



广州市昊志机电股份有限公司

**DIL500-0.5-48K low voltage inverter
user manual**

Foreword

Thank you for choosing this low-voltage DC series products, this manual provides you with the relevant operation instructions and parameters of the detailed explanation, please read this manual carefully before installation, operation, maintenance or inspection.

Before use, be sure to confirm whether the wiring is correct and whether the motor steering is correct please

catalogue

foreword	2
safety precautions	4
chapter 1 specifications	10
1.1 product model.....	10
1.2 technical specifications	12
1.3 Product appearance	13
1.4 installation dimensions	14
chapter 2 wiring the system.....	15
chapter 3 operations and displays	16
3.1 operation and display interface introduction	16
3.2 parameter modification and viewing.....	18
3.3 Display	19
3.4 password settings	20
chapter 4 parameter settings	21
4.1 permissions	21
4.2 application parameters	21
4.3 monitoring parameters	29
4.4 system parameters	29
chapter 5 run and setup	31
5.1 run and setup	31
chapter 6 fault diagnosis and countermeasures	36
chapter 7 List of parameters	45
chapter 8 communication description.....	91

Safety precautions

- ⚠ DANGER: Indicates a situation which could result in death or serious personal injury.。
- ⚠ Caution: Indicates situations that may result in moderate or minor personal injury or equipment damage. This symbol is also used to indicate precautions for incorrect or unsafe use.

■ Arrival inspection



◎ If the drive is damaged or parts are missing, it may not be installed or operated.
Failure to do so may result in equipment damage or personal injury

■ Install



- ◎Please hold the bottom of the product when installing and moving it. Do not just hold the shell to prevent the drive from being damaged or broken.
- ◎The driver should be kept away from flammable and explosive objects, away from heat sources, and installed on metal and other flame-retardant materials.
- ◎When the driver is installed in an electrical cabinet or other enclosure, a fan or other cooling device and ventilation openings must be installed in the cabinet to ensure that the ambient temperature is below 40°C. Otherwise, the driver may be damaged due to excessive ambient temperature.



- ◎Wiring must be completed by qualified professional electrical engineers, otherwise there may be electric shock or damage to the driver.
- ◎Make sure the power supply is disconnected before wiring, otherwise it may cause electric shock or fire.
- ◎The ground terminal must be reliably grounded, otherwise the driver shell may be electrified.
- ◎Do not touch the main circuit terminals, and do not contact the main circuit terminal wiring of the driver with the shell, otherwise it may cause electric shock.
- ◎The connection terminals of the braking resistor are VIN and BRK. Do not connect other terminals, otherwise it may cause fire.

■ wiring

- ◎ Before wiring, make sure the rated voltage of the driver matches the input power voltage, otherwise it may cause fire or personal injury.
- ◎ The input power cannot be connected to the driver output terminals U, V, W, otherwise the driver will be damaged and the warranty service will not be valid.
- ◎ The driver cannot be tested for withstand voltage, otherwise the driver will be damaged.
- ◎ The main circuit terminal wiring and control circuit wiring of the driver should be routed separately or cross vertically, otherwise the control signal will be interfered.
- ◎ The wiring cables of the main circuit terminals should use wire lugs with insulating sleeves.

■ run

- ◎When the drive is set to have automatic fault reset or automatic restart after a power outage, safety protection measures should be taken for the equipment system in advance, otherwise personal injury may result.
- ◎The "Run/Stop" button may be disabled due to certain function settings. An independent emergency power-off switch can be installed in the drive control system, otherwise personal injury may occur.
- ◎After the driver is powered on, even if it is in shutdown state, the terminals of the driver are still live and cannot be touched, otherwise there is a risk of electric shock.



- ◎Do not use a circuit breaker to control the stop and start of the driver, otherwise the driver may be damaged.
- ◎Since the drive takes a very short time to change the operating speed from low to high, please confirm that the motor and mechanical equipment are within the allowed range of use before operation, otherwise the equipment may be damaged.
- ◎The radiator and braking resistor are very hot, please do not touch them, otherwise you may cause burns.
- ◎The factory-set parameters of the driver can meet the operating requirements of most equipment. Please do not modify the driver parameters unless necessary. Even if some equipment has special needs, only the necessary parameters can be modified. Otherwise, modifying parameters at will may cause equipment damage.

■ Maintenance and inspection



- ◎Do not touch the terminals of the driver when power is on, otherwise it may cause electric shock.
- ◎Please designate qualified electrical engineers to perform maintenance, inspection or replacement of parts.
- ◎Wait at least 10 minutes after a power outage or make sure there is no residual voltage before performing maintenance and inspection. Otherwise, personal injury may occur.



- ◎There is a CMOS integrated circuit on the PCB, please do not touch it with your hands, otherwise static electricity may damage the PCB.

■ other



- ◎It is strictly prohibited to modify the driver without authorization, otherwise it may cause personal injury or death. Drives that have been modified without authorization will no longer be covered by the warranty.

Chapter 1 Specifications

1.1 Product model

DIL500 - 0.5 - 48 K

Low voltage DC
frequency conversion
series

(1st) series

symbol	specification
DIL500	Low voltage DC frequency conversion series

Power and
model

Voltage
level

parameter

(2nd) Power and model

symbol	specification
0.5	500W

(3rd)

Voltage level

symbol	specification
48	48

(4th)

