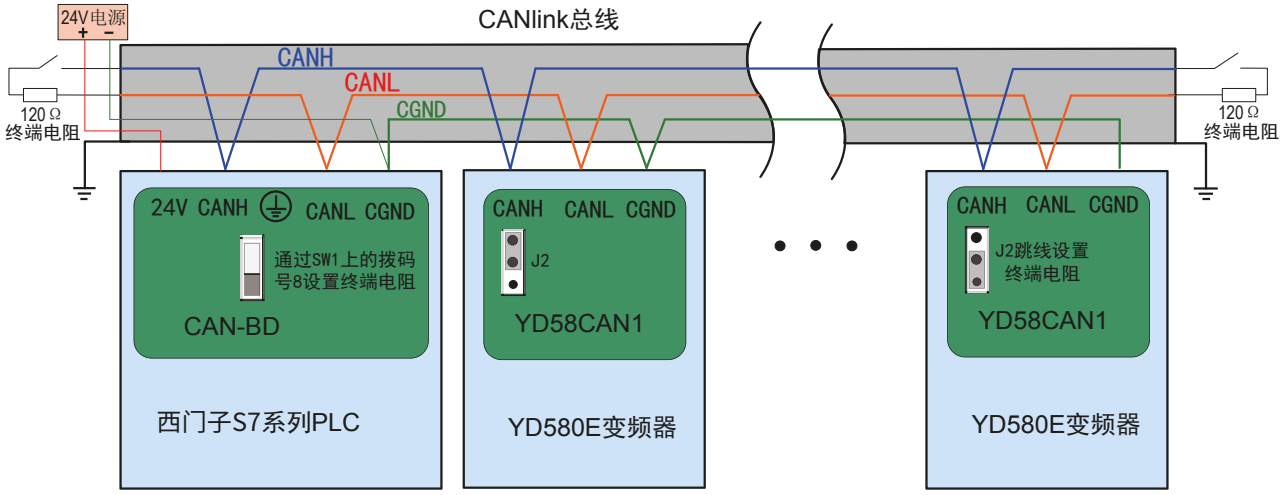
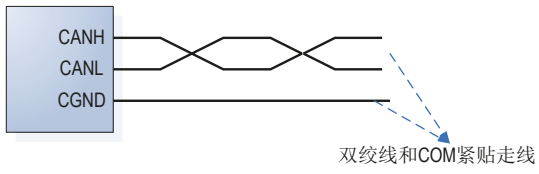
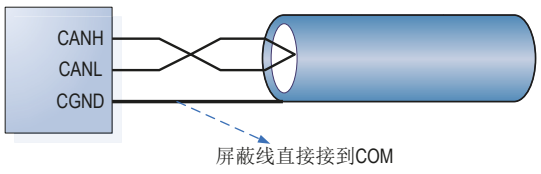


图 11-7 CANlink 总线连接拓扑结构

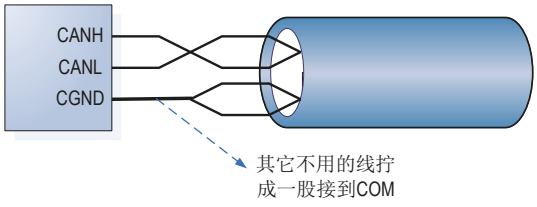
现场不同线缆的推荐使用方式：



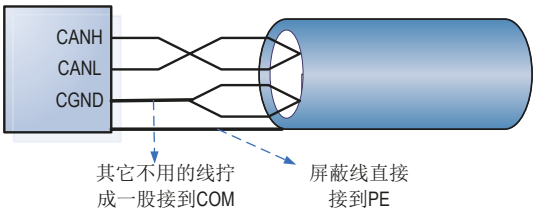
（1）单芯自绕线缆



（2）双芯双绞带屏蔽



（3）多芯双绞非屏蔽



（4）多芯双绞带屏蔽

2） CANlink 传输距离

CANlink 总线的传输距离与波特率、通讯电缆有直接关系，最大总线线路长度与波特率关系如下表所示：

序号	传输距离	速率	节点数	线径
1	25m	1Mbps	64	0.205mm^2
2	95m	500kbps	64	0.34mm^2
3	560m	100kbps	64	0. 5mm^2
4	1100m	50kbps	64	0.75mm^2

NOTE

● 关于 CANlink 扩展卡（YD58CAN1）的详细信息，请参见《YD580E 系列 CAN 通信扩展卡说明书》。

10.3.2 CANopen 扩展卡（YD58CAN2）端子分布与功能说明

YD58CAN2 通讯卡是设计用于 YD580E 系列变频器进行 CAN 通讯网络的专用扩展卡，可让变频器接入高速的 CAN 通讯网络，实现现场总线的控制。CANopen 是国际通用的现场总线标准，支持该协议的设备均可接入 CANopen 网络。

YD58CAN2 卡支持 5 种协议，说明如下：

- 支持 Node Guard 协议，主站可使用此功能查询设备状态；
- 支持 Heartbeat 协议，由从站定时向主站报告当前状态；
- SDO 仅支持加速传送机制，每次传输 1 个参数 2 个字节；
- 支持 3 个 TPDO、3 个 RPDO；
- 支持紧急对象；

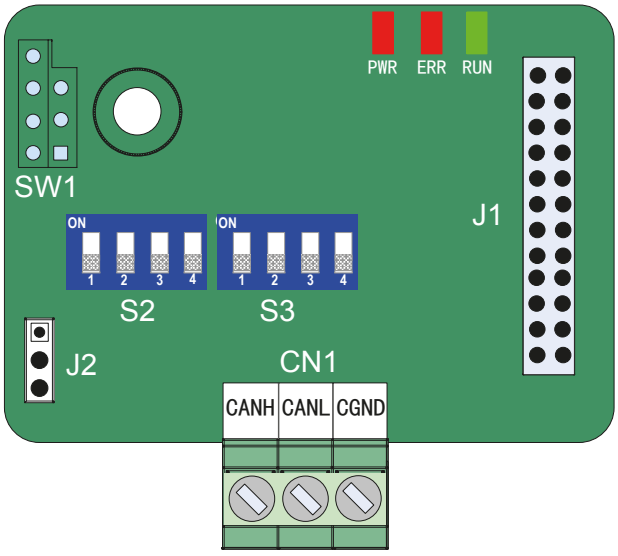


图 10-8 YD58CAN2 端子分布示意图

表 10-12 YD58CAN2 扩展卡端子功能说明

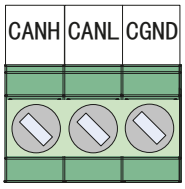
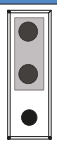
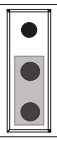
端子标识		端子名称	功能说明	端子分布
CN1	CANH	CAN 正输入	连接 CAN 总线正极端	
	CANL	CAN 负输入	连接 CAN 总线反极端	
	CGND	电源地	连接所有 CAN 节点的参考地	

表 10-13 YD58ICAN2 扩展卡跳线说明

端子标识	端子名称	功能说明	跳线 / 拨码位置
J2	CAN 终端匹配电阻设置跳线	进行终端电阻匹配	
		不进行终端电阻匹配	

NOTE

- 跳线的设置是将扩展卡以主接线端子为底侧时的俯视图为观察视角，另外跳线在板上有丝印，请以丝印为标准。

表 10-14 YD58CAN2 扩展卡拨码开关说明

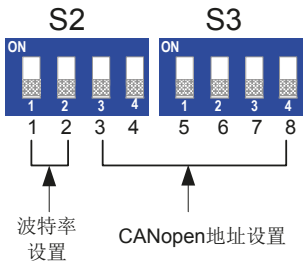
波特率		定义	地址设置						定义	拨码开关
1	2		3	4	5	6	7	8		
0	0	125Kbps	0	0	0	0	0	0	保留	
			0	0	0	0	0	1	1	
0	1	250Kbps	0	0	0	0	1	0	2	
			0	0	0	0	1	1	3	
1	0	500Kbps	…						…	
			1	1	1	1	0	1	61	
1	1	1Mbps	1	1	1	1	1	0	62	
			1	1	1	1	1	1	63	

表 10-15 YD58CAN2 状态指示灯说明

指示灯状态	说明
PWR	灯亮：上电正常
PWR	灯灭：上电不正常，请检测安装是否正常
ERR	灯亮：内部变频器通讯超时
ERR	慢闪：CANopne 紧急报文变频器故障
ERR	快闪：CANopen 地址设置错误
RUN	灯灭：CANopen 进入 Stopped
RUN	灯亮：CANopen 进入 Operational
RUN	闪烁：CANopen 进入 Pre-Operational

NOTE

- CANopen 的拓扑结构和接线与 C ANlink 总线相同，请参照“10.3.1 CANlink 扩展卡（YD58CAN1）端子分布与功能说明”。
- 关于 CANopen 扩展卡（YD58C AN2）的详细信息，请参见《YD580 系列 CANOpen 扩展卡说明书》的介绍。

10.3.3 RS-485 扩展卡（YD58TX1）端子分布与功能说明

10.3.3.1 YD58TX1 端子分布与功能说明

YD58TX1 通讯卡是为 YD580E 系列变频器提供 485 通讯功能而专门研制，采用隔离方案，电气参数符合国际标准，用户可根据需要选用，以实现远程串口方式控制变频器运行及参数设定等功能。

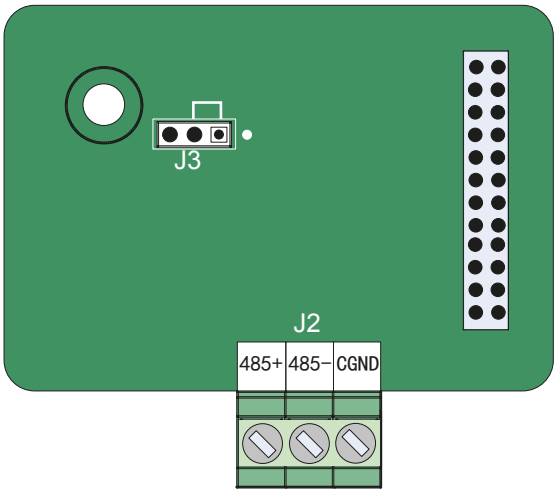


图 10-9 YD58TX1 端子分布示意图

表 10-16 YD58TX1 扩展卡端子功能说明

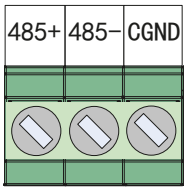
端子标识		端子名称	功能说明	端子分布
J2	485+	485 通讯信号正	485 通讯输入端子，隔离输入	
	485-	485 通讯信号负	485 通讯输入端子，隔离输入	
	CGND	485 通讯信号参考地	电源为隔离电源	

表 10-17 YD58TX1 扩展卡跳线说明

端子标识	端子名称	功能说明	跳线 / 拨码位置
J3	485 通讯终端电阻设置跳线	进行终端电阻匹配	
		不进行终端电阻匹配	

NOTE

- 跳线的设置是将扩展卡以主接线端子为底侧时的俯视图为观察视角，另外跳线在板上有丝印，请以丝印为标准。

10.3.3.2 RS485 通讯总线使用说明

1） RS485 连接拓扑

RS485 总线连接拓扑结构如 C.5-2 所示，485 总线推荐使用带屏蔽双绞线连接，485+、485- 采用双绞线连接；只在总线两端分别连接 120Ω 终端匹配电阻防止信号反射；所有节点 485 信号的参考地连接在一起；最多连接 128 个节点，每个节点支线的距离要小于 3M。

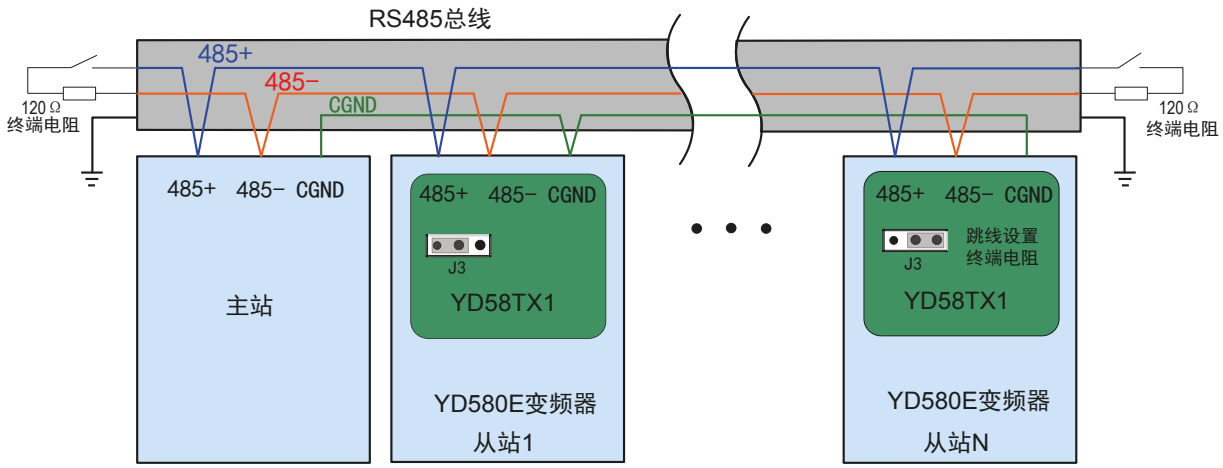
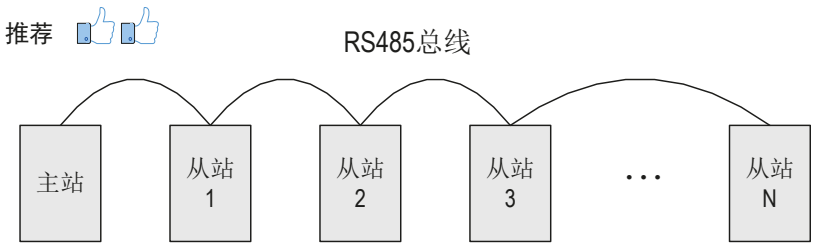


图 11-10 RS485 总线连接拓扑结构

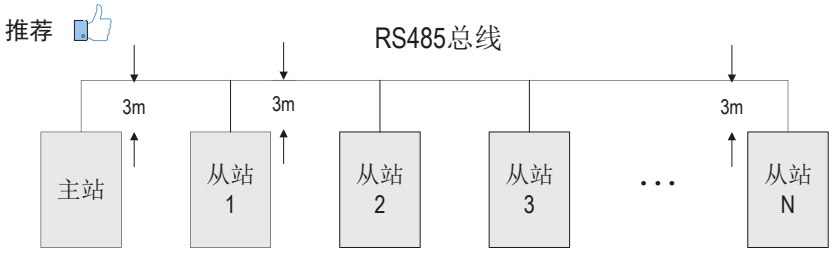
2） 多节点连接方式

当节点数较多时，485 总线一定要是菊花链连接方式。如果需要分支线连接，总线到节点间的分支长度越短越好，建议不超过 3m，坚决杜绝星型连接。常见总线结构示意图如下：

◆ 菊花链连接结构

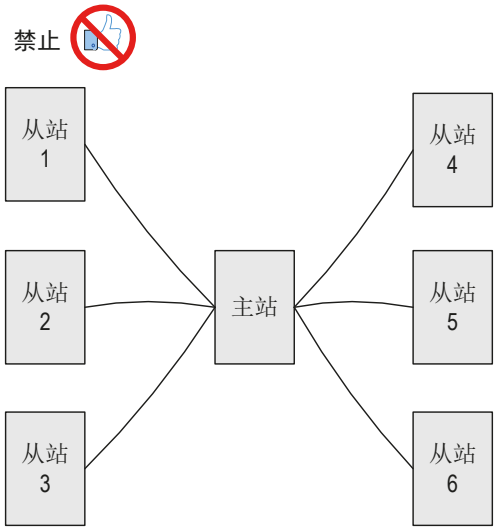


◆ 采用分支线连接



注意：分支线建议不要超过 3m。

◆ 星形接线方式（禁止使用）

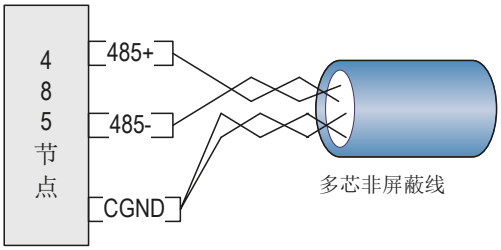


3） 端子接线方式

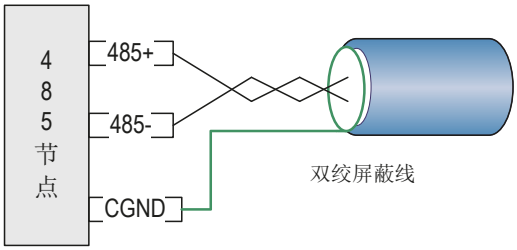
◆ 对端口有 CGND 接线点的节点

YD58TX1 有三根连接线缆，依次连接 485+，485-，CGND 三个端子。请检查现场 485 总线是否包含三根线缆，且接线端子没有接反或者接错。如果使用的是屏蔽线缆，尤其需注意，屏蔽层也必须接 CGND 端子，在任何节点或者中途位置，除了接节点的 CGND，屏蔽层都禁止接其它任何地方（包括现场机壳，设备接地端子等都不能接）。

由于线缆的衰减作用，建议对连接长度大于 3m 的线缆都使用 AGW26 或者更粗的线缆，任何时候都建议 485+ 和 485- 连接线缆使用双绞线缆。



a 多芯非屏蔽线

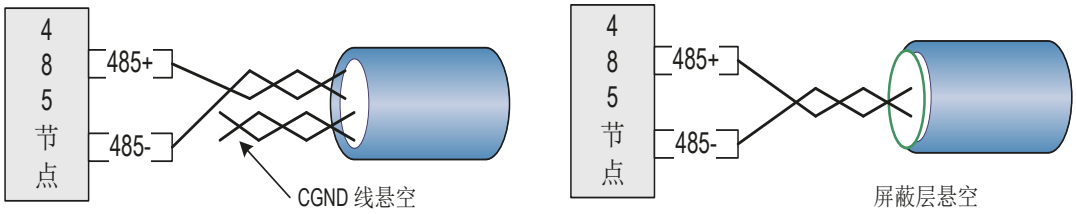


b 双绞屏蔽线

- 推荐接线线缆 1：带双绞线缆的多芯线缆，取其中一对双绞线作为 485+ 和 485- 的连接线，其它多余线缆拧在一起作为 CGND 的连接线。
- 推荐接线线缆 2：带屏蔽层的双绞线缆，双绞线作为 485+ 和 485- 的连接线，屏蔽层作为 CGND 的连接线。
- 对于采用屏蔽线作为连接线缆的场合，尤其需注意，屏蔽层只能接 CGND，不能接现场大地。

◆ 对于某些没有 CGND 接线点的节点

对于某些没有 CGND 接线点的节点，不能简单的将 CGND 或者屏蔽层直接接到节点的 PE 上，需按如下方法进行处理：



a 多芯非屏蔽线　　b 双绞屏蔽线

- 处理方法一：在这个节点其它端口寻找是否有与 485 电路共用的参考地，如果有，总线的 CGND 线缆（屏蔽层）直接接到这个 Pin 脚即可；
- 处理方法二：在节点单板上找到 485 电路的参考地，引线出来接 CGND 或者屏蔽层；
- 处理方法三：如果实在找不到 485 电路的参考地，如上图 CGND 线缆或者屏蔽层悬空，同时使用额外的接地线将这个节点和其它节点的 PE 连起来。

4） 传输距离与节点数

标准 RS485 电路在不同速率下支持的最大节点数和传输距离如下表所示

序号	速率	传输距离	节点数	线径
1	115.2kbps	100m	128	AWG26
2	19.2kbps	1000m	128	AWG26

注：关于 Modbus 通讯协议请参考附录 C。

10.3.4 Profibus-DP 扩展卡 (YD58DP2) 端子分布与功能说明

10.3.4.1 YD58DP2 端子分布与功能说明

YD58DP2 卡是 Profibus-DP 现场总线适配卡，符合国际通用的 Profibus 现场总线标准。该卡安装到 YD580E 变频器上，提高通讯效率，便于实现变频器组网功能，使变频器成为现场总线的从站，接受现场总线主站控制。YD58DP2 卡不仅可以实现 Profibus-DP 通讯，还提供了 CANlink 通讯接口，实现 CANlink 通讯功能。

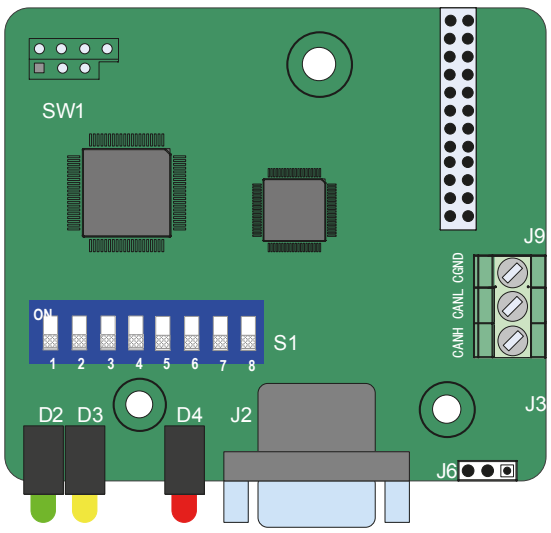


图 10-11 YD58DP2 端子分布示意图

表 10-18 YD58DP2 扩展卡端子功能说明

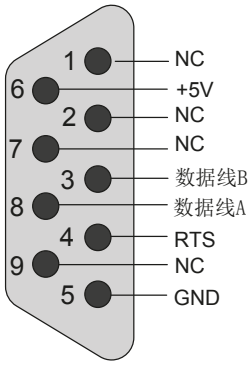
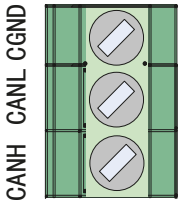
端子名称标识	引脚号	引脚定义	功能说明	端子分布
J2 Profibus 通信端子	1、2、7、9	NC	内部悬空	
	3	数据线 B	数据线正极	
	4	RTS	请求发送信号	
	5	GND	隔离 5V 电源地	
	6	+5V	隔离 5V 电源	
	8	数据线 A	数据线负极	
J3、J9 CANlink 通信端子	CANH	CAN 正输入	数据线正极	
	CANL	CAN 负输入	数据线负极	
	GND	电源地	隔离 5V 电源地	

