Yolico

YD587 Series

AC Driver for Crane

380V 3-phase 0.75 ~ 630kW

Ver 1.2

Preface

Thank you for purchasing Yolico's YD587 series AC drive for cranes.

This product is a new-generation AC drive designed for cranes by Yolico. Featuring rich functions, the AC drive supports high-performance vector control on asynchronous motors. With the optional crane technique card installed, the AC drive can implement anti-sway and grab bucket control. It is mainly used to drive and control asynchronous motors for operations of cranes, such as hoisting, horizontal motion, and rotation.

This user guide describes how to use the YD587 series AC drive for cranes properly. Read this guide before installing, running, maintaining, or checking the AC drive. In addition, use this product only after comprehending all safety precautions.

Precautions
◆ For the illustration purpose, the drawings in this user guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified before using the product, and perform operations in accordance with the instructions.
◆ The drawings in the user guide are for illustration only and may be different from the product you purchased.
◆ The instructions are subject to change without notice due to product upgrade, specification modification as well as efforts to improve the accuracy and convenience of the guide.
◆ Contact the regional agent or customer service center of Inovance if you need a new user guide.
◆ Contact the customer service center of Inovance if you have problems during the use.

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Safety Precautions

Safety Disclaimer

1) Read the safety precautions before installing, operating, and maintaining this product.
2) To ensure personal and equipment safety, follow all safety precautions marked on the product and described in the user guide when installing, operating, and maintaining this product.
3) "CAUTION", "WARNING", and "DANGER" messages in the guide are only examples and do not cover all safety precautions.
4) Use this product in an environment that complies with the design specifications. Malfunctions or component damage caused by improper use is not covered by warranty.
5) Inovance shall not be liable for any physical injuries or property loss caused by improper use.

Safety Categories and Definitions

Danger "DANGER" indicates that failure to comply with the notice will result in severe physical injuries or even death.

Warning "WARNING" indicates that failure to comply with the notice may result in severe physical injuries or even death.

Caution "CAUTION" indicates that failure to comply with the notice may result in minor or moderate physical injuries or equipment damage.

Safety Precautions

Unpacking
Caution ◆ Before unpacking, check whether the package is intact without damage, water seepage, damp, and deformation. ◆ Unpack the product layer by layer. Do not strike the package violently. ◆ Check the surface of the product and accessories for damage or rust. ◆ Check the product, accessories, and materials in the package against the packing list to ensure that all items are complete.

Safety Label

For safe operation and maintenance, follow the instructions on safety labels on the equipment.
Do not stain or remove the safety labels. The following table describes the safety labels.

Safety Label	Description
	◆ Read the user guide before installation and operation. Failure to comply will result in an electric shock. ◆ Do not remove the cover during power-on or within 10 minutes after power-off. ◆ Before maintenance, inspection, and wiring, cut off the input and output power and wait for 10 minutes until the power indicator goes off.

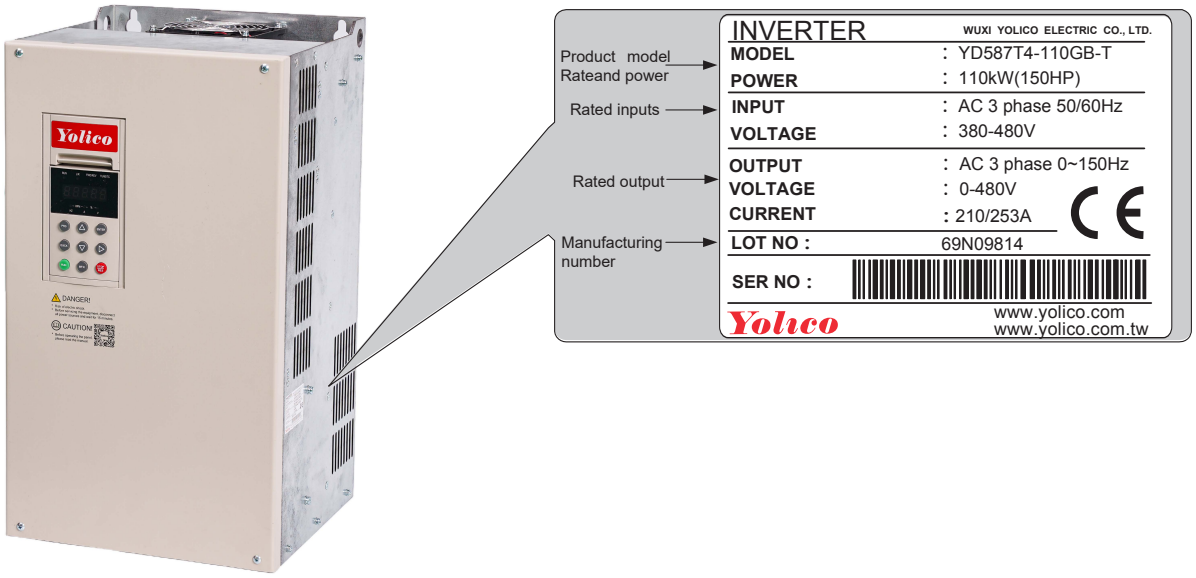
Chapter 1 Product Information

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



YD587 T4- 110 G B -T

Mark	Product name
YD587	AC Drive for Crane

Mark	Voltage level
T4-	3-PH 380~480VAC

Mark	Power Rating (kW)
0P7	0.75
1P5	1.5
...	...
630	630

Mark	Overload type
G	150%*60s level

Mark	DCL
NULL	Without
-T	With DC reactor

Mark	Brake unit
NULL	Without
B	With

Figure 1-1 Product naming and nameplate identification

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 YD587 System Connection Diagram

When using YD587 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：

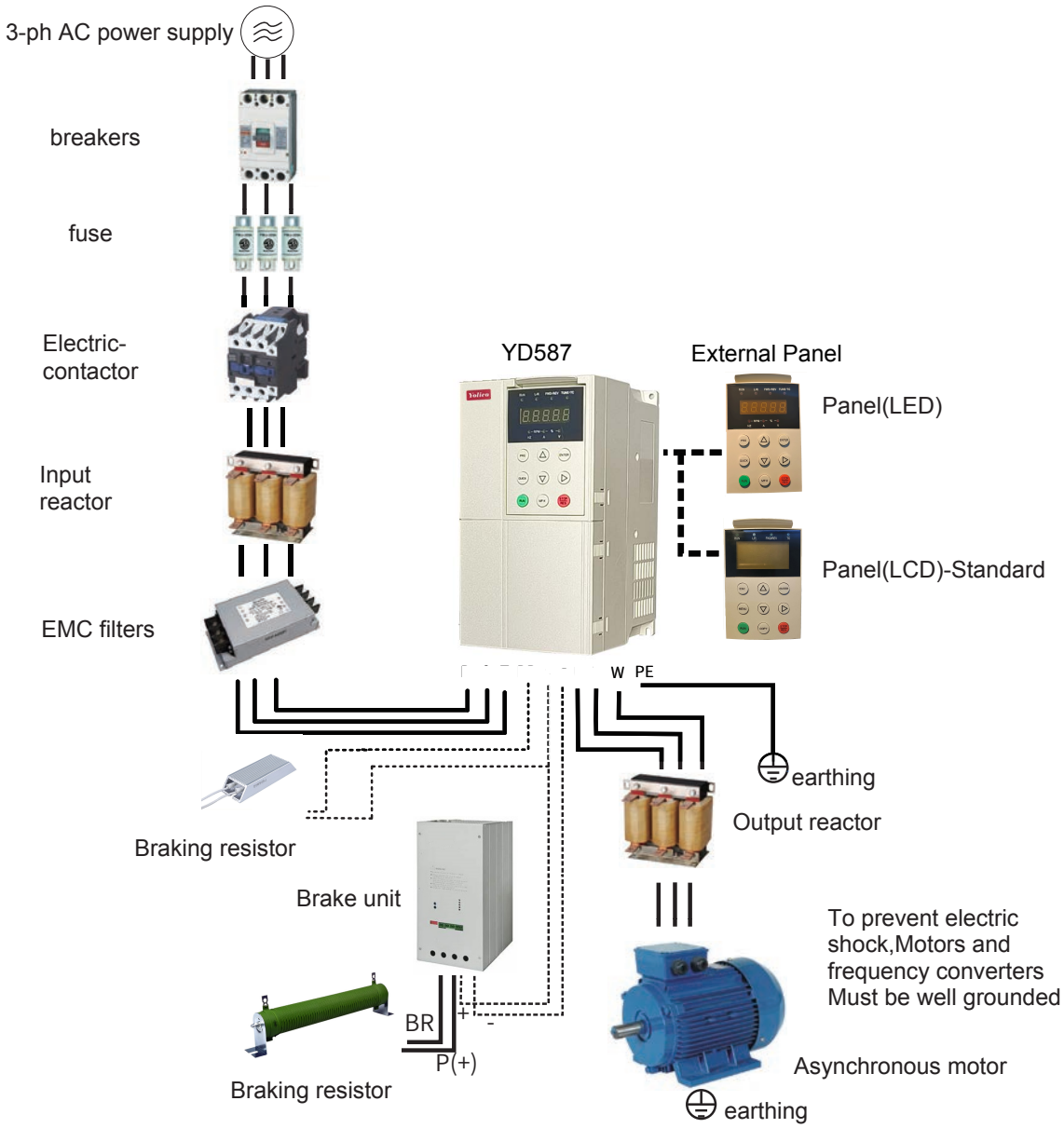


Figure 2-1 YD587 series system configuration

NOTE

● The above picture is only used as a schematic diagram of the YD587 inverter system connection, please refer to Chapter 9 "Specifications and Selection" for the selection of peripheral equipment.。

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.

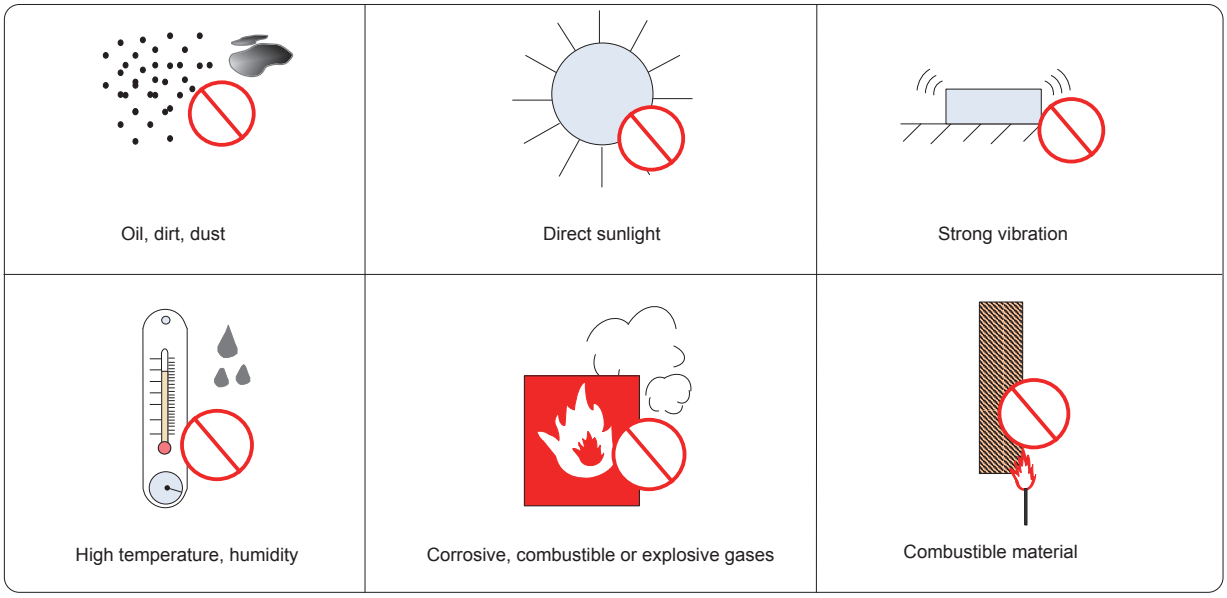


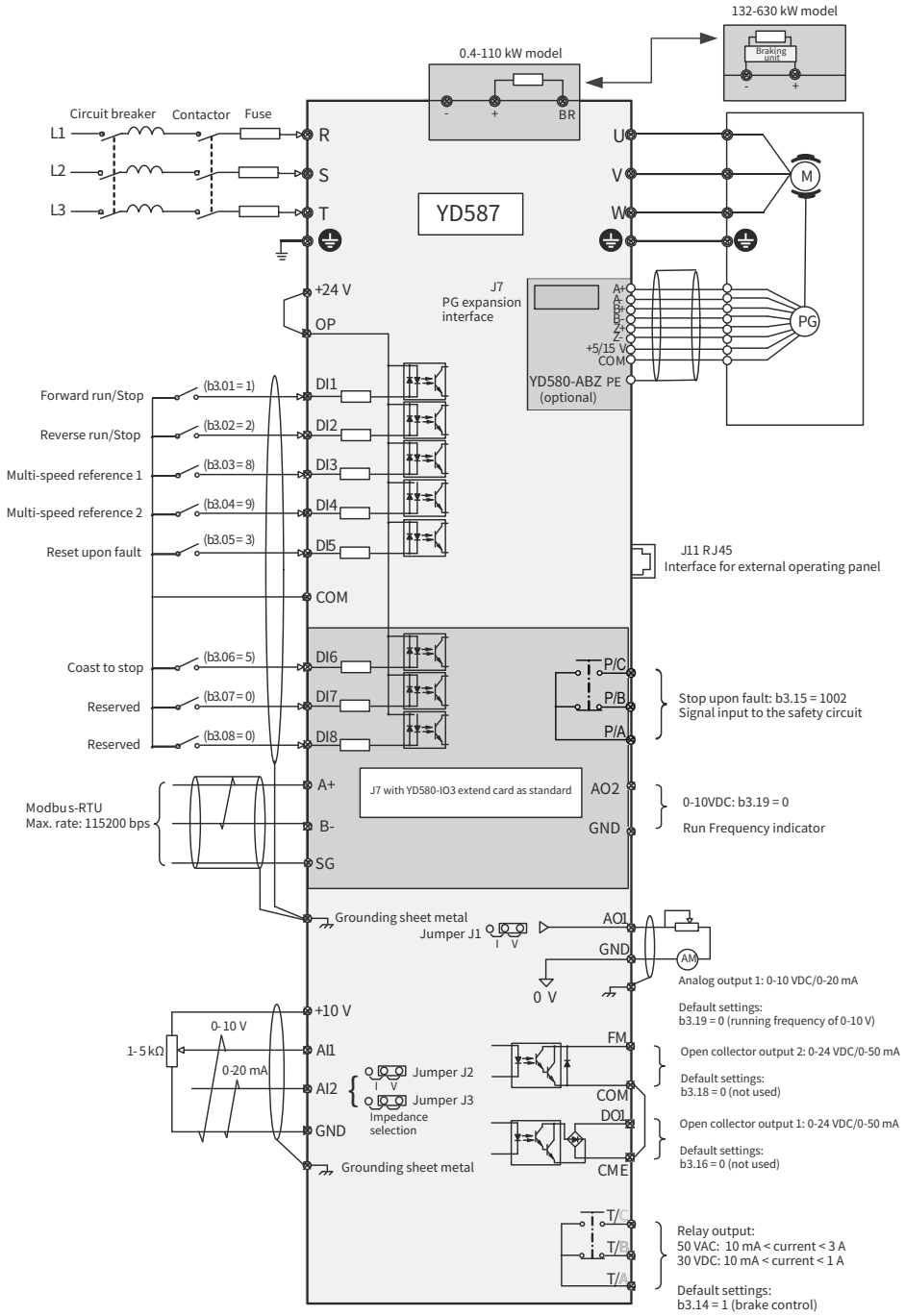
Figure 3-1 Requirements for the installation environment

7) YD587 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:

3.2 Wiring

3.2.1 Standard Wiring Diagram

The wiring parts marked by the double-headed arrow are different for 0.4–110 kW models and 132–630 kW models, as shown in the figure below.



Note: —Shield; —Twisted pair

Figure 3-26 Typical wiring of three-phase 380–480 V drive

3.2.2 Function of main circuit terminal

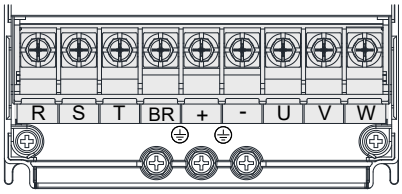


Figure 3-27

YD587T4-0P7GPB ~ YD587T4-22GB

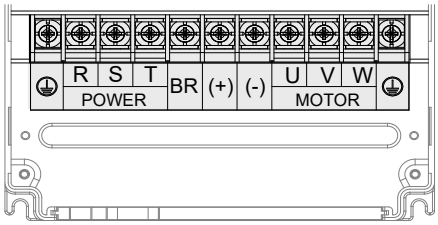
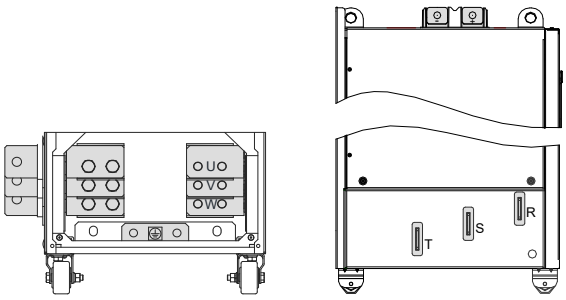


Figure 3-28

YD587T4-30GB-T ~ YD587T4-160G-T



(Front view) (Side view)

Figure 3-29

YD587T4-200G/250P-T ~ YD587T4-450G-T

Table 3-3 Main circuit terminals of YD587 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

3.2.3 Distribution of Control circuit terminal

◆ Control loop terminal arrangement

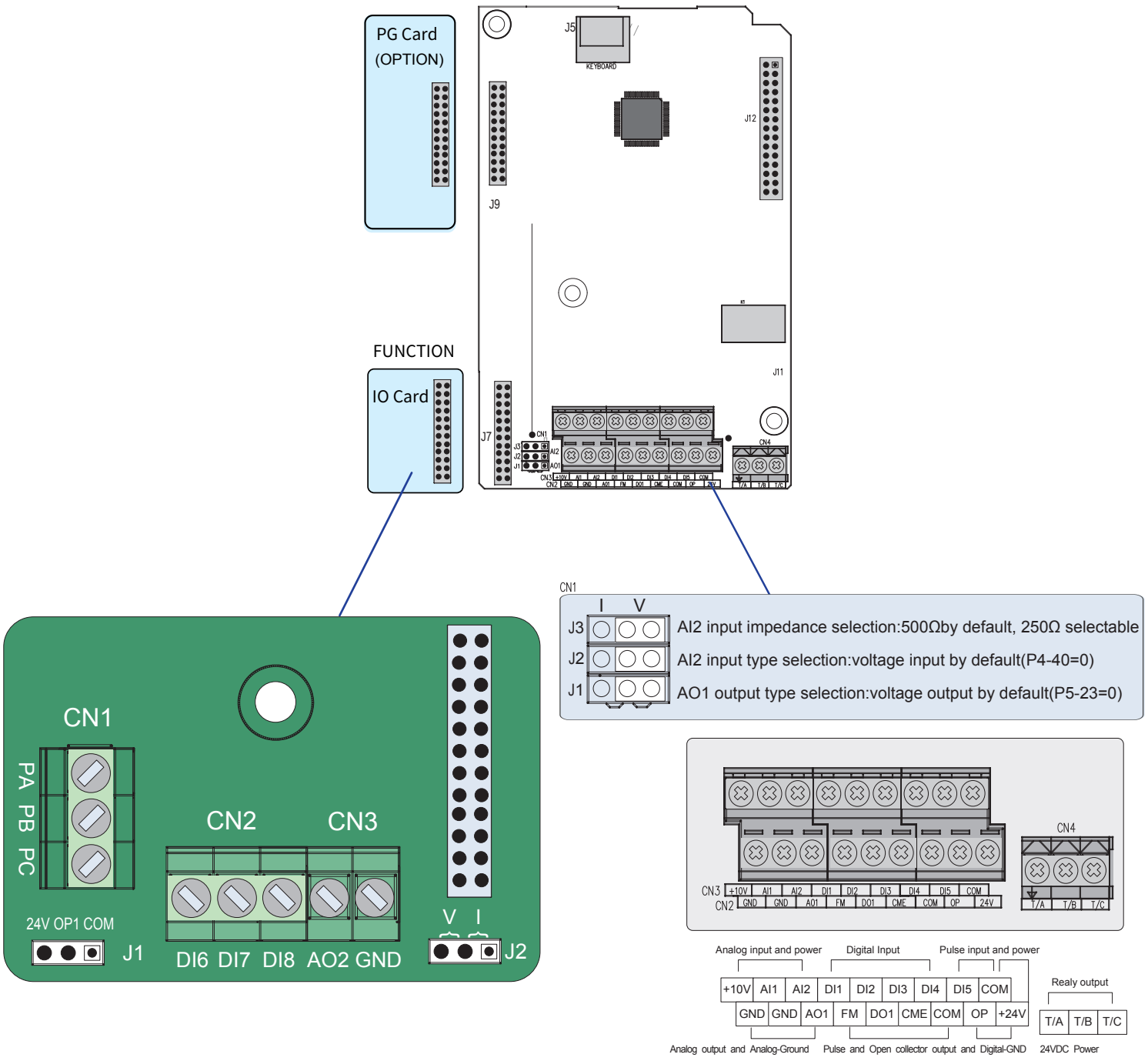


Figure 3-57 Terminal layout of the control circuit

Table 3-17 YD587 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 J2。 Input impedance：22 kΩ (voltage input)，500 Ω or 250 Ω (current input) by J3。【note 2】
Analog output	AO1-GND	Analog output 1	Either a voltage or a current output,determined by jumper J1. Output voltage range：0V~10V Output current range：0mA~20mA
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 b3.18 "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	J7	Extension card interface	28-pin terminals, interface with optional cards (I/O expansion cards, PLC cards, various bus cards, etc.).
	J9	PG card interface	Selectable: OC, differential, resolver and other encoder interfaces
	J5	OP interface RJ45	Keyboard is pulled out with via a network cable
Jumpers 【Note 3】	J1	AO1-Out select	Voltage and current output are optional, default is voltage
	J2	AI2-Input select	Voltage and current input are optional, default is voltage input
	J3	AI2 impedance select	500Ω, 250Ω optional, default is 500Ω

Chapter 4 Operating Panel

4.1 Introduction

YD587 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:

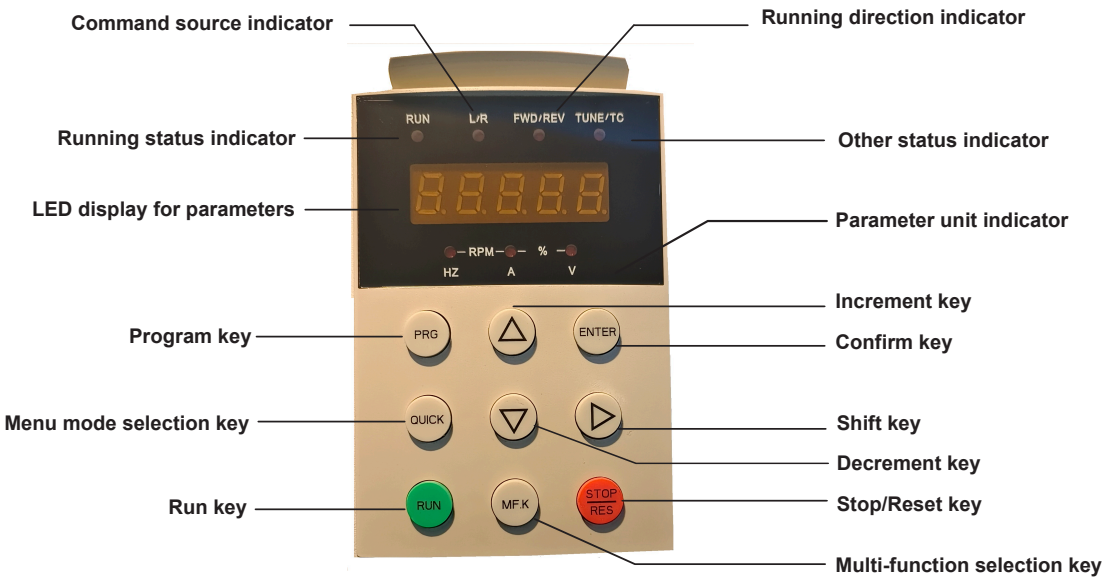


Figure 4-1 Details of the operating panel

4.2.1 Function Indicator

Table 4-1 Indicator descriptions on the operation panel

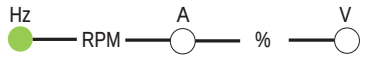
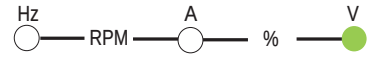
■ Status Indicators

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
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 or S	b	B	L	L	u	u

The five-digit LED display shows monitoring data, fault codes, and parameters.

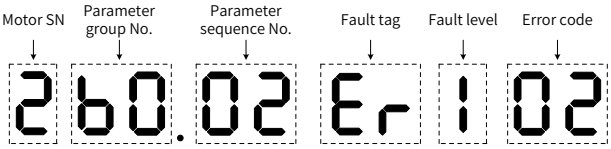


Figure 4-2 Example of the LED display

NOTE

◆ If DI is not set to motor switching (input functions 27 and 28), the LED display does not show the sequence number of the currently connected motor.

4.2.3 Keys on the LED Operating Panel

Table 4-3 Functions of keys on the operating panel

Key	Key Name	Function
PRG	Programming	Enter or exit level I menu.
ENTER	Enter	Access the menu interfaces level by level and confirm parameter settings.
△	Up	Used to increase the data or parameter.
▽	Down	Used to decrease the data or parameter.
▷	Shift	Used to select any parameters displayed cyclically in the STOP or RUNNING status. Select the bit to modify when modifying a parameter.
RUN	Run	Start the AC drive in the operating panel running mode.
STOP RES	Stop/Reset	Stop the AC drive in the operating panel control mode. Reset the AC drive in the faulty state.
MF.K	Reserved	Function reserved.
QUICK	Quick	Press the key to quickly enter the password input interface. Long-press the key for 5s to quickly enter the parameter auto-tuning mode.

4.2.4 How to view and modify parameters

The operating panel of the YD587 series AC drive provides three interfaces: status display → parameter numbers → parameter settings. When you enter a menu and see the displayed data blinking, you can press the , , or key to modify the data.

The following figure shows the operation flowchart.

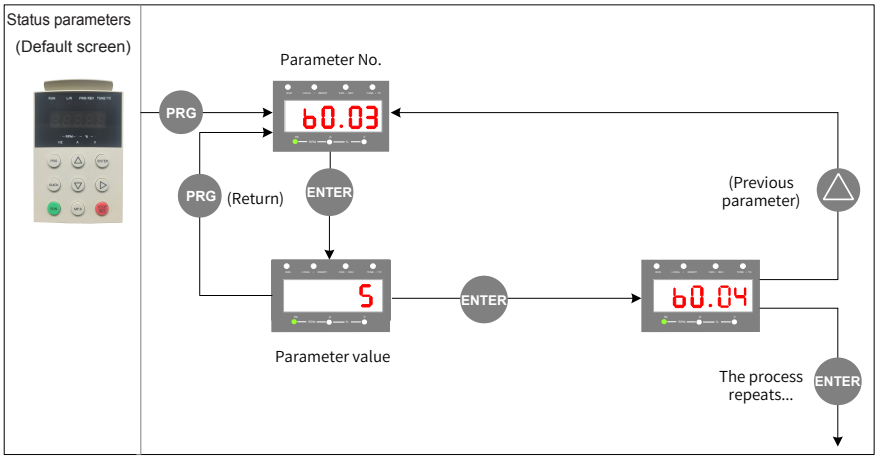


Figure 4-3 Switching between different operation interfaces

Example: Change the value of parameter b1.02 from 10.00 Hz to 15.00 Hz.

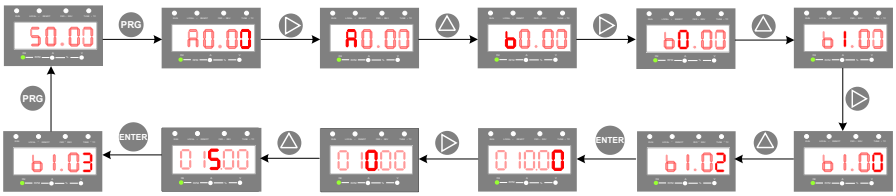


Figure 4-4 Changing the value of a parameter

In the parameter setting interface, if a parameter has no blinking digit, the parameter cannot be modified. Possible causes include:

1) The parameter is read-only. For example, it indicates the monitoring information and running status.
2) The parameter cannot be modified while the AC drive is running. You can modify it only after stopping the AC drive.

4.2.5 Parameter Group

Table 4-4 Parameter groups

Parameter Group	Function Description	Description
Group P	Basic crane parameter group	Used to set motor parameters and basic information about the crane
Group b	AC drive function parameter group	Function parameters such as operation command, frequency command, speed curve, and brake time sequence
Group F	AC drive performance parameter group	Core performance parameters of the AC drive
Group U	Monitoring parameter group	Basic monitoring parameters of the AC drive
Group E	Fault parameter group	Fault record display

4.2.6 Viewing Status Parameters

When the AC drive is in the stop or running state, you can view multiple status parameters by pressing the key on the operating panel. In the operation state, you can view five parameters: reference frequency, output synchronous frequency, output current, output voltage, and bus voltage. In the stop state, you can view only the target frequency and bus voltage.

4.3 Introduction to the LCD Control Panel

The YKEY060 is an external operator panel (optional) for the YD587, 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:

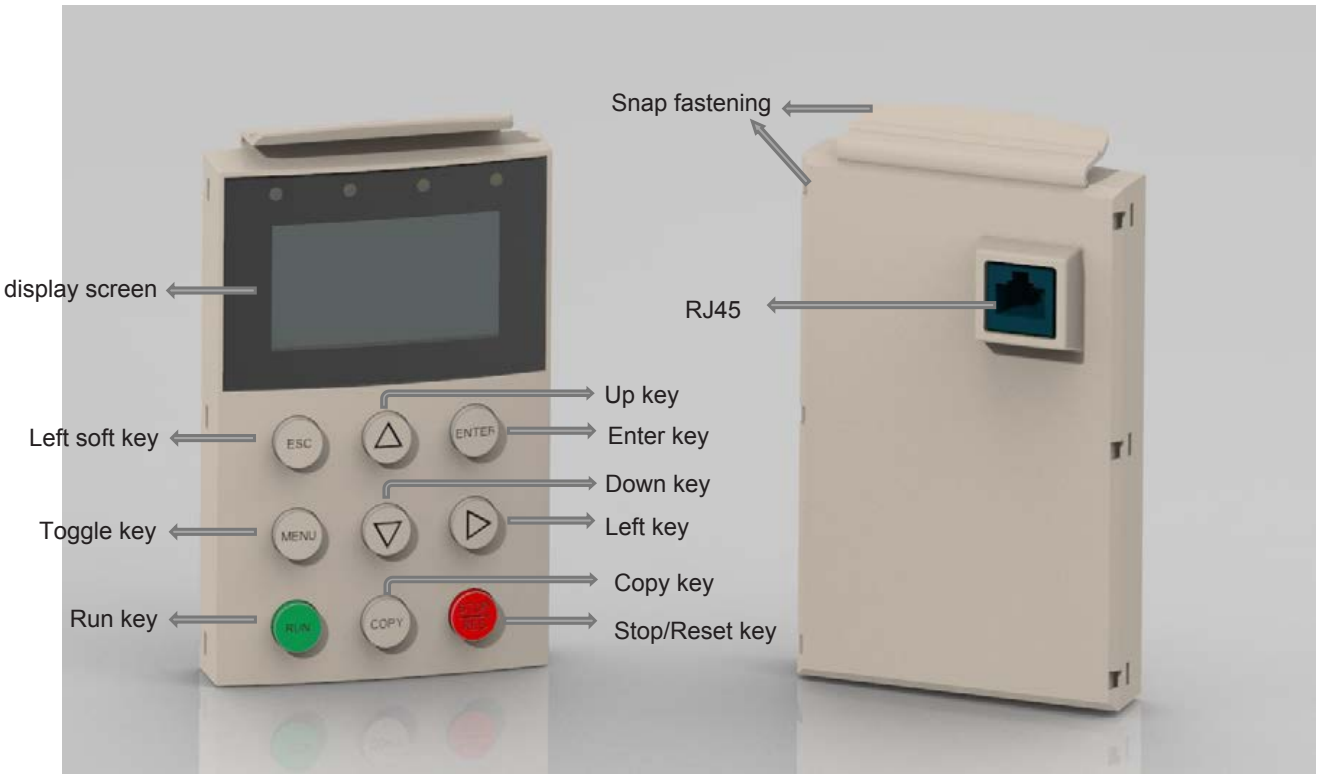


Figure 4-6 Appearance of YKEY060

2) Keyboard installation dimensions

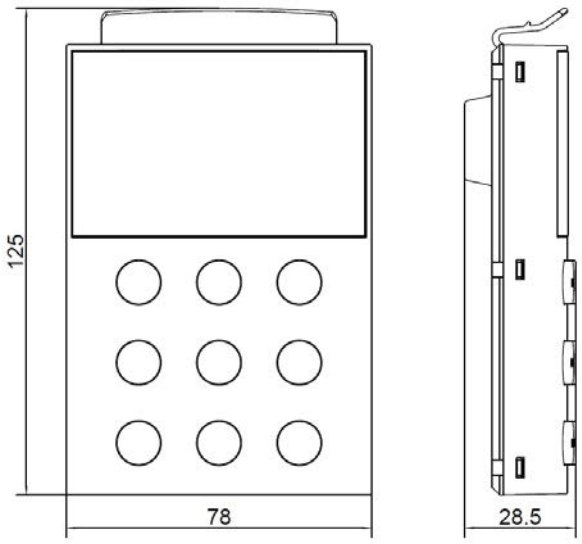


Figure 4-7 YDKEY060 external operation panel dimensions

5 System Commissioning

This chapter describes basic commissioning operations for a trial run of the AC drive, including setting the frequency reference, and stopping and starting the AC drive.

5.1 Quick Commissioning Guide

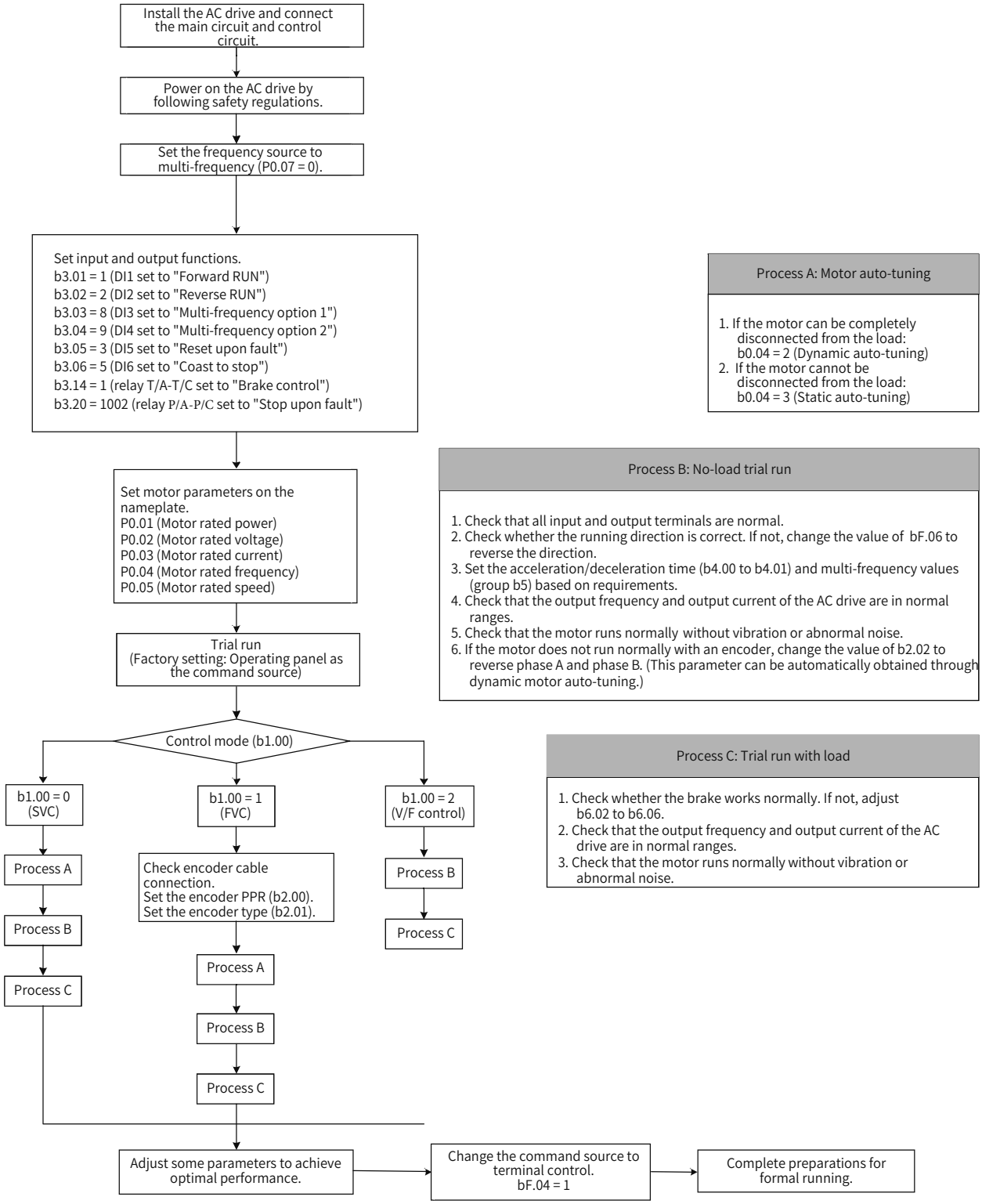


Figure 5-1 Quick commissioning steps

5.2 Precautions Before Power-on

Check the following items before powering on the AC drive.

Item	Requirement
Power supply voltage	The input voltage is in the range of three-phase 380 VAC to 480 VAC, 50/60 Hz.
	The input terminals R, S, and T are connected reliably.
	The AC drive and motor are reliably grounded.
Connection between AC drive output terminals and motor terminals	The AC drive output terminals U, V, and W are correctly and firmly connected to the motor terminals.
Connection of control circuit terminals	Control circuit terminals of the AC drive are correctly and firmly connected to other control devices.
Status of AC drive control terminals	All terminals of the AC drive control circuit are OFF (the AC drive is not running).
Load	The motor is off load and disconnected from the mechanical system.

5.3 Status Display After Power-on

After power-on, the operating panel displays the following information.

State	Display	Description
Normal		The default value 8.00 Hz is displayed.
Faulty		The AC drive stops and the error type is displayed.

5.4 Restoring to Factory Settings

The YD587 series defines three levels of menus for parameters. Each menu allows you to restore to factory settings (except for certain parameters) and check user-defined settings. The operating panel displays only parameters whose default values are changed.

Menu Level	Parameter	Function Description	Remarks
Level-1 menu	PF.01	Restoration of parameters in the level-2 menu to factory settings	Some parameters cannot be restored to the factory settings. For details, see the description of PF.01.
	PF.02	Display of user-defined parameter settings in the level-1 menu	The operating panel displays only parameters whose default values are changed in the level-1 menu.

Menu Level	Parameter	Function Description	Remarks
Level-2 menu	bF.01	Restoration of parameters in the level-2 menu to factory settings	You can restore parameters in the level-2 menu or in the level-1 and level-2 menus to factory settings. Some parameters cannot be restored to factory settings. For details, see the description of bF.01.
	bF.02	Display of user-defined parameter settings in the level-2 menu	The operating panel displays only parameters whose default values are changed in the level-2 menu.
	bF.03	Removal of historical records	This parameter is used to clear parameters stored upon a power failure of the AC drive, including the monitoring parameters in group U1 and fault record parameters. For the usage of bF.03, see its description.
Level-3 menu	FF.10	Restoration of parameters in the level-3 menu to factory settings	You can restore parameters in the level-3 menu or all parameters to factory settings. Some parameters cannot be restored to factory settings. For details, see the description of FF.10.
	FF.11	Display of user-defined parameter settings in the level-3 menu	The operating panel displays only parameters whose default values are changed in the level-3 menu.

5.5 Motor Control Modes

Parameter	Description	Scenario
b1.00: Motor control mode	0: SVC	SVC is the sensorless vector control mode applicable to common hoisting scenarios.
	1: FVC	FVC is the feedback vector control mode. The motor must have an encoder, and the AC drive must have a PG card of the same type as the encoder. This control mode is applicable to scenarios requiring high precision speed or torque control.
	2: V/f control	This control mode is applicable to scenarios that do not require high load capacity or where one drive is used to drive multiple motors.

5.6 Start and Stop Commands

There are three sources of start/stop commands for the AC drive: operating panel control, terminal control, and communication control. You can select the command source using bF.04.

bF.04	Command source selection		Default	0
	Value range	0	Operating panel control (LED off)	
		1	Terminal control (LED on)	
		2	Communication control (LED blinking)	

This parameter defines the input channel of the AC drive control commands, such as start, stop, forward running, and reverse running.

0: Operating panel control (LOCAL/REMOT indicator off)

The commands are given by pressing the RUN and STOP/RES keys on the operating panel.

1: Terminal I/O control (LOCAL/REMOT indicator on)

The commands are given by using multi-functional input terminals.

2: Communication control (LOCAL/REMOT indicator blinking)

5.6.1 Operating Panel Control

Set bF.04 to 0 to select the operating panel as the input channel for the AC drive control commands. After you press the RUN key on the operating panel, the AC drive starts to run (the RUN indicator is on). After you press the STOP key while the AC drive is running, the AC drive stops running (the RUN indicator is off).

5.6.2 Terminal Control (DI)

This control mode is applicable to scenarios where the DIP switch or electromagnetic button is used to start or stop the application system or scenarios where the dry contact signal is used to start or stop the AC drive.

The YD587 series AC drive can be controlled using terminals. Parameters b3.01 to b3.13 determine the functions of the AC drive control signals. For details, see the description of these parameters.

Example 1: To use the DIP switch to start and stop the AC drive, and allocate the forward rotation switch signal to DI1 and the reverse rotation switch signal to DI2, perform the settings according to the following figure.

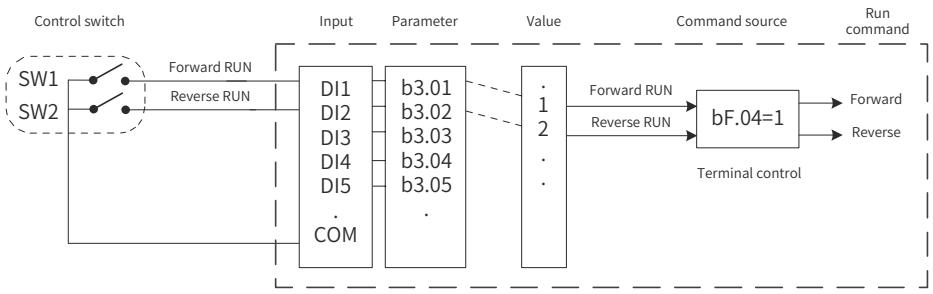


Figure 5-2 Example of AC drive control using terminals

In the figure above, when SW1 is closed, the AC drive runs in the forward direction; when SW1 is open, the AC drive stops. When SW2 is closed, the AC drive runs in the reverse direction; when SW2 is open, the AC drive stops. When both SW1 and SW2 are closed, the AC drive reports error 44# (both forward and reverse running commands are active).

In operating panel control mode, the AC drive drives the motor to operate in the forward direction after you press the RUN key. If the rotating direction is reverse to the direction required by the device, power off the AC drive (after the main capacitor of the AC drive is discharged) and exchange any two of the output U, V, and W cables. You can also set bF.06 to 1 to reverse the rotating direction of the motor.

5.6.3 Communication Control

AC drive control through communication with a host controller becomes more and more widely used. After you install an RS485 interface card in the AC drive and select communication as the source of AC drive control commands (bF.04 = 2), you can control the AC drive in communication mode. The following figure shows how to set the parameter for this control mode.

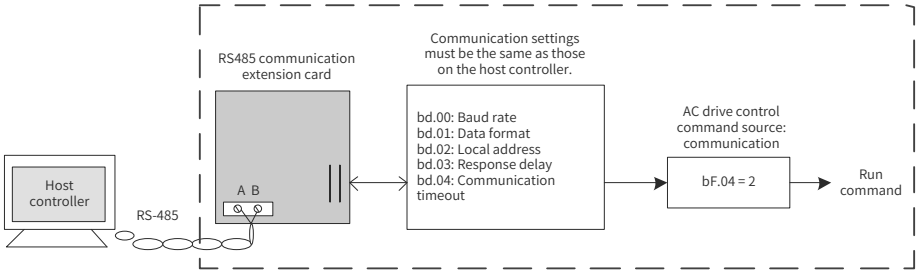


Figure 5-3 Example of AC drive control through communication with a host controller

When the communication timeout interval (bd.04) is set to a non-zero value, the AC drive will automatically stop after the timeout interval ends. This function prevents uncontrollable AC drive running due to faults of the communication cable or the host controller. This function can be enabled in some application scenarios.

5.7 Start and Stop Settings

5.7.1 Start Mode

The YD587 supports the direct startup mode and provides professional brake sequence control dedicated for cranes. (For details, see the description of parameters in group b6.)

5.7.2 Stop Mode

The YD587 supports two stop modes: decelerate to stop and coast to stop, which can be set using b4.03. The default mode is decelerate to stop (b4.03 = 0).

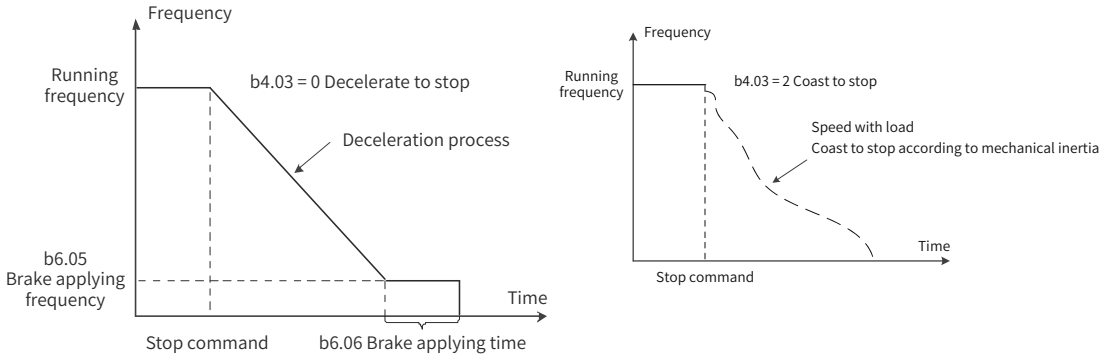


Figure 5-4 Stop modes

5.8 Frequency Reference Source Selection

The YD587 series AC drive supports five frequency reference sources, namely, multi-reference, analog AI1, analog AI2, acceleration/deceleration, and communication. You can select the sources using P0.07 and b3.00. For details, see the description of the two parameters.

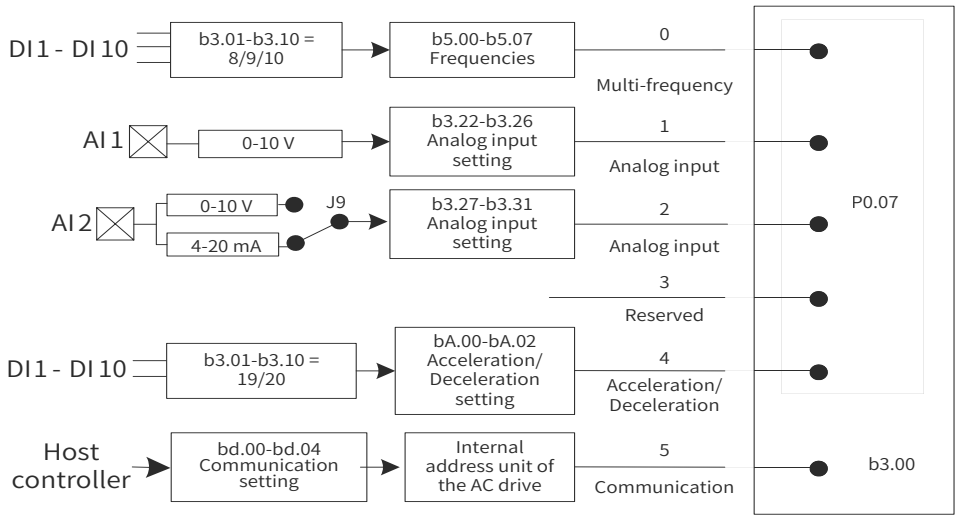


Figure 5-5 Frequency reference source selection

Set the related parameters for each frequency reference source according to the preceding figure.

5.8.1 Setting the Multi-Reference Mode

You can select the multi-reference mode in scenarios where only several frequencies are required and continuous adjustment of frequencies are not required. For the YD587 series AC drive, you can set a maximum of eight frequencies using a maximum of three DI functions. To specify multi-frequency command input terminals, set the parameters corresponding to the DIs to values in the range of 8 to 10. You can set the multi-frequency values according to the multi-frequency table of b5 group parameters. Set the frequency source to multi-frequency, as shown in the following figure.

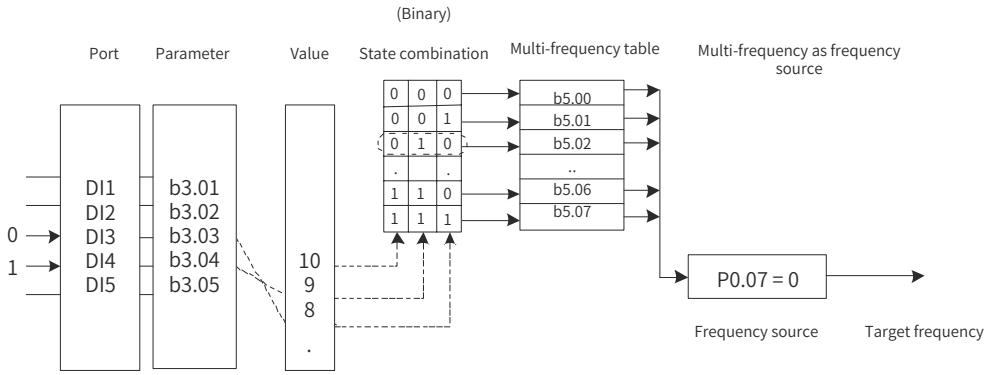


Figure 5-6 Setting the multi-reference mode

In the preceding figure, DI3 and DI4 are used as the multi-frequency input terminals. Each state combination is a 3-bit binary value. Therefore, if only two DIs are used, supplement bit 0 after the binary values of the two DIs. For example, when the input states of DI3 and DI4 are set to 0 and 1, respectively, the binary value is 0 1 0 and therefore the state combination value is 2. In this case, the frequency set by b5.02 is used. As the frequency source is multi-frequency, the value of b5.02 determines the target frequency.

For the YD587 series AC drive, you can select a maximum of three DIs as multi-frequency command input terminals (as described above). The empty bits are calculated as 0.

5.8.2 Using the AI to Set Frequency Reference

The following figure shows how to use a potentiometer to adjust the frequency reference of the AC drive. When the potentiometer is adjustable in the full range, the output frequency of the running AC drive can change between 0 and the maximum frequency.

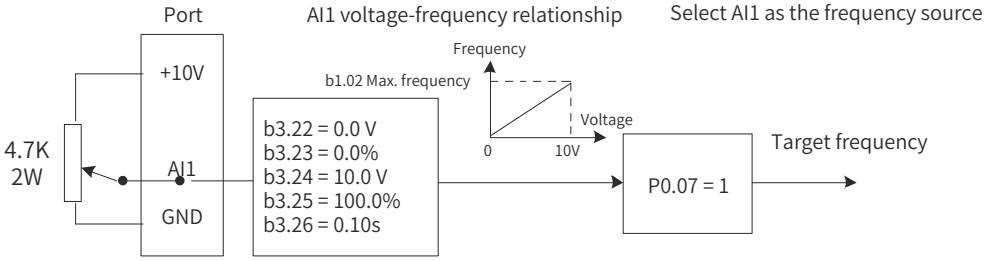


Figure 5-7 Using the AI to set frequency reference

5.9 Terminal Descriptions

5.9.1 DI Descriptions

The internal hardware of a DI is configured with a 24 VDC power supply for detection. After you short the DI and the COM terminal, the DI can input signals to the AC drive.

You can also set the software filter time (b3.21) for input signals from the DI to improve the anti-interference capability of the AC drive.

Parameters b3.01 to b3.08 can be used to select functions for the eight DIs. For details, see the description of parameters b3.01 to b3.08.

5.9.2 AI Descriptions

The YD587 series AC drive supports two AIs, which are designated as AI1 and AI2 on the control board.

Terminal	Input Signal Specification
AI1-GND	Receives a voltage signal of 0–10 VDC.
AI2-GND	Receives a voltage signal of 0–10 VDC when jumper J9 is in the position marked by "V" and receives a current signal of 4–20 mA when J9 is in the position marked by "I".

The AI can be used when external voltage or current signals are used to set the frequency source reference and torque reference for the AC drive. The mapping between voltage or current values and the actual setting or feedback is defined by b3.22 to b3.31.

The sampling values of AIs can be obtained from parameters U0.12 and U0.13. The calculated values are used for subsequent internal calculation of the AC drive and are not open to users.

5.9.3 DO Descriptions

The control board provides five DOs: FM, DO1, T/A-T/B-T/C. FM and DO1.
are transistor outputs capable of driving a 24 VDC low-voltage signal circuit. T/A-T/B-T/C, P/A-P/B-P/C are relay outputs capable of driving a 250 VAC control circuit.

Terminal	Parameter	Output Specification
FM-CME	b3.18	Transistor; drive capacity: 24 VDC, 50 mA
DO1-CME	b3.16	Transistor; drive capacity: 24 VDC, 50 mA
T/A-T/B-T/C	b3.14	Relay; drive capacity: 250 VAC, 3 A
P/A-P/B-P/C	b3.15	

5.9.4 AO Descriptions

The AC drive supports two AOs, AO1 and AO2. AO1 is on the control board of the AC drive, and AO2 is provided by an external expansion card.

Terminal	Input Signal Specification
AO1-GND	Outputs 0–10 VDC voltage signals when J7 is in the position marked by "V".
	Outputs 0–20 mA current signals when J7 is in the position marked by "I".
AO2-GND	Located on an expansion board and outputs 0–10 VDC voltage signals.

AO1 and AO2 can specify internal running parameters in analog mode. The specified parameter attributes are set using b3.19 and b3.20.
The specified running parameters can be corrected before being output. The correction characteristic curve is Y = kX + b, where X indicates the running parameter, and k and b of AO1 can be set using b3.44 and b3.43.

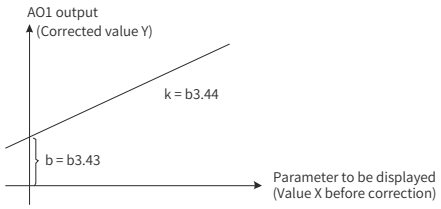


Figure 5-8 Output characteristic curve of AO1

5.9.5 PG Terminal Descriptions

The FVC mode (b1.00 = 1) can improve the frequency control performance of the AC drive. To use this mode, install an encoder on the motor shaft. Signals sent from the encoder are transmitted to the AC drive through the PG card (encoder signal interface card). The YD587 series AC drive supports five PG cards with different signal characteristics.

The AC drive supports four types of encoders, including differential encoders, UVW encoders, resolvers, and open collector encoders.

The encoder parameters must be set based on the actual type of encoder used. The following example describes the settings of motor parameter group 1.

1) When a differential encoder is used, use b2.00 to set the encoder pulses per revolution and set b2.01 to 0 (ABZ incremental encoder/differential encoder).

2) When a UVW encoder is used, use b2.00 to set the encoder pulses per revolution and set b2.01 to 1 (UVW incremental encoder).

3) When a resolver is used, set b2.01 to 2 (resolver).

4) When an open collector encoder or a push-pull encoder is used, use b2.00 to set the encoder pulses per revolution and set b2.01 to 0 (ABZ incremental encoder).

5.10 Auto-tuning

5.10.1 Motor Parameter Settings

When the AC drive runs in vector control mode (b1.00 = 0 or 1), accurate motor parameters are required to ensure excellent drive performance and running efficiency. This is one of major differences between the vector control mode and the V/f control mode (b1.00 = 2).

5.10.2 Motor Parameter Auto-tuning

The AC drive can automatically obtain internal electrical parameters of the motor in the following ways: dynamic auto-tuning and static auto-tuning.