parameter

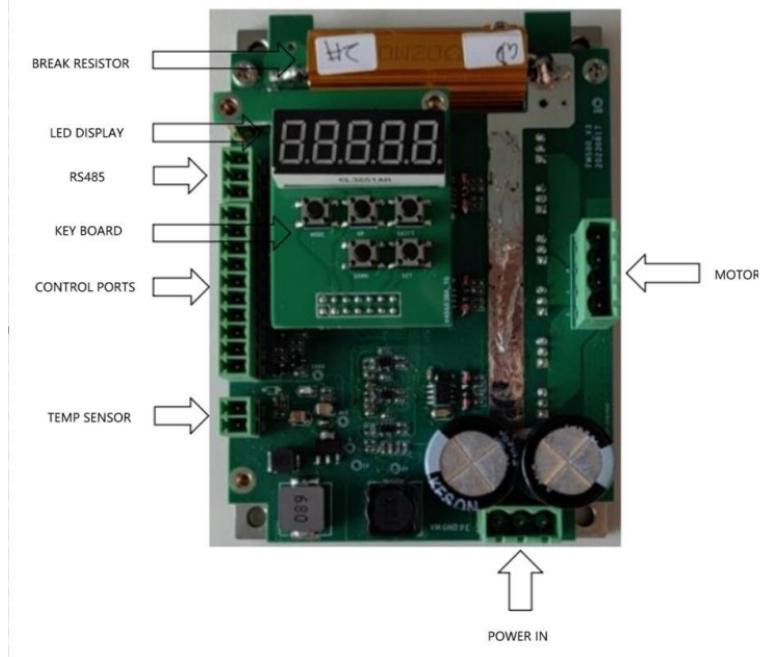
symbol	specification
48	48

1.2 technical specifications

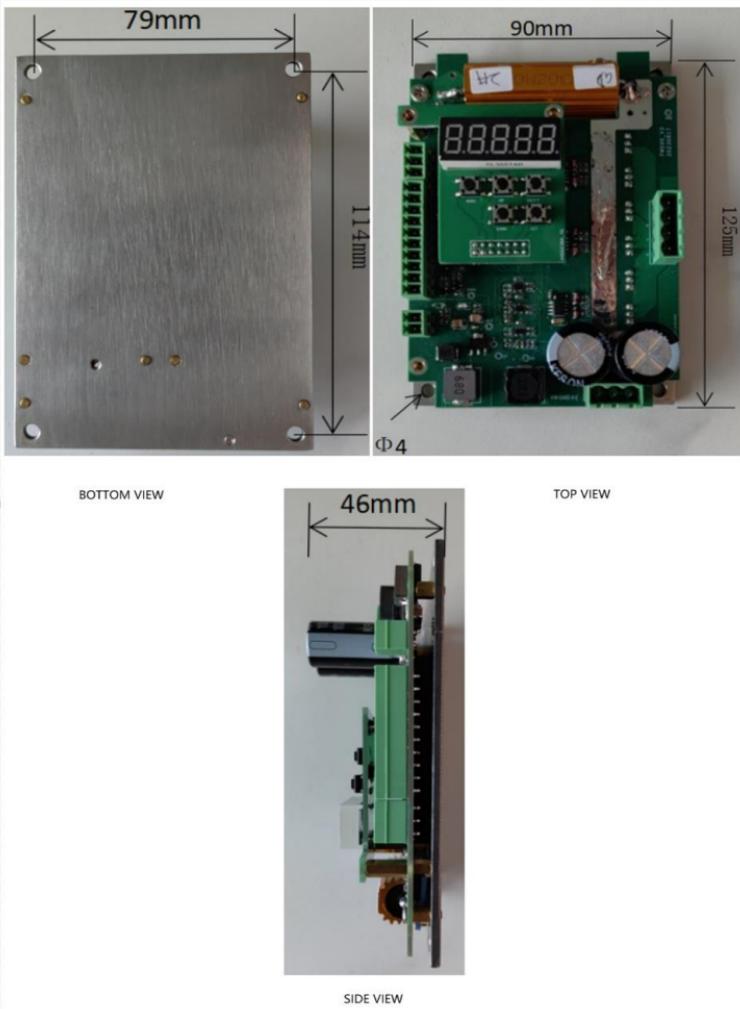
project	specification	
enter	Rated input voltage (V)	36~80VDC
output	Rated output current (A)	20A
	Output frequency (Hz)	V/F control: 0~1667Hz;
Technic al control perform ance	Control method	V/F control
	Motor control type	Three-phase ac asynchronous motor
	Input frequency resolution	Digital settings : 0.01Hz ; simulation : highest frequency×0.025%
	Overload capacity	150% rated current60s 180% rated current 2s
Basic func tions	Speed setting method	Digital given, analog voltage given, serial port given. can be Switched in various ways.
	Run command control mode	Control terminal given, serial communication port given. can be switched in various ways.
	Acceleration and deceleration curve	S curve acceleration and deceleration mode; 0.0~6500.0s
Periphe ral interfa ce functio n	Input terminal	1digital input terminal 1analog input terminal, used as 0~10V voltage input
	Output terminal	3 digital input terminals 1 analog voltage output terminal, which can realize the output of physical quantities such as setting frequency and output frequency
Display and keyboar d operati ons	LED display	Display parameters
	Protection function	Power-on phase loss protection detection, short circuit protection, overcurrent protection, overvoltage protection, undervoltage protection, overheating protection, overload protection, etc.
	Optional accessories	Brake components
	Installation method	Vertical or horizontal installation
	Protection level	IP20

	Cooling method	Natural cooling
envionm ent	Place of use	Indoors, away from direct sunlight, dust, corrosive gas, flammable gas, oil mist, water vapor, dripping water or salt, etc.
	Altitude	Less than 1000m
	Ambient temperature	-10°C ~ +40°C (When the ambient temperature is 40°C ~ 50°C, please use it at a reduced rating)
	Humidity	Less than 95% RH, no condensation
	Vibration	Less than 5.9m/s ² (0.6g)
	Storage temperature	-20°C ~ +60°C

1.3 Description of the names of each component of the servo drive

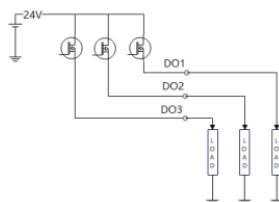
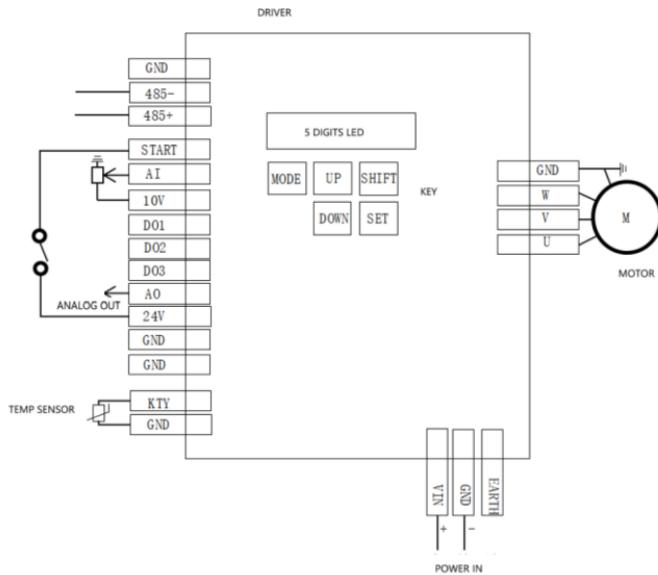


1.4 Installation dimensions



Chapter 2 System Wiring

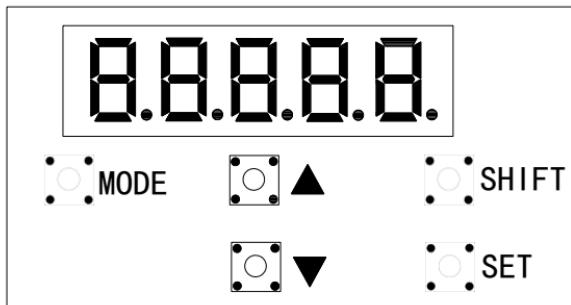
Basic operation wiring connection



Chapter 3 Operation and Display

3.1 Operation and display interface introduction

The operation panel can be used to modify the function parameters of the driver, monitor the working status of the driver, etc. Its appearance and function area are shown in the figure below:



Digital display area:

5-digit LED display, which can display operating frequency, parameters, voltage, alarm code, etc.

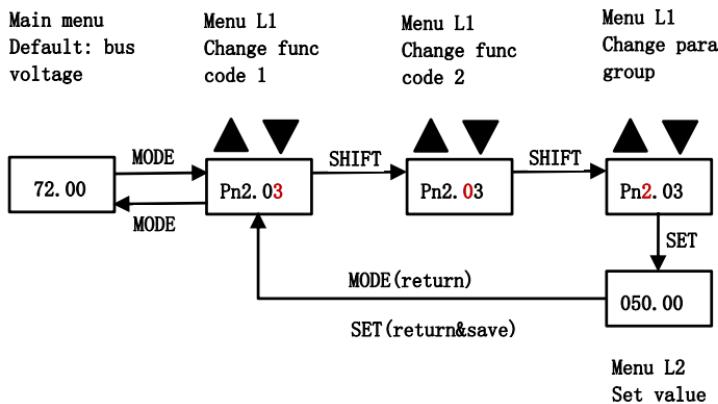
Button description:

key	name	function
MODE	Menu/return	Enter or return to the first level menu
SET	confirm	Enter the menu level by level, set parameters
UP	Add	Increment of data or function code
DOWN	Reduce	Decrement of data or function code

SHIFT	shift	When modifying parameters, you can select the parameter modification position
-------	-------	---

3.2 Parameter modification and viewing

The operation panel of the driver adopts the main interface and secondary menu structure. The main interface displays the power supply voltage by default, and the secondary menus are: function code (first-level menu) → function code setting value (second-level menu). The operation process is shown in the figure below (red is the bit to be operated).