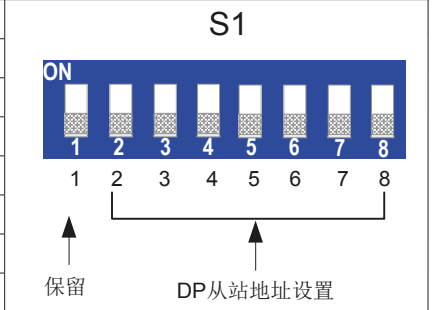
表 11-19 表 10-19 YD58DP2 状态指示灯说明

指示灯	状态	说明
D4 电源指示灯		灯亮：上电正常
		灯灭：上电不正常，请检测安装是否正常
D3 DP 卡与主站通讯指示灯		灯亮：表示 DP 卡与 Profibus 主站通讯正常；
		闪烁：表示主站未运行或 DP 卡和 Profibus 主站通讯有错误
		灯灭：表示 DP 卡和 Profibus 主站无通讯 (检查 Profibus 电缆连接和站号);
D2 DP 卡与变频器通讯指示灯		灯亮：表示 DP 卡和变频器通讯正常；
		闪烁: 表示 DP 卡和变频器通讯有干扰存在或扩展卡地址不在 1~125 范围内;
		灯灭：表示 DP 卡和变频器通讯不成功 (检查波特率设置是否正确)。

表 10-20 YD58DP2 扩展卡跳线说明

端子标识	端子名称	功能说明	跳线 / 拨码位置
J6	CANlink 通讯终端电阻设置跳线	进行终端电阻匹配	
		不进行终端电阻匹配	

表 10-21 YD58DP2 扩展卡拨码开关说明

Profibus-DP 通讯从站地址设置								从站地址	拨码开关
1	2	3	4	5	6	7	8		
DP 卡类型切换，出厂默认为“OFF：YD58DP2”	0	0	0	0	0	0	0	保留	
	0	0	0	0	0	0	1	1	
	0	0	0	0	0	1	0	2	
		0	0	0	0	1	1	3	
		...						...	
	1	1	1	1	1	0	1	123	
	1	1	1	1	1	1	0	124	
	1	1	1	1	1	1	1	125	

【注】：拨码位号 1 为 ON 时表示 YD58DP1，改变该位号，需重新上电才生效，改变从站地址拨码，无需重新上电。

10.3.4.2 Profibus-DP 通讯总线使用说明

DP 卡与 Profibus 主站的接线示意图如下图所示：

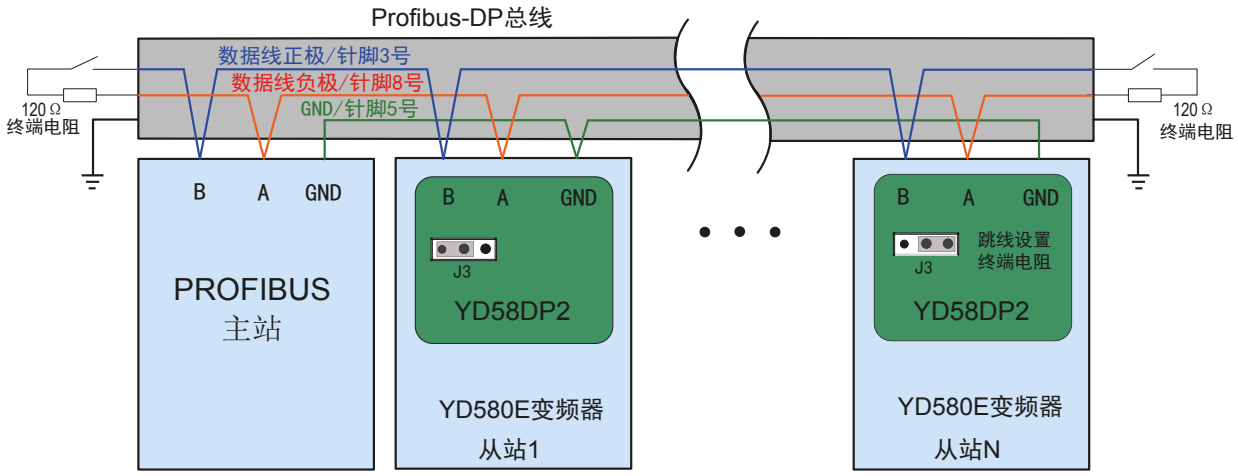


图 10-12 YD58DP2 卡与 Profibus 主站的连接示意图

在 Profibus 总线终端需要接入终端匹配电阻，需根据接线端子上的示意拨动拨码。系统的 PE 级一定要可靠的接地。

根据主站通讯波特率设置的不同，DP 卡与 Profibus 主站通讯导线的长度也有要求，须严格的按 照 SIEMENS 的 DB9 接线标准限制通讯数据导线长度。波特率与导线长度要求如下表所示：

传输率 Kbps	导线 A 最大长度 (m)	导线 B 最大长度 (m)
9.6	1200	1200
19.2	1200	1200
187.5	600	600
500	200	200
1500	100	70
3000	100	不支持
6000	100	不支持
12000	100	不支持

NOTE

- 关于 Profibus-DP 扩展卡 (YD58DP2) 的详细信息，请参见《YD580E 系列 YD58DP2 Profibus 接口卡说明书》的介绍。

11.3.4 Profinet 通讯扩展卡 (YD580-PN1) 端子分布与功能说明

YD580PN 卡是 Profinet 现场总线适配卡，符合国际通用的 Profinet 以太网标准。

该卡安装到 YD580E 系列变频器上，提高通讯效率，便于实现变频器组网功能，使变频器成为现场总线的从站，接受现场总线主站控制。

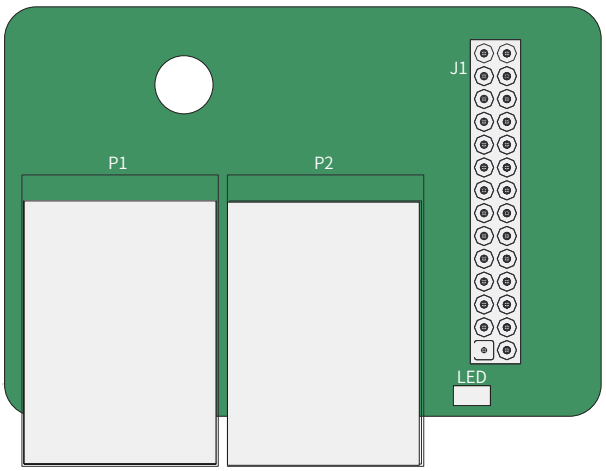


图 10-13 YD580PN 卡端子分布示意图 表

10-22 YD580PN 卡端子功能说明

端子标识	端子名称	功能说明
P1	Port 1	接线端子，无方向，任一个与近 PLC 端相连都可以。 485 通讯输入端子，隔离输入
P2	Port 2	
J1	排针插头	用于与变频器连接

表 10-23 YD580PN 卡指示灯状态说明

指示灯标识	指示灯名称	状态说明
LED	电源指示灯	亮：表示上电正常； 不亮：表示上电不正常，请检测安装是否正确。

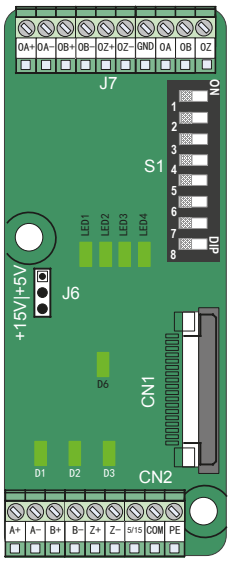
NOTE

- 关于 P rofinet 通讯扩展卡 (YD580- PN1) 的详细信息，请参见《YD580E 系列 Profinet 扩展卡说明书》的介绍。

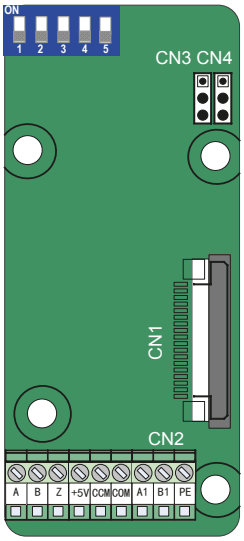
10.4 编码器扩展卡的使用

10.4.1 编码器扩展卡规格

YD58PGMD



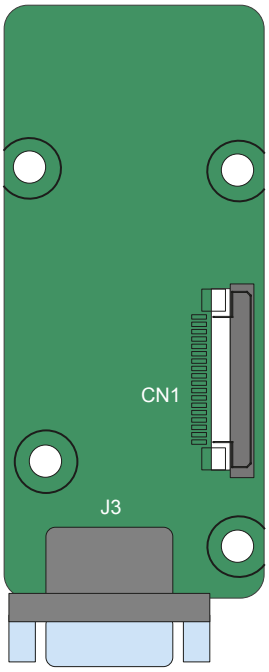
YD58PG5D



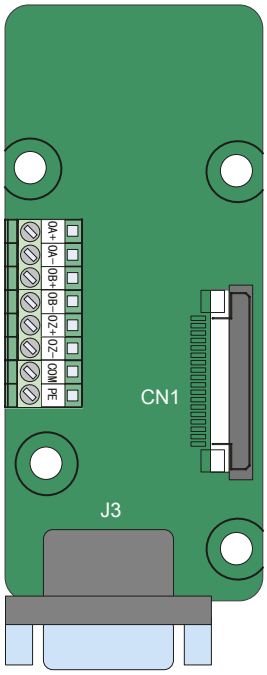
YD58PG5 规格	
编码器供电电源	5V/200mA，15V/100mA
最高输入频率	差分：500kHz，集电极：100kHz
编码器接口类型	支持差分、集电极、推挽
分频接口类型	支持差分、集电极
线规	16~26AWG 具体线规选择参考 11.4.2 小节内容
端子间距	3.5mm
端子螺丝	一字
端子形式	斜插端子台
分频范围	0~63

YD58PG5D 规格	
用户接口	斜插端子台
间距	3.5mm
螺钉	一字
拔插	否
线规	16-26AWG
最大速率	100kHz
分频范围	2~62 偶数

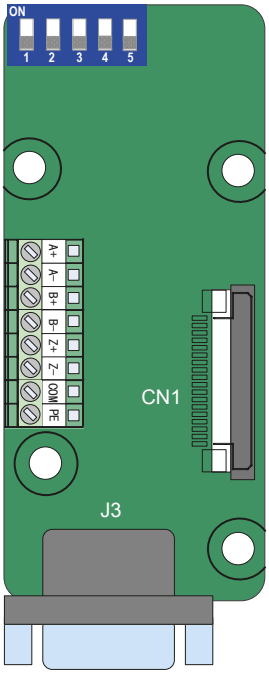
YD58PG4



YD58PG6



YD58PG6D



YD58PG4 规格	
用户接口 J3	DB9 母座
拔插	是
线规	21AWG-26AWG
分辨率	12 位
激励频率	10kHz
VRMS	7V
VP-P	3.15±27%
分频范围	不带分频

YD58PG6 规格	
用户接口 J3	DB9 母座
拔插	是
线规	21AWG-26AWG
最大速率	500kHz
输入差分信号幅度	≤ 7V
用户接口 J7，J8	斜插端子台
间距	3.5mm
螺钉	一字
插拔	否
分频速率	500kHz
分频范围	1：1

YD58PG6D 规格	
用户接口 J3	DB9 母座
拔插	是
线规	21AWG-26AWG
最大速率	500kHz
输入差分信号幅度	≤ 7V
用户接口 J7，J8	斜插端子台
间距	3.5mm
螺钉	一字
插拔	否
分频速率	500kHz
分频范围	2~62 偶数

10.4.2 多功能 PG 卡 (YD58PGMD)

表 10-24 YD58PGMD 端子功能说明

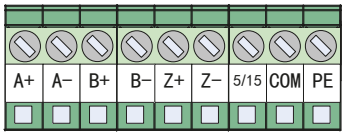
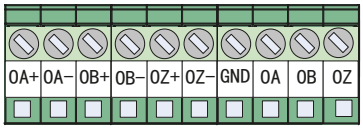
端子标识		功能说明	端子分布
CN2	A+	编码器输出 A 信号正	
	A-	编码器输出 A 信号负	
	B+	编码器输出 B 信号正	
	B-	编码器输出 B 信号负	
	Z+	编码器输出 Z 信号正	
	Z-	编码器输出 Z 信号负	
	5V/15V	编码器 5V/15V 供电电源	
	COM	编码器供电电源地	
	PE	屏蔽层接线端	
J7	OA+	差分分频输出 A 信号正	
	OA-	差分分频输出 A 信号负	
	OB+	差分分频输出 B 信号正	
	OB-	差分分频输出 B 信号负	
	OZ+	差分分频输出 Z 信号正	
	OZ-	差分分频输出 Z 信号负	
	GND	分频输出参考地	
	OA	集电极分频输出 A 信号	
	OB	集电极分频输出 B 信号	
	OZ	集电极分频输出 Z 信号	
CN1	18Pin FFC 软排线接口，连接变频器控制板的 J4		

表 10-25 YD58PGMD 拨码开关说明

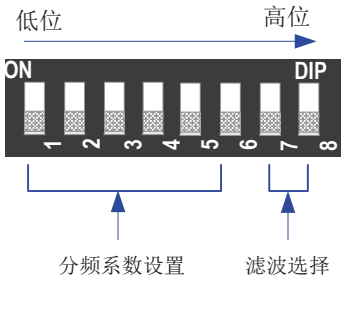
滤波选择		定义	地址设置						数值	分频系数	拨码开关
8	7		6	5	4	3	2	1			
0	0	非自适应滤波	0	0	0	0	0	0	保留	无输出	
			0	0	0	0	0	1	1	1 分频	
0	1	自适应滤波	0	0	0	0	1	0	2	2 分频	
			0	0	0	0	1	1	3	3 分频	
1	0	固定互锁	...								
			1	1	1	1	0	1	61	61 分频	
1	1	自动互锁	1	1	1	1	1	0	62	62 分频	
			1	1	1	1	1	1	63	63 分频	

表 10-26 YD58PGMD 指示灯状态说明

指示灯名称	指示灯状态	状态说明
D1/D2/D3 编码器输入信号指示灯		常亮或闪烁：编码器有信号输入
		灯灭：编码器无信号输入
D6 电源指示灯		灯亮：正常
		灯灭：电源无连接
LED1 编码器输入信号质量指示灯		灯灭：输入信号正常，速度很稳定或者没有干扰
		灯亮：输入信号轻微不稳定，通常在电机加减速或者编码器输入信号受到轻微干扰时出现
		慢闪：输入信号中度不稳定，通常在电机加减速或者编码器输入信号受到中度干扰时出现
		快闪：编码器输入信号严重不稳定，通常在电机加减速很快或者编码器输入信号受到严重干扰时出现
LED2 PG 卡信号处理质量指示灯		灯灭：PG 卡信号正常，速度稳定或者没有干扰
		灯亮：PG 卡信号轻微不稳定，通常在电机加减速或者 PG 卡没有能够完全过滤掉编码器输入信号中的干扰，但是不多 (单位时间内没有过滤掉的干扰脉冲小于 10 个)
		慢闪：PG 卡信号中度不稳定，通常在电机加减速或者 PG 卡没有能够完全过滤掉编码器输入信号中的干扰，有一定数目 (单位时间内没有过滤掉的干扰脉冲小于 30 个)
		快闪：PG 卡信号严重不稳定，通常在电机加减速或者 PG 卡没有能够完全过滤掉编码器输入信号中的干扰，有一定数目 (单位时间内没有过滤掉的干扰脉冲大于 30 个)
LED3 互锁状态指示灯		灯灭：禁止互锁功能
		灯亮：使能互锁功能
LED4 系统工作指示灯		灯灭：系统不工作或异常
		闪烁：编码器线缆出现断线
		灯亮：系统正常工作

10.4.3 旋转变压器 PG 卡 (YD58PG4)

表 10-27 YD58PG4 端子功能说明

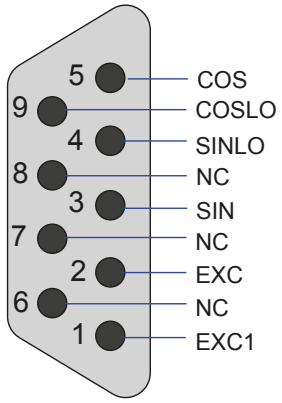
端子标识	引脚号	引脚定义	功能说明	端子分布
J3	1	EXC1	旋转变压器激励负	
	2	EXC	旋转变压器激励正	
	3	SIN	旋转变压器反馈 SIN 正	
	4	SINLO	旋转变压器反馈 SIN 负	
	5	COS	旋转变压器反馈 COS 正	
	6、7、8	NC	内部悬空	
	9	COSLO	旋转变压器反馈 COS 负	
CN1	18Pin FFC 软排线接口，连接变频器控制板的 J4			

表 10-28 YD58PG4 指示灯状态说明

故障指示灯	YD58PG4 故障状态	故障原因及对策
	正常	无
	锁相环失锁	一般是所选的旋转变压器的相位滞后过大引起。
	信号 SIN/COS 幅值超出上限	通常 D6 闪烁都是干扰引起的。将电机良好接地以及将 PG 卡上面的接地点接到变频器的 PE 端子可以有效解决。
	信号 SIN/COS 幅值过小	一般是 DB9 接头没有接上或者接错、甚至断线。若检查发现并没有出现上述情况，需要检查旋变变压器选型与 YD58PG4 是否匹配。

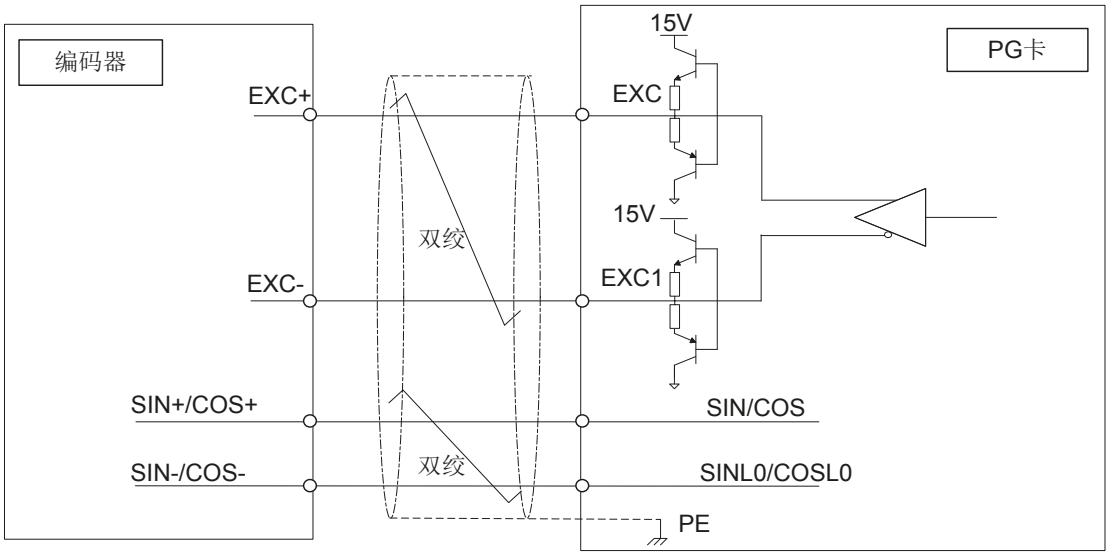


图 10-14 YD58PG4 接口回路

NOTE

- 旋转变压器的选型必须要满足 YD58PG4 的参数要求，特别是激励的输入直流电阻必须要大于17Ω（可用万用表测量），否则 YD58PG4 不能正常工作；
- 为避免选择过高的极对数的旋转变压器会使得 YD58PG4 处于过载状态，建议不要选用极对数高于 4 对极的旋转变压器。

10.4.4 开集电极输入 PG 卡 (YD58PG5D)