Auto-tuning Mode	Application	Auto-tuning Effect	Parameter Setting
Static auto-tuning (complete auto-tuning)	Applicable to all scenarios.	Good	b0.04 = 3
No-load dynamic auto-tuning (complete auto-tuning)	Applicable to scenarios where the motor can be disconnected from the load. If the motor load is of the roller type (pure inertia load), the roller can remain attached during the parameter auto-tuning process.	Optimal	b0.04 = 2
Static auto-tuning (incomplete auto-tuning)	Applicable to scenarios where the motor cannot be disconnected from the load and dynamic auto-tuning is not allowed (no auto-tuning for motor mutual inductance and no-load current).	Acceptable	b0.04 = 1

1. Procedure for implementing dynamic auto-tuning of motor parameters:

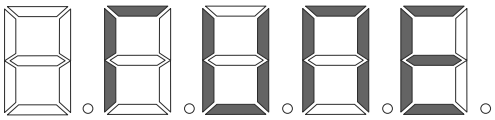
Step 1: If the motor can be disconnected from the load, cut off the power and disconnect the motor from the load so that the motor runs without load.

Step 2: Power on the AC drive, and then set the command source (bF.04 of the AC drive to operating panel control.

Step 3: Correctly set the nameplate parameters (P0.01 to P0.05) of the motor. Set the following parameters based on motor selection:

Manually Set Parameters
P0.01: Rated motor power P0.02: Rated motor voltage P0.03: Rated motor current P0.04: Rated motor frequency P0.05: Rated motor speed

Step 4: If the motor can be disconnected from the load, set parameter b0.04 to 2 (asynchronous motor dynamic auto-tuning) and press **ENTER**. The display on the operating panel is as follows:



Press "RUN" on the operating panel. The AC drive then drives the motor (acceleration time and deceleration time set by b4.06 and b4.07 respectively), and the RUN indicator turns on. Then, the preceding display disappears and the operating panel returns to parameter display state, indicating completion of the parameter auto-tuning.

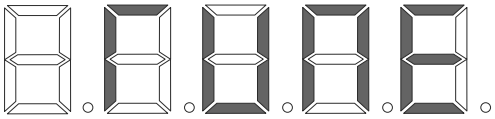
After dynamic parameter auto-tuning, the AC drive automatically obtains the following motor parameters:

Automatically Refreshed Parameters After Auto-tuning
F0.00: Asynchronous motor stator resistance F0.01: Asynchronous motor rotor resistance F0.02: Asynchronous motor leakage inductive reactance F0.03: Asynchronous motor mutual inductive reactance F0.04: Asynchronous motor no-load current

If the motor cannot be disconnected from the load, set b0.04 to 1 or 3 (recommended) to start static auto-tuning of motor parameters. Static auto-tuning mode 3 can be used to obtain all motor parameters but takes a relatively long time.

2. One-key quick auto-tuning:

Hold down the QUICK key on the AC drive panel for 5s until "TUNE" is displayed, and then press RUN to start auto-tuning.



The quick auto-tuning function can be used when a new round of auto-tuning is required after motor parameters are set. Auto-tuning mode 3 (complete static auto-tuning) is used by default in this case. You do not need to disconnect the motor from the load or change the value of bF.04 or any other parameters.

5.11 Password Settings

The YD587 series AC drive provides user password protection.

Parameter	Function Description	Content
PF.00	Password for all functional parameters	Password for groups P, b, E, U, and F
bF.00	Level-2 menu password	Password for groups b, E, U, and F
FF.00	Level-3 menu password	Password for group F

The password function is enabled when PF.00, bF.00, and FF.00 are set to non-zero values. In this case, after you press the QUICK key, the operating panel displays -----. You can enter the menu only after entering the correct password. If you enter wrong passwords for three consecutive times, the system is locked. In this case, restart the system to unlock it. To disable the password protection function, set PF.00, bF.00, and FF.00 to 0.

5.12 Application Examples

5.12.1 Crane System Braking

■ Brake time sequence overview

The YD587 provides the built-in brake time sequence control function. To use this function, set the function of an output terminal to output function 1 (brake control). The following figure shows the brake control time sequence.

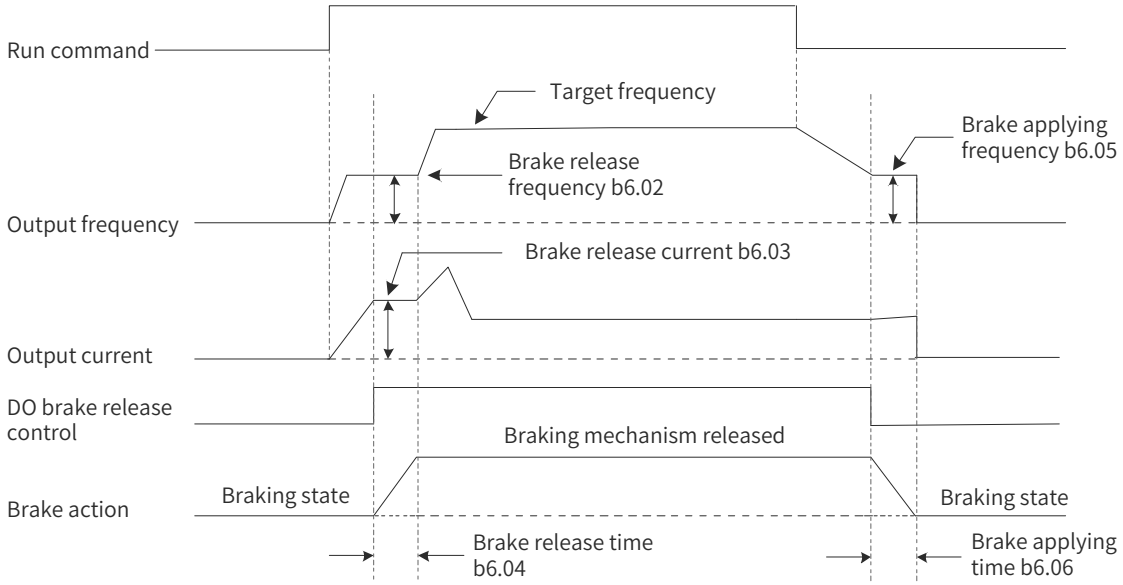


Figure 5-9 Typical control process of a crane system and parameter settings

The brake is engaged when it is powered off and is released after it is powered on. Actions of the brake are controlled with mechanical operations; therefore, there is a delay between brake signal output and braking state change. Set the brake time (6.06) and brake release time (b6.04) based on the mechanical operation delay of the brake. Theoretically, the time set by the two parameters should be slightly longer than the mechanical operation delay to prevent unintentional slip.

5.12.2 Safety Limit and Stop upon Faults

The following figure shows the electrical wiring for safety limit and stop upon faults. A limit switch is installed on each end of the rail. When the mechanism touches a limit switch, the control cabinet automatically stops running of the AC drive in this direction. Running of the AC drive in the opposite direction is not affected, and you can press the opposite running switch to restore running of the equipment.

When a level-I fault occurs on the AC drive, relay terminal P/C-P/A on the I/O expansion card sends a fault stop signal to trigger an action of contactor KM in the control cabinet. (For example, the contactor may cut off power to the running circuit. In this case, the equipment can resume normal running only after being reset).

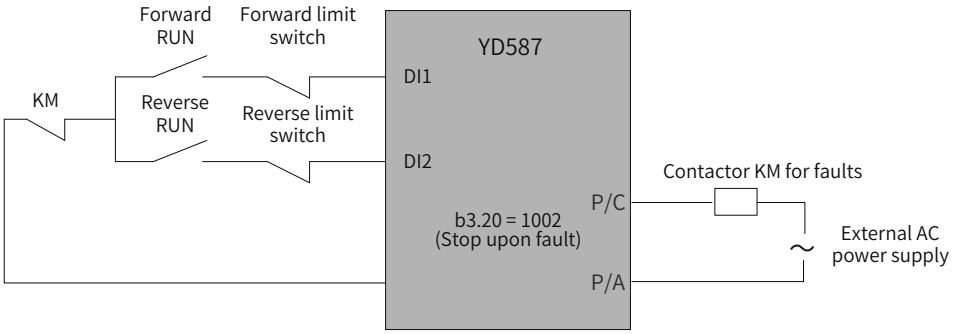


Figure 5-10 Circuit for safety limit and stop upon faults

NOTE

- The figure shows a commonly used connection of limit switches. You can change the connection based on your own requirements.

6 Parameter List

The YD587 series AC drive has some manufacturer-reserved parameters, and their parameter numbers are not listed in the parameter tables. Therefore, the parameter numbers in the parameter tables are discontinuous. Do not modify the parameters that are not described in this user guide as doing so may cause errors in equipment operation.

You can modify some functional parameters only after the AC drive stops. Do not modify these parameters when the AC drive is running. The monitoring parameters are displayed on the operating panel only for view and cannot be modified.

6.1 Level-1 Menu (Group P) Parameter List

The level-1 menu contains motor parameters and basic feature parameters of the crane. Correct settings of level-1 menu parameters can ensure normal running of the motor driven by the AC drive. Parameters for enhanced functions of the AC drive need to be set in the level-2 menu.

Parameter No.	Parameter Name	Description	Value Range	Default
Group P0: Basic crane parameters				
P0.01	Rated motor power	This parameter sets the rated motor power displayed on the motor nameplate.	0.4 kW to 1000.0 kW	Depending on drive model
P0.02	Rated motor voltage	This parameter sets the rated motor voltage displayed on the motor nameplate.	0 V to 2000 V	380 V
P0.03	Rated motor current	This parameter sets the rated motor current displayed on the motor nameplate.	(≤ 55 kW) 0.01 A to 655.35 A (> 55 kW) 0.1 A to 6553.5 A	Depending on drive model
P0.04	Rated motor frequency	Indicates the rated motor frequency displayed on the motor nameplate.	0.01 Hz to b1.02 (maximum frequency)	50.00 Hz
P0.05	Rated motor speed	Indicates the rated motor speed displayed on the motor nameplate.	0 RPM to 65535 RPM	1400 RPM

Parameter No.	Parameter Name	Description	Value Range	Default
P0.07	Frequency source selection A	This parameter is used together with b3.00 (frequency source selection B) in the level-2 menu. P0.07 in the level-1 menu lists only four commonly used frequency sources, whereas b3.00 in the level-2 menu lists all frequency sources. If b3.00 is greater than 4, the frequency source specified by b3.00 takes effect. If b3.00 is less than or equal to 4, the frequency source specified by P0.07 takes effect. 0: Multi-frequency The binary value combinations of input functions 8, 9, and 10 can provide eight frequencies, which corresponds the frequencies set by b5.00 to b5.07. For details, see the description of parameters in group b5. 1: AI1 AI1 supports only the voltage input of 0 V to 10 V. 2: AI2 AI2 supports voltage input of 0 V to 10 V or current input of 4 mA to 20 mA, which is determined by jumper J9 on the control board. The AI is linearly proportional to the target frequency. The reference frequency is b1.02 (frequency top). 3: Reserved 4: Acceleration/Deceleration This mode must be used together with input terminals that are assigned with functions 19 and 20. For details, see the description of parameters in group bA.	0 to 4	0

<table>
<tr><th>Parameter No.</th><th>Parameter Name</th><th>Description</th><th>Value Range</th><th>Default</th></tr>
<tr><td>P0.08</td><td>Crane mechanism selection</td><td>This parameter is used to select the crane mechanism driven by the AC drive.
0: Hoisting mechanism
1: Translation mechanism
2: Rotation mechanism
<table>
<tr><th>Mechanism Type</th><th>Parameter</th><th>Description</th></tr>
<tr><td rowspan="5">Hoisting mechanism</td><td>b1.00 = 0</td><td>The control mode is changed to SVC.</td></tr>
<tr><td>b6.03 = 30.0%</td><td>The brake release current is changed to 30.0%.</td></tr>
<tr><td>bC.02 = 0.50s</td><td>Error 37# is triggered.</td></tr>
<tr><td>bC.04 = 0.50s</td><td>Error 38# is triggered.</td></tr>
<tr><td>F1.00 = 60</td><td>Speed loop gain 1 is changed to 60.</td></tr>
<tr><td rowspan="5">Translation mechanism</td><td>b1.00 = 2</td><td>The control mode is changed to V/f control.</td></tr>
<tr><td>b6.03 = 0.0%</td><td>The brake release current is changed to 0.0%.</td></tr>
<tr><td>bC.02 = 0.0s</td><td>Error 37# is invalid.</td></tr>
<tr><td>bC.04 = 0.0s</td><td>Error 38# is invalid.</td></tr>
<tr><td>F1.00 = 30</td><td>Speed loop gain 1 is changed to 30.</td></tr>
<tr><td>Rotation mechanism</td><td colspan="2">Same as the translation mechanism.</td></tr>
</table>
Note:
When the value of P0.08 is changed, the values of parameters listed in the preceding table are also changed.</td><td>0 to 2</td><td>0</td></tr>
<tr><td colspan="5">Group AF: Level-1 menu auxiliary parameters</td></tr>
<tr><td>AF.00</td><td>User password</td><td>This parameter is used to set the password for displaying and modifying all functional parameters. If this parameter is set to a non-zero value, you must enter the password before accessing any menu. If you enter wrong passwords for three consecutive times, all menus are locked. In this case, you must power off and restart the AC drive to view or modify parameters. After this parameter is set to 0, the password protection function is disabled.</td><td>0 to 65535</td><td>0</td></tr>
<tr><td>AF.01</td><td>Restoration of parameters in the level-1 menu to factory settings</td><td>0: No operation
1: Restore parameters in level-1 menu to factory settings
P0.00 to P0.05, P0.08 to P0.09, and PF.00 in the level-1 menu cannot be restored to factory settings.</td><td>0 to 1</td><td>0</td></tr>
</table>

Parameter No.	Parameter Name	Description	Value Range	Default
PF.02	Level-1 menu setting display	0: Display level-1 menu parameters normally 1: Display level-1 menu parameters with default values changed 2: Display level-1 menu parameters with all indicators on	0 to 2	0

6.2 Level-2 Menu (Group b, Group E*, Group U) Parameter List

The level-2 menu contains basic functional parameters, monitoring parameters, and fault record parameters of the AC drive. You can implement all functions of the AC drive by setting parameters in the level-2 menu. To improve the output performance of the AC drive, you need to set parameters in the level-3 menu.

You can enter the level-2 menu only after entering the correct password set by bF.00.

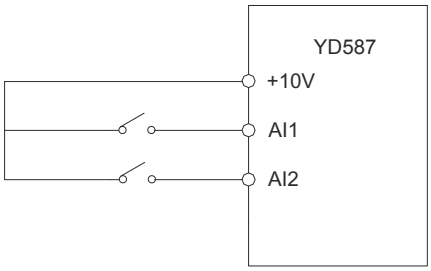
Parameter No.	Parameter Name	Description	Value Range	Default
Group b0: Basic motor parameters				
b0.00	Protection frequency of shaft-cooling motor running at a low speed	The two parameters are used when error 43# occurs, and are used for shaft-cooling motor protection. When the reference frequency of the AC drive keeps below the value set in b0.00 for a period longer than the value specified by b0.01, the AC drive reports error 43#. This function is invalid when b0.01 is set to 0.	0.01 Hz to 20.00 Hz	5.00 Hz
b0.01	Low-speed running time of shaft-cooling motor		0s to 1000s	0s
b0.04	Parameter auto-tuning selection	0: No operation 1: Static auto-tuning for an asynchronous motor (some motor parameters obtained) 2: Dynamic auto-tuning for an asynchronous motor (all motor parameters obtained) 3: Static auto-tuning for an asynchronous motor (all motor parameters obtained)	0 to 3	0
b0.05	Auto-tuning upon power-on	The YD587 series AC drive supports auto-tuning of stator resistance upon power-on. If this function is enabled, the AC drive takes 2s to 3s in static auto-tuning to achieve the optimal control effect every time it is powered on. 0: Disable 1: Enable	0 to 1	0
Group b1: Motor control parameters				
b1.00	Control mode	0: SVC control (open-loop control) 1: FVC control (closed-loop control) 2: V/f control	0 to 2	0

Parameter No.	Parameter Name	Description	Value Range	Default
b1.01	Slip compensation	This parameter is used to adjust the speed stability accuracy of the motor in SVC control mode. When the motor is connected to a heavy load and runs at a too low speed, increase the value of this parameter; otherwise, decrease the value of this parameter. In FVC control mode, this parameter can be used to change the output current of the AC drive under the same load.	50.0% to 200.0%	100.0%
b1.02	Maximum frequency	This parameter is used as the base value for calculating the target frequency when the frequency source is set to the analog or communication. It indicates the maximum output frequency of the AC drive at any time.	50.00 Hz to 300.00 Hz	50.00 Hz
b1.03	Minimum frequency	This parameter is used to set the minimum output frequency of the AC drive at any time.	0.00 Hz to 15.00 Hz	0.00 Hz
b1.04	Forward torque upper limit	Used to set the output torque upper limits when DI function 1 (Forward RUN) and DI function 2 (Reverse RUN) are enabled. The values are percentages of the rated motor torque. In SVC mode, even if the parameters are set to below 50.0%, the AC drive will regard the output torque upper limit as 50.0%.	0.0% to 500.0%	180.0%
b1.05	Reverse torque upper limit			
b1.06	Forward torque upper limit during brake release	The two parameters are valid only when b6.00 is set to 2 (manual brake control). The torque upper limits specified by the two parameters are used within the brake release time (b6.04) after the AC drive starts. After the brake is released completely, the torque upper limits change to the values specified by b1.04 and b1.05.		150.0%
b1.07	Reverse torque upper limit during brake release			130.0%
Group b2: Encoder parameters				
b2.00	Encoder pulses per revolution	This parameter is used to set the pulses per revolution of an ABZ or a UVW incremental encoder. In FVC mode, the pulses per revolution must be set properly to ensure normal running of the motor.	0 to 8192	1024

Parameter No.	Parameter Name	Description	Value Range	Default
b2.01	Encoder type	0: ABZ incremental encoder/Differential encoder Use YD580-ABZ PG card for this type of encoder. 1: UVW incremental encoder Use YD580-UVW PG card for this type of encoder. 2: Resolver Use YD580-RZV PG card for this type of encoder. 3: Reserved 4: Reserved The YD587 series AC drive supports multiple types of encoders, which are used with different PG cards. Choose an appropriate PG card for the encoder used. After installing the PG card, set this parameter properly to ensure normal running of the AC drive.	0 to 4	0
b2.02	AB phase sequence of ABZ incremental encoder	This parameter is valid only for an ABZ incremental encoder (b2.01 = 0). It is used to set the AB phase sequence of the ABZ incremental encoder. During auto-tuning for an asynchronous motor, the AC drive automatically identifies the AB phase sequence.	0 to 1	0
b2.03	Encoder disconnection detection	This parameter is used to enable or disable detection of error 20# (encoder disconnection). When it is set to 1, detection of error 20# is enabled. When it is set to 0, error 20# is shielded.	0 to 1	1
b2.07	Encoder disconnection detection time	This parameter is used to set the encoder hardware disconnection detection time and is valid only for a PG card of the YD580-ABZ model. When it is set to 0, encoder disconnection detection is disabled. When signals of the encoder are abnormal, the AC drive reports error 120#.	0.000s to 1.000s	0.000s
Group b3: I/O control parameters				
b3.00	Frequency source selection B	0–4: Same as P0.07 5: Communication The YD587 series AC drive supports setting of the frequency source in the following six communication modes: Modbus RTU, EtherCAT, EtherNet/IP, CANopen, and PROFINET. To implement different communication modes, applicable communication expansions cards must be selected, which is set in bd.07. For details, see "10.2 Communication Extension Cards" and descriptions of bd.07. For the frequency reference data format in each communication mode, see details of the specific communication mode.	0 to 6	0

Parameter No.	Parameter Name	Description	Value Range	Default
b3.01	DI1 function selection	1: Forward run 2: Reverse run An external terminal is used to control forward or reverse operation of the AC drive. 3: Reset upon fault A terminal is used the reset the AC drive when a fault occurs. It functions the same as the RESET key on the operating panel. This function allows you to reset the AC drive remotely. 4: Quick stop The AC drive outputs brake frequency (b6.05) immediately and executes the brake time sequence normally. 5: Coast to stop The AC drive blocks output and does not control the stop process of the motor. This stop mode is the same as coast to stop described in b4.03. 6: Decelerate to stop The AC drive decelerates normally and stops the motor after the brake time sequence is complete. The effect of this stop mode is the same as that of cancellation of the running command. 7: External fault input When this signal is sent to the AC drive, the AC drive reports error 50# (external input fault). 8: Multi-frequency selection 1 9: Multi-frequency selection 2 10: Multi-frequency selection 3 These options are valid when the frequency source is set to multi-frequency. For details, see the description of parameters in group b5. 11: Brake release feedback 12: Brake feedback They are feedback input signals of errors 41# and 42#. For details, see the description of the two errors. 13: Second acceleration ramp switching 14: Second deceleration ramp switching 15: Third acceleration ramp switching 16: Third deceleration ramp switching They are the DI switching point input functions for the acceleration and deceleration time during a special curve running. For details, see the description of special curve parameters in group b8.	0 to 133 (Input functions 1 to 33 are NO inputs. Input functions 101 to 133 are NC inputs. Input functions 0 and 100 are invalid.)	1
b3.02	DI2 function selection			2
b3.03	DI3 function selection			8
b3.04	DI4 function selection			9
b3.05	DI5 function selection			3
b3.06	DI6 function selection			5

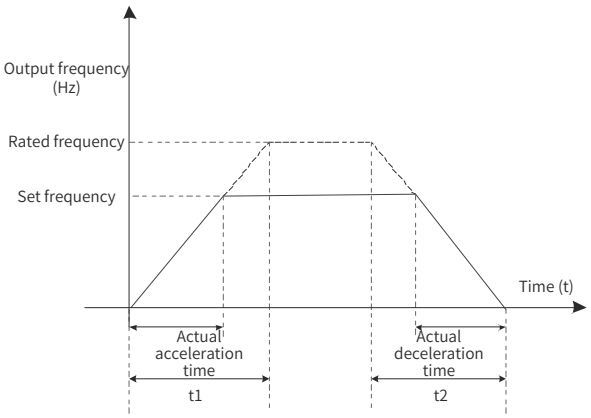
<table>
<tr><th>Parameter No.</th><th>Parameter Name</th><th>Description</th><th>Value Range</th><th>Default</th></tr>
<tr><td>b3.07</td><td>DI7 function selection</td><td rowspan="4">19: Acceleration
20: Deceleration
They are used as the frequency increment and decrement commands when the frequency is determined by external terminals. They are valid when the frequency source is set to acceleration/ deceleration.
21: Torque/Speed control switchover
If the function is valid, the AC drive changes to the torque control mode. If the function is invalid, the AC drive changes to the speed control mode. For details, see the description torque control parameters in group bb.
22: Forward stop switch
23: Reverse stop switch
24: Forward deceleration switch
25: Reverse deceleration switch
After a stop switch takes effect, the AC drive performs the quick stop action (the same as input function 4). After a deceleration switch takes effect, the maximum output frequency of the AC drive is limited below the value specified by bF.16 (deceleration frequency limit). Using functions 22 and 24 and functions 23 and 25 can implement simple positioning function.
26: Positioning point shielding
If this function is active, the stop and deceleration switch inputs are both invalid.
27: Motor switchover switch 1
28: Motor switchover switch 2
A YD587 series AC drive has three sets of functional parameters for switchover between three motors. The motor switchover function takes effect only after the AC drive stops output. If you select functions 27 and 28 for one motor, they are also forcibly selected for the same DIs of the other two motors. The two input functions are used in combination in binary format, with the logic in the following table.
<table><tr><th>Input Function 28</th><th>Input Function 27</th><th>Motor SN</th></tr><tr><td>Off</td><td>Off</td><td>1#</td></tr><tr><td>Off</td><td>On</td><td>2#</td></tr><tr><td>On</td><td>Off</td><td>3#</td></tr><tr><td>On</td><td>On</td><td>3#</td></tr></table>
31: Position check
If the function becomes active, the accumulative number of pulses in the AC drive is reset to b7.10 x b7.11, and the position value is reset to b7.11. For details, see the description of b7.10 and b7.11.</td><td rowspan="4">0 to 133
(Input functions 1 to 33 are NO inputs.
Input functions 101 to 133 are NC inputs. Input functions 0 and 100 are invalid.)</td><td>0</td></tr>
<tr><td>b3.08</td><td>DI8 function selection</td><td>0</td></tr>
<tr><td>b3.09</td><td>DI9 function selection</td><td>0</td></tr>
<tr><td>b3.10</td><td>DI10 function selection</td><td>0</td></tr>
</table>

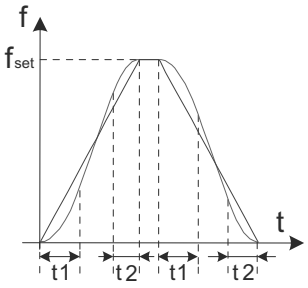
Parameter No.	Parameter Name	Description	Value Range	Default
b3.11	AI1 function selection	When this parameter is set to 0, the corresponding AI input is used as the target frequency input or is not used. When it is set to a non-zero value, the input function is the same as that of b3.01 to b3.10. The input is valid when the input voltage is greater than 7.00 V and is invalid when the input voltage is lower than 3.00 V. The wiring shown in the following figure is recommended for DI. 	0 to 133 (Input functions 1 to 33 are NO inputs. Functions 101–133 are NC inputs. 0 and 100 are invalid.)	0
b3.12	AI2 function selection			

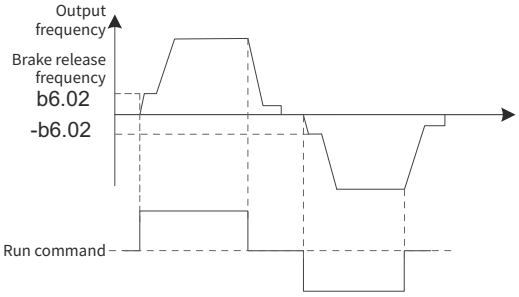
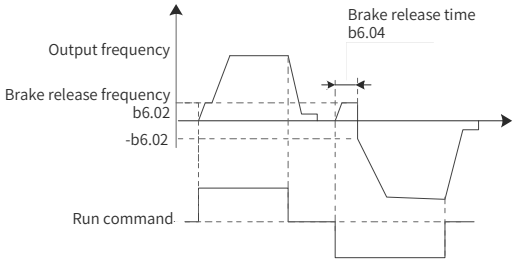
Parameter No.	Parameter Name	Description	Value Range	Default
b3.14	Relay 1 function selection (T/A-T/B-T/C)	1: Brake control This output is valid when the brake release condition is met in the brake sequence. For details, see the description of parameters in group b6. 2: Stop upon fault This output becomes valid after a level-1 fault occurs on the AC drive. 3: Alarm upon fault This output becomes valid after a level-2 or level-3 fault occurs on the AC drive. 4: Fault prompt This output becomes valid after a level 4 fault occurs on the AC drive. 5: Motor 1 connected indication 6: Motor 2 connected indication 7: Motor 3 connected indication If you select output functions 5 to 7 for one motor, they are also forcibly selected for the same outputs of the other two motors. 8: AC drive overload pre-warning This output becomes valid signals 10s before the AC drive performs overload protection. 9: Motor overload pre-warning Before triggering motor overload protection, the AC drive determines whether the load of the motor exceeds the overload pre-warning threshold. If the pre-warning threshold is exceeded, the output becomes valid. For details, see the description of the motor overload parameters bE.00 to bE.02. 11: Overload protection start This output function becomes valid after the AC drive enters the overload protection state. For details, see the description of bE.13. 12: Over-torque output This output function becomes valid when the output torque of the AC drive exceeds the threshold set in bF.17 and becomes invalid when the output torque is less than 90% of the threshold. For details, see the description of bF.17. 13: Motor fan control This output function becomes valid after the AC drive starts to operate and become invalid when the delay time set in bF.21 expires after the AC drive stops operation. 14: Output upon frequency reached For details, see the description of the parameters bF.07 and bF.08. 15: AC drive running This output function becomes valid when the AC drive is under operation and becomes invalid after the AC drive stops operation. 16: Automatic start output This output function is valid when the automatic start function of the AC drive is enabled. For details, see the description of bC.00. 17: Reserved 18: Communication control The output function is controlled by communication commands. For details, see the description of U0.11.	0 to 118 (Output functions 1 to 18 are NO outputs, 101 to 118 are NC outputs, and 0 and 100 are invalid.)	1
b3.15	Relay 2 (P/A-P/B-P/C)			-
b3.16	DO1 function selection			0
b3.17	DO2/Relay Y2 function selection			4

Parameter No.	Parameter Name	Description	Value Range	Default
b3.18	FM function selection	When the thousands position is set to 1, the FM output terminal is used as the DO. In this case, the parameter has the same output function as parameters b3.12 to b3.17. When the thousands position is set to 0, the FM output terminal is used as the high-speed pulse output terminal. In this case, the parameter has the same output function has parameters b3.19 to b3.20.	0 to 118 (Output functions 1 to 18 are NO outputs, 101 to 118 are NC outputs, and 0 and 100 are invalid.)	0
b3.19	AO1 function selection	When the thousands positions of the two parameters are set to 1, the AOs are used as the DOs. In this case, the parameters have the same output functions as parameters b3.14 to b3.17, with the output range from 0.00 V to 10.00 V. When the thousands position is set to 0, the output range 0.00 V to 10.00 V corresponds to 0.0% to 100.0%. Ones (position): AO function selection 0: Output frequency, 0 to the maximum frequency 1: Output current, 0 to 2 times the rated motor current 2: Output torque, 0 to 2 times the rated motor torque 3: Output power, 0 to 2 times the rated motor power 4: Output voltage, 0 to 1.2 times the rated motor voltage 5: Target frequency, 0 to the maximum frequency 6: Communication control output Tens (position): Reserved Hundreds (position): Reserved Thousands (position): DO/AO selection 0: AO 1: DO Ten thousands (position): Reserved The output is controlled through communication. For details, see the descriptions of U0.15 and U0.16.		0
b3.20	AO2 function selection			0
	Relay Y1 function selection			
	P/A-P/C function selection (YD580-IO3)			1001
b3.21	DI filter time	This parameter is used to set the software filter time of DI status. If DIs are prone to suffer from interference, which may cause malfunction, increase the value of this parameter to enhance the anti-interference capability. However, increasing the DI filter time will slow the response speed of DIs.	0.000s to 1.000s	0.010s

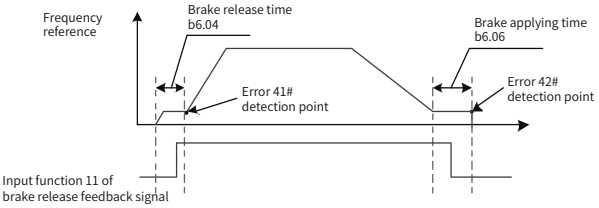
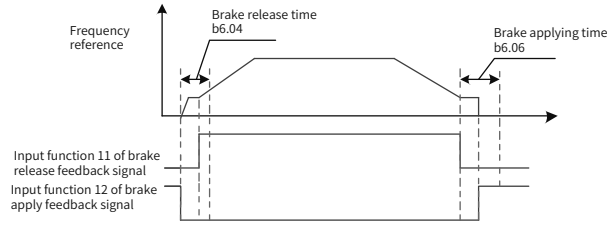
Parameter No.	Parameter Name	Description	Value Range	Default
b3.22	AI1 minimum input	Parameters b3.22 to b3.26 are used to define the relationship between AI voltages and setpoints. When the AI voltage exceeds the maximum value, the maximum value is used. When the AI voltage is less than the minimum value, the value set for the condition of "AI lower than minimum input" or 0.0% is used. When the AI is current input, 1 mA current corresponds to 0.5 V voltage. The input filter time is used to set the software filter time of the AI. If the AI is prone to suffer interference, increase the value of this parameter to stabilize the detected AI. However, increasing the AI filter time will slow the response speed of analog detection. Set this parameter properly based on actual conditions. In different applications, 100.0% of analog setting corresponds to different nominal values. For details, see the descriptions of different applications.	0.00 V to b3.24	0.00 V
b3.23	Settings corresponding to AI1 minimum input		0.0% to 100.0%	0.0%
b3.24	AI1 maximum input		B3.22 to 10.00 V	10.00 V
b3.25	Percentage corresponding to AI1 maximum input		0.0% to 100%	100.0%
b3.26	AI1 fitter time		0.00s to 10.00s	0.10s
b3.27	AI2 minimum input	For the specific function and usage, see the descriptions of b3.22 to b3.26.	0.00 V to b3.29	0.00 V
b3.28	Settings corresponding to AI2 minimum input		0.0% to 100.0%	0.0%
b3.29	AI2 maximum input		B3.27 to 10.00 V	10.00 V
b3.30	Percentage corresponding to AI2 maximum input		0.0% to 100%	100.0%
b3.31	AI2 fitter time		0.00s to 10.00s	0.10s
b3.43	AO1 zero offset coefficient	These parameters are used to correct the offset of the AO zero drift and the output amplitude. They can also be used to define the required AO curve. If b represents zero offset, k represents gain, Y represents actual output, and X represents standard output, the actual output is Y = kX + b. The zero offset coefficient 100% of AO1 and AO2 corresponds to 10 V (or 20 mA). The standard output refers to the value corresponding to the AO of 0 V to 10 V (or 0 mA to 20 mA) with no zero offset or gain adjustment. For example, the AO is frequency. If you want the AC drive to provide 8 V output when the frequency is 0 and provide 3 V output when the frequency reaches the maximum value, set the gain to -0.50 and the zero offset to 80%.	-100.0% to +100.0%	0.0%
b3.44	AO1 gain		-10.00 to +10.00	1.00
b3.45	AO2 zero offset coefficient		-100.0% to +100.0%	0.0%
b3.46	AO2 gain		-10.00 to +10.00	1.00

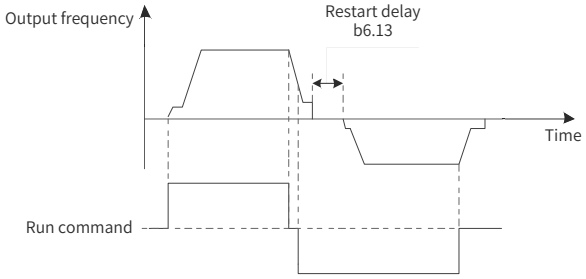
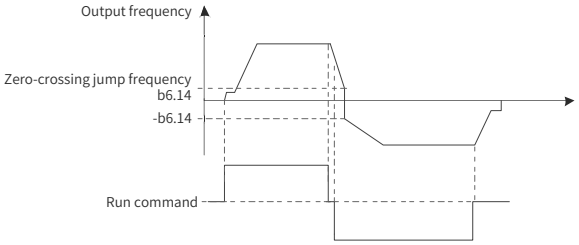
Parameter No.	Parameter Name	Description	Value Range	Default
Group b4: Ramp parameters				
b4.00	Acceleration time	Acceleration time (t1 in the following figure) is the time required for the AC drive to accelerate from 0 to the rated frequency (P0.04). Deceleration time (t2 in the following figure) is the time required for the AC drive to decelerate from the rated frequency (P0.04) to 0. 	0.0s to 600.0s	3.0s
b4.01	Deceleration time			
b4.02	Running curve mode selection	0: Linear acceleration/deceleration The output frequency increases or decreases linearly. 1: S-curve acceleration/deceleration The output frequency increases or decreases along the S curve. This mode is applicable to the scenarios that require soft start or stop.	0 to 1	0
b4.03	Stop mode selection	0: Decelerate to stop After the stop command takes effect, the AC drive ramps to stop based on the deceleration time set by b4.01. 1: Coast to stop After the stop command becomes valid, the AC drive immediately stops output. Then, the motor coasts to stop based on the mechanical inertia.	0 to 1	0

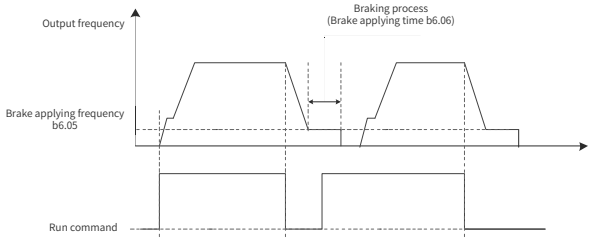
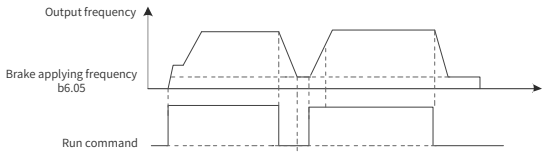
<table>
<tr><th>Parameter No.</th><th>Parameter Name</th><th>Description</th><th>Value Range</th><th>Default</th></tr>
<tr><td>b4.04</td><td>Time proportion of S-curve initial segment</td><td rowspan="2">The two parameters define the time proportions of the initial and final segments for S-curve acceleration and deceleration, respectively.
In the following figure, t1 is defined by b4.04, during which the slope of the output frequency increases gradually. t2 is defined by b4.05, during which the slope of the output frequency change gradually decreases to 0. Within the time between t1 and t2, the slope of the output frequency remains unchanged. That is, the output frequency increases or decreases linearly.
 
</td><td rowspan="2">0.0% to 40.0%</td><td rowspan="2">30.0%</td></tr>
<tr><td>b4.05</td><td>Time proportion of S-curve final segment</td></tr>
<tr><td colspan="5">Group b5: Multi-frequency parameters</td></tr>
<tr><td>b5.00</td><td>Multi-frequency 1</td><td rowspan="8">The multi-frequency functions are selected by input terminal functions 8, 9, and 10. The AC drive supports eight speeds through digital status combinations of the three input functions, as shown in the following table.
<table><tr><th>Input Function 10</th><th>Input Function 9</th><th>Input Function 8</th><th>Target Speed</th></tr><tr><td>Off</td><td>Off</td><td>Off</td><td>b5.00</td></tr><tr><td>Off</td><td>Off</td><td>On</td><td>b5.01</td></tr><tr><td>Off</td><td>On</td><td>Off</td><td>b5.02</td></tr><tr><td>Off</td><td>On</td><td>On</td><td>b5.03</td></tr><tr><td>On</td><td>Off</td><td>Off</td><td>b5.04</td></tr><tr><td>On</td><td>Off</td><td>On</td><td>b5.05</td></tr><tr><td>On</td><td>On</td><td>Off</td><td>b5.06</td></tr><tr><td>On</td><td>On</td><td>On</td><td>b5.07</td></tr></table></td><td rowspan="8">Minimum frequency (b1.03) to maximum frequency (b1.02)</td><td>5.00 Hz</td></tr>
<tr><td>b5.01</td><td>Multi-frequency 2</td><td>20.00 Hz</td></tr>
<tr><td>b5.02</td><td>Multi-frequency 3</td><td>35.00 Hz</td></tr>
<tr><td>b5.03</td><td>Multi-frequency 4</td><td>50.00 Hz</td></tr>
<tr><td>b5.04</td><td>Multi-frequency 5</td><td rowspan="4">0.00 Hz</td></tr>
<tr><td>b5.05</td><td>Multi-frequency 6</td></tr>
<tr><td>b5.06</td><td>Multi-frequency 7</td></tr>
<tr><td>b5.07</td><td>Multi-frequency 8</td></tr>
</table>

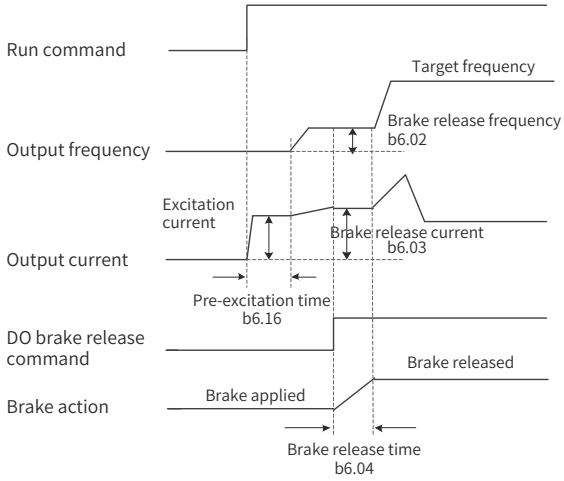
Parameter No.	Parameter Name	Description	Value Range	Default
Group b6: Brake logic control parameters				
b6.00	Brake curve type	0: No brake control The AC drive does not define the brake release frequency, brake release time, or brake applying time. Output function 1 is equivalent to the output function of "AC drive under operation." 1: Automatic brake control The AC drive automatically retains current (with upper torque limits specified by b1.04 and b1.05) within the brake release time. When the output current reaches the product of b6.03 multiplied by the rated motor current, the AC drive delivers the brake release command. 2: Manual brake control The AC drive uses values specified by b1.06 and b1.07 as torque upper limits. When the output current reaches the product of b6.03 multiplied by the rated motor current, the AC drive delivers the brake release command. For details, see the descriptions of the parameters b1.06 and b1.07.	0 to 2	1
b6.01	Startup direction	This parameter defines the output torque direction of the AC drive within the brake release time. 0: The direction of brake release torque is the same as the running direction.  1: The direction of brake release torque is always forward. 	0 to 1	0
b6.02	Brake release frequency	This parameter is used to set the output frequency of the AC drive before the brake releases completely, namely, the minimum frequency at which the motor can have full torque.	Minimum frequency (b1.03) to 15.00 Hz	2.00 Hz

Parameter No.	Parameter Name	Description	Value Range	Default
b6.03	Brake release current	This parameter is used to set the percentage of the output current to the rated motor current (P0.03). When the output current of the AC drive reaches this value, the AC drive delivers the brake release command immediately (output function 1 valid).	0.0% to 150.0%	30.0%
b6.04	Brake release time	This parameter is used to set the time from start to complete of mechanical brake release. The AC drive keeps the output at the brake release frequency within this period of time.	0.00s to 5.00s	0.50s
b6.05	Brake apply frequency	When the output frequency of the AC drive falls below this value during deceleration after the RUN command is canceled, the AC drive delivers the brake command immediately (output function 1 invalid).	Minimum frequency (b1.03) to 20.00 Hz	2.00 Hz
b6.06	Brake time	This parameter defines the time required for the mechanical brake to apply completely. The AC drive maintains the output at the brake applying frequency within this period of time.	0.00s to 5.00s	0.50s
b6.07	Brake delay	This parameter defines the delay time for the AC drive to output the brake applying command when the brake applying condition is met. This function is invalid when quick stop or coast to stop is selected and the crane mechanism type (P0.08) is set to 0, 3, or 4.	0.0s to 30.0s	0.0s

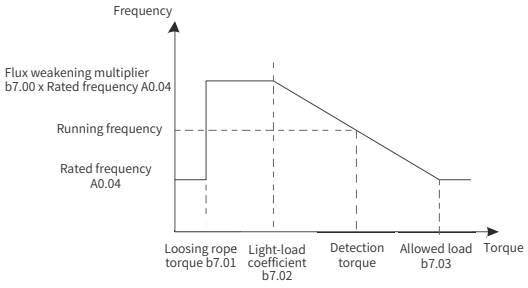
Parameter No.	Parameter Name	Description	Value Range	Default
b6.08	Brake feedback purpose	It is used when errors 41# and 42# occur. For details, see the description of the two errors. 0: Brake feedback not used No brake feedback contact is not connected to the AC drive, or the brake feedback function is not required. 1: Feedback over one terminal The AC drive detects brake feedback signals only during brake applying and release processes. This application requires only one brake feedback contact input. The following figure shows the correct application logic.  2: Feedback over two terminals The brake release time and brake applying time are determined by the brake feedback contact signal. The AC drive starts to check brake feedback signals immediately after being powered on. In this application, both the brake release contact and brake contact must be connected to the AC drive. The following figure shows the correct application logic.  	0 to 2	0

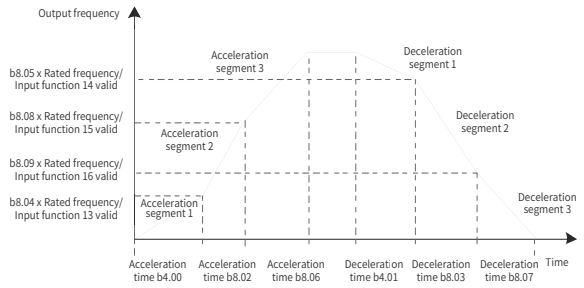
Parameter No.	Parameter Name	Description	Value Range	Default
b6.09	Command reverse control	0: Direct reverse not allowed during operation When the operating AC drive receives the reverse run command, it decelerates following the normal stop process and then starts reverse operation.  1: Reverse allowed during operation When the operating AC drive receives the reverse run command, it decelerates to the zero-crossing jump frequency (b6.14) and then directly starts reverse operation from the reversed zero-crossing jump frequency. Brake applying and release control are not performed in this process.  When the crane mechanism type is set to hoisting mechanism (P0.08 = 0), this function is valid only in closed-loop control mode. When other mechanism types are selected, this function is valid in all control modes.	0 to 1	0

Parameter No.	Parameter Name	Description	Value Range	Default
b6.12	Restart during braking	0: Restart not allowed during braking The AC drive does not accept the start command if the braking has started in the stop process. The AC drive can restart only after the brake is applied completely and the AC drive stops output.  1: Restart allowed during braking The AC drive accepts a new operation command even if the braking has started in the stop process.  	0 to 1	0
b6.13	Restart delay time	This parameter defines the delay time for the AC drive to wait before a restart every time it stops. For details, see the description of b6.09.	0.0s to 15.0s	0.3s
b6.14	Zero-crossing jump frequency	If the AC drive can change to run in the reverse direction to the current direction during running (b6.09 = 1) and the output frequency falls below the value of b6.14 during deceleration, the output frequency will jump from b6.14 to -b6.14. The actual value of this parameter must be greater than the brake release frequency b6.02 and braking frequency b6.05. For details, see the description of b6.09.	0.00 Hz to 20.00 Hz	2.00 Hz

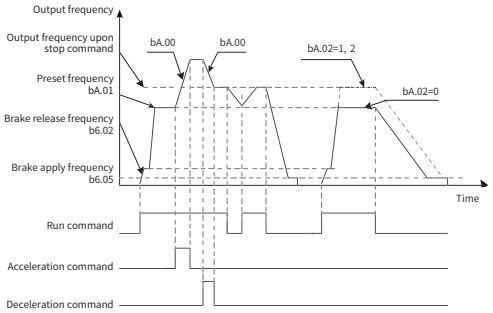
Parameter No.	Parameter Name	Description	Value Range	Default
b6.16	Pre-excitation time	 This parameter is used to set how long the pre-excitation stage lasts during AC drive startup. This function takes effect only in closed-loop vector control mode. When it is set to 0, the pre-excitation function is invalid.	0.00s to 5.00s	0.30s
b6.17	Excitation holding time after stop	This parameter defines the holding time of the excitation state after the AC drive stops. During this holding time, the AC drive provides zero speed output and retains the exciting current. If the AC drive receives the RUN command during this period, it can skip the pre-excitation stage and release the brake quickly.	0s to 65535s	30s
b6.18	Droop adjustment frequency	This parameter is read-only. It shows the difference value between the set frequency and actual frequency after droop calculation. See the description of b6.19 for more details.	-	-
b6.19	Droop control	This parameter is used to set the droop rate for droop control. When it is set to 0, the droop control function is disabled. Droop control is applicable to scenarios where two AC drives drive two motors in rigid connection. To prevent running conflict between the two motors, droop control allows minor speed deviation between the two motors. The droop rate is calculated using the following formula: Droop adjustment frequency (b6.18) = Set frequency x Output torque x Droop rate (b6.19)/10 Example: If b6.19 is 1.00, the set frequency is 50.00 Hz, and the output torque is 50.0%, then: Droop adjustment frequency = 50.00 Hz x 50.0% x 1.00/10 = 2.50 Hz Actual frequency of the AC drive = 50.00 Hz - 2.50 Hz = 47.50 Hz	0.00 to 20.00	0.00

Parameter No.	Parameter Name	Description	Value Range	Default
b6.21	Stator auto-tuning before startup	This parameter is used to enable or disable stator auto-tuning before startup. 0: Disable 1: Enable	0 to 1	0
b6.22	Brake release timeout interval	If brake release is not implemented after the time set by this parameter, a brake release error is reported.	0s to 5.00s	3.00s
B6.23	Delay time before braking	This parameter indicates the delay time before braking.	0s to 1.00s	0.1s
B6.24	Current threshold for braking	This parameter indicates the current threshold for braking.	0% to 500%	0%
B6.25	Coefficient for braking	This parameter indicates the coefficient for braking.	100% to 1000%	500%

Parameter No.	Parameter Name	Description	Value Range	Default
Group b7: Light-load and positioning control parameters				
b7.00	Flux weakening multiplier	The light-load high-speed function enables the AC drive to automatically calculate the maximum output frequency based on the load when the target frequency is greater than the rated frequency, thereby preventing faults caused by a heavy load, such as overload and overcurrent. The parameters b7.00 to b7.07 are used to set the light-load high-speed function. When the output frequency of the AC drive reaches the value specified by b7.07, the AC drive retains the output frequency for the time set in b7.06. When the time expires, the AC drive measures the output torque T and uses it to calculate the maximum frequency F for operation according to the curve, as shown in the following figure. If the target frequency is greater than the rated frequency and the value of b7.00 exceeds 100.0%, the light-load high-speed function is enabled. When the T ⩽ loosing rope torque or T ⩾ allowed load condition is met, the maximum value of F is the rated frequency. When the loosing rope torque < T ⩽ light-load coefficient condition is met, the maximum value of F is b7.00 multiplied by the rated frequency. When the light-load coefficient < T < allowed load condition is met, F is automatically adjusted according to the following curve.  b7.08 and b7.09 indicate that when the light-load coefficient ⩽ T ⩽ allowed load condition is met, the target frequency is calculated as follows: F x b7.08 (forward run) or F x b7.09 (reverse run). The actual running frequency is limited by the maximum torque of the AC drive or motor.	100.0% to 300.0%	100.0%
b7.01	Loosing rope torque		0.0% to light-load coefficient (b7.02)	5.0%
b7.02	Light-load coefficient		Loosing rope torque (b7.01) to Allowed load (b7.03)	35.0%
b7.03	Load capacity		Light-load coefficient (b7.02) to 100.0%	80.0%
b7.06	Detection time		0.0s to 5.0s	0.5s
b7.07	Detection frequency		Brake release frequency (b6.02) to rated frequency (A0.04)	40.00 Hz
b7.08	Forward correction		0% to 100%	100%
b7.09	Reverse correction		0% to 100%	100%
b7.10	Position display proportion	This parameter is set based on the position display accuracy. It is used to convert the number of pulses into position data. Position data displayed in U0.08 and U0.09 is the current number of pulses divided by the value of b7.10. Note: The pulses provided to YD587 series AC drive are quadruplicated.	1 to 65535	1

Parameter No.	Parameter Name	Description	Value Range	Default
b7.11	Position check value	When input function 31 (position check) is valid, the accumulative number of pulses in the AC drive is reset to the value of b7.10 multiplied by the value of b7.11, and the position data is reset to the value specified by b7.11.	0 to 65535	0
Group b8: Special curve parameters				
b8.00	Special acceleration	0: Disabled Special acceleration/deceleration is not used. 1: Two-segment (frequency switchover) Two-segment acceleration/deceleration is used. When the output frequency exceeds the rated frequency multiplied by b8.04 during acceleration, the acceleration time changes to the value of b8.02. When the output frequency falls below the rated frequency multiplied by b8.05 during deceleration, the deceleration time changes to the value of b8.03. 2: Three-segment (frequency switchover) Three-segment acceleration/deceleration is used. Functions in the two segments (frequency switchover) are supported in the three segments. Moreover, when the output frequency exceeds the rated frequency multiplied by b8.08 during acceleration, the acceleration time changes to the value of b8.06. When the output frequency falls below the rated frequency multiplied by b8.09 during deceleration, the deceleration time changes to the value of b8.07. 3: Two-segment (DI switchover) Two-segment acceleration/deceleration is used. When input function 13 is valid during acceleration, the acceleration time changes to the value of b8.02. When input function 14 is valid during deceleration, the deceleration time changes to the value of b8.03. 4: Three-segment (DI switchover) Three-segment acceleration/deceleration is used. Functions in the two segments (DI switchover) are supported in the three segments. Moreover, when input function 15 is valid during acceleration, the acceleration time changes to the value of b8.06. When input function 16 is valid during deceleration, the deceleration time changes to the value of b8.07.  	0 to 4	0
b8.01	Special deceleration			

Parameter No.	Parameter Name	Description	Value Range	Default
b8.02	Segment-2 acceleration time	For details, see the descriptions of b8.00 and b8.01.	0.1s to 600.0s	3.0s
b8.03	Segment-2 deceleration time		0.1s to 600.0s	3.0s
b8.04	Segment-2 acceleration switchover frequency		0% to segment-3 acceleration switchover frequency (b8.08)	0%
b8.05	Segment-2 deceleration switchover frequency		Segment-3 deceleration switchover frequency (b8.09) to 99%	99%
b8.06	Segment-3 acceleration time		0.1s to 600.0s	3.0s
b8.07	Segment-3 deceleration time		0.1s to 600.0s	3.0s
b8.08	Segment-3 acceleration switchover frequency		Segment-2 acceleration switchover frequency b8.04 to 99%	99%
b8.09	Segment-3 deceleration switchover frequency		0% to segment-2 deceleration switchover frequency (b8.05)	0%
Group bA: Acceleration/Deceleration parameters				
bA.00	Acceleration/ Deceleration rate	This parameter is used to set the frequency change rate when the frequency source is set to acceleration/deceleration or input function 19 (acceleration) and input function 20 (deceleration) are valid.	0.01 Hz/s to 50.00 Hz/s	5.00 Hz/s
bA.01	Preset frequency	This parameter is used to set the initial value of the target frequency when the frequency source is set to acceleration/deceleration.	Brake release frequency (b6.02) to Maximum frequency (b1.02)	50.00 Hz

Parameter No.	Parameter Name	Description	Value Range	Default
bA.02	Frequency retentive option	0: Not save The value of bA.01 is used as the initial target frequency each time. 1: Retentive until power failure The value of bA.01 is used as the initial target frequency for the first run of the AC drive after power-on. If the power is not cut off, the initial target frequency is always the output frequency of the AC drive when it cancels the run command last time. 2: Retentive all along The initial target frequency is the frequency set when the AC drive cancels the run command and starts to decelerate last time. This frequency is retentive upon power failure. 	0 to 2	0
bA.03	Minimum frequency for acceleration/ deceleration	This parameter is used to set the lower limit of the output frequency during deceleration when the deceleration switch is active.	0.00 Hz to 15.00 Hz	0.00 Hz

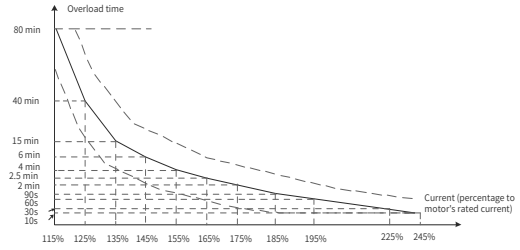
Parameter No.	Parameter Name	Description	Value Range	Default
Group bb: Torque control parameters				
bb.00	Torque control function selection	0: Disable torque control The speed control mode is used all the time. 1: Torque control all along The torque control mode is used all the time. 2: Torque/Speed control mode switchover by frequency The torque control mode is used when the output frequency of the AC drive is greater than the value of bb.01. Otherwise, the speed control mode is used. 3: Torque/Speed control mode switchover by torque The torque control mode is used when the output torque of the AC drive is greater than the value of bb.02. Otherwise, the speed control mode is used. 4: Torque/Speed control mode switchover by frequency and torque The torque control mode is used when the output frequency of the AC drive is greater than the value of bb.01 and the output torque is greater than the value of bb.02. Otherwise, the speed control mode is used. 5: Torque/Speed control mode switchover by DI The torque control mode is used when input function 21 is valid, and the speed control mode is used when the function is invalid. 6: Torque/Speed control mode switchover by communication	0 to 6	0
bb.01	Frequency threshold	For details, see the description of bb.00.	0.00 Hz to maximum frequency (b1.02)	25.00 Hz
bb.02	Torque threshold		0.0% to 150.0%	50.0%
bb.03	Torque source	1: AI1 AI1 supports only the voltage input of 0 V to 10 V. 2: AI2 AI2 supports voltage input of 0 V to 10 V or current input of 4 mA to 20 mA, which is determined by jumper J9 on the control board. When AI is used as the torque reference, 100.0% of voltage/current input corresponds to 200.0% of output torque. 4: Operating panel, with the value set by bb.08 5: Communication, with the torque written into address 0xbb08	0 to 5	0