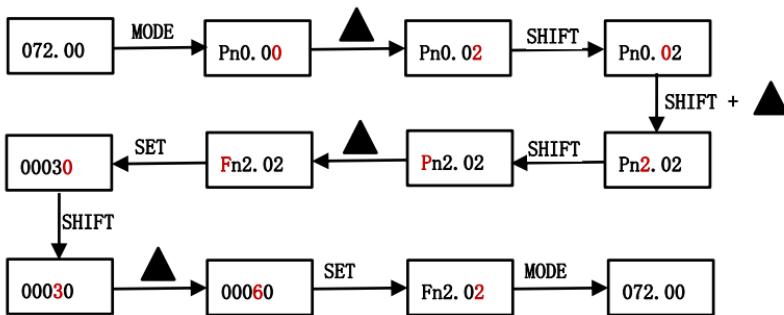


Notes:

- (1) When operating the first-level menu, use the SHIFT key to cycle through the bits to be operated, and use the UP/DOWN key to change the number after the function parameter;
- (2) When operating the second-level menu, use the MODE or SET key to return to the first-level menu. Using the MODE key to return will not save the parameters, while using the SET key to return will save the parameters;
- (3) The main interface displays the power supply voltage by

default. Press the MODE key to enter the first-level menu. Press the MODE key to return to the main interface in the first-level menu. Press the MODE key to return to the main interface in other menus.

Example: Change the function code Fn2.02 from 30V to 60v.



Notes:

- (1) If the parameter setting fails, it means that the function code is a non-modifiable parameter or cannot be modified in the running state. It can only be modified after stopping the machine;
- (2) There is a default password when the machine is turned on, and "PPPPP" is displayed. Enter the main interface after entering the correct password.

3.3 DISPLAY

- (1) In the stopped state: set "Pn0.11" to display the set speed, power supply voltage, input voltage and actual current;
- (2) In the rotating state: set "Pn0.09" to display the current speed, set speed and power supply voltage;

(3) After power on, enter the main interface. If "Pn0.27" is not empty, you need to enter the password (default 00001), and the main interface will display "PPPPP". If it is empty, the default display is the parameters set by "Pn0.11".

3.4 Password setting

(1) The driver provides a user password protection function. When Pn0.27 is set to non-zero, it is the user password. The default password is "00001". Enter the correct password to enter the main interface. If you want to change the password, just change "Pn0.27". After pressing the SET key, you need to re-enter the new password to enter the main interface;

(2) To cancel the password protection function, you can only enter with the password and set Pn0.27 to 0;

Chapter 4 Parameter Settings

4.1 Permissions

“☆” : indicates that the setting value of this parameter can be changed when the drive is in shutdown or running state;

“★” : indicates that the setting value of this parameter cannot be changed when the drive is in running state;

“●” : indicates that the value of this parameter is the actual detection record value and cannot be changed;

“*” : indicates that this parameter is a “factory parameter”, which is limited to the manufacturer’s setting and users are prohibited from operating;

4.2 Application Parameters

(1) BASIC Parameters

Function code	name	range	Minimum unit	default	Change
Pn0.00	Function selection application switch 0	<p>Units: Rotation direction selection (speed control is effective)</p> <p>0: CCW direction is the forward direction</p> <p>1: CW direction is the forward direction</p> <p>2~3: Reserved</p> <p>Tens: Control mode selection</p> <p>0: Speed control mode</p> <p>1: Torque control mode</p> <p>2~6: Reserved</p> <p>Hundreds: Operation command selection</p> <p>0: Operation panel command channel</p> <p>1: Terminal command channel</p> <p>2: Serial port communication command channel</p> <p>Thousands: Control mode</p> <p>0: Open-loop vector control</p> <p>1: Closed-loop vector control</p> <p>2: V/F control</p>	1	2100	★

Function code	name	range	Minimum unit	default	Change
Pn2.00	Speed control application switch 0	Units, Tens: Main speed command A 0: Digital setting 1, no memory after power off 1: Communication setting 2: AI 3: Digital setting 2, memory after power off 4: Reserved 5: Reserved 6: Reserved 7: Reserved 8: Reserved A~F: Reserved	1	1	★
Pn2.03	Internal speed	0.0Hz~Maximum speed	0.1Hz	500.0Hz	☆
Pn2.05	Maximum speed	50.0Hz~1667.0Hz	0.1Hz	1000.0Hz	★
Pn2.07	Upper speed limit	Lower speed limit ~ maximum speed	0.1Hz	1000.0Hz	☆
Pn2.09	Lower speed limit	0.0Hz~Upper speed limit	0.1Hz	0.0Hz	☆
Pn2.10	Acceleration time 1	0.00s~65000s	0.01s	1.00s	☆
Pn2.11	Deceleration time 1	0.00s~65000s	0.01s	1.00s	☆

Note:

1. Pn0.00 is used to set the operation command channel and control

mode.

2. Fn2.00 is used to set the main speed source for speed control, which can be analog, 485 communication input, or digital input.
3. Fn2.10 and Fn2.11 are used to set the acceleration and deceleration time of speed control.
4. If the rated speed of the motor is 80,000 rpm, set Fn2.05 and Fn2.07 to 1334.0Hz.

(2) motor parameters

Function code	name	range	Minimum unit	default	change
Fn2.00	Motor Type Selection	0: Asynchronous motors	1	0	★
Fn2.01	rated power	0.1kW~630.0kW	0.1kW	0.2	★
Fn2.02	Rated voltage	0V~1140V	1V	48	★
Fn2.03	Rated current	0.01A~655.35A	0.01A	4.10	★
Fn2.04	Rated frequency	0.0Hz~Maximum speed	0.1Hz	1000.0	★
Fn2.05	Rated speed	0rpm~65535rpm	1rpm	60000	★

Note:

1. If the rated speed of the motor is 80,000 rpm, set Fn2.04 to 1334.0Hz.
2. If the rated speed of the motor is 80,000 rpm, set Fn2.05 to 60,000 (the maximum range of the parameter is 65,535, 80,000 rpm exceeds the maximum range, and setting 60,000 here does not affect the actual rated speed).

(3) Multi-function output

function code	name	range	Minimum unit	default	change
Pn8. 03	D03	0: No output 2: Zero speed detection 4: Speed reached 6: Motor alarm output	1	6	☆
Pn8. 04	D01		1	4	☆
Pn8. 05	D02		1	2	☆

(4) Analog input

function code	name	range	Minimum unit	default	change
Pn7. 13	Curve 1 minimum input	0. 00V～Pn7. 15	0. 01	0. 00V	☆
Pn7. 14	Curve 1 minimum input corresponding setting	-100. 0%～+100. 0%	0. 1	0. 0%	☆
Pn7. 15	Curve 1 Maximum Input	Pn7. 13～+10. 00V	0. 01	10. 00V	☆
Pn7. 16	Curve 1 Maximum Input Corresponding Setting	-100. 0%～+100. 0%	0. 1	100. 0%	☆
Pn7. 17	AI filter time	0. 00s～10. 00s	0. 01	0. 50s	☆

(5) VF curve

function code	name	range	Minimum	default	change
Pnd. 00	10-point built-in curve selection	0: For 250W motor 2: For 500W motor	1	0	★
Pnd. 01	Switch between no-load curve and full-load curve	0: Use no-load curve 1: auto select 2: Use full-load curve	1	0	★
Pnd. 02	10-point VF curve frequency point 1	0.0～Pnd. 05	0. 1Hz	50. 0	★
Pnd. 03	10-point VF curve no-load voltage point 1	0. 0%～100. 0%	0. 1%	13. 6	★
Pnd. 04	10-point VF curve full load voltage point 1	0. 0%～100. 0%	0. 1%	19. 8	★
Pnd. 05	10-point VF curve frequency point 2	Pnd. 02～Pnd. 08	0. 1Hz	83. 3	★
Pnd. 06	No-load voltage point 2	0. 0%～100. 0%	0. 1%	15. 6	★
Pnd. 07	Full load voltage point 2	0. 0%～100. 0%	0. 1%	26. 5	★
Pnd. 08	10-point VF curve frequency point 3	Pnd. 05～Pnd. 11	0. 1Hz	100. 0	★