表 10-29 YD58PG5D 端子功能说明

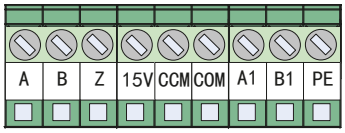
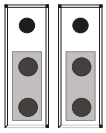
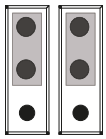
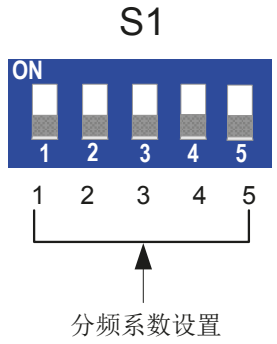
端子标识		端子说明	端子分布
CN2	A	编码器输出 A 信号	
	B	编码器输出 B 信号	
	Z	编码器输出 Z 信号	
	15V	对外提供 15V/100mA 电源	
	COM	电源地以及分频输出地	
	COM	电源地以及分频输出地	
	A1	PG 卡分频输出 A 信号（OC 输出， 0V~24V，0mA~50mA）	
	B1	PG 卡分频输出 B 信号（OC 输出，0V~24V，0mA~50mA）	
	PE	屏蔽接线端	
CN3 CN4	“脉冲+方向”功能设置跳线	支持“脉冲 + 方向”功能 脉冲信号接 A 相，方向信号接 B 相	CN3  CN4
		不支持“脉冲 + 方向”功能（默认设置）	CN3  CN4
CN1	18Pin FFC 软排线接口，连接变频器控制板的 J4		

表 10-30 表 11-28 YD58PG5D 拨码开关说明

拨码开关设置					数值	分频系数	拨码开关
1	2	3	4	5			
0	0	0	0	0	0	无输出	
0	0	0	0	1	1	无输出	
0	0	0	1	0	2	4 分频	
0	0	0	1	1	3	6 分频	
…							
1	1	1	1	1	31	62 分频	

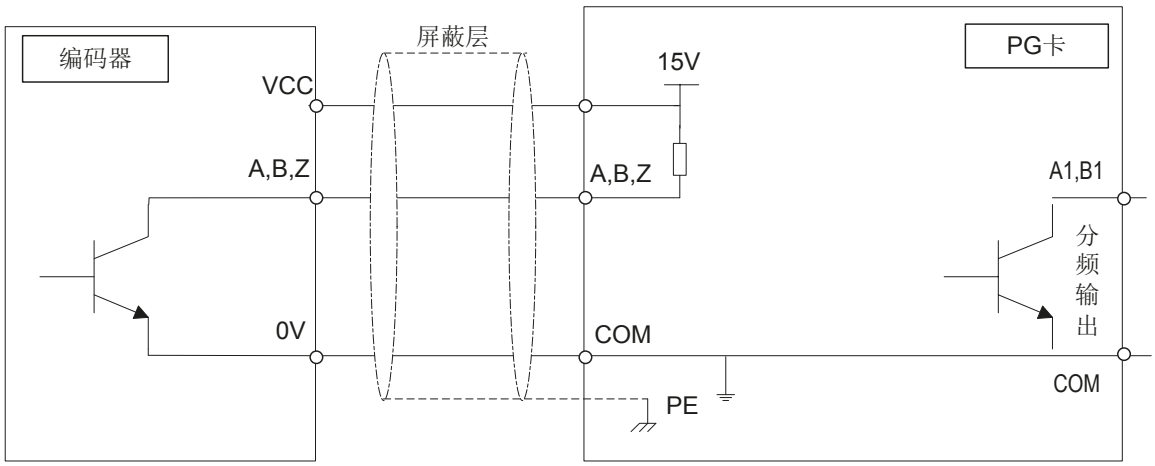


图 11-15 YD58PG5D 接口回路

10.4.5 带分频输出的差分 PG 卡 (YD58PG6、YD58PG6D)

表 11-31 YD58PG6、YD58PG6D 端子功能说明

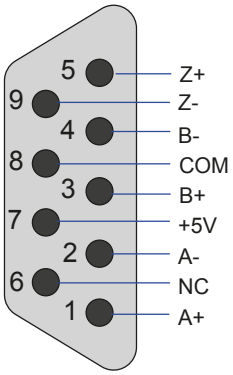
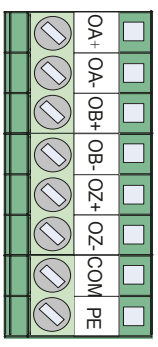
端子标识	引脚号	引脚定义	功能说明	端子分布
J3	1	A+	编码器 A 信号正	
	2	A-	编码器 A 信号负	
	3	B+	编码器 B 信号正	
	4	B-	编码器 B 信号负	
	5	Z+	编码器 Z 信号正	
	6	空	内部悬空	
	7	+5V	编码器 5 伏电源正	
	8	COM	编码器电源负	
	9	Z-	编码器 Z 信号负	
J7、J8	OA+		分频输出 A 信号正	
	OA-		分频输出 A 信号负	
	OB+		分频输出 B 信号正	
	OB-		分频输出 B 信号负	
	OZ+		分频输出 Z 信号正	
	OZ-		分频输出 Z 信号负	
	COM		信号电源地	
	PE		屏蔽接线端子	
CN1	18Pin FFC 软排线接口，连接变频器控制板的 J4			

表 10-32 YD58PG6D 拨码开关说明

拨码开关设置					数值	分频系数	拨码开关
1	2	3	4	5			
0	0	0	0	0	0	无输出	S1 ON 1 2 3 4 5 1 2 3 4 5 分频系数设置
0	0	0	0	1	1	无输出	
0	0	0	1	0	2	4	
0	0	0	1	1	3	6	
…					…	…	
1	1	1	1	1	31	62	

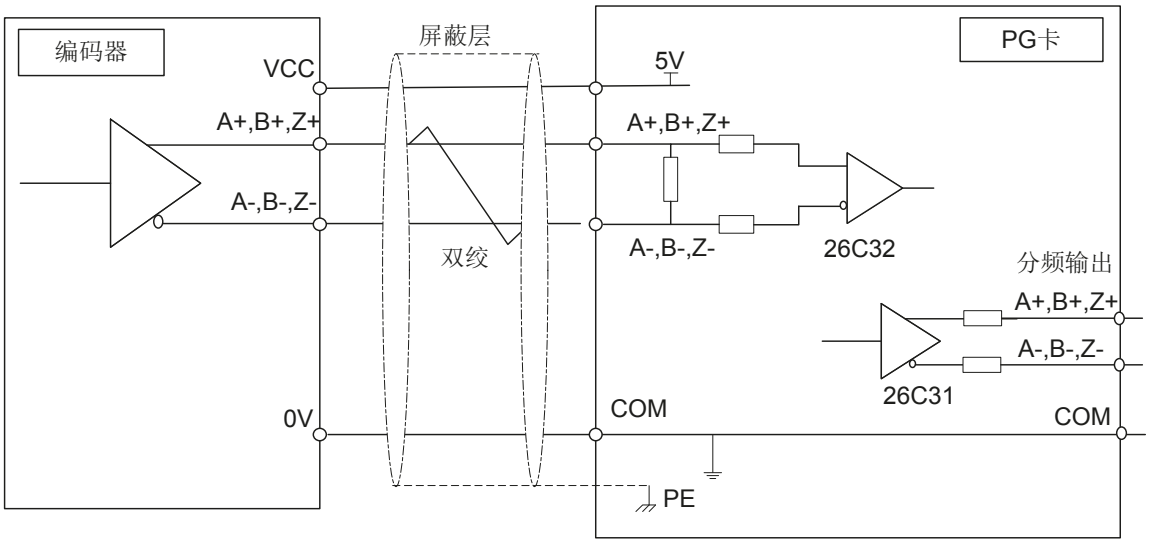
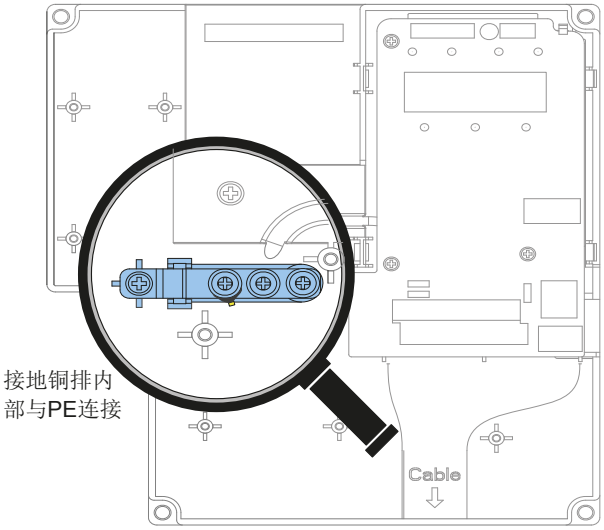


图 10-16 YD58PG6/YD58PG6D 接口回路

10.4.6 PG 卡屏蔽层接地说明

变频器软件参数正确设置的前提下，如果发现 PG 卡反馈的速度或者位置不稳定，说明 PG 卡受到电磁干扰。将编码器信号线的屏蔽层接到变频器的 PE 接地点可以有效抑制电磁干扰。



YD580E 在结构上进行了整机接地处理，在完成 PG 卡安装后，可实现与 PG 卡 PE 端子的内部连接；进行编码器接线时，只需将信号线的屏蔽层引出后接入该 PG 卡上的 PE 端子，即可完成信号线的屏蔽层接地。

安装说明：在安装 PG 卡之前，先卸下图中放大处的螺钉，对齐其余 3 处固定柱（位于图中放大处的左上方）后，将 PG 卡逐一用 M3×8 螺钉进行固定。

10.4.7 EMC 指导

1) 现场安装调试时，需要将信号线（如编码器线）和动力线分不同线槽走线，严禁编码器线与动力线捆在一起走线，否则很容易出现编码器干扰问题；

2) 电机外壳必须要接到变频器的接地端子（PE 端子），而且电机外壳侧的地线必须要良好搭接，否则达不到良好接地效果；

3) 建议使用双绞屏蔽线线缆，对于差分编码器，双绞线必须按照差分对接线，屏蔽层接到变频器接地端子（PE 端子）；

4) 对于某些大型设备，变频器离电机距离较远，电机线缆很长（>10m），线缆电感影响，接地效果会变差，这时编码器屏蔽层可以不接变频器接地端子（PE 端子）；

5) YD58PGMD 卡输入是否存在干扰，可以通过 PG 卡上面的状态指示灯来判断，详细内容见上述章节状态指示灯具体含义。

附录B YD580E 同步电机专用参数一览表

B.1 基本功能参数简表

P0 组 基本功能组							
参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P0-00	0xF000	GP类型显示	1：G型（恒转矩负载机型） 2：P型（风机，水泵类负载机型）	1	-	不可更改	—
P0-01	0xF001	第1电机控制方式	0：无速度传感器矢量控制（SVC） 1：有速度传感器矢量控制（FVC）	0	-	停机更改	—
P0-02	0xF002	命令源选择	0：液晶键盘/后台软件命令通道 1：端子命令通道 2：通讯命令通道	0	-	实时更改	第110/177/178页
P0-03	0xF003	主频率源X选择	0：数字设定（预置频率P0-08，UP/DOWN可修 改，掉电不记忆） 1：数字设定（预置频率P0-08，UP/DOWN可修改，掉电记忆） 2：AI1 3：AI2 4：AI3 5：PULSE脉冲设定 （DI5） 6：多段指令 7：简易PLC 8：PID 9：通讯给定	0	-	停机更改	第177/178页
P0-04	0xF004	辅助频率源Y选择	同P0-03	0	-	停机更改	第133页
P0-05	0xF005	叠加时辅助频率源Y范围选择	0：相对于最大频率 1：相对于频率源X	0	-	实时更改	第135页
P0-06	0xF006	叠加时辅助频率源Y范围	0%~150%	100	%	实时更改	第135页
P0-07	0xF007	频率源叠加选择	个位： 0：主频率源X 1：主辅运算结果（运算关系由十位确定） 2：主频率源X与辅助频率源Y切换 3：主频率源X与主辅运算结果切换 4：辅助频率源Y与主辅运算结果切换 十位： 0：主+辅 1：主- 辅 2：二者最大值 3：二者最小值	0	-	实时更改	第135页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P0-08	0xF008	预置频率	0.00Hz~P0-10 (P0-10) 最大频率	50.00	Hz	实时更改	第117页
P0-09	0xF009	运行方向	0：默认方向运行 1：与默认方向相反方向运行	0	-	实时更改	第202页
P0-10	0xF00A	最大频率	50.00Hz~500.00Hz	50.00	Hz	停机更改	第117/136/177/178页
P0-11	0xF00B	上限频率源	0：上限频率(P0-12)设定 1：AI1 2：AI2 3：AI3 4：PULSE脉冲设定 5：通讯给定	0	-	停机更改	第136页
P0-12	0xF00C	上限频率	P0-14 ~ P0-10 (下限频率) ~ (最大频率)	50.00	Hz	实时更改	第136页
P0-13	0xF00D	上限频率偏置	0.00Hz ~ 最大频率 P0-10	0.00	Hz	实时更改	第136页
P0-14	0xF00E	下限频率	0.00Hz ~ 上限频率 P0-12	0.00	Hz	实时更改	第136页
P0-15	0xF00F	载波频率	2kHz~8.0kHz	机型确定	kHz	实时更改	—
P0-16	0xF010	载波频率随温度调整	0：否 1：是	1	-	实时更改	—
P0-17	0xF011	加速时间1	0.00s ~ 650.00s(P0-19=2) 0.0s ~ 6500.0s(P0-19=1) 0s ~ 65000s(P0-19=0)	20.0	s	实时更改	第141/178页
P0-18	0xF012	减速时间1		20.0	s	实时更改	第141/178/179页
P0-19	0xF013	加减速时间单位	0：1秒 1：0.1秒 2：0.01秒	1	-	停机更改	第141页
P0-21	0xF015	叠加时辅助频率源偏置频率	0.00Hz ~ 最大频率 P0-10	0.00	Hz	实时更改	—
P0-22	0xF016	频率指令分辨率	2：0.01Hz	2	Hz	不可更改	—
P0-23	0xF017	数字设定频率停机记忆选择	0：不记忆 1：记忆	0	-	实时更改	第117页
P0-24	0xF018	电机参数组选择	0：电机参数组1 1：电机参数组2	0	-	停机更改	第170页
P0-25	0xF019	加减速时间基准频率	0：最大频率(P0-10) 1：设定频率 2：100Hz	0	-	停机更改	第141/199页
P0-26	0xF01A	运行时频率指令UP/DOWN基准	0：运行频率 1：设定频率	0	-	停机更改	—