Parameter No.	Parameter Name	Description	Value Range	Default
bb.04	Maximum forward frequency in torque control mode	These two parameters set the maximum frequency in the forward or reverse direction when the torque control mode is used. In torque control mode, if the load torque is less than the output torque of the motor, the motor speed keeps rising. Therefore, to prevent accidents such as runaway in the mechanical system, the motor speed must be controlled within a proper range.	0.00 Hz to maximum frequency (b1.02)	50.00 Hz
bb.05	Maximum reverse frequency in torque control mode			
bb.06	Torque control acceleration time	In 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 load. The motor speed may change quickly, which may result in too loud noise or high mechanical stress. Setting the acceleration and deceleration time properly in torque control mode can ensure smooth change of the motor speed. If the motor needs to respond to torque changes quickly, set the torque control acceleration/deceleration time to 0.0s. For example, two motors are connected in the hard connection mode to drive the same load. To ensure balanced load distribution, set one AC drive as the master to work in speed control mode and the other as the slave to work in torque control mode. The slave receives the master's output torque as the torque command and must follow the master rapidly. In this case, the acceleration/deceleration time of the slave in torque control mode is set to 0.0s. The time base of the two parameters is 200.0% of the output torque.	0.0s to 600.0s	0.0s
bb.07	Torque control deceleration time			
bb.08	Target torque	This parameter is used to set the target torque used when bb.03 is set to 4 or 5.	-500.0% to +500.0%	180.0%
bb.09	Connection method selection	The torque control mode is usually used for master-slave control among multiple AC drives. The master AC drive uses the speed control mode, and the slave drives use the torque control mode. This parameter determines the type of connection used between master and slave drives. 0: Hard connection 1: Soft connection	0 to 1	0

Parameter No.	Parameter Name	Description	Value Range	Default
Group bC: Overspeed protection parameters				
bC.00	Number of pulses for automatic start	This parameter is used to set the automatic start function of the AC drive. When the AC drive stops in the closed-loop mode with the brake in the stop state, the AC drive can automatically run with 0 Hz output if the system detects that the change of encoder pulses reaches the value of this parameter multiplied by the encoder pulses per revolution. Meanwhile, the AC drive reports error E453#, and output function 16 takes effect.	0 to 100.00	0
bC.01	Detection time of V/f speed error	When the difference between the motor actual running speed and the synchronous speed is above the deviation threshold specified by bC.03, Er*52 is reported after the time specified by bC.01.	0s to 60.0s	5.0s
bC.02	Abnormal frequency detection period	This parameter is used to set the error 37# detection time. When the motor feedback frequency keeps in an opposite direction to the reference frequency in a period longer than the value specified by bC.02, the AC drive reports error 37#. If this parameter is set to 0, error 37# is shielded.	0.00s to 1.00s	0.50s
bC.03	Frequency following error	This parameter is used to set the error 38# detection threshold. For details, see the description of bC.04 or error 38#.	0% to 30%	20%
bC.04	Frequency following detection period	This parameter is used to set the error 38# detection time. When the difference between the motor feedback frequency and reference frequency stays above the value of bC.03 multiplied by the rated frequency for a period longer than the value specified by bC.04, the AC drive reports error 38#. If this parameter is set to 0, error 38# is shielded. After the reference frequency and output frequency are higher than the rated frequency, this fault is invalid.	0.00s to 1.00s	0.50s
Group bd: Communication parameters				
bd.00	Baud rate	This parameter is used to set the speed of data transmission between the host controller and the AC drive in the Modbus communication mode. The baud rate of the host controller must be the same as that of the AC drive. Otherwise, communication will fail. A higher baud rate results in a faster communication speed. 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS	5 to 9	5

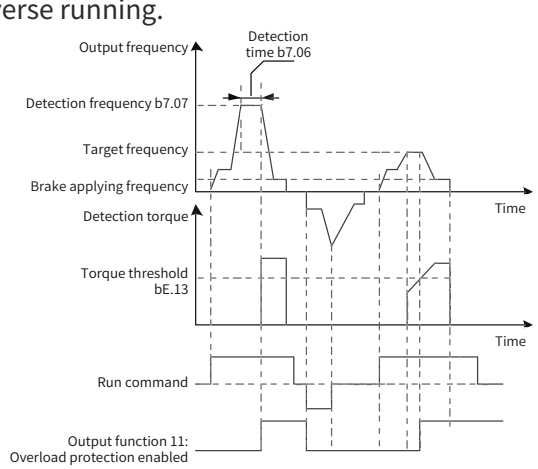
Parameter No.	Parameter Name	Description	Value Range	Default
bd.01	Data format	This parameter is used to set the data format used in the Modbus communication mode. The data format on the host controller must be the same as that on the AC drive. Otherwise, communication will fail. 0: No check, with the data format of <8,N,2> 1: Even parity check, with the data format of <8,E,1> 2: Odd parity check, with the data format of <8,O,1> 3: No check, with the data format of <8,N,1>	0 to 3	0
bd.02	Local address	When the local address is set to 0 (broadcast address), host controller broadcast is enabled. The local address (except the broadcast address) is unique, which is the prerequisite for point-to-point communication between the host controller and AC drive.	0 to 247	1
bd.03	Expansion card response delay	This parameter is used to set the time that the AC drive waits before sending data to the host controller after it finishes receiving data. If the response delay is shorter than the system processing time, the system processing time prevails. If the response delay is longer than the system processing time, the AC drive sends data to the host controller only after the response delay elapses. This parameter is valid only for RS485 communication.	0 ms to 20 ms	2 ms
bd.04	Expansion card timeout interval	If the communication interval between the AC drive and communication expansion card exceeds the value set by bd.04, the AC drive reports error 48#. This parameter is valid only for Modbus RTU, EtherCAT, EtherNet/IP, CANopen, and PROFINET communication modes.	0.0s to 60.0s	0.0s
bd.07	Expansion card selection	0: Modbus RTU communication 2: CANopen, PROFINET, EtherCAT, or EtherNet/IP communication Different communication modes require different expansion cards.	0 to 2	0
bd.08	Expansion card software version	This parameter sets the software version of the optional expansion card in use, such as the CANopen PROFINET, EtherCAT, or EtherNet/IP card.	0 to 65535	0

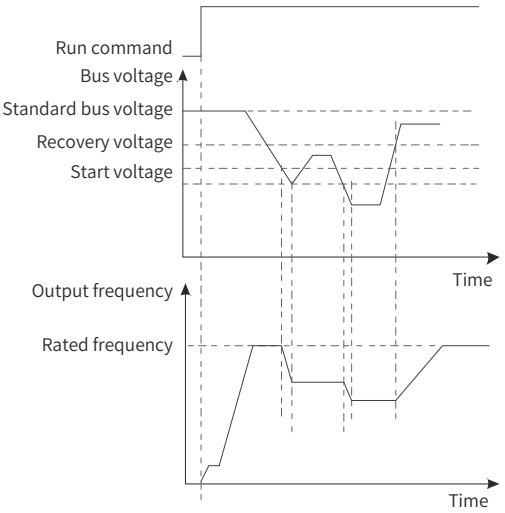
Parameter No.	Parameter Name	Description	Value Range	Default
bd.11 to bd.30	User-defined parameters 1 to 20	You can use the 20 user-defined parameters to redefine parameter and address mapping for the AC drive. For example, if bd.11 is mapped to P0.01, you can obtain the value of P0.01 by reading the bd.11 address. With settings of the user-defined parameters, inconsecutive parameters can be read continuously. For example, if values of P0.01, b0.05, and F0.04 need to be read circularly in Modbus RTU communication, three data frames need to be sent. However, after mapping bd.11, bd.12, and bd.13 to P0.01, b0.05, and F0.04, respectively, only one data frame needs to be sent to read the three continuous parameters starting with bd.11. In PROFIBUS DP communication and CANopen communication, each user-defined parameter is mapped to a communication address (one-to-one mapping). PROFIBUS DP communication: bd.11 to bd.20 are mapped to PZD3 to PZD12 sent from the master to the slave. bd.21 to bd.30 are mapped to PZD3 to PZD12 sent from the slave to the master. CANopen communication: bd.11 to bd.18 are mapped to RPDO1 to RPDO3. bd.21 to bd.28 are mapped to TPDO2 to TPDO3.	P0-00 to P*-** b0-00 to b*-** U0-00 to U*-** F0-00 to F*-**	0

Parameter No.	Parameter Name	Description	Value Range	Default
Group bE: Fault and protection parameters				
bE.00	Motor overload protection	To provide effective protection for motors with different loads, you need to set bE.00 properly based on motor overload capacity. See the following inverse time curve for motor overload protection.  When the motor runs at 175% of the rated motor current for 2 minutes, the AC drive reports a motor overload error (11#). When the motor runs at 115% of the rated motor current for 80 minutes, the AC drive reports a motor overload error (11#). Example: The rated motor current is 100 A. bE.01 = 1.00: When the motor runs at 125 A (125% of 100 A) for 40 minutes, the AC drive reports a motor overload error. bE.01 = 1.20: When the motor runs at 125 A (125% of 100 A) for 48 (40 x 1.2) minutes, the AC drive reports a motor overload error. The maximum time for reporting a motor overload error is 80 minutes, and the minimum time is 10 seconds. Example of setting the motor overload protection function: The AC drive needs to report a motor overload error after the motor runs for 2 minutes at 150% of the rated current. In the preceding figure, 150% (I) is between 145% (I1) and 155% (I2). The overload error reporting time for 145% of the rated current is 6 minutes (T1), and that for 155% is 4 minutes (T2). Therefore, the overload error reporting time for 150% of the rated current is calculated as follows by default: T = T1 + (T2 - T1) x (I – I1)/(I2 – I1) = 4 + (6 - 4) x (150% – 145%)/(155% – 145%) = 5 (minutes) If you want the AC drive to report a motor overload error after the motor runs for 2 minutes at 150% of the rated current, the motor overload protection gain should be: bE.01 = 2/5 = 0.4 Caution: Set bE.01 properly based on the actual overload capacity of the motor. If the value is too large, the AC drive may not report an alarm timely when the motor is damaged caused by overheating.	0: Motor overload protection is disabled. 1: Motor overload protection is enabled.	1
bE.01	Motor overload protection gain	The motor overload pre-warning coefficient indicates the percentage of the time the motor can continuously run at a certain overload point without reporting an overload fault. When the motor overload detection level reaches the value of this parameter, output function 9 (motor overload pre-warning) is active. For example, if the motor overload protection gain is set to 1.00 and the motor overload pre-warning coefficient is set to 80%, output function 9 (motor overload pre-warning) is active after the motor runs consecutively for 4.8 minutes (80% x 6 minutes) at 145% of the rated current.	0.01 to 10.00	1.00

Parameter No.	Parameter Name	Description	Value Range	Default
bE.02	Motor overload pre-warning coefficient	The AC drive can send a pre-warning signal to the control system through the DO before triggering motor overload protection. The pre-warning coefficient determines how early the AC drive sends the pre-warning signal before motor overload protection. The larger the value is, the later the pre-warning signal is sent. When the accumulative output current of the AC drive is greater than the product of overload inverse time-lag curve multiplied by the value of bE.02, output function 9 (motor overload pre-warning) becomes valid.	50% to 100%	80%
bE.03	Overvoltage stall gain	When the DC bus voltage exceeds the overvoltage stall protective voltage during deceleration of the AC drive, the AC drive stops deceleration and keeps the present operation frequency. After the bus voltage drops, the AC drive continues to decelerate. This parameter is used to adjust the overvoltage suppression capacity of the AC drive. A larger value indicates a greater the overvoltage suppression capacity. The value should be kept as small as possible as long as overvoltage does not occur. For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the overvoltage stall gain should be large, because a small gain cannot achieve good overvoltage suppression effect. When the overvoltage stall gain is set to 0, the overvoltage stall function is disabled. This function is invalid for the hoisting mechanism (P0.08 = 0).	0 to 100	0
bE.04	Overvoltage stall protection voltage		330–800 V	Three-phase 380–400 V models: 670 V Three-phase 200–240 V models: 380 V

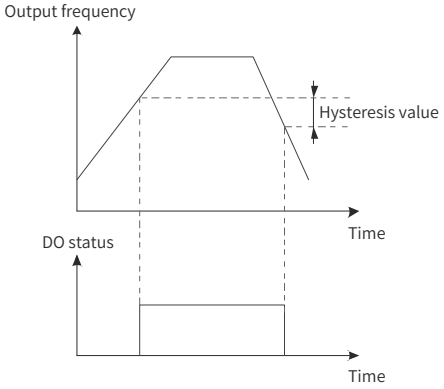
Parameter No.	Parameter Name	Description	Value Range	Default
bE.05	Overcurrent stall gain	When the output current exceeds the overcurrent stall protective current during acceleration/deceleration of the AC drive, the AC drive stops acceleration/deceleration and keeps the current frequency. After the output current decreases, the AC drive continues acceleration/deceleration. This parameter is used to adjust the overcurrent suppression capacity of the AC drive during acceleration/deceleration. A larger the value indicates a greater the overcurrent suppression capacity. The value should be kept as small as possible as long as overcurrent does not occur. For small-inertia load, the value should be small. Otherwise, the system dynamic response will be slow. For large-inertia load, the overcurrent stall gain should be large, because a small gain cannot achieve good overcurrent suppression effect. If the overcurrent stall gain is set to 0, the overcurrent stall function is disabled. bE.05 and bE.06 are valid only in V/f control mode.	0 to 100	20
bE.06	Overcurrent stall protective current		100% to 200%	150%
bE.07	Protection against short circuit to ground upon power-on	This parameter is used to check whether the motor is short-circuited to the ground after the AC drive is powered on. If this function is enabled, the U, V, and W terminals of the AC drive will have voltage output for a while after power-on. 0: Disable 1: Enable	0 to 1	1
bE.08	Input phase loss protection	This parameter determines whether to enable input phase loss protection. 0: Disable 1: Enable hardware input phase loss protection Note: YD587 series AC drive models with power ratings lower than 18.5 kW do not support this function. 2: Enable both hardware and software input phase loss protection 3: Enable software input phase loss protection	0 to 3	2
bE.09	Output phase loss protection	If this parameter is set to 1, output phase loss protection is enabled. If it is set to 0, output phase loss protection is disabled.	0 to 1	1

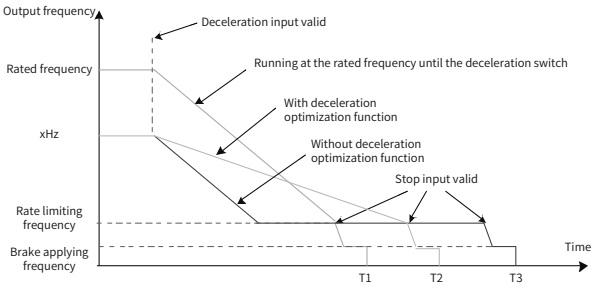
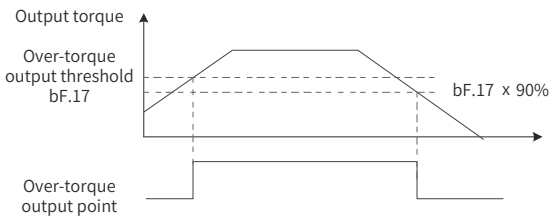
Parameter No.	Parameter Name	Description	Value Range	Default
bE.13	Overload protective torque limit	This parameter is used to set the start torque for triggering the overload protection function. When the parameter is set to 0, the overload protection function is disabled. During forward running, the AC drive measures the output torque when the output frequency reaches the value of b7.07 or keeps at a constant value. For details, see the descriptions of b7.06 and b7.07. If the output torque exceeds the value of bE.13, the AC drive stops automatically and restricts forward running. The restriction is disabled immediately after the AC drive starts reverse running. 	0.0% to 150.0%	0

Parameter No.	Parameter Name	Description	Value Range	Default
bE.14	Power dip ride-through function Select	The two parameters are used to set the power dip ride-through function. The power dip ride-through function enables the AC drive to automatically reduce the output frequency to maintain full torque output when the DC bus voltage stays low. When bE.14 is set to 1, the power dip ride-through function is enabled. When bE.14 is set to 0, this function is disabled. bE.15 is used to set the voltage for triggering power dip ride-through. This parameter sets the percentage to the standard DC bus voltage.	0 to 1	0
bE.15	Power dip ride-through Voltage		70% to 95%	85%
bE.16	Built-in braking unit action voltage	This parameter is used to set the built-in braking unit applied voltage Vbreak. The value range is as follows: 800 ⩾ Vbreak ⩾ (1.414Vs + 30) Vs is the input AC voltage of the AC drive. Note: If Vbreak is not set properly, the built-in braking unit may run abnormally.	330–800 V	Three-phase 380–480 V models: 660 V Three-phase 200–240 V models: 370 V
bE.17	Contactor fault detection	When this parameter is set to 1, contactor fault (17#) detection is enabled. When it is set to 0, contactor fault detection is disabled. Note: YD587 series AC drive models with power ratings lower than 18.5 kW do not support this function.	0 to 1	1

Parameter No.	Parameter Name	Description	Value Range	Default
Group bF: Auxiliary parameters in the level-2 menu				
bF.00	Level-2 menu password	This parameter is used to set the password for displaying and modifying level-2 menu parameters. If this parameter is set to a non-zero value, you must enter the password before accessing the level-2 menu. If you enter wrong passwords for three consecutive times, all menus are locked. In this case, you must power off and restart the AC drive to view or modify parameters. After this parameter is set to 0, the password protection function is disabled.	0 to 65535	0
bF.01	Restoration of parameters in the level-2 menu to factory settings	0: No operation 1: Restore in the level-2 menu to factory settings b0.02 to b0.03, b2.00 to b2.02, b7.10 to b7.11, and bF.00 in the level-2 menu cannot be restored to factory settings. 2: Restore parameters in the level-1 and level-2 menus to factory settings	0 to 2	0
bF.02	Display of user-defined parameter settings in the level-2 menu	0: Display all level-2 menu parameters 1: Display parameters with default values changed in the level-2 menu	0 to 1	0
bF.03	Clearing of historical data	0: No operation 1: Clear historical data When this parameter is set to 1, all parameters stored upon power failure and fault records (parameters in groups E* and U1) are cleared.	0 to 1	0

Parameter No.	Parameter Name	Description	Value Range	Default
bF.04	Command source selection	This parameter determines the input channel of AC drive control commands, including start, stop, forward run, and reverse run commands. 0: Operating panel control (LOCAL/REMOT indicator off) The commands are given by pressing the RUN and STOP/RES keys on the operating panel. When the operating panel is used as the input channel of AC drive control commands, all DI and DO terminals and the brake control logic sequence are invalid. When the AC drive receives the RUN command, output function 1 (brake control) becomes valid. When the AC drive receives the STOP command, it decelerates to the braking frequency (b6.05) and then stops output. Output function 1 becomes invalid. 1: Terminal I/O control (LOCAL/REMOT indicator on) AC drive control commands are given through terminal input functions 1 (Forward RUN) and 2 (Reverse RUN). 2: Communication control (LOCAL/REMOT indicator blinking) AC drive control commands are given by a host controller, PLC, or touch screen through communication.	0 to 2	0
bF.05	Operation frequency in operating panel control	This parameter is used to set the target operation frequency of the AC drive when bF.04 (command source selection) is set to 0.	Minimum frequency (b1.03) to Maximum frequency (b1.02)	50.00 Hz
bF.06	Running direction	You can change the rotation direction of the motor by modifying this parameter without changing the motor wiring. Modifying this parameter is equivalent to exchanging any two of the U, V, and W wires of the motor. Note that the motor will resume operation in the original direction after parameter initialization. Do not use this function in applications where changing the motor rotation direction is prohibited after system commissioning is completed. 0: Run in the same direction 1: Enable	0 to 1	0

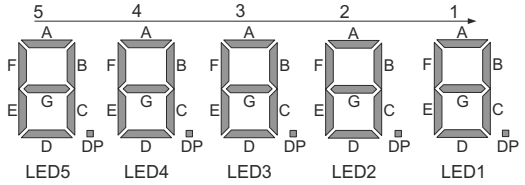
<table>
<tr><th>Parameter No.</th><th>Parameter Name</th><th>Description</th><th>Value Range</th><th>Default</th></tr>
<tr><td>bF.07</td><td>Frequency detection value</td><td rowspan="2">When the reference frequency is greater than the frequency detection value, output function 7 (output upon frequency limit) of the AC drive becomes valid. When the reference frequency is lower than the detection value, output function 7 becomes invalid.
These two parameters are used to set the detection value of the output frequency and hysteresis value upon output cancellation, respectively. bF.07 sets the detection value, and bF.08 sets the hysteresis level (percentage to the value set in bF.07).
 
</td><td>Minimum frequency (b1.03) to Maximum frequency (b1.02)</td><td>50.00 Hz</td></tr>
<tr><td>bF.08</td><td>Frequency detection hysteresis value</td><td>0.0 to 100.0%.</td><td>5.0%</td></tr>
<tr><td>bF.09</td><td>Cooling fan working mode</td><td>This parameter is used to set the working mode of the cooling fan.
0: Working during motor operation
The cooling fan works when the AC drive is in the operation state. When the AC drive stops, the cooling fan works if the heatsink temperature is higher than 40° C, and stops working when the heatsink temperature is lower than 40° C.
1: Working continuously after power-on</td><td>0 to 1</td><td>0</td></tr>
<tr><td>bF.10</td><td>Fault protection action 1</td><td rowspan="5">These parameters are used to determine the fault level of errors 41# to 65#. The value of each parameter is a 5-digit number, representing levels of five faults. The following table describes the relationship between digits and fault meanings.
<table>
<tr><th>Parameter</th><th>Bit</th><th>Description</th></tr>
<tr><td>bF.10</td><td>Ten thousands</td><td>Fault level of 41#</td></tr>
<tr><td>bF.10</td><td>Thousands</td><td>Fault level of 42#</td></tr>
<tr><td>...</td><td>...</td><td>...</td></tr>
<tr><td>bF.10</td><td>Ones</td><td>Fault level of 45#</td></tr>
<tr><td>bF.11</td><td>Ten thousands</td><td>Fault level of 46#</td></tr>
<tr><td>...</td><td>...</td><td>...</td></tr>
<tr><td>bF.11</td><td>Ones</td><td>Fault level of 50#</td></tr>
<tr><td>...</td><td>...</td><td>...</td></tr>
<tr><td>bF.14</td><td>Ten thousands</td><td>Fault level of 61#</td></tr>
<tr><td>...</td><td>...</td><td>...</td></tr>
<tr><td>bF.14</td><td>Ones</td><td>Fault level of 65#</td></tr>
</table></td><td rowspan="5">11111 to 55555</td><td>11115</td></tr>
<tr><td>bF.11</td><td>Fault protection action 2</td><td>11111</td></tr>
<tr><td>bF.12</td><td>Fault protection action 3</td><td>11411</td></tr>
<tr><td>bF.13</td><td>Fault protection action 4</td><td>11111</td></tr>
<tr><td>bF.14</td><td>Fault protection action 5</td><td>11111</td></tr>
</table>

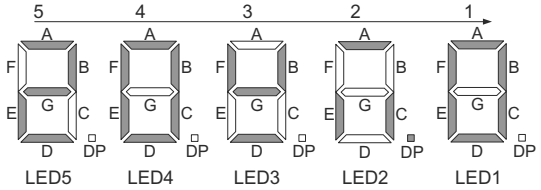
Parameter No.	Parameter Name	Description	Value Range	Default
bF.16	Deceleration frequency limit	When the deceleration switch (input functions 24 and 25) becomes valid, the output frequency of the AC drive is limited below the value specified by bF.16. After the stop switch (input functions 22 and 23) becomes valid, the AC drive performs a quick stop. bF.15 is used to select the deceleration mode after the deceleration switch becomes valid. 0: Disable deceleration optimization The AC drive decelerates normally according to the deceleration time specified by the corresponding parameter in group b4. 1: Enable deceleration optimization After the deceleration switch is turned on, the AC drive recalculates the optimal deceleration time based on the deceleration distance from the rated frequency to the frequency set in bF.16. This minimizes the operation time in the deceleration process. 	Minimum frequency (b1.03) to Rated frequency (P0.04)	5.00 Hz
bF.17	Over-torque output threshold	This parameter is used together with output function 12. When the output torque reaches the threshold specified by this parameter, output function 12 becomes valid. When the output torque falls below 90% of the threshold specified by this parameter, output function 12 becomes invalid. In vector control mode, the AC drive controls the output function based on the output torque. In V/f control mode, the AC drive controls this function based on the percentage of the output current divided by the rated motor current. When this parameter is set to 0, the output function 12 is invalid. 	0.0 to 200.0%.	0.0%

Parameter No.	Parameter Name	Description	Value Range	Default
bF.19	Operation mode selection	0: Application mode This parameter must be set to 0 for normal use of the AC drive. 1: Commissioning mode The commissioning mode is used for AC drive or control cabinet inspection before delivery. In this mode, functions such as brake release time sequence and output phase loss protection are shielded, and the V/f control mode is used forcibly. The parameter value is automatically cleared after the AC drive is powered on.	0 to 1	0
bF.20	Constant power function	0: Disable 1: Enable	0 to 1	1
bF.21	Motor fan control delay	This parameter is used together with output function 13. For details, see the description of output function 13.	0s to 3000s	30s
bF.25	Frequency limit	This parameter is used to enable frequency limit in different modes. Ones position: Enable frequency limit in the SVC mode. Tens position: Enable frequency limit in the FVC mode. Hundreds position: Enable frequency limit in the V/f mode.	0 to 111	1
bF.26	Execution of coast to stop during auto-tuning upon power-on	0: Disable 1: Enable	0 to 1	0
bF.30	Stator resistance auto-tuning upon motor switchover	By default, the stator resistance will be tuned upon motor switchover.	0 to 1	1

Groups E0 to E9 display fault information. Each group of parameters indicates a fault record. Group E0 displays information about the latest fault, and group E9 displays information about the earliest fault. All groups display the information using the same structure. Parameters of group E* cannot be modified and are retentive at power failure.

Parameter No.	Parameter Name	Minimum Unit	Description
E*.00	Fault codes	0.01	The five LEDs on the operating panel are numbered 5, 4, 3, 2, and 1 from left to right. Take the display of 104.01 as an example. LEDs 5, 4, and 3 display the error code, where 1 on LED 5 indicates the fault level, and 04 on LEDs 4 and 3 indicate the error code. LEDs 2 and 1 are reserved by the manufacturer.
E*.01	Frequency reference upon fault	Display on the operating panel: 0.1 Hz Value read by communication: 0.01 Hz	It displays the value of U0.00 when a fault occurs.
E*.02	Feedback frequency upon fault	Display on the operating panel: 0.1 Hz Value read by communication: 0.01 Hz	It displays the value of U0.01 when a fault occurs.
E*.03	Output current upon fault	0.01 A	It displays the value of U0.03 when a fault occurs.
E*.04	Output voltage upon fault	1 V	It displays the value of U0.04 when a fault occurs.
E*.05	Output power upon fault	0.1%	It displays the value of U0.05 when a fault occurs.
E*.06	Output torque upon fault	0.1%	It displays the value of U0.06 when a fault occurs.
E*.07	Bus voltage upon fault	0.1 V	It displays the value of U0.07 when a fault occurs.

<table>
<tr><th>Parameter No.</th><th>Parameter Name</th><th>Minimum Unit</th><th>Description</th></tr>
<tr><td>E*.08</td><td>State of input functions 1 to 16 upon fault</td><td>1</td><td rowspan="4">The four parameters indicate the status of input and output functions. Each parameter can indicate the states of 16 input or output functions with its bits. When you select a parameter, its decimal value is displayed on the operating panel. Press △ to switch the user view mode. In this mode:
The five LEDs on the operating panel are numbered 5, 4, 3, 2, and 1 from left to right.
 

Digits 5 and 4 show the number of the current input/output function. Digit 1 shows the validity of this function (0: invalid; 1: valid). You can press △ and ▽ to change the number of the input/output function to be displayed. Digits 2 and 3 show 16 functions and their status in combination using the following mappings: A to DP on LED2 mapping functions 1 to 8 and A to DP on LED3 mapping functions 9 to 16. The following is an example.
 

The above figure shows that input function 20 (display of LEDs 5 and 4) is invalid (display of LED 1), and among functions 17 to 32, functions 17, 19, 21, 24, 26, 28, 30, and 31 are valid, while the others are invalid (display of LEDs 2 and 3).</td></tr>
<tr><td>E*.09</td><td>State of input functions 17 to 32 upon fault</td><td>1</td></tr>
<tr><td>E*.10</td><td>State of input functions 33 to 48 upon fault</td><td>1</td></tr>
<tr><td>E*.11</td><td>State of output functions 1 to 16 upon fault</td><td>1</td></tr>
<tr><td>E*.12</td><td>Running step upon fault</td><td>1</td><td>This parameter records the step performed in the AC drive when a fault occurs. For details, see the description of U0.26.</td></tr>
<tr><td>E*.13</td><td>Control mode upon fault</td><td>1</td><td>This parameter records settings of the command source, frequency source, and control mode when a fault occurs.
<table>
<tr><th>Bit</th><th>Description</th><th>Description</th></tr>
<tr><td>Ten thousands</td><td>Reserved</td><td>-</td></tr>
<tr><td>Thousands</td><td>Reserved</td><td>-</td></tr>
<tr><td>Hundreds</td><td>Command source</td><td>See bF.04 for data description.</td></tr>
<tr><td>Tens</td><td>Frequency source</td><td>See P0.07 for data description.</td></tr>
<tr><td>Ones</td><td>Drive control mode</td><td>See b1.00 for data description.</td></tr>
</table></td></tr>
</table>

Parameter No.	Parameter Name	Minimum Unit	Description
E*.15	Synchronous frequency upon fault	Display on the operating panel: 0.1 Hz Value read by communication: 0.01 Hz	This parameter records the instantaneous value of the synchronous frequency displayed on the operating panel when a fault occurs.
E*.16	Braking transistor current upon fault	0.01 A	This parameter records the instantaneous current of the braking transistor when a braking transistor overload fault (15#) occurs.
E*.17	Accumulative running time upon fault	1 h	It displays the value of U1.05 when a fault occurs.
E*.18	Accumulative power-on time upon fault	1 h	It displays the value of U1.06 when a fault occurs.

Groups U0 and U1 display real-time monitoring information of the AC drive. Parameters in group U0 are refreshed in real time and are not saved upon power-off. Parameters in group U1 display accumulated information and are saved upon power-off.

Parameter No.	Parameter Name	Minimum Unit	Description
U0.00	Running frequency	Display on the operating panel: 0.1 Hz Value read by communication: 0.01 Hz	It displays the current reference frequency of the AC drive.
U0.01	Feedback frequency	Display on the operating panel: 0.1 Hz Value read by communication: 0.01 Hz	It displays the feedback value of the actual motor operation frequency. If the AC drive runs without an encoder, this parameter shows the feedback frequency calculated by the AC drive software. If the AC drive operates with an encoder, this parameter shows the actual motor operation frequency provided by the encoder.
U0.02	Target frequency	Display on the operating panel: 0.1 Hz Value read by communication: 0.01 Hz	It displays the final frequency of the AC drive in this operation process.
U0.03	Output current	0.01 A	It displays the output current of the operating AC drive.
U0.04	Output voltage	1 V	It displays the output voltage of the operating AC drive.
U0.05	Output power	0.1%	It displays the output power of the operating AC drive.

Parameter No.	Parameter Name	Minimum Unit	Description
U0.06	Output torque	0.1%	It displays the output torque (percentage of the rated motor torque) of the running AC drive.
U0.07	Bus voltage	0.1 V	It displays the bus voltage of the AC drive.
U0.08	High-order bits of position data	1	These two parameters display the current position of the hoisting mechanism, that is, accumulative number of pulses/b7.10. U0.08 shows the high-order 16 bits (with negative or positive signs) of the current position, and U0.09 shows the low-order 16 bits (only positive values) of the current position. For details, see the descriptions of b7.10 and b7.11.
U0.09	Low-order bits of position data	1	
U0.10	DI state	1	It displays the DI state of the AC drive (Y1 delay state or state when an AO functions as a DO). The display mode is the same as that of E*.08 to E*.11.
U0.11	DO state	1	It displays the DO state of the AC drive. The display mode is the same as that of E*.08 to E*.11.
U0.12	AI1 voltage	0.01 V	It displays the input voltage of AI1 on the AC drive.
U0.13	AI2 voltage	0.01 V	It displays the input voltage of AI2 on the AC drive.
U0.15	AO1 output voltage	0.01 V	It displays the output voltage of AO1 on the AC drive.
U0.16	AO2 output voltage	0.01 V	It displays the output voltage of AO2 on the AC drive.
U0.19	CAN communication quality	1%	It displays the CAN communication quality between the AC drive expansion card and an external device in the percentage of correct received frames to total received frames. The AC drive detects the communication quality every time after it sends 100 data frames.
U0.20	SPI communication quality	1%	It displays the communication quality between the AC drive and the process sheet. The AC drive detects the communication quality every time after it sends 100 data frames.
U0.23	Drive unit heatsink temperature	1° C	It displays temperature of the insulated gate bipolar transistor (IGBT) in the inverter.
U0.24	Function software version	0.01	It displays the function software version of the AC drive.
U0.25	Performance software version	0.01	It displays the performance software version of the AC drive.

<table>
<tr><th>Parameter No.</th><th>Parameter Name</th><th>Minimum Unit</th><th>Description</th></tr>
<tr><td>U0.26</td><td>AC drive internal status</td><td>1</td><td>It displays the internal operation approach of the AC drive. This parameter facilitates field commissioning and troubleshooting. The LEDs are numbered 5 to 1 from left to right. The following table describes the information displayed on the LEDs.
<table>
<tr><th>LED No.</th><th>Description</th><th>Content</th><th>Description</th></tr>
<tr><td>5</td><td>Reserved</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Brake applying approach</td><td>0</td><td>No brake applying command delivered</td></tr>
<tr><td>1</td><td>Brake applying command delivered</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Brake release approach</td><td>0</td><td>No brake release command delivered</td></tr>
<tr><td>1</td><td>Brake release command delivered</td></tr>
<tr><td rowspan="8">1</td><td rowspan="8">Operation step</td><td>0</td><td>Standby</td></tr>
<tr><td>1</td><td>Brake release in progress</td></tr>
<tr><td>2</td><td>The system runs normally.</td></tr>
<tr><td>3</td><td>Run command canceled and brake applying in progress</td></tr>
<tr><td>4</td><td>Operation state in operating panel control</td></tr>
<tr><td>6</td><td>Motor auto-tuning state</td></tr>
<tr><td>7</td><td>AC drive stop in progress</td></tr>
</table></td></tr>
<tr><td>U0.28</td><td>Fault codes</td><td>1</td><td>It displays the code of the fault that occurs on the AC drive.</td></tr>
<tr><td>U0.29</td><td>Braking transistor current</td><td>0.01 A</td><td>It displays the output current of the braking transistor when the built-in braking unit of the AC drive is working.</td></tr>
<tr><td>U0.30</td><td>Maximum frequency in flux weakening area</td><td>0.01 Hz</td><td>It displays the maximum frequency in the flux weakening area.</td></tr>
<tr><td>U0.31</td><td>Temporary function software version</td><td>0.01</td><td>It displays the temporary function software version.</td></tr>
<tr><td>U0.32</td><td>Temporary performance software version</td><td>0.01</td><td>It displays the temporary performance software version.</td></tr>
</table>

Parameter No.	Parameter Name	Minimum Unit	Description
U1.00	Number of emergency stops	1	It displays the total number of level-1 faults that have occurred in the AC drive.
U1.01	Number of quick stops	1	It displays the total number of level-2 and level-3 faults that have occurred in the AC drive.
U1.02	High bits in the number of brake operations	1	The two parameters display the total number of operations of the brake when controlled by the AC drive. When the value of low bits reaches 65535, the value of high bits increases by 1 and the low bits are reset to 0.
U1.03	Low bits in the number of brake operations	1	
U1.04	Total time used to reach the torque limit	0.1 h	It displays the total time elapsed before the output torque of the AC drive reaches or exceeds the torque upper limits (b1.04 and b1.05).
U1.05	Accumulative running time	1 h	It displays the accumulative running time of the AC drive.
U1.06	Accumulative power-on time	1 h	It displays the accumulative power-on time of the AC drive.

6.3 Level-3 Menu (Group F) Parameter Table

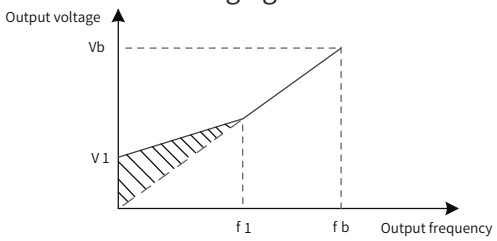
Level-3 menu parameters include output performance adjusting parameters and factory parameters of the AC drive. You do not need to change the values of level-3 menu parameters in most cases.

To access a level-3 menu, you need to enter the password specified by FF.00.

No.	Parameter Name	Description	Value Range	Default
Group F0: Motor parameters				
F0.00	Asynchronous motor stator resistance	The five parameters are asynchronous motor parameters, and they are unavailable on the motor nameplate and are obtained by means of AC drive auto-tuning. In auto-tuning mode 1, only parameters F0.00 to F0.02 can be obtained. In auto-tuning mode 3, all the five parameters can be obtained. In auto-tuning mode 2, the five parameters as well as other parameters, such as the encoder phase sequence and current loop PI parameters can be obtained. When you change the rated motor power (P0.01), the AC drive automatically restores values of these five parameters to commonly used settings for standard Y series asynchronous motors. If the motor parameters are known, you can manually input the five parameters.	(≤ 55 kW) 0.001 Ω to 65.535 Ω (> 55 kW) 0.0001 Ω to 6.5535 Ω	Motor OK
F0.01	Asynchronous motor rotor resistance		(≤ 55 kW) 0.001 Ω to 65.535 Ω (> 55 kW) 0.0001 Ω to 6.5535 Ω	Motor OK
F0.02	Asynchronous motor leakage inductance		(≤ 55 kW) 0.01 mH to 655.35 mH (> 55 kW) 0.001 mH to 65.535 mH	Motor OK
F0.03	Asynchronous motor mutual inductance		(≤ 55 kW) 0.1 mH to 6553.5 mH (> 55 kW) 0.01 mH to 655.35 mH	Motor OK
F0.04	Asynchronous motor no-load current		(≤ 55 kW) 0.01 A to A0.03 (> 55 kW) 0.1 A to A0.03	Motor OK

<table>
<tr><th>No.</th><th>Parameter Name</th><th>Description</th><th>Value Range</th><th>Default</th></tr>
<tr><td>F0.16</td><td>Carrier frequency</td><td>This parameter is used to adjust the carrier frequency of the AC drive. It helps reduce the motor noise, avoid the resonance of the mechanical system, and reduce the leakage current to the earth and interference generated by the AC drive.
A low carrier frequency will cause an increase in the high-order harmonic components of the output current and the power loss and temperature rise of the motor.
A high carrier frequency can reduce the power loss and temperature rise of the motor. However, it will cause an increase in interference, power loss, and temperature of the AC drive.
Adjusting the carrier frequency will affect the parameters in the following table.<table><tr><td>Carrier frequency</td><td>Low → High</td></tr><tr><td>Motor noise</td><td>Large → Small</td></tr><tr><td>Output current waveform</td><td>Bad → Good</td></tr><tr><td>Motor temperature rise</td><td>High → Low</td></tr><tr><td>AC drive temperature rise</td><td>Low → High</td></tr><tr><td>Leakage current</td><td>Small → Large</td></tr><tr><td>External radiation interference</td><td>Small → Large</td></tr></table></td><td>1.0 kHz to 12.0 kHz</td><td>Depending on drive model OK</td></tr>
</table>

No.	Parameter Name	Description	Value Range	Default
Group F1: Vector control parameters				
F1.00	Speed loop proportional gain 1	Speed loop PI parameters vary with operation frequencies of the AC drive. If the operation frequency is less than switchover frequency 1 (F1.02), the speed loop PI parameters F1.00 and F1.01 are used. If the operation frequency is greater than the switchover frequency 2, the speed loop PI parameters F1.03 and F1.04 are used. If the operation frequency is between switchover frequency 1 and switchover frequency 2, the speed loop PI parameters are obtained from linear switchover between the two groups of PI parameters. The speed dynamic response characteristics in the vector control mode can be adjusted by setting the proportional gain and integral time of the speed regulator. To achieve a faster system response, increase the proportional gain or reduce the integral time. Be aware that either a too big gain or a too short time may lead to system oscillation. We recommend that you adjust these parameters as follows: If the default setting cannot meet the requirements, make proper adjustment. Increase the proportional gain first to ensure that the system does not oscillate, and then reduce the integral time to ensure that the system has quick response and small overshoot. Caution: Improper PI parameter settings may cause high speed overshoot. Even worse, overvoltage may occur when overshoot drops.	1 to 100	60
F1.01	Speed loop integral time 1		0.01s to 10.00s	0.50s
F1.02	Switchover frequency 1		0.00 Hz to F1.05	5.00 Hz
F1.03	Speed loop proportional gain 2		1 to 100	20
F1.04	Speed loop integral time 2		0.01s to 10.00s	1.00s
F1.05	Switchover frequency 2		F1.02 to b1.02	10.00 Hz
F1.06	Filter time constant of speed loop	In VC mode, the output of the speed loop regulator is torque current command. This parameter is used to filter the torque commands. This parameter need not be adjusted generally and can be increased in the case of large speed fluctuation. In the case of motor oscillation, decrease the value of this parameter properly. If the value of this parameter is small, the output torque of the AC drive may fluctuate greatly, but the response is quick.	0.000s to 1.000s	0.070s

No.	Parameter Name	Description	Value Range	Default
F1.08	Excitation adjustment proportional gain	They are current loop PI parameters for vector control. Their values are automatically obtained after the asynchronous motor completes auto-tuning mode 2, and do not need to be changed. The dimension of the current loop integral regulator is integral gain rather than integral time. Note that too large current loop PI gain may lead to oscillation of the entire control loop. Therefore, when current oscillation or torque fluctuation is great, manually decrease the proportional gain or integral gain.	0 to 20000	2000
F1.09	Excitation adjustment integral gain		0 to 20000	1300
F1.10	Torque adjustment proportional gain		0 to 20000	2000
F1.11	Torque adjustment integral gain		0 to 20000	1300
Group F2: V/f control parameters				
F2.01	Torque boost	To compensate for the low frequency torque of V/f control, you can boost the output voltage of the AC drive running at low frequency. A very large setting will result in motor overheat and AC drive overcurrent. If the motor is connected to heavy load but does not have sufficient startup torque, increase the torque boost. If the motor is connected to light load, decrease the torque boost. If torque boost is set to 0.0, the AC drive performs automatic torque boost. In this case, the AC drive automatically calculates the torque boost value based on motor parameters including the stator resistance. Cutoff frequency of torque boost: Torque boost is valid when the operation frequency within this value and becomes invalid when the operation frequency exceeds this value, as shown in the following figure.  V1: Manual torque boost voltage Vb: Max. output voltage f1: Manual torque boost cutoff frequency fb: Rated running frequency	0.0% to 30.0%	Motor power dependent
F2.02	Cut-off frequency of torque boost		0.00 Hz to b1.02	50.00 Hz

No.	Parameter Name	Description	Value Range	Default
F2.09	V/f slip compensation coefficient	This parameter is valid only for the asynchronous motor. It can compensate for the speed slip of an asynchronous motor when the load increases, reducing the variation in the motor speed in case of load change. If this parameter is set to 100.0%, it indicates that the compensation when the motor bears rated load is the rated motor slip. The rated motor slip is automatically obtained by the AC drive through calculation based on the rated motor frequency and rated motor speed in group F1. When adjusting the V/f slip compensation gain, confirm that the motor speed under the rated load is the same as the target motor speed. Generally, if the motor speed is different from the target speed, slightly adjust this parameter.	0.0% to 100.0%	0.0%
F2.10	V/f overexcitation gain	During deceleration of the AC drive, over-excitation control can suppress rise of the bus voltage to avoid the overvoltage fault. A larger overexcitation gain indicates better suppression effect. Increase the over-excitation gain if the AC drive is liable to overvoltage fault during deceleration. However, too large over-excitation gain may lead to an increase in the output current. Set this parameter to a proper value in actual applications. Set the over-excitation gain to 0 in the applications where the inertia is small and the bus voltage will not rise during motor deceleration or where there is a braking resistor.	0 to 200	0
F2.11	Oscillation suppression gain	To avoid negative influence on V/f control, keep this gain as small as possible while ensuring efficient oscillation suppression. Set this parameter to 0 if the motor has no oscillation. Increase the value properly only when the motor has obvious oscillation. A larger oscillation suppression gain indicates a better suppression effect. When oscillation suppression is enabled, the rated motor current and no-load current must be accurate. Otherwise, the V/f oscillation suppression effect will not be satisfactory.	0 to 100	40

No.	Parameter Name	Description	Value Range	Default
Group F3: Control optimization parameters				
F3.00	DPWM switchover frequency upper limit	This parameter determines the wave modulation mode of an asynchronous motor. If the frequency reference of the AC drive is lower than the upper limit, the waveform is modulated continuously in seven segments. If the frequency reference is higher than or equal to the upper limit, the waveform is modulated intermittently in 5 segments. The 7-segment continuous modulation causes more loss to switches of the AC drive but smaller current ripple. The 5-segment intermittent modulation causes less loss to switches of the AC drive but larger current ripple. This may lead to motor operation instability at high frequency. Generally, you do not need to modify this parameter. For details about AC drive loss and temperature rise, see the description of F0.16.	0.00 Hz to maximum frequency (b1.02)	12.00 Hz
F3.01	PWM Modulation Mode	This parameter is valid only for V/f control. In synchronous modulation mode, the carrier frequency changes linearly with the output frequency, so the ratio between them (carrier ratio) remains unchanged. This modulation mode is generally used at high output frequency, which helps improve the output voltage quality. Synchronous modulation is not required at low output frequency (100 Hz or lower). This is because asynchronous modulation is preferred when the ratio of carrier frequency to output frequency is high. Synchronous modulation takes effect only when the reference frequency is higher than 85 Hz. Asynchronous modulation is used when the reference frequency is below 85 Hz. 0: Asynchronous modulation 1: Synchronous commissioning	0 to 1	0
F3.02	Deadzone compensation	Generally, this parameter does not need to be modified. You need to try a different compensation mode only when there is any special requirement on the waveform quality of the output voltage or when oscillation occurs on the motor. Mode 2 is recommended for high-power drives. 0: Disabled 1: Compensation mode 1 2: Compensation mode 2	0 to 2	1

No.	Parameter Name	Description	Value Range	Default
F3.03	Random PWM depth	This parameter is used to lower the unpleasant motor noise and reduce the electromagnetic interference. If this parameter is set to 0, random PWM is invalid. You will obtain different results by adjusting the random PWM depth. 0: Random PWM invalid 1 to 10: Random PWM depth	0 to 10	0
F3.04	Fast current limit	Rapid current limit minimizes risks of overcurrent, ensuring uninterrupted operation of the AC drive. However, if the AC drive stays in the fast current limit state for a long time, it may be damaged due to over-temperature or other reasons. To prevent this problem, the AC drive reports error 40# (pulse-by-pulse current limit) if current limit lasts for a long time. This error indicates that the AC drive is overloaded and needs to be stopped. (This parameter must be set to 0 for the hoisting mechanism to prevent unintentional slip.) 0: Disable 1: Enable	0 to 1	0
F3.05	Current detection delay compensation	This parameter is used to set the current detection compensation for the AC drive. If the compensation value is too large, the control performance may deteriorate. Generally, you do not need to change this parameter.	0 to 100	5
F3.06	Undervoltage threshold	This parameter is used to set the voltage value for triggering an undervoltage error (09#). When the bus voltage falls below this value, the AC drive changes to the undervoltage state and stops running.	140–630 V	Three-phase 380–480 V models: 350 V Three-phase 200–240 V models: 200 V
FD group: EtherCAT and EtherNet/IP parameters				
FD.01	EtherCAT station alias backup	This parameter is used to back up the EtherCAT station alias.	0 to 65535	0
FD.02	EtherCAT station	This parameter indicates the EtherCAT station.	0 to 65535	0
FD.37	DHCP	This parameter is used to set whether the Dynamic Host Configuration Protocol (DHCP) is used for a local area network (LAN).	0 to 1	0
FD.38	Highest byte of the IP address	This parameter indicates the highest byte of an IP address.	0 to 255	0

No.	Parameter Name	Description	Value Range	Default
FD.39	Second highest byte of the IP address	This parameter indicates the second highest byte of an IP address.	0 to 255	0
FD.40	Third highest byte of IP address	This parameter indicates the third highest byte of an IP address.	0 to 255	0
FD.41	Lowest byte of IP address	This parameter indicates the lowest byte of an IP address.	0 to 255	0
FD.42	Highest byte of subnet mask	This parameter indicates the highest byte of a subnet mask.	0 to 255	0
FD.43	Second highest byte of subnet mask	This parameter indicates the second highest byte of a subnet mask.	0 to 255	0
FD.44	Third highest byte of subnet mask	This parameter indicates the third highest byte of a subnet mask.	0 to 255	0
FD.45	Lowest byte of subnet mask	This parameter indicates the lowest byte of a subnet mask.	0 to 255	0
FD.46	Highest byte of gateway	This parameter indicates the highest byte of a gateway.	0 to 255	0
FD.47	Second highest byte of gateway	This parameter indicates the second highest byte of a gateway.	0 to 255	0
FD.48	Third highest byte of gateway	This parameter indicates the third highest byte of a gateway.	0 to 255	0
FD.49	Lowest byte of gateway	This parameter indicates the lowest byte of a gateway.	0 to 255	0
FD.58	Communication error code	This parameter indicates the communication error code.	0 to 255	0
FD.61	First two bytes of MAC address	This parameter indicates the first two bytes of a MAC address.	0 to 65535	0
FD.62	Two bytes in the middle of MAC address	This parameter indicates the two bytes in the middle of MAC address.	0 to 65535	0
FD.63	Last two bytes of MAC address	This parameter indicates the last two bytes of the MAC address.	0 to 65535	0

No.	Parameter Name	Description	Value Range	Default
Group FF: Factory parameters				
FF.00	Level-3 menu password	This parameter is used to set the password for displaying and modifying level-3 menu parameters. If this parameter is set to a non-zero value, you must enter the password before accessing the level-3 menu. If you enter wrong passwords for three consecutive times, all menus are locked. In this case, you must power off and restart the AC drive to view or modify parameters. After this parameter is set to 0, the password protection function is disabled.	0 to 65535	0
FF.10	Restoration of parameters in the level-3 menu to factory settings	0: No operation 1: Restore parameters in the level-3 menu to factory settings Parameters F0.00 to F0.04, F0.16, F2.01, F2.11, and FF.00 in the level-1 menu cannot restore to factory settings. 2: Restore all parameters to factory settings	0 to 2	0
FF.11	Display of user-defined parameter settings in the level-3 menu	0: Display all level-3 menu parameters 1: Display parameters whose default values are changed in the level-3 menu	0 to 1	0

7 Troubleshooting

7.1 Safety Precautions

Danger

* Perform wiring only when the power is disconnected (all circuit breakers must be shut off). Failure to comply may result in an electric shock.

Warning

* Ground the AC drive according to local laws and regulations. Failure to comply may result in an electric shock or fire.
* Never remove the front cover or touch internal circuit while the power is on. Failure to comply may result in an electric shock.
* Never allow unqualified personnel to perform any maintenance, inspection, or repair. Failure to comply may result in an electric shock or fire.
* When installing the AC drive inside an enclosed cabinet or chassis, use a cooling fan or air conditioner to keep the temperature below 50° C. Failure to comply will result in overheat or fire.
* Tighten all screws with the specified tightening torque. Failure to comply may result in an electric shock or a fire.
* Ensure that the input voltage of the AC drive is not higher than the rated voltage on the nameplate. Failure to comply may result in an electric shock or fire.
* Keep flammable and combustible materials away from the AC drive.

Caution

* Cover the top of the AC drive with a piece of cloth or paper during installation to prevent unwanted objects such as metal chippings, oil, and water from falling into the equipment. Failure to comply may cause malfunction of the AC drive.
* Remove the paper or cloth after installation is done. Failure to comply will deteriorate ventilation and result in overheating.
* Follow the proper ESD procedure when operating the AC drive. Failure to comply will damage the internal circuit of the AC drive.

7.2 Troubleshooting Before Trial Run

1) SVC (b1.00 = 0: Factory Default)

In this mode, the drive controls the speed and torque of the motor in scenarios without an encoder for speed feedback. Motor auto-tuning is required to obtain motor-related parameters.

Problem	Solution
Overload or overcurrent detected during motor start	◆ Set motor parameters (P0.01 to P0.05) according to values on the motor nameplate. ◆ Select a proper motor auto-tuning mode (b0.04) and perform motor auto-tuning.
Slow torque or speed response and motor vibration at a frequency below 5 Hz	◆ To speed up the torque and speed response, increase the value of F1.00 (speed loop proportional gain) in increments of 10 or decrease the value of F1.01 (speed loop integral time) in decrements of 0.05. ◆ If vibration occurs, decrease the values of F1.00 and F1.01.
Slow torque or speed response and motor vibration at a frequency above 5 Hz	◆ To speed up the torque and speed response, increase the value of F1.03 (speed loop proportional gain) in increments of 10 or decrease the value of F1.04 (speed loop integral time) in decrements of 0.05. ◆ If vibration occurs, decrease the values of F1.03 and F1.04.
Low speed accuracy	◆ If there is an excessive deviation in the motor's load speed, increase the value of b1.01 (slip compensation gain) in increments of 10%.
Large speed fluctuation	◆ If the motor speed fluctuates severely, increase the value of F1.06 (speed filter time) in increments of 0.001s.
Loud motor noise	◆ Increase the value of F0.16 (carrier frequency) in increments of 1.0 kHz. (Note that increasing the carrier frequency will result in a capacity decrease of the AC drive and an increase in the leakage current of the motor. For details about capacity decrease, contact the manufacturer.)
Insufficient motor torque	◆ Check whether the torque upper limit is low. If so, increase the torque upper limit (b1.04 and b1.05) in velocity mode or increase the torque demand value in torque mode.

2) FVC (b1.00 = 1)

This mode is applicable to scenarios with an encoder for speed feedback. In this mode, you need to set the encoder pulses per revolution, encoder type, and encoder direction correctly and perform auto-tuning on motor parameters.

Problem	Solution
Overload or overcurrent detected during motor start	◆ Set the encoder pulses per revolution, encoder type, and encoder direction correctly.
Overload or overcurrent during motor running	◆ Set motor parameters (P0.01 to P0.05) according to values on the motor nameplate. ◆ Select a proper motor auto-tuning mode (b0.04) and perform motor auto-tuning.
Slow torque or speed response and motor vibration at a frequency below 5 Hz	◆ To speed up the torque and speed response, increase the value of F1.00 (speed loop proportional gain) in increments of 10 or decrease the value of F1.01 (speed loop integral time) in decrements of 0.05. ◆ If vibration occurs, decrease the values of F1.00 and F1.01.

Problem	Solution
Slow torque or speed response and motor vibration at a frequency above 5 Hz	◆ To speed up the torque and speed response, increase the value of F1.03 (speed loop proportional gain) in increments of 10 or decrease the value of F1.04 (speed loop integral time) in decrements of 0.05. ◆ If vibration occurs, decrease the values of F1.03 and F1.04.
Large speed fluctuation	◆ If the motor speed fluctuates severely, increase the value of F1.06 (speed filter time) in increments of 0.001s.
Loud motor noise	◆ Increase the value of F0.16 (carrier frequency) in increments of 1.0 kHz. (Note that increasing the carrier frequency will result in a capacity decrease of the AC drive and an increase in the leakage current of the motor. For details about capacity decrease, contact the manufacturer.)
Insufficient motor torque	◆ Check whether the torque upper limit is low. If so, increase the torque upper limit (b1.04 and b1.05) in velocity mode or increase the torque demand value in torque mode.

3) V/f Control (b1.00 = 2)

This mode is applicable to scenarios without an encoder for speed feedback. You only need to set rated motor voltage and rated motor frequency correctly.

Problem	Solution
Oscillation of the running motor	◆ Increase the value of F2.11 (oscillation suppression gain) in increments of 10. The permissible maximum value of this parameter is 100.
Overcurrent during high-power start	◆ Decrease the value of F2.01 (torque boost) in decrements of 0.5%.
Large current during running	◆ Set the rated voltage (P0.02) and rated frequency (P0.04) of the motor correctly. ◆ Decrease the value of F2.01 (torque boost) in decrements of 0.5%.
Loud motor noise	◆ Increase the value of F0.16 (carrier frequency) in increments of 1.0 kHz. (Note that increasing the carrier frequency will result in a capacity decrease of the AC drive and an increase in the leakage current of the motor. For details about capacity decrease, contact the manufacturer.)

7.3 Fault Display

The YD587 series AC drive monitors various input signals, operating conditions, and external feedback in real time. Once a fault occurs, the AC drive takes the corresponding protection action, and the operating panel displays fault information, such as  .