Pnd. 09	No-load voltage point 3	0. 0%~100. 0%	0. 1%	16. 3	★
Pnd. 10	Full load voltage point 3	0. 0%~100. 0%	0. 1%	29. 5	★
Pnd. 11	10-point VF curve frequency point 4	Pnd. 08~Pnd. 14	0. 1Hz	133. 3	★
Pnd. 12	No-load voltage point 4	0. 0%~100. 0%	0. 1%	17. 7	★
Pnd. 13	Full load voltage point 4	0. 0%~100. 0%	0. 1%	32. 4	★
Pnd. 14	10-point VF curve frequency point 5	Pnd. 11~Pnd. 17	0. 1Hz	166. 6	★
Pnd. 15	No-load voltage point 5	0. 0%~100. 0%	0. 1%	19. 1	★
Pnd. 16	Full load voltage point 5	0. 0%~100. 0%	0. 1%	38. 3	★
Pnd. 17	10-point VF curve frequency point 6	Pnd. 14~Pnd. 20	0. 1Hz	333. 3	★
Pnd. 18	No-load voltage point 6	0. 0%~100. 0%	0. 1%	26. 0	★
Pnd. 19	Full load voltage point 6	0. 0%~100. 0%	0. 1%	47. 1	★
Pnd. 20	10-point VF curve frequency point 7	Pnd. 17~Pnd. 23	0. 1Hz	500. 0	★

Pnd. 21	No-load voltage point 7	0. 0%~100. 0%	0. 1%	31. 7	★
Pnd. 22	Full load voltage point 7	0. 0%~100. 0%	0. 1%	56. 0	★
Pnd. 23	10-point VF curve frequency	Pnd. 20~Pnd. 26	0. 1Hz	666. 6	★
Pnd. 24	No-load voltage point 8	0. 0%~100. 0%	0. 1%	38. 2	★
Pnd. 25	Full load voltage point 8	0. 0%~100. 0%	0. 1%	64. 8	★
Pnd. 26	10-point VF curve frequency point 9	Pnd. 23~Pnd. 29	0. 1Hz	833. 3	★
Pnd. 27	No-load voltage point 9	0. 0%~100. 0%	0. 1%	44. 1	★
Pnd. 28	Full load voltage point 9	0. 0%~100. 0%	0. 1%	73. 7	★
Pnd. 29	10-point VF curve frequency point 10	Pnd. 26~额定频率	0. 1Hz	1000. 0	★
Pnd. 30	No-load voltage point 10	0. 0%~100. 0%	0. 1%	50. 0	★
Pnd. 31	Full load voltage point 10	0. 0%~100. 0%	0. 1%	82. 5	★
Pnd. 40	Frequency point 1 compensation	0. 0~oo	0. 1hz	0	★
Pnd. 41	Frequency point 2 compensation	0. 0~oo	0. 1hz	0	★

Pnd. 42	Frequency point 3 compensation	0. 0~oo	0. 1Hz	0	★
Pnd. 43	Frequency point 4 compensation	0. 0~oo	0. 1hz	0	★
Pnd. 44	Frequency point 5 compensation	0. 0~oo	0. 1hz	0	★
Pnd. 45	Frequency point 6 compensation	0. 0~oo	0. 1Hz	0	★
Pnd. 46	Frequency point 7 compensation	0. 0~oo	0. 1hz	0	★
Pnd. 47	Frequency point 8 compensation	0. 0~oo	0. 1hz	0	★
Pnd. 48	Frequency point 9 compensation	0. 0~oo	0. 1Hz	0	★
Pnd. 49	Frequency point 10 compensation	0. 0~oo	0. 1hz	0	★

4.3 Monitoring parameters

function code	name	range	Minimum	default	change
Pn0. 09	LED display when running	1: Operating speed 2: Set speed 4: Bus voltage 8: Current	1	1	★
Pn0. 11	LED display when shutdown	1: Set speed 2: Bus voltage 4: AI input	1	2	☆

4.4 System Parameters

function code	name	range	Minimum	default	change
Pn0. 26	Parameter initialization	0: No operation 01: Restore factory parameters	1	0	★



广州市昊志机电股份有限公司

Pn0. 27	User Password	0~65535	1	00001	☆
---------	---------------	---------	---	-------	---

Chapter 5 Operation and Settings

5.1 Run and setup

5.1.1 Parameter settings

After the drive is powered on normally, the parameter function code can be entered by pressing the MODE button on the drive operation panel. The relevant parameters for trial operation are shown in the following table:

function code	name	range	Mini unit	default	change
Pn0.00	Function selection application switch 0	Units: Rotation direction selection (speed control is effective) 0: CCW direction is the forward direction 1: CW direction is the forward direction 2~3: Reserved Tens: Control mode selection 0: Speed control mode 1: Torque control mode 2~6: Reserved Hundreds: Operation command selection 0: Operation panel command channel 1: Terminal command channel 2: Serial port communication command channel Thousands: Control mode 0: Open-loop vector control 1: Closed-loop vector control 2: V/F control	1	2100	★

Pn2. 00	Speed control application switch 0	Units, Tens: Main speed command A 0: Digital given 1, not memorized after power off 1: Communication given 2: AI 3: Digital given 2, memorized after power off 4: Reserved 5: Reserved 6: Reserved 7: Reserved 8: Reserved A~F :	1	2	★
Pn2. 03	Internal speed	0. 0Hz~Maximum speed	0. 1Hz	500. 0Hz	★
Pn2. 05	Maximum speed	50. 0Hz~1667. 0Hz	0. 1Hz	1000. 0Hz	★
Pn2. 07	Upper speed limit	Lower speed limit ~ maximum speed	0. 1Hz	1000. 0Hz	★
Pn2. 10	Acceleration time 1	0.00s~65000s	0.01s	1.00s	★
Pn2. 11	Deceleration time 1	0.00s~65000s	0.01s	1.00s	★
Fn2. 00	Motor Type Selection	0: Asynchronous motors	1	0	★
Fn2. 01	Motor rated power	0.1kW~630.0kW	0.1kW	0.2kw	★
Fn2. 02	Motor rated voltage	0V~1140V	1V	48V	★

Fn2. 03	Motor rated current	0. 01A~655. 35A	0. 01 A	4. 10A	★
Fn2. 04	Motor rated frequency	0. 0Hz~Maximum speed	0. 1Hz	1000hz	★
Fn2. 05	Motor rated speed	0rpm~65535rpm	1rpm	60000rpm	★
PnF. 01	Motor Model	702: 702 Motor 803: 803 Motor	1	702	

Note: If you modify the PnF. 01 motor model, Fn2. 01~Fn2. 05, Pnd. 00, Pnd. 02~Pnd. 49 will be automatically refreshed. For example, if PnF. 01 is modified from 702 to 803, Fn2. 01~Fn2. 05, Pnd. 00, Pnd. 02~Pnd. 49 will be refreshed to 803 motor parameters.

5.1.2 run

(1) Set motor parameters and control parameters

Example 1: Debugging a 250W 48V spindle motor (702 motor), input voltage 48V

Debugging steps:

1、Set PnF. 01 to 702. After setting, be sure to check whether Fn2. 01~Fn2. 05 are correct.