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P0-27	0xF01B	命令源捆绑频率源	个位：操作面板命令绑定 频率源选择 0：无绑定 1：数字设定频率 2：AI1 3：AI2 4：AI3 5：PULSE脉冲设定(DI5) 6：多段速 7：简易PLC 8：PID 9：通讯给定 十位：端子命令绑定 频率源选择 百位：通讯命令绑定 频率源选择	0	-	实时更改	第136页
P0-28	0xF01C	通讯协议选择	0：Modbus 协议 1：CANopen协议	0	-	停机更改	第114/132/192页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P1 组 第一电机参数							
P1-00	0xF100	电机类型选择	2：永磁同步电机	2	-	停机更改	第143页
P1-01	0xF101	电机额定功率	0.1kW~1000.0kW	机型确定	kW	停机更改	第143页
P1-02	0xF102	电机额定电压	1V~2000V	机型确定	V	停机更改	第143页
P1-03	0xF103	电机额定电流	0.01～655.35A（≤ 55kW） 0.1～6553.5A （>55kW）	机型确定	A	停机更改	第143页
P1-04	0xF104	电机额定频率	0.01Hz～最大频率	机型确定	Hz	停机更改	第143页
P1-05	0xF105	电机额定转速	1rpm~65535rpm	机型确定	rpm	停机更改	第143页
P1-16	0xF110	同步电机定子电阻	0.001～65.535Ω（≤55kW） 0.0001～6.5535Ω（> 55kW）	调谐参数	Ω	停机更改	第143页
P1-17	0xF111	同步电机D轴电感	0.01～655.35mH（≤ 55kW） 0.001～65.535mH（> 55kW）	调谐参数	mH	停机更改	第143页
P1-18	0xF112	同步电机Q轴电感		调谐参数	mH	停机更改	第143页
P1-20	0xF114	同步电机反电动势	0.1V~6553.5V	调谐参数	V	停机更改	第143页
P1-27	0xF11B	编码器线数	1~65535	1024	-	停机更改	第144页
P1-28	0xF11C	编码器类型	0：ABZ增量编码器 1：UVW增量编码器 2：旋转编码器 4：省线式UVW编码器	0	-	停机更改	第144页
P1-30	0xF11E	ABZ增量编码器 AB 相序	0：正向 1：反向	0	-	停机更改	第144页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P1-31	0xF11F	编码器零点位置角	0.0~359.9	0.0	-	停机更改	第144页
P1-32	0xF120	UVW编码器相序	0：正向 1：反向	0	-	停机更改	第144页
P1-34	0xF122	旋变变压器极对数	1~65535	1	-	停机更改	第144页
P1-36	0xF124	PG断线检测时间	0.0~10.0 0.0s：不动作	0.0	-	停机更改	第144页
P1-37	0xF125	参数辨识选择	0：无操纵 11：同步带载参数辨识(静) 12：同步空载参数辨识(动)	0	-	停机更改	第142页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P2 组 第一电机矢量控制参数							
P2-00	0xF200	速度环比例增益1	1~100	30	-	实时更改	第149页
P2-01	0xF201	速度环积分时间1	0.01~10.00	0.50	s	实时更改	第149页
P2-02	0xF202	切换频率1	0.00 ~ P2-05	5.00	Hz	实时更改	第149页
P2-03	0xF203	速度环比例增益2	1~100	20	-	实时更改	第149页
P2-04	0xF204	速度环积分时间2	0.01s~10.00s	1.00	s	实时更改	第149页
P2-05	0xF205	切换频率2	P2-02 ~ 最大频率	10.00	Hz	实时更改	第149页
P2-06	0xF206	转差补偿系数	50%~200%	100	%	实时更改	第150页
P2-07	0xF207	速度环滤波时间常数	0~31	15	-	实时更改	第150页
P2-08	0xF208	矢量控制过励磁增益	0~200	64	-	实时更改	第150页
P2-09	0xF209	速度控制(驱动)转矩上限源	0：功能码 P2-10 设定 1：AI1 2：AI2 3：AI3 4：脉冲（DI5） 5：通讯给定 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) 1-7 选项的满量程对应 P2-10	0	-	实时更改	第150页
P2-10	0xF20A	速度控制(驱动)转矩上限数字设定	0.0%~200.0%	150.0	%	实时更改	第150/177页
P2-11	0xF20B	速度控制(制动)转矩上限源	0：功能码 P2-12 设定 1：AI1 2：AI2 3：AI3 4：脉冲（DI5） 5：通讯给定 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) 1-7 选项的满量程对应 P2-12	0	-	实时更改	第151页
P2-12	0xF20C	速度控制(制动)转矩上限数字设定	0.0%~200.0%	150.0	%	实时更改	第151页
P2-13	0xF20D	M轴电流环Kp	0~60000	8000	-	实时更改	第153页
P2-14	0xF20E	M轴电流环Ki	0~60000	1321	-	实时更改	第153页
P2-15	0xF20F	T轴电流环Kp	0~60000	8000	-	实时更改	第153页
P2-16	0xF210	T轴电流环Ki	0~60000	1321	-	实时更改	第153页
P2-17	0xF211	速度环积分属性	0~1	0	-	实时更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P2-18	0xF212	同步机弱磁模式	0~2	2	-	停机更改	-
P2-19	0xF213	同步机弱磁系数	1~50	1	-	实时更改	-
P2-20	0xF214	最大弱磁电流	1~300	100	-	停机更改	-
P2-21	0xF215	弱磁自动参数辨识系数	10~500	100	-	实时更改	第153页
P2-22	0xF216	弱磁积分倍数	0~1	0	-	停机更改	第151页
P2-23	0xF217	弱磁深度	0%~50%	0	%	实时更改	第151页
P2-24	0xF218	同步机弱磁系数	80%~180%	80	%	实时更改	-
P2-25	0xF219	初始位置是否检测	0~2	0	-	实时更改	-
P2-26	0xF21A	速度环模式选择	0~1	0	-	实时更改	-
P2-27	0xF21B	最大出力调整系数	50~500	50	-	实时更改	-
P2-28	0xF21C	跟据母线电压对频率限幅使能	0~1	0	-	实时更改	-
P2-29	0xF21D	前馈补偿模式	0：无补偿 1：加反电动势前馈补偿 2：加电压前馈补偿	0	-	实时更改	-
P2-30	0xF21E	参数辨识时电流环Kp	1~100	6	-	实时更改	-
P2-31	0xF21F	参数辨识时电流环Ki	1~100	6	-	实时更改	-
P2-32	0xF220	Z信号校正使能	0~1	1	-	实时更改	-
P2-33	0xF221	同步机SVC速度滤波级别	10~1000	100	-	实时更改	-
P2-34	0xF222	同步机SVC速度估算比例增益	5~200	40	-	实时更改	-
P2-35	0xF223	同步机SVC速度估算积分增益	5~500	30	-	实时更改	-
P2-36	0xF224	同步机SVC初始励磁电流限幅	0~80	30	-	实时更改	-
P2-37	0xF225	同步机SVC最低载波频率	0.8K ~ P0-15	1.5	KHz	实时更改	-
P2-38	0xF226	低频运行方式	0~1	0	-	实时更改	-
P2-39	0xF227	低频生效	0.00~10.00	2.00	-	实时更改	-
P2-40	0xF228	低频频率步长	0.00050~1.00000	0.0010	-	实时更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P2-41	0xF229	低频制动电流	30%~120%	80%	-	实时更改	-
P2-42	0xF22A	同步机SVC 速度跟踪	0~1	0	-	实时更改	-
P2-43	0xF22B	零伺服使能	0~1	1	-	实时更改	-
P2-44	0xF22C	切换频率	0.00 ~ P2-02	0.00	Hz	实时更改	-
P2-45	0xF22D	零伺服速度环比例增益	1~100	1	-	实时更改	-
P2-46	0xF22E	零伺服速度环积分时间	0.01~10.00	0.01	s	实时更改	-
P2-47	0xF22F	停机禁止反转	0~1	0	-	实时更改	-
P2-48	0xF230	停机角度	0.0°~10.0°	0.0	°	实时更改	-
P2-49	0xF231	在线参数辨识使能	0：关闭	0	-	实时更改	-
P2-50	0xF232	在线反电动势辨识	0：关闭 1：开启	0	-	停机更改	-
P2-51	0xF233	初始位置补偿角度	0.0~359.9	0.0	-	实时更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P3 组 V/F 控制参数							
P3-00	0xF300	V/f曲线设定	0：直线V/f曲线 1：多点V/f曲线 2：平方V/f曲线 3：1.2次V/f曲线 4：1.4次V/f曲线 6：1.6次V/f曲线 8：1.8次V/f曲线 9：保留 10：V/f完全分离模式 11：V/f半分离模式	0	-	停机更改	第144页
P3-01	0xF301	转矩提升	0.0%~30.0% 0.0%：（无转矩提升）	2.0	%	实时更改	第144页
P3-02	0xF302	转矩提升截止频率	0.00Hz ~ 最大频率	50.00	Hz	停机更改	第144页
P3-03	0xF303	多点V/f频率点1	0.00Hz ~ P3-05	0.00	Hz	停机更改	第144页
P3-04	0xF304	多点V/f电压点1	0.0%~100.0%	0.0	%	停机更改	第144页
P3-05	0xF305	多点V/f频率点2	P3-03 ~ P3-07	0.00	Hz	停机更改	第144页
P3-06	0xF306	多点V/f电压点2	0.0%~100.0%	0.0	%	停机更改	第144页
P3-07	0xF307	多点V/f频率点3	P3-05 ~ (P1-04) 电机额定频率= (P1-04)	0.00	Hz	停机更改	第144页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P3-08	0xF308	多点V/f电压点3	0.0%~100.0%	0.0	%	停机更改	第144页
P3-09	0xF309	转差补偿系数	0.0%~200.0%	0.0	%	实时更改	-
P3-10	0xF30A	V/f过励磁增益	0~200	64	-	实时更改	第148页
P3-11	0xF30B	V/f振荡抑制增益	0~100	40	-	实时更改	第148页
P3-13	0xF30D	V/f分离的电压源	0：数字设定（P3-14） 1：AI1 2：AI2 3：AI3 4：PULSE脉冲设定（DI5） 5：多段指令 6：简易PLC 7：PID 8：通讯给定	0	-	实时更改	第145页
P3-14	0xF30E	V/f分离的电压数字设定	0V ~ 电机额定电压	0	V	实时更改	第145页
P3-15	0xF30F	V/f分离的电压加速时间	0.0s~1000.0s 表示0V到电机额定电压的时间)	0.0	s	实时更改	第146页
P3-16	0xF310	V/f分离的电压减速时间	0.0s~1000.0s 表示0V到电机额定电压的时间)	0.0	s	实时更改	第146页
P3-17	0xF311	V/f分离停机方式选择	0：频率/电压独立减至0 1：电压减为0后频率再减	0	-	停机更改	第146页
P3-18	0xF312	V/f过流失速动作电流	50%~200%	150	%	停机更改	第147页
P3-19	0xF313	过流失速使能	0：不使能 1：使能	1	-	停机更改	第147页
P3-20	0xF314	过流失速抑制增益	0~100	20	-	实时更改	第147页
P3-21	0xF315	倍速过流失速动作电流补偿系数	50%~200%	50	%	停机更改	第147页
P3-22	0xF316	V/f过压失速动作电压	650.0V~800.0V	770.0	V	停机更改	第148页
P3-23	0xF317	V/f过压失速使能	0：无效 1：有效	1	-	停机更改	第148页
P3-24	0xF318	V/f过压失速抑制频率增益	0~100	30	-	实时更改	第148页
P3-25	0xF319	V/f过压失速抑制电压增益	0~100	30	-	实时更改	第148页
P3-26	0xF31A	过压失速最大上升频率限制	0Hz~50Hz	5	Hz	停机更改	第148页
P3-27	0xF31B	转差补偿时间常数	0.1~10.0	0.5	-	实时更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P3-28	0xF31C	自动升频使能	0：不使能 1：使能	0	-	停机更改	-
P3-29	0xF31D	最小电动力矩电流	10~100	50	-	停机更改	-
P3-30	0xF31E	最大发电力矩电流	10~100	20	-	停机更改	-
P3-31	0xF31F	自动升频Kp	0~100	50	-	实时更改	-
P3-32	0xF320	自动升频Ki	0~100	50	-	实时更改	-
P3-33	0xF321	在线转矩补偿增益	80~150	100	-	停机更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P4 组 输入端子							
P4-00	0xF400	DI1端子功能选择	0：无功能 1：正转运行（FWD） 2：反转运行（REV） 3：三线式运行控制 4：正转点动（FJOG） 5：反转点动（RJOG） 6：端子UP 7：端子DOWN 8：自由停机 9：故障复位（RESET） 10：运行暂停 11：外部故障常开输入 12：多段指令端子1 13：多段指令端子2 14：多段指令端子3 15：多段指令端子4 16：加减速选择端子1 17：加减速选择端子2 18：频率源切换 19：UP/DOWN设定清零（端子、键盘） 20：运行命令切换端子 21：加减速禁止 22：PID暂停 23：简易PLC状态复位 24：摆频暂停 25：计数器输入 26：计数器复位 27：长度计数输入 28：长度复位 29：转矩控制禁止	1	-	停机更改	（注：设定1、2时，需配合P4-11） 第181页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P4-00	0xF400	DI1端子功能选择	30：脉冲频率输入（仅对DI5有效） 31：保留 32：立即直流制动 33：外部故障常闭输入 34：频率修改使能 35：PID作用方向取反 36：外部停机端子1 37：控制命令切换端2 38：PID积分暂停 39：主频率与预置频率切换 40：辅频率与预置频率切换 41：电机端子选择功能 42：保留 43：PID参数切换 44：用户自定义故障1 45：用户自定义故障2 46：速度控制/转矩控制切换 47：紧急停机 48：外部停机端子2 49：减速直流制动 50：本次运行时间清零 51：两线式/三线式切换 52：禁止反转 53：保留 54：保留 55：保留 56：保留 57：保留 58：保留 59：保留	1	-	停机更改	第181页
P4-01	0xF401	DI2端子功能选择		4	-	停机更改	第181页
P4-02	0xF402	DI3端子功能选择		9	-	停机更改	第181页
P4-03	0xF403	DI4端子功能选择		12	-	停机更改	第181页
P4-04	0xF404	DI5端子功能选择		13	-	停机更改	第181页
P4-05	0xF405	DI6端子功能选择	同P4-00	0	-	停机更改	第181页
P4-06	0xF406	DI7端子功能选择		0	-	停机更改	第140/181页
P4-07	0xF407	DI8端子功能选择		0	-	停机更改	第140/181页
P4-08	0xF408	DI9端子功能选择		0	-	停机更改	第181页
P4-09	0xF409	DI10端子功能选择		0	-	停机更改	第181页
P4-10	0xF40A	DI滤波时间	0.000s~1.000s	0.010	s	实时更改	-
P4-11	0xF40B	端子命令方式	0：两线式1 1：两线式2 2：三线式1 3：三线式2	0	-	停机更改	第110页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P4-12	0xF40C	端子UP/DOWN变化率	0.001 ~65.535	1.000	Hz/s	实时更改	-
P4-13	0xF40D	AI曲线1最小输入	0.00V ~ P4-15	0.00	V	实时更改	第119页
P4-14	0xF40E	AI曲线1最小输入对应设定	-100.0% ~ +100.0%	0.0	%	实时更改	第119页
P4-15	0xF40F	AI曲线1最大输入	P4-13 ~ +10.00V	10.00	V	实时更改	第119页
P4-16	0xF410	AI曲线1最大输入对应设定	-100.0% ~ +100.0%	100.0	%	实时更改	第119页
P4-17	0xF411	AI1滤波时间	0.00s~10.00s	0.10	s	实时更改	第121页
P4-18	0xF412	AI曲线2最小输入	0.00V ~ P4-20	0.00	V	实时更改	第119页
P4-19	0xF413	AI曲线2最小输入对应设定	-100.0% ~ +100.0%	0.0	%	实时更改	第119页
P4-20	0xF414	AI曲线2最大输入	P4-18 ~ +10.00V	10.00	V	实时更改	第119页
P4-21	0xF415	AI曲线2最大输入对应设定	-100.0% ~ +100.0%	100.0	%	实时更改	第119页
P4-22	0xF416	AI2滤波时间	0.00s~10.00s	0.10	s	实时更改	第121页
P4-23	0xF417	AI曲线3最小输入	-10.00V ~ P4-25	-10.00	V	实时更改	第119页
P4-24	0xF418	AI曲线3最小输入对应设定	-100.0% ~ +100.0%	-100.0	%	实时更改	第119页
P4-25	0xF419	AI曲线3最大输入	P4-23 ~ +10.00V	10.00	V	实时更改	第119页
P4-26	0xF41A	AI曲线3最大输入对应设定	-100.0% ~ +100.0%	100.0	%	实时更改	第119页
P4-27	0xF41B	AI3滤波时间	0.00s~10.00s	0.10	s	实时更改	第121页
P4-28	0xF41C	PULSE最小输入	0.00kHz ~ P4-30	0.00	kHz	实时更改	第123页
P4-29	0xF41D	PULSE最小输入对应设定	-100.0% ~ +100.0%	0.0	%	实时更改	第123页
P4-30	0xF41E	PULSE最大输入	P4-28 ~ 100.00kHz	50.00	kHz	实时更改	第123页
P4-31	0xF41F	PULSE最大输入设定	-100.0% ~ +100.0%	100.0	%	实时更改	第123页
P4-32	0xF420	PULSE滤波时间	0.00s~10.00s	0.10	s	实时更改	第123页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P4-33	0xF421	AI曲线选择	个位：AI1曲线选择 1：曲线1（2点） 2：曲线2（2点） 3：曲线2（2点） 4：曲线4（4点） 5：曲线5（4点） 十位：AI2曲线选择 1：曲线1（2点） 2：曲线2（2点） 3：曲线3（2点） 4：曲线4（4点） 5：曲线5（4点） 百位：AI3曲线选择 1：曲线1（2点） 2：曲线2（2点） 3：曲线3（2点） 4：曲线4（4点） 5：曲线5（4点）	321	-	实时更改	第121页 注： 个位：AI1曲线选择 1：曲线1(2点，见P4-13～P4-16) 2：曲线2(2点，见P4-18～P4-21) 3：曲线3(2点，见P4-23～P4-26) 4：曲线4(4点，见A6-00～A6-07) 5：曲线5(4点，见A6-08～A6-15)
P4-34	0xF422	AI低于最小输入设定选择	个位：AI1低于最小输入设定选择 0：对应最小输入设定 1：0.0% 十位：AI2低于最小输入设定选择 0：对应最小输入设定 1：0.0% 百位：AI3低于最小输入设定选择 0：对应最小输入设定 1：0.0%	0	-	实时更改	-
P4-35	0xF423	DI1延迟时间	0.0s~3600.0s	0.0	s	实时更改	第181页
P4-36	0xF424	DI2延迟时间	0.0s~3600.0s	0.0	s	实时更改	第181页
P4-37	0xF425	DI3延迟时间	0.0s~3600.0s	0.0	s	实时更改	第181页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P4-38	0xF426	DI端子有效状模式选择1	个位：DI1 0：高电平有效 1：低电平有效 十位：DI2 0：高电平有效 1：低电平有效 百位：DI3 0：高电平有效 1：低电平有效 千位：DI4 0：高电平有效 1：低电平有效 万位：DI5 0：高电平有效 1：低电平有效	0	-	停机更改	第181页
P4-39	0xF427	DI端子有效状模式选择2	个位：DI6 0：高电平有效 1：低电平有效 十位：DI7 0：高电平有效 1：低电平有效 百位：DI8 0：高电平有效 1：低电平有效 千位：DI9 0：高电平有效 1：低电平有效 万位：DI10 0：高电平有效 1：低电平有效	0	-	停机更改	第181页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P5 组 输出端子							
P5-00	0xF500	FM端子输出模式选择	0：脉冲输出(FMP) 1：开关量输出(FMR)	0	-	实时更改	第184/189页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P5-01	0xF501	FMR输出功能选择	0：无输出 1：变频器运行中 2：故障输出(故障停机) 3：频率水平检测FDT1输出 4：频率到达 5：零速运行中（停机时 不输出） 6：电机过载预报警 7：变频器过载预报警 8：设定记数值到达 9：指定记数值到达 10：长度到达 11：PLC循环完成 12：累计运行时间到达 13：频率限定中 14：转矩限定中 15：运行准备就绪 16：AI1>AI2 17：上限频率到达 18：下限频率到达(运行有关) 19：欠压状态输出 20：通讯设定 21：定位完成 22：定位接近 23：零速运行中2（停机 时） 24：累计上电时间到达 25：频率水平检测FDT2输出 26：频率1到达输出 27：频率2到达输出 28：电流1达到输出 29：电流2到达输出 30：定时达到输出 31：AI1输入超限 32：变频器输出掉载 33：反向运行中 34：零电流状态 35：模块温度到达 36：输出电流超限 37：下限频率到达（停 机也输出） 38：异常输出（故障停 机才输出） 39：电流过温预报警 40：本次运行时间到达 41：故障输出2（欠压不 输出）	0	-	实时更改	第184页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P5-02	0xF502	控制板继电器功能选择（T/A-T/B-T/ C）	0~40：同P5-01 41：故障输出2	2	-	实时更改	第184页
P5-03	0xF503	扩展卡继电器输出功能 选择（P/A-P/ B-P/C）	同P5-02	0	-	实时更改	第184页
P5-04	0xF504	DO1输出功能选择	同P5-02	1	-	实时更改	第184页
P5-05	0xF505	扩展卡DO2输出功能选择	同P5-02	4	-	实时更改	第184页
P5-06	0xF506	FMP输出功能选择	0：运行频率 1：设定频率 2：输出电流 3：输出转矩（绝对值，相对电机的百分比） 4：输出功率 5：输出电压 6：PULSE脉冲输入(100.%对应100.0kHz) 7：AI1 8：AI2 9：AI3（扩展卡） 10：长度 11：记数值 12：通讯设定 13：电机转速 14：输出电流(100.0%对应1000.0A) 15：输出电压(100.0%对应1000.0V) 16：保留	0	-	实时更改	第189页
P5-07	0xF507	AO1输出功能选择	同P5-06	0	-	实时更改	第189页
P5-08	0xF508	AO2输出功能选择	同P5-06	1	-	实时更改	第189页
P5-09	0xF509	FMP输出最大频率	0.01kHz~100.00kHz	50.00	kHz	实时更改	第189页
P5-10	0xF50A	AO1零偏系数	-100.0% ~ +100.0%	0.0	%	实时更改	第189页
P5-11	0xF50B	AO1增益	-10.00 ~ +10.00	1.00	-	实时更改	第189页
P5-12	0xF50C	AO2零偏系数	-100.0% ~ +100.0%	0.0	%	实时更改	第189页
P5-13	0xF50D	AO2增益	-10.00 ~ +10.00	1.00	-	实时更改	第189页
P5-17	0xF511	FMR输出延迟时间	0.0s~3600.0s	0.0	s	实时更改	第184页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P5-18	0xF512	RELAY1输出延时时间	0.0s~3600.0s	0.0	s	实时更改	第184页
P5-19	0xF513	RELAY2输出延时时间	0.0s~3600.0s	0.0	s	实时更改	第184页
P5-20	0xF514	DO1输出延迟时间	0.0s~3600.0s	0.0	s	实时更改	第184页
P5-21	0xF515	DO2输出延时时间	0.0s~3600.0s	0.0	s	实时更改	第184页
P5-22	0xF516	DO输出端子有效状态选择	个位：FMR 0：正逻辑 1：反逻辑 十位：RELAY1 0：正逻辑 1：反逻辑 百位：RELAY2 0：正逻辑 1：反逻辑 千位：DO1 0：正逻辑 1：反逻辑 万位：DO2 0：正逻辑 1：反逻辑	0	-	实时更改	第184页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P6 组 启停控制							
P6-00	0xF600	启动方式	0：直接启动	0	-	不可更改	第137页
P6-01	0xF601	转速跟踪模式	0：从停机频率开始	0	-	不可更改	第137页
P6-02	0xF602	转速跟踪快慢	20	20	-	不可更改	第137页
P6-03	0xF603	启动频率	0.00Hz~10.00Hz	0.00	Hz	实时更改	第137页
P6-04	0xF604	启动频率保持时间	0.0s~100.0s	0.0	s	停机更改	第137页
P6-05	0xF605	启动直流制动电流/预励磁电流	50%	0	%	不可更改	第137页
P6-06	0xF606	启动直流制动时间/预励磁时间	0.0s	0.0	s	不可更改	第137页
P6-07	0xF607	加减速方式	0：直线加减速 1：静态S曲线加减速 2：动态S曲线加减速	0	-	停机更改	第141页
P6-08	0xF608	S曲线开始段时间比例	0.0% ~ (100.0%-P6-09)	30.0	%	停机更改	第141页
P6-09	0xF609	S曲线结束段时间比例	0.0% ~ (100.0%-P6-08)	30.0	%	停机更改	第141页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P6-10	0xF60A	停机方式	0：减速停机 1：自由停机	0	-	实时更改	第139页
P6-11	0xF60B	停机直流制动起始频率	0.00Hz~最大频率	0.00	Hz	实时更改	第139页
P6-12	0xF60C	停机直流制动等待时间	0.0s	0.0	s	不可更改	第139页
P6-13	0xF60D	停机直流制动电流	50%	50	%	不可更改	第139页
P6-14	0xF60E	停机直流制动时间	0.0s	0.0	s	不可更改	第139页
P6-15	0xF60F	制动使用率	0%~100%	100	%	实时更改	-
P6-16	0xF610	制动电阻开通时间	0~65000	400	-	实时更改	-
P6-22	0xF616	最低输出频率	0.00~P6-11	0.00	-	实时更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P7 组 键盘与显示							
P7-00	0xF700	数码管缺画检验使能	0：无效 1：有效	0	-	停机更改	-
P7-01	0xF701	MF.K键功能选择	0：MF.K无效 1：操作面板命令通道与远程命令通道（端子命令通道或通讯命令通道切换） 2：正反转切换 3：正转点动 4：反转点动	0	-	停机更改	-
P7-02	0xF702	STOP/RESET键功能	0：只在键盘操作方式下，STOP/RES键停机功能有效 1：在任何操作方式下，STOP/RES键停机功能有效	1	-	实时更改	-
P7-03	0xF703	LED运行显示参数1	bit0：运行频率(Hz) bit1：设定频率(Hz) bit2：母线电压(V) bit3：输出电压(V) bit4：输出电流(A) bit5：输出功率(kW) bit6：输出转矩(%) bit7：DI输入状态 bit8：DO输出状态 bit9：AI1电压(V) bit10：AI2电压(V) bit11：AI3电压(V) bit12：计数值 bit13：长度值 bit14：负载速度显示 bit15：PID设定	1F	-	停机更改	第162页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P7-04	0xF704	LED运行显示参数2	bit0：PID反馈 bit1：PLC阶段 bit2：PULSE输入脉冲频率(kHz) bit3：运行频率2(Hz) bit4：剩余运行时间 bit5：AI1校正前电压(V) bit6：AI2校正前电压(V) bit7：AI3校正前电压(V) bit8：线速度 bit9：当前上电时间(h) bit10：当前运行时间 (min) bit11：PULSE输入脉冲频率(Hz) bit12：通讯设定值 bit13：编码器反馈速度(Hz) bit14：主频率X显示(Hz) bit15：辅频率Y显示(Hz)	0	-	停机更改	第163页
P7-05	0xF705	LED停机显示参数	bit0：设定频率(Hz) bit1：母线电压(V) bit2：DI输入状态 bit3：DO输出状态 bit4：AI1电压(V) bit5：AI2电压(V) bit6：AI3电压(V) bit7：计数值 bit8：长度值 bit9：PLC阶段 bit10：负载速度 bit11：PID设定 bit12：PULSE输入脉冲频率(kHz)	33	-	停机更改	第163页
P7-06	0xF706	负载速度显示系数	0.001~65.000	1.000	-	实时更改	-
P7-07	0xF707	逆变器模块散热器温度	-20°C~120°C	0	°C	不可更改	-
P7-08	0xF708	产品号	0.00~655.35	0.00	-	不可更改	-
P7-09	0xF709	累计运行时间	0h~65535h	0	h	不可更改	-
P7-10	0xF70A	性能软件版本号	0.00~655.35	0.00	-	不可更改	-
P7-11	0xF70B	功能软件版本号	0.00~655.35	0.00	-	不可更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P7-12	0xF70C	负载速度显示小数点位数	个位：U0-14的小数位个数 0：0位小数位 1：1位小数位 2：2位小数位 3：3位小数位 十位：U0-19/U0-29小数点个数 1：1位小数位 2：2位小数位	20	-	实时更改	-
P7-13	0xF70D	累计上电时间	0h~65535h	0	h	不可更改	-
P7-14	0xF70E	累计耗电量	0~65535 度	0	-	不可更改	-
P7-15	0xF70F	性能临时版本号	0.00~655.35	0.00	-	不可更改	-
P7-16	0xF710	功能临时版本号	0.00~655.35	0.00	-	不可更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P8 组 辅助功能							
P8-00	0xF800	点动运行频率	0.00Hz~P0-10 (最大频率)	2.00	Hz	实时更改	第199页
P8-01	0xF801	点动加速时间	0.0s~6500.0s	20.0	s	实时更改	第199页
P8-02	0xF802	点动减速时间	0.0s~6500.0s	20.0	s	实时更改	第199页
P8-03	0xF803	加速时间2	0.0s~6500.0s	20.0	s	实时更改	第141页
P8-04	0xF804	减速时间2	0.0s~6500.0s	20.0	s	实时更改	第141页
P8-05	0xF805	加速时间3	0.0s~6500.0s	20.0	s	实时更改	第141页
P8-06	0xF806	减速时间3	0.0s~6500.0s	20.0	s	实时更改	第141页
P8-07	0xF807	加速时间4	0.0s~6500.0s	0.0	s	实时更改	第141/177页
P8-08	0xF808	减速时间4	0.0s~6500.0s	0.0	s	实时更改	第141/177页
P8-09	0xF809	跳跃频率1	0.00Hz~P0-10 (最大频率)	0.00	Hz	实时更改	第201页
P8-10	0xF80A	跳跃频率2	0.00Hz~P0-10 (最大频率)	0.00	Hz	实时更改	第201页
P8-11	0xF80B	跳跃频率幅度	0.00Hz~P0-10 (最大频率)	0.00	Hz	实时更改	第201页
P8-12	0xF80C	正反转死区时间	0.0s~3000.0s	0.0	s	实时更改	第201页
P8-13	0xF80D	反向频率禁止	0：允许反转 1：禁止反转	0	-	实时更改	第201页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P8-14	0xF80E	设定频率低于下限频率运行模式	0：以下限频率运行 1：停机 2：零速运行	0	-	实时更改	第136页
P8-15	0xF80F	下垂控制	0.00%~10.00%	0.00	%	实时更改	第178/179页
P8-16	0xF810	设定累计上电到达时间	0h~65000h	0	h	实时更改	第206页
P8-17	0xF811	设定累计运行到达时间	0h~65000h	0	h	实时更改	第206页
P8-18	0xF812	启动保护选择	0：不保护 1：保护	0	-	实时更改	第156页
P8-19	0xF813	频率检测值1	0.00Hz~P0-10	50.00	Hz	实时更改	第202页
P8-20	0xF814	频率检测滞率1	0.0% ~ 100.0%（FDT1电平）	5.0	%	实时更改	第202页
P8-21	0xF815	频率到达检出幅度	0.0% ~ 100.0%（最大频率）	0.0	%	实时更改	第203页
P8-22	0xF816	加减速过程中跳跃频率是否 有效	0：无效 1：有效	0	-	实时更改	第201页
P8-25	0xF819	加速时间1/加速时间2切换频率点	0.00Hz~P0-10（最大频率）	0.00	Hz	实时更改	第203页
P8-26	0xF81A	减速时间1/减速时间2切换频率点	0.00Hz~P0-10（最大频率）	0.00	Hz	实时更改	第203页
P8-27	0xF81B	端子点动优先	0：无效 1：有效	0	-	实时更改	第199页
P8-28	0xF81C	频率检测值2	0.00Hz~P0-10（最大频率）	50.00	Hz	实时更改	第202页
P8-29	0xF81D	频率检测滞后率2	0.0% ~ 100.0%（FDT2电平）	5.0	%	实时更改	第202页
P8-30	0xF81E	任意到达频率检测值1	0.00Hz~P0-10（最大频率）	50.00	Hz	实时更改	第204页
P8-31	0xF81F	任意到达频率检出幅度1	0.0%~100.0%（最大频率）	0.0	%	实时更改	第204页
P8-32	0xF820	任意到达频率检测值2	0.00Hz~P0-10（最大频率）	50.00	Hz	实时更改	第204页
P8-33	0xF821	任意到达频率检出幅度2	0.0%~100.0%（最大频率）	0.0	%	实时更改	第204页
P8-34	0xF822	零电流检测水平	0.0%~300.0% （100.0%对应电机额定电流）	5.0	%	实时更改	第204页
P8-35	0xF823	零电流检测延迟时间	0.01s~600.00s	0.10	s	实时更改	第204页
P8-36	0xF824	输出电流超限值	0.1% ~ 300.0%（电机额定电流） 0.0%（不检测）	200.0	%	实时更改	第205页
P8-37	0xF825	输出电流超限检测延迟时间	0.00s~600.00s	0.00	s	实时更改	第205页
P8-38	0xF826	任意到达电流1	0.0% ~ 300.0% （电机额定电流）	100.0	%	实时更改	第205页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P8-39	0xF827	任意到达电流1幅度	0.0% ~ 300.0% （电机额定电流）	0.0	%	实时更改	第205页
P8-40	0xF828	任意到达电流2	0.0% ~ 300.0% （电机额定电流）	100.0	%	实时更改	第205页
P8-41	0xF829	任意到达电流2幅度	0.0% ~ 300.0% （电机额定电流）	0.0	%	实时更改	第205页
P8-42	0xF82A	定时功能选择	0：无效 1：有效	0	-	停机更改	第206页
P8-43	0xF82B	定时运行时间选择	0：定时运行时间(P8- 44)设定 1：AI1 2：AI2 3：AI3	0	-	停机更改	第206页 模拟输入量程对应 P8-44
P8-44	0xF82C	定时运行时间	0.0min~6500.0min	0.0	min	停机更改	第206页
P8-45	0xF82D	AI1输入电压保护值下限	0.00V~P8-46	3.10	V	实时更改	第206页
P8-46	0xF82E	AI1输入电压保护值上限	P8-45~11.00V	6.80	V	实时更改	第206页
P8-47	0xF82F	模块温度到达	0°C~100°C	75	°C	实时更改	第206页
P8-48	0xF830	散热风扇控制	0：运行时风扇运转 1：风扇一直运转	0	-	停机更改	第206页
P8-49	0xF831	唤醒频率	P8-51 ~ P0-10 (休眠频率) ~（最大频率）	0.00	Hz	实时更改	第207页
P8-50	0xF832	唤醒延迟时间	0.0s~6500.0s	0.0	s	实时更改	第207页
P8-51	0xF833	休眠频率	0.00Hz~P8-49 （唤醒频率）	0.00	Hz	实时更改	第207页
P8-52	0xF834	休眠延迟时间	0.0s~6500.0s	0.0	s	实时更改	第207页
P8-53	0xF835	本次运行到达时间	0.0min~6500.0min	0.0	min	停机更改	第207页
P8-54	0xF836	输出功率校正系数	0.0%~200.0%	100.0	%	实时更改	第207页
P8-57	0xF839	输出电流系数	95.0%~105.0%	100.0	%	实时更改	第207页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P9 组 故障与保护							
P9-00	0xF900	电机过载保护选择	0：禁止 1：允许	1	-	实时更改	第156页
P9-01	0xF901	电机过载保护增益	0.20~10.00	1.00	-	实时更改	第156页
P9-02	0xF902	电机过载预警系数	50%~100%	80	%	实时更改	第156页
P9-03	0xF903	过压失速增益	30~100	30	-	实时更改	第148页
P9-04	0xF904	过压设置点	650.0V~800.0V	770.0	V	停机更改	第148页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P9-05	0xF905	过流失速增益	0~100	20	-	实时更改	-
P9-06	0xF906	过流失速保护电流	50%~200%	150	%	实时更改	-
P9-07	0xF907	对地短路保护选择	个位：上电对地短路保护 0：无效 1：有效 十位：运行前对地短路保护 0：无效 1：有效	1	-	实时更改	-
P9-08	0xF908	制动单元动作起始电压	650.0V~800.0V	760.0	V	实时更改	第148页
P9-09	0xF909	故障自动复位次数	0~20	0	-	实时更改	第158页
P9-10	0xF90A	故障自动复位期间故障DO动作选择	0：不动作 1：动作	0	-	实时更改	第158页
P9-11	0xF90B	故障自动复位间隔时间	0.1s~100.0s	1.0	s	实时更改	第158页
P9-12	0xF90C	输入缺相/接触器吸合保护选择	个位：输入缺相保护 0：禁止 1：允许 十位：接触器吸合保护 0：禁止 1：允许	01	-	实时更改	第158页
P9-13	0xF90D	输出缺相保护选择	个位：输出缺相保护 0：禁止 1：允许 十位：运行前输出缺相保护 0：禁止 1：允许	01	-	实时更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P9-14	0xF90E	第一次故障类型	0：无故障 1：保留 2：加速过电流 3：减速过电流 4：恒速过电流 5：加速过电压 6：减速过电压 7：恒速过电压 8：缓冲电阻过载 9：欠压 10：变频器过载 11：电机过载 12：输入缺相 13：输出缺相 14：模块过热 15：外部故障 16：通讯异常 17：接触器异常 18：电流检测异常 19：电机参数辨识异常 20：保留 21：参数读写异常 22：变频器硬件异常 23：电机对地短路 24：保留 25：保留 26：运行时间到达 27：用户自定义故障1 28：用户自定义故障2 29：上电时间到达 30：掉载 31：运行时PID 反馈丢失 40：快速限流超时 41：运行时切换电机 42：保留 43：保留 45：电机过温 55：主从控制时从机故障	0	-	不可更改	-
P9-15	0xF90F	第二次故障类型	同P9-14	0	-	不可更改	-
P9-16	0xF910	第三次(最近一次)故障类型	同P9-14	0	-	不可更改	-
P9-17	0xF911	第三次(最近一次)故障时频率	0.00Hz~655.35Hz	0.00	Hz	不可更改	-
P9-18	0xF912	第三次(最近一次)故障时电流	0.00A~655.35A	0.00	A	不可更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P9-19	0xF913	第三次(最近一次)故障时母线电压	0.0V~6553.5V	0.0	V	不可更改	-
P9-20	0xF914	第三次(最近一次)故障时输入端子状态	0~65535	0	-	不可更改	-
P9-21	0xF915	第三次(最近一次)故障时输出端子状态	0~65535	0	-	不可更改	-
P9-22	0xF916	第三次(最近一次)故障时变频器状态	0~65535	0	-	不可更改	-
P9-23	0xF917	第三次(最近一次)故障时上电时间	0~65535	0	s	不可更改	-
P9-24	0xF918	第三次(最近一次)故障时运行时间	0.0~6553.5	0.0	s	不可更改	-
P9-25	0xF919	第三次(最近一次)故障时反电动势	0.0~6553.5	0.0	V	不可更改	-
P9-27	0xF91B	第二次故障时频率	0.00Hz~655.35Hz	0.00	Hz	不可更改	-
P9-28	0xF91C	第二次故障时电流	0.00A~655.35A	0.00	A	不可更改	-
P9-29	0xF91D	第二次故障时母线电压	0.0V~6553.5V	0.0	V	不可更改	-
P9-30	0xF91E	第二次故障时输入端子状态	0~65535	0	-	不可更改	-
P9-31	0xF91F	第二次故障时输出端子状态	0~65535	0	-	不可更改	-
P9-32	0xF920	第二次故障时变频器状态	0~65535	0	-	不可更改	-
P9-33	0xF921	第二次故障时上电时间	0~65535	0	-	不可更改	-
P9-34	0xF922	第二次故障时运行时间	0.0~6553.5	0.0	-	不可更改	-
P9-35	0xF923	第二次故障时反电动势	0.0~6553.5	0.0	V	不可更改	-
P9-37	0xF925	第一次故障时频率	0.00Hz~655.35Hz	0.00	Hz	不可更改	-
P9-38	0xF926	第一次故障时电流	0.00A~655.35A	0.00	A	不可更改	-
P9-39	0xF927	第一次故障时母线电压	0.0V~6553.5V	0.0	V	不可更改	-
P9-40	0xF928	第一次故障时输入端子状态	0~65535	0	-	不可更改	-
P9-41	0xF929	第一次故障时输出端子状态	0~65535	0	-	不可更改	-
P9-42	0xF92A	第一次故障时变频器状态	0~65535	0	-	不可更改	-
P9-43	0xF92B	第一次故障时上电时间	0~65535	0	-	不可更改	-
P9-44	0xF92C	第一次故障时运行时间	0.0~6553.5	0.0	-	不可更改	-
P9-45	0xF92D	第一次故障时反电动势	0.0~6553.5	0.0	V	不可更改	-