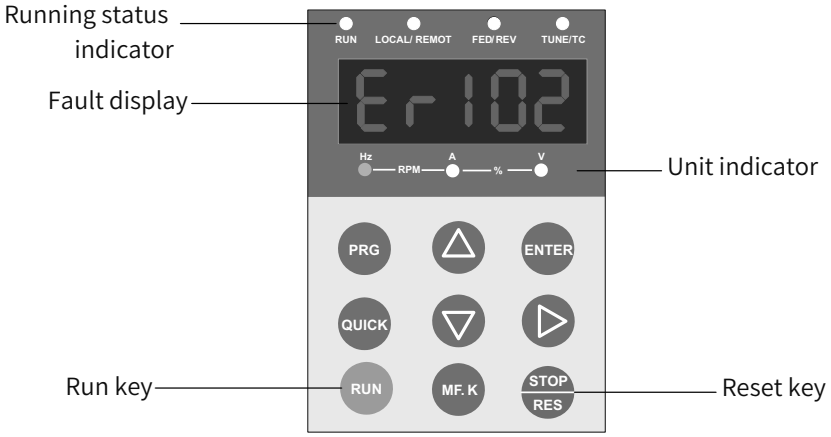


Figure 7-1 Fault display

The five digits on the operating panel are numbered 5, 4, 3, 2, and 1 from left to right. Take the display of 103.02 as an example. Digits 5, 4, and 3 show the fault code, in which 1 on digit 5 indicates the fault level, and 03 on digits 4 and 3 indicates the fault code. 02 on digits 2 and 1 indicates the fault subcode, which is reserved by the manufacturer. You can obtain fault information by checking parameters in E* group. The following figure shows the display in this example.

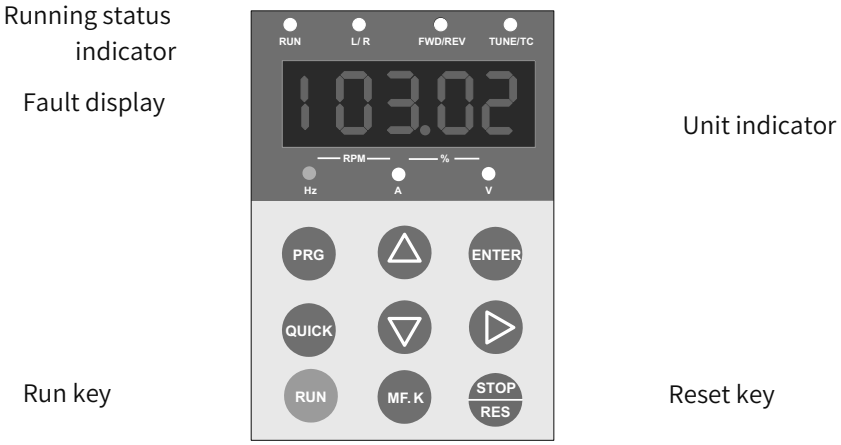


Figure 7-2 LED display of a fault

Before asking Inovance engineers for help, you can perform self-check according to instructions in this section, analyze the fault causes, and find solutions.

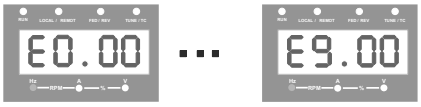
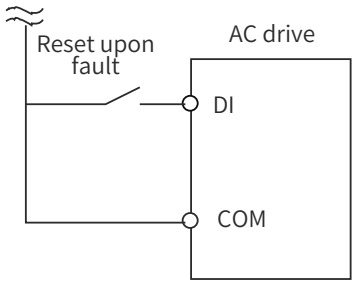
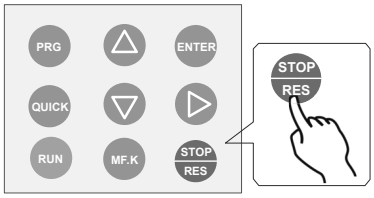
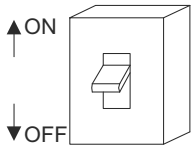
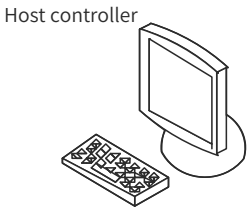
The YD587 series AC drive is the core of a crane's electronic control system. Fault information provided by the AC drive is graded into five levels based on the impact on the system. The following table describes responses of the AC drive to different levels.

Fault Level	Response	Display
Level 1	◆ The operating panel displays the error code. ◆ Output function 1 (brake control) is inactive. ◆ Output function 2 (stop upon fault) is active. ◆ The AC drive coasts to stop.	Er 1**
Level 2	◆ The operating panel displays the error code. ◆ Output function 3 (fault alarm) is active. ◆ The AC drive performs a quick stop.	Er2**
Level 3	◆ The operating panel displays the error code. ◆ Output function 3 (fault alarm) is active. ◆ The AC drive decelerates to stop.	Er3**
Level 4	◆ The operating panel displays the error code. ◆ Validate output function 4 (fault prompt). ◆ System operation is not affected.	Er4**
Level 5	◆ System operation is not affected.	

NOTE

- ◆ Faults with error codes 1# to 40# are driving performance faults of YD587 series AC drive and are graded level 1 by default. Their fault levels cannot be changed.
- ◆ Faults with error codes 41# to 65# are function faults. You can change their fault levels by setting parameters bF.10 to bF.14. (See the descriptions of bF.10 to bF.14.)

7.4 Reset upon Fault

Stage	Solution	Remarks
When the fault occurs	Check fault information on the operating panel.	View groups E0 to E9. 
Before reset	Find the cause of the fault based on the fault type displayed on the operating panel and rectify the fault. Then reset the AC drive.	Troubleshoot the fault according to "7.5 Error Codes and Solutions."
Reset method	1. Set the DI to function 3 (b3.01 to b3.10 = 3: reset upon fault). Verify that the RUN command has been canceled, and the reset terminal is valid.	
	2. Press the stop/reset key on the operating panel to reset the AC drive.	Press the red STOP key on the operating panel to reset the fault. 
	3. Power off and then power on the AC drive to reset it. Cut off the power supply to the main circuit. When the error code on the operating panel disappears, resume the power supply.	
	4. Reset the AC drive on the host controller (Modbus RTU serial communication control). In communication control mode (bF.04 = 2), confirm that the RUN command has been canceled, and then write 7 (reset upon fault) to the 2000H communication address, so that the AC drive will reset after the fault is rectified.[Note]	

7.5 Error Codes and Solutions

The following table lists the faults that may occur during use of the AC drive and solutions to these faults.

Fault Code	Fault Name	Cause	Solution
Er102	Overcurrent during acceleration	1. The output circuit of the AC drive is grounded or short-circuited. 2. The control mode is vector control but motor auto-tuning is not performed. 3. The acceleration time is too short. 4. The customized torque boost or V/f curve is not appropriate. 5. The voltage is too low. 6. The motor is started while rotating. 7. A sudden load is applied during acceleration. 8. The AC drive power rating is too low.	1. Eliminate external faults. 2. Perform motor auto-tuning. 3. Increase the acceleration time. 4. Adjust the customized torque boost or V/f curve. 5. Adjust the voltage to the normal range. 6. Enable the flying start function or start the motor after it stops. 7. Remove the sudden load. 8. Select an AC drive of a higher power rating.
Er103	Deceleration Overcurrent	1. The output circuit of the AC drive is grounded or short-circuited. 2. The control mode is vector control but motor auto-tuning is not performed. 3. The deceleration time is too short. 4. The voltage is too low. 5. A sudden load is applied during deceleration. 6. The braking unit and braking resistor are not installed. 7. The braking circuit is short-circuited.	1. Eliminate external faults. 2. Perform motor auto-tuning. 3. Increase the deceleration time. 4. Adjust the voltage to the normal range. 5. Remove the sudden load. 6. Install the braking unit and braking resistor. 7. Check whether the braking resistor is faulty.
Er104	Constant speed Overcurrent	1. The output circuit of the AC drive is grounded or short-circuited. 2. The control mode is vector control but motor auto-tuning is not performed. 3. The voltage is too low. 4. A sudden load is applied during operation. 5. The AC drive power rating is too low. 6. The braking circuit is short-circuited.	1. Eliminate external faults. 2. Perform motor auto-tuning. 3. Adjust the voltage to the normal range. 4. Remove the sudden load. 5. Select an AC drive of a higher power rating. 6. Check whether the braking resistor is faulty.

Fault Code	Fault Name	Cause	Solution
Er105	Acceleration Overvoltage	1. The input voltage is too high. 2. An external force drives the motor during acceleration. 3. The acceleration time is too short. 4. The braking unit and braking resistor are not installed.	1. Adjust the voltage to the normal range. 2. Cancel the external force or install a braking resistor. 3. Increase the acceleration time. 4. Install the braking unit and braking resistor.
Er106	Deceleration Overvoltage	1. The input voltage is too high. 2. An external force drives the motor during deceleration. 3. The deceleration time is too short. 4. The braking unit and braking resistor are not installed.	1. Adjust the voltage to the normal range. 2. Cancel the external force or install a braking resistor. 3. Increase the deceleration time. 4. Install the braking unit and braking resistor.
Er107	Constant speed Overvoltage	1. The input voltage is too high. 2. An external force drives the motor during operation.	1. Adjust the voltage to the normal range. 2. Cancel the external force or install a braking resistor.
Er108	Control power supply fault	The input voltage is out of the specified range.	Adjust the input voltage to the specified range.
Er109	Undervoltage Fault	1. An instantaneous power failure occurs. 2. The input voltage of the AC drive is out of the allowable range. 3. The bus voltage is lower than the voltage specified by F3.06. 4. The rectifier bridge and pre-charge resistor are faulty. 5. The driver board is faulty. 6. The control board is faulty.	1. Reset to clear the fault. 2. Adjust the voltage to the normal range. 3. Contact the agent for technical support. 4. Contact the agent for technical support. 5. Contact the agent for technical support. 6. Contact the agent for technical support.
Er110	AC drive Overload	1. The load is too heavy or locked-rotor occurs on the motor. 2. The AC drive power rating is too low.	1. Reduce the load and check the motor and machinery. 2. Select an AC drive of a higher power rating.
Er111	Motor overload	1. The motor overload protection gain (bE.01) is set incorrectly. 2. The load is too heavy or locked-rotor occurs on the motor. 3. The AC drive power rating is too low.	1. Set the parameter properly. 2. Reduce the load and check the motor and machinery. 3. Select an AC drive of a higher power rating.
Er112	Input phase loss	1. Three-phase power input is abnormal. 2. The driver board, lightning protection board, main control board, or rectifier bridge is abnormal.	1. Check and eliminate external wiring problems. 2. Contact the agent for technical support.

Fault Code	Fault Name	Cause	Solution
Er114	AC drive overheating	1. The ambient temperature is too high. 2. The air filter is blocked. 3. The fan is damaged. 4. The thermistor of the IGBT is damaged. 5. The inverter module is faulty.	1. Reduce the ambient temperature. 2. Clean the air filter. 3. Replace the fan. 4. Replace the thermistor. 5. Replace the inverter module.
Er115	Built-in braking unit overloaded	1. The resistance of the braking resistor is too small. 2. The braking resistor is short-circuited. 3. The built-in braking unit is damaged. 4. The power rate of the external load is too high.	1. Use a braking resistor with larger resistance. 2. Check the wiring between the AC drive and braking resistor. 3. Contact the agent for technical support.
Er116	Built-in braking unit short-circuited		
Er117	Contactor Fault	1. The driver board and power supply are faulty. 2. The contactor is faulty.	1. Replace the driver board or power supply board. 2. Replace the contactor.
Er118	Current detection fault	1. The Hall device is faulty. 2. The driver board is faulty.	1. Replace the Hall device. 2. Replace the driver board.
Er119	Motor parameter auto-tuning fault	1. The motor parameters are not set according to the nameplate. 2. Motor auto-tuning times out.	1. Set the motor parameters according to the nameplate properly. 2. Check the wiring between the AC drive and the motor.
Er120	Encoder Fault	1. The encoder model does not match the AC drive. 2. The encoder wiring is incorrect. 3. The encoder is damaged. 4. The PG card is faulty.	1. Set the encoder model correctly based on the actual situation. 2. Eliminate the wiring fault. 3. Replace the encoder. 4. Replace the PG card.
Er123	Short circuit to ground	1. The motor is short-circuited to the ground.	1. Replace the cable or motor.
Er125	Output phase loss	1. The wiring between the AC drive and the motor is faulty. 2. The three-phase outputs of the AC drive are unbalanced when the motor is running. 3. The driver board is faulty. 4. The IGBT is faulty.	1. Eliminate external faults. 2. Check whether the motor three-phase winding is normal and eliminate the fault. 3. Contact the agent for technical support. 4. Contact the agent for technical support.
Er137	Abnormal frequency direction	The directions of operation frequency and motor feedback frequency are reverse.	1. Check whether motor parameters are set properly. 2. Check whether the load is too heavy. 3. Adjust the setting of bC.02.

Fault Code	Fault Name	Cause	Solution
Er138	Abnormal frequency following	The error between the frequency reference and motor feedback frequency is too large.	1. Check whether motor parameters are set properly. 2. Check whether the load is too heavy. 3. Adjust the settings of bC.03 and bC.04.
Er140	Pulse-by-pulse current limit fault	1. The load is too heavy or locked-rotor occurs on the motor. 2. The AC drive power rating is too low.	1. Reduce the load and check the motor and machinery. 2. Select an AC drive of a higher power rating.
Er453	Brake failure protection	When b1.00 is set to 1 (FVC) and the AC drive stops and detects accumulated encoder pulse feedback, the brake is loose and has not completely gripped the motor shaft. In this case, the AC drive automatically runs at 0 Hz.	1. Check whether the brake is loose. If yes, increase the braking torque or contact the manufacturer. 2. Check whether bC.00 is set correctly. If its value is too small, increase the value as required. When it is set to 0, this function is disabled.
Er*41	Brake release fault	1. The brake release time exceeds the timeout interval specified by B6.22. 2. The input brake release feedback signal is incorrect. For details, see the description of b6.08.	1. Check whether the brake output signal is correct. 2. Check the wiring of the brake circuit. 3. Check the function selection (input function 11) of the brake release feedback input point on the control board.
Er*42	Brake applying fault	The brake applying feedback signal input is abnormal. For details, see the description of b6.08.	1. Check the wiring of the brake circuit. 2. Check the function selection (input function 12) of brake applying feedback input point on the control board.
Er*43	Timeout of shaft-cooling motor at low-speed operation	See the descriptions of b0.00 and b0.01.	1. Adjust the settings of b0.00 and b0.01. 2. Protect the motor from overheating.
Er*44	Forward and reverse run commands valid simultaneously	The AC drive detects the forward and reverse run commands at the same time.	1. Check the external circuit of the forward and reverse run command input points. 2. Increase the terminal filter time properly.
Er*45	Joystick not reset	A run command or frequency reference signal input is detected when the AC drive is powered on.	1. Ensure that all the NO input signals are invalid during the power-on process. 2. Input a run command after the system initialization is completed.
Er*46	Process sheet communication fault	Communication between the AC drive and process sheet (587CF*) is abnormal.	1. Check that bF.18 is set correctly. 2. Contact the agent or Inovance for technical support.

Fault Code	Fault Name	Cause	Solution
Er*47	CAN bus fault	1. The CANlink expansion card does not work normally. 2. The communication cable does not work normally.	1. Check that communication cables between expansion cards are securely connected. 2. Check that the expansion card interfaces are securely connected. 3. Shorten the distances between communication nodes.
Er*48	Communication error	1. The host controller does not work normally. 2. The communication cable does not work normally. 3. Communication parameters in group bd are not set properly.	1. Check the wiring of the host controller. 2. Check the communication cable connection. 3. Set the communication expansion card type correctly. 4. Set the communication parameters correctly.
Er*49	Parameter read-write fault	The EEPROM chip is damaged.	Replace the main control board.
Er*50	External input fault	DI function 7 is valid.	Reset the AC drive.
Er*51	Parameter Fault	1. Parameters are set incorrectly. 2. The EEPROM memory chip is damaged.	1. Use the parameter self-check function and correct the parameters that are set incorrectly. 2. Replace the main control board.
Er*52	Excessive speed deviation in V/f mode	The difference between the motor actual running frequency and the synchronous frequency exceeds the speed difference threshold.	1. Check whether the load is too heavy. 2. Adjust the settings of bC.01 and bC.03. 3. Check whether motor parameters are set properly.

◆ In the preceding table, the asterisk (*) represents the fault level, with a value range of 1 to 5. For example, in Er*52, 52 is the fault code, and the * represents the adjustable fault level.

7.6 Fault Symptoms and Solutions

No.	Fault Description	Possible Cause	Solution
1	No information is displayed upon power-on.	The drive is not connected to the grid or the grid voltage is too low.	Check the power supply.
		The switched-mode power supply (SMPS) on the driver board of the AC drive is faulty.	Check the bus voltage or contact the agent .
		The control board is disconnected from the driver board or the operating panel.	Reconnect the 8-pin and 40-pin cables.
		The pre-charge resistor of the AC drive is damaged.	Contact the agent for technical support.
		The control board or operating panel is faulty.	
		The rectifier bridge is damaged.	
2	"CrAnE" is displayed after power-on.	The cable connection between the driver board and control board is poor.	Reconnect the 8-pin and 28-pin cables.
		Related components on the control board are damaged.	Contact the agent for technical support.
		The motor or motor cable is short-circuited to the ground.	
		The Hall sensor is faulty.	
		The grid voltage is too low.	
3	"Er123" is displayed upon power-on. Alarm	The motor or output cable is shorted to ground.	Check the insulation status of the motor and the output cable with a megohmmeter.
		The AC drive is damaged.	Contact the agent for technical support.
4	The display is normal after power-on, but "CrAnE" is displayed in the running state and the AC drive stops immediately.	The cooling fan is damaged or locked-rotor occurs.	Replace the fan.
		A short circuit occurs on external control terminals.	Rectify the short circuit fault.
5	Er114 (IGBT overtemperature) is reported frequently.	The carrier frequency is set too high.	Reduce the carrier frequency (F0.15).
		The fan is damaged or the air duct is clogged.	Replace the fan or clean the air duct.
		Components (thermistor or others) inside the AC drive are damaged.	Contact the agent for technical support.

No.	Fault Description	Possible Cause	Solution
6	The motor does not rotate after the AC drive runs.	The motor or motor cable is abnormal.	Check that wiring between the AC drive and motor is normal.
		Motor parameters on the AC drive are set incorrectly.	◆ Restore the servo drive to default settings and reset related parameters correctly. ◆ Ensure proper settings of the encoder parameters and rated motor parameters (such as the rated motor frequency and rated motor speed). ◆ Check that b1.00 (control mode) and bF.04 (command source selection) are set correctly. ◆ Adjust F2.01 (torque boost) in V/f control mode under heavy load.
		The cable connection between the driver board and control board is poor.	Re-connect the cables and ensure secure connection.
		The driver board is faulty.	Contact the agent for technical support.
7	DI terminals are invalid.	Incorrect parameter	Check and reset parameters in group b3.
		External signal transmission errors occurred.	Re-connect the external signal cable.
		The jumper across OP and +24 V becomes loose.	Connect the jumper across OP and +24 V securely.
		The control board is faulty.	Contact the agent for technical support.
8	The motor speed fails to rise in FVC mode.	The encoder is faulty.	Replace the encoder and check the cable connection.
		The encoder connection is incorrect or in poor contact.	Replace the PG card.
		The PG card is faulty.	Contact the agent for technical support.
		The driver board is faulty.	
9	Frequent overcurrent and overvoltage faults	Motor parameters are set incorrectly.	Set the motor parameters or perform motor auto-tuning again.
		The acceleration/deceleration time is improper.	Set a proper acceleration/ deceleration time.
		The load fluctuates.	Contact the agent for technical support.

No.	Fault Description	Possible Cause	Solution
10	Er117 is displayed when the AC drive is powered on or is running.	The soft start contactor is not closed or it is not conductive in a low-temperature and high-humidity environment.	* Check whether the contactor cable is loose. * Check whether the contactor is faulty. * Check whether the +24V power supply of the contactor is faulty. * Contact the agent for technical support. * Apply a heating device in the electric cabinet.
11	The lightning protection board reports Err12.	The cable between the lightning protection board and the driver board is loosen.	Check that the input phase loss signal cable between the lightening protection board and the driver board is connected reliably.
		The lightning protection board is damaged or corroded.	Replace the lightening protection board.

7.7 Fault Subcodes

The YD587 series AC drive provides fault subcodes to facilitate fault analysis and location. The two digits after the decimal point in a parameter of group E* indicate the fault subcode.

The following table describes fault subcodes.

Fault Code	Code Meaning	Fault Subcode	Subcode Meaning
02# to 04#	Overcurrent	1	Overcurrent on the drive unit hardware
		10	Overcurrent on the built-in braking unit
05# to 07#	Overvoltage	1	Software overvoltage fault 1
		2	Software overvoltage fault 2
08#	Pre-charge resistor overheat or control power supply fault	1	The voltage fluctuates during power-on, and the power-on process repeats more than five times within a short time due to undervoltage.
09#	Undervoltage	1	The bus voltage of the running AC drive is lower than the value of F3.06.
10#	AC drive overload	1	The overload fault is detected based on the overload curve of the AC drive.
		2	The output pulse-by-pulse current limit time of any phase reaches 5s.
11#	Motor overload	1	The overload fault is detected based on the overload curve of the motor.

Fault Code	Code Meaning	Fault Subcode	Subcode Meaning
12#	Input phase loss	1	Hardware input phase loss 1 is detected.
		2	Hardware input phase loss 2 is detected.
		3	Software input phase loss 1 is detected.
		4	Software input phase loss 2 is detected.
14#	Heatsink or module overheat	1	The inverter temperature exceeds the over-temperature threshold.
15#	Built-in braking transistor overload	1	The instantaneous current of the braking transistor exceeds twice the rated braking current.
		2	The instantaneous current of the braking transistor exceeds the AC drive overvoltage threshold divided by the minimum resistance.
		3	The overload fault is detected based on the overload curve of the built-in braking transistor.
16#	Built-in braking transistor short circuit	1	The current of the braking transistor exceeds the detection threshold during the power-on or stop process of the AC drive.
17#	Pre-charge resistor not closed	1	Hardware pre-charge resistor fault 1 is detected.
		2	Hardware pre-charge resistor fault 2 is detected.
18#	Zero drift too large or current sensor fault	1	The zero drift on phase U is too large.
		2	The zero drift on phase V is too large.
		3	The zero drift on phase W is too large.
19#	Parameter auto-tuning failure	1	The no-load current is abnormal.
20#	Encoder fault	1	Hardware encoder disconnection is detected (supported only by YD580-ABZ).
		2	Software encoder disconnection is detected.
		9	The encoder pulses per revolution is incorrect during dynamic complete auto-tuning in closed-loop mode.
		10	The encoder is disconnected during dynamic complete auto-tuning in closed-loop mode.
23#	Short circuit to ground	1	Hardware overcurrent occurs during detection of short circuit to ground.
		2	Hardware overvoltage occurs during detection of short circuit to ground.
		3	The detection current exceeds the rated peak current of the AC drive during detection of short circuit to ground.

Fault Code	Code Meaning	Fault Subcode	Subcode Meaning
25#	Output phase loss	1	Phase U output loss occurs.
		2	Phase V output loss occurs.
		3	Phase W output loss occurs.
		4	The output voltage in closed-loop mode is high.
		5	The fault is reported upon output phase loss during stator resistance auto-tuning.
37#	Stall warning 1	1	See the description of bC.02.
38#	Stall warning 2	1	See the descriptions of bC.03 to bC.04.
40#	Pulse-by-pulse current limit fault	1	Continuous pulse-by-pulse current limit occurs on any phase output in a short time.

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.

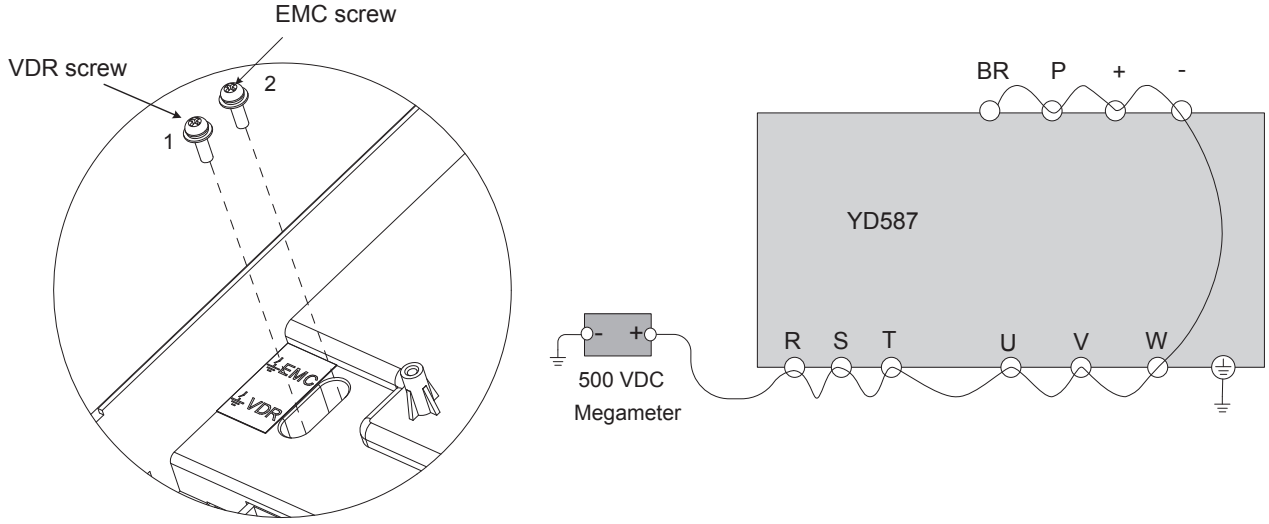
Inspection Item	Inspection Points	Solutions	Checked
General	Inspect for wastes, dirt and dust on the surface of the AC drive.	Use a vacuum cleaner to suck up wastes and dust to prevent direct touching. Wipe surface dirt gently with a soft cloth immersed in neutral detergent.	
Cables	Inspect power cables 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.

■ 8.3.2 Number of Fans on the Drive

Model	Number of Fans
3PH 380~480V，50/60Hz	
YD587T4-0P7GB	1
YD587T4-1P5GB	1
YD587T4-2P2GB	1
YD587T4-3P0GB	1
YD587T4-3P7GB	1
YD587T4-5P5GB	1
YD587T4-7P5GB	1
YD587T4-11GB	2
YD587T4-15GB	2
YD587T4-18P5GB	1
YD587T4-22GB	1
YD587T4-30GB	1
YD587T4-30GB-T	1
YD587T4-37GB-T	1
YD587T4-45GB-T	1
YD587T4-55GB-T	1
YD587T4-75GB-T	2
YD587T4-90GB-T	2
YD587T4-110GBT	2
YD587T4-132G-T	2
YD587T4-160G-T	2
YD587T4-200G-T	2
YD587T4-220G-T	2
YD587T4-250G-T	3
YD587T4-280G-T	3
YD587T4-315G-T	3
YD587T4-315G-T	3
YD587T4-355G-T	3
YD587T4-400G-T	3
YD587T4-450G-T	3

Chapter 9 Specifications and Selection

9.1 YD587 Specifications and Dimensions

9.1.1 Technical Specifications.

Table 9-1 YD587 inverter model and technical data (3-phase 380V~480V)

Item		specification												
YD587T4-□G(B)		0P7	1P5	2P2	3P0	3P7	5P5	7P5	11	15	18P5	22	30	37
Adaptation motor	(kW)	0.75	1.5	2.2	3.0	3.7	5.5	7.5	11	15	18.5	22	30	37
	(HP)	1	2	3	4	5	7.5	10	15	20	25	30	40	50
Input	Rated input current (A)	2.4	4.6	6.3	9.0	12	17	22	33	42	50	59	64	69
Output	Rated output current (A)	2.1	3.8	5.1	7.2	9.0	13	17	25	32	37	45	60	75
	Output Voltage	3-phase 380~480V（follow input voltage）												
	Max. output frequency	50 to 150 Hz												
	Carrier freq	0.8kHz~8.0kHz												
	Overload	G:150% 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	6.7	9.5	12	18	23	34	43	45	54	58	63
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														
YD587T4-□G(B)		45	55	75	90	110	132	160	200	220	250	280	315	355	400	450
Adaptation motor	(kW)	45	55	75	90	110	132	160	200	220	250	280	315	355	400	450
	(HP)	60	75	100	120	150	180	215	265	300	330	375	420	475	530	600
Input	Rated input current (A)	89	106	139	164	196	240	287	365	410	441	495	565	617	687	782
Output	Rated output current (A)	91	112	150	176	210	253	304	377	426	465	520	585	650	725	820
	Output Voltage	3-phase 380~480V（follow input voltage）														
	Max. output frequency	50 to 150 Hz														
	Carrier freq	0.8kHz~8.0kHz														
		0.8kHz~6.0kHz														
	Overload	G:150% 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	127	150	179	220	263	334	375	404	453	517	565	629	716
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 9-2 Technical specifications of YD587 series AC drives

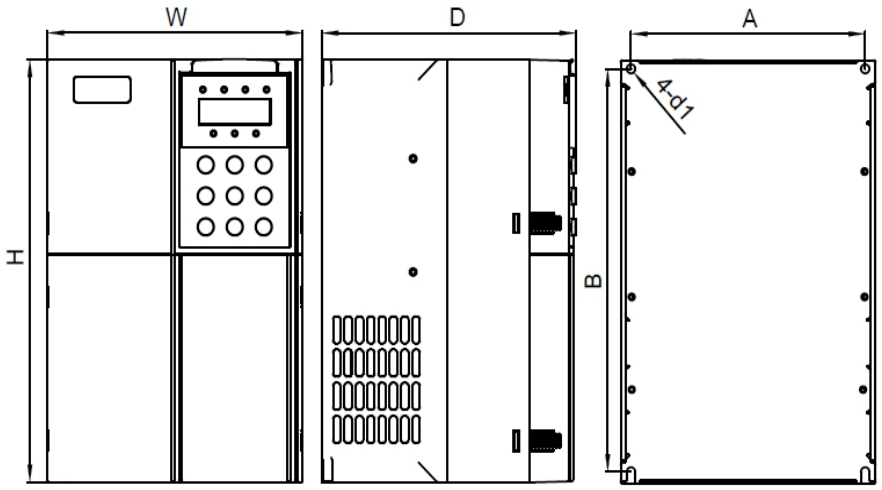
Item		Technical Specifications	
Basic functions	Input frequency resolution	Digital setting: 0.01 Hz Analog setting: maximum frequency x 0.025%	
	Control mode	SVC FVC V/f control	
	Starting torque	0.25 Hz/150% (SVC) 0 Hz/180% (FVC)	
	Speed range	1:200 (SVC)	1:1000 (FVC)
	Speed stability accuracy	±0.5% (SVC)	±0.02% (FVC)
	Torque control accuracy	±3% (FVC) ±5% above 10 Hz (SVC)	
	Torque boost	Automatic torque boost; customized torque boost: 0.1% to 30.0%	
	DC injection braking	DC injection braking frequency: Minimum frequency to rated frequency DC injection braking current: 0.0% to 120.0% of the rated current	
	Acceleration/ Deceleration curve	Straight-line or S-curve acceleration/deceleration	
	Automatic voltage regulation (AVR)	Automatically maintains a constant output voltage when the grid voltage changes.	
	Overvoltage/ Overcurrent stall control	Automatically limits the current and voltage during operation to avoid frequent tripping caused by overvoltage/overcurrent.	
	Fast current limit	This function reduces overcurrent to the minimum and guarantees normal running of the AC drive.	
	Torque limit and control	The system limits the torque automatically to prevent frequent trips caused by overcurrent during operation. Torque control is applied in vector control mode.	
Customized functions	Crane process sheet	The AC drive can use a crane process sheet to implement complex crane process control for the built-in anti-sway device.	
	Overload protection	Overloads are automatically identified to permit falling-down and deny rising in case of overload.	
	Multi-motor switchover	Three backups for all parameters of the AC drive, allowing switchover between three motors	
	Multiple field buses	The AC drive supports six types of field buses: Modbus, CANopen, PROFINET, EtherNet/IP, and EtherCAT.	
	Motor overtemperature protection	The optional I/O expansion card 1 enables AI3 to receive the motor temperature sensor input (PT100 and PT1000).	
	Multiple encoder types	The AC drive supports differential encoders, open collectors, UVW encoders, and resolvers.	
	Speed reduction with the voltage drop	When the bus voltage is too low, the AC drive can keep the voltage at a normal level through load feedback energy.	
	Brake sequence control	Provides professional brake sequence control dedicated for cranes.	
	Light-load and high-speed	Automatically calculates the highest output frequency by detecting the output torque of the AC drive.	
	Special curve	Three-segment acceleration/deceleration curves are supported.	
	Load overspeed determination	Designs the frequency direction exception alarm and frequency following exception alarm according to the encoder feedback frequency.	
	Deceleration/Stop switch	Provides a simple positioning function.	
	Various fault alarms	Optional AC drive output fault types and handling modes	
	Static auto-tuning of motor parameters	Supports static auto-tuning of all motor parameters.	
	Advanced software tool	The AC drive software allows you to configure parameters, and provides a virtual oscilloscope to show the internal status of the AC drive.	

Item		Technical Specifications
Operation	Operation command	Operation commands can be delivered by using the operating panel, control terminals, and communication (RS485, CANopen, and PROFINET).
	Frequency reference	Frequency reference can be set by using the multi-frequency, analog voltage, analog current, and communication.
	Input terminal	Standard: Five DIs Two AIs. One AI supports only 0–10 V voltage input and the other AI supports 0–10 V voltage input and 4–20 mA current input. Expansion capability: YD580-IO3 expansion card is standard. It provides three DI input，one relay output, one AO output terminals.
	Output terminals	Standard: Two DOs One relay output terminal One AO that supports 0–10 V voltage output and 0–20 mA current output Expansion capability: YD580-IO3 expansion card is standard. It provides three DI input，one relay output, one AO output terminals.
Display and operating panel	LED display	It shows parameter values.
	Parameter copy	The operating panel allows for quick parameter copy on the parameter copy interface.
Protection functions	Phase loss protection	The AC drive provides input phase loss protection and output phase loss protection.
	Instantaneous overcurrent protection	The AC drive stops when the operating current exceeds 250% of the rated current.
	Overvoltage protection	The AC drive stops when the DC voltage of the main circuit rises above 820 V.
	Undervoltage protection	The AC drive stops when the DC voltage of the main circuit falls below 350 V.
	Overtemperature protection	The AC drive triggers protection when the inverter bridge overheats.
	Overload protection*1	The AC drive stops after running at 150% of the rated current for 60 seconds.
	Braking protection	Braking protection indicates protection against braking unit overload and braking resistor short circuit.
	Short circuit protection	The AC drive triggers output interphase short-circuit protection and protection against output short-circuit to ground.

9.1.2 Appearance and installation dimensions

F1~F4 Dimensions

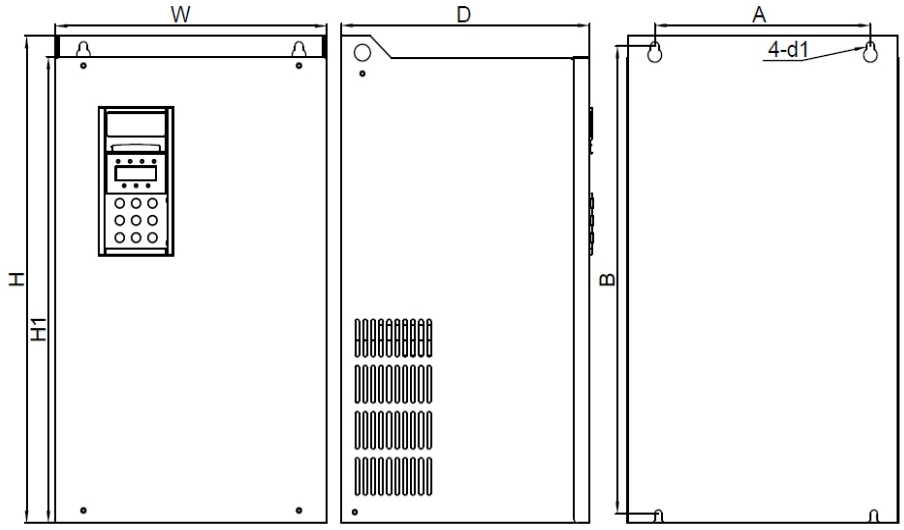
F1~F4



YD587T4-0P7GB ~ YD587T4-22GB

F5~F8 Dimensions

F5~F8

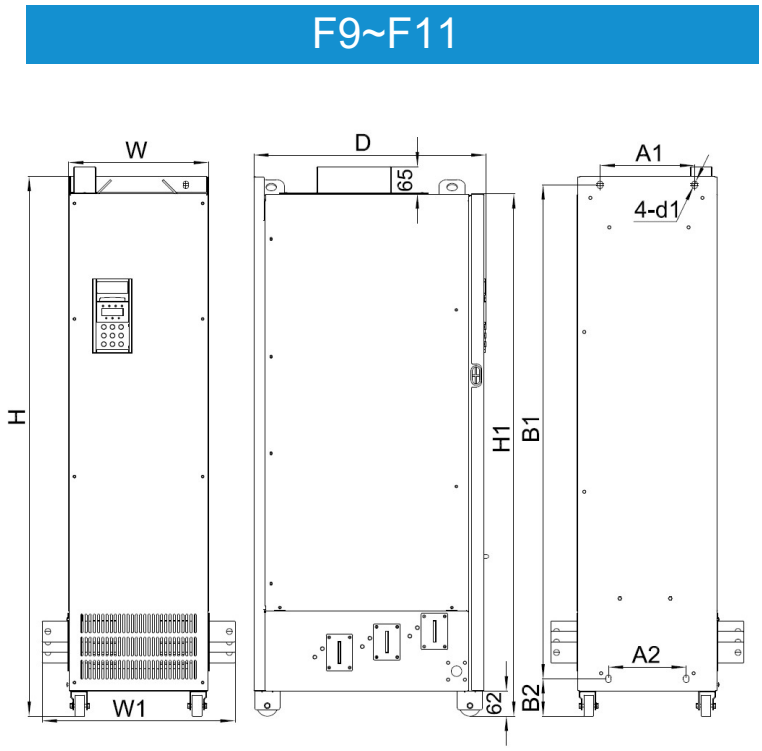


YD587T4-30GB(-T) ~ YD587T4-160GB-T

Table 9-6 YD587T4-0P7GB ~ YD587T4-160G-T
Appearance and Mounting Hole Dimensions (3-phase 380V~480V)

Case	Model	Dimensions mm				Mounting holes mm		Holes mm
		W	H	H1	D	A	B	d1
F1	**YD587T4-0P7GB**	130	200	/	172	119.4	189.4	φ5
	YD587T4-1P5GB							
	YD587T4-2P2GB							
	YD587T4-3P0GB							
	YD587T4-3P7GB							
	YD587T4-5P5GB							
F2	**YD587T4-7P5GB**	140	250	/	178	129	239	φ6
	YD587T4-11GB							
F3	**YD587T4-15GB**	180	280	/	180	165.4	266.7	φ6
F4	**YD587T4-18P5GB**	225	360	/	225	206	341	Φ7
	YD587T4-22GB							
F5	**YD587T4-30GB**	256	436	422	254	213	421	φ7
	YD587T4-30GB-T							
	YD587T4-37GB(-T)							
F6	**YD587T4-45GB(-T)**	302	540	527	300	245	521	φ10
	YD587T4-55GB-T							
F7	**YD587T4-75GB-T**	340	581	556	331	270	560	φ10
	YD587T4-90GB-T							
	YD587T4-110GB-T							
F8	**YD587T4-132G-T**	400	925	885	337	320	905	φ10
	YD587T4-160G-T							

F9~F11 Dimensions



YD587T4-200G-T ~ YD587T4-450G-T

Figure 9-8 Schematic diagram of YD587T4-200G-T ~ YD580T4-450G-T exterior and installation dimensions

YD580T4-200G-T ~ YD580T4-450G-T Appearance and Mounting Hole Dimensions

Case	Model	Dimensions mm					Mounting holes mm				Holes mm
		W	W1	H	H1	D	A1	A2	B1	B2	d1
F9	**YD587T4-200G-T**	303	426	1136	1091	523	240	150	1035	83	φ13
	YD587T4-220G-T										
F10	**YD587T4-250G-T**	333	459	1286	1245	568	225	185	1175	91	φ13
	YD587T4-280G-T										
F11	**YD587T4-315G-T**	345	458	1404	1355	561	240	185	1291	91	φ16
	YD587T4-355G-T										
	YD587T4-400G-T										
	YD587T4-450G-T										

9.2 Selection Guidance

9.2.1 Brake Resistance Selection Table

Table 9-13 YD587 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		
YD587T4-0P7GB	0.75	Built-in standard		140W 800Ω	1	Model suffix +B	96
YD587T4-1P5GB	1.5			300W 380Ω	1		96
YD587T4-2P2GB	2.2			440W 260Ω	1		64
YD587T4-3P0GB	3.0			440W 200Ω	1		64
YD587T4-3P7GB	3.7			740W 150Ω	1		32
YD587T4-5P5GB	5.5			1100W 100Ω	1		32
YD587T4-7P5GB	7.5			1500W 75Ω	1		32
YD587T4-11GB	11			2200W 50Ω	1		20
YD587T4-15GB	15			3000W 38Ω	1		20
YD587T4-18P5GB	18.5			4000W 32Ω	1		24
YD587T4-22GB	22			4500W 27Ω	1		24
YD587T4-30GB YD587T4-30GB-T	30	Built-in options		6000W 20Ω	1		19.2
YD587T4-37GB-T	37			7000W 16Ω	1		14.8
YD587T4-45GB-T	45			9000W 13Ω	1		12.8
YD587T4-55GB-T	55			11000W 10.5Ω	1		9.6
YD587T4-75GB-T	75			15000W 7.7Ω	1		6.8
YD587T4-90GB-T	90			18000W 6.2Ω	1		6.0
YD587T4-110GB-T	110			22000W 5.3Ω	1		5.0

Chapter 10 Matching Cards

YD587 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.

10.1 Installation and Function Description of the Expansion Card

10.1.1 YD580-IO1 Terminal distribution and function description

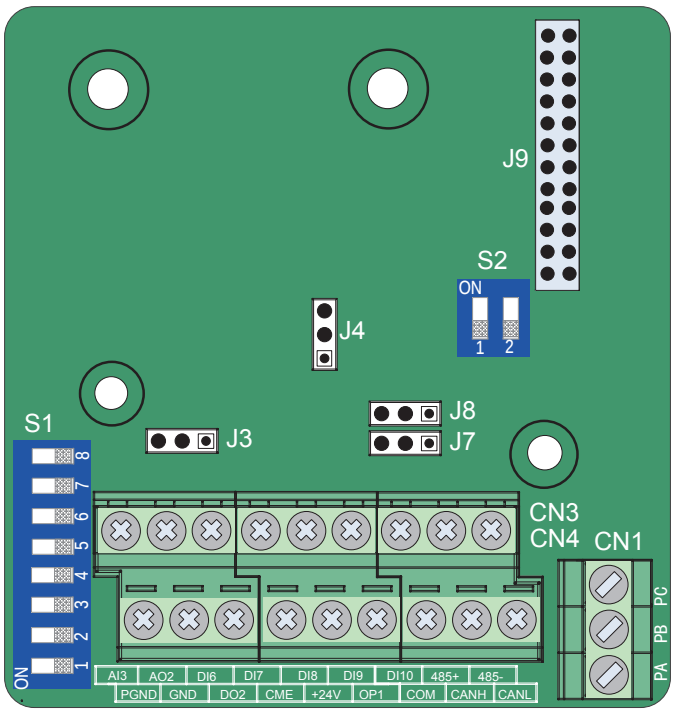
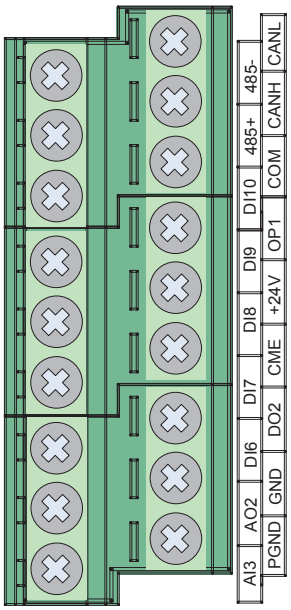
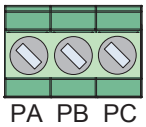


Figure 10-2 YD580-IO1 Terminal distribution

Table 10-2 YD580-IO1 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

● YD580-IO1 RS485 communication terminal 485+/485-/COM and CANlink communication terminal are independent of CANH/CANL/COM and can be used at the same time

10.1.2 YD580-IO2 Terminal distribution and function description

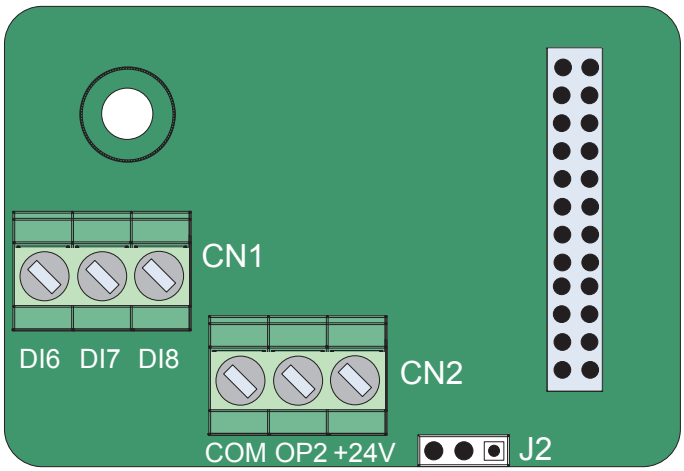


Figure 10-3 YD580-IO2 Terminal distribution

Table 10-4 YD580-IO2 expansion card terminal functions

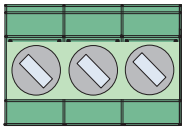
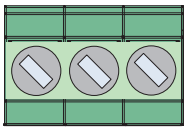
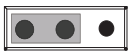
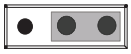
Identification		Name	Feature description	Terminal distribution
CN2	+24V/COM	Exte-24VDC power supply	1. Provide +24V power supply to the outside, which is generally used as the working power supply of the digital input and output terminals and the power supply of external sensors 2. Maximum output current: 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 10-5 YD580-IO2 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.

10.1.3 YD580-IO3 Terminal distribution and function description

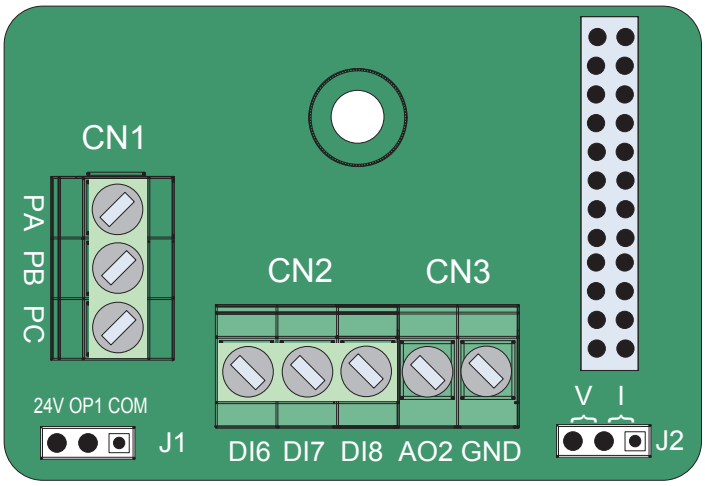


Figure 10-4 YD580-IO3 Terminal distribution

Table 10-6 YD580-IO3 expansion card terminal functions

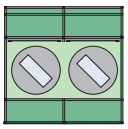
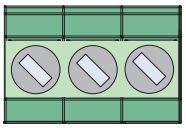
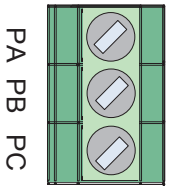
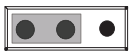
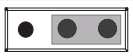
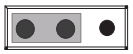
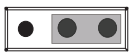
Identification		Name	Feature description	Terminal distribution
CN3	AO2	Analog output 2 b3.19: Fun.	1、Voltage type： 0V~10V (J2=V) 2、Current type：0mA~20mA (J2=I)	 AO2 GND
	GND	Analog GND		
CN2	DI6 ~ DI8	3 digital inputs b3.06/07/08: Fun.	1. Optical lotus isolation, compatible with bipolar input, the maximum input frequency is 100Hz 2. Input impedance: 3.4kΩ 3. Voltage range when level input: 9~24V	 DI6 DI7 DI8
CN1	PA/PB/PC	Relay output b3.15: Fun.	Contact Drive Capability: 250VAC/5A; 30VDC/5A PB-PA; N.C PC-PA; N.O	 PA PB PC

Table 10-7 YD580-IO3 Expansion card jumpers

Identification	Name	Feature description	Terminal distribution
J1	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	
J2	AO2 output type sets the jumper	Voltage type 0V~10V	
		Current type: 0mA~20mA	

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.

10.1.4 YD580-IO4 Terminal Distribution and Function Description

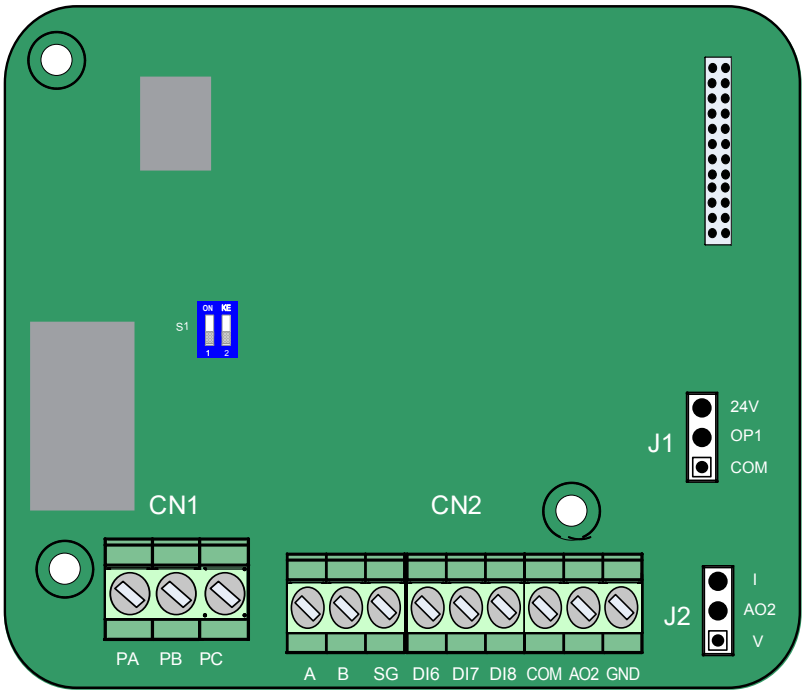


Table 10-9 YD580-IO4 Terminal Function Description

Identification and Functions		Parameter	Function Description	Supplement
Analog output	AO2~GND	b3.19	1、Voltage Type：0V~10V (J2=V) 2、Current Type：0mA~20mA (J2=I)	
Relay Output	PB-PA (NC) PC-PA (NO)	b3.15	Contact drive capability: 250V AC，5A，COS ∅ =0.4 30V DC，1A	
Digital Input	DI6~COM DI7~COM DI8~COM	b3.06 b3.07 b3.08	Optocoupler isolation, bipolar input input impedance: 2.4 kΩ Input voltage range: 9V ～ 30V	
RS485	A B SG	bF.04=2 bd.00 ~ bd.04	It is recommended to use twisted pair shielded cables.	
DIP SWITCH	S1	Terminal Resistor Selection	Choose the RS485 communication terminal matching resistor	it is not connected by default

Table 10-7 YD580-IO4 Jumper Description

Identification	Name	Function	JUMP / DIP switch position
J1	DI source leak-type wiring method setting jumper	DI to drain, OP connected to 24V	
		DI to source, OP connected to COM	
J2	AO2 output type setting jumper	Voltage type: 0~10V	
		Current type: 0~20mA	

10.2.1 RS-485 Expansion Card (YD580-RS485) Terminal Distribution and Function Description

YD580-RS485 communication card is specially developed for YD587 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.

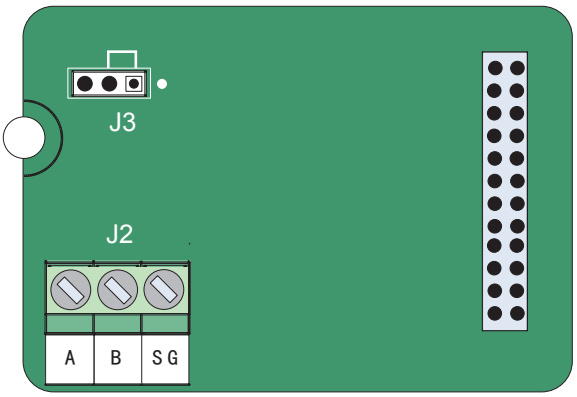


Figure 10-9 YD580-RS485 Terminal distribution

Table 10-16 YD580-RS485 Functions of expansion card

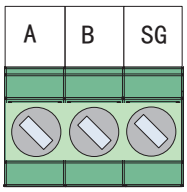
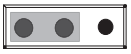
Identification			Description	Terminal distribution
J2	A	485 signal positive	485 input terminal, isolated input	
	B	485 signal negative	485 input terminal, isolated input	
	SG	485 signal ground	power supply is isolated	

Table 10-17 YD580-RS485 Expansion card jumper description

Identification	Name	Description	Terminal distribution
J3	485 Termination Resistor Setup Jumper	Terminal resistor match	
		No-terminal resistor match	

10.2.2 Profinet Communication Expansion Card (YD580-PN) Terminal Distribution and Function Description

The YD580-PN card is a Profinet fieldbus adapter that complies with the internationally accepted Profinet Ethernet standard. The card is installed on the YD587 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.