2、Set 10-point VF curve, Fn9. 00 is 9

3、Adjust the acceleration and deceleration time

Pn2. 10, Pn2. 11

4、Set the debugging mode Pn2. 00 (0: Digital given

1, not memorized after power off 1: Communication 2: AI

input 3: Digital given 2, memorized after power off)

Example 2: Debugging a 500W 60V spindle motor (803 motor),

input voltage 60V

Debugging steps:

1. Set PnF. 01 to 803. After setting, be sure to confirm whether Fn2. 01~Fn2. 05 are correct.

2. Set 10-point VF curve, Fn9. 00 is 9

3. just the acceleration and deceleration time

Pn2.10, Pn2.11

4. Set the debugging mode Pn2.00 (0: Digital given

1, not memorized after power off 1: Communication 2: AI

input 3: Digital given 2, memorized after power off)

(2) Setting VF parameters

After setting the PnF.01 parameter, the VF parameter will be automatically updated. You can also manually modify the Pnd group parameters as follows:

Pnd.01 0

Pnd.02 50

Pnd.03 Can be edited manually

Pnd.05 83.3

Pnd.06 Can be edited manually

Pnd.08 100

Pnd.09 Can be edited manually

Pnd.11 133.3

Pnd.12 Can be edited manually

Pnd.14 166.6

Pnd.15 Can be edited manually

Pnd.17 333.3

Pnd.18 Can be edited manually

Pnd.20 500

Pnd.21 Can be edited manually

Pnd.23 666.6

Pnd.24 Can be edited manually

Pnd.26 833.3

Pnd.27 Can be edited manually

Pnd.29 1000

Pnd. 30 Can be edited manually

(3) run

After the parameter setting is completed, the drive and motor can be tested using the speed regulation mode of Pn2.00.

Pn2.00=0, digital speed regulation: START signal needs to be connected to 24v, and the frequency is set by Pn2.03 for speed regulation;

Pn2.00=1, communication speed regulation: directly adjust the speed (not frequency) by the host computer, and no START signal is required;

Pn2.00=2, AI speed regulation: START signal needs to be connected to 24V, and AI terminal needs to be connected to 0~10V voltage for speed regulation;

Note: To change the direction of motor operation, please swap any two phase lines of the motor, or modify the ones digit of the Pn0.00 parameter to change the direction.

Chapter 6 Fault Diagnosis and Countermeasures

If a fault occurs during the operation of the drive system, the drive will immediately protect the motor and stop output. The drive panel will display a fault code. The fault types and common solutions corresponding to the fault codes are detailed in the table below. The table is for reference only. Please do not repair or modify without authorization. If the fault cannot be eliminated, please seek technical support from our company or product agents.

Fault name	Operation panel display	Troubleshooting	Troubleshooting measures
Inverter unit protection	Err01	1、Driver output circuit short circuit 2、The wiring between the motor and the driver is too long 3、Module overheating 4、The internal wiring of the driver is loose 5、Main control board abnormality 6、Driver board abnormality 7、Inverter module abnormality	1. Eliminate peripheral faults 2. Install reactors or output filters 3. Check whether the air duct is blocked and whether the fan is working properly 4. Plug in all connecting wires 5. Seek technical support 6. Seek technical support 7. Seek technical support
Acceleration overcurrent	Err02	1. The driver output circuit is grounded or short-circuited 2. The control mode is vector and no parameter tuning is performed 3. The acceleration time is too short 4. Manual torque boost or inappropriate V/F curve 5. Low voltage 6. Start the rotating motor 7. Sudden load during acceleration 8. The drive is too small	1. Eliminate peripheral faults 2. Perform motor parameter tuning 3. Increase acceleration time 4. Adjust manual torque boost or V/F curve 5. Adjust voltage to normal range 6. Wait until the motor stops before restarting 7. Cancel sudden load 8. Select a driver with a higher power rating 9. Power off and restart
Deceleration overcurrent	Err03	1. The driver output circuit is grounded or short-circuited 2. The control mode is vector and no parameter tuning is performed 3. The deceleration time is too short 4. Low voltage 5. Sudden load increase during deceleration 6. No brake resistor installed	1. Eliminate peripheral faults 2. Perform motor parameter tuning 3. Increase deceleration time 4. Adjust voltage to normal range 5. Eliminate sudden load 6. Install brake resistor 7. Power off and restart

Fault name	Operation panel display	Troubleshooting	Troubleshooting measures
Constant speed overcurrent	Err04	1. The output circuit of the driver is grounded or short-circuited 2. The control mode is vector and no parameter tuning is performed 3. The voltage is too low 4. Is there a sudden load during operation 5. The driver is too small	1. Eliminate peripheral faults 2. Perform motor parameter tuning 3. Adjust the voltage to the normal range 4. Remove sudden loads 5. Select a driver with a higher power rating 6. Power off and restart
Acceleration overvoltage	Err05	1. The input voltage is too high 2. There is an external force dragging the motor during acceleration 3. The acceleration time is too short 4. No brake resistor is installed	1. Adjust the voltage to the normal range 2. Cancel the external power or install a brake resistor 3. Increase the acceleration time 4. Install a brake resistor 5. Power off and restart
Deceleration overvoltage	Err06	1. The input voltage is too high 2. There is an external force dragging the motor during deceleration 3. The deceleration time is too short 4. No brake resistor is installed	1. Adjust the voltage to the normal range 2. Cancel the external power or install a brake resistor 3. Increase the deceleration time 4. Install a brake resistor 5. Power off and restart
Constant speed overvoltage	Err07	1. The input voltage is too high 2. There is an external force dragging the motor during operation	1. Adjust the voltage to the normal range 2. Cancel the external power or install a brake resistor 3. Cut off the power and restart
Control Power Failure	Err08	1. The input voltage is not within the specified range	1. Adjust the voltage to within the range required by the specification

Fault name	Operation panel display	Troubleshooting	Troubleshooting measures
Undervoltage fault	Err09	1. Instantaneous power failure 2. The voltage at the driver input terminal is not within the range required by the specification 3. The bus voltage is abnormal 4. The driver board is abnormal 5. The control board is abnormal	1. Reset the fault 2. Adjust the voltage to the normal range 3. Seek technical support 4. Seek technical support 5. Seek technical support 6. Seek technical support
Drive overloaded	Err10	1. Is the load too large or the motor is blocked? 2. The driver is too small.	1. Reduce the load and check the motor and mechanical condition. 2. Choose a driver with a higher power rating.
Motor overloaded	Err11	1. Is the motor protection parameter PnC.01 set appropriately? 2. Is the load too large or is the motor stalled? 3. Is the driver too small?	1. Set this parameter correctly 2. Reduce the load and check the motor and mechanical conditions 3. Select a driver with a higher power rating 4. Press the "SET" key or power off and restart
Output phase loss	Err13	1. The lead from the driver to the motor is abnormal 2. The three-phase output of the driver is unbalanced when the motor is running 3. The driver board is abnormal 4. The module is abnormal	1. Eliminate peripheral faults 2. Check whether the three-phase winding of the motor is normal and eliminate the fault 3. Seek technical support 4. Power off and restart
Module overheating	Err14	1. Ambient temperature is too high 2. Air duct is blocked 3. Fan is damaged 4. Module thermistor is damaged 5. Inverter module is damaged	1. Lower the ambient temperature 2. Clean the air duct 3. Replace the fan 4. Replace the thermistor 5. Replace the inverter module

Fault name	Operation panel display	Troubleshooting	Troubleshooting measures
External device failure	Err15	1. Input external fault signal through multi-function terminal DI 2. Input external fault signal through virtual IO function	1. Reset operation 2. Reset operation
Communication failure	Err16	1. The host computer is not working properly 2. The communication line is not working properly 3. The communication expansion card PnA.00 is not set correctly 4. The communication parameter PnA group is not set correctly	1. Check the host computer wiring 2. Check the communication connection line 3. Correctly set the communication expansion card type 4. Correctly set the communication parameters
Current Detection Fault	Err18	1. Check if the Hall device is abnormal 2. Driver board is abnormal	1. Replace the Hall device 2. Replace the driver board
Motor tuning Fault	Err19	1. The motor parameters are not set according to the nameplate 2. The parameter tuning process has timed out	1. Set the motor parameters correctly according to the nameplate. 2. Check the leads from the drive to the motor.
Code disk failure	Err20	1. Encoder model does not match 2. Encoder connection error 3. Encoder damage	1. Correctly set the encoder type according to the actual situation 2. Eliminate line faults 3. Replace the encoder 4. Replace the PG card
EEPROM Read and write failure	Err21	1、 EEPROM Chip damage	1. Replace the main control board