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P9-47	0xF92F	故障保护动作选择1	个位：电机过载 （Err11） 0：自由停机 1：按停机方式停机 2：继续运行 十位：输入缺相 （Err12） 0：自由停机 1：按停机方式停机 2：继续运行 百位：输出缺相 （Err13） 0：自由停机 1：按停机方式停机 2：继续运行 千位：外部故障 （Err15） 0：自由停机 1：按停机方式停机 2：继续运行 万位：通讯异常 （Err16） 0：自由停机 1：按停机方式停机 2：继续运行	0	-	实时更改	第159页
P9-48	0xF930	故障保护动作选择2	个位：保留 十位：功能码读写异常 (Err21) 0：自由停机 1：按停机方式停机 百位：变频器过载故障动作选择（Err10） 0：自由停机 1：降额运行 千位：电机过热(Err25) 0：自由停机 1：按停机方式停机 万位：运行时间到达 (Err26) 0：自由停机 1：按停机方式停机	0	-	实时更改	第159页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P9-49	0xF931	故障保护动作选择3	个位：用户自定义故障 1（Err27） 0：自由停机 1：按停机方式停机 2：继续运行 十位：用户自定义故障 2（Err28） 0：自由停机 1：按停机方式停机 2：继续运行 百位：上电时间到达（Err29） 0：自由停机 1：按停机方式停机 2：继续运行 千位：掉载（Err30） 0：自由停机 1：减速停机 2：直接跳至电机额定频率的7%继续运行，不掉载时自动恢复到设定频率运行. 万位：运行时PID反馈丢失（Err31） 0：自由停机 1：按停机方式停机 2：继续运行	0	-	实时更改	第159页
P9-50	0xF932	故障保护动作选择4	个位：初始位置错误（Err51） 0：自由停机 1：按停机方式停机 2：继续运行 十位：电机超速度（Err43） 0：自由停机 1：按停机方式停机 2：继续运行 千位：保留 万位：保留	0	-	实时更改	第159页
P9-54	0xF936	故障时继续运行频率选择	0：以当前的运行频率运行 1：以设定频率运行 2：以上限频率运行 3：以下限频率运行 4：以异常时备用频率运行	0	-	实时更改	第159页
P9-55	0xF937	异常备用频率设定	0.0% ~ 100.0% (100.0% 对应最大频率 P0-10)	100.0	%	实时更改	第159页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
P9-56	0xF938	电机温度传感器类型	0：无传感器 1：PT100 2：PT1000	0	-	实时更改	第160页
P9-57	0xF939	电机过热保护阈值	0℃~200℃	110	℃	实时更改	第160页
P9-58	0xF93A	电机过热预报警阈值	0℃~200℃	90	℃	实时更改	第160页
P9-59	0xF93B	瞬停不停功能选择	0：无效 1：母线电压恒定控制 2：减速停机	0	-	实时更改	第160页
P9-60	0xF93C	瞬停不停恢复电压	80%~100%	85	%	实时更改	第160页
P9-61	0xF93D	瞬停不停电压恢复判断时间	0.0s~100.0s	0.5	s	实时更改	第160页
P9-62	0xF93E	瞬停不停动作电压	60%~100%	80	%	实时更改	第160页
P9-63	0xF93F	掉载保护选择	0：无效 1：有效	0	-	实时更改	第161页
P9-64	0xF940	掉载检测水平	0.0%~100.0%	10.0	%	实时更改	第161页
P9-65	0xF941	掉载检测时间	0.0s~60.0s	1.0	s	实时更改	第161页
P9-67	0xF943	过速度检测值	0.0% ~ 50.0% (最大频率)	20.0	%	实时更改	第161页
P9-68	0xF944	过速度检测时间	0.01~0.60	0.01	-	实时更改	第161页
P9-69	0xF945	速度偏差过大检测值	0.0% ~ 50.0% (最大频率)	20.0	%	实时更改	第161页
P9-70	0xF946	速度偏差过大检测时间	0.0s~60.0s 0.0s：不检测	5.0	s	实时更改	第161页
P9-71	0xF947	瞬停不停增益Kp	0~100	40	-	实时更改	第160页
P9-72	0xF948	瞬停不停积分系数Ki	0~100	30	-	实时更改	第160页
P9-73	0xF949	瞬停不停动作减速时间	0.0s~300.0s	20.0	s	实时更改	第160页
P9-74	0xF94A	UVW编码器故障使能	0~1	1	-	实时更改	-
P9-75	0xF94B	初始位置故障使能	十位：带载零点位置角参数辨识故障使能 0：关闭 1：开启	00	-	实时更改	-