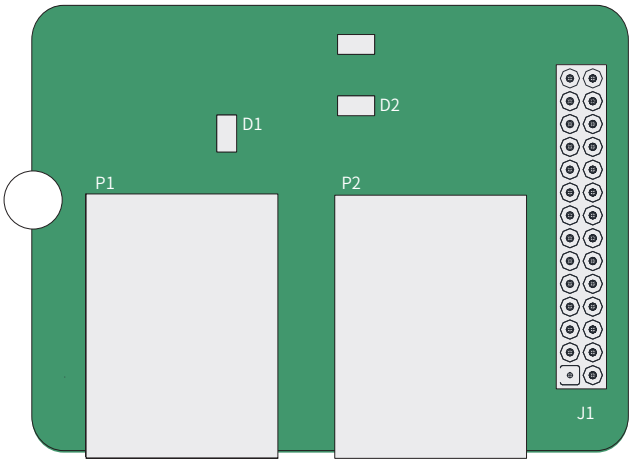


Figure 10-13 YD580-PN Card terminal distribution Table

10-22 YD580-PN 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

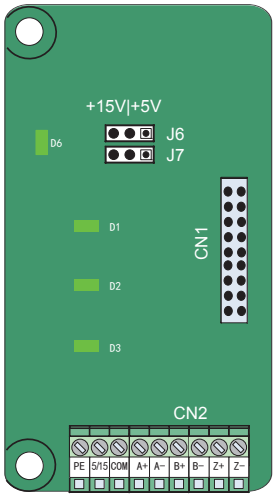
Table 10-23 YD580-PN card indicator status

Identification	Name	Status description
D1	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.
D2	YD580 Communication Status	NOTE
D3	PLC Communication Status	NOTE

NOTE: For more information about Profinet Expansion Card (YD580-PN), please refer to the introduction of YD587 Series Profinet Expansion Card Manual

10.3 Use of Encoder Expansion Cards

10.3.1 YD580-ABZ Encoder Expansion Card Specifications



YD580-ABZ Specification	
Encoder power supply	5V/200mA，15V/100mA
Input Max frequency	Differential: 500kHz, Collector:100kHz
Encoder interface type	Differential, Collector, Push-pull
Wire gauges	16~26AWG specific wire gauge selection parameters
Terminal spacing	3.5mm
Terminal screws	Slotted screws
Terminal form	Diagonal terminal blocks

Table 10-24 YD580-ABZ Terminal functions

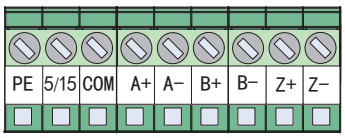
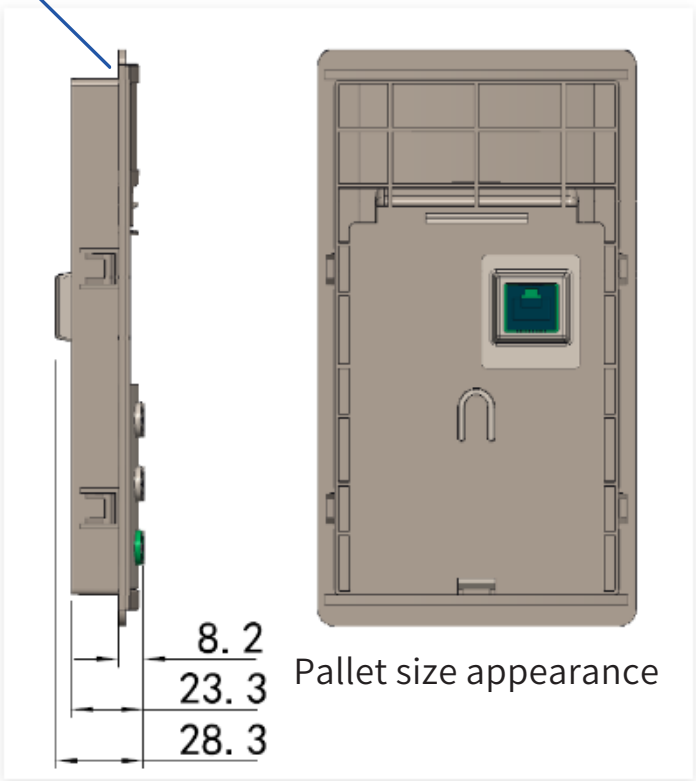
Identification		Description	Distribution
CN2	A+	The encoder outputs A positive	
	A-	The encoder outputs A negative	
	B+	The encoder outputs B positive	
	B-	The encoder outputs B negative	
	Z+	The encoder outputs Z positive	
	Z-	The encoder outputs Z negative	
	5V/15V	Encoder 5V/15V power supply	
	COM	Encoder power supply ground	
	PE	Shield terminals	
CN1	18Pin DIP cable interface, connect to J9 of the inverter control board		

Table 10-26 YD580-ABZ Indicator status

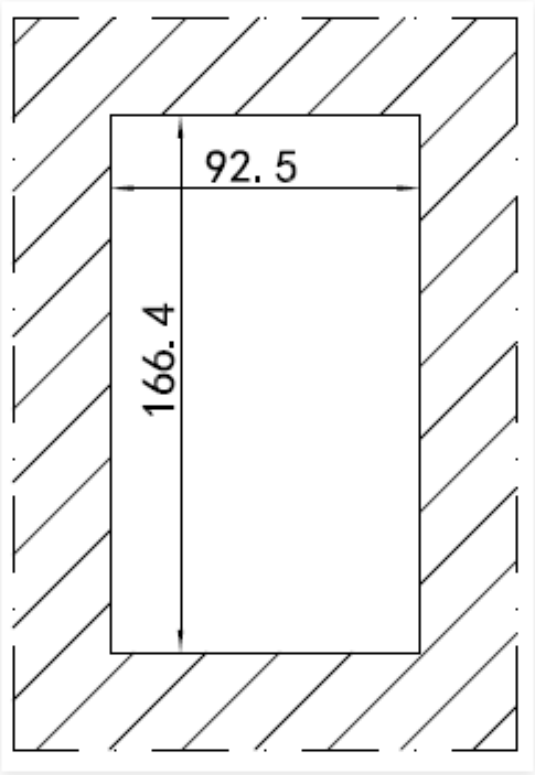
Indicator	status	description
D1/D2/D3 Encoder input signal indicator Power indicator		Solid or flashing: The encoder has a signal input
		Light off: The encoder has no signal input
D6 Power Indicator		Light on: Norma
		Light off: The power supply is not connected
J6,J7 Encoder Power Selection		+15V or +5V selection(must be same)

10.4 Keyboard tray with cut-out size

thickness of mounting plate ⩽ 2mm



Pallet size appearance



YD580 pallet cut-out size
unit (mm)

Appendix A Modbus Communication Protocol

YD587 series AC drives provide the RS232/RS485 interfaces and support the Modbus communication protocol. This protocol enables centralized control of the AC drive using a computer or PLC. For example, you can set AC drive control commands, modify or read parameters, and read AC drive running status and fault information on the computer or PLC by using the protocol.

A.1 Data Rules

This protocol defines the content and format of messages transmitted during serial communication, including the master polling (or broadcasting) format and master coding method (parameter for the action, transmitted data, and error check). The slave uses the same structure for response, including action confirmation, returned data, and error check. If the slave has an error upon receiving a message or fails to complete the action required by the master, it responds with a fault message to the master.

1. Application mode

The AC drive is connected to a "single-master multi-slave" PC/PLC control network with an RS232/RS485 bus.

2. Bus structure

* Interface type

RS232/RS485 hardware interface

* Transmission mode

The network adopts the asynchronous serial communication in half-duplex mode. In this mode, when the master or slave is sending data, the other can only receive data. During asynchronous serial communication, data is sent frame by frame in packet.

* Topology structure

The system consists of a single master and multiple slaves. The slave addresses range from 1 to 247, and 0 is the broadcast address. A slave address must be unique in the network.

3. Protocol description

The YD587 series AC drive uses the master/slave Modbus protocol in asynchronous serial communication mode. In a network, only one device (master) can initiate communication (query/command). Other devices (slaves) can only respond to queries or commands with required data or perform required actions. The master may be a PC, an industrial device, or a PLC, and a slave is a YD587 series AC drive. 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 every query or command from the master. For a broadcast message sent by the master, the slaves do not need to return a response.

4. Communication data structure

The data format defined by the Modbus protocol for the YD587 series AC drive is as follows:

Data frames are in RTU format, the interval between two messages must be at least 3.5-byte transmission time. The first field transmitted is the device address. The allowable transmitted characters are hexadecimal numbers 0 ... 9, A ... F. The network devices keep monitoring the network bus, even during the idle interval. After receiving the first field (address field), each device decodes the field to determine whether itself is the destination device. Following the last transmitted character, an interval of at least 3.5-byte transmission time marks the end of the message. A new message is sent after this interval. The entire message frame must be transmitted as a continuous stream. If there is an idle interval of longer than 1.5-byte transmission time before completion of the frame, the receiving device updates the incomplete message and assumes that the next byte is the address field of a new message. Similarly, if a new message begins earlier than 3.5-byte transmission time following a previous message, the receiving device considers the new message as a continuation of the previous message. This results in an error, as the value in the final cyclical redundancy check (CRC) field is incorrect for the combined messages.

* * RTU frame format

Field	Description
Frame header	3.5-byte transmission time
Slave address	Communication address: 0 to 247
Command code	03H: Read slave parameters 06H: Write slave parameters
Data field (N-1)	Parameter address, number of parameters, and values of parameters
Data field (N-2)	
...	
Data field 0	
CRC CHK low bits	Check value: CRC value
CRC CHK high bits	
Frame trailer	3.5-byte transmission time

* Example of a command to read slave parameters

Read values of two consecutive parameters starting from F0.02.

Data sent from the master

Data Name	Data Field	Description
Slave address	01H	Set by bD.02
Command code	03H	Read instruction
High-order eight bits of the start address	F0H	Read data from parameter F0.02
Low-order eight bits of the start address	02H	
High-order eight bits of the read data volume	00H	Read two parameters in total
Low-order eight bits of the read data volume	02H	
CRC CHK low bits	CRC CHK value to be calculated	-
CRC CHK high bits		

Slave response data

Data Name	Data Field	Description
Slave address	01H	Same as the data sent from the master
Command code	03H	Same as the data sent from the master
Total number of bytes that have been read	04H	Number of parameters sent by the master x 2
High bits of address F002H	00H	Value of parameter F0.02
Low bits of address F002H	00H	
High bits of address F003H	00H	Value of parameter F0.03
Low bits of address F003H	01H	
CRC CHK low bits	CRC CHK value to be calculated	-
CRC CHK high bits		

* Example of a command to write slave parameters

Write 1388H into 1000AH of the AC drive whose slave address is 02H.

Data sent from the master

Data Name	Data Field	Description
Slave address	02H	Set by bD.02
Command code	06H	Write instruction
High bits of the address where data will be written	10H	Write data into the register address 1000H
Low bits of the address where data will be written	00H	
High bits of the data to be written	13H	Write the value of 1388H into the register address 1000H
Low bits of the data to be written	88H	
CRC CHK low bits	CRC CHK value to be calculated	
CRC CHK high bits		

Slave response data: Same as the data sent from the master

5. Check Method

CRC is used for data check.

In RTU frame format, a message includes a CRC-based error-check field, which checks content of the entire message. The CRC field is two bytes, containing a 16-bit binary value. It is added to the message after being calculated by the TX device. Each receiving device recalculates a CRC value after receiving the message, and compares the calculated value with the CRC value in the CRC field of the message. If the two values are different, a transmission error occurs.

The CRC is first stored to 0xFFFF. Then a process is invoked to process the consecutive eight-bit byte in the message and the value in the register. Only the eight bits in each byte are used for CRC. The start bit, stop bit and parity bit do not apply to CRC. During the production process of CRC, each combination of eight bits is exclusive OR (XOR) with the register value. Then the result is shifted toward the least significant bit, with a zero filled into the most significant bit. The LSB is extracted and checked. If the LSB is 1, the register is then XOR with a preset value. If the LSB is 0, no XOR operation is performed. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next eight-bit byte is XOR with the register's current value, and the process repeats for eight more shifts as described above. The final value of the register is the CRC value after the XOR operation is performed on all bytes in the message.
The CRC value is added to the message from the low-order bytes to high-order bytes.

A.2 Data Address Definition

This section describes the communication data used to control the running, status, and parameter setting of the AC drive.

Parameters can be read and written. (Some parameters cannot be modified because they are only for manufacturer use or monitoring).

1 Parameter Address Expression Rules

The address of a parameter is identified by its group number and code, as described in the following table.

Menu	Parameter Group	High-Order Byte	Low-Order Byte
Level-1 menu	Groups A0 to AF	A0 to AF	00 to FF
Level-2 menu	Groups b0 to bF	b0 to bF	00 to FF
	Groups U0 to U1	d0 to d1	00 to FF
	Groups E0 to EF	E0 to EF	00 to FF
Level-3 menu	Groups F0 to FF	F0 to FF	00 to FF

For example, the address of bF.12 is bF0C.

◆ Some parameters cannot be modified when the AC drive is running. Some parameters cannot be modified in any status of the AC drive. In addition, pay attention to value ranges, units, and descriptions of parameters when modifying them.

2 Target Frequency Setting (Write-Only)

Parameter Address	Command Function
1000H	Communication setting value (0 to 10000, decimal)

◆ The communication setting value is a percentage. The value 10000 maps to 100.00% of the maximum frequency (b1.02).

3 Control Command Input to the AC Drive (Write-Only)

Command Word Address	Command Function
2000H	0001: Forward running
	0002: Reverse running
	0005: Coast to stop
	0006: Stop according to the stop mode specified by F6-10 (Stop mode)
	0007: Reset upon fault
	0008: Quick stop

4 Read AC Drive Status (Read-Only)

Command Word Address	Command Function
3000H	0: Stop
	Bit 0: Forward running
	Bit 1: Reverse running
	Bit 2: Fault

5 Read Current Error Code (Read-Only)

Command Word Address	Command Function
8000H	Display of the current error of the AC drive. For details, see "7.5 Error Codes and Solutions."

6 Format of Communication Error Messages (Response from the Slave)

Data Name	Data Field	Description
Data 1	Slave address	Communication address
Data 2	Command code+0x80	When a communication error occurs, the slave returns an error message frame. The command code of this frame is the read or write command code plus 0x80.
Data 3	Error code	Meanings of error codes: 01: Command code error 02: Address error 03: Data error 04: Command processing failure
Data 4	CRC low bits	CRC
Data 5	CRC high bits	

Innovation Harmony Honesty Progmatic

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PHONE: +086(0510) 8516 1131
http://www.yolico.com

Yolico

YD587 系列

起重专用变频器用户手册

380V 3-phase 0.75 ~ 630kW

Ver 1.3

前 言

首先感谢您购买使用无锡优利康电气开发生产的 YD587 系列变频器！

该产品是优利康电气的起重专用变频器。产品的各项性能指标进一步提高，产品功能更加丰富，可对异步电机实现高性能的矢量控制、可支持起重工艺卡选件，实现变频器内置防摇、抓斗等复杂起重工艺控制等。本系列产品主要用于驱动异步电机，应用于起重设备中的提升、平移、回转等驱动和控制场合。

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。

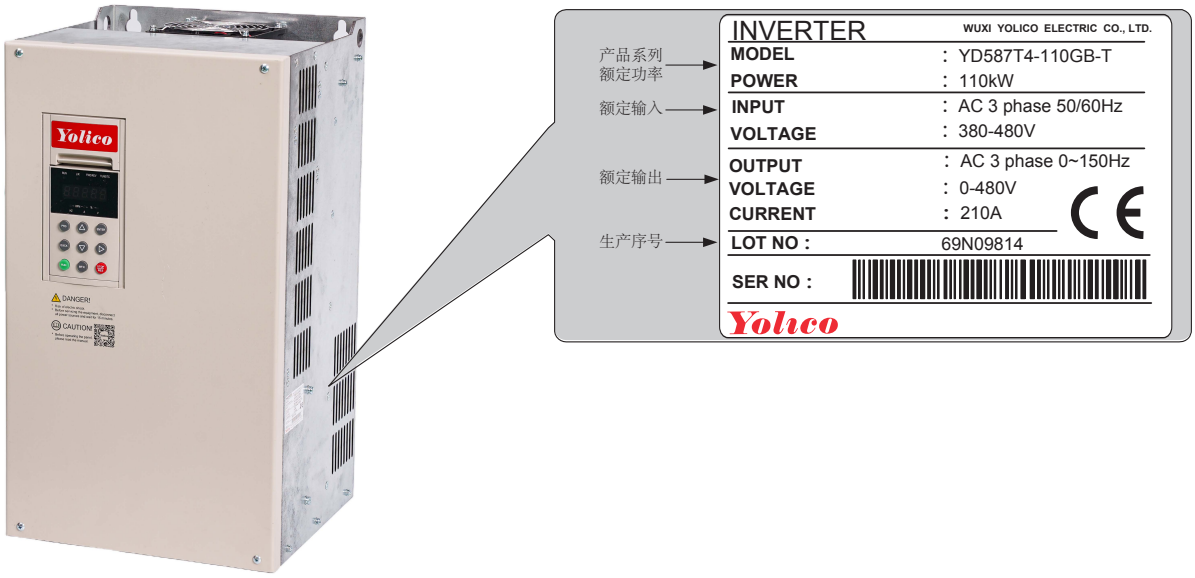
第一章　产品信息

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



YD587 T4- 110 G B -T

标识	产品名称
YD587	起重专用系列

标识	电压等级
T4-	三相380V~480V
T2-	三相200V~240V
T2S-	单相200V~240V

标识	G型功率等级(kW)
0P7	0.75
1P5	1.5
...	...
630	630

标识	类过载型
G	150%*60秒 重载

标识	直流电抗
空	无
-T	含直流电抗

标识	制动单元
空	无
B	含制动单元

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 YD587 系统连接图

使用 YD587 系列变频器控制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。产品系统构成如下图所示：

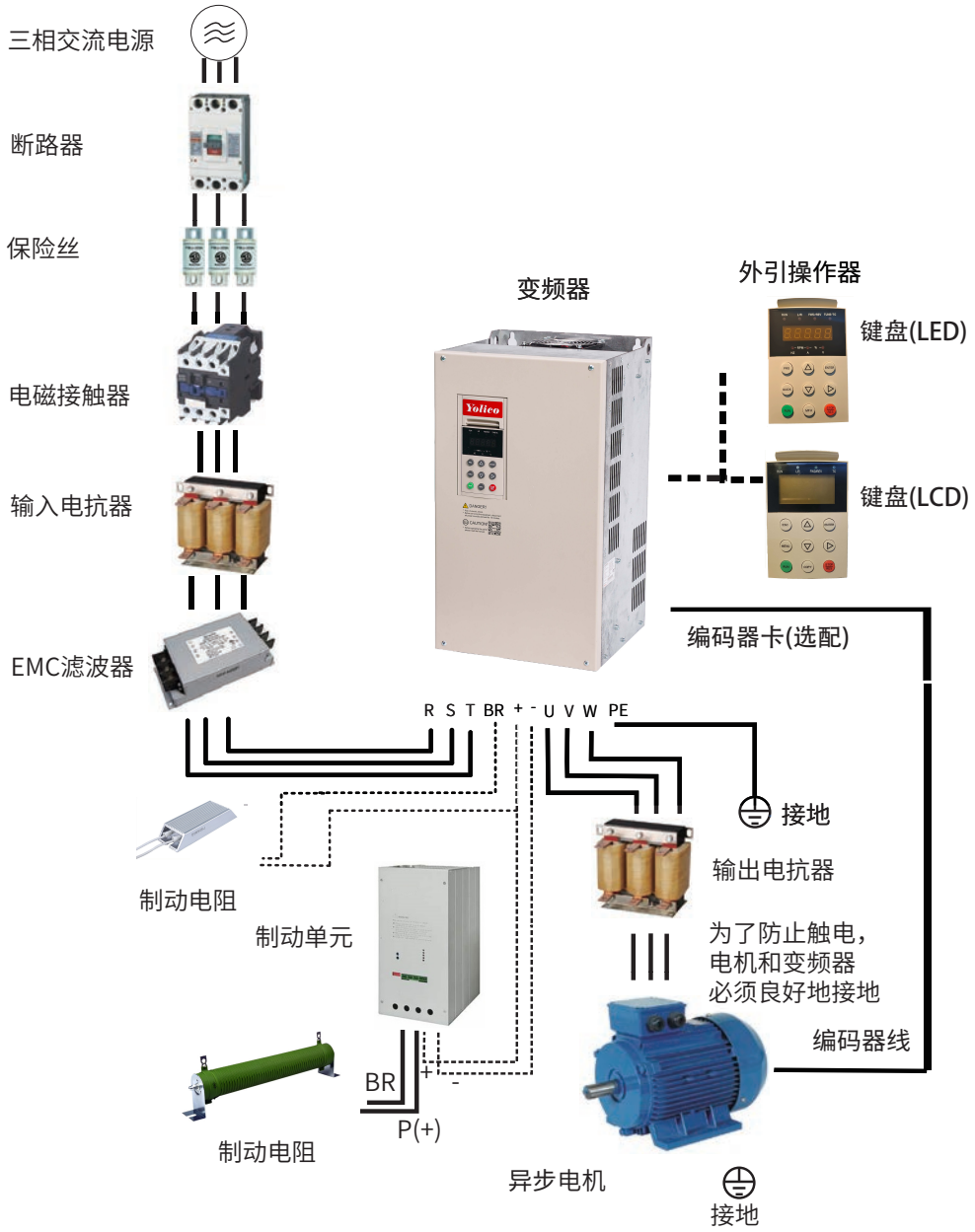


图 2-1 YD587 系列系统构成

NOTE

- 上图仅作为 YD587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》。

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。

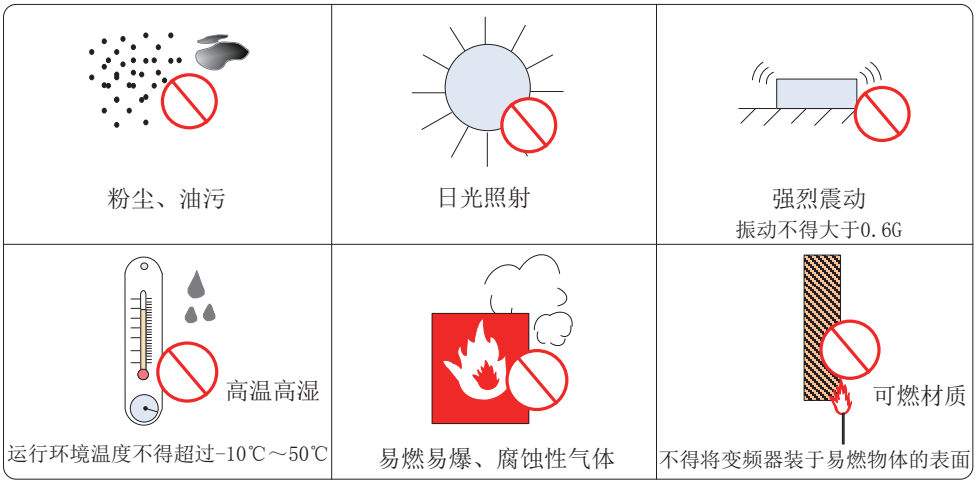
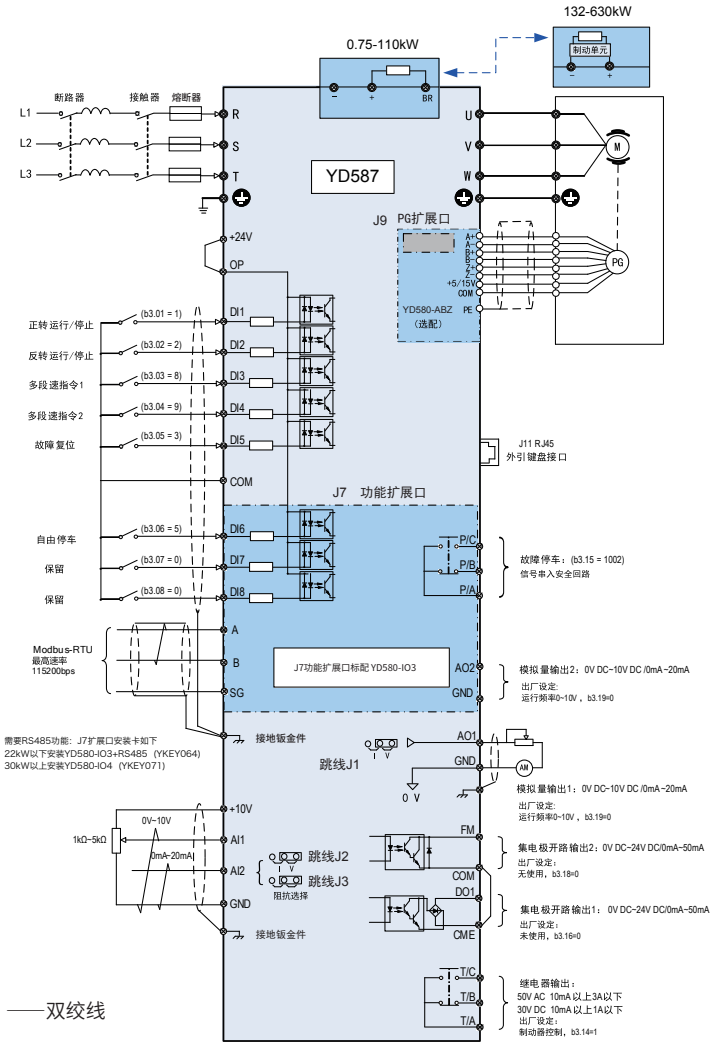


图 3-1 安装环境要求

7） YD587 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



注：——屏蔽层；——双绞线

图 3-26 YD587 典型接线图

3.2.2 主回路端子功能说明及注意事项

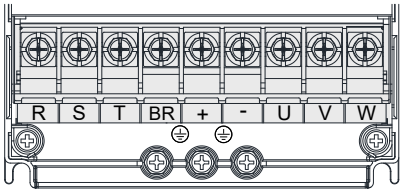


图 3-27 0.75kW~ 22kW 主回路端子分布图

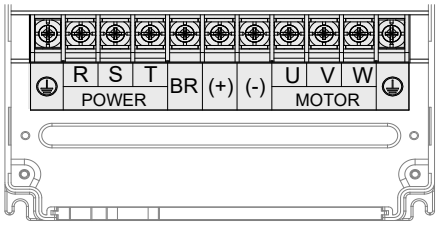


图 3-28 30kW~160kW 主回路端子分布图

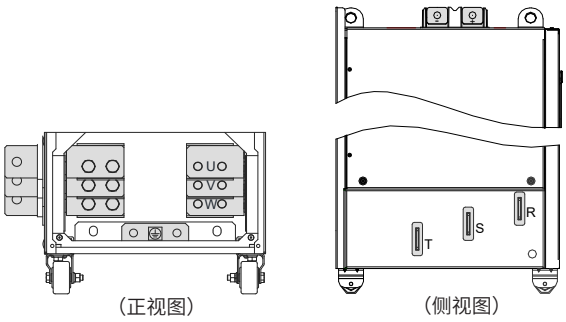


图 3-29 200kW~630kW 主回路端子分布图表 3-4

主回路端子分布图 图表 3-3 YD587 系列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	交流输入电源连接点
（+）、（-）	直流母线正、负端子	共直流母线输入点，或制动单元的连接点
（+）、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

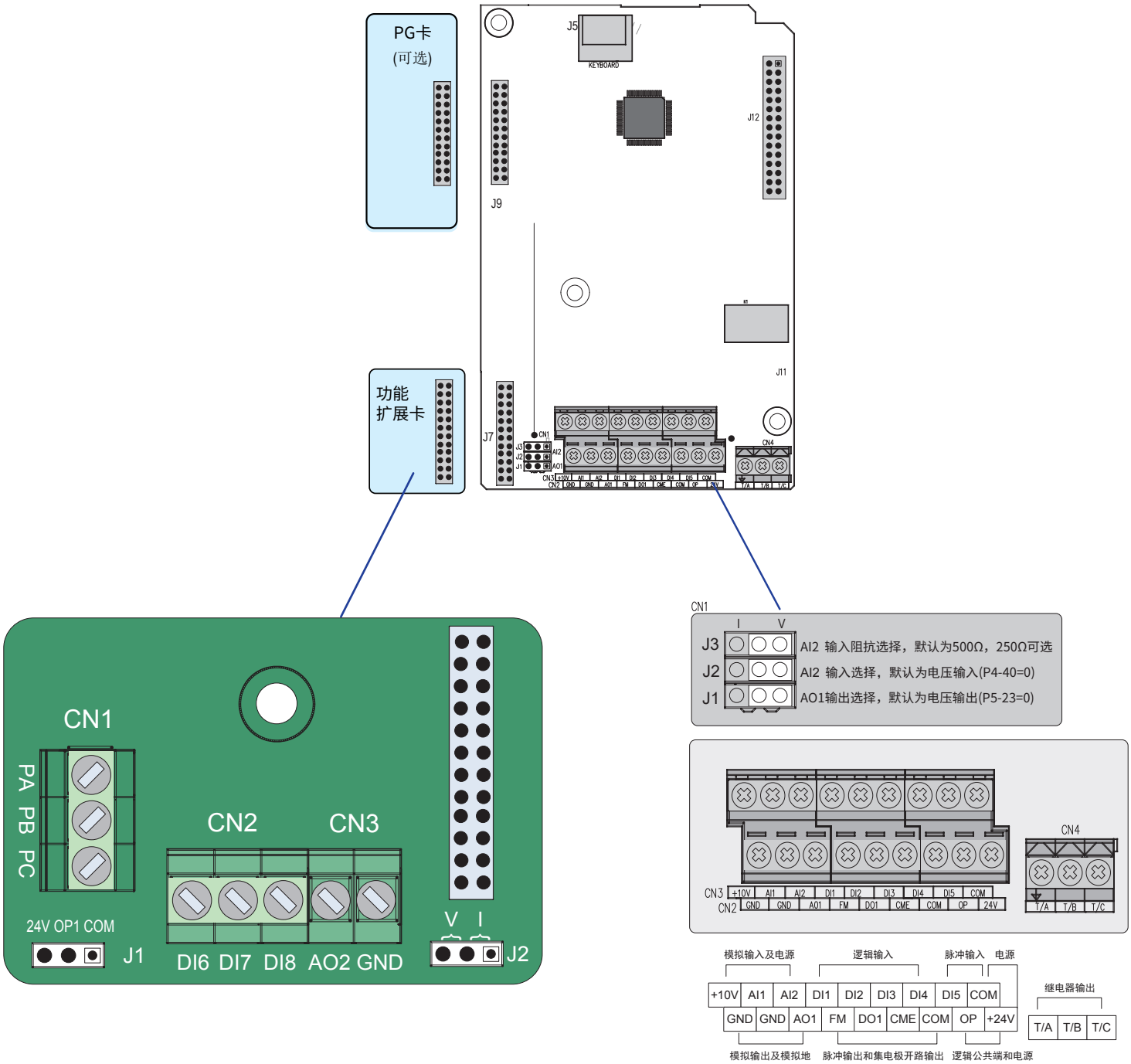


图 3-57 控制回路端子布置图

表 3-17 YD587 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：0V DC~+10V DC 输入阻抗：22kΩ
	AI2-GND	模拟量输入端子 2	输入范围：0V DC~+10V DC/0mA~20mA，由控制板上的 J2 跳线选择决定电压或电流输入。 输入阻抗：电压输入时 22kΩ，电流输入时通过 J3 跳线可选阻抗为 500Ω 或者 250Ω。【注 2】
数字输入	DI1- OP	数字输入 1	光耦隔离，兼容双极性输入 输入阻抗：1.39kΩ 工作电压范围： +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	数字输入 5	
	DI6- OP	数字输入 5	
	DI7- OP	数字输入 6	
	DI8- OP	数字输入 7	
模拟输出	AO1-GND	模拟输出 1	由控制板上的 J1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
	AO2-GND	模拟输出 2	由IO3板上的 J2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
数字输出	DO1-CME	数字输出 1	光耦隔离，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-CME	数字输出 2	
继电器输出	T/A-T/B	常闭端子 1	触点驱动能力： 250V AC，3A，COS ∅ =0.4 30V DC，1A
	T/A-T/C	常开端子 1	
	P/A-P/B	常闭端子 2	
	P/A-P/C	常开端子 2	
辅助接口	J7	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
	J9	PG 卡接口	可选择：OC、差分、旋变等编码器接口
	J5	外引键盘接口	外引键盘
跳线【注 3】	J1	AO1 输出选择	电压、电流输出可选，默认为电压输出
	J2	AI2 输入选择	电压、电流输入可选，默认为电压输入
	J3	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 J1、J2 与 J3 在控制板上的位置如图 3-57 所示。

第四章　面板操作

4.1 面板操作说明

YD587 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 LCD 操作面板外，用户还可选配 LED 操作面板,并实现面板外引。

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	RUN	灯灭：停机
	RUN	灯亮：运行
L/R 运行指令指示灯	LOCAL/ REMOT	灯灭：面板控制
	LOCAL/ REMOT	灯亮：端子控制
	LOCAL/ REMOT	闪烁：通讯控制
FWD/REV 正反转指示灯	FED/REV	灯灭：正转运行
	FED/REV	灯亮：反转运行
TUNE/TC 调谐 / 转矩控制 / 故障指示灯	TUNE/TC	灯灭：正常运行
	TUNE/TC	灯亮：转矩控制模式
	TUNE/TC	慢闪：调谐状态 （1 次 / 秒）
	TUNE/TC	快闪：故障状态（4 次 / 秒）
Hz RPM A % V		频率单位 Hz
Hz RPM A % V		电流单位 A
Hz RPM A % V		电压单位 V
Hz RPM A % V		转速单位 RMP
Hz RPM A % V		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

5 位 LED 显示，可显示各种监视数据、报警代码以及功能参数等，例如：

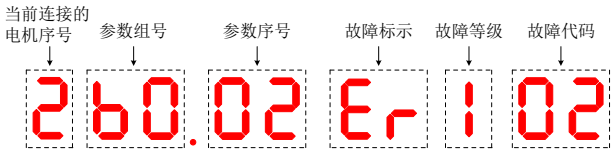


图 4-2 LED 显示举例

NOTE

◆ 当 DI 没有设置为电机切换功能（输入功能 27 和 28）时，当前连接的电机序号位默认不显示。

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	数据或功能码的递增。
▽	递减键	数据或功能码的递减。
▷	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	停机 / 复位	在“操作面板”启停控制方式下，用于停止操作； 故障报警状态时，可用来复位操作。
MF.K	保留	功能保留。
QUICK	快捷键	按此键可快速进入密码输入界面、长按 5 秒可进入快速参数辨识模式。

4.2.4 参数查看、修改方法

YD587 的操作面板显示分为三个界面，分别为：状态显示→功能参数代码→功能参数设定值，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。

操作流程如下图所示。

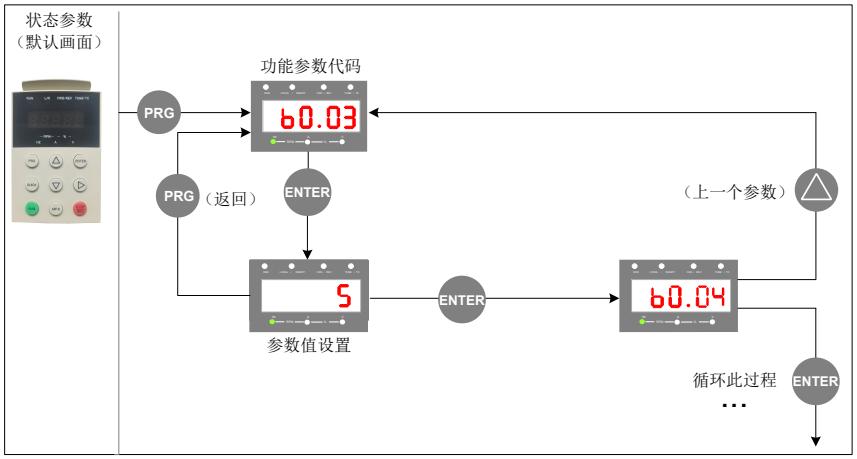


图 4-3 不同界面操作流程图

举例：将功能码 b1.02 从 10.00Hz 更改设定为 15.00Hz。

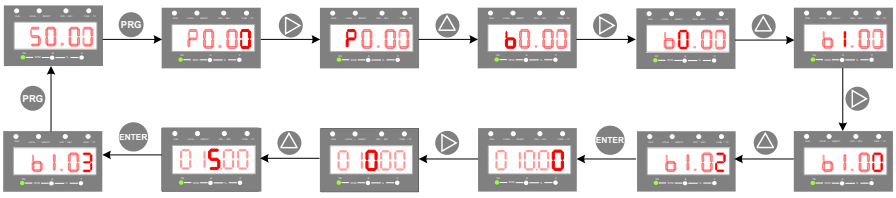


图 4-4 功能码修改示意图

在功能参数设置界面时，若参数没有闪烁位，表示该功能码不能修改，可能原因有：

1） 该功能码为不可修改参数，如监控参数、运行记录参数等。

2） 该功能码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

表 4-4 功能码组成

功能码组	功能描述	说明
P 组	起重机基本参数组	设定电机参数和起重机的基本信息
b 组	变频器功能组	运行指令、频率指令、速度曲线、制动时序等功能参数
F 组	变频器性能组	变频器的核心性能参数
U 组	监视功能码组	变频器基本监视参数的显示。
E 组	故障参数组	故障记录的显示

4.2.6 状态参数的查询

在停机或运行状态下，用操作面板上的键，可以显示多个状态参数。在运行状态下，可查阅给定频率、输出同步频率、输出电流、输出电压、母线电压等五个参数。在停机状态下，只可显示目标频率和母线电压这两个参数。

4.3 LCD 操作面板介绍

YKEY060 是适配于 YD587 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

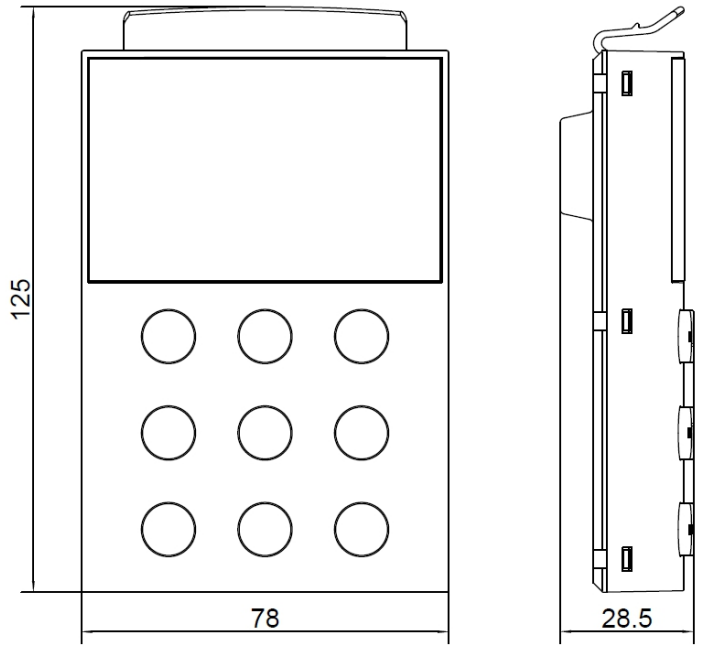


图 4-7 YKEY060 外引操作面板尺寸

第五章　基本操作与试运行

本章介绍起重专用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

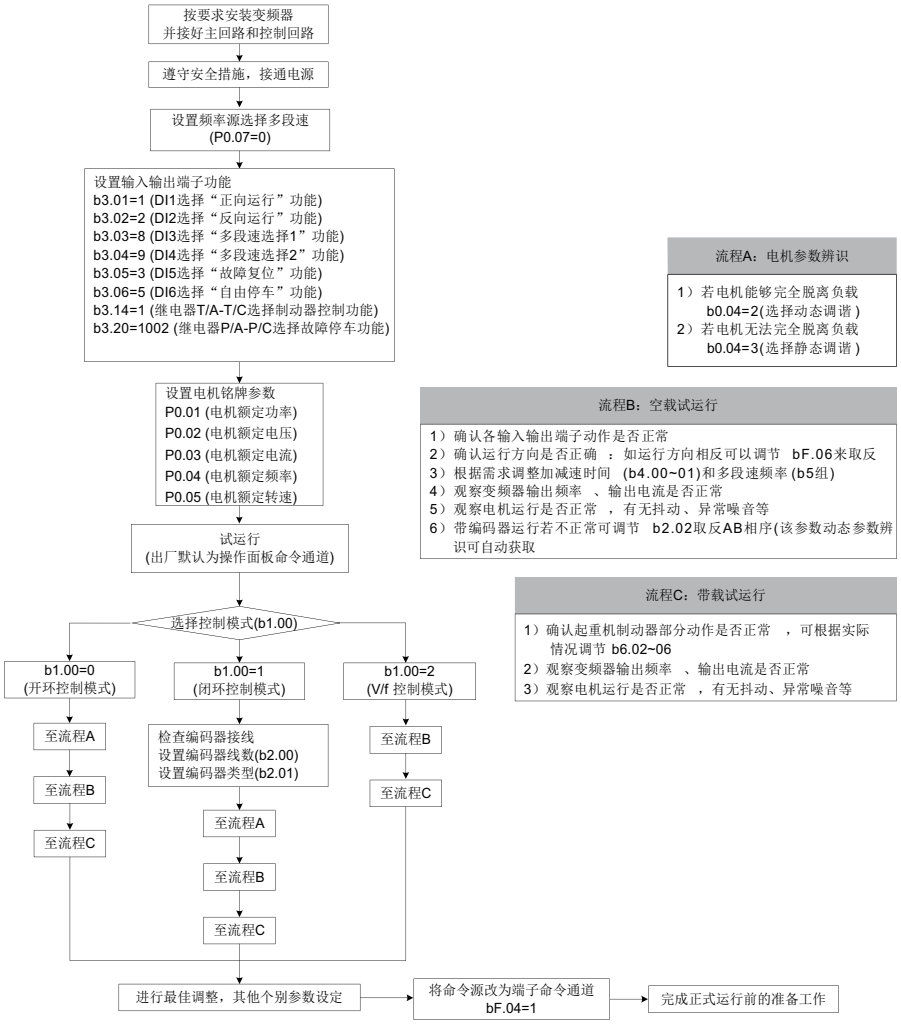


图 5-1 快速调试步骤指南

5.2 接通电源前确认事项

请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 3PH 380V AC~480V AC 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	请确认变频器输出端子（U/V/W）和电机端子的连接是否正确及可靠
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正确及可靠
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

5.3 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 8.00Hz
故障时		故障时变频器处停机状态，显示故障类型

5.4 参数初始化

YD587将整个功能参数分为三级，每级菜单都为用户提供了恢复出厂参数(个别参数不能够恢复)以及用户设定检查功能 (操作面板只显示与出厂默认值不同的参数)。

菜单号	参数名	功能描述	备注
一级菜单	PF.01	一级菜单恢复出厂参数	个别参数不能恢复，具体使用方法请参阅 PF.01 的详细说明
	PF.02	一级菜单用户设定检查	只显示一级菜单中与出厂默认值不同的参数
二级菜单	bF.01	二级菜单恢复出厂参数	支持恢复二级菜单或一级二级同时恢复功能；个别参数不能恢复，具体使用方法请参阅 bF.01 的详细说明
	bF.02	二级菜单用户设定检查	只显示二级菜单中与出厂默认值不同的参数
	bF.03	历史记录清除	清除变频器内掉电存储参数，主要为 U1 组监控参数和故障记录参数，具体使用方法请参阅 bF.03 的详细说明
三级菜单	FF.10	三级菜单恢复出厂参数	支持恢复三级菜单或所有参数同时恢复的功能；个别参数不能恢复，具体使用方法请参阅 FF.10 的详细说明
	FF.11	三级菜单用户设定检查	只显示三级菜单中与出厂默认值不同的参数

5.5 电机控制方式选择

功能码	说明	应用场合
b1.00：选择电机控制方式	设置为 0：无速度传感器矢量控制	指开环矢量控制，适用于普通提升应用
	设置为 1：有速度传感器矢量控制	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。
	设置为 2：V/f 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平移应用。

5.6 启动和停机命令

变频器的启停控制命令有 3 个来源，分别是面板控制、端子控制和通信控制，通过功能参数 bF.04 选择。

bF.04	命令指令选择		出厂值	0
	设定范围	0	操作面板命令通道 (LED 灭)	
		1	端子命令通道 (LED 亮)	
		2	通信命令通道 (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进行运行命令控制。

2：通信命令通道（“LOCAL/REMOT”灯闪烁）

5.6.1 操作面板启停

通过键盘操作，使功能码 bF.04=0，即为面板启停控制方式，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 键，变频器即停止运行 (RUN 指示灯熄灭)。

5.6.2 端子启停（DI）

端子启停控制方式适合采用拨动开关、电磁开关按钮作为应用系统启停的场合，也适合控制器以干接点信号控制变频器运行的电气设计。

YD587提供了端子控制功能，参数 b3.01~b3.13 确定启停控制信号的输入端口。具体设定方法，请查阅 b3.01~b3.13 等参数的详细说明。

例 1：要求将变频器用拨动开关作为变频器启停开关，将正转运行开关信号接 DI1 端口、反转运行开关信号接 DI2 端口，使用与设置的方法如下图：

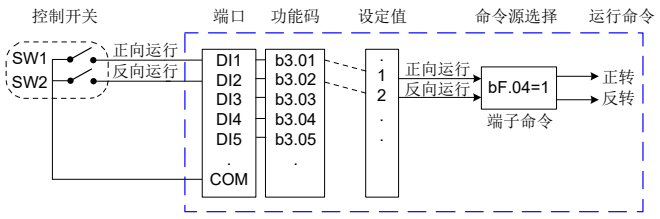


图 5-2 端子启停控制方式举例

上图控制方式中，SW1 命令开关闭合时，变频器正向运行，SW1 命令开关断开时，变频器停机；而 SW2 命令开关闭合时，变频器反向运行，SW2 命令开关断开时，变频器停机；若将 SW1 和 SW2 同时闭合，变频器报 44#(正、反向运行指令同时有效) 故障。

在面板控制方式，按下 RUN 键，变频器驱动马达的转向，称为正向，若此时的旋转方向与设备要求的转向相反，请断电后 (注意待变频器主电容电荷泄放完毕)，将变频器 UVW 输出线中的任何两个接线掉换一下，排除旋转方向的问题；或可以通过将 bF.06 设置为 1 来取反电机的转向。

5.6.3 通信启停

上位机以通信方式控制变频器运行的应用已愈来愈多，插入 RS485 通信接口卡，并将控制命令源选择为通信方式 (bF.04=2)，就可以通信方式控制变频器的启停运行了。通信设置相关的功能码如下图：

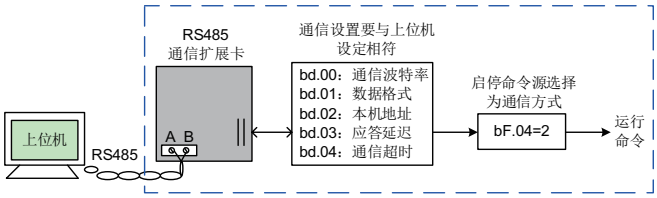


图 5-3 通信启停控制方式举例

上图中，将通信超时时间 (bd.04) 设定为非 0 的数值，即启动了通信超时故障后变频器自动停机的功能，可避免因通信线故障，或上位机故障而导致的变频器不受控运行。在一些应用中可开启这个功能。

5.7 启停设置

5.7.1 启动模式

YD587 采用直接启动方式，内置了专业起重制动器控制时序 (详见 b6 组参数介绍)。

5.7.2 停机模式

YD587的停机模式有2种，分别为减速停机和自由停机，通过功能码b4.03选择。出厂默认采用“减速停机”模式 (b4.03=0)。

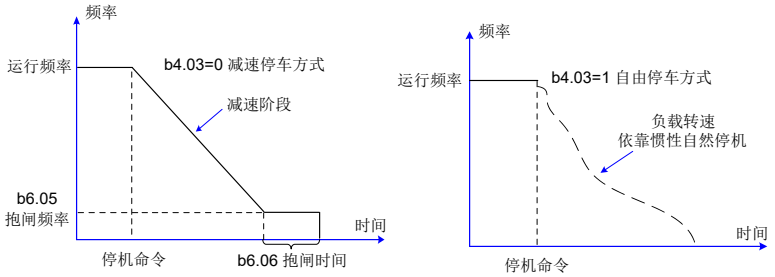


图 5-4 停机模式

5.8 频率给定的来源选择

YD587 共设置了 5 个频率源，分别为多段速、模拟量 AI1、模拟量 AI2、加减速和通信，可以通过 P0.07 和 b3.00 来选择，具体使用方法请查阅这两个参数的说明。

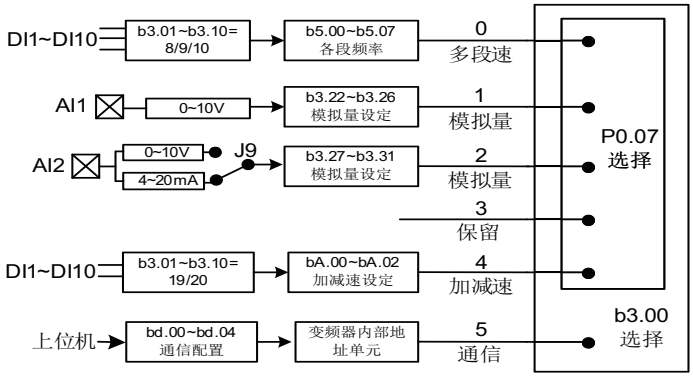


图 5-5 频率给定来源选择

上图中给出了每种频率源给定设置的相关参数，设置时可查阅对应参数的说明。

5.8.1 多段速模式的设置方法

对于仅使用若干个频率值，不需要连续调整变频器给定频率的应用场合，可使用多段速控制。 YD587 最多可设定 8 段给定频率，最多可通过 3 个 DI 输入功能的组合来选择。将 DI 端口对应的功能码设置为 8~10 的功能值，即指定成了多段频率指令输入端口，多段频率可通过 b5 组的多段频率表来设定。将“频率源选择”指定为多段频率给定方式，如下图所示：

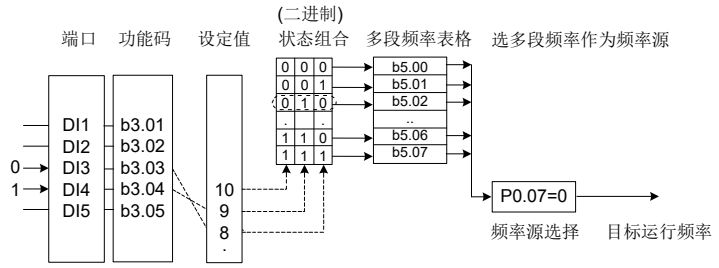


图 5-6 多段速模式设置

上图中，选择了 DI3、DI4 作为多段频率指定的信号输入端，对于缺少的设置位，按状态 0 计算，并按位组成 3 位二进制数，并按状态组合值，挑选多段频率。如图，当 (DI3、DI4 的输入状态)=(0、 1) 时，依次组成 (0、1、0)3 位二进制数，形成的状态组合数为 2，就会挑选 b5.02 功能码所设定的频率值，加之频率源选为“多段速”，即由 (b5.02) 功能码值决定了目标给定频率。

YD587 最多可以设定 3 个 DI 端口作为多段频率指令输入端，也允许少于 3 个 DI 端口进行多段频率给定的情况 (如本例所示)，对于缺少的设置位，一直按状态 0 计算。

5.8.2 模拟量给定频率的设置方法

若要用电位器调节变频器的给定频率，使用方法如下图，图中电位器在全范围调节时，变频器运行时的输出频率可在 0~ 最高频率范围内变化。

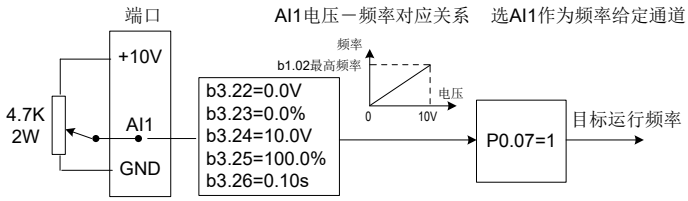


图 5-7 模拟量给定频率设置

5.9 变频器端口使用说明

5.9.1 DI 端口使用说明

DI 端口的内部硬件上配有 24V DC 检测用电源，用户只需将 DI 端口与 COM 端口短接，即可给变频器输入该 DI 的信号。

变频器对 DI 端口的输入信号还设置了软件滤波时间 (b3.21)，可提高抗干扰水平。

上述 8 个 DI 端口的功能，可在 b3.01~b3.08 功能码中进行使用功能选择。具体使用方法参阅b3.01~b3.08 功能码的详细说明。

5.9.2 AI 端口使用说明

变频器共支持 2 路 AI 资源，为控制板上的 AI1 和 AI2。

端口	输入信号特性
AI1-GND	可接受 0V DC ～ 10V DC 信号
AI2-GND	跳线 J2 在“V”标识位置，可接受 0V DC ～ 10V DC 信号； 跳线 J2 在“I”标识位置，则可接受 4mA ～ 20mA 电流信号

AI 可以作为变频器使用外部电压电流信号作为频率源给定、转矩给定等情况时使用。电压或电流值对应实际给定或反馈物理量关系通过 b3.22 ～ b3.31 设定。

AI 端口的采样值，可以在参数 U0.12 和 U0.13 中读取；其折算后的计算值供内部后续计算使用，用户无法直接读取。

5.9.3 DO 端口使用说明

控制板自带 5 路 DO 输出，分别为 FM、DO1、T/A-T/B-T/C、P/A-P/B-P/C，其中 FM、DO1为晶体管型输出，可驱动 24V DC 低压信号回路，T/A-T/B-T/C、P/A-P/B-P/C 则为继电器输出，可驱动 250V AC 控制回路。

端口名称	对应功能码	输出特性说明
FM-CME	b3.18	晶体管；驱动能力：+24V DC， 50mA
DO1-CME	b3.16	晶体管；驱动能力：+24V DC，50mA
T/A-T/B-T/C	b3.14	继电器；驱动能力：250V AC，3A
P/A-P/B-P/C	b3.15	

5.9.4 AO 端口使用说明

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 IO3。

端口	输入信号特性
AO1-GND	J7 短接“V”标识位置，可输出 0V DC ～ 10V DC 信号
	J7 短接“I”标识位置，可输出 0mA ～ 20mA 电流信号
AO2-GND	该端口在扩展板提供，可输出 0V DC ～ 10V DC 信号

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 b3.19 和 b3.20来选择。
所指定的运行参数在输出之前，还可以进行修正，修正特性曲线如下图中的斜线，Y ＝ kX+b，其中的 X 为待输出的运行参数，AO1 的 k 和 b 可由参数 b3.44 和 b3.43 设定。

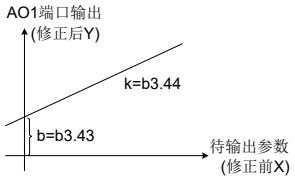


图 5-8 AO1 端口输出特性曲

5.9.5 PG 端口使用说明

采用有传感器的闭环矢量控制 (b1.00=1)，可以提高变频调速性能，则需给电机轴上安装编码器，将编码器的信号经 PG 卡 (编码器信号接口卡) 反馈给变频器。YD587 系列变频器共有 5 种不同信号特性的 PG 卡可供用户选用。

变频器所支持 4 种编码器类型，分别为差分编码器、UVW 编码器、旋转变压器、开路集电极编码器。

根据实际所使用的编码器类型需要设定不同的编码器相关参数，以电机参数组 1 为例说明如下：

1) 为差分编码器时，b2.00 设置编码器线数，b2.01 设置为 0：ABZ 增量编码器 / 差分编码器；
2) 为 UVW 编码器时，b2.00 设置编码器线数，b2.01 设置为 1：UVW 增量编码器；
3) 为旋转变压器时，b2.01 设置为 2：旋转变压器；
4) 为开路集电极 / 推挽型编码器时，b2.00 设置编码器线数，b2.01 设置为 0: ABZ 增量编码器；

5.10 电机参数辨识

5.10.1 需要设定的电机参数

变频器以“矢量控制”(b1.00=0 或 1) 模式运行时，对准确的电机参数依赖性很强，这是与“V/f 控制”(b1.00=2) 模式的重要区别之一，要让变频器有良好的驱动性能和运行效率，变频器必须获得被控电机的准确参数。

5.10.2 电机参数的自动参数辨识

让变频器自动学习电机内部电气参数的方法有：动态辨识、静态辨识方式。

辨识方式	适用情况	辨识效果	参数设定
静态辨识 (完整辨识)	适用于所有场合	佳	b0.04=3
空载动态辨识 (完整辨识)	电机与应用系统方便脱离的场合，如果电机负载为辊筒类型负载（纯惯量负载），在参数辨识过程中也可以不拆除辊筒直接进行辨识。	最优	b0.04=2
静态辨识 (不完整辨识)	适用于电机与负载很难脱离，且不允许动态辨识运行的场合（不辨识电机互感抗、空载电流）	可以	b0.04=1

1. 电机参数动态参数辨识步骤如下：

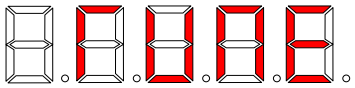
第一步：若电机可以和负载完全脱开，请在断电的情况下，从机械上将电机与负载部分脱离，保证电机能空载自由转动。

第二步：上电后，首先将变频器命令源 (bF.04) 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 P0.01~P0.05)，请按电机实际参数输入下面的参数 (根据当前电机选择)：

手动设置参数
P0.01：电机额定功率 P0.02：电机额定电压 P0.03：电机额定电流 P0.04：电机额定频率 P0.05：电机额定转速

第四步：若电机可以和负载完全脱开，则将功能码 b0.04 设为 2(异步机动态参数辨识)，然后按 ENTER 键确认。此时，键盘显示：



然后按键盘面板上“RUN” 键，变频器会驱动电机开始运行 (加减速时间为 b4.06 和 b4.07 的设定值)，运行指示灯点亮。上述显示信息消失，退回正常参数显示状态时，表示参数辨识完成。

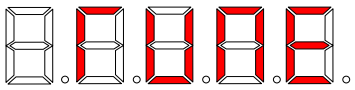
经过该动态参数辨识，变频器会自动学习出电机的下列参数：

辨识后自动刷新的参数
F0.00：异步电机定子电阻 F0.01：异步电机转子电阻 F0.02：异步电机漏感抗 F0.03：异步电机互感抗 F0.04：异步电机空载电流

如果电机不可和负载完全脱开，则将 b0.04 设置为 1 或 3(推荐)，开始电机参数的静态参数辨识。静态参数辨识方式 3 也能够学习完整电机参数，但参数辨识时间略长。

2. 一键快速参数辨识功能：

常按变频器面板上的“QUICK” 按键 5s，面板直接显示 “TUNE” 标识，再按 “RUN” 启动参数辨识。



该功能主要针对于现场电机参数已经设置完成，需要重新进行电机参数辨识的情况，快速参数辨识默认参数辨识方式为 3，完整静态电机参数辨识，不需要电机脱开负载，不需要更改 bF.04等参数。

5.11 密码设置

YD587 提供了用户密码保护功能

参数名	功能描述	内容
PF.00	所有功能参数密码	P 组、b 组、E 组、U 组、F 组密码
bF.00	二级菜单密码	b 组、E 组、U 组、F 组密码
FF.00	三级菜单密码	F 组密码

当 PF.00、bF.00、FF.00 设为非零时启用密码功能，此时按下操作面板的“QUICK” 键将显示 “-----” ，必须正确输入用户密码，才能进入菜单，否则无法进入。如果连续输入三次以上错误密码，系统将被锁定，无法查看。断电再上电后可以继续输入密码，将 AF.00、bF.00、FF.00 重新设为 0 后，密码解除。