Fault name	Operation panel display	Troubleshooting	Troubleshooting measures
Drive hardware failure	Err22	1. Overvoltage exists 2. Overcurrent exists	1. Handle the overvoltage fault 2. Handle the overcurrent fault
Short circuit to ground Fault	Err23	1. The motor is short-circuited to ground	1. Replace the cable or motor
Cumulative running time Fault	Err26	1. The cumulative running time reaches the set value	1. Use parameter initialization function to clear record information
User defined fault 1	Err27	1. Input the signal of user-defined fault 1 through the multi-function terminal DI 2. Input the signal of user-defined fault 1 through the virtual IO function	1. Reset operation 2. Reset operation
User defined fault 2	Err28	1. Input the signal of user-defined fault 2 through the multi-function terminal DI 2. Input the signal of user-defined fault 2 through the virtual IO function	1. Reset operation 2. Reset operation
Cumulative power-on time reached Fault	Err29	1. The cumulative power-on time reaches the set value	1. Use parameter initialization function to clear record information
Communication failure	Err32	1. Communication parameter settings are incorrect	1. Check the PnA communication parameter group 2. Check the communication connection line 3. Press the "SET" key or power off and restart

Fault name	Operation panel display	Troubleshooting	Troubleshooting measures
Wave-by-wave current limiting fault	Err40	1. Is the load too large or the motor is blocked? 2. The driver is too small.	1. Reduce the load and check the motor and mechanical condition. 2. Choose a driver with a higher power rating.
Speed deviation too large fault	Err42	1. Incorrect encoder parameter settings 2. No parameter tuning 3. Too large speed deviation detection parameters PnC.36 and PnC.37 are not set properly	1. Correctly set the encoder parameters 2. Perform motor parameter tuning 3. Reasonably set the detection parameters according to the actual situation
Motor overspeed fault	Err43	1. Incorrect encoder parameter settings 2. No parameter tuning 3. Inappropriate settings for motor overspeed detection parameters PnC.34 and PnC.35	1. Correctly set the encoder parameters 2. Perform motor parameter tuning 3. Reasonably set the detection parameters according to the actual situation
Motor overheating	Err45	1. The KTY interface motor temperature sensor detects overheating 2. The temperature sensor is not connected or the model is set incorrectly	1. Take measures to cool the motor 2. Check whether KTY is properly connected or damaged 3. If the temperature sensor alarm is turned off, set PnF.02=0

The following faults may occur during the use of the drive. Please refer to the following methods for simple fault analysis:

Serial number	Fault phenomenon	Possible causes	Workaround
1	No display after power on	1. The grid voltage is not available or is too low 2. The switch power supply on the driver board is faulty 3. The control board or keyboard is faulty 4. The connection between the control board and the driver board or keyboard is broken	1. Check the input power 2. Check the bus voltage 4~6. Seek manufacturer service
2	Power on display CFD	1. The connection between the driver board and the control board is poor 2. The related components on the control board are damaged 3. The motor or motor line is short-circuited to the ground 4. Hall fault 5. The grid voltage is too low	2~5. Seek manufacturer services
3	Power-on display "Err23" alarm	1. The motor or output line is short-circuited to the ground 2. The driver is damaged	1. Use an ohmmeter to measure the insulation of the motor and output wires 2. Seek manufacturer service
4	The drive is powered on and displays normal. After running, it displays "CFD" and stops immediately.	1. The peripheral control terminal wiring is short-circuited	1. Eliminate external short circuit fault

Serial number	Fault phenomenon	Possible causes	Workaround
5	Frequent reporting of Err14 (module overheating) fault	1. The fan is damaged or the air duct is blocked 2. The internal components of the driver are damaged (thermocouple or other)	1. Replace the fan and clean the air duct 2. Seek manufacturer service
6	After the drive is running, the motor does not rotate	1. Motor and motor line 2. Driver parameter setting error (motor parameters) 3. Poor contact between the driver board and the control board 4. Driver board failure	1. Reconfirm the connection between the driver and the motor 2. Replace the motor or eliminate the mechanical fault 3. Check and reset the motor parameters 4. Seek manufacturer service
7	DI terminal failure	1. Parameter setting error 2. External signal error 3. Control board failure	1. Check and reset the relevant parameters of Pn7 group 2. Reconnect the external signal line 3. Seek manufacturer service
9	The driver frequently reports overcurrent and overvoltage faults	1. Motor parameter settings are incorrect 2. Acceleration and deceleration time is inappropriate 3. Load fluctuation	1. Reset motor parameters or perform motor tuning 2. Set appropriate acceleration and deceleration time 3. Seek manufacturer service
10	88888	1. Related components on the control board are damaged	1. Replace the control board

Chapter 7 Parameter List

“☆”：Indicates that the setting value of this parameter can be changed when the drive is in the shutdown or running state;

“★”：Indicates that the setting value of this parameter cannot be changed when the drive is in operation;

“●”：Indicates that the value of this parameter is the actual detection record value and cannot be changed;

“*”：Indicates that the parameter is a "manufacturer parameter" and is limited to the manufacturer's settings. Users are prohibited from operating it.

function code	name	range	Minimum unit	default	change
Pn0 System Management Parameter Group					
Pn0.00	Function selection application switch 0	Units: Rotation direction selection (speed control is effective) 0: CCW direction is the forward direction 1: CW direction is the forward direction 2~3: Reserved Tens: Control mode selection 0: Speed control mode 1: Torque control mode 2~6: Reserved Hundreds: Operation	1	2100	★

function code	name	range	Minimum unit	default	change
		command selection 0: Operation panel command channel 1: Terminal command channel 2: Serial port communication command channel Thousands: Control mode 0: Open-loop vector control 1: Closed-loop vector control 2: V/F control			
Pn0.03	Carrier frequency	0. 5kHz~16. 0kHz	0. 01kHz	Model confirmation	☆
Pn0.09	LED operation display parameters 1	Units: Operation monitoring 0 1: Operation speed 2: Set speed 4: Bus voltage (V) 8: Output current (A) Tens: Operation monitoring 1 1: Reserved 2: Reserved 4: Reserved 8: Reserved Hundreds: Operation monitoring 2 1: Reserved	1111	1	☆

function code	name	range	Minimum unit	default	change
		2: Reserved 4: Reserved 8: Reserved Thousands: Operation monitoring 4 1: Reserved 2: Reserved 4: Reserved 8: Reserved			
Pn0.10	LED operation display parameter 2	Units: Operation monitoring 5 1: Reserved 2: Reserved 4: Reserved 8: Reserved Tens: Operation monitoring 6 1: Reserved 2: Reserved 4: Reserved 8: Reserved Hundreds: Operation monitoring 7 1: Reserved 2: Reserved 4: Reserved 8: Reserved Thousands: Operation monitoring 8 1: Reserved 2: Reserved 4: Reserved	1111	0	☆

function code	name	range	Minimum unit	default	change
		8: Reserved			
Pn0.11	LED stop display parameters	Units: Shutdown monitoring 0 1: Set speed (Hz) 2: Bus voltage (V) 4: AI input voltage 8: Reserved Tens: Shutdown monitoring 1 1: Reserved 2: Reserved 4: Reserved 8: Reserved Hundreds: Shutdown monitoring 2 1: Reserved 2: Reserved 4: Reserved 8: Reserved Thousands: Shutdown monitoring 3 1: Reserved 2: Reserved 4: Reserved 8: Reserved	1111	2	☆
Pn0.13	Driver temperature	0.0°C ~ 100°C	0.1°C		●
Pn0.17	DSP software version number	-			●
Pn0.23	Function code read-only control	0: Function code is read-only and invalid 1: Function code is read-only and valid	1	0	☆