PA 组 PID 功能							
参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PA-00	0xFA00	PID给定源	0：PA-01设定 1：AI1 2：AI2 3：AI3 4：PULSE设定（DI5） 5：通讯给定 6：多段指令给定	0	-	实时更改	第129页
PA-01	0xFA01	PID数值给定	0.0%~100.0%	50.0	%	实时更改	第129页
PA-02	0xFA02	PID反馈源	0：AI1 1：AI2 2：AI3 3：AI1-AI2 4：脉冲设定（DI5） 5：通讯给定 6：AI1+AI2 7：MAX(|AI1|, |AI2|) 8：MIN(|AI1|, |AI2|)	0	-	实时更改	第129页
PA-03	0xFA03	PID作用方向	0：正作用 1：反作用	0	-	实时更改	第129页
PA-04	0xFA04	PID给定反馈量程	0~65535	1000	-	实时更改	第129页
PA-05	0xFA05	比例增益Kp1	0.0~1000.0	20.0	-	实时更改	第130页
PA-06	0xFA06	积分时间Ti1	0.01s~10.00s	2.00	s	实时更改	第130页
PA-07	0xFA07	微分时间Td1	0.000s~10.000s	0.000	s	实时更改	第130页
PA-08	0xFA08	PID反转截止频率	0.00Hz~10.00Hz	0.00	Hz	实时更改	第130页
PA-09	0xFA09	PID偏差极限	0.0%~100.0%	0.0	%	实时更改	第130页
PA-10	0xFA0A	PID微分限幅	0.00%~100.00%	0.10	%	实时更改	第130页
PA-11	0xFA0B	PID给定变化时间	0.00s~650.00s	0.00	s	实时更改	第130页
PA-12	0xFA0C	PID反馈滤波时间	0.00s~60.00s	0.00	s	实时更改	第130页
PA-13	0xFA0D	PID输出滤波时间	0.00s~60.00s	0.00	s	实时更改	第130页
PA-15	0xFA0F	比例增益Kp2	0.0~1000.0	20.0	-	实时更改	第130页
PA-16	0xFA10	积分时间Ti2	0.01s~10.00s	2.00	s	实时更改	第130页
PA-17	0xFA11	微分时间Td2	0.000s~10.000s	0.000	s	实时更改	第130页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PA-18	0xFA12	PID参数切换条件	0：不切换 1：DI端子 2：根据偏差自动切换 3：根据运行频率切换	0	-	实时更改	第130页
PA-19	0xFA13	PID参数切换偏差1	0.0% ~ PA-20	20.0	%	实时更改	第130页
PA-20	0xFA14	PID参数切换偏差2	PA-19 ~ 100.0%	80.0	%	实时更改	第130页
PA-21	0xFA15	PID初值	0.0%~100.0%	0.0	%	实时更改	第130页
PA-22	0xFA16	PID初值保持时间	0.00s~650.00s	0.00	s	实时更改	第130页
PA-25	0xFA19	PID积分属性	个位：积分分离 0：无效 1：有效 十位： 0：继续积分 1：停止积分	00	-	实时更改	第130页
PA-26	0xFA1A	PID反馈丢失检测值	0.0%~100.0% 0.0%：不判断	0.0	%	实时更改	第131页
PA-27	0xFA1B	PID反馈丢失检测时间	0.0s~20.0s	0.0	s	实时更改	第131页
PA-28	0xFA1C	PID停机运算	0：停机不运算 1：停机时运算	0	-	实时更改	第131页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
Pb 组 摆频、定长和计数							
Pb-00	0xFB00	摆频设定方式	0：相对于中心频率 1：相对于最大频率	0	-	实时更改	-
Pb-01	0xFB01	摆频幅度	0.0%~100.0%	0.0	%	实时更改	-
Pb-02	0xFB02	突跳频率幅度	0.0%~50.0%	0.0	%	实时更改	-
Pb-03	0xFB03	摆频周期	0.1s~3000.0s	10.0	s	实时更改	-
Pb-04	0xFB04	摆频的三角波上升时间	0.1%~100.0%	50.0	%	实时更改	-
Pb-05	0xFB05	设定长度	0m~65535m	1000	m	实时更改	第168页
Pb-06	0xFB06	实际长度	0m~65535m	0	m	实时更改	第168页
Pb-07	0xFB07	每米脉冲数	0.1~6553.5	100.0	-	实时更改	第168页
Pb-08	0xFB08	设定计数值	1~65535	1000	-	实时更改	第169页
Pb-09	0xFB09	指定计数值	1~65535	1000	-	实时更改	第169页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PC 组 多段指令、简易 PLC							
PC-00	0xFC00	多段指令0	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-01	0xFC01	多段指令1	-100.0%~100.0%	0.0	%	实时更改	第124页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PC-02	0xFC02	多段指令2	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-03	0xFC03	多段指令3	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-04	0xFC04	多段指令4	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-05	0xFC05	多段指令5	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-06	0xFC06	多段指令6	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-07	0xFC07	多段指令7	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-08	0xFC08	多段指令8	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-09	0xFC09	多段指令9	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-10	0xFC0A	多段指令10	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-11	0xFC0B	多段指令11	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-12	0xFC0C	多段指令12	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-13	0xFC0D	多段指令13	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-14	0xFC0E	多段指令14	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-15	0xFC0F	多段指令15	-100.0%~100.0%	0.0	%	实时更改	第124页
PC-16	0xFC10	简易PLC运行方式	0：单次运行结束停机 1：单次运行结束保持终值 2：一直循环	0	-	实时更改	第127页
PC-17	0xFC11	简易PLC掉电记忆选择	个位： 0：掉电不记忆 1：掉电记忆 十位： 0：停机不记忆 1：停机记忆	0	-	实时更改	第127页
PC-18	0xFC12	PLC第0段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第126页
PC-19	0xFC13	PLC第0段加减速时间选择	0~3	0	-	实时更改	第126页
PC-20	0xFC14	PLC第1段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第126页
PC-21	0xFC15	PLC第1段加减速时间选择	0~3	0	-	实时更改	第126页
PC-22	0xFC16	PLC第2段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第126页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PC-23	0xFC17	PLC第2段加减速时间选择	0~3	0	-	实时更改	第126页
PC-24	0xFC18	PLC第3段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第126页
PC-25	0xFC19	PLC第3段加减速时间选择	0~3	0	-	实时更改	第126页
PC-26	0xFC1A	PLC第4段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第126页
PC-27	0xFC1B	PLC第4段加减速时间选择	0~3	0	-	实时更改	第126页
PC-28	0xFC1C	PLC第5段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第126页
PC-29	0xFC1D	PLC第5段加减速时间选择	0~3	0	-	实时更改	第126页
PC-30	0xFC1E	PLC第6段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第126页
PC-31	0xFC1F	PLC第6段加减速时间选择	0~3	0	-	实时更改	第126页
PC-32	0xFC20	PLC第7段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第126页
PC-33	0xFC21	PLC第7段加减速时间选择	0~3	0	-	实时更改	第126页
PC-34	0xFC22	PLC第8段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第126页
PC-35	0xFC23	PLC第8段加减速时间选择	0~3	0	-	实时更改	第126页
PC-36	0xFC24	PLC第9段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第127页
PC-37	0xFC25	PLC第9段加减速时间选择	0~3	0	-	实时更改	第127页
PC-38	0xFC26	PLC第10段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第127页
PC-39	0xFC27	PLC第10段加减速时间选择	0~3	0	-	实时更改	第127页
PC-40	0xFC28	PLC第11段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第127页
PC-41	0xFC29	PLC第11段加减速时间选择	0~3	0	-	实时更改	第127页
PC-42	0xFC2A	PLC第12段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第127页
PC-43	0xFC2B	PLC第12段加减速时间选择	0~3	0	-	实时更改	第127页
PC-44	0xFC2C	PLC第13段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第127页
PC-45	0xFC2D	PLC第13段加减速时间选择	0~3	0	-	实时更改	第127页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PC-46	0xFC2E	PLC第14段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第127页
PC-47	0xFC2F	PLC第14段加减速时间选择	0~3	0	-	实时更改	第127页
PC-48	0xFC30	PLC第15段运行时间	0.0s(h)~6500.0s(h)	0.0	s(h)	实时更改	第127页
PC-49	0xFC31	PLC第15段加减速时间选择	0~3	0	-	实时更改	第127页
PC-50	0xFC32	PLC运行时间单位	0：s（秒） 1：h（小时）	0	-	实时更改	第127页
PC-51	0xFC33	多段指令0给定方式	0：功能码(PC-00)给定 1：AI1 2：AI2 3：AI3 4：脉冲 5：PID 6：预置频率（P0-08）给定，UP/DOWN可修改	0	-	实时更改	第124/127页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
Pd 组 通讯参数							
Pd-00	0xFD00	波特率	个位：Modbus 0：300bps 1：600bps 2：1200bps 3：2400bps 4：4800bps 5：9600bps 6：19200bps 7：38400bps 8：57600bps 9：115200bps 十位：保留 0：115200bps 1：208300bps 2：256000bps 3：512000bps 百位：保留 千位：CANlink 波特率 0：20 1：50 2：100 3：125 4：250 5：500 6：1M	5005	-	实时更改	第177/178/192页
Pd-01	0xFD01	数据格式	0：无校验(8-N-2) 1：偶校验(8-E-1) 2：奇校验(8-O-1) 3：8-N-1	0	-	实时更改	第192页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
Pd-02	0xFD02	本机地址	0~247 0：广播地址	1	-	实时更改	第192页
Pd-03	0xFD03	Modbus应答延迟	0ms~20ms	2	ms	实时更改	第192页
Pd-04	0xFD04	串口通讯超时时间	0.0s~60.0s 0.0：无效	0.0	s	实时更改	第193页
Pd-05	0xFD05	Modbus通讯数据格式	个位：Modbus 0：非标准的Modbus协议 1：标准的Modbus协议 十位：保留 0：PPO1格式 1：PPO2格式 2：PPO3格式 3：PPO4格式	30	-	实时更改	第193页
Pd-06	0xFD06	通讯读取电流分辨率	0：0.01A（≤55kW） 1：0.1A	0	-	实时更改	第193页
Pd-08	0xFD08	保留	0.0s~60.0s 0.0s：无效	0.0	s	实时更改	第193页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PE 组 用户定制参数							
PE-00	0xFE00	用户功能码0	0~65535	u3.16	-	实时更改	
PE-01	0xFE01	用户功能码1	0~65535	u3.16	-	实时更改	
PE-02	0xFE02	用户功能码2	0~65535	0	-	实时更改	
PE-03	0xFE03	用户功能码3	0~65535	0	-	实时更改	
PE-04	0xFE04	用户功能码4	0~65535	0	-	实时更改	
PE-05	0xFE05	用户功能码5	0~65535	0	-	实时更改	
PE-06	0xFE06	用户功能码6	0~65535	0	-	实时更改	
PE-07	0xFE07	用户功能码7	0~65535	0	-	实时更改	
PE-08	0xFE08	用户功能码8	0~65535	0	-	实时更改	
PE-09	0xFE09	用户功能码9	0~65535	0	-	实时更改	
PE-10	0xFE0A	用户功能码10	0~65535	0	-	实时更改	
PE-11	0xFE0B	用户功能码11	0~65535	0	-	实时更改	
PE-12	0xFE0C	用户功能码12	0~65535	0	-	实时更改	
PE-13	0xFE0D	用户功能码13	0~65535	0	-	实时更改	

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PE-14	0xFE0E	用户功能码14	0~65535	0	-	实时更改	
PE-15	0xFE0F	用户功能码15	0~65535	0	-	实时更改	
PE-16	0xFE10	用户功能码16	0~65535	0	-	实时更改	
PE-17	0xFE11	用户功能码17	0~65535	0	-	实时更改	
PE-18	0xFE12	用户功能码18	0~65535	0	-	实时更改	
PE-19	0xFE13	用户功能码19	0~65535	0	-	实时更改	
PE-20	0xFE14	用户功能码20	0~65535	u0.68	-	实时更改	
PE-21	0xFE15	用户功能码21	0~65535	u0.69	-	实时更改	
PE-22	0xFE16	用户功能码22	0~65535	0	-	实时更改	
PE-23	0xFE17	用户功能码23	0~65535	0	-	实时更改	
PE-24	0xFE18	用户功能码24	0~65535	0	-	实时更改	
PE-25	0xFE19	用户功能码25	0~65535	0	-	实时更改	
PE-26	0xFE1A	用户功能码26	0~65535	0	-	实时更改	
PE-27	0xFE1B	用户功能码27	0~65535	0	-	实时更改	
PE-28	0xFE1C	用户功能码28	0~65535	0	-	实时更改	
PE-29	0xFE1D	用户功能码29	0~65535	0	-	实时更改	
PE-30	0xFE1E	用户功能码30	0~65535	0	-	实时更改	
PE-31	0xFE1F	用户功能码31	0~65535	0	-	实时更改	

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PP 组 参数管理							
PP-00	0x1F00	用户密码	0~65535	0	-	实时更改	
PP-01	0x1F01	参数初始化	0：无操作 1：恢复出厂参数，不包括电机参数、编码器、线数、最大频率 . 2：清除记录信息 4：恢复用户备份参数 501：备份用户当前参数	0	-	停机更改	

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
PP-02	0x1F02	功能参数显示选择	个位：U组显示选择 0：不显示 1：显示 十位：A组显示选择 0：不显示 1：显示	11	-	实时更改	
PP-03	0x1F03	个性参数方式显示选择	个位：用户定制参数组显示选择 0：不显示 1：显示 十位：用户变更参数组选择 0：不显示 1：显示	0	-	实时更改	
PP-04	0x1F04	功能码修改属性	0：可修改 1：不可修改	0	-	实时更改	

B.2 进阶功能参数简表

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A0 组 转矩控制参数							
A0-00	0xA000	速度/转矩控制方式选择	0：速度控制 1：转矩控制	0	-	实时更改	第151/177/179页
A0-01	0xA001	转矩控制方式下转矩设定选择	0：数字设定（A0-03） 1：AI1 2：AI2 3：AI3 4：PILSE脉冲 5：通讯给定 （通讯地址 为h1000） 6：MIN（AI1，AI2） 7：MAX（AI1，AI2）	0	-	实时更改	第152/177页
A0-03	0xA003	转矩控制方式下转矩数字设定	-200.0%~200.0%	150.0	%	实时更改	第152/177页
A0-05	0xA005	转矩控制正向最大频率	0.00Hz ~ 最大频率	50.00	Hz	实时更改	第152页
A0-06	0xA006	转矩控制反向最大频率	0.00Hz ~ 最大频率	50.00	-	实时更改	第152页
A0-07	0xA007	转矩上升滤波时间	0.00s~650.00s	0.00	s	实时更改	第152/177页
A0-08	0xA008	转矩下降滤波时间	0.00s~650.00s	0.00	s	实时更改	第152/177页

A1 组 虚拟 IO							
参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A1-00	0xA100	虚拟VDI1端子功能选择	0：无功能 1：正转运行（FWD） 2：反转运行（REV） 3：三线式运行控制 4：正转点动（FJOG） 5：反转点动（RJOG） 6：端子UP 7：端子DOWN 8：自由停机 9：故障复位（RESET） 10：运行暂停 11：外部故障常开输入 12：多段指令端子1 13：多段指令端子2 14：多段指令端子3 15：多段指令端子4 16：加减速选择端子1 17：加减速选择端子2 18：频率源切换 19：UP/DOWN设定清零（端子、键盘） 20：运行命令切换端子 21：加减速禁止 22：PID暂停 23：简易PLC状态复位 24：摆频暂停 25：计数器输入 26：计数器复位 27：长度计数输入 28：长度复位 29：转矩控制禁止 30：脉冲频率输入（仅 对ID5有效） 31：保留	0	-	停机更改	第187页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A1-00	0xA100	虚拟VDI1端子功能选择	32：立即直流制动 33：外部故障常闭输入 34：频率修改使能 35：PID作用方向取反 36：外部停机端子1 37：控制命令切换端2 38：PID积分暂停 39：主频率与预置频率切换 40：辅频率与预置频率切换 41：电机端子选择功能 42：保留 43：PID参数切换 44：用户自定义故障1 45：用户自定义故障2 46：紧急停机 47：外部停机端子2 48：减速直流制动 49：本次运行时间清零 50：两线式/三线式切换 51：保留 52：保留 53：保留 54：保留 55：保留 56：保留 57：保留 58：保留 59：保留	0	-	停机更改	第187页
A1-01	0xA101	虚拟VDI2端子功能选择	同A1-00	0	-	停机更改	第187页
A1-02	0xA102	虚拟VDI3端子功能选择	同A1-00	0	-	停机更改	第187页
A1-03	0xA103	虚拟VDI4端子功能选择	同A1-00	0	-	停机更改	第187页
A1-04	0xA104	虚拟VDI5端子功能选择	同A1-00	0	-	停机更改	第187页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A1-05	0xA105	虚拟VDI端子状态设置模式	个位：虚拟VDI1 0：由虚拟VDOx的状态决定VDI是否有效 1：由功能码A1-06设定VDI是否有效 十位：虚拟VDI2 0：由虚拟VDOx的状态决定VDI是否有效 1：由功能码A1-06设定VDI是否有效 百位：虚拟VDI3 0：由虚拟VDOx的状态决定VDI是否有效 1：由功能码A1-06设定VDI是否有效 千位：虚拟VDI4 0：由虚拟VDOx的状态决定VDI是否有效 1：由功能码A1-06设定VDI是否有效 万位：虚拟VDI5 0：由虚拟VDOx的状态决定VDI是否有效 1：由功能码A1-06设定VDI是否有效	0	-	停机更改	第187页
A1-06	0xA106	虚拟VDI端子状态设置	个位：虚拟VDI1 0：无效 1：有效 十位：虚拟VDI2 0：无效 1：有效 百位：虚拟VDI3 0：无效 1：有效 千位：虚拟VDI4 0：无效 1：有效 万位：虚拟VDI5 0：无效 1：有效	0	-	实时更改	第187页
A1-07	0xA107	AI1端子作为DI时的功能选择	同A1-00	0	-	停机更改	第189页
A1-08	0xA108	AI2端子作为DI时的功能选择	同A1-00	0	-	停机更改	第189页
A1-09	0xA109	AI3端子作为DI时的功能选择	同A1-00	0	-	停机更改	第189页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A1-10	0xA10A	AI作为DI有效状态选择	个位：AI1 0：高电平有效 1：低电平有效 十位：AI2 0：高电平有效 1：低电平有效 百位：AI3 0：高电平有效 1：低电平有效	0	-	停机更改	第189页
A1-11	0xA10B	虚拟VDO1输出功能选择	0：无输出 1：变频器运行中 2：故障输出 (为自由停机的故障) 3：频率水平检测1 4：频率到达 5：零速运行中 （停机时 不输出） 6：电机过载预报警 7：变频器过载预报警 8：设定记数值到达 9：指定记数值到达 10：长度到达 11：简易PLC循环完成 12：累计运行时间到达 13：频率限定中 14：转矩限定中 15：运行准备就绪 16：AI1>AI2 17：上限频率到达 18：下限频率到达 (停机 时不输出) 19：欠压状态 20：通讯设定 21：保留 22：保留 23：零速运行中2 （停机 时也输出） 24：累计上电时间到达 25：频率水平检测2 26~41：保留	0	-	实时更改	第187页
A1-12	0xA10C	虚拟VDO2输出功能选择	同A1-11	0	-	实时更改	第187页
A1-13	0xA10D	虚拟VDO3输出功能选择	同A1-11	0	-	实时更改	第187页
A1-14	0xA10E	虚拟VDO4输出功能选择	同A1-11	0	-	实时更改	第187页
A1-15	0xA10F	虚拟VDO5输出功能选择	同A1-11	0	-	实时更改	第187页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A1-16	0xA110	VDO1输出延时时间	0.0s~3600.0s	0.0	s	实时更改	第187页
A1-17	0xA111	VDO2输出延时时间	0.0s~3600.0s	0.0	s	实时更改	第187页
A1-18	0xA112	VDO3输出延时时间	0.0s~3600.0s	0.0	s	实时更改	第188页
A1-19	0xA113	VDO4输出延时时间	0.0s~3600.0s	0.0	s	实时更改	第188页
A1-20	0xA114	VDO5输出延时时间	0.0s~3600.0s	0.0	s	实时更改	第188页
A1-21	0xA115	VDO输出端子有效状态选择	个位：VD01 0：正逻辑 1：反逻辑 十位：VD02 0：正逻辑 1：反逻辑 百位：VD03 0：正逻辑 1：反逻辑 千位：VD04 0：正逻辑 1：反逻辑 万位：VD05 0：正逻辑 1：反逻辑	0	-	实时更改	第188页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A2 组 第二电机参数							
A2-00	0xA200	电机类型选择	2：永磁同步电机	2	-	停机更改	第15.页
A2-01	0xA201	电机额定功率	0.1kW~6553.5kW	机型确定	kW	停机更改	第15.页
A2-02	0xA202	电机额定电压	1V~2000V	机型确定	V	停机更改	第15.页
A2-03	0xA203	电机额定电流	0.01～655.35A（≤ 55kW） 0.1～6553.5A （>55kW）	机型确定	A	停机更改	第15.页
A2-04	0xA204	电机额定频率	0.01Hz～最大频率	机型确定	Hz	停机更改	第15.页
A2-05	0xA205	电机额定转速	1rpm~65535rpm	机型确定	rpm	停机更改	第15.页
A2-16	0xA210	同步电机定子电阻	0.001～65.535Ω（≤ 55kW） 0.0001～6.5535Ω（＞55kW）	协调参数	-	停机更改	第15.页
A2-17	0xA211	同步电机D轴电感	0.01～655.35mH（≤55kW） 0.001～65.535mH（＞55kW）	协调参数	mH	停机更改	第15.页
A2-18	0xA212	同步电机Q轴电感		协调参数	mH	停机更改	第15.页
A2-20	0xA214	同步电机反电动势	0.1V~6553.5V	协调参数	V	停机更改	第15.页
A2-27	0xA21B	编码器线数	1~65535	1024	-	停机更改	第15/页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A2-28	0xA21C	编码器类型	0：ABZ增量编码器 1：UVW增量编码器 2：旋转编码器 4：省线式UVW编码器	0	-	停机更改	第15/页
A2-29	0xA21D	速度反馈 PG 选择	0：本地 PG 1：扩展 PG 2：脉冲输入（DI5）	0	-	停机更改	
A2-30	0xA21E	ABZ增量编码器AB相序	0：正向 1：反向	0	-	停机更改	第15/页
A2-31	0xA21F	编码器零点位置角	0.0~359.9	0.0	-	停机更改	第15/页
A2-32	0xA220	UVW编码器相序	0：正向 1：反向	0	-	停机更改	
A2-34	0xA222	旋变变压器极对数	1~65535	1	-	停机更改	第15/页
A2-36	0xA224	PG断线检测时间	0.0~10.0 0.0：不动作	0.0	-	停机更改	第15/页
A2-37	0xA225	参数辨识选择	0：无操纵 11：同步带载参数辨识 12：同步空载参数辨识	0	-	停机更改	第15/页
A2-38	0xA226	速度环比例增益1	1~100	30	-	实时更改	
A2-39	0xA227	速度环积分时间1	0.01s~10.00s	0.50	s	实时更改	
A2-40	0xA228	切换频率1	0.00 ~ A2-43	5.00	-	实时更改	
A2-41	0xA229	速度环比例增益2	1~100	20	-	实时更改	
A2-42	0xA22A	速度环积分时间2	0.01s~10.00s	1.00	s	实时更改	
A2-43	0xA22B	切换频率2	A2-40 ~ 最大频率	10.00	-	实时更改	
A2-44	0xA22C	转差补偿系数	50~200	100	-	实时更改	
A2-45	0xA22D	速度环滤波时间常数	0~31	15	-	实时更改	
A2-46	0xA22E	矢量控制过励磁增益	0~200	64	-	实时更改	
A2-47	0xA22F	速度控制(驱动)转矩上限源	0~7	0	-	实时更改	
A2-48	0xA230	速度控制(驱动)转矩上限数字设定	0.0~200.0	150.0	-	实时更改	
A2-49	0xA231	速度控制(制动)转矩上限源	0	0	-	不可更改	
A2-50	0xA232	速度控制(制动)转矩上限数字设定	150.0	150.0	-	实时更改	
A2-51	0xA233	M轴电流环Kp	0~60000	3000	-	实时更改	
A2-52	0xA234	M轴电流环Ki	0~60000	500	-	实时更改	

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A2-53	0xA235	T轴电流环Kp	0~60000	3000	-	实时更改	
A2-54	0xA236	T轴电流环Ki	0~60000	500	-	实时更改	
A2-55	0xA237	速度环积分属性	0~1	0	-	实时更改	
A2-56	0xA238	同步机弱磁模式	0~2	0	-	停机更改	
A2-57	0xA239	同步机弱磁系数	1~50	1	-	实时更改	
A2-58	0xA23A	最大弱磁电流	1~300	105	-	停机更改	
A2-59	0xA23B	弱磁自动参数辨识系数	10~500	100	-	实时更改	
A2-60	0xA23C	弱磁积分倍数	0：无效 1：有效	0	-	停机更改	
A2-61	0xA23D	第二电机控制方式	0：无速度传感器矢量控制（SVC） 1：有速度传感器矢量控制（FVC） 2：V/f控制	0	-	停机更改	
A2-62	0xA23E	第二电机加减速时间选择	0：与第一电机相同 1：加减速时间1 2：加减速时间2 3：加减速时间3 4：加减速时间4	0	-	实时更改	
A2-63	0xA23F	第二电机转矩提升	0.0%~30.0%	1.0	%	实时更改	
A2-65	0xA241	第二电机振荡抑制增益	0~100	40	-	实时更改	
A2-66	0xA242	弱磁深度	0~50%	5	%	实时更改	
A2-67	0xA243	同步机弱磁系数	50~180%	80	%	实时更改	
A2-68	0xA244	初始位置是否检测	0~2	0	-	实时更改	
A2-69	0xA245	速度环模式选择	0~1	0	-	实时更改	
A2-70	0xA246	最大出力调整系数	50~500	100	-	实时更改	
A2-71	0xA247	跟据母线电压对频率限幅使能	0~1	0	-	实时更改	
A2-72	0xA248	前馈补偿模式	0~2	0	-	实时更改	
A2-73	0xA249	参数辨识时电流环 Kp	1~100	6	-	实时更改	