5.12 应用举例

5.12.1 起重系统的制动

■ 制动时序介绍

YD587 软件内置了制动器时序控制功能，该功能要求将一个输出端口选择为输出功能 1(制动器控制)。具体的制动器控制时序如下图所示：

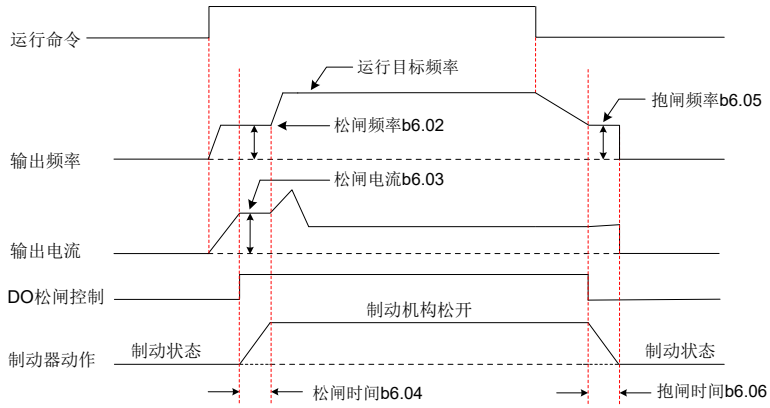


图 5-9 起重系统典型控制工艺及功能码

制动器的制动机构在没有得电时，为抱闸状态，必须在给制动机构通电的条件下，才会松闸；由于制动器的动作需要有机械动作，因此变频器的制动器输出信号与制动状态会有一个机械延迟，松闸时间 (b6.04)、抱闸时间 (b6.06) 需根据实际制动器的机械延迟来进行设置。理论上，这两个参数的设置实际要稍长于机械延迟，避免出现溜钩的现象。

5.12.2 安全限位及故障停机

安全限位与故障停机的电气接线图如下图所示，在轨道的两端分别安装一个限位开关，在机构触碰到限位开关时，控制柜自动切断变频器该方向的运行命令，此时反方向运行不受影响，在此情况下，可通过按反方向运行开关，使设备恢复正常运行；

当变频器产生一级故障时，IO 扩展卡上的继电器端子 P/C-P/A 吸合，输出故障停机信号使控制柜中的故障接触器 KM 动作继而做出相应处理 (如断开运行回路等，此时需进行故障复位后设备才能够恢复正常运行。)

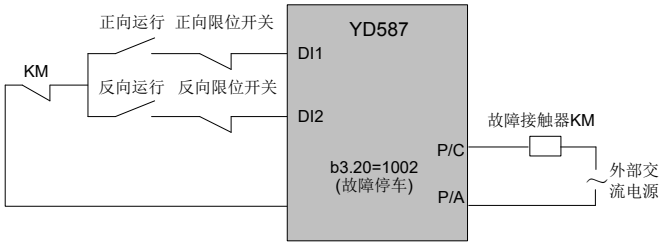


图 5-10 安全限位及故障停机应用接线图

NOTE

◆ 在此提到的限位开关接法为常用接法之一，用户可以根据自身情况进行更改。

第六章 参数说明

YD587 系列变频器中，部分参数为“厂家保留”，其序号在功能参数表中没有列出，导致表中部分参数序号不连续，对于手册中没有介绍的参数，请用户不用试图进行修改，避免引起错误。

变频器部分功能参数需要在变频器停机状态下修改，变频器正在运行时不能修改。监控参数在操作面板上稳定显示，不能修改。

6.1 一级菜单 (P 组) 参数表

一级菜单主要包含电机参数和起重机的基本特性参数，正确完成一级菜单参数的设置便能控制变频器带动电机正常运行，若需要进一步完善变频器功能则需要进入二级菜单进行设置。

<table>
<tr><th>参数</th><th>名称</th><th>参数说明</th><th>设置范围</th><th>出厂值</th></tr>
<tr><td colspan="5">P0 组：起重机基本参数</td></tr>
<tr><td>P0.01</td><td>电机额定功率</td><td>该参数表示电机铭牌显示的该电机的额定功率。</td><td>0.4kW~1000.0kW</td><td>机型确定</td></tr>
<tr><td>P0.02</td><td>电机额定电压</td><td>该参数表示电机铭牌显示的该电机的额定电压。</td><td>0V~2000V</td><td>380V</td></tr>
<tr><td>P0.03</td><td>电机额定电流</td><td>该参数表示电机铭牌显示的该电机的额定电流。</td><td>(≤ 55kW)
0.01A~655.35A
(>55kW)
0.1A~6553.5A</td><td>机型确定</td></tr>
<tr><td>P0.04</td><td>电机额定频率</td><td>该参数表示电机铭牌显示的该电机的额定频率。</td><td>0.01Hz~b1.02
(最高频率)</td><td>50.00Hz</td></tr>
<tr><td>P0.05</td><td>电机额定转速</td><td>该参数表示电机铭牌显示的该电机的额定转速。</td><td>0rpm~65535rpm</td><td>1400rpm</td></tr>
<tr><td>P0.07</td><td>频率源选择 A</td><td>该参数配合二级菜单中的 b3.00(频率源选择 B) 一同使用。一级菜单中的 A0.07 只列出 4 种常用频率源，二级菜单中的 b3.00 列出所有频率源。若 b3.00>4 则最终频率源以 b3.00 为准，若 b3.00 ≤ 4 则最终频率源以 A0.07 为准。
0：多段速给定
输入功能 8、9、10 三个点进行二进制组合实现八个段速，分别对应 b5.00~b5.07 所设定的频率。具体使用方法请查阅 b5 组参数的介绍。
1：AI1 给定
仅支持 0V~10V 电压型输入。
2：AI2 给定
支持 0V~10V 电压型输入或 4mA~20mA 电流型输入，由控制板上的 J9 跳线选择输入类型。
输入模拟量与目标频率为正比线性对应关系，基准频率为 b1.02(最高频率)。
3：保留
4：加减速给定
需配合输入功能 19 和 20 一同使用。详见 bA 组参数介绍。</td><td>0~4</td><td>0</td></tr>
<tr><td>P0.08</td><td>起重机构选择</td><td>该参数用于选择变频器所驱动的起重机构类型。
0：起升机构
1：平移机构
2：旋转机构
<table>
<tr><th>机构类型</th><th>相关功能码</th><th>含义</th></tr>
<tr><td rowspan="5">起升机构</td><td>b1.00=0</td><td>控制模式改为开环</td></tr>
<tr><td>b6.03=30.0%</td><td>松闸电流改为 30.0%</td></tr>
<tr><td>bC.02=0.50s</td><td>37# 故障使能</td></tr>
<tr><td>bC.04=0.50s</td><td>38# 故障使能</td></tr>
<tr><td>F1.00=60</td><td>速度环增益 1 改为 60</td></tr>
<tr><td rowspan="5">平移机构</td><td>b1.00=2</td><td>控制模式改为 V/f 控制</td></tr>
<tr><td>b6.03=0.0%</td><td>松闸电流改为 0.0%</td></tr>
<tr><td>bC.02=0.0s</td><td>37# 故障无效</td></tr>
<tr><td>bC.04=0.0s</td><td>38# 故障无效</td></tr>
<tr><td>F1.00=30</td><td>速度环增益 1 改为 30</td></tr>
<tr><td>旋转机构</td><td colspan="2">与平移机构相同</td></tr>
</table>
注：当改变 P0.08 时，表格中涉及到的功能码将会自动更改。</td><td>0~2</td><td>0</td></tr>
<tr><td colspan="5">PF 组：一级菜单辅助参数</td></tr>
<tr><td>PF.00</td><td>用户密码</td><td>该参数表示所有功能参数的显示和修改密码。若该参数设置为非零值则进入任何菜单均需要输入该密码。若连续输入三次错误密码则所有菜单被锁定，需要重新上电才能继续查看或修改参数，重新设为 0 后，密码解除。</td><td>0~65535</td><td>0</td></tr>
<tr><td>PF.01</td><td>一级菜单恢复出厂参数</td><td>0：不恢复
1：恢复一级菜单出厂参数
一级菜单中的 P0.00~05、P0.08~09、PF.00 不恢复</td><td>0~1</td><td>0</td></tr>
<tr><td>PF.02</td><td>一级菜单设定检查</td><td>0：正常显示所有一级菜单参数
1：只显示与出厂默认值不同的一级菜单参数
2：一级菜单全部点亮显示</td><td>0~2</td><td>0</td></tr>
</table>

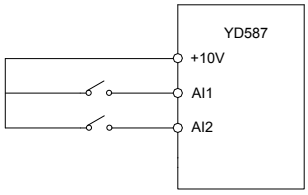
6.2 二级菜单 (b 组、E 组、U 组) 参数表

二级菜单主要包含变频器的各种基本功能参数、监控参数和故障存储参数组，正确完成二级菜单参数的设置便能实现内含的所有功能，若需要进一步提升变频器的输出性能则需要进入三级菜单进行设置。

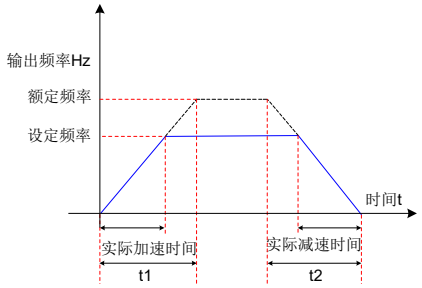
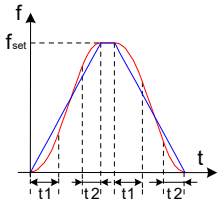
进入二级菜单需要正确输入参数 bF.00 所设定的密码。

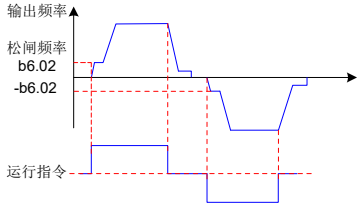
参数	名称	参数说明	设置范围	出厂值
b0 组：电机基本参数				
b0.00	轴冷电机低速运行保护频率	这两个参数为 43# 故障所使用，属于对轴冷电机的一项保护。当变频器给定频率低于 b0.00 的设定值且维持时间超过 b0.01 的设定值时变频器报 43# 故障。 b0.01 设定为 0 则该功能无效。	0.01Hz~20.00Hz	5.00Hz
b0.01	轴冷电机低速运行时间		0s~1000s	0s
b0.04	参数辨识选择	0：无操作 1：异步机静态参数辨识 (学习部分电机参数) 2：异步机动态参数辨识 (学习全部电机参数) 3：异步机静态参数辨识 (学习全部电机参数)	0~3	0
b0.05	上电自动参数辨识选择	具有上电自动参数辨识定子电阻功能。 若启用该功能，则变频器每次上电后自动进行 2s~3s 静态参数辨识，以确保最优的控制效果。 0：不使用该功能 1：使用	0~1	0
b1 组：电机控制参数				
b1.00	控制方式	0：不带编码器矢量控制 (开环控制模式) 1：带编码器矢量控制 (闭环控制模式) 2：V/f 控制	0~2	0
b1.01	滑差补偿	对于不带编码器矢量控制，该参数用来调整电机的稳速精度，当电机重载时速度偏低则加大该参数，反之则减小； 对于带编码器矢量控制，该参数可以调节同样负载下变频器的输出电流。	50.0%~200.0%	100.0%
b1.02	最高频率	当频率源选择为模拟量、通信时，该参数作为目标频率计算的基准值。 该参数表示变频器在任意时刻输出频率的最高上限值。	50.00Hz ~150.00Hz	50.00Hz
b1.03	最低频率	该参数表示变频器在任意时刻输出频率的最低下限值。	0.00Hz~15.00Hz	0.00Hz
b1.04	正向转矩上限	这两个参数分别表示变频器正转运行 (输入功能 1 有效) 和反向运行 (输入功能 2 有效) 时的输出转矩上限值，对应电机额定转矩的百分比。在无传感器矢量控制模式 (开环) 下，即使设定值小于 50.0% 变频器也判定为 50.0%。	0.0%~500.0%	180.0%
b1.05	反向转矩上限			
b1.06	松闸正向转矩上限	这两个参数仅在 b6.00 选择为 2（手动制动控制）时有效：变频器启动后在松闸时间（b6.04）内，转矩上限为这两个参数的设定值，当制动器完全打开后转矩上限切换为 b1.04 和 b1.05 的设定值。		150.0%
b1.07	松闸反向转矩上限			130.0%
b2 组：编码器设置参数				
b2.00	编码器线数	该参数用于设定 ABZ 或 UVW 增量编码器每转脉冲数。 带速度传感器矢量控制方式下，必须正确设置编码器脉冲数，否则电机运行将不正常。	0~8192	1024
b2.01	编码器类型	0：ABZ 增量编码器 / 差分编码器 对应使用 YD580-ABZ 1：UVW 增量编码器 对应使用 YD580-PG 2：旋转变压器 对应使用 YD580-RZV 3：保留 4：保留 YD587 支持多种编码器类型，不同编码器需要选配不同的PG 卡，使用时请正确选购 PG 卡。 安装好 PG 卡后，要根据实际情况正确设置该参数，否则变频器可能运行不正常。	0~4	0
b2.02	ABZ 增量编码器 AB 相序选择	该参数只对 ABZ 增量编码器有效，即仅 b2.01=0 时有效。 用于设置 ABZ 增量编码器 AB 信号的相序。 在异步机动态参数辨识时变频器自动识别 AB 相序。	0~1	0
b2.03	编码器断线检测功能选择	该参数作为 20# 故障 (编码器断线检测) 的使能信号。设置为 1 则启用 20# 故障检测，设置为 0 则屏蔽 20# 故障。	0~1	1
b2.07	编码器断线检测时间	该参数用于设定编码器硬件断线检测时间，该功能仅针对 YD580-ABZ 有效，该参数设置为 0 则屏蔽硬件断线检测功能。 当编码器信号异常时，变频器报 Er120 故障	0.000s~10.00s	0.000s

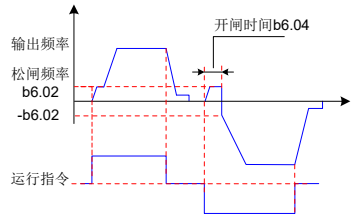
<table>
<tr><th>参数</th><th>名称</th><th>参数说明</th><th>设置范围</th><th>出厂值</th></tr>
<tr><td colspan="5">b3 组：输入输出控制参数</td></tr>
<tr><td>b3.00</td><td>频率源选择 B</td><td>0~4：参照 P0.07 介绍
5：通信给定
支持六种通信方式给定，分别为 Modbus-RTU、EtherCAT、EtherNet/IP、CANopen、PROFIBUS DP、PROFINET
不同通信方式选择对应的扩展卡不同，bd.07 设置不同，详细参照 10.2 通信扩展卡说明及 bd.07 介绍。
频率给定数据格式参照相应通信方式的详细介绍。</td><td>0~6</td><td>0</td></tr>
<tr><td>b3.01</td><td>DI1 功能选择</td><td rowspan="6">1：正向运行
2：反向运行
通过外部端子来控制变频器正转与反转。
3：故障复位
利用端子进行故障复位的功能。与键盘上 RESET 键功能相同。用此功能可实现远距离故障复位。
4：快速停机
变频器立即输出抱闸频率 (b6.05) 并正常执行抱闸时序。
5：自由停机
变频器封锁输出，此时电机的停机过程不受变频器控制。此方式与 b4.03 所述的自由停机的含义是相同的。
6：减速停机
变频器正常减速并经过抱闸时序后停机，与取消运行命令的效果相同。
7：外部故障输入
当该信号送给变频器后，变频器报 50#(外部输入) 故障。
8：多段速选择 1
9：多段速选择 2
10：多段速选择 3
频率源选择“多段速给定”时有效，详细内容请查阅 b5 组参数的介绍。
11：松闸反馈
12：抱闸反馈
41# 和 42# 故障的反馈输入信号。具体使用方法请查阅这两个故障的详细介绍。
13：第 2 段加速斜坡切换
14：第 2 段减速斜坡切换
15：第 3 段加速斜坡切换
16：第 3 段减速斜坡切换
特殊曲线运行加减速时间的 DI 切换点输入功能。具体使用方法请查阅 b8 组特殊曲线参数。</td><td rowspan="6">0~133
(输入功能 1~33 为对应功能的常开输入；
101~133 为对应功能的常闭输入；
0 和 100 无效)</td><td>1</td></tr>
<tr><td>b3.02</td><td>DI2 功能选择</td><td>2</td></tr>
<tr><td>b3.03</td><td>DI3 功能选择</td><td>8</td></tr>
<tr><td>b3.04</td><td>DI4 功能选择</td><td>9</td></tr>
<tr><td>b3.05</td><td>DI5 功能选择</td><td>3</td></tr>
<tr><td>b3.06</td><td>DI6 功能选择</td><td>5</td></tr>
<tr><td>b3.07</td><td>DI7 功能选择</td><td rowspan="5">19：加速运行
20：减速运行
由外部端子给定频率时修改频率的递增、递减指令。在频率源选择为“加减速给定”时有效。
21：转矩 / 速度控制切换
该功能输入有效则变频器进入转矩控制模式；无效则进入速度控制模式。具体使用方法请查阅 bb 组转矩控制参数。
22：正向停止开关
23：反向停止开关
24：正向减速开关
25：反向减速开关
停止开关有效后变频器执行快速停机动作 (与输入功能 4 相同)，减速开关有效后变频器运行的最高输出频率被限制到 bF.16(减速开关限制频率) 所设定的频率。通过这 2 对输入点可以实现简易的定位功能。
26：定位点屏蔽
该功能输入有效则停止和减速开关输入均无效
27：电机切换开关 1
28：电机切换开关 2
内置 3 套完整功能参数，可实现 3 台电机的切换使用。
电机切换功能必须在变频器停止输出时才有效。一旦选择这两个输入功能，则其他两套参数的相同 DI 点将强制选择这两个输入功能。这两个输入功能为二进制组合，逻辑如下表所示：
<table><tr><th>输入功能 28</th><th>输入功能 27</th><th>使用电机序号</th></tr><tr><td>无效</td><td>无效</td><td>1# 电机</td></tr><tr><td>无效</td><td>有效</td><td>2# 电机</td></tr><tr><td>有效</td><td>无效</td><td>3# 电机</td></tr><tr><td>有效</td><td>有效</td><td>3# 电机</td></tr></table>
31：位置校验
一旦该功能输入有效则变频器内部累计的当前脉冲数复位成 b7.10× b7.11，位置数据复位成 b7.11 的设定值，具体使用方法请查阅 b7.10 和 b7.11 的说明。
33：计数器输入</td><td rowspan="5">0~133
(输入功能 1~33 为对应功能的常开输入；
101~133 为对应功能的常闭输入；
0 和 100 无效)</td><td>0</td></tr>
<tr><td>b3.08</td><td>DI8 功能选择</td><td>0</td></tr>
<tr><td>b3.09</td><td>DI9 功能选择</td><td>0</td></tr>
<tr><td>b3.10</td><td>DI10 功能选择</td><td>0</td></tr>
</table>

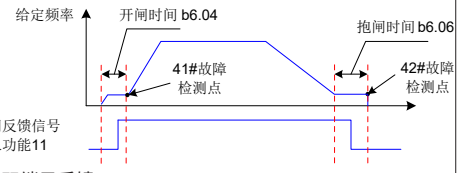
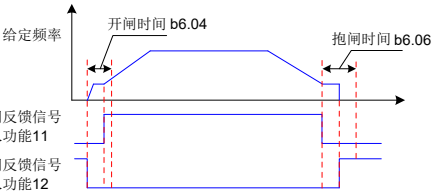
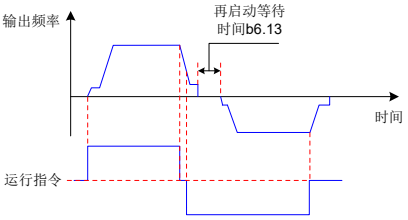
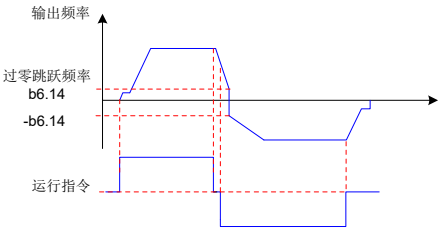
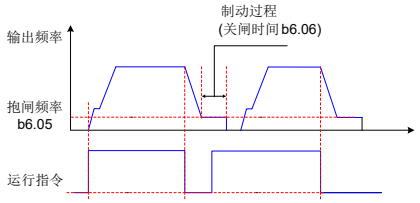
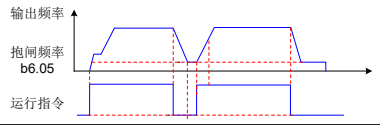
参数	名称	参数说明	设置范围	出厂值
b3.11	AI1 功能选择	该参数设定为 0 时表示对应 AI 输入点用作目标频率输入或没有使用；设定为非 0 时用作数字量输入，此时输入功能与 b3.01~10 相同，输入电压高于 7.00V 时变频器判断输入有效，输入电压低于 3.00V 时认为输入无效。 用作数字量输入时，推荐接线方式如下图所示：  	0~133 (输入功能 1~33 为对应功能的常开输入； 101~133 为对应功能的常闭输入； 0 和 100 无效)	0
b3.12	AI2 功能选择			
b3.14	继电器 1 功能选择 (T/A-T/B-T/C)	1：制动器控制 在制动时序中满足制动器打开条件后该输出有效。具体使用方法请查阅 b6 组参数介绍。 2：故障停机 变频器产生 1 级故障后输出。 3：故障报警 变频器产生 2 级、3 级故障后输出。 4：故障提示 变频器产生 4 级故障后输出。 5：电机 1 接通指示 6：电机 2 接通指示 7：电机 3 接通指示 若选择 5~7 三种输出功能，则其他两套电机参数相同输出点的输出功能将会强制跟随变化。 8：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。 9：电机过载预报警 电机过载保护动作之前，根据过载预报警的阈值判断，在超过预报警阈值后输出有效。电机过载参数设定参见 bE.00~bE.02 的说明。 11：超载保护启动 变频器进入超载保护状态后该输出功能有效。具体使用方法请查阅 bE.13 的说明。 12：过转矩输出 变频器的输出转矩超过参数 bF.17 的设定值后该功能输出有效，低于设定值的 90% 后输出无效。具体使用方法请查阅 bF.17 的说明。 13：电机风扇控制 变频器运行后该功能输出有效，变频器停止运行后延迟 bF.21 设定的时间后该功能输出无效。 14：频率到达输出 具体使用方法请查阅 bF.07 及 bF.08 说明。 15：变频器运行中 变频器处于运行状态时该功能输出有效，变频器停机运行后该功能输出无效。 16：自启动功能输出 变频器自启动功能有效时，该功能输出有效，详细参见 bC.00 最新注解。 17：保留 18：通信控制 输出功能受通信命令控制，具体参照 U0.11 介绍。	0~118 (输出功能 1~18 为对应功能的常开输出； 101~118 为对应功能的常闭输出； 0 和 100 无效)	0
b3.15	继电器 2 (P/A-P/B-P/C) (YD580-IO3)			13
b3.16	DO1 功能选择			0
b3.17	DO2/ 继电器 Y2 功能选择			4
b3.18	FM 功能选择	该参数的千位设置为 1 表示 FM 输出点使用数字量输出，此时输出功能与 b3.12~17 相同；千位设置为 0 表示 FM 输出点使用高速脉冲输出，此时输出功能与 b3.19~20 相同。	0~118 (输出功能 1~18 为对应功能的常开输出； 101~118 为对应功能的常闭输出； 0 和 100 无效)	0
b3.19	AO1 功能选择	这两个参数的千位设置为 1 表示模拟量输出点用作数字量输出，输出功能与 b3.14~17 相同，有效输出 10.00V，无效输出 0.00V；千位设置为 0 表示用作模拟量输出，输出范围与模拟量输出 0.0%~100.0% 相对应。		0
b3.20	AO2 功能选择	个位：AO 输出功能选择 0：输出频率 0~ 最高频率 1：输出电流 0~2 倍电机额定电流 2：输出转矩 0~2 倍电机额定转矩 3：输出功率 0~2 倍电机额定功率 4：输出电压 0~1.2 倍电机额定电压 5：目标频率 0~ 最高频率 6：通信控制输出 十位：保留 百位：保留 千位：数字量 / 模拟量输出选择 0：模拟量输出 1：数字量输出 万位：保留 输出受外围通信控制，具体参照 U0.15,U0.16。		0
	继电器 Y1 功能选择			
	P/A-P/C 功能选择			1001

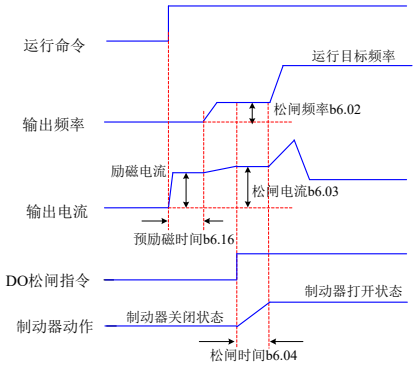
参数	名称	参数说明	设置范围	出厂值
b3.21	DI 滤波时间	设置 DI 端子状态的软件滤波时间。若使用场合输入端子易受干扰而引起误动作，可将此参数增大，以增强其抗干扰能力。但是该滤波时间增大会引起 DI 端子的响应变慢。	0.000s~1.000s	0.010s
b3.22	AI1 最小输入	b3.22~26 用于设置模拟量输入电压与其代表的设定值之间的关系。当模拟量输入的电压大于所设定的“最大输入”时，则模拟量电压按照“最大输入”计算；同理，当模拟输入电压小于所设定的“最小输入”时，则根据“AI 低于最小输入对应设定”的设置以最小输入或者 0.0% 计算。 当模拟输入为电流输入时，1mA 电流相当于 0.5V 电压。 输入滤波时间，用于设置 AI 的软件滤波时间，当现场模拟量容易被干扰时，请加大滤波时间，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。 在不同的应用场合，模拟设定的 100.0% 所对应标称值的含义有所不同，具体请参考各应用部分的说明。	0.00V~b3.24	0.00V
b3.23	AI1 最小输入对应设定		0.0%~100.0%	0.0%
b3.24	AI1 最大输入		b3.22~10.00V	10.00V
b3.25	AI1 最大输入对应设定		0.0%~100%	100.0%
b3.26	AI1 滤波时间		0.00s~10.00s	0.10s
b3.27	AI2 最小输入	功能及使用方法请查阅 b3.22~b3.26 的说明。	0.00V~b3.29	0.00V
b3.28	AI2 最小输入对应设定		0.0%~100.0%	0.0%
b3.29	AI2 最大输入		b3.27~10.00V	10.00V
b3.30	AI2 最大输入对应设定		0.0%~100%	100.0%
b3.31	AI2 滤波时间		0.00s~10.00s	0.10s
b3.43	AO1 零偏系数	这两组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。 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 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：若模拟输出内容为给定频率，希望在频率为 0 时输出 8V，频率为最大频率时输出 3V，则增益应设为“-0.50”，零偏应设为“80%”。	-100.0%~+100.0%	0.0%
b3.44	AO1 增益		-10.00~+10.00	1.00
b3.45	AO2 零偏系数		-100.0%~+100.0%	0.0%
b3.46	AO2 增益		-10.00~+10.00	1.00

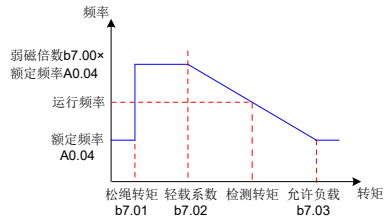
参数	名称	参数说明	设置范围	出厂值
b4 组：斜坡设置参数				
b4.00	加速时间	加速时间指变频器从零频率加速到额定频率 (A0.04) 所需要的时间，见下图中的 t1。 减速时间指变频器从额定频率 (A0.04) 减速到零频率所需时间，见下图中的 t2。 	0.0s~600.0s	3.0s
b4.01	减速时间			
b4.02	运行曲线模式选择	0：直线加减速 输出频率按照直线递增或递减。 1：S 曲线加减速 输出频率按照 S 曲线递增或递减。S 曲线在要求平缓启动或停机的场合使用。	0~1	0
b4.03	停机模式选择	0：减速停机 停机命令有效后变频器按照 b4.01 设定的减速时间以斜坡减速的方式停机。 1：自由停机 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机。	0~1	0
b4.04	S 曲线开始段比例	这两个参数分别定义了，S 曲线加减速的起始段和结束段时间比例。下图中 t1 即为参数 b4.04 定义的参数，在此段时间内输出频率变化的斜率逐渐增大。t2 即为参数 b4.05 定义的时间，在此时间段内输出频率变化的斜率逐渐变化到 0。在 t1 和 t2 之间的时间内，输出频率变化的斜率是固定的，即此区间进行直线加减速。 	0.0%~40.0%	30.0%
b4.05	S 曲线结束段比例			

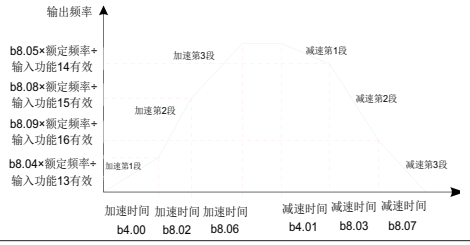
<table>
<tr><th>参数</th><th>名称</th><th>参数说明</th><th>设置范围</th><th>出厂值</th></tr>
<tr><td colspan="5">b5 组：多段速参数</td></tr>
<tr><td>b5.00</td><td>多段速 1</td><td rowspan="8">多段速功能由输入端子功能的 8、9 和 10 来选择。8 个多段速是通过三个端子的数字状态组合来实现，详细组合如下表所示：
<table>
<tr><th>输入功能 10</th><th>输入功能 9</th><th>输入功能 8</th><th>目标段速</th></tr>
<tr><td>无效</td><td>无效</td><td>无效</td><td>b5.00</td></tr>
<tr><td>无效</td><td>无效</td><td>有效</td><td>b5.01</td></tr>
<tr><td>无效</td><td>有效</td><td>无效</td><td>b5.02</td></tr>
<tr><td>无效</td><td>有效</td><td>有效</td><td>b5.03</td></tr>
<tr><td>有效</td><td>无效</td><td>无效</td><td>b5.04</td></tr>
<tr><td>有效</td><td>无效</td><td>有效</td><td>b5.05</td></tr>
<tr><td>有效</td><td>有效</td><td>无效</td><td>b5.06</td></tr>
<tr><td>有效</td><td>有效</td><td>有效</td><td>b5.07</td></tr>
</table></td><td rowspan="8">最低频率 (b1.03)
~
最高频率 (b1.02)</td><td>5.00Hz</td></tr>
<tr><td>b5.01</td><td>多段速 2</td><td>20.00Hz</td></tr>
<tr><td>b5.02</td><td>多段速 3</td><td>35.00Hz</td></tr>
<tr><td>b5.03</td><td>多段速 4</td><td>50.00Hz</td></tr>
<tr><td>b5.04</td><td>多段速 5</td><td rowspan="4">0.00Hz</td></tr>
<tr><td>b5.05</td><td>多段速 6</td></tr>
<tr><td>b5.06</td><td>多段速 7</td></tr>
<tr><td>b5.07</td><td>多段速 8</td></tr>
<tr><td colspan="5">b6 组：制动逻辑控制参数</td></tr>
<tr><td>b6.00</td><td>制动曲线类型</td><td>0：无制动控制
变频器不具有开闸频率和开、抱闸时间等功能，此时输出功能 1 等效于“变频器运行中”输出功能。
1：自动制动控制
开闸时间内变频器自动憋电流 (此时的转矩上限为 b1.04 和 b1.05 的设定值)，当输出电流达到 (b6.03× 电机额定电流) 后输出松闸指令。
2：手动制动控制
开闸时间内变频器以 b1.06 和 b1.07 为转矩上限，当输出电流值达到 (b6.03× 电机额定电流) 后输出松闸指令，具体使用详见 b1.06 和 b1.07 的说明。</td><td>0~2</td><td>1</td></tr>
<tr><td>b6.01</td><td>启动方向</td><td>该参数表示在松闸时间内变频器输出转矩的方向选择。
0：松闸力矩与运行方向相同
 

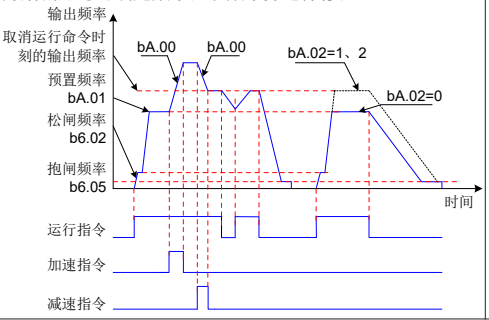
1：松闸力矩始终为正转方向
 
</td><td>0~1</td><td>0</td></tr>
<tr><td>b6.02</td><td>松闸频率</td><td>该参数表示变频器在制动器完全打开前的输出频率，即电机能够输出满力矩的最低频率。</td><td>最低频率 (b1.03) ~15.00Hz</td><td>2.00Hz</td></tr>
<tr><td>b6.03</td><td>松闸电流</td><td>该参数表示电机额定电流 (P0.03) 的百分比。当变频器的输出电流达到该值后立即输出制动器打开指令 (输出功能 1有效)。</td><td>0.0%~150.0%</td><td>30.0%</td></tr>
<tr><td>b6.04</td><td>松闸时间</td><td>该参数表示机械制动器由开始打开到完全打开的时间，该段时间内变频器维持松闸频率输出。</td><td>0.00s~5.00s</td><td>0.50s</td></tr>
<tr><td>b6.05</td><td>抱闸频率</td><td>该参数表示取消运行命令后变频器减速过程中输出频率低于该参数的设定值则立即输出制动器关闭指令 (输出功能 1 无效)。</td><td>最低频率 (b1.03) ~20.00Hz</td><td>2.00Hz</td></tr>
<tr><td>b6.06</td><td>抱闸时间</td><td>该参数表示机械制动器由开始闭合到完全闭合的时间，该段时间内变频器维持抱闸频率输出。</td><td>0.00s~5.00s</td><td>0.50s</td></tr>
<tr><td>b6.07</td><td>抱闸延时</td><td>该参数表示当符合制动器关闭条件后不立即输出制动器关闭指令，而是经过该参数的设置时间延迟后再输出制动器关闭指令。当快速停机、自由停机、起重机构类型选择 (P0.08) 为 0、3、4 时，该功能无效。</td><td>0.0s~30.0s</td><td>0.0s</td></tr>
</table>

参数	名称	参数说明	设置范围	出厂值
b6.08	制动反馈用途	该参数涉及到 41# 和 42# 故障的使用，具体使用方法请查阅这两个故障的说明。 0：不使用制动反馈 表示没有制动反馈接点输入到变频器或不需要使用制动反馈功能。 1：单端子反馈 表示只有在制动器打开和关闭过程中才检测制动器反馈信号，其他时间均不检测。此种应用只需要一个制动器反馈触点输入即可。正确应用逻辑图如下图所示：  2：双端子反馈 表示开闸和关闸时间由制动器反馈触点信号决定，且只要变频器上电就开始检测制动器的反馈信号是否正确。此种应用需要开闸和抱闸两个反馈触点均接入变频器。正确应用逻辑图如下图所示： 	0~2	0
b6.09	指令反向控制	0：不允许在运行过程中直接反向 若在运行过程中给定反向运行指令则变频器按正常停机过程停止输出后重新开始反向运行。  1：允许在运行过程中反向 若在运行过程中给定反向运行指令则变频器减速到过零跳跃频率 (b6.14) 后直接由反向过零跳跃频率开始反向运行，整个过程中不进行制动器开关控制。  当起重机构类型选择为起升机构 (P0.08 选择 0) 时，该功能仅在闭环控制方式下有效，选择其他机构时所有控制方式下均有效。	0~1	0
b6.12	制动过程再启动	0：在制动过程中不允许再启动 在停机过程中若制动器已经开始关闭则不接受启动指令，必须等到制动器完全关闭变频器停止输出后才能继续运行  1：在制动过程中允许再启动 在停机过程中即使制动器已经开始关闭，变频器同样接受新的运行命令 	0~1	0

参数	名称	参数说明	设置范围	出厂值
b6.13	再启动等待时间	该参数指变频器每次停机后必须经过该参数设置时间的延迟才能开始下次启动运行。详见参数 b6.09 介绍中的图例。	0.0s~15.0s	0.3s
b6.14	过零跳跃频率	该参数指在变频器允许指令反向运行 (b6.09=1) 时，在减速过程中当输出频率低于 b6.14 时，输出频率由 b6.14 跳变到 -b6.14。该参数在使用中的实际值强制大于松闸频率 b6.02 和抱闸频率 b6.05。具体使用方法详见参数 b6.09 介绍中的图例。	0.00Hz~20.00Hz	2.00Hz
b6.16	预励磁时间	 该参数用于设定变频器启动时预励磁阶段的持续时间。该功能仅在闭环控制模式下有效，设置为 0 表示不使用预励磁功能。	0.00s~5.00s	0.30s
b6.17	停机励磁保持时间	该参数用于设定变频器停机后保持励磁的时间。在励磁保持阶段变频器输出零速并保持励磁电流，若在此期间变频器接收到运行命令，便能够跳过预励磁阶段并快速打开制动器。	0s~65535s	30s
b6.18	下垂调整速度	该功能码只读，显示下垂计算后的设置频率与实际频率的差值，参见 b6.19 介绍。	-	-
b6.19	下垂控制	该参数用于下垂控制的下垂率，设置为 0，则关闭下垂控制功能。 下垂控制主要用于两台变频器拖动两台刚性连接的电机运行场合，下垂控制允许两台电机之间存在微小的速度差，从而避免两台电机的运行冲突。 下垂调整频率计算如下： 下垂调整频率（b6.18）= 设置频率 × 输出转矩 × 下垂率（b6.19）÷10 如：b6.19 = 1.00，设置频率 50.00Hz，输出转矩 50.0%，则： 下垂调整频率 = 50.00Hz×50.0%×1.00÷10=2.50Hz 变频器实际频率 = 50.00Hz–2.50Hz = 47.50Hz	0.00~20.00	0.00
b6.21	启动前定子辨识使能	开启此功能运行前会进行定子电阻辨识，0：无效，1：开启	0~1	0
b6.22	松闸超时时间	在松闸阶段，超过松闸超时时间未进行松闸，报出松闸故障(按功率给固定值)	0s~5.00s	3.00s
B6.23	抱闸时的拉闸判断时间	抱闸时的拉闸判断时间(按功率给固定值)	0s~1.00s	0.1s
B6.24	抱闸时的拉闸判断电流	抱闸时的拉闸判断电流(按功率给固定值)	0%~500%	0%
B6.25	抱闸时的拉闸系数	抱闸时的拉闸系数(按功率给固定值)	100%~1000%	500%

参数	名称	参数说明	设置范围	出厂值
b7 组：轻载与定位控制功能参数				
b7.00	弱磁倍数	轻载高速功能指的是当目标频率大于额定频率时，变频器根据负载情况自动计算最高可达输出频率从而避免由于负载太大而发生过载、过流等故障。b7.00~07 是轻载高速功能的相关设定参数。 当变频器的输出频率达到 b7.07 的设定值时，变频器维持该频率输出，维持时间为 b7.06，维持时间到后检测输出转矩 T 用于下图曲线计算，得到本次运行所能达到的最高频率 F。若本次运行的目标频率大于额定频率且 b7.00 > 100.0%，则启用轻载高速功能。当 T ≤松绳转矩或 T ≥允许负载时，F 的最高值为额定频率；当松绳转矩 < T ≤轻载系数时，F 的最高值为 b7.00× 额定频率；当轻载系数 < T < 允许负载时，F 根据下图曲线进行自动调整。  b7.08 和 b7.09 表示当轻载系数≤ T ≤允许负载时，最终变频器的目标频率为 F×b7.08(正向运行时) 或 F×b7.09(反向运行时)。实际运行频率还会受到变频器或电机所能达到的最大转矩限制。	100.0%~300.0%	100.0%
b7.01	松绳转矩		0.0%~ 轻载系数 (b7.02)	5.0%
b7.02	轻载系数		松绳转矩 (b7.01) ~ 允许负载 (b7.03)	35.0%
b7.03	允许负载		轻载系数 (b7.02) ~100.0%	80.0%
b7.06	检测时间		0.0s~5.0s	0.5s
b7.07	检测频率		松闸频率 (b6.02) ~ 额定频率 (A0.04)	40.00Hz
b7.08	正向修正		0%~100%	100%
b7.09	反向修正		0%~100%	100%
b7.10	位置显示比例	该参数由用户根据显示位置的精度进行设定，用于将脉冲数折算成位置数据。U0.08 和 U0.09 显示的位置数据为当前脉冲数 /b7.10。 注：YD587 提供的脉冲数已经经过四倍频。	1~65535	1
b7.11	位置校验值	该参数表示当输入功能 31(位置校验) 有效时，变频器内部累计的当前脉冲数复位成 b7.10× b7.11，位置数据被复位成 b7.11 的设定值。	0~65535	0

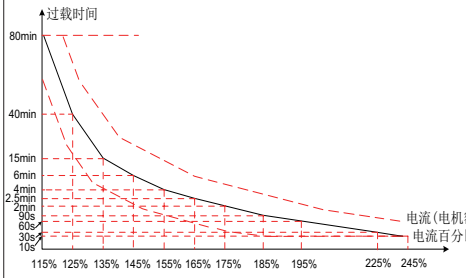
参数	名称	参数说明	设置范围	出厂值
b8 组：特殊曲线设置参数				
b8.00	特殊加速	0：不使用 表示设置为 0 表示不使用特殊加减速功能。 1：两段 (频率切换) 表示使用两段加减速功能，加速过程中输出频率大于 (额定频率 ×b8.04) 后加速时间切换到 b8.02 的设定值；减速过程中输出频率小于 (额定频率 ×b8.05) 后减速时间切换到 b8.03 的设定值。 2：三段 (频率切换) 表示使用三段加减速功能，在第两段的基础上，加速过程中输出频率大于 (额定频率 ×b8.08) 后加速时间切换到 b8.06 的设定值；减速过程中输出频率小于 (额定频率 ×b8.09) 后减速时间切换到 b8.07 的设定值。 3：两段 (DI 切换) 表示使用两段加减速功能，加速过程输入功能 13 有效则加速时间切换到 b8.02 的设定值；减速过程中输入功能 14 减速时间切换到 b8.03 的设定值。 4：三段 (DI 切换) 表示使用三段加减速功能，在第两段的基础上，加速过程输入功能 15 有效则加速时间切换到 b8.06 的设定值；减速过程中输入功能 16 减速时间切换到 b8.07 的设定值。  	0~4	0
b8.01	特殊减速			
b8.02	第二段加速时间	具体使用方法请查阅 b8.00 及 b8.01 说明	0.1s~600.0s	3.0s
b8.03	第二段减速时间		0.1s~600.0s	3.0s
b8.04	第二段加速频率切换点		0%~ 第三段加速频率切换点 (b8.08)	0%
b8.05	第二段减速频率切换点		第三段减速频率切换点 (b8.09)~99%	99%
b8.06	第三段加速时间		0.1s~600.0s	3.0s
b8.07	第三段减速时间		0.1s~600.0s	3.0s
b8.08	第三段加速频率切换点		第二段加速频率切换点 (b8.04)~99%	99%
b8.09	第三段减速频率切换点		0%~ 第二段减速频率切换点 (b8.05)	0%

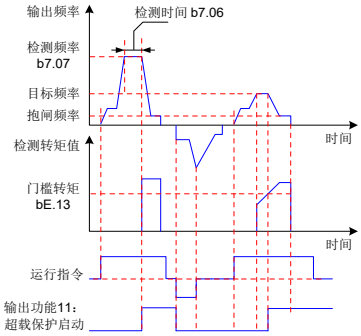
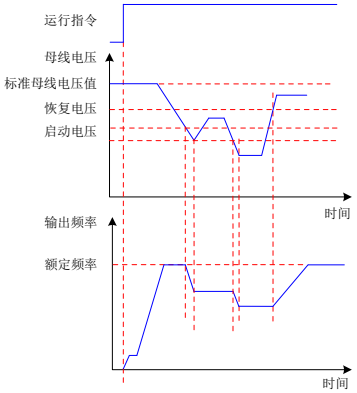
参数	名称	参数说明	设置范围	出厂值
bA 组：加减速参数				
bA.00	加减速变化率	该参数用于设置频率源为加减速给定时输入功能 19(加速运行) 和输入功能 20(减速运行) 有效时频率变化的速度，即每秒钟频率的变化量。	0.01Hz/s~50.00Hz/s	5.00Hz/s
bA.01	预置频率	该参数表示当频率源选择为加减速给定时变频器的运行目标频率的初始值。	开闸频率 (b6.02) ~ 最高频率 (b1.02)	50.00Hz
bA.02	速度保存类型选择	0：不保存 表示每次运行的初始目标频率均为 bA.01 的设定值。 1：保存至断电 表示变频器上电后首次运行的初始目标频率为 bA.01 的设定值，不断电情况下，运行的初始目标频率均为上次取消运行命令时刻的输出频率。 2：始终保持 表示每次运行的初始目标频率均为上次运行取消运行命令开始减速时的设定频率。该频率掉电保存。  	0~2	0
bA.03	加减速运行最低频率	该参数用于设置当减速开关有效时，变频器减速运行的输出频率下限。	0.00Hz~15.00Hz	0.00Hz

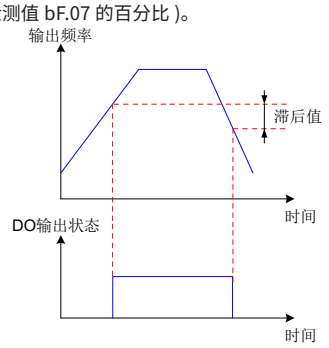
参数	名称	参数说明	设置范围	出厂值
bb 组：转矩控制参数				
bb.00	转矩控制功能选择	0：不使用转矩控制功能 表示全程使用速度控制模式运行 1：全程转矩控制 表示全程使用转矩控制模式运行 2：使用转矩控制，频率切换 表示当变频器输出频率大于 bb.01 的设定值后使用转矩控制模式，否则使用速度控制模式。 3：使用转矩控制，转矩切换 表示当变频器输出转矩大于 bb.02 的设定值后使用转矩控制模式，否则使用速度控制模式。 4：使用转矩控制，频率转矩切换 表示当变频器输出频率大于 bb.01 的设定值并且输出转矩大于 bb.02 的设定值时使用转矩控制模式，否则使用速度控制模式。 5：使用转矩控制，DI 切换 当输入功能 21 有效时使用转矩控制模式，无效时使用速度控制模式。 6：使用转矩控制，通信切换	0~6	0
bb.01	转矩切换频率门槛	具体使用方法请查阅 bb.00 的说明	0.00Hz~最高频率 (b1.02)	25.00Hz
bb.02	转矩切换转矩门槛		0.0%~150.0%	50.0%
bb.03	转矩源	1：AI1 仅支持 0V~10V 电压型输入。 2：AI2 给定 支持 0V~10V 电压型输入或 4mA~20mA 电流型输入，由控制板上的 J9 跳线选择输入类型。 AI 作为转矩给定时，电压 / 电流输入对应设定的 100.0% 对应 200.0% 的输出转矩。 4：键盘设定，设定值由 bb.08 设置 5：通信给定 , 转矩写入地址 0xbb08	0~5	0
bb.04	转矩控制正向最大频率	用于设置转矩控制方式下，变频器的正向或反向最高给定频率。 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。	0.00Hz~最高频率 (b1.02)	50.00Hz
bb.05	转矩控制反向最大频率			
bb.06	转矩控制加速时间	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。但是对需要转矩快速响应的场合，需要设置转矩控制加减速时间为 0.0s。 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 0.0s。 这两个参数的时间计算基准为 200.0% 输出转矩。	0.0s~600.0s	0.0s
bb.07	转矩控制减速时间			
bb.08	目标转矩	该参数用于设置目标转矩，当 bb.03 设置为 4 或者 5 时，该值为当前的目标转矩。	-500.0%~500.0%	0.0%
bb.09	连接方式选择	转矩模式一般应用于多台变频器的主从控制，此时主机使用速度模式，从机使用转矩模式，该功能码用于选择主机与从机间的连接方式。 0：硬连接 1：软连接	0~1	1

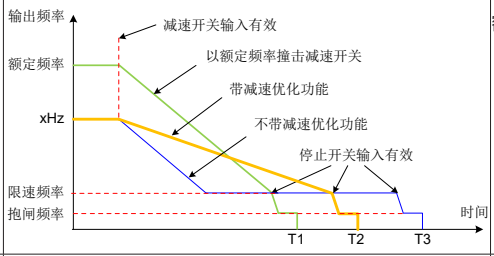
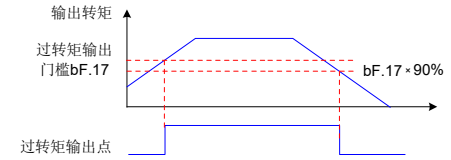
参数	名称	参数说明	设置范围	出厂值
bC 组：负载超速保护参数				
bC.00	自启动脉冲圈数	该参数用于设置变频器的自启动功能。 变频器在闭环运行模式时，并且处于抱闸停机状态时，如检测到编码器的脉冲数变化量达到该参数设定值 × 编码器线数时，变频器自动运行，保持 0Hz 输出，同时报 E453# 号提示故障，输出功能 16 有效。 该功能可以有效避免由于抱闸松动所造成的溜车，可以提前预警抱闸松动故障。	0~65535	0
bC.01	V/f 速度偏差过大检测时间	电机实际运行速度与同步速度超出 bc-03 设置偏差阈值，经过 bc.01 检测时间，报出故障 Er*52；	0s~60.0s	0.0s
bC.02	频率异常检测周期	该参数表示 37# 故障的检测时间。当电机反馈频率与给定频率的方向相反且持续时间超过 bC.02 的设定值则变频器报 37# 故障。 该参数设置为 0 则可屏蔽 37# 故障。	0.00s~1.00s	0.50s
bC.03	频率跟随误差	该参数表示 38# 故障的检测基准。具体使用方法请查阅 bC.04 或 38# 故障的说明。	0%~30%	20%
bC.04	频率跟随检测周期	该参数表示 38# 故障的检测时间。当电机反馈频率与给定频率的差值大于 (bC.03× 额定频率) 且持续时间超过 bC.04 的设定值则变频器报 38# 故障。 该参数设置为 0 则可屏蔽 38# 故障。给定频率和输出频率均大于额定频率后该故障无效。	0.00s~1.00s	0.50s

参数	名称	参数说明	设置范围	出厂值
bd 组：通信参数				
bd.00	波特率	该参数用来设定 Modbus 通信时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，通信无法进行。波特率越大，通信速度越快。 5：9600bps 6：19200bps 7：38400bps 8：57600bps 9：115200bps	5~9	5
bd.01	数据格式	该参数用来选择 Modbus 通信时变频器的数据格式。上位机与变频器设定的数据格式必须一致，否则通信无法进行。 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>	0~3	0
bd.02	本机地址	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信的基础。	0~247	1
bd.03	扩展卡通信应答延迟	该参数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。 该参数仅对 RS485 通信有效。	0ms~20ms	2ms
bd.04	扩展卡通信超时时间	该参数表示变频器与通信扩展卡之间的通信间隔超过通信超时时间，变频器报 48# 故障。 该参数仅对 Modbus-RTU、EtherCAT、EtherNet/IP、CANopen、PROFIBUS DP、PROFINET 有效。	0.0s~60.0s	0.0s
bd.07	扩展卡选择	0：Modbus-RTU 通信 1：DP 通信 2：CANopen 通信、PROFINET 通信、EtherCAT 通信、EtherNet/IP 通信 当选择不同的通信方式时，适配不同的通信扩展卡。	0~2	0
bd.08	扩展卡软件版本号	该参数用于显示扩展的 DP 通信卡、CANopen 通信卡、PROFINET 通信卡、EtherCAT 通信卡、EtherNet/IP 通信卡等选配卡件的软件版本号。	0~65535	0
bd.11 ~ bd.30	用户定制参数 1~ 用户定制参数 20	此 20 个参数为用户定制参数。 用户利用定制参数，可以对YD587中的功能码地址重新映射，如 bd.11 选择 A0.01，则用户通过读取 bd.11 地址的值，即可获取 P0.01 的值。 通过用户定制参数，可以实现分散地址的数据连续读取，如 Modbus-RTU 需要循环读取 P0.01、b0.05、F0.04 三个参数的值，则需发送三帧协议循环读取，而利用用户定制参数，则可将 bd.11、bd.12、bd.13 分别设置为 P0.01、b0.05、F0.04，然后读取 bd.11 地址开头的连续三个数据，只需一帧数据即可。 在 DP 通信、CANopen 通信时，用户定制参数与通信协议地址一一对应： DP 通信： bd.11~bd.20 对应 DP 通信主站至从站协议 PZD3~PZD12。 bd.21~bd.30 对应 DP 通信从站至主站协议 PZD3~PZD12。 CANopen 通信： bd.11~bd.18 对应于 CANopen 通信协议 RPDO1~RPDO3。 bd.21~bd.28 对应于 CANopen 通信协议 TPDO2~TPDO3。	P0-00~P*-** b0-00~b*-** U0-00~U*-** F0-00~F*-** E0-00~E*-**	0

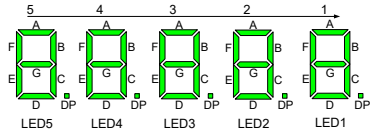
参数	名称	参数说明	设置范围	出厂值
bE 组：故障与保护参数				
bE.00	电机过载保护选择	为了对不同的负载电机进行有效保护，需要根据电机过载能力对该参数进行设置。电机过载保护为反时限曲线，电机过载保护曲线如下图所示：  在电机运行电流到达 1.75 倍电机额定电流条件下，持续运行 2 分钟后报电机过载故障（11#）；在电机运行电流到达 1.15 倍电机额定电流的条件下，持续运行 80 分钟后报电机过载故障（11#）。 例如：电机额定电流为 100A 若 bE.01 设定成 1.00，则当电机运行电流达到 100A 的 125%（125A）时，持续 40 分钟后，变频器报电机过载故障; 若 bE.01 设定成 1.20，则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； 最长 80 分钟过载，最短时间 10 秒过载。	0：禁止电机过载保护功能 1：启用电机过载保护功能	1
bE.01	电机过载保护增益	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，电机过载保护增益： bE.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 bE.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，输出功能 9（电机过载预报警）有效，该参数按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，输出功能 9（电机过载预报警）有效。	0.20~10.00	1.00
bE.02	电机过载预警系数	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。 该参数设置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反时限曲线与 bE.02 乘积后，变频器输出功能 9(电机过载预报警) 输出有效。	50%~100%	80%
bE.03	过压失速增益	在变频器减速过程中，当直流母线电压超过过压失速保护电压后，变频器停止减速保持在当前给定频率，待母线电压下降后继续减速。 过压失速增益用于调整在减速过程中变频器抑制过压的能力。此值越大抑制过压能力越强。在不发生过压的前提下该增益设置的越小越好。	0~100	0
bE.04	过压失速保护电压	对于小惯量的负载，过压失速增益宜小，否则引起系统动态响应变慢。对于大惯量的负载此值宜大，否则抑制效果不好，可能出现过压故障。 当过压失速增益设置为 0 时，取消过压失速功能，该功能在提升机构（P0.08=0）时无效。	330V~800V	三相 380-400V 机型：670V 三相 200-240V 机型：380V
bE.05	过流失速增益	在变频器加减速过程中，当输出电流超过过流失速保护电流后，变频器停止加减速过程保持在当前给定频率，待输出电流下降后再继续加减速。 过流失速增益用于调整在加减速过程中变频器抑制过流的能力。此值越大抑制过流能力越强。在不发生过流的前提下该增益设置的越小越好。	0~100	20
bE.06	过流失速保护电流	对于小惯量的负载，过流失速增益宜小，否则引起系统动态响应变慢。对于大惯量的负载此值宜大，否则抑制效果不好，可能出现过流故障。 当过流失速增益设置为 0 时，取消过流失速功能。 bE.05、bE.06 仅在 V/f 控制时有效。	100%~200%	150%