function code	name	range	Minimum unit	default	change
Pn0.25	Fault record display times	0~15 0: Most recent fault 1: One fault before the most recent fault 2: Two faults before the most recent fault 3: Three faults before the most recent fault	0	0	☆
Pn0.26	Parameter initialization	0: No operation 01: Restore factory parameters 02: Clear record information 03: Restore factory parameters, including motor parameters	1	0	★
Pn0.27	User Password	0~65535	1	00001	☆
Pn2 Speed control parameter group					
Pn2.00	Speed control application switch 0	Units, Tens: Source of Main Speed Command A 0: Digital Setting 1 (Not Memory after Power-off) 0: Digital Setting 1, Not Memory after Power-off 1: Communication 2: AI 3: Digital Setting 2, Memory after Power-off 4: Reserved 5: Reserved 6: Reserved 7: Reserved	1	1	★

function code	name	range	Minimum unit	default	change
		8: Reserved A: Reserved B~F: Reserved Hundreds: Upper Speed Source Selection 0: Digital Setting (Pn2.07) 1: Reserved 2: Reserved 3: Reserved 4: Reserved 5: Reserved Thousands: Reserved			
Pn2.01	Speed control application switch 1	Units, Tens: Source of auxiliary speed command B 0: Digital setting 1 (no memory after power failure) 1: Digital setting 2 (memory after power failure) 2: Reserved 3: Reserved 4: Reserved 5: Reserved 6: Reserved 7: Reserved 8: Reserved 9: Reserved A: Reserved B~F: Reserved Hundreds: Source of speed	1	0	★

function code	name	range	Minimum unit	default	change
		control (drive) torque upper limit 0: Reserved 1: Reserved 2: Reserved 3: Reserved 4: Reserved 5: Reserved 6: Reserved 7: Reserved Thousands: Reserved			
Pn2.02	Speed control application switch 2	Units, Tens: Speed source selection 0: Reserved 1: Reserved 2: Reserved 3: Reserved 4: Reserved 5~14: Reserved Hundreds: Speed source main and auxiliary operation relationship 0: Reserved 1: Reserved 2: Reserved 3: Reserved Thousands: Reserved	11	00	☆
Pn2.03	Internal speed command	0.0Hz~Maximum speed Pn2.05	0.1Hz	500.0Hz	☆
Pn2.05	Maximum speed	50.0Hz~1667.0Hz	0.1Hz	1000.0Hz	★
Pn2.07	Upper speed limit	Lower speed limit Pn2.09~maximum speed	0.1Hz	1000.0Hz	☆

function code	name	range	Minimum unit	default	change
		Pn2. 05			
Pn2. 08	Upper speed bias	0.0Hz~Maximum speed Pn2. 05	0.1Hz	0.0Hz	☆
Pn2. 09	Lower speed limit	0.0Hz~Upper speed limit Pn2. 07	0.1Hz	0.0Hz	☆
Pn2. 10	Acceleration time 1	0.00s~65000s	0.01s	5.00s	☆
Pn2. 11	Deceleration time 1	0.00s~65000s	0.01s	5.00s	☆
Pn2. 13	Speed control (drive) torque upper limit digital setting	0.0%~200.0%	0.1%	150.0%	☆
Pn2. 15	Speed control (brake) torque upper limit digital setting	0.0%~200.0%	0.1%	150.0%	☆
Pn2. 16	Jog speed	0.00Hz~Maximum speed	0.01Hz	2.00Hz	☆
Pn2. 17	Jog acceleration time	0.0s~6500.0s	0.1s	20.0s	☆
Pn2. 18	Jog deceleration time	0.0s~6500.0s	0.1s	20.0s	☆
Pn4 Vector control gain parameter group					
Pn4. 00	Speed loop proportional gain 1	1~100	1	30	☆
Pn4. 01	Speed loop integral time 1	0.01s~10.00s	0.01s	0.50s	☆
Pn4. 02	Switching speed 1	0.0~Pn4. 05	0.1Hz	50.0Hz	☆

function code	name	range	Minimum unit	default	change
Pn4. 03	Speed loop proportional gain 2	1~100	1	20	☆
Pn4. 04	Speed loop integral time 2	0. 01s~10. 00s	0. 01s	1. 00s	☆
Pn4. 05	Switching speed 2	Pn4. 02~Maximum speed	0. 1Hz	100. 0Hz	☆
Pn4. 06	Slip compensation coefficient	50%~200%	1%	100%	☆
Pn4. 07	Speed loop filter time constant	0. 000s~1. 000s	0. 001s	0. 016s	☆
Pn4. 08	Vector control overexcitation gain	0~200	1	64	☆
Pn4. 13	M-axis current loop proportional gain	0~20000	1	2000	☆
Pn4. 14	M-axis current loop integral gain	0~20000	1	1300	☆
Pn4. 15	T-axis current loop proportional gain	0~20000	1	2000	☆
Pn4. 16	T-axis current loop integral gain	0~20000	1	1300	☆
Pn4. 17	Speed loop integral properties	Units: Integral separation 0: Invalid 1: Valid	1	0	☆

function code	name	range	Minimum unit	default	change
Pn6 Closed-loop vector control encoder parameter group					
Pn6.00	Number of encoder pulses	1~65535	1	2500	★
Pn6.01	Servo encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: resolver 3: sine-cosine encoder 4: UVW encoder with wire saving method 5: Tamagawa serial bus encoder 6: Tamagawa absolute encoder	1	0	★
Pn6.03	Encoder phase sequence/main direction	0: Forward 1: Reverse	1	0	★
Pn6.04	Encoder installation position angle	0.0~359.9 °	0.1 °	0.0 °	★
Pn6.05	UVW signal direction	0: Forward 1: Reverse	1	0	★
Pn6.06	UVW signal zero point position angle	0.0~359.9 °	0.1 °	0.0 °	★
Pn6.07	Resolver pole pair number	1~65535	1	1	★
Pn6.08	UVW pole pairs	1~65535	1	4	★
Pn6.09	Speed feedback PG disconnection	0.0: No action 0.1s~10.0s	0.1	0.0	★

function code	name	range	Minimum unit	default	change
	detection time				
Pn6.10	Motor gear ratio numerator	1~65535	1	1	★
Pn6.11	Motor gear ratio denominator	1~65535	1	1	★
Pn7 Terminal input parameter group					
Pn7.00	START terminal function selection	0: No function 1: Forward operation (FWD)	1	1	★
Pn7.01	reserve	2: Reverse operation (REV)	1	—	★
Pn7.02	reserve	3: Three-wire operation control	1	—	★
Pn7.03	reserve	4: Forward jog (FJOG)	1	—	★
Pn7.04	reserve	5: Reverse jog (RJOG)	1	—	★
Pn7.05	reserve	6: Terminal UP	1	—	★
Pn7.06	reserve	7: Terminal DOWN	1	—	★
Pn7.07	reserve	8: Free stop 9: Fault reset (RESET) 10: Operation pause 11: External fault normally open input			
Pn7.08	reserve	16: Acceleration and deceleration selection terminal 1 17: Acceleration and deceleration selection terminal 2	1	—	★

function code	name	range	Minimum unit	default	change
Pn7.09	reserve	18: Speed source switching 19: UP/DOWN setting clear (terminal, keyboard) 20: Run command switching terminal 32: Immediate DC braking 33: External fault normally closed input 39: Speed source X and preset speed switching terminal 40: Speed source Y and preset speed switching terminal 44: User-defined fault 1 45: User-defined fault 2 47: Emergency stop	1		★
Pn7.10	DI filter time	0.000s~1.000s	1	0.010s	☆
Pn7.11	Terminal command mode	0: Two-wire 1 1: Two-wire 2 2: Three-wire 1 3: Three-wire 2	1	0	★
Pn7.12	Terminal UP/DOWN change rate per second	0.001Hz~65.535Hz	1	1.00Hz	☆
Pn7.13	Curve 1 minimum input	0.00V~Pn7.15	0.01	0.00V	☆
Pn7.14	Curve 1 minimum input corresponding setting	-100.0%~-+100.0%	0.1	0.0%	☆
Pn7.15	Curve 1 Maximum Input	Pn7.13~-+10.00V	0.01	10.00V	☆
Pn7.16	Curve 1	-100.0%~-+100.0%	0.1	100.0%	☆