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A2-74	0xA24A	参数辨识时电流环 Ki	1~100	6	-	实时更改	
A2-75	0xA24B	Z信号校正使能	0~1	1	-	实时更改	
A2-76	0xA24C	同步机SVC速度滤波级别	10~1000	100	-	实时更改	
A2-77	0xA24D	同步机SVC速度估算比例增益	5~200	40	-	实时更改	
A2-78	0xA24E	同步机SVC速度估算积分增益	5~500	30	-	实时更改	
A2-79	0xA24F	同步机SVC初始励磁电流限幅	0~80%	30	%	实时更改	
A2-80	0xA250	同步机SVC最低载波频率	0.8~5.0Khz	1.5	kHz	实时更改	
A2-81	0xA251	低频运行方式	0~1	0	-	实时更改	
A2-82	0xA252	低频生效	0.00~10.00Hz	2.00	Hz	实时更改	
A2-83	0xA253	低频频率步长	0.00050~1.00000Hz	0.0010	Hz	实时更改	
A2-84	0xA254	低频制动电流	0~80%	80	%	实时更改	
A2-85	0xA255	同步机SVC速度跟踪	0~1	0	-	实时更改	
A2-86	0xA256	零伺服使能	0~1	0	-	实时更改	
A2-87	0xA257	切换频率	0.00 ~ P2-02	0.30	Hz	实时更改	
A2-88	0xA258	零伺服速度环比例增益	1~100	10	-	实时更改	
A2-89	0xA259	零伺服速度环积分时间	0.01~10.00s	0.50	s	实时更改	
A2-90	0xA25A	停机禁止反转	0~1	0	-	实时更改	
A2-91	0xA25B	停机角度	0.0°~10.0°	0.8	°	实时更改	
A2-92	0xA25C	在线参数辨识使能	0：关闭 1：上电第一次运行前参数辨识 2：运行前参数辨识	0	-	实时更改	
A2-93	0xA25D	在线反电动势辨识	0：关闭 1：开启	0	-	实时更改	
A2-94	0xA25E	初始位置补偿角度	0~100°	50°	°	实时更改	

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A5 组 控制优化参数							
A5-00	0xA500	DPWM切换上限频率	5.00Hz~500.00Hz	8.00	Hz	实时更改	第136页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A5-01	0xA501	PWM调制方式	0：异步调制 1：同步调制	0	-	实时更改	第136页
A5-02	0xA502	死区补偿模式选择	0：不补偿 1：补偿模式1	1	-	实时更改	变频器同桥臂上下开关管的开关信号必须要有死区。 死区补偿可以改善电机低频运行时的电流波形。
A5-03	0xA503	随机PWM深度	0~10	0	-	实时更改	第136页
A5-04	0xA504	快速限流使能	0：不使能 1：使能	1	-	实时更改	快速限流功能可最大限度减小过流故障，保护变频器正常运行。 在起重等提升场合，建议关闭此功能。
A5-05	0xA505	最大电压输出系数	100~120	105	-	实时更改	第14/页
A5-06	0xA506	欠压点设置	120.0V~1500.0V	350.0	V	实时更改	当母线电压低于A5-06时，报Err09故障。
A5-08	0xA508	死区时间调整	100%~200%	100	%	停机更改	第14/页
A5-09	0xA509	过压点设置	200.0V~820.0V	820.0	V	停机更改	第14/页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A6 组 AI 曲线设定							
A6-00	0xA600	曲线4最小输入	-10.00V ~ A6-02	0.00	V	实时更改	第10.页
A6-01	0xA601	曲线4最小输入对应设定	-100.0% ~ +100.0%	0.0	%	实时更改	第10.页
A6-02	0xA602	曲线4拐点1输入	A6-00 ~ A6-04	3.00	V	实时更改	第10.页
A6-03	0xA603	曲线4拐点1输入对应设定	-100.0% ~ +100.0%	30.0	%	实时更改	第10.页
A6-04	0xA604	曲线4拐点2输入	A6-02 ~ A6-06	6.00	V	实时更改	第10.页
A6-05	0xA605	曲线4拐点2输入对应设定	-100.0% ~ +100.0%	60.0	%	实时更改	第10.页
A6-06	0xA606	曲线4最大输入	A6-04 ~ +10.00V	10.00	V	实时更改	第10.页
A6-07	0xA607	曲线4最大输入对应设定	-100.0% ~ +100.0%	100.0	%	实时更改	第10.页
A6-08	0xA608	曲线5最小输入	-10.00V ~ A6-10	-10.00	V	实时更改	第10.页
A6-09	0xA609	曲线5最小输入对应设定	-100.0%~ + 100.0%	-100.0	%	实时更改	第10.页
A6-10	0xA60A	曲线5拐点1输入	A6-08 ~ A6-12	-3.00	V	实时更改	第10.页
A6-11	0xA60B	曲线5拐点1输入对应设定	-100.0% ~ +100.0%	-30.0	%	实时更改	第10.页
A6-12	0xA60C	曲线5拐点2输入	A6-10 ~ A6-14	3.00	V	实时更改	第10.页
A6-13	0xA60D	曲线5拐点2输入对应设定	-100.0% ~ +100.0%	30.0	%	实时更改	第10.页
A6-14	0xA60E	曲线5最大输入	A6-12 ~ +10.00V	10.00	V	实时更改	第10.页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A6-15	0xA60F	曲线5最大输入对应设定	-100.0% ~ +100.0%	100.0	%	实时更改	第10.页
A6-24	0xA618	AI1设定跳跃点	-100.0% ~ +100.0%	0.0	%	实时更改	第10.页
A6-25	0xA619	AI1设定跳跃幅度	0.0%~100.0%	0.5	%	实时更改	第10.页
A6-26	0xA61A	AI2设定跳跃点	-100.0% ~ +100.0%	0.0	%	实时更改	第10.页
A6-27	0xA61B	AI2设定跳跃幅度	0.0%~100.0%	0.5	%	实时更改	第10.页
A6-28	0xA61C	AI3设定跳跃点	-100.0% ~ +100.0%	0.0	%	实时更改	第10.页
A6-29	0xA61D	AI3设定跳跃幅度	0.0%~100.0%	0.5	%	实时更改	第10.页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A7 用户可编程卡参数							
A7-00	0xA700	用户可编程功能	0：无效 1：有效	0	-	停机更改	第173页
A7-01	0xA701	控制板输出端子控制模式选择	个位：FMR （FM端子作为开关量输出） 0：变频器控制 1：用户可编程控制卡控制 十位：继电器 （T/A-T/B-T/C） 0：变频器控制 1：用户可编程控制卡控制 百位：DO1 0：变频器控制 1：用户可编程控制卡控制 千位：FMP 0：变频器控制 1：用户可编程控制卡控制 万位：AO1 0：变频器控制 1：用户可编程控制卡控制	0	-	停机更改	第174页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A7-02	0xA702	可编程卡扩展AIAO端子功能 配置	0：AI3 电压输入，AO2 电压输出 1：AI3 电压输入，AO2 电流输出 2：AI3 电流输入，AO2 电压输出 3：AI3 电流输入，AO2 电流输出 4：AI3 PTC输入，AO2 电压输出 5：AI3 PTC输入，AO2 电流输出 6：AI3 PTC100输入，AO2 电压输出 7：AI3 PTC100输入，AO2 电流输出	0	-	停机更改	第173页
A7-03	0xA703	FMP输出	0.0%~100.0%	0.0	%	实时更改	第174页
A7-04	0xA704	AO1输出	0.0%~100.0%	0.0	%	实时更改	第174页
A7-05	0xA705	开关量输出	个位：FMR 0：无效 1：有效 十位：继电器1 0：无效 1：有效 百位：DO 0：无效 1：有效	000	-	实时更改	第174页
A7-06	0xA706	可编程卡频率给定	-100.00% ~ +100.00%	0.00	%	实时更改	第175页
A7-07	0xA707	可编程卡转矩给定	-200.0% ~ +200.0%	0.0	%	实时更改	第175页
A7-08	0xA708	可编程卡命令给定	0：无命令 1：正转命令 2：反转命令 3：正转点动 4：反转点动 5：自由停机 6：减速停机 7：故障复位	0	-	实时更改	第174页
A7-09	0xA709	可编程卡给定故障	0：无故障 80 ~ 89：故障编码	0	-	实时更改	第175页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A8 组 点对点通讯							
A8-00	0xA800	点对点通讯功能选择	0：无效 1：有效	0	-	停机更改	第177/178/179页
A8-01	0xA801	主从控制	0：主机 1：从机	0	-	停机更改	第177/178/179页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A8-02	0xA802	从机命令跟随主从信息交互	个位：从机命令跟随 0：从机不跟随主机运行命令运行 1：从机跟随主机运行命令运行 十位：从机故障信息传输 0：从机故障信息不传输 1：从机故障信息传输 百位：主机显示从机掉线 0：从机掉线主机不报故障 1：从机掉线主机报故障（Err-16）	011	-	停机更改	第177/178/179页
A8-03	0xA803	从机接收数据作用选择	0：主机运行频率 1：主机目标频率	0	-	停机更改	第180页
A8-04	0xA804	接收数据零偏（转矩）	-100.00% ~ +100.00%	0.00	%	实时更改	第180页
A8-05	0xA805	接收数据增益（转矩）	-10.00 ~ +10.00	1.00	-	实时更改	第180页
A8-06	0xA806	点对点通讯中断检测时间	0.0s~10.0s	1.0	s	停机更改	第180页
A8-07	0xA807	点对点通讯主机数据发送周期	0.001s~10.000s	0.001	s	停机更改	第180页
A8-08	0xA808	频率接收数据零偏	-100.00 ~ +100.00	0.00	-	实时更改	第180页
A8-09	0xA809	频率接收数据增益	-10.00 ~ +10.00	1.00	-	实时更改	第180页
A8-10	0xA80A	防飞车系数	0.00~100.00	10.00	-	实时更改	第180页
A8-11	0xA80B	从机频率反向最大偏差	0.20%~10.00%	0.50	%	实时更改	第177/180页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
A9 组 优化参数							
A9-00	0xA900	电感饱和系数	30~200	30	-	停机更改	用于微调控制模型中的电感值，调整控制相关参数。
A9-01	0xA901	电感保护系数微调使能	0~1	0	-	停机更改	
A9-02	0xA902	PMW开关母线电压纹波阈值	0V~300V	0	V	停机更改	电容漏液相关阈值，一般不改变，设置为默认值。
A9-03	0xA903	母线电压纹波阈值	0V~80V	0	V	停机更改	
A9-04	0xA904	PMW开关母线电压 纹波阈值计数	0~100	0	-	停机更改	
A9-05	0xA905	电容故障检测使能	0~1	0	-	停机更改	

AC 组 AIAO 校正							
参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
AC-00	0xAC00	AI1实测电压1	-10.000V ~ +10.000V	0.000	V	实时更改	
AC-01	0xAC01	AI1显示电压1	-10.000V~10.000V	0.000	V	实时更改	
AC-02	0xAC02	AI1实测电压2	-10.000V~10.000V	0.000	V	实时更改	
AC-03	0xAC03	AI1显示电压2	-10.000V~10.000V	0.002	V	实时更改	
AC-04	0xAC04	AI2实测电压1	-10.000V~10.000V	0.002	V	实时更改	
AC-05	0xAC05	AI2显示电压1	-10.000V~10.000V	0.002	V	实时更改	
AC-06	0xAC06	AI2实测电压2	-10.000V~10.000V	0.002	V	实时更改	
AC-07	0xAC07	AI2显示电压2	-10.000V~10.000V	0.002	V	实时更改	
AC-08	0xAC08	AI3实测电压1	-10.000V~10.000V	2.000	V	实时更改	
AC-09	0xAC09	AI3显示电压1	-10.000V~10.000V	2.000	V	实时更改	
AC-10	0xAC0A	AI3实测电压2	-10.000V~10.000V	8.000	V	实时更改	
AC-11	0xAC0B	AI3显示电压2	-10.000V~10.000V	8.000	V	实时更改	
AC-12	0xAC0C	AO1实测电压1	-10.000V~10.000V	0.002	V	实时更改	
AC-13	0xAC0D	AO1目标电压1	-10.000V~10.000V	0.002	V	实时更改	
AC-14	0xAC0E	AO1实测电压2	-10.000V~10.000V	0.002	V	实时更改	
AC-15	0xAC0F	AO1目标电压2	-10.000V~10.000V	0.002	V	实时更改	
AC-16	0xAC10	AO2实测电压1	-10.000V~10.000V	2.000	V	实时更改	
AC-17	0xAC11	AO2目标电压1	-10.000V~10.000V	2.000	V	实时更改	
AC-18	0xAC12	AO2实测电压2	-10.000V~10.000V	8.000	V	实时更改	
AC-19	0xAC13	AO2目标电压2	-10.000V~10.000V	8.000	V	实时更改	

B.3 监视参数简表

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
U0 组 基本监视参数							
U0-00	0x7000	运行频率	0.00Hz~320.00Hz	0.00	Hz	不可更改	第164页
U0-01	0x7001	设定频率	0.00Hz~320.00Hz	0.00	Hz	不可更改	第164页
U0-02	0x7002	母线电压	0.0V~3000.0V	0.0	V	不可更改	第164页
U0-03	0x7003	输出电压	0V~1140V	0	V	不可更改	第164页
U0-04	0x7004	输出电流	0.00A~655.35A	0.00	A	不可更改	第164页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
U0-05	0x7005	输出功率	0.0kW~3276.7kW	0.0	kW	不可更改	第164页
U0-06	0x7006	输出转矩	-200.0%~200.0%	0.0	%	不可更改	第164页
U0-07	0x7007	DI输入状态	0~32767	0	-	不可更改	第164页
U0-08	0x7008	DO输出状态	0~1023	0	-	不可更改	第165页
U0-09	0x7009	AI1电压	0.00V~10.57V	0.00	V	不可更改	第165页
U0-10	0x700A	AI2电压	0.00V~10.57V	0.00	V	不可更改	第165页
U0-11	0x700B	AI3电压	0.00V~10.57V	0.00	V	不可更改	第165页
U0-12	0x700C	计数值	0~65535	0	-	不可更改	第165页
U0-13	0x700D	长度值	0~65535	0	-	不可更改	第165页
U0-14	0x700E	负载速度显示	0~65535	0	-	不可更改	第165页
U0-15	0x700F	PID设定	0~65535	0	-	不可更改	第165页
U0-16	0x7010	PID反馈	0~65535	0	-	不可更改	第165页
U0-17	0x7011	PLC阶段	0~65535	0	-	不可更改	第165页
U0-18	0x7012	PULSE输入脉冲频率	0.00kHz~100.00kHz	0.00	kHz	不可更改	第165页
U0-19	0x7013	反馈速度	0.00Hz~320.00Hz	0.00	Hz	不可更改	第165页
U0-20	0x7014	剩余运行时间	0.0min~6500.0min	0.0	min	不可更改	第165页
U0-21	0x7015	AI1校正前电压	0.000V~10.570V	0.000	V	不可更改	第165页
U0-22	0x7016	AI2校正前电压	0.000V~65.535V	0.000	V	不可更改	第165页
U0-23	0x7017	AI3校正前电压	-10.570V~10.570V	0.000	V	不可更改	第165页
U0-24	0x7018	线速度	0m/min~65535m/min	0	m/min	不可更改	第165页
U0-25	0x7019	当前上电时间	0min~65535min	0	min	不可更改	第165页
U0-26	0x701A	当前运行时间	0.0min~6553.5min	0.0	min	不可更改	第166页
U0-27	0x701B	PULSE输入脉冲频率	0Hz~65535Hz	0	Hz	不可更改	第166页
U0-28	0x701C	通讯设定值	-100.00%~100.00%	0.00	%	不可更改	第166页
U0-29	0x701D	编码器反馈速度	0.00~最大频率	0.00	Hz	不可更改	第166页

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
U0-30	0x701E	主频率X显示	0.00Hz~320.00Hz	0.00	Hz	不可更改	第166页
U0-31	0x701F	辅频率Y显示	0.00Hz~320.00Hz	0.00	Hz	不可更改	第166页
U0-32	0x7020	查看任意内存地址值	0~65535	0	-	不可更改	-
U0-34	0x7022	电机温度值	0℃~200℃	0	℃	不可更改	第166页
U0-36	0x7024	旋变位置	0~65535	0	-	不可更改	第166页
U0-37	0x7025	功率因素角	0.0~6553.5	0.0	-	不可更改	第166页
U0-38	0x7026	ABZ位置	0~65535	0	-	不可更改	第166页
U0-39	0x7027	V/f分离目标电压	0V~65535V	0	V	不可更改	第166页
U0-40	0x7028	V/f分离输出电压	0V~65535V	0	V	不可更改	第166页
U0-41	0x7029	DI输入直观显示	0~65535	0	-	不可更改	第166页
U0-42	0x702A	DO输入直观显示	0~65535	0	-	不可更改	第166页
U0-43	0x702B	DI功能状态直观显示	0~65535	0	-	不可更改	第167页
U0-44	0x702C	DO功能状态直观显示	0~65535	0	-	不可更改	第167页
U0-45	0x702D	故障信息	0~65535	0	-	不可更改	第167页
U0-58	0x703A	Z 信号计数器	0~65535	0.00	%	不可更改	第167页
U0-59	0x703B	设定频率	-100.00%~100.00%	0.00	%	不可更改	第167页
U0-60	0x703C	运行频率	-100.00%~100.00%	0.00	%	不可更改	第167页
U0-61	0x703D	变频器运行状态	0~65535	0	-	不可更改	第167页
U0-62	0x703E	当前故障	0~99	0	-	不可更改	第167页
U0-63	0x703F	点对点主机通讯发送值	0.00~655.35	0.00	-	不可更改	第167页
U0-64	0x7040	主从控制主机下属从机个数	0~65535	0	-	不可更改	第167页
U0-65	0x7041	转矩上限	-100.00%~100.00%	0	-	不可更改	第167页
U0-66	0x7042	通信控展卡型号	0~65535	0	-	不可更改	
U0-67	0x7043	通信控展卡版本号	0~65535	0	-	不可更改	
U0-68	0x7044	DP卡变频器状态	0~65535	0	-	不可更改	

参数	通讯地址	参数名称	设定值	默认值	单位	更改方式	页码
U0-69	0x7045	传送DP卡的速度	0.00Hz~655.35Hz	0.00	Hz	不可更改	
U0-70	0x7046	转速rpm	0rpm~65535rpm	0	rpm	不可更改	
U0-71	0x7047	通信卡专用电流显示	0~65535	0	-	不可更改	
U0-72	0x7048	通信卡出错状态	0~65535	0	-	不可更改	
U0-73	0x7049	电机序号	0~65535	0	-	不可更改	
U0-74	0x704A	在线辨识的反电动势	0.0~6553.5	0.0	-	不可更改	
U0-75	0x704B	过载状态(转矩模式下)	0~65535	0	-	不可更改	
U0-76	0x704C	累计耗电量fc低位	0~65535	0	-	不可更改	第167页
U0-77	0x704D	累计耗电量fc高位	0~65535	0	-	不可更改	第167页
U0-78	0x704E	线速度	0~65535	0	-	不可更改	

附录 C 通 讯

C.1 通讯数据地址定义

YD580E 系列变频器支持 Modbus-RTU、CANopen、CANlink、Profibus-DP 四种通讯协议，用户可编程卡和点对点通讯属于 CANlink 协议的衍生。上位机通过这些通讯协议可以实现对变频器的控制、监视及功能参数修改查看操作。

YD580E 通讯数据可分为参数数据、非参数数据，后者包括运行命令、运行状态、运行参数、告警信息等。

C.1.1 YD580E 参数数据

参数数据为变频器的重要设置参数，P 组 功能基础参数，A 组 进阶功能参数

如下：

YD580E 参数数据	P 组 (可读写)	P0、P1、P2、P3、P4、P5、P6、P7、P8、P9、PA、PB、PC、PD、PE、PF
	A 组 (可读写)	A0、A1、A2、A3、A4、A5、A6、A7、A8、A9、AA、AB、AC、AD、AE、AF

参数数据通讯地址定义如下：

1） 当为通讯读取参数数据时

对于 P0~PF、A0~AF 组参数数据，其通讯地址高十六位直接为功能组编号，低十六位直接为参数在功能组中序号，举例如下：

P0-16 功能参数， 其通讯地址为 F010H，其中 F0H 代表 P0 组功能参数，10H 代表参数在功能组中序号 16 的十六进制数据格式

AC-08 功能参数，其通讯地址为 AC08，其中 ACH 代表 AC 组功能参数，08H 代表参数在功能组中序号 8 的十六进制数据格式

2） 当为通讯写入参数数据时

对于 P0~PF 组参数数据，其通讯地址高十六位，根据是否写入 EEPROM，区分为 00~0F 或 F0~FF，低十六位直接为参数在功能组中序号，举例如下：

---- 写功能参数 P0-16：

不需要写入 EEPROM 时，其通讯地址为 0010H

需要写入 EEPROM 时，其通讯地址为 F010H

对于 A0~AF 组参数数据，其通讯地址高十六位，根据是否需要写入 EEPROM，区分为 40~4F 或 A0~AF，低十六位直接为参数在功能组中序号，举例如下：