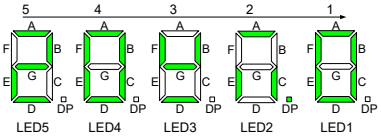
参数	名称	参数说明	设置范围	出厂值
bE.07	上电对地短路保护选择	用于选择变频器在上电时，检测电机是否对地短路。如果此功能有效，则变频器 UVW 端在上电后一段时间内会有电压输出。 0: 不启用上电对地短路保护选择功能 1：启用上电对地短路保护选择功能	0~1	1
bE.08	输入缺相保护选择	用于选择输入缺相保护功能 0：不启用输入缺相保护功能 1：启用硬件输入缺相保护。 注：18.5kW 以下功率机型不支持该功能。 2：同时开启硬件和软件输入缺相保护 3：开启软件输入缺相保护	0~3	2
bE.09	输出缺相保护选择	该参数设置为 1 则变频器对输出缺相的进行保护； 设置为 0 则不启用输出缺相保护功能。	0~1	1
bE.13	超载保护转矩限制门槛	该参数用于设置超载限制功能的启动转矩。该参数设置为 0 则超载保护功能无效。 当变频器正向运行时，输出频率达到 b7.07 或达到恒速运行状态时检测输出转矩，具体使用方法详见 b7.06 和 b7.07 的说明。若输出转矩大于 bE.13 的设定值则自动停机并限制继续正向运行；当变频器反向运行后限制立即解除。  	0.0%~150.0%	0
bE.14	随压降速功能选择	这两个参数用于随压降速功能的设置。随压降速功能表示在母线电压持续偏低的情况下变频器能够自动降低输出频率维持满力矩输出的功能。 bE.14 置 1 则启用随压降速功能，设置为 0 则该功能无效。 bE.15 用于设置随压降速功能的启动电压。该参数表示标准母线电压的百分比。  	0~1	0
bE.15	随压降速动作电压		70%~100%	85%
bE.16	内置制动单元动作电压	内置制动单元动作的起始电压 Vbreak，此电压值的设置参考： 800 ≥ Vbreak ≥（1.414Vs+30） Vs- 输入变频器的交流电源电压 注： 此电压设置不当有可能导致内置制动单元运行不正常！	330V~800V	三相 380V~480V 机型：660V 三相 200V~240V 机型：370V
bE.17	接触器故障检测使能	该参数设置为 1 启用接触器故障检测（17#）。设置为 0 不启用。 注：18.5kW 以下功率机型不支持该功能。	0~1	1

参数	名称	参数说明	设置范围	出厂值
bF 组：二级菜单辅助参数				
bF.00	二级菜单密码	该参数表示二级菜单功能参数的显示和修改密码。若该参数设置为非零值则进入二级菜单需要输入该密码。若连续输入三次错误密码则所有菜单被锁定，需要重新上电才能继续查看或修改参数，重新设为 0 后，密码解除。	0~65535	0
bF.01	二级菜单恢复出厂参数	0：不恢复 1：恢复二级菜单出厂参数 二级菜单中的 b0.02 ~ 03、b2.00~02、b7.10~11、 bF.00 不恢复。 2：恢复一二级菜单参数	0~2	0
bF.02	二级菜单用户设定检查	0：正常显示所有二级菜单参数 1：只显示与出厂默认值不同的二级菜单参数	0~1	0
bF.03	历史记录数据清零	0：不处理 1：历史记录清空 清除所有掉电存储参数以及故障记录，即 E* 组和 U1 组参数全部清零。	0~1	0
bF.04	命令源选择	该参数用于选择变频器控制命令 (启动、停机、正转、反转、等) 的输入通道。 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。 在操作面板命令通道下变频器的所有端子输入输出以及制动器控制的逻辑时序功能均无效。此时，当变频器接收到 RUN 指令后输出功能 1“制动器控制”有效，当变频器接收到 STOP 指令开始减速，减速到抱闸频率 (b6.05) 后停止输出，输出功能 1 无效。 1：端子命令通道 (“LOCAL/REMOT”灯亮) 由端子输入功能 1(正向运行)、2(反向运行)、进行运行命令控制。 2：通信命令通道 (“LOCAL/REMOT”灯闪烁) 运行指令由上位机、PLC、触摸屏等设备通过通信给定。	0~2	0
bF.05	操作面板运行频率	当 bF.04(命令源选择) 选择为 0 时，变频器的运行目标频率由该参数确定	最低频率 (b1.03) ~ 最高频率 (b1.02)	8.00Hz
bF.06	运行方向选择	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。 提示：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。 0：方向一致 1：方向取反	0~1	0
bF.07	频率检测值	当给定频率高于频率检测值时变频器的 DO 输出功能 7(频率到达输出) 有效；给定频率低于检测值一定频率后，输出功能 7 无效。 这 2 个参数用于设定输出频率的检测值及输出动作解除的滞后值。其中 bF.07 表示检测值，bF.08 是滞后频率 (相对于频率检测值 bF.07 的百分比)。  	最低频率 (b1.03) ~ 最高频率 (b1.02)	50.00Hz
bF.08	频率检测滞后值		0.0~100.0%	5.0%
bF.09	散热风扇控制	该参数用于选择散热风扇的动作模式 0：电机运行时散热风扇运转 变频器在运行状态下风扇运转，停机状态下如果散热器温度高于 40 度则风扇运转，低于 40 度时风扇不运转。 1：上电后散热风扇一直运转	0~1	0

<table>
<tr><th>参数</th><th>名称</th><th>参数说明</th><th>设置范围</th><th>出厂值</th></tr>
<tr><td>bF.10</td><td>故障保护动作1</td><td rowspan="5">这几个参数用于选择 41#~65# 故障的故障等级。每个参数由一个 5 位数字组成，代表 5 个故障的故障等级，具体对应关系如下表所示：
<table>
<tr><th>参数名</th><th>位数</th><th>含义</th></tr>
<tr><td>bF.10</td><td>万位</td><td>41# 故障等级</td></tr>
<tr><td>bF.10</td><td>千位</td><td>42# 故障等级</td></tr>
<tr><td>…</td><td>…</td><td>…</td></tr>
<tr><td>bF.10</td><td>个位</td><td>45# 故障等级</td></tr>
<tr><td>bF.11</td><td>万位</td><td>46# 故障等级</td></tr>
<tr><td>…</td><td>…</td><td>…</td></tr>
<tr><td>bF.11</td><td>个位</td><td>50# 故障等级</td></tr>
<tr><td>…</td><td>…</td><td>…</td></tr>
<tr><td>bF.14</td><td>万位</td><td>61# 故障等级</td></tr>
<tr><td>…</td><td>…</td><td>…</td></tr>
<tr><td>bF.14</td><td>个位</td><td>65# 故障等级</td></tr>
</table></td><td rowspan="5">11111~55555</td><td>11115</td></tr>
<tr><td>bF.11</td><td>故障保护动作2</td><td>11111</td></tr>
<tr><td>bF.12</td><td>故障保护动作3</td><td>11411</td></tr>
<tr><td>bF.13</td><td>故障保护动作4</td><td>11111</td></tr>
<tr><td>bF.14</td><td>故障保护动作5</td><td>11111</td></tr>
<tr><td>bF.16</td><td>减速开关限制频率</td><td>当减速开关 (输入功能 24、25) 输入有效后变频器输出频率最高被限制为 bF.16 设置的频率，当停机开关 (输入功能 22、23) 输入有效后变频器执行快速停机。
bF.15 用于选择减速开关有效后的减速模式
0：不带减速优化功能
按照 b4 组参数设定的减速时间正常减速
1：带减速优化功能
当减速开关输入有效后，变频器按照以额定频率撞击减速开关的减速距离为基准，重新计算本次运行的减速时间，实现整个减速过程运行时间最短的效率最优控制。
 
</td><td>最低频率 (b1.03)
~
额定频率 (A0.04)</td><td>5.00Hz</td></tr>
<tr><td>bF.17</td><td>过转矩输出门槛</td><td>该参数配合输出功能 12 使用。输出转矩达到该参数的设置值则输出功能 12 有效。当输出转矩回落到该参数设置值的 90% 以下，输出功能 12 无效
矢量控制时该功能的检测值使用转矩输出，V/f 控制使用输出电流 ÷ 电机额定电流的百分比。
该参数设置为 0 则该输出功能 12 无效。
 
</td><td>0.0~200.0%</td><td>0.0%</td></tr>
<tr><td>bF.19</td><td>运行模式选择</td><td>0：应用模式
正常使用情况下该参数必须选择为 0。
1：调试模式
调试模式用于变频器 / 控制柜的出厂检测时使用。该模式下 YD587 屏蔽了开闸时序和输出缺相保护等功能，并且强制使用 V/f 控制方式运行。
该参数在上电时自动清零。</td><td>0~1</td><td>0</td></tr>
<tr><td>bF.20</td><td>恒功率功能选择</td><td>0：禁止恒功率功能
1：使能恒功率功能</td><td>0~1</td><td>1</td></tr>
<tr><td>bF.21</td><td>电机风扇控制延时</td><td>该参数配合输出功能 13 使用。
详细使用方法参见输出功能 13 的说明</td><td>0~3000s</td><td>30s</td></tr>
<tr><td>bF.25</td><td>频率限制使能</td><td>过流抑制时减速频率处理
个位：SVC 控制方式下，开启频率限制
十位：FVC 控制方式下，开启频率限制
百位：V/f 控制方式下，开启频率限制</td><td>0~111</td><td>0</td></tr>
<tr><td>bF.26</td><td>上电自动参数辨识过程是否响应自由停机命令</td><td>0：无效；
1：响应自由车</td><td>0~1</td><td>0</td></tr>
</table>

E0~E9 组参数显示故障信息，每组参数分别代表一个故障的记录信息。E0 组表示最近一次故障记录信息，E9 组表示最早一次故障记录信息，每组故障信息的显示内容都完全相同。E* 组参数为显示值，不能更改，掉电保存。

<table>
<tr><th>参数</th><th>名称</th><th>最小单位</th><th>参数说明</th></tr>
<tr><td>E*.00</td><td>故障代码</td><td>0.01</td><td>操作面板上的五个数码管从左至右依次编号为 5、4、3、2、1，例如：显示内容为 104.01，5#、4# 和 3# 数码管组成故障代码，其中 5# 数码管的“1”为故障等级；4# 和 3# 数码管的“04” 为故障代号；2# 和 1# 数码管是厂家保留内容。</td></tr>
<tr><td>E*.01</td><td>故障时给定频率</td><td>键盘显示:
0.1Hz
通信读取:
0.01Hz</td><td>故障时监控参数 U0.00 的显示值</td></tr>
<tr><td>E*.02</td><td>故障时反馈频率</td><td>键盘显示:
0.1Hz
通信读取:
0.01Hz</td><td>故障时监控参数 U0.01 的显示值</td></tr>
<tr><td>E*.03</td><td>故障时输出电流</td><td>0.01A</td><td>该参数记录故障时监控参数 U0.03 的显示值</td></tr>
<tr><td>E*.04</td><td>故障时输出电压</td><td>1V</td><td>该参数记录故障时监控参数 U0.04 的显示值</td></tr>
<tr><td>E*.05</td><td>故障时输出功率</td><td>0.1%</td><td>该参数记录故障时监控参数 U0.05 的显示值</td></tr>
<tr><td>E*.06</td><td>故障时输出转矩</td><td>0.1%</td><td>该参数记录故障时监控参数 U0.06 的显示值</td></tr>
<tr><td>E*.07</td><td>故障时母线电压</td><td>0.1V</td><td>该参数记录故障时监控参数 U0.07 的显示值</td></tr>
<tr><td>E*.08</td><td>故障时输入功能 1~16 状态</td><td>1</td><td rowspan="4">这 4 个参数表示多功能输入输出功能的状态。每个功能码可以按照比特位指示出 16 个输入或者输出功能的状态。当进入该功能码时，显示该功能码的十进制数值，按下△键后切换到用户查看模式，查看方式如下：
操作面板上的五个数码管从左至右依次编号为 5、4、3、2、1。
 

进入查看模式后，5、4 号数码管直接显示当前查看的输入 / 输出功能号；1 号数码管显示该功能号的输入 / 输出是否有效，0 表示无效，1 表示有效，利用△和▽键可以改变当前查看的输入 / 输出功能号；通过 2、3 两个数码管的按段位显示 , 将 16 个功能的状态一起显示出来 , 其对应关系为 1~8 对应第 2 个数码管的 A~DP ,8~16 对应第 3 个数码管的 A~DP。举例如下：
 

该图表示：当前显示的是输入功能 20 的状态 (5、4 号数码管)；目前输入功能 20 无效 (第 1 号数码管)；输入功能 17~32 中 17、19、21、24、26、28、30 和 31 有效，其余无效 (2、3 号数码管)。</td></tr>
<tr><td>E*.09</td><td>故障时输入功能 17~32 状态</td><td>1</td></tr>
<tr><td>E*.10</td><td>故障时输入功能 33~48 状态</td><td>1</td></tr>
<tr><td>E*.11</td><td>故障时输出功能 1~16 状态</td><td>1</td></tr>
<tr><td>E*.12</td><td>故障时运行步骤</td><td>1</td><td>记录故障时变频器内部运行步骤，显示内容参见 U0.26</td></tr>
<tr><td>E*.13</td><td>故障时控制方式</td><td>1</td><td>该参数记录故障时命令源、频率源和控制方式的设定值
<table><tr><th>位数</th><th>含义</th><th>说明</th></tr><tr><td>万位</td><td>保留</td><td>-</td></tr><tr><td>千位</td><td>保留</td><td>-</td></tr><tr><td>百位</td><td>命令源</td><td>数据含义参见 bF.04</td></tr><tr><td>十位</td><td>频率源</td><td>数据含义参见 P0.07</td></tr><tr><td>个位</td><td>驱动控制方式</td><td>数据含义参见 b1.00</td></tr></table></td></tr>
<tr><td>E*.15</td><td>故障时同步频率</td><td>键盘显示:
0.1Hz
通信读取:
0.01Hz</td><td>该参数记录故障时控制面板运行显示菜单中“同步频率”的瞬时值</td></tr>
<tr><td>E*.16</td><td>故障时制动管电流</td><td>0.01A</td><td>该参数记录发生制动管过载（15#）故障时的制动管瞬时电流。</td></tr>
<tr><td>E*.17</td><td>故障时变频器累计运行时间</td><td>1h</td><td>该参数记录故障时监控参数 U1.05</td></tr>
<tr><td>E*.18</td><td>故障时变频器累计上电时间</td><td>1h</td><td>该参数记录故障时监控参数 U1.06</td></tr>
</table>

U0 和 U1 组参数显示变频器的实时监控信息，U0 组参数实时刷新，掉电不保存；U1 组参数显示需要累积计算的信息，掉电存储。

参数	名称	最小单位	参数说明
U0.00	运行频率	键盘显示：0.1Hz 通信读取：0.01Hz	变频器的当前给定频率。
U0.01	反馈频率	键盘显示：0.1Hz 通信读取：0.01Hz	该参数显示的是电机实际运行频率的反馈值。在不带编码器运行时该参数为变频器软件计算的反馈频率，带编码器运行时为编码器反馈的实际电机运行频率。
U0.02	目标频率	键盘显示：0.1Hz 通信读取：0.01Hz	变频器本次运行最终需要达到的频率。
U0.03	输出电流	0.01A	显示运行时变频器输出电流值。
U0.04	输出电压	1V	显示运行时变频器输出电压值。
U0.05	输出功率	0.1%	显示运行时变频器输出功率值。
U0.06	输出转矩	0.1%	显示运行时变频器输出转矩值 (电机额定转矩的百分比)。
U0.07	母线电压	0.1V	显示变频器的母线电压值。
U0.08	位置数据高位	1	显示起重机构的当前位置，即“当前累计脉冲数 /b7.10”。 U0.08 显示当前位置的高 16 位部分 (区分正负号)；U0.09 显示当前位置的低 16 位部分 (只显示正数)。详细使用方法请查阅 b7.10 和 b7.11 的详细说明。
U0.09	位置数据低位	1	
U0.10	DI 输入状态	1	显示变频器 DI 端子的输入状态 (Y1 继电器状态；AO 当 DO 时的状态), 显示方式与 E*.08~11 相同。
U0.11	DO 输出状态	1	显示变频器 DO 端子的输出状态，显示方式与 E*.08~11 相同。
U0.12	AI1 电压	0.01V	显示变频器 AI1 端子的输入电压值。
U0.13	AI2 电压	0.01V	显示变频器 AI2 端子的输入电压值。
U0.15	AO1 输出电压	0.01V	显示变频器 AO1 端子的输出电压值。
U0.16	AO2 输出电压	0.01V	显示变频器 AO2 端子的输出电压值。
U0.19	CAN 通信质量	1%	显示变频器扩展卡与外部设备的 CAN 通信质量。 变频器每发送 100 帧数据检测一次，该参数显示的是收到正确数据的帧数。
U0.20	SPI 通信质量	1%	显示变频器与工艺卡的通信质量。 变频器每发送 100 帧数据检测一次，该参数显示的是收到正确数据的帧数。
U0.23	逆变器模块散热器温度	1° C	显示逆变模块 IGBT 的温度。
U0.24	功能软件版本号	0.01	显示变频器功能软件版本号。
U0.25	性能软件版本号	0.01	显示变频器性能软件版本号。
U0.26	变频器内部状态	1	显示变频器内部运行步骤，通过该参数能够方便现场调试以及查找疑难问题。键盘上数码管从左到右的排列顺序是 5、4、3、2、1，具体显示内容如下表所示：
U0.28	故障代码	1	显示变频器当前发生故障的故障代码。
U0.29	制动管电流	0.01A	显示变频器的内置制动单元工作时制动管的输出电流值
U0.30	弱磁能够达到的最高频率	0.01Hz	显示在弱磁区能达到的最高频率。
U0.31	功能临时软件版本号	0.01	显示该功能临时软件版本号。
U0.32	性能临时软件版本号	0.01	显示该性能临时软件版本号。

数码管序号	含义	显示内容	说明
5	保留	-	-
3	抱闸步骤	0	未发出抱闸指令
		1	已发出抱闸指令
2	开闸步骤	0	未发出开闸指令
		1	已发出开闸指令
1	运行步骤	0	待机状态
		1	制动器开闸过程中
		2	正常运行状态
		3	取消运行命令及制动器抱闸过程中
		4	操作面板运行状态
		6	电机参数辨识状态
		7	变频器停机过程中

参数	名称	最小单位	参数说明
U1.00	紧急停止次数	1	显示该台变频器累计发生 1 级故障的次数。
U1.01	快速停止次数	1	显示该台变频器累计发生 2 级和 3 级故障的次数。
U1.02	制动器使用次数高位	1	显示该台变频器所控制的制动器累计使用次数。低位累计超过 65535 次后高位加 1 同时低位清零。
U1.03	制动器使用次数低位	1	
U1.04	达到转矩限幅的总计时间	0.1h	显示该台变频器的输出转矩达到或超过转矩上限值 (b1.04 和 05) 的累计时间。
U1.05	累计运行时间	1h	显示该台变频器累计运行时间。
U1.06	累计上电时间	1h	显示该台变频器累计上电时间。

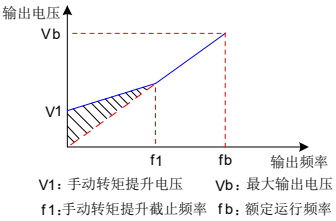
6.3 三级菜单 (F 组) 参数表

三级菜单主要包含变频器输出性能的调节参数以及厂家参数。一般情况下用户无需调节三级菜单参数。

进入三级菜单需要正确输入参数 FF.00 所设定的密码。

<table>
<tr><th>序号</th><th>名称</th><th>参数说明</th><th>设置范围</th><th>出厂值</th></tr>
<tr><td colspan="5">F0 组：电机参数</td></tr>
<tr><td>F0.00</td><td>异步机定子电阻</td><td rowspan="5">这 5 个参数是异步电机的电机参数，这些参数电机铭牌上一般没有，需要通过变频器自动参数辨识获得。参数辨识方式 1 只能获得 F0.00~F0.02 这 3 个参数，参数辨识方式 3 可以获得全部 5 个参数，参数辨识方式 2 除可以获得这里全部 5 个参数外，还可以获得编码器相序、电流环 PI 参数等。
更改电机额定功率 (P0.01) 时，变频器会自动修改这 5 个参数值，将这 5 个参数恢复为常用标准 Y 系列电机参数。若已知电机参数，可手动输入这 5 个参数。</td><td>(≤ 55kW)
0.001Ω~65.535Ω
(>55kW)
0.0001Ω~6.5535Ω</td><td>电机确定</td></tr>
<tr><td>F0.01</td><td>异步机转子电阻</td><td>(≤ 55kW)
0.001Ω~65.535Ω
(>55kW)
0.0001Ω~6.5535Ω</td><td>电机确定</td></tr>
<tr><td>F0.02</td><td>异步机漏感抗</td><td>(≤ 55kW)
0.01mH~655.35mH
(>55kW)
0.001mH~65.535mH</td><td>电机确定</td></tr>
<tr><td>F0.03</td><td>异步机互感抗</td><td>(≤ 55kW)
0.1mH~6553.5mH
(>55kW)
0.01mH~655.35mH</td><td>电机确定</td></tr>
<tr><td>F0.04</td><td>异步机空载电流</td><td>(≤ 55kW)
0.01A~A0.03
(>55kW)
0.1A~A0.03</td><td>电机确定</td></tr>
<tr><td>F0.16</td><td>载波频率</td><td>此功能调节变频器的载波频率。通过调整载波频率可以降低电机噪声，避开机械系统的共振点，减小线路对地漏电流及减小变频器产生的干扰。
当载波频率较低时，输出电流高次谐波分量增加，电机损耗增加，电机温升增加。
当载波频率较高时，电机损耗降低，电机温升减小，但变频器损耗增加，变频器温升增加，干扰增加。
调整载波频率会对下列性能产生影响：
<table>
<tr><td>载波频率</td><td>低</td></tr>
<tr><td>电机噪音</td><td>大</td></tr>
<tr><td>输出电流波形</td><td>差</td></tr>
<tr><td>电机温升</td><td>高</td></tr>
<tr><td>变频器温升</td><td>低</td></tr>
<tr><td>漏电流</td><td>小</td></tr>
<tr><td>对外辐射干扰</td><td>小</td></tr>
</table>
</td><td>1.0kHz~12.0kHz</td><td>机型确定</td></tr>
</table>

序号	名称	参数说明	设置范围	出厂值
F1 组：矢量控制参数				
F1.00	速度环比例增益 1	变频器运行在不同频率下，可以选择不同的速度环 PI 参数。给定频率小于切换频率 1(F1.02) 时，速度环 PI 调节参数为 F1.00 和 F1.01。给定频率大于切换频率 2 时，速度换 PI 调节参数为 F1.03 和 F1.04。切换频率 1 和切换频率 2 之间的速度环 PI 参数为两组 PI 参数线性切换。 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。 注意：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。	1~100	60
F1.01	速度环积分时间 1		0.01s~10.00s	0.50s
F1.02	切换频率 1		0.00Hz~F1.05	5.00Hz
F1.03	速度环比例增益 2		1~100	20
F1.04	速度环积分时间 2		0.01s~10.00s	1.00s
F1.05	切换频率 2		F1.02~b1.02	10.00Hz
F1.06	速度环滤波时间常数	矢量控制方式下，速度环调节器的输出为力矩电流指令，该参数用于对力矩指令滤波。此参数一般无需调整，在速度波动较大时可适当增大该滤波时间；若电机出现振荡，则应适当减小该参数。 速度环滤波时间常数小，变频器输出力矩可能波动较大，但速度的响应快。	0.000s~1.000s	0.080s
F1.08	励磁调节比例增益	矢量控制电流环 PI 调节参数，该参数在异步机参数辨识方式 2 完成后会自动获得，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。	1~500	10
F1.09	励磁调节积分增益		1~500	10
F1.10	转矩调节比例增益		1~500	10
F1.11	转矩调节积分增益		1~500	10

序号	名称	参数说明	设置范围	出厂值
F2 组：V/f 控制参数				
F2.01	转矩提升	为了补偿 V/f 控制低频转矩特性，对低频时变频器输出电压做一些提升补偿。但是转矩提升设置过大，电机容易过热，变频器容易过流。 当负载较重而电机启动力矩不够时，建议增大此参数。在负荷较轻时可减小转矩提升。 当转矩提升设置为 0.0 时，变频器为自动转矩提升，此时变频器根据电机定子电阻等参数自动计算需要的转矩提升值。 转矩提升转矩截止频率：在此频率之下，转矩提升转矩有效，超过此设定频率，转矩提升失效，具体如下图所示：  V1：手动转矩提升电压 Vb：最大输出电压 f1:手动转矩提升截止频率 fb：额定运行频率	0.0%~30.0%	电机功率确定
F2.02	转矩提升截止频率		0.00Hz~b1.02	50.00Hz
F2.09	V/f 转差补偿系数	该参数只对异步电机有效。 V/f 转差补偿，可以补偿异步电机在负载增加时产生的电机转速偏差，使负载变化时电机的转速能够基本保持稳定。 V/f 转差补偿增益设置为 100.0%，表示在电机带额定负载时补偿的转差为电机额定滑差，而电机额定转差，变频器通过 F1 组电机额定频率与额定转速自行计算获得。 调整 V/f 转差补偿增益时，一般以当额定负载下，电机转速与目标转速基本相同为原则。当电机转速与目标值不同时，需要适当微调该增益。	0.0%~100.0%	0.0%
F2.10	V/f 过励磁增益	在变频器减速过程中，过励磁控制可以抑制母线电压上升，避免出现过压故障。过励磁增益越大，抑制效果越强。 对变频器减速过程容易过压报警的场合，需要提高过励磁增益。但过励磁增益过大，容易导致输出电流增大，需要在应用中权衡。 对惯量很小的场合，电机减速中不会出现电压上升，则建议设置过励磁增益为 0；对有制动电阻的场合，也建议过励磁增益设置为 0。	0~200	0
F2.11	振荡抑制增益	该增益的选择方法是在有效抑制振荡的前提下尽量取小，以免对 V/f 运行产生不利的影响。在电机无振荡现象时请选择该增益为 0。只有在电机明显振荡时，才需适当增加该增益，增益越大，则对振荡的抑制越明显。 使用抑制振荡功能时，要求电机额定电流及空载电流参数要准确，否则 V/f 振荡抑制效果不好。	0~100	40

序号	名称	参数说明	设置范围	出厂值
F3 组：控制优化参数				
F3.00	DPWM 切换上限频率	该参数用于选择异步机运行时的发波方式，变频器给定频率低于此数值为 7 段式连续调制方式，否则为 5 段断续调制方式。 7 段式连续调制时变频器的开关损耗较大，但带来的电流纹波较小； 5 段断续调试方式下开关损耗较小，电流纹波较大；但在高频率时可能导致电机运行的不稳定性，一般不需要修改。 关于变频器损耗和温升请参考 F0.16 的调试。	5.00Hz~ 最大频率 (b1.02)	12.00Hz
F3.01	PWM 调制方式	该参数只对 V/f 控制有效。同步调制指载波频率随输出频率变换而线性变化，保证两者的比值 (载波比) 不变，一般在输出频率较高时使用，有利于输出电压质量。 在较低输出频率时 (100Hz 以下)，一般不需要同步调制，因为此时载波频率与输出频率的比值比较高，异步调制优势更明显一些。 给定频率高于 85Hz 时，同步调制才生效，该频率以下固定为异步调制方式。 0：异步调制 1：同步调试	0~1	0
F3.02	死区补偿模式选择	此参数一般不需要修改，只在对输出电压波形质量有特殊要求，或者电机出现振荡等异常时，需要尝试切换选择不同的补偿模式。大功率建议使用补偿模式 2。 0：不补偿 1：补偿模式 1 2：补偿模式 2	0~2	1
F3.03	随机 PWM 深度	设置随机 PWM，可以把单调刺耳的电机声音变得较为柔和，并能有利于减小对外的电磁干扰。 当设置随机 PWM 深度为 0 时，随机 PWM 无效。 调整随机 PWM 不同深度将得到不同的效果。 0：随机 PWM 无效 1~10：PWM 载频随机深度	0~10	0
F3.04	快速限流使能	启用快速限流功能，能最大限度的减小变频器过流故障，保证变频器不间断运行。若变频器长时间持续处于快速限流状态，变频器有可能出现过热等损坏，这种情况是不允许的，所以变频器长时间快速限流时将报 40#(逐波限流) 故障，表示变频器过载并需要停机（用于提升机构的时候必须设置为 0，否则有溜钩的风险。） 0：不使能 1：使能	0~1	0
F3.05	电流检测延时补偿	该参数用于设置变频器的电流检测补偿，设置过大可能导致控制性能下降。一般该数不需要修改。	0~100	5
F3.06	欠压点设置	该参数用于设置变频器欠压故障 (09#) 的电压值。当母线电压低于该参数的设定值时变频器为欠压状态限制继续运行。	140~630V	三相 380~480V 机型：350V 三相 200~240V 机型：200V

FD 组：EtherCAT、EtherNet/IP				
FD.01	EtherCAT 站点别名备份	EtherCAT 站点别名备份	0~65535	0
FD.02	EtherCAT 站点	EtherCAT 站点	0~65535	0
FD.37	DHCP 使能	是否使能动态主机配置协议是一个局域网的网络协议	0~1	0
FD.38	IP 地址最高字节	IP 地址最高字节	0~255	0
FD.39	IP 地址次高字节	IP 地址次高字节	0~255	0
FD.40	IP 地址三高字节	IP 地址三高字节	0~255	0
FD.41	IP 地址最低字节	IP 地址最低字节	0~255	0
FD.42	子网掩码最高字节	子网掩码最高字节	0~255	0
FD.43	子网掩码次高字节	子网掩码次高字节	0~255	0
FD.44	子网掩码三高字节	子网掩码三高字节	0~255	0
FD.45	子网掩码最低字节	子网掩码最低字节	0~255	0
FD.46	网关最高字节	网关最高字节	0~255	0
FD.47	网关次高字节	网关次高字节	0~255	0
FD.48	网关三高字节	网关三高字节	0~255	0
FD.49	网关最低字节	网关最低字节	0~255	0
FD.58	通信错误码	通信错误码	0~255	0
FD.61	MAC 地址开始的两个字节	MAC 地址开始的两个字节	0~65535	0
FD.62	MAC 地址中间的两个字节	MAC 地址中间的两个字节	0~65535	0
FD.63	MAC 地址最后的两个字节	MAC 地址最后的两个字节	0~65535	0

FF 组：厂家参数				
FF.00	三级菜单密码	该参数表示三级菜单功能参数的显示和修改密码。若该参数设置为非零值则进入三级菜单需要输入该密码。若连续输入三次错误密码则所有菜单被锁定，需要重新上电才能继续查看或修改参数，重新设为 0 后，密码解除。	0~65535	0
FF.10	三级菜单恢复出厂参数	0：不恢复 1：恢复三级菜单出厂参数 一级菜单中的 F0.00~04、F0.16、F2.01、F2.11、FF.00 不恢复。 2：恢复所有参数	0~2	0
FF.11	三级菜单用户设定检查	0：正常显示所有三级菜单参数 1：只显示与出厂默认值不同的三级菜单参数	0~1	0

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 试运行前调整指南

1） 开环矢量控制模式（b1.00=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电机参数辨识，完成电机参数的自动整定。

故障描述	解决对策
电机启动过程中报过载或过流故障	◆ 电机参数（P0.01~P0.05）按电机铭牌设定。 ◆ 进行电机参数辨识（b0.04）。
5Hz 以上转矩或速度响应慢、电机振动	◆ 改善转矩和速度的响应，需要加强速度环比例调节（F1.03 按 10 为单位增大设定值）或者降低速度环积分时间（F1.04 按 0.05 为单位降低）。 ◆ 如果出现振动，需要减弱 F1.03 和 F1.04 参数值。
速度精度低	◆ 当电机带载速度偏差过大时，需增大滑差补偿（b1.01），按 10% 为单位增减。
速度波动大	◆ 当电机速度有异常波动时，可适当增加速度环滤波时间常数（F1.06），按 0.001s 为单位增加。
电机噪音大	◆ 适当增加载频频率值（F0.16），以 1.0kHz 为单位升高。（注意：1、升高载频变频器会降容 (具体细节咨询厂家)；2、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（b1.04 和 b1.05）；转矩模式下增大转矩指令。

2） 闭环矢量控制模式（b1.00=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。

故障描述	解决对策
启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（P0.01~P0.05）按电机铭牌设定。 ◆ 进行电机参数辨识（b0.04）。
5Hz 以下转矩或速度响应慢、电机振动	◆ 改善转矩和速度的响应，需要加强速度环比例调节（F1.00 按 10 为单位增大设定值）或者降低速度环积分时间（F1.01 按 0.05 为单位降低）。 ◆ 如果出现振动，需要减弱 F1.00 和 F1.01 参数值。
5Hz 以上转矩或速度响应慢、电机振动。	◆ 改善转矩和速度的响应，需要加强速度环比例调节（F1.03 按 10 为单位增大设定值）或者降低速度环积分时间（F1.04 按 0.05 为单位降低）。 ◆ 如果出现振动，需要减弱 F1.03 和 F1.04 参数值。
速度波动大	◆ 当电机速度有异常波动时，可适当增加速度环滤波时间常数（F1.06），按 0.001s 为单位增加。
电机噪音大	◆ 适当增加载频频率值（F0.16），以 1.0kHz 为单位升高。（注意：1、升高载频变频器会降容 (具体细节咨询厂家)；2、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（b1.04 和 b1.05）；转矩模式下增大转矩指令。

3） V/f 控制模式 (b1.00=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。

故障描述	解决对策
运行中电机振荡	◆ 增加振荡抑制参数（F2.11），以 10 为单位增加（最大调整到 100）。
大功率启动报过流	◆ 降低转矩提升（F2.01），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（P0.02）、额定频率（P0.04）。 ◆ 降低转矩提升（F2.01），以 0.5% 为单位调节。
电机噪音大	◆ 适当增加载波频率值（F0.16），以 1.0kHz 为单位升高。 （注意：1、升高载频变频器会降容 (具体细节咨询厂家)； 2、升高载频电机漏电流会增大）

7.3 警报及故障显示

YD587 实时监控着各种输入信号、运行条件、外部反馈信息等，一旦发生异常，相应的保护功能动作同时操作面板显示故障信息，如 “ Er 102 ” 等。

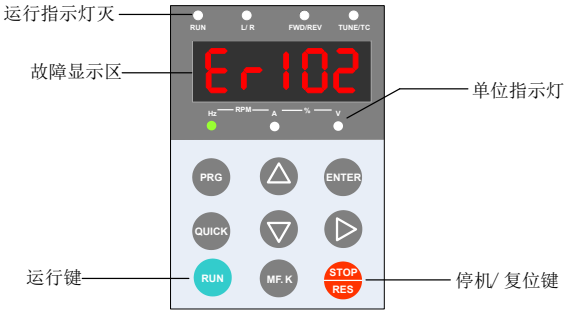


图 7-1 故障界面示意图

操作面板上的五个数码管从左至右依次编号为 5、4、3、2、1，例如：显示内容为 103.02，5#、4# 和 3# 数码管组成故障代码，其中 5# 数码管的 “1” 为故障等级；4# 和 3# 数码管的 “03” 为故障代码；2# 和 1# 数码管的 “02” 为故障子码，作为厂家保留内容，用户可通过故障记录（E* 组参数）查看。具体如下图所示。

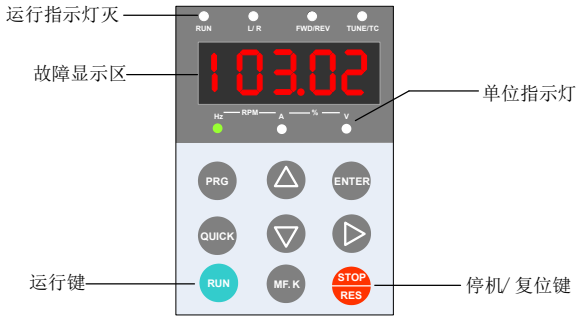


图 7-2 故障记录界面 LED 显示举例

用户在寻求服务之前，可以先按本节提示进行自查，分析故障原因，找出解决方法。
YD587 是整个起重机电控系统的核心，它产生的故障信息可以根据对系统的影响程度分为 5 个类别，不同类别的故障相应的处理方式也不同，对应关系如下表所示。

NOTE

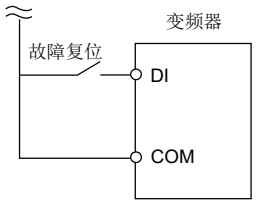
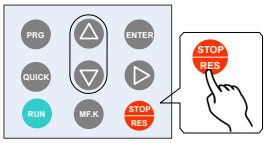
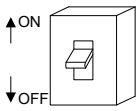
◆ * 表示故障级，* 的取值范围为 1~5. 例如 Er*52，其中 52 为故障码，* 表示故障等级可调整。

故障等级	处理方式	显示方式
一级故障	◆ 操作面板显示故障代码 ◆ 输出功能 1(制动器控制) 无效 ◆ 输出功能 2(故障停机) 有效 ◆ 变频器执行自由停机	Er 1**
二级故障	◆ 操作面板显示故障代码 ◆ 输出功能 3(故障报警) 有效 ◆ 变频器执行快速停机	Er2**
三级故障	◆ 操作面板显示故障代码 ◆ 输出功能 3(故障报警) 有效 ◆ 变频器执行减速停机	Er3**
四级故障	◆ 操作面板显示故障代码 ◆ 输出功能 4(故障提示) 有效 ◆ 各种工况运行不受影响	Er4**
五级故障	◆ 各种工况运行不受影响	Er5**

NOTE

◆ 1#~40# 故障为变频器驱动性能故障，YD587 默认为一级故障无法更改；
◆ 41#~65# 故障为变频器功能故障，用户可通过参数 bF.10~14 更改相应故障的故障等级 (详见 bF.10~14 的说明)。

7.4 故障复位

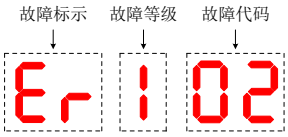
阶段	措施	备注
故障时	通过操作面板显示查看记录	通过 E0 组 ~E9 组可查看 
故障复位前	从操作面板显示的故障类型上查找故障原因并解除故障，解除故障原因后再复位	请参考“7.5 故障码处理”进行处理
解除故障复位方法	1）将 DI 设定为功能 3（b3.01~b3.10=3 故障复位），确认已经取消变频器的运行命令后，复位功能端子有效。	
	2）确认已经取消变频器的运行命令后，按下面板上红色停机复位键使其复位	按面板红色停机复位键 
	3）给变频器重新上电后自动复位 暂时将主回路电源切断，待操作面板上显示的内容消失后再次接通电源	
	4）使用 Modbus-RTU 串口通信功能的可通过通信方式复位。 在 bF.04=2（通信控制）时，确认已经取消变频器的运行命令后，通过上位机对 2000H 通信地址写入“7”（故障复位），可使变频器在故障源清除后进行复位[注]	

NOTE

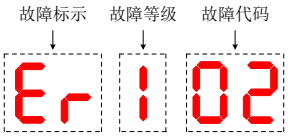
◆ [注] 具体可参考“附录 A：Modbus 通信协议介绍”。

7.5 故障码处理

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。



故障码	故障名称	故障原因	解决对策
Er102	加速 过电流	1、变频器输出回路存在接地或短路 2、控制方式为矢量且没有进行参数辨识 3、加速时间太短 4、手动转矩提升或 V/f 曲线不合适 5、电压偏低 6、对正在旋转的电机进行启动 7、加速过程中突加负载 8、变频器选型偏小	1、排除外围故障 2、进行电机参数辨识 3、增大加速时间 4、调整手动提升转矩或 V/f 曲线 5、将电压调至正常范围 6、选择转速追踪启动或等电机停止后再启动 7、取消突加负载 8、选用功率等级更大的变频器
Er103	减速 过电流	1、变频器输出回路存在接地或短路 2、控制方式为矢量且没有进行参数辨识 3、减速时间太短 4、电压偏低 5、减速过程中突加负载 6、没有加装制动单元和制动电阻 7、制动电路短路	1、排除外围故障 2、进行电机参数辨识 3、增大减速时间 4、将电压调至正常范围 5、取消突加负载 6、加装制动单元及电阻 7、排查制动电阻
Er104	恒速 过电流	1、变频器输出回路存在接地或短路 2、控制方式为矢量且没有进行参数辨识 3、电压偏低 4、运行中是否有突加负载 5、变频器选型偏小 6、制动电路短路	1、排除外围故障 2、进行电机参数辨识 3、将电压调至正常范围 4、取消突加负载 5、选用功率等级更大的变频器 6、排查制动电阻
Er105	加速 过电压	1、输入电压偏高 2、加速过程中存在外力拖动电机运行 3、加速时间过短 4、没有加装制动单元和制动电阻	1、将电压调至正常范围 2、取消外力或加装制动电阻 3、增大加速时间 4、加装制动单元及电阻
Er106	减速 过电压	1、输入电压偏高 2、减速过程中存在外力拖动电机运行 3、减速时间过短 4、没有加装制动单元和制动电阻	1、将电压调至正常范围 2、取消外力或加装制动电阻 3、增大减速时间 4、加装制动单元及电阻
Er107	恒速 过电压	1、输入电压偏高 2、运行过程中存在外力拖动电机运行	1、将电压调至正常范围 2、取消外力或加装制动电阻
Er108	控制电源故障	输入电压不在规定的范围内	将电压调至要求的范围内
Er109	欠压 故障	1、瞬时停电 2、变频器输入端电压不在要求的范围 3、母线电压低于 F3.06 4、整流桥及缓冲电阻不正常 5、驱动板异常 6、控制板异常	1、复位故障 2、调整电压到正常范围 3、寻求技术支持 4、寻求技术支持 5、寻求技术支持 6、寻求技术支持
Er110	变频器 过载	1、负载是否过大或发生电机堵转 2、变频器选型偏小	1、减小负载并检查电机及机械情况 2、选用功率等级更大的变频器
Er111	电机过载	1、电机保护参数 bE.01 设定是否合适 2、负载是否过大或发生电机堵转 3、变频器选型偏小	1、正确设定此参数 2、减小负载并检查电机及机械情况 3、选用功率等级更大的变频器
Er112	输入缺相	1、三相电源输入不正常 2、驱动板、防雷板、主控板、整流桥异常	1、检查并排除外围接线问题 2、寻求厂家技术支持
Er114	变频器过热	1、环境温度过高 2、风道堵塞 3、风扇损坏 4、模块热敏电阻损坏 5、逆变模块损坏	1、降低环境温度 2、清理风道 3、更换风扇 4、更换热敏电阻 5、更换逆变模块
Er115	内置制动单元过载	1、制动电阻选型偏小 2、制动电阻短路 3、内置制动单元损坏 4、外部负载发电量偏大	1、选择更大阻值的制动电阻 2、检查变频器到制动电阻的接线是否正常 3、寻求技术支持
Er116	内置制动单元直通		
Er117	接触器故障	1、驱动板和电源不正常 2、接触器不正常	1、更换驱动板或电源板 2、更换接触器
Er118	电流检测故障	1、霍尔器件异常 2、驱动板异常	1、更换霍尔器件 2、更换驱动板
Er119	电机参数辨识故障	1、电机参数未按铭牌设置 2、参数辨识过程超时	1、根据铭牌正确设定电机参数 2、检查变频器到电机接线



故障码	故障名称	故障原因	解决对策
Er120	编码器故障	1、编码器型号不匹配 2、编码器连线错误 3、编码器损坏 4、PG 卡异常	1、根据实际正确设定编码器类型 2、排除线路故障 3、更换编码器 4、更换 PG 卡
Er123	对地短路故障	1、电机对地短路	1、更换电缆或电机
Er125	输出缺相	1、变频器到电机的接线不正常 2、电机运行时变频器三相输出不平衡 3、驱动板异常 4、模块异常	1、排除外围故障 2、检查电机三相绕组是否正常并排除故障 3、寻求技术支持 4、寻求技术支持
Er137	频率方向异常	运行给定频率和电机反馈频率的方向相反。	1、检查电机参数设置是否正确 2、检查负载是否过重 3、调整 bC.02 的设置
Er138	频率跟随异常	给定频率和电机反馈频率跟随误差过大	1、检查电机参数设置是否正确 2、检查负载是否过重 3、调整 bC.03 和 bC.04 的设置
Er140	逐波限流故障	1、负载是否过大或发生电机堵转 2、变频器选型偏小	1、减小负载并检查电机及机械情况 2、选用功率等级更大的变频器
Er453	抱闸失效保护	变频器在 b1.00=1(FVC) 且停机时，检测到编码器脉冲反馈累加，说明制动器松动，没有完全将电机轴抱住，此时变频器将自动运行于 0Hz。	1、查看制动器是否松动，若存在松动，调大制动力矩，或者联系主机厂。 2、查看 bC.00 参数是否设置合适，如果设置过小，适当调大，设置为 0 则关闭该功能

故障码	故障名称	故障原因	解决对策
Er*41	松闸故障	1、在松闸阶段，松闸时间超过 b6.22 设置超时时间 2、松闸反馈信号输入有误。 详见参数 b6.08 的使用说明。	1、检查抱闸输出信号是否正确 2、检查制动器电路接线 3、检查控制板松闸反馈输入点的功能选择 (输入功能 11)
Er*42	抱闸故障	抱闸反馈信号输入有误。 详见参数 b6.08 的使用说明。	1、检查制动器电路接线 2、检查控制板抱闸反馈输入点的功能选择 (输入功能 12)
Er*43	轴冷电机低速运行超时	详见参数 b0.00 和 b0.01 的使用说明。	1、适当调整 b0.00 和 b0.01 的设置 2、注意保护电机过热
Er*44	正、反向运行指令同时有效	变频器同时检测到正反向运行指令	1、检查正反向运行命令输入点的外围电路 2、适当提高端子滤波时间
Er*45	操纵杆未归零	变频器上电时检测到有运行命令或频率给定信号输入	1、上电过程中确保各常开输入点信号无效; 2、待系统初始化结束后再开始输入运行指令。
Er*46	工艺卡通信异常	变频器与工艺卡 (YD587CF*) 之间通信异常	1、检查 bF.18 的设置是否正确 2、寻求技术支持
Er*47	CAN 总线故障	1、CANlink 扩展卡工作异常 2、通信线不正常	1、检查各扩展卡之间的通信接线是否有松动 2、检查各扩展卡接口是否有松动 3、尽可能缩短各个通信节点之间的距离
Er*48	通信异常	1、上位机工作异常 2、通信线异常 3、通信参数 bd 组设置不正确	1、检查上位机接线 2、检查通信连接线 3、正确设置通信扩展卡类型 4、正确设置通信参数
Er*49	参数读写异常	EEPROM 芯片损坏	更换主控板
Er*50	外部输入故障	DI 输入功能 7 有效	复位运行
Er*51	功能码故障	1、功能参数设置异常 2、EEPROM 存储芯片异常	1、使用参数自检功能，查看出错功能后修改 2、更新主控板
Er*52	V/f 模式专用速度偏差过大	电机实际运行频率与同步频率超出速度偏差阈值	1、检查负载是否过重 2、调整 bC.01 和 bC.03 的设置 3、检查电机参数设置是都正确。
Er*53	抱闸失效保护	变频器在停机时，检测到编码器脉冲反馈累加，说明制动器松动，没有完全将负载抱住，此时变频器将自动运行于 0Hz，在 b1.00=1(FVC) 时有效。	1、查看制动器是否松动，若存在松动，调大制动力矩，或者联系主机厂。 2、查看 bC.00 参数是否设置合适，如果设置过小，适当调大，设置为 0 则关闭该功能。

7.6 故障现象处理

序号	故障现象	可能原因	解决对策
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	检查母线电压或寻求厂家服务
		控制板与驱动板、键盘之间连线断	重新拔插 8 芯和 40 芯排线
		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 CrAnE	驱动板与控制板之间的连线接触不良	重新拔插 8 芯和 28 芯排线
		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 Er123 报警	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 CrAnE 并马上停机	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 Er114（模块过热）故障	载频设置太高	降低载频（F0.15）
		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（热电偶或其他）	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 b1.00（控制方式）、bF.04（运行方式）设置正确； ◆ V/f 模式下，重载启动下，调整 F2.01(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 b3 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	更换 PG 卡
		PG 卡故障	寻求厂家服务
		驱动板故障	
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参数辨识
		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 Er117	软启动接触器未吸合或在低温高湿环境下，软启动接触器未导通	* 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 * 在电控箱里加设加热装置
11	防雷板异常报 Err12	防雷板与驱动板之间连线松动	检查防雷板与驱动板之间的输入缺相信号线是否连接可靠
		防雷板腐蚀或损坏	检查防雷板是否明显损坏或腐蚀严重，更换防雷板

7.7 故障子码介绍

为了更好的推断故障原因及排查故障，YD587 对部分故障设计了子码。

用户查看故障记录（E*组参数）时，E*.00 的小数点后两位表示故障子码。具体的子码内容请参考下表。

故障代码	代码含义	故障子码	子码含义
02#~04#	过流	1	逆变单元硬件过流
		10	内置制动单元硬件过流
05#~07#	过压	1	软件过压故障 1
		2	软件过压故障 2
08#	缓冲电阻过热故障或控制电源故障	1	上电过程中电压不稳，造成上电后欠压，短时间内再次上电次数达到 5 次以上。
09#	欠压	1	变频器运行过程中母线电压低于欠压点的（F3.06）设定电压
10#	变频器过载	1	按照变频器过载曲线报出的过载故障
		2	任何一相输出逐波限流时间达到 5s
11#	电机过载	1	按照电机过载曲线报出的过载故障
12#	输入缺相	1	硬件输入缺相 1
		2	硬件输入缺相 2
		3	软件输入缺相 1
		4	软件输入缺相 2
14#	散热器过热或模块过热	1	逆变器温度超过过温点
15#	内置制动管过载	1	制动管瞬时电流大于两倍的额定制动电流
		2	制动管瞬时电流大于“变频器过压点电压除以最小电阻值”
		3	根据内置制动管过载曲线报出故障
16#	内置制动管直通	1	在变频器上电过程及停机时检测到制动管电流大于检测阈值
17#	缓冲电阻吸合故障	1	硬件缓冲电阻检测故障 1
		2	硬件缓冲电阻检测故障 2
18#	零漂检测过大或电流传感器故障	1	U 相检测零漂过大
		2	V 相检测零漂过大
		3	W 相检测零漂过大
19#	参数辨识失败	1	空载电流异常
20#	编码器故障	1	硬件编码器断线检测（仅 YD580-ABZ 支持）
		2	软件编码断线检测
		9	闭环模式下动态完整参数辨识，编码器线数错误
		10	闭环模式下动态完整参数辨识，编码器断线
23#	对地短路故障	1	对地短路检测阶段发生硬件过流
		2	对地短路检测阶段发生硬件过压
		3	对地短路检测阶段检测电流大于变频器额定电流峰值
25#	输出缺相	1	U 相输出缺相
		2	V 相输出缺相
		3	W 相输出缺相
		4	闭环模式下输出电压较大
		5	定子电阻参数辨识时，输出缺相时报此故障
37#	失速预警 1	1	详见 bC.02 的介绍
38#	失速预警 2	1	详见 bC.03~bC.04 的介绍
40#	逐波限流故障	1	任何一相输出短时间内连续出现逐波限流

Memo NO. _____

Date / /

Memo NO. _____

Date　　/　　/

Memo NO. _____

Date / /

Memo NO. _____

Date　　/　　/

Memo NO. _____

Date / /

Memo NO. _____

Date / /

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）。

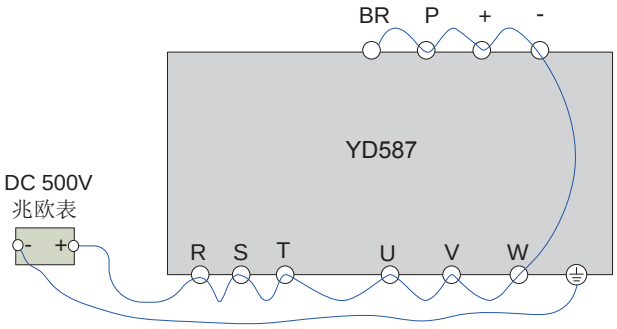


图 8-1 主回路绝缘测试示意图

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：

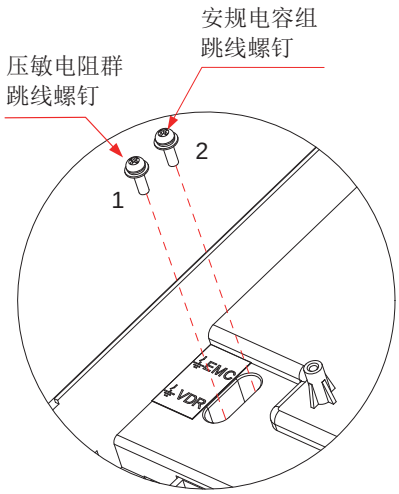


图 8-2 压敏电阻（VDR）、安规电容（EMC）对地跳线位置示意图

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

型号	冷却风扇	型号	冷却风扇
三相 380V AC~480V AC，50/60Hz			
YD587T4-0P7GB	1	YD587T4-45GB-T	1
YD587T4-1P5GB	1	YD587T4-55GB-T	1
YD587T4-2P2GB	1	YD587T4-75GB-T	2
YD587T4-3P0GB	1	YD587T4-90GB-T	2
YD587T4-3P7GB	1	YD587T4-110GB-T	2
YD587T4-5P5GB	1	YD587T4-132GB-T	2
YD587T4-7P5GB	1	YD587T4-160GB-T	2
YD587T4-11GB	2	YD587T4-200GB-T	2
YD587T4-15GB	2	YD587T4-220GB-T	2
YD587T4-18P5GB	1	YD587T4-250GB-T	3
YD587T4-22GB	1	YD587T4-280GB-T	3
YD587T4-30GB	1	YD587T4-315GB-T	3
YD587T4-30GB-T	1	YD587T4-355GB-T	3
YD587T4-37GB-T	1	YD587T4-400GB-T	3

第九章 规格与选型

9.1 YD587 变频器技术规格与尺寸

9.1.1 电气规格

表 9-1 YD587 变频器型号与技术数据（三相 380V~480V）

项 目		规 格									
型号:YD587T4-XXG(B)(-T)		-	0P7	-	1P5	2P2	3P0	3P7	5P5	7P5	11
适用电机容量 (kW)		-	0.75	-	1.5	2.2	3	3.7	5.5	7.5	11
输入	额定输入电流 (A)	-	2.4	-	4.6	6.3	9	11.4	16.7	21.9	32.2
输出	额定输出电流 (A)	-	2.1	-	3.8	5.1	7.2	9	13	17	25
	最高输出电压	三相 380V~480V（跟随输入电压）									
	最高输出频率	150Hz（可通过参数更改）									
	载波频率	1.0kHz~6.0kHz(矢量控制)；1.0kHz~12kHz（V/f 控制）									
	过载能力	40°C时连续输出 150% 额定电流 60s，会发生过载									
电源	额定电压、额定频率	三相 380V AC~480V AC，50/60Hz									
	电压允许波动范围	-15%~+10%，实际允许范围：323V AC~528V AC									
	频率允许波动范围	±5%，实际允许范围：47.5Hz~63Hz									
	电源容量 (kVA)	-	2.8	-	5	6.7	9.5	12	17.5	22.8	33.4
发热功耗 (kW)		-	0.046	-	0.068	0.081	0.109	0.138	0.201	0.24	0.355
排风量（CFM）		-	-	-	9	9	9	20	24	30	40
过电压等级		OVCIII									
污染等级		PD2									
防护等级		IP20（open type，IP 防护等级适用于 IEC 产品） Type1（enclosed type，Type1 防护等级适用于 UL 产品）									
防护类别		Class I									
电网类型		TN-S、TN-T、TN-CS、TT/IT（非角型接地）									

项 目		规 格									
型号:YD587T4-XXG(B)(-T)		15	18P5	22	30	37	45	55	75	90	110
适用电机容量 (kW)		15	18.5	22	30	37	45	55	75	90	110
输入	额定输入电流 (A)	41.3	49.5	59	57	69	89	106	139	164	196
输出	额定输出电流 (A)	32	37	45	60	75	91	112	150	176	210
	最高输出电压	三相 380V~480V（跟随输入电压）									
	最高输出频率	150Hz（可通过参数更改）									
	载波频率	1.0kHz~6.0kHz(矢量控制)；1.0kHz~12kHz（V/f 控制）									
	过载能力	40°C连续输出 150% 额定电流 60s，会发生过载									
电源	额定电压、额定频率	三相 380V AC~480V AC，50/60Hz									
	电压允许波动范围	-15%~+10%，实际允许范围：323V AC~528V AC									
	频率允许波动范围	±5%，实际允许范围 :47.5Hz~63Hz									
	电源容量 (kVA)	42.8	45	54	52	63	81	97	127	150	179
发热功耗 (kW)		0.454	0.478	0.551	0.694	0.815	1.01	1.21	1.57	1.81	2.14
排风量（CFM）		42	51.9	57.4	118.5	118.5	122.2	122.2	218.6	287.2	342.2
过电压等级		OVCIII									
污染等级		PD2									
防护等级		IP20（open type，IP 防护等级适用于 IEC 产品） Type1（enclosed type，Type1 防护等级适用于 UL 产品）									
防护类别		Class I									
电网类型		TN-S、TN-T、TN-CS、TT/IT（非角型接地）									

项 目		规 格								
型号: YD587T4-XXG(B)(-T)		132	160	200	220	250	280	315	355	400
适用电机容量 (kW)		132	160	200	220	250	280	315	355	400
输入	额定输入电流 (A)	240	287	365	410	441	495	565	617	687
输出	额定输出电流 (A)	253	304	377	426	465	520	585	650	725
	最高输出电压	三相 380V~480V（跟随输入电压）								
	最高输出频率	150Hz（可通过参数更改）								
	载波频率	1.0kHz~6.0kHz(矢量控制)；1.0kHz~12kHz（V/f 控制）								
	过载能力	40°C连续输出 150% 额定电流 60s，会发生过载								
电源	额定电压、额定频率	三相 380V AC~480V AC，50/60Hz								
	电压允许波动范围	-15%~10%，实际允许范围：323V AC~528V AC								
	频率允许波动范围	±5%，实际允许范围 :47.5Hz~63Hz								
	电源容量 (kVA)	220	263	334	375	404	453	517	565	629
发热功耗 (kW)		2.85	3.56	4.15	4.55	5.06	5.33	5.69	6.31	6.91
排风量（CFM）		547	627	638.4	722.5	789.4	882	645	860	860
过电压等级		OVCIII								
污染等级		PD2								
防护等级		IP20（open type，IP 防护等级适用于 IEC 产品） Type1（enclosed type，Type1 防护等级适用于 UL 产品）				IP00（open type，IP 防护等级适用于 IEC 产品）				
防护类别		Class I								
电网类型		TN-S、TN-T、TN-CS、TT/IT（非角型接地）								

表 9-2 YD587 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%（SVC）；0Hz/180%（FVC）	
	调速范围	1：200 （SVC）	1：1000 （FVC）
	稳速精度	±0.5%（SVC）	±0.02%（FVC）
	转矩控制精度	FVC：±3%； SVC：10Hz 以上 ±5%。	
	转矩提升	自动转矩提升；手动转矩提升 0.1%~30.0%	
	直流制动	直流制动频率：最低频率～额定频率 直流制动电流：0.0% ～ 120.0% 额定电流	
	加减速曲线	直线或 S 曲线加减速方式	
	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	起重工艺卡	支持起重工艺卡选件，可实现变频器内置防摇复杂起重工艺控制	
	超载保护	自动识别负载情况，超载后限制提升运行，只能下放运行	
	多电机切换	变频器所有参数备份三套，可实现三个电机切换控制	
	多线程总线支持	支持六种现场总线：Modbus、PROFIBUS DP、 CANopen、PROFINET、EtherNet/IP、EtherCAT。	
	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	
	随压降速	母线电压偏低时通过负载回馈能量保证电压维持在正常水平	
	制动器时序控制	内置专业的起重专用制动器时序控制	
	轻载高速	通过检测变频器输出转矩自动计算最高可达输出频率	
	特殊曲线	三段可选加减速曲线	
	负载超速判断	依据编码器反馈频率设计频率方向异常和频率跟随异常两个报警	
	减速、停止开关	简易的定位功能	
	多类故障报警	变频器输出故障类型以及处理方式可选	
	电机参数静态辨识	支持静态辨识所有电机参数	
	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	
运行	运行指令	操作面板给定、控制端子给定、通信给定 (RS485/CANopen/PROFINET)	
	频率指令	多段速给定、模拟电压给定、模拟电流给定、通信给定给定	
运行	输入端子	标准： 5 个数字输入端子 2 个模拟量输入端子，其中 1 个仅支持 0V~+10V 电压输入，另 1 个支持 0V~+10V 电压输入或 4mA~20mA 电流输入 扩展能力： 标配 YD580-IO3，增加 3 个DI，1个RLY，1个AO2；	
	输出端子	标准： 2 个数字输出端子 1 个继电器输出端子 1 个模拟输出端子，支持 0V~+10V 电压输出或 0mA~20mA 电流输出扩展能力： 标配 YD580-IO3，增加 3 个DI，1个RLY，1个AO2；	
显示与键盘操作	LED 显示	显示参数	
	参数拷贝	可通过参数拷贝面板实现参数的快速拷贝和复制	

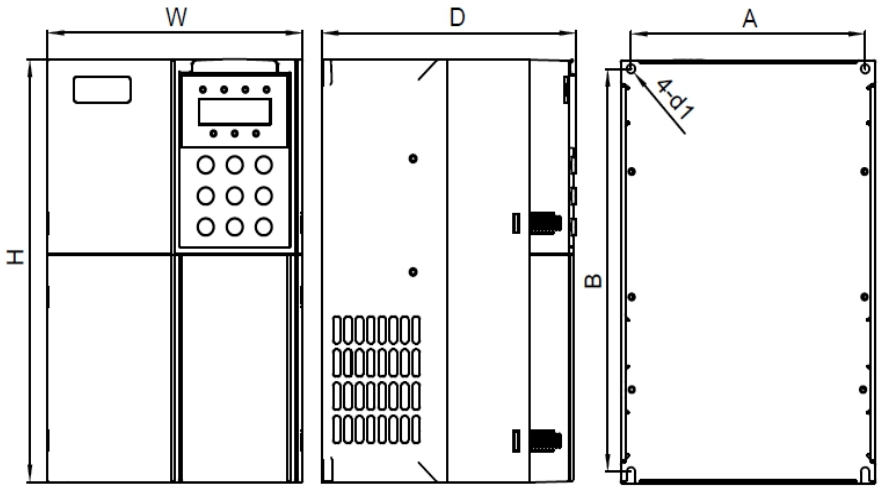
项 目		技术规格
保护功能	缺相保护	输入缺相保护，输出缺相保护
	瞬间过电流保护	在 2.5 倍额定电流峰值以上时停机
	过压保护	主回路直流电压在 820V 以上时停机
	欠压保护	主回路直流电压在 350V 以下时停机
	过热保护	逆变桥过热时会触发保护
	过载保护 *1	150% 额定电流运行 60s 停机
	制动保护	制动单元过载保护，制动电阻短路保护
	短路保护	输出相间短路保护，输出对地短路保护
环境	使用场所	室内，不受阳光直晒，无尘埃、腐蚀性气体、可燃性气体、油雾、水蒸汽、滴水或盐分等
	海拔高度	1000m 以下使用无需降额，1000m 以上每升高 100m 降额 1%，最高使用海拔为 3000m
	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	使用场景：根据 IEC 60068-2-6 测试。5Hz~8.4Hz 时振幅为 3.5 mm，8.4Hz~200Hz 时加速度为 1g，10 个循环 / 轴向； 运输场景：根据 IEC 60068-2-64 测试。5Hz~100Hz 时功率谱密度为 $0.01g^2/Hz$，200Hz 时功率谱密度为 $0.001g^2/Hz$，Grms 为 1.14g
	冲击	使用 / 运输场景：根据 IEC 60068-2-27 测试。加速度为 15g，脉宽为 11ms，三轴向共 18 次
	存储温度	-20°C ~ + 60°C

9.1.2 外型与安装尺寸

◆ YD587整机尺寸

F1~F4整机尺寸

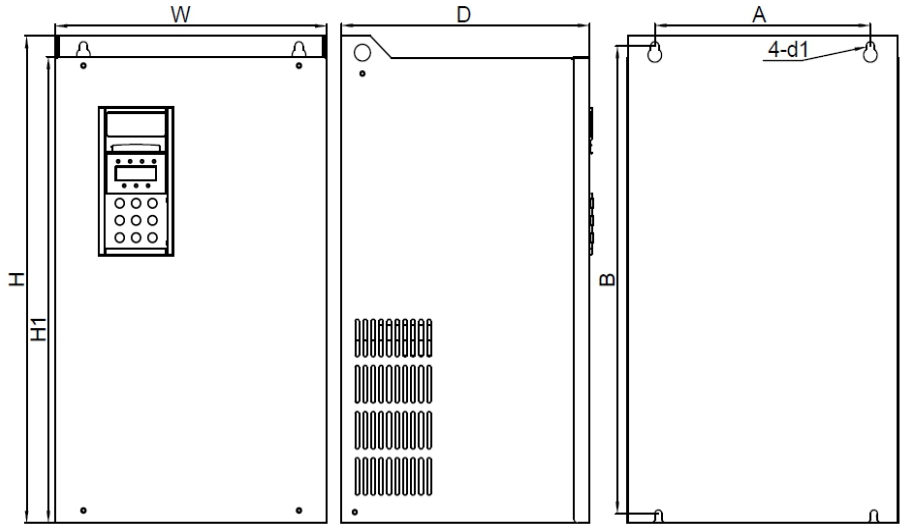
F1~F4



YD587T4-0P7GB ~ YD587T4-22GB

F5~F8整机尺寸

F5~F8



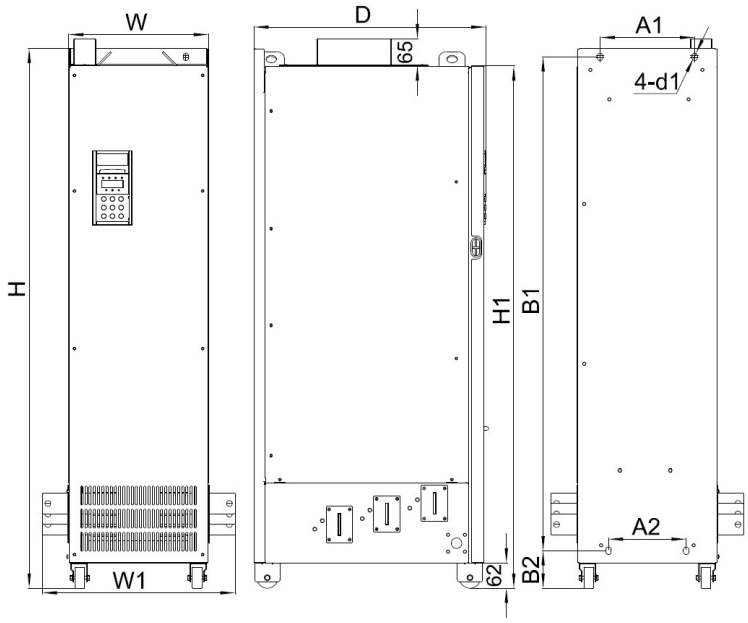
YD587T4-30GB(-T) ~ YD587T4-160GB-T

表9-6 YD587T4-0P7GB～YD587T4-160G-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
		W	H	H1	D	A	B	d1
F1	**YD587T4-0P7GB**	130	200	/	172	119.4	189.4	φ5
	YD587T4-1P5GB							
	YD587T4-2P2GB							
	YD587T4-3P0GB							
	YD587T4-3P7GB							
	YD587T4-5P5GB							
F2	**YD587T4-7P5GB**	140	250	/	178	129	239	φ6
	YD587T4-11GB							
F3	**YD587T4-15GB**	180	280	/	180	165.4	266.7	φ6
F4	**YD587T4-18P5GB**	225	360	/	225	206	341	Φ7
	YD587T4-22GB							
F5	**YD587T4-30GB**	256	436	422	254	213	421	φ7
	YD587T4-30GB-T							
	YD587T4-37GB(-T)							
F6	**YD587T4-45GB(-T)**	302	540	527	300	245	521	φ10
	YD587T4-55GB-T							
F7	**YD587T4-75GB-T**	340	581	556	331	270	560	φ10
	YD587T4-90GB-T							
	YD587T4-110GB-T							
F8	**YD587T4-132G-T**	400	925	885	337	320	905	φ10
	YD587T4-160G-T							

F9~F11整机尺寸

F9~F11



YD587T4-200G-T ~ YD587T4-450G-T

表 9-8 YD587T4-200G-T ~ YD587T4-450G-T 外型及安装孔位尺寸

YD587T4-200G-T ~ YD587T4-450G-T 外形尺寸/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
		W	W1	H	H1	D	A1	A2	B1	B2	d1
F9	**YD587T4-200G-T**	303	426	1136	1091	523	240	150	1035	83	φ13
	YD587T4-220G-T										
F10	**YD587T4-250G-T**	333	459	1286	1245	568	225	185	1175	91	φ13
	YD587T4-280G-T										
F11	**YD587T4-315G-T**	345	458	1404	1355	561	240	185	1291	91	φ16
	YD587T4-355G-T										
	YD587T4-400G-T										
	YD587T4-450G-T										

9.2 制动组件选型指导

9.2.1 制动组件选型表

表 9-13 变频器制动组件选型表

变频器型号	制动单元		起升应用时推荐最小功率（kW）	平移应用时推荐最小功率（kW）	允许的最小制动电阻（Ω）
YD587T4-0P4GB	内置标配		0.2	0.08	96
YD587T4-0P7GB	内置标配		0.35	0.14	96
YD587T4-1P1GB	内置标配		0.55	0.22	96
YD587T4-1P5GB	内置标配		0.75	0.3	96
YD587T4-2P2GB	内置标配		1.1	0.44	64
YD587T4-3P0GB	内置标配		1.5	0.6	64
YD587T4-3P7GB	内置标配		1.8	0.75	32
YD587T4-5P5GB	内置标配		2.7	1.1	32
YD587T4-7P5GB	内置标配		3.7	1.5	32
YD587T4-11GB	内置标配		5.5	2.2	20
YD587T4-15GB	内置标配		7.5	3	20
YD587T4-18P5GB	内置标配		9	3.7	24
YD587T4-22GB	内置标配		11	4.4	24
YD587T4-30GB(-T)	内置标配		15	6	19.2
YD587T4-37GB-T	内置标配		18	7.5	14.8
YD587T4-45GB-T	内置标配		22	9	12.8
YD587T4-55GB-T	内置标配		27	11	9.6
YD587T4-75GB-T	内置标配		37	15	6.8
YD587T4-90GB-T	内置标配		45	18	6.0
YD587T4-110GB-T	内置标配		55	22	5.0
YD587T4-132G-T	输入电压≤ 440V AC	YDBUN-200-T	66	26.4	2.5
YD587T4-160G-T	输入电压≤ 440V AC	YDBUN-200-T	88	32	2.5
YD587T4-200G-T	输入电压≤ 440V AC	YDBUN-200-T×2	50×2	20×2	2.5×2
YD587T4-220G-T	输入电压≤ 440V AC	YDBUN-200-T×2	55×2	22×2	2.5×2
YD587T4-250G-T	输入电压≤ 440V AC	YDBUN-200-T×2	63×2	25×2	2.5×2
YD587T4-280G-T	输入电压≤ 440V AC	YDBUN-200-T×2	70×2	28×2	2.5×2
YD587T4-315G-T	输入电压≤ 440V AC	YDBUN-200-T×3	80×3	31×3	2.5×3
YD587T4-355G-T	输入电压≤ 440V AC	YDBUN-200-T×3	60×3	24×3	2.5×3
YD587T4-400G-T	输入电压≤ 440V AC	YDBUN-200-T×3	67×3	26×3	2.5×3

第十章 选配件

10.1 IO 功能扩展卡

10.1.1 多功能 IO 扩展卡（YD580-IO1）

(15kW 及以上机型使用)

YD580-IO1 扩展卡是设计用于 YD587 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 RS485 通信接口，可实现现场总线控制。

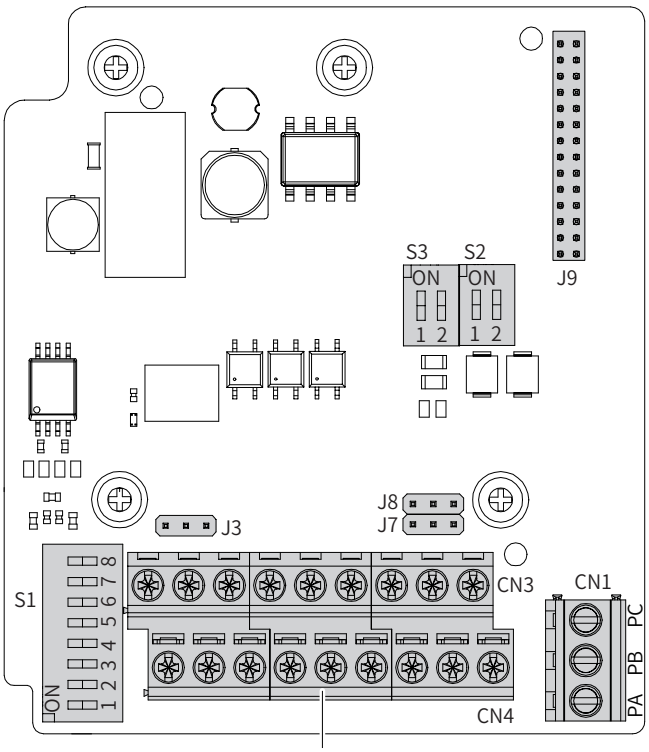


图 10-1 YD580-IO1 端子分布示意图

表 10-1 YD580-IO1 扩展卡端子功能说明

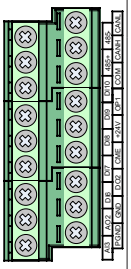
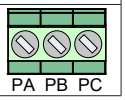
端子标识		端子名称	功能说明	端子分布
CN4	+24V/COM/CGND	外接 +24V DC 电源	1、向外提供 +24V 电源，一般用作数字输入输出端子工作电源和外接传感器电源 2、最大输出电流：200mA	
	OP1	数字输入电源端子	1、出厂时 OP1 与“+24V”已用跳线 J8 连接 2、当要用外部电源时，OP1 需与外部电源连接，且必须把 J8 取掉。	
	DO2-CME	数字输出 2	1、光耦隔离，双极性开路集电极输出 2、输出电压范围：0V ～ 24V 3、输出电流范围：0mA ～ 50mA 注意：数字输出地 CME 与数字输入地 COM/CGND 是内部隔离的，默认内部通过 J7 连接，当 DO2 想用外部电源驱动时，必须断开 J7。	
	CANH/CANL/COM/CGND	通信接口端子	CANlink 协议通信输入端子，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：+9V ～ +30V	
	C485+/C485-/COM/CGND	通信接口端子	Modbus-RTU 协议通信的输入、输出信号端子，隔离输入	
CN1	PA- PB	常闭端子	触点驱动能力： 250V AC，3A，COS ∅ =0.4。 30V DC，1A	
	PA- PC	常开端子		

表 10-2 YD580-IO1 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	
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	-
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	
S3	AI3、PT100、PT1000 功能选择	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	-

NOTE

◆ 变频器主从运行使用 CAN 通信、变频器与显示屏使用 RS485 通信时，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 S3 和 S2 进行匹配），中间变频器 IO1 扩展卡上的拨码保持出厂状态。

10.1.2 IO功能扩展卡2（YD580-IO2）

（全系列机型适用）

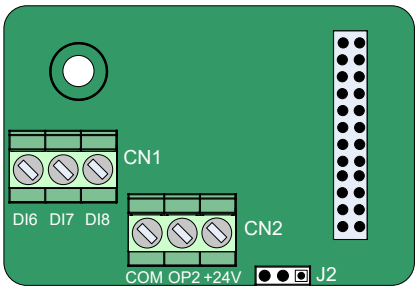


图 10-2 YD580-IO2 端子分布示意图表

10-3 YD580-IO2 扩展卡端子功能说明

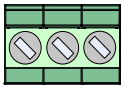
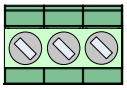
端子标识		端子名称	功能说明	端子分布
CN2	+24V/COM	外接 +24V DC 电源	1、向外提供 +24V 电源，一般用作数字输入输出端子工作电源和外接传感器电源 2、最大输出电流：200mA	
	OP2	数字输入电源端子	出厂时 OP2 无电源连接，可根据需要连接外部电源或 +24V 电源	
CN1	DI6-OP2~ DI8-OP2	3 路数字输入	1、光耦隔离，兼容双极性输入 2、输入阻抗：DI6、DI7 为 3.3kΩ，DI8 为 2.4kΩ 3、电平输入时电压范围：+9V ～ +30V 4、 DI6、DI7、DI8 为普通输入端子，输入频率 <100Hz	

表 10-4 YD580-IO2 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

10.1.3 YD580-IO3 端子分布与功能说明

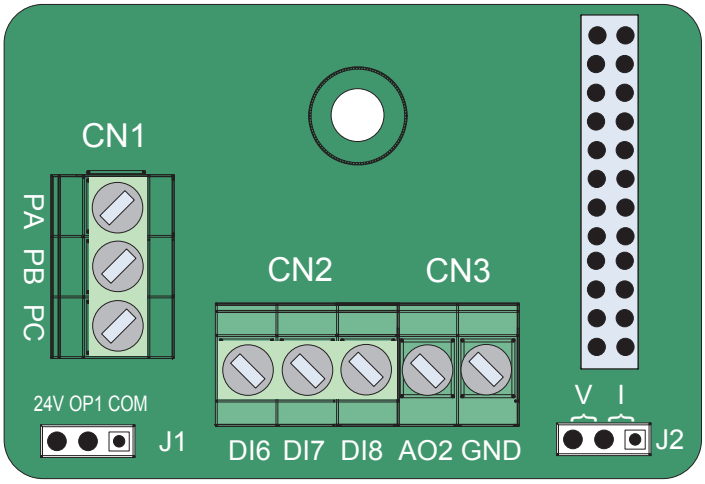


图 10-4 YD580-IO3 端子分布示意图

表 10-6 YD580-IO3 扩展卡端子功能

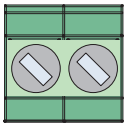
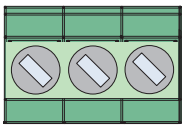
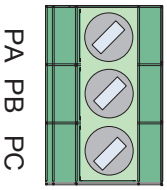
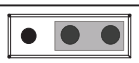
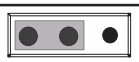
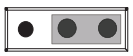
端子标识			功能说明	端子分布
CN3	AO2	模拟量输出 b3.19：参数	1、输出电压量：0V~10V （J2=V） 2、输出电流量：0mA~20mA （J2=I）	 AO2 GND
	GND	模拟量地		
CN2	DI6 ~ DI8	3 路数字输入 b3.06/07/08：参数	1、光藕隔离，兼容双极性输入，最大输入频率为 100Hz 2、输入阻抗：3.4kΩ 3、电平输入时电压范围：9~24V	 DI6 DI7 DI8
CN1	PA/PB/PC	继电器输出 b3.15：参数	触点驱动能力： 250VAC/5A、 30VDC/5A PB-PA；常闭 PC-PA；常开	 PA PB PC

表 10-7 YD580-IO3 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	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	
J2	AO2 输出类型设置跳线	电压型 0 V~10V	
		电流型 0mA~20mA	

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。

10.1.4 多功能 IO 扩展卡（YD580-IO4）

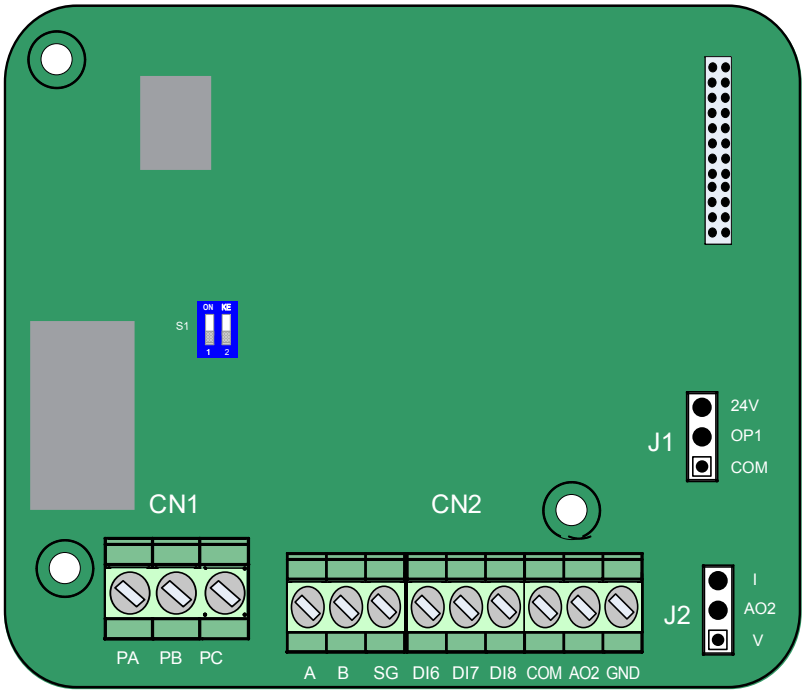


表 10-9 YD580-IO4 扩展卡端子功能说明

端子标识与功能		对应参数	功能说明	补充
模拟量输出	AO2~GND	b3.19	1、输出电压量：0V~10V（J2=V） 2、输出电流量：0mA~20mA（J2=I）	
继电器输出端子	PB-PA（NC） PC-PA（NO）	b3.15	触点驱动能力： 250V AC，5A，COS ∅ =0.4 30V DC，1A	
数字量输入端子	DI6~COM DI7~COM DI8~COM	b3.06 b3.07 b3.08	光耦隔离，兼容双极性输入 输入阻抗：2.4kΩ 电平输入时电压范围： +9V ～ +30V	
RS485 通信	A B SG	bF.04=2 bd.00 ~ bd.04	建议使用双绞屏蔽线。	
拨码开关	S1	RS485 通信终端电阻选择	选择 RS485 通信终端匹配电阻，出厂默认不连接	

表 10-7 YD580-IO4 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	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	
J2	AO2 输出类型设置跳线	电压型 0 V~10V	
		电流型 0mA~20mA	

10.2 通信扩展卡

10.2.1 CANopen 扩展卡（YD580-CAN）（全系列机型通用）

CANopen 通信扩展卡是专为 CANopen 通信而专门研制，具有如下特点：

- 支持 Node Guard 协议，主站可使用此功能查询设备状态；
- 发送和接收各有 4 个 PDO 通道，发送 PDO 支持同步、异步等传输类型；
- SDO 仅支持加速传送机制，最多传输 4 个字节；
- TPDO、RPDO 及 SDO 等通信对象 COB-ID 与设备 ID 相关，在软件内部已设定，使用时不必进行修改；
- 不支持紧急对象，另 CANopen 通信的电气参数符合国际标准。

1、YD580-CAN 外观：

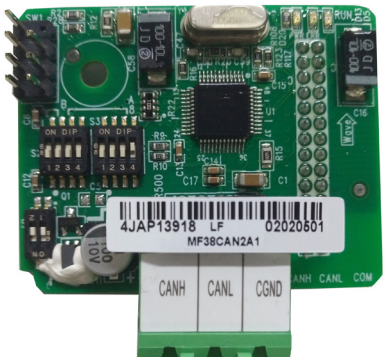


图 10-6 YD580-CAN 外型

2、接线端子功能说明：

表 10-10 接线端子功能说明

类别	端子符号	端子名称	功能说明
CAN 通信 (CN1)	CANH/CANL	通信接口端子	CANopen 通信输入，隔离输入
	COM	CAN 通信电源地	与 +24V 电源地共模电感连接
程序烧写	SW1	ARM 程序烧写接口	

3、拨码开关：

的拨码开关 S1 组成 2 位拨码开关，用于配置 CAN 总线终端电阻。
推荐在网络拓扑结构两端设置终端电阻。拨码打到“ON”表示“1”，打到下面表示“0”。

表 10-11 YD580-CAN 终端电阻

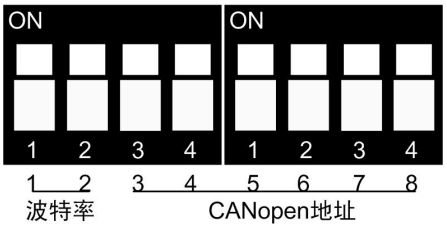
拨码号		终端电阻
1	2	
0	0	不使用终端电阻
1	1	终端电阻接入

图 10-7 YD580-CAN 拨码开关

位号	功能	说明		
1～2	CAN 总线波特率	位 1	位 2	波特率
		0	0	125kbps
		0	1	250kbps
		1	0	500kbps
		1	1	1Mbps
3～8	CANopen 网络 ID 号	6 位二进制共组成 64 个地址，范围 0~63		
		地址	开关设置	
		0	00 0000	
		7	00 0111	
		20	01 0100	

注意：在使用 CANopen 通信时，如果是末端的变频器，则应接通终端电阻。

拨码开关 S2、S3 组成 8 位拨码开关，用于设置 CAN 总线通信波特率与通信设备地址。拨码开关编号如图 10-6 所示，其中 1、2 用于设置波特率，3~8 用于设置 CANopen 地址。拨码打到“ON”表示“1”，打到下面表示“0”。



4. PDO 数据定义及功能码地址定义

1）RPDO 数据定义

RPDO 定义			
RPDO1	驱动命令	bit0: 减速停机，bit1: 自由停机 bit2: 正转运行，bit3: 反转运行	bit4: 快速停机，bit5: 转矩控制 bit6: 故障复位，bit7: 命令有效 bit8~bit15: 保留
	设定目标频率	该频率可以采用两种给定方式，通过 bd.06 设置 bd.06 最低位为 0，则采用百分比方式给定，默认为百分比，此时设定为范围为 0~10000，对应最大频率的 0.00%~100.00%，不区分正负 2、bd.06 最低位为 1，则采用实际频率给定，此时设定范围为 0Hz~ 最大频率，不区分正负	
	bd.11	该 10 个数据用于固定向某个功能码地址的 RAM 中写入相应的数值。 写入功能参数的地址由 bd.11~bd.20 指定。 例：bd.11 设置为 b5.00，向 RPDO1 的第三个数据中写入 500，则 b5.00 参数的数值更改为 500. 注： YD587 中所有功能码地址编码采用统一规则，即说明书中功能码所在组数为地址的高位，所在组编号转换为 16 进制数为地址的低位，如 A0.05 的地址为 0xa005,b3.18 地址为 0xb312，U 组对应地址为 D，如 U0.18，地址为 0xd012。 YD587 的 eds 文件支持直接配置 PDO 数据，请从厂家获取最新的 eds 文件。	
	bd.12		
RPDO2	bd.13		
	bd.14		
	bd.15		
	bd.16		
RPDO3	bd.17		
	bd.18		
	bd.19		
	bd.10		

2）TPDO 数据定义

RPDO 定义		
TPDO1	驱动状态	bit0: 变频器运行中，bit1: 变频器正转运行 bit2: 变频器反转运行，bit3: 变频器无故障 bit4: 自由停机，bit5: 与变频器无通信 bit6: 频率到达，bit7: 转矩控制有效 bit8~bit15: 保留
	反馈频率	返回当前的运行频率
	bd.21	该 10 个数据用于固定获取某个功能码的数值。 功能参数的地址由 bd.11~bd.20 指定。 例：bd.21 设置为 b5.00，则 TPDO1 第三个数据的数值为 b5.00 参数的实时值。 注： YD587 中所有功能码地址编码采用统一规则，即说明书中功能码所在组数为地址的高位，所在组编号转换为 16 进制数为地址的低位，如 A0.05 的地址为 0xa005,b3.18 地址为 0xb312，U 组对应地址为 D，如 U0.18，地址为 0xd012。 YD587 的 eds 文件支持直接配置 TPDO 数据，请从厂家获取最新的 eds 文件。
	bd.22	
TPDO2	bd.23	
	bd.24	
	bd.25	
	bd.26	
TPDO3	bd.27	
	bd.28	
	bd.29	
	bd.30	

10.2.2 RS485 扩展卡（YD580-RS485）

(全系列机型通用)

YD580-RS485 扩展卡是为 YD587 系列变频器提供 RS485 通信功能而专门研制，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；

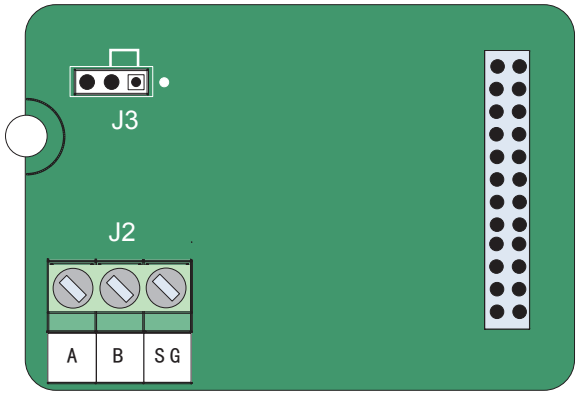


图 10-9 YD580-RS485 端子分布示意图

表 10-16 YD580-RS485 扩展卡端子功能说明

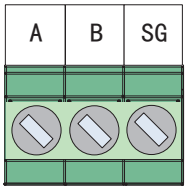
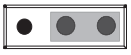
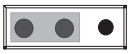
端子标识		端子名称	功能说明	端子分布
J2	A	485 通讯信号正	485 通讯输入端子，隔离输入	
	B	485 通讯信号负	485 通讯输入端子，隔离输入	
	SG	485 通讯信号参考地	电源为隔离电源	

表 10-17 YD580-RS485 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	

10.2.3 PROFIBUS DP 扩展卡（YD580-DP）(15kW 及以上机型使用)

PROFIBUS DP 卡用于将 YD871 变频器连接至 PROFIBUS DP 总线，功能包括：配置功能、更新调节参数、控制信号发送、监视和诊断。

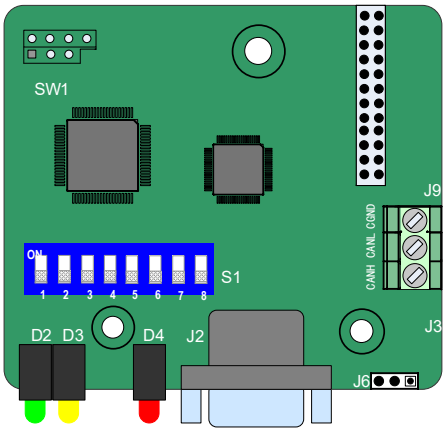


图 10-9 YD580-DP 端子分布示意图

表 10-14 YD580-DP 扩展卡端子功能说明

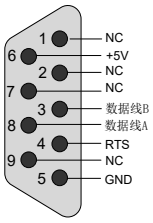
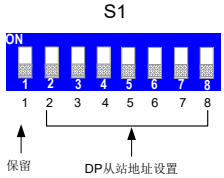
端子名称标识	引脚号	引脚定义	功能说明	端子分布
PROFIBUS 通信端子 (J2)	1、2、7、9	NC	内部悬空	
	3	数据线 B	数据线正极	
	4	RTS	请求发送信号	
	5	GND	隔离 5V 电源地	
	6	+5V	隔离 5V 电源	
	8	数据线 A	数据线负极	

表 10-15 YD580-DP 状态指示灯说明

指示灯	状态	说明
电源指示灯 (D4)	D4	灯亮：上电正常
	D4	灯灭：上电不正常，请检测安装是否正常
DP 卡与主站通信指示灯 (D3)	D3	灯亮：表示 DP 卡与 PROFIBUS 主站通信正常
	D3	闪烁：表示主站未运行或 DP 卡和 PROFIBUS 主站通信有错误
	D3	灯灭：表示 DP 卡和 PROFIBUS 主站无通信 (检查 PROFIBUS 电缆连接和站号)
DP 卡与变频器通信指示灯 (D2)	D2	灯亮：表示 DP 卡和变频器通信正常
	D2	闪烁：表示 DP 卡和变频器通信不成功 (检查波特率设置是否正确)
	D2	灯灭：表示 DP 卡和变频器通信有干扰存在或扩展卡地址不在 1~125 范围内

表 10-16 YD580-DP 扩展卡拨码开关说明

PROFIBUS DP 通信从站地址设置								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：YD580-DP	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	

NOTE

- 拨码位号 1 为 ON 时表示 YD580-DP1，
- 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。

10.2.4 PROFINET 通信扩展卡 (YD580-PN) (全系列机型通用)

YD580-PN 卡是 PROFINET 现场总线适配卡，符合国际通用的 PROFINET 以太网标准。

该卡安装到变频器上，提高通信效率，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。

10.2.4 Profinet 通讯扩展卡 (YD580-PN) 端子分布与功能说明

YD580-PN 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 YD580 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。

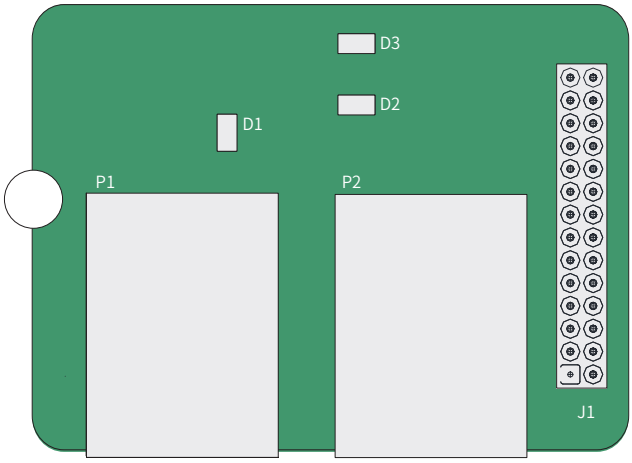


图 10-13 YD580-PN 卡端子分布示意图

表 10-22 YD580-PN 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(背面)	用于与变频器连接

表 10-23 YD580-PN 卡指示灯状态说明

指示灯标识	指示灯名称	状态说明
D1	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。
D2	变频器通讯状态	注
D3	PLC通讯状态	注

NOTE

注 关于 P rofinet 通讯扩展卡 (YD580- PN) 的详细信息，请参见《YD580 系列 Profinet 扩展卡说明书》

10.2.5 PZD 过程数据描述及功能码地址的定义

1） PZD 区数据定义

主站发送数据 PZD 描述	
PZD1	bit0: 减速停机，bit1: 自由停机 bit2: 正转运行，bit3: 反转运行 bit4: 快速停机，bit5: 转矩控制 bit6: 故障复位，bit7: 命令有效 bit8~bit15: 保留 注：PZD1 命令有效必须 bit7 命令有效置位 1。
PZD2	固定为设定变频器的目标频率（变频器频率源需设置为通信给定） 该频率可以采用两种给定方式，通过 bd.06 设置 1.bd.06 最低位为 0，则采用百分比方式给定，默认为百分比，此时设定为范围为 0~10000，对应最大频率的 0.00%~100.00%，不区分正负 2.bd.06 最低位为 1，则采用实际频率给定，此时设定范围为 0Hz~ 最大频率，不区分正负
PZD3~PZD12	PZD3 ～ PZD12，需要通过参数地址映射到 PLC 的寄存器，例如参数 B4.00 地址是 16#B400 转为 10#46080，将该地址写入 PLC 映射区。
	从站返回数据 PZD 描述
PZD1	bit0: 变频器运行中，bit1: 变频器正转运行 bit2: 变频器反转运行，bit3: 变频器无故障 bit4: 自由停机，bit5: 与变频器无通信 bit6: 频率到达，bit7: 转矩控制有效 bit8~bit15: 保留
PZD2	变频器当前运行频率 返回的为当前的实际频率，如返回 2500， 则变频器当前运行频率为 25.00Hz
PZD3~PZD12	固定返回相应地址功能码的当前值。 功能参数地址由 bd.21~bd.30 指定 例如：bd.21 设置为 B5.01，B5.01 当前值为 25.00，则 PZD3 返回当前数值 2500。 功能参数地址也可以在 PLC 从站属性“设备专用参数”中配置，一旦在从站属性中配置，bd.21~bd.30 所指定参数地址将自动变更为设备专用参数中所配置的地址。具体参照第 4 标题。

2） PKW 区数据定义

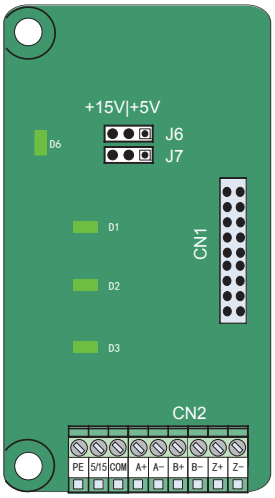
主站发送数据 PKW 描述	
PKE	高 4 位：命令代码 0：无请求 1：读取功能码参数数据 2：更改功能码参数数据 低 4 位：保留 低 8 位：功能码参数地址高位
IND	高 8 位：功能码参数地址低位 低 8 位：保留
PWE	高 16 位：保留 低 16 位：读请求时无使用；写请求时表示参数值
从站发送数据 PKW 描述	
PKE	高 4 位：响应代码 0：无请求 1：功能码参数操作正确 7：无法执行 低 8 位：功能码参数地址高位
IND	高 8 位：功能码参数地址低位 低 8 位：保留
PWE	请求成功时：参数值 请求失败时：错误代码 (与标准 Modbus 一致)： 1：非法命令 2：非法地址 3：非法数据 4：其他错误

10.3 编码器扩展卡

10.3.1 光编码器扩展卡规格

10.4 编码器扩展卡的使用

10.4.1 YD580-ABZ 编码器扩展卡规格



YD580-ABZ 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
最大速率	100kHz
线规	16~26AWG
端子螺丝	一字
端子形式	斜插端子台

表 10-24 YD580-ABZ 端子功能说明

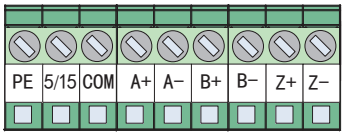
端子标识		功能说明	端子分布
CN2	A+	编码器输出 A 信号正	
	A-	编码器输出 A 信号负	
	B+	编码器输出 B 信号正	
	B-	编码器输出 B 信号负	
	Z+	编码器输出 Z 信号正	
	Z-	编码器输出 Z 信号负	
	5V/15V	编码器 5V/15V 供电电源	
	COM	编码器供电电源地	
	PE	屏蔽层接线端	
CN1		18Pin DIP 排线接口，连接变频器控制板的 J9	

表 10-26 YD580-ABZ 指示灯状态和跳线说明

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 D1：A相指示灯 D2：B相指示灯 D3：C相指示灯
		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
J6，J7 编码器电源选择		+15V与+5V选择(同时切换)

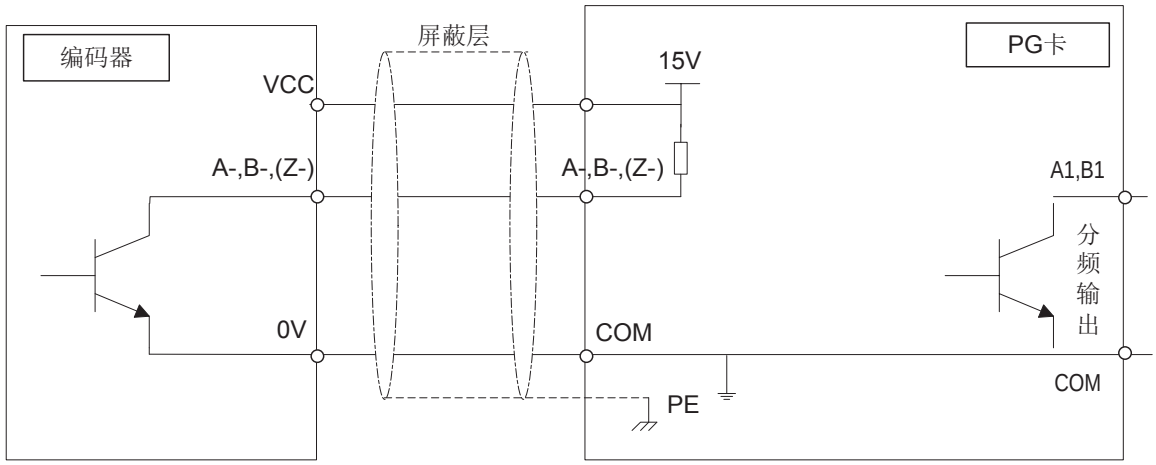


图 10-15 接口回路1

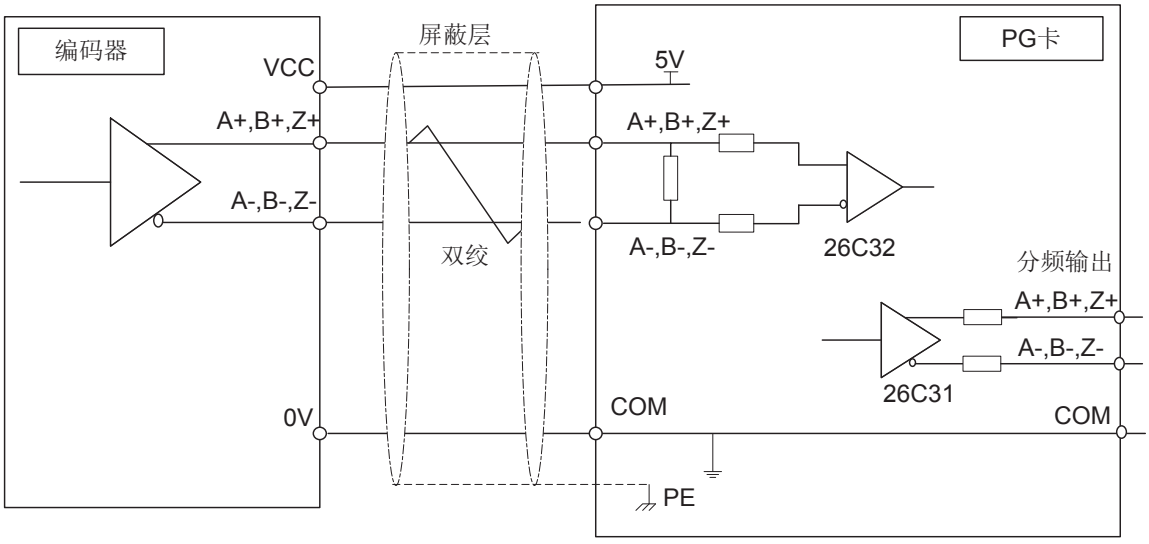


图 10-16 接口回路2

10.4.3 旋转变压器 PG 卡 (YD580-RZV)

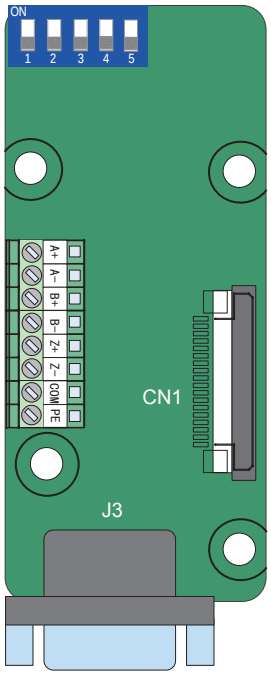


表 10-27 YD580-RZV 端子功能说明

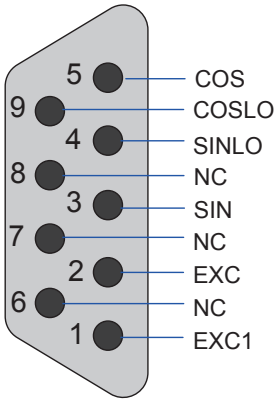
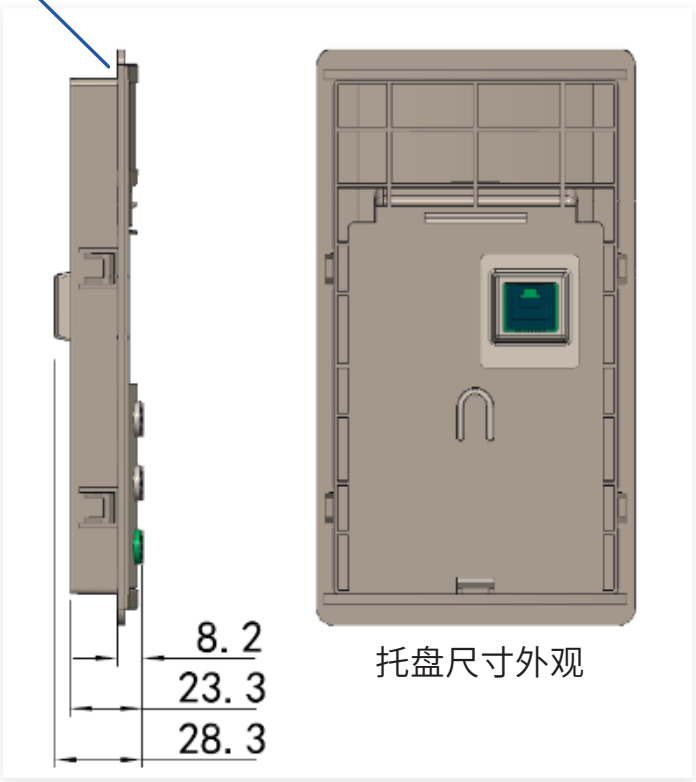
端子标识	引脚号	引脚定义	功能说明	端子分布
J3	1	EXC1	旋转变压器激励负	
	2	EXC	旋转变压器激励正	
	3	SIN	旋转变压器反馈 SIN 正	
	4	SINLO	旋转变压器反馈 SIN 负	
	5	COS	旋转变压器反馈 COS 正	
	6、7、8	NC	内部悬空	
	9	COSLO	旋转变压器反馈 COS 负	
CN1	18Pin DIP 排线接口，连接变频器控制板的 J4			

表 10-28 YD580-RZV 指示灯状态说明

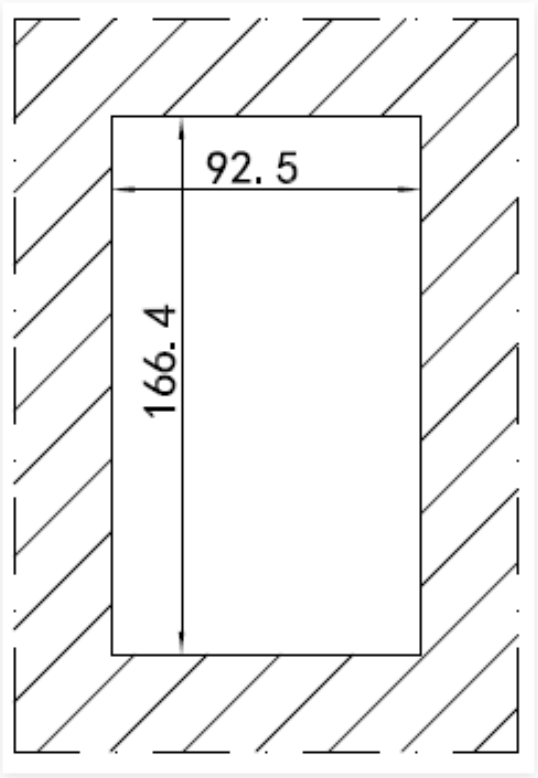
故障指示灯	YD580-RZV 故障状态	故障原因及对策
D5 D6	正常	无
D5 D6	锁相环失锁	一般是所选的旋转变压器的相位滞后过大引起。
D5 D6	信号 SIN/COS 幅值超出上限	通常 D6 闪烁都是干扰引起的。将电机良好接地以及将 PG 卡上面的接地点接到变频器的 PE 端子可以有效解决。
D5 D6	信号 SIN/COS 幅值过小	一般是 DB9 接头没有接上或者接错、甚至断线。若检查发现并没有出现上述情况，需要检查旋变变压器选型与 YD58PG4 是否匹配。

10.4 键盘托盘尺寸

安装固定板厚度不大于2mm



托盘尺寸外观



YD587 pallet cut-out size
unit (mm)

附录 A Modbus 通信协议介绍

YD587 系列变频器提供 RS485 通信接口，并支持 Modbus 通信协议。用户可通过计算机或 PLC 实现集中控制，通过该通信协议设定变频器运行命令，修改或读取功能码参数，读取变频器的工作状态及故障信息等。

A.1 数据规则

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：要求动作的功能码，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。

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。

2、总线结构

* 接口方式

RS485 硬件接口

* 传输方式

异步串行，半双工传输方式。在同一时刻主机和从机只能有一个发送数据而另一个只能接收数据。数据在串行异步通信过程中，是以报文的形式，一帧一帧发送。

* 拓扑结构

单主机多从机系统。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、协议说明

YD871 系列变频器通信协议是一种异步串行的主从 Modbus 通信协议，网络中只有一个设备 (主机) 能够建立协议 (称为“查询 / 命令”)。其他设备 (从机) 只能通过提供数据响应主机的“查询 / 命令”，或根据主机的“查询 / 命令”做出相应的动作。主机在此是指个人计算机 (PC)，工业控制设备或可编程逻辑控制器 (PLC) 等，从机是指 YD871 变频器。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。对于单独访问的主机“查询 / 命令”，从机都要返回一个信息 (称为响应)，对于主机发出的广播信息，从机无需反馈响应给主机。

4、通信资料结构

YD587 系列变频器的 Modbus 协议通信数据格式如下：

使用 RTU模式，消息发送至少要以3.5个字节时间的停顿间隔开始。传输的第一个域是设备地址。可以使用的传输字节是十六进制的 0...9，A...F。网络设备不断侦测网络总线，包括停顿间隔时间内。当第一个域 (地址域) 接收到，每个设备都进行解码以判断是否发往自己的。在最后一个传输字节之后，一个至少 3.5 个字节时间的停顿标定了消息的结束。一个新的消息可在此停顿后开始。
整个消息帧必须作为一连续的流传输。如果在帧完成之前有超过 1.5 个字节时间的停顿时间，接收设备将刷新不完整的消息并假定下一字节是一个新消息的地址域。同样地，如果一个新消息在小于 3.5 个字节时间内接着前个消息开始，接收的设备将认为它是前一消息的延续。这将导致一个错误，因为在最后的 CRC 域的值不可能是正确的。

* RTU 帧格式

数据内容	描述
帧头	3.5 个字节时间
从机地址	通信地址范围为 0~247
命令码	03H：读从机参数 06H：写从机参数
数据内容 (N-1)	表示功能码参数地址、功能码参数个数、功能码参数值等。
数据内容 (N-2)	
……	
数据内容 0	
CRC CHK 低位	检测值： CRC 值
CRC CHK 高位	
帧尾	3.5 个字节时间

* 读从机参数命令举例

例如：需要读取 F0.02 开始的连续 2 个功能码的数值。

主机发送数据

数据名称	数据内容	说明
从机地址	01H	由 bD.02 设置
命令码	03H	读取指令
启始地址高八位	F0H	从功能码 F0.02 开始读取数据
启始地址低八位	02H	
读取数据个数高八位	00H	共读取两个数据
读取数据个数低八位	02H	
CRC、CHK 低位	有待计算其 CRC、CHK 值	-
CRC、CHK 高位		

从机回应数据

数据名称	数据内容	说明
从机地址	01H	与主机发送数据相同
命令码	03H	与主机发送数据相同
读取数据字节总个数	04H	主机发送的读取个数 ×2
地址 F002H 高位	00H	功能码 F0.02 的具体数值
地址 F002H 低位	00H	
地址 F003H 高位	00H	功能码 F0.03 的具体数值
地址 F003H 低位	01H	
CRC CHK 低位	有待计算其 CRC、CHK 值	-
CRC CHK 高位		

* 写从机参数命令举例

例如：将 1388H 写入到从机地址 02H 变频器的 1000AH 地址处。

主机发送数据

数据名称	数据内容	说明
从机地址	02H	由 bD.02 设置
命令码	06H	写入指令
写入地址高位	10H	对寄存器地址 1000H 进行写数据操作
写入地址低位	00H	
写入内容高位	13H	对寄存器地址 1000H 进行写入数值 1388H
写入内容低位	88H	
CRC CHK 低位	有待计算 CRC、CHK 值	
CRC CHK 高位		

从机回应数据：与主机发送数据相同

5、校验方式

数据校验采用 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。仅每个字节中的 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 位字节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。

A.2 数据地址

该部分是通信数据的具体内容，用于控制变频器的运行，变频器状态及相关参数设定。读写功能码参数 (有些功能码是不能更改的，只供厂家使用或监视使用):

1、功能码参数地址标示规则:

以功能码组号和标号为参数地址表示规则，具体规则入下表所示:

菜单	功能参数组	高位字节	低位字节
一级菜单	P0 组 ~PF 组	A0~AF	00~FF
二级菜单	b0 组 ~bF 组	b0~bF	00~FF
	U0 组 ~U1 组	d0~d1	00~FF
	E0 组 ~EF 组	E0~EF	00~FF
三级菜单	F0 组 ~FF 组	F0~FF	00~FF

例如：bF.12，地址表示为 bF0C;

◆ 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；更改功能码参数，还要注意参数的范围、单位、及相关说明。

2、目标频率设定 (只写):

参数地址	命令功能
1000H	通信设定值 (0~10000)(十进制)

◆ 通信设定值是相对值的百分数，10000 对应 100.00%, 该百分比是相对最大频率(b1.02) 的百分数

3、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
	0005：自由停机
	0006：根据 F6-10 设定的停机方式停机
	0007：故障复位
	0008：快速停机

4、读取变频器状态：(只读)

命令字地址	命令功能
3000H	0：停机
	bit0：正转
	bit1：反转
	bit2：故障

5、当前故障代码 (只读)

命令字地址	命令功能
8000H	变频器当前故障显示。具体故障代码详见 7.5 故障码处理。

6、通信异常返回信息格式（从机回复）

数据名称	数据内容	说明
数据 1	从机地址	通信地址。
数据 2	命令码 +0x80	在通信异常时，从机返回异常信息桢，异常信息桢的命令码是在读取或写入桢的基础上加上 0x80。
数据 3	异常代码	异常代码解释: 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 4	CRC 校验低位	CRC 校验。
数据 5	CRC 校验高位	

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