---- 写功能参数 AC-08：

不需要写入 EEPROM 时，其通讯地址为 4C08H

需要写入 EEPROM 时，其通讯地址为 AC08H

C.1.2 YD580E 非参数数据

YD580E 非参数数据	状态数据（只读）	U 组监视参数、变频器故障描述、变频器运行状态
	控制参数 (只写)	控制命令、通讯设定值、数字输出端子控制、模拟输出 AO1 控制、模拟输出 AO2 控制、高速脉冲 (FMP) 输出控制、参数初始化

1） 状态数据

状态数据分为 U 组监视参数、变频器故障描述、变频器运行状态

U 组参数监视参数

U 组监视数据描述见“附录 C 功能参数表”、“第六章 参数说明”相关描述，其地址定义如下：

U0~UF，其通讯地址高十六位为 70~7F，低十六位为监视参数在组中的序号，举例如下：

U0-11，其通讯地址为 700BH

变频器故障描述

通讯读取变频器故障描述时，通讯地址固定为 8000H，上位机通过读取该地址数据，可以获取当前变频器故障代码，故障代码描述见“附录 A或B 功能参数表”P9-14 参数中定义

变频器运行状态

通讯读取变频器运行状态时，通讯地址固定为 3000H，上位机通过读取该地址数据，可以获取当前变频器运行状态信息，定义如下：

变频器运行状态通讯地址	读取状态字定义
3000H	1：正转运行
	2：反转运行
	3：停机

2） 控制参数

控制参数分为控制命令、数字输出端子控制、模拟输出 AO1 控制、模拟输出 AO2 控制、高速脉冲 (FMP) 输出控制

- 控制命令

在 P0-02(命令源) 选择为 2：通讯控制时，上位机通过该通讯地址，可以实现对变频器的启停等相关命令控制，控制命令定义如下：

控制命令通讯地址	命令功能
2000H	1：正转运行
	2：反转运行
	3：正转点动
	4：反转点动
	5：自由停机
	6：减速停机
	7：故障复位

● 通讯设定值

通讯设定值主要用于 YD580E 中频率源、转矩上限源、V/F 分离电压源、PID 给定源、PID 反馈源等选择为通讯给定时的给定数据。其通讯地址为 1000H，上位机设定该通讯地址值时，其数据范围为 -10000~10000，对应相对给定值 -100.00%~100.00%

● 数字输出端子控制

当数字输出端子功能选择为 20：通讯控制时，上位机通过该通讯地址，可以实现对变频器数字输出端子的控制，定义如下：

数字输出端子控制通讯地址	命令内容
2001H	BIT0：DO1 输出控制 BIT1：DO2 输出控制 BIT2：RELAY1 输出控制 BIT3：RELAY2 输出控制 BIT4：FMR 输出控制 BIT5：VDO1 BIT6：VDO2 BIT7：VDO3 BIT8：VDO4 BIT9：VDO5

● 模拟量输出 AO1、AO2，高速脉冲输出 FMP 控制

当模拟量输出 AO1、AO2，高速脉冲输出 FMP 输出功能选择为 12：通讯设定时，上位机通过该通讯地址，可以实现对变频器模拟量、高速脉冲输出的控制，定义如下：

输出控制通讯地址		命令内容
AO1	2002H	0 ～ 7FFF 表示 0%～ 100%
AO2	2003H	
FMP	2004H	

● 参数初始化

当需要通过上位机实现对变频器的参数初始化操作时，需要使用该功能。

如果 PP-00(用户密码) 不为 0，则首先需要通过通讯进行密码校验，校验通过后，在 30 秒内，上位机进行参数初始化操作。

通讯进行用户密码校验的通讯地址为 1F00H，直接将正确的用户密码写入该地址，则可以完成密码校验

通讯进行参数初始化的地址为 1F01H，其数据内容定义如下：

参数初始化通讯地址	命令功能
1F01H	1：恢复出厂参数
	2：清楚记录信息
	4：恢复用户备份参数
	501：备份用户当前参数

C.2 Modbus 通讯协议

YD580E系列变频器提供 RS485 通信接口，并支持 Modbus-RTU 从站通讯协议。用户可通过计算机或 PLC 实现集中控制，通过该通讯协议设定变频器运行命令，修改或读取参数参数，读取变频器的工作状态及故障信息等。

该串行通信协议定义了串行通信中传输的信息内容及使用格式。其中包括：主机轮询（或广播）格式；主机的编码方法，内容包括：要求动作的参数，传输数据和错误校验等。从机的响应也是采用相同的结构，内容包括：动作确认，返回数据和错误校验等。如果从机在接收信息时发生错误，或不能完成主机要求的动作，它将组织一个故障信息作为响应反馈给主机。

C.2.1 应用方式

变频器接入具备 RS485 总线的“单主多从”PC/PLC 控制网络，作为通讯从机。

C.2.2 总线结构

1） 硬件接口

需在变频器上插入 RS485 扩展卡 YD58TX1 硬件。

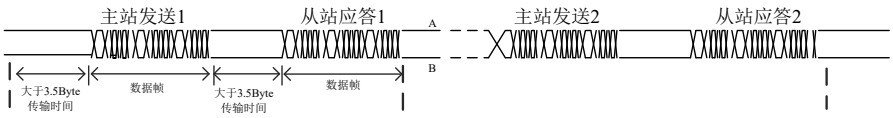
2） 拓扑结构

单主机多从机系统。网络中每一个通讯设备都有一个唯一的从站地址，其中有一个设备作为通讯主机（常为 PC 上位机、PLC、HMI 等），主动发起通讯，对从机进行参数读或写操作，其他设备在为通讯从机，响应主机对本机的询问或通讯操作。在同一时刻只能有一个设备发送数据，而其他设备处于接收状态。

从机地址的设定范围为 1~247，0 为广播通信地址。网络中的从机地址必须是唯一的。

3） 通讯传输方式

异步串行，半双工传输方式。数据在串行异步通信过程中，是以报文的形式，一次发送一帧数据，MODBUS-RTU 协议中约定，当通讯数据线上无数据的空闲时间大于 3.5Byte 的传输时间，表示新的一个通讯帧的起始。



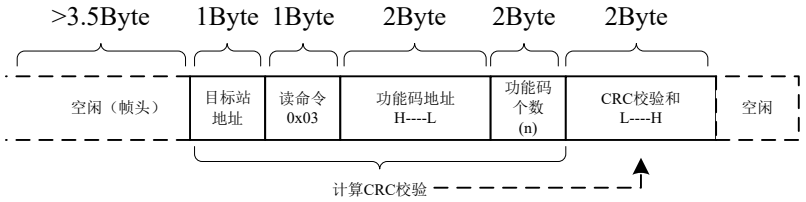
YD580E 系列变频器内置的通信协议是 Modbus-RTU 从机通信协议，可响应主机的“查询 / 命令”， 或根据主机的“查询 / 命令”做出相应的动作，并通讯数据应答。

主机可以是指个人计算机（PC），工业控制设备或可编程逻辑控制器（PLC）等，主机既能对某个从机单独进行通信，也能对所有下位从机发布广播信息。对于主机的单独访问“查询 / 命令”，被访问从机要返回一个应答帧；对于主机发出的广播信息，从机无需反馈响应给主机。

C.3 通讯资料结构

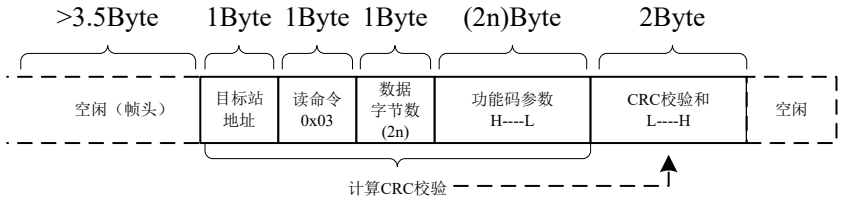
YD580E 系列变频器的 Modbus-RTU 协议通讯数据格式如下，变频器只支持 Word 型参数的读或写，对应的通讯读操作命令为 0x03；写操作命令为 0x06，不支持字节或位的读写操作：

主站读命令帧

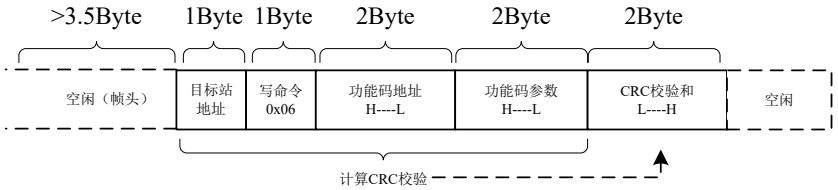


理论上，上位机可以一次读取连续的几个参数（即其中 n 最大可达 12 个），但要注意不能跨过本参数组的最后一个参数，否则会答复出错。

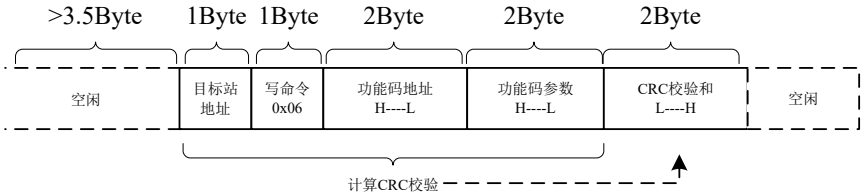
从站读应答帧



主站写命令帧

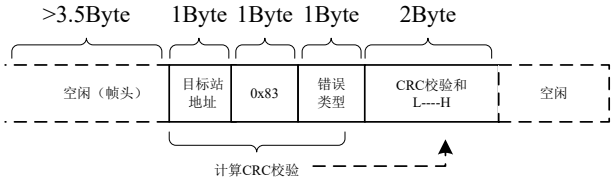


从站写应答帧

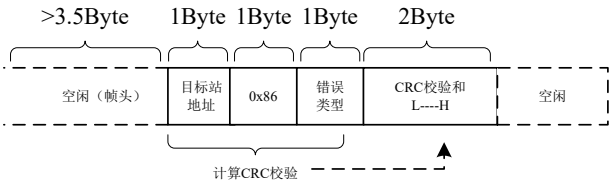


若从机检测到通讯帧错误，或其他原因导致的读写不成功，会答复错误帧。

从站读应答错误帧



从站写应答错误帧



错误类型：
01：命令码错误
02：地址错误
03：数据错误
04：命令无法处理

数据帧字段说明：

帧头 START	大于 3.5 个字符传输时间的空闲
从机地址 ADR	通讯地址范围：1 ～ 247；0 ＝广播地址
命令码 CMD	03：读从机参数；06：写从机参数
参数地址 H	变频器内部的参数地址，16 进制表示；分为参数型和非参数型（如运行状态参数、运行命令等）参数等，详见地址定义。 传送时，高字节在前，低字节在后。
参数地址 L	
参数个数 H	本帧读取的参数个数，若为 1 表示读取 1 个参数。传送时，高字节在前，低字节在后。 本协议一次只能改写 1 个参数，没有该字段。
参数个数 L	
数据 H	应答的数据，或待写入的数据，传送时，高字节在前，低字节在后。
数据 L	
CRC CHK 低位	检测值： CRC16 校验值。传送时，低字节在前，高字节在后。 计算方法详见本节 CRC 校验的说明。
CRC CHK 高位	
END	3.5 个字符时

CRC 校验方式：

CRC（Cyclical Redundancy Check）使用 RTU 帧格式，消息包括了基于 CRC 方法的错误检测域。CRC 域检测了整个消息的内容。CRC 域是两个字节，包含 16 位的二进制值。它由传输设备计算后加入到消息中。接收设备重新计算收到消息的 CRC，并与接收到的 CRC 域中的值比较，如果两个 CRC 值不相等，则说明传输有错误。

CRC 是先存入 0xFFFF，然后调用一个过程将消息中连续的 8 位字节与当前寄存器中的值进行处理。仅每个字符中的 8Bit 数据对 CRC 有效，起始位和停止位以及奇偶校验位均无效。

CRC 产生过程中，每个 8 位字符都单独和寄存器内容相异或（XOR），结果向最低有效位方向移动，最高有效位以 0 填充。LSB 被提取出来检测，如果 LSB 为 1，寄存器单独和预置的值相异或，如果 LSB 为 0，则不进行。整个过程要重复 8 次。在最后一位（第 8 位）完成后，下一个 8 位字节又单独和寄存器的当前值相异或。最终寄存器中的值，是消息中所有的字节都执行之后的 CRC 值。

CRC 添加到消息中时，低字节先加入，然后高字节。 CRC 简单函数如下：

```
unsigned int crc_chk_value（unsigned char *data_value,unsigned char length）
{
                    unsigned int crc_value=0xFFFF;
                    int i;
                    while（length--）
      {
                            crc_value^=*data_value++;
                            for（i=0;i<8;i++）
        {
                                    if（crc_value&0x0001）
          {
                                            crc_value=（crc_value>>1）^0xa001;
                                     }
                                    else
                                     {
                                            crc_value=crc_value>>1;
                                     }
                            }
                    }
                    return（crc_value）;
}
```

通信参数的地址定义

读写参数（有些参数不能更改，只供厂家使用或监视使用）

C.4 参数参数地址标示规则

以参数组号和标号为参数地址表示规则：

高位字节： P0~PF(P 组)、A0~AF(A 组)、70~7F(U 组)

低位字节：00~FF

例如：若要访问参数 P3-12，则参数的访问地址表示为 0xF30C；

注意：

PF 组：既不可读取参数，也不可更改参数；

U 组：只可读取，不可更改参数。

有些参数在变频器处于运行状态时，不可更改；有些参数不论变频器处于何种状态，均不可更改；更改参数参数，还要注意参数的范围、单位及相关说明。

参数组号	通讯访问地址	通讯修改 RAM 中参数地址
P0 ～ PE 组	0xF000 ～ 0xFEFF	0x0000 ～ 0x0EFF
A0 ～ AC 组	0xA000 ～ 0xACFF	0x4000 ～ 0x4CFF
U0 组	0x7000 ～ 0x70FF	

注意 : 由于 EEPROM 频繁被存储，会减少 EEPROM 的使用寿命，所以，有些参数在通讯的模式下，无须存储，只要更改 RAM 中的值就可以了。

如果为 P 组参数，要实现该功能，只要把该参数地址的高位 P 变成 0 就可以实现。

如果为 A 组参数，要实现该功能，只要把该参数地址的高位 A 变成 4 就可以实现。

相应参数地址表示如下：

高位字节：00~0F(F 组)、40~4F(A 组)

低位字节：00~FF

如：

参数 P3-12 不存储到 EEPROM 中，地址表示为 030C；

参数 A0-05 不存储到 EEPROM 中，地址表示为 4005；

该地址表示只能做写 RAM，不能做读的动作，读时，为无效地址。

停机 / 运行参数部分：

参数地址	参数描述	参数地址	参数描述
1000H	* 通信设定值（十进制） –10000 ～ 10000	1010H	PID 设置
1001H	运行频率	1011H	PID 反馈
1002H	母线电压	1012H	PLC 步骤
1003H	输出电压	1013H	PULSE 输入脉冲频率，单位 0.01kHz
1004H	输出电流	1014H	反馈速度，单位 0.1Hz
1005H	输出功率	1015H	剩余运行时间

参数地址	参数描述	参数地址	参数描述
1006H	输出转矩	1016H	AI1 校正前电压
1007H	运行速度	1017H	AI2 校正前电压
1008H	DI 输入标志	1018H	AI3 校正前电压
1009H	DO 输出标志	1019H	线速度
100AH	AI1 电压	101AH	当前上电时间
100BH	AI2 电压	101BH	当前运行时间
100CH	AI3 电压	101CH	PULSE 输入脉冲频率，单位 1Hz
100DH	计数值输入	101DH	通讯设定值
100EH	长度值输入	101EH	实际反馈速度
100FH	负载速度	101FH	主频率 X 显示
–	–	1020H	辅频率 Y 显示

- 通信设定值是相对值的百分数，10000 对应 100.00%，-10000 对应 -100.00%；
- 对频率量纲的数据，该百分比是相对最大频率（P0-10）的百分数；对转矩量纲的数据，该百分比是 P2-10、A2-48（转矩上限数字设定，分别对应第一、二电机）。

控制命令输入到变频器：（只写）

命令字地址	命令功能
2000H	0001：正转运行
	0002：反转运行
	0003：正转点动
	0004：反转点动
	0005：自由停机
	0006：减速停机
	0007：故障复位

读取变频器状态：（只读）

状态字地址	状态字功能
3000H	0001：正转运行
	0002：反转运行
	0003：停机

参数锁定密码校验：如果返回实际密码值，即表示密码校验通过。（如果没有密码，即密码为 0，校验返回 0000H）

密码地址	输入密码的内容
1F00H	*****

数字输出端子控制：（只写）

命令地址	命令内容
2001H	BIT0：DO1 输出控制 BIT1：DO2 输出控制 BIT2：RELAY1 输出控制 BIT3：RELAY2 输出控制 BIT4：FMR 输出控制 BIT5：VDO1 BIT6：VDO2 BIT7：VDO3 BIT8：VDO4 BIT9：VDO5

模拟输出 AO1 控制：（只写）

命令地址	命令内容
2002H	0 ～ 7FFF 表示 0%～ 100%

模拟输出 AO2 控制：（只写）

命令地址	命令内容
2003H	0 ～ 7FFF 表示 0%～ 100%

脉冲（PULSE）输出控制：（只写）

命令地址	命令内容
2004H	0 ～ 7FFF 表示 0%～ 100%

变频器故障描述：

变频器故障地址	变频器故障信息	
8000H	0000：无故障 0001：保留 0002：加速过电流 0003：减速过电流 0004：恒速过电流 0005：加速过电压 0006：减速过电压 0007：恒速过电压 0008：缓冲电阻过载故障 0009：欠压故障 000A：变频器过载 000B：电机过载 000C：输入缺相 000D：输出缺相 000E：模块过热 000F：外部故障 0010：通讯异常 0011：接触器异常 0012：电流检测故障 0013：电机调谐故障 0014：编码器 /PG 卡故障	0015：参数读写异常 0016：变频器硬件故障 0017：电机对地短路故障 0018：保留 0019：保留 001A：运行时间到达 001B: 用户自定义故障 1 001C: 用户自定义故障 2 001D: 上电时间到达 001E：掉载 001F：运行时 PID 反馈丢失 0028：快速限流超时故障 0029：运行时切换电机故障 002A: 速度偏差过大 002B：电机超速度 002D：电机过温 005A：编码器线数设定错误 005B：未接编码器 005C：初始位置错误 005E：速度反馈错误

C.5 PD 组通讯参数说明

Pd-00	波特率	出厂值	5005
	设定范围	个位：Modbus 波特率	
		0：300bps 1：600bps 2：1200bps 3：2400bps 4：4800bps	5：9600bps 6：19200bps 7：38400bps 8：57600bps 9：115200bps

此参数用来设定上位机与变频器之间的数据传输速率。注意，上位机与变频器设定的波特率必须一致，否则，通讯无法进行。波特率越大，通讯速度越快。

Pd-01	数据格式	出厂值	0
	设定范围	0：无校验：数据格式 <8,N,2> 1：偶检验：数据格式 <8,E,1> 2：奇校验：数据格式 <8,O,1> 3：无校验：数据格式 <8,N,1>	

上位机与变频器设定的数据格式必须一致，否则，通讯无法进行。

Pd-02	本机地址	出厂值	1
	设定范围	1~247，0 为广播地址	

当本机地址设定为 0 时，即为广播地址，实现上位机广播功能。

本机地址具有唯一性（除广播地址外），这是实现上位机与变频器点对点通讯的基础。

Pd-03	应答延时	出厂值	2ms
	设定范围	0~20ms	

应答延时：是指变频器数据接受结束到向上位机发送数据的中间间隔时间。如果应答延时小于系统处理时间，则应答延时以系统处理时间为准，如应答延时长于系统处理时间，则系统处理完数据后，要延迟等待，直到应答延迟时间到，才往上位机发送数据。

Pd-04	通讯超时时间	出厂值	0.0s
	设定范围	0.0s（无效）；0.1~60.0s	

当该参数设置为 0.0s 时，通讯超时时间参数无效。

当该参数设置成有效值时，如果一次通讯与下一次通讯的间隔时间超出通讯超时时间，系统将报通讯故障错误（Err16）。通常情况下，都将其设置成无效。如果在连续通讯的系统中，设置此参数，可以监视通讯状况。

Pd-05	通讯协议选择	出厂值	0
	设定范围	0：非标准的 Modbus-RTU 协议；1：标准的 Modbus-RTU 协议	

Pd-05=1：选择标准的 Modbus 协议，具体参见本协议“C.3 通讯资料结构”部分。

Pd-05=0：读命令时，从机返回字节数比标准的 Modbus 协议多一个字节，其他读写操作与标准 Modbus 协议操作一致。

Pd-06	通讯读取电流分辨率	出厂值	0
	设定范围	0：0.01A；1：0.1A	

用来确定通讯读取输出电流时，电流值的输出单位。