function code	name	range	Minimum unit	default	change
	Maximum Input Corresponding Setting				
Pn7.17	AI Filter time	0.00s~10.00s		0.50s	★
Pn7.33	AI Set Curve Selection	Units: AI curve selection 1: Curve 1 (2 points, see Pn7.13~Pn7.16) 2: Reserved 3: Reserved 4: Curve 4 (4 points, see Fn6.00~Fn6.07) 5: Reserved Tens: Reserved Hundreds: Reserved		321	★
Pn7.34	AI Below minimum input setting selection	Units: AI is lower than the minimum input setting selection 0: Minimum input corresponding setting 1: 0.0% Tens: Reserved Hundreds: Reserved		000	★
Pn7.35	START terminal delay time	0.0s~3600.0s		0.0s	★
Pn7.36	reserve				
Pn7.37	reserve				
Pn7.38	Input terminal valid state setting 1	0: high level 1: low level Units: START terminal Tens: reserved Hundreds: reserved Thousands: reserved		00000	★

function code	name	range	Minimum unit	default	change
		Ten thousand: reserved			
Pn8 Terminal output parameter group					
Pn8. 00	reserve				
Pn8. 01	reserve	0: No output 1: Driver in operation			
Pn8. 02	reserve	2: Zero speed detection			
Pn8. 03	D03 output selection	3: Speed level detection FDT1 output 4: Speed arrival	1	6	☆
Pn8. 04	D01 output selection	5: Zero speed operation (no output when stopped)	1	4	☆
Pn8. 05	D02 output selection	6: Motor alarm 7: Driver overload pre-alarm 8: Reserved 9: Reserved 10: Reserved 11: Reserved 12: Reserved 13: Speed limited 14: Torque limited 15: Ready to run 16: Reserved 17: Upper speed limit reached 18: Lower speed limit reached (operation related) 19: Undervoltage status output 20: Communication setting 21: Reserved 22: Reserved 23: Zero speed operation (output when stopped) 24: Reserved	1	2	☆

function code	name	range	Minimum unit	default	change
		25: Speed level detection FDT2 output 26: Speed arrival 1 output 27: Speed arrival 2 output 28: Current arrival 1 output 29: Current arrival 2 output 30: Reserved 31: AI input exceeds upper and lower limits 32: Load loss 33: Running direction 34: Zero current detection 35: Module temperature reached 36: Software overcurrent output 37: Lower speed limit reached (irrelevant to operation) 38: Fault output (continue to run) 39: Motor overtemperature pre-alarm 40: Reserved 41: User-defined output 1 42: User-defined output 2			
Pn8.06	reserve	0: Running speed 1: Set speed 2: Output current 3: Output torque 4: Reserved 5: Output voltage 6: Reserved 7: AI	1	0	☆
Pn8.07	A0 output selection				
Pn8.08	A02 output selection		1	1	☆
Pn8.09	reserve				

function code	name	range	Minimum unit	default	change
Pn8.10	A0 bias coefficient	-100.0%~100.0%	0.1%	0.0%	☆
Pn8.11	A0 Gain	-10.00~10.00	0.01	1.00	☆
Pn8.12	reserve				
Pn8.13	reserve				
Pn8.14	reserve				●
Pn8.15	reserve				●
Pn8.16	reserve				●
Pn8.17	reserve				
Pn8.18	reserve				
Pn8.19	D03 output delay time	0.0s~3600.0s	0.1s	0.0s	☆
Pn8.20	D01 output delay time	0.0s~3600.0s	0.1s	0.0s	☆
Pn8.21	D02 output delay time	0.0s~3600.0s	0.1s	0.0s	☆
Pn8.22	D0 output terminal effective state selection	0: Positive logic 1: Negative logic Units: Reserved Tens: Reserved Hundreds: D03 Thousands: D01 Ten thousand: D02	11111	00000	☆
Pn8.23	User defined output variable selection (EX) 1	0: Running speed 1: Set speed 2: Bus voltage 3: Output voltage 4: Output current 5: Start/stop status flag 6: Control status flag 7: Reserved 8: Reserved 9: Inverter module temperature	none	0	☆

function code	name	range	Minimum unit	default	change
		10: AI input 11: Reserved			
Pn8.24	User selected comparison method 1	Units: Comparison test mode 0: Equal (EX == X1) 1: Greater than or equal to 2: Less than or equal to 3: Interval comparison (X1 ≤ EX ≤ X2) 4: Bit test (EX & X1=X2) Tens: Output mode 0: False value output 1: True value output	none	00	☆
Pn8.25	User defined deadband 1	0~65535	none	0	☆
Pn8.26	User defined first comparison value 1	0~65535	none	0	☆
Pn8.27	User defined second comparison value 1	0~65535	none	0	☆
Pn8.28	User defined output variable selection (EX) 2	0: Running speed 1: Set speed 2: Bus voltage 3: Output voltage 4: Output current 5: Start/stop status flag 6: Control status flag 7: Reserved 8: Reserved	none	0	☆

function code	name	range	Minimum unit	default	change
		9: Inverter module temperature 10: AI input 11: Reserved			
Pn8.29	User selected comparison method 2	Units: Comparison test mode 0: Equal (EX == X1) 1: Greater than or equal to 2: Less than or equal to 3: Interval comparison (X1 ≤ EX ≤ X2) 4: Bit test (EX & X1=X2) Tens: Output mode 0: False value output 1: True value output	none	00	☆
Pn8.30	User defined deadband 2	0~65535	none	0	☆
Pn8.31	User defined first comparison value 1	0~65535	none	0	☆
Pn8.32	User defined second comparison value 2	0~65535	none	0	☆
PnA Communication parameter group					
PnA.00	Communication Type	0: 485 communication 1: Reserved 2: Reserved 3: Reserved 4: Reserved	1	0	☆
		Units: MODBUS 0: 300BPS			

function code	name	range	Minimum unit	default	change
PnA. 01	Baud rate	1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Tens: Reserved Hundreds: Reserved Thousands: Reserved	1	6005	☆
PnA. 02	Data Format	0: No parity (8.N.2) 1: Even parity (8.E.1) 2: Odd parity (8.0.1) 3: 8.N.1	1	0	☆
PnA. 03	Local address	1 to 247, 0 is the broadcast address	1	1	☆
PnA. 04	Response delay	0ms~20ms	1ms	2	☆
PnA. 05	Communication timeout	0.0 (invalid), 0.1s~60.0s	0.1s	0.0	☆
PnA. 06	Data transfer format selection	Units: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol Tens: Reserved	1	01	☆
PnA. 07	Communication reading current resolution	0: 0.01A 1: 0.1A	1	0	☆
PnC Fault and protection parameter group					
PnC. 00	Motor overload software protection selection	0: Disable 1: Enable	1	1	☆

function code	name	range	Minimum unit	default	change
PnC. 01	Motor overload software protection gain	0.20~10.00	0.01	1.00	☆
PnC. 02	Motor overload warning factor	50%~100%	1%	80%	☆
PnC. 03	Overspeed stall gain	0~100	1	0	☆
PnC. 04	Overspeed stall protection voltage	120%~150%	1%	130%	☆
PnC. 05	Overspeed stall gain	0~100	1	20	☆
PnC. 06	Over-current stall protection current	100%~200%	1%	150%	☆
PnC. 07	Power-on short-circuit protection selection	0: Invalid 1: Valid	1	0	☆
PnC. 08	reserve	—	—	—	●
PnC. 09	Fault automatic reset times	0~20	1	0	☆
PnC. 10	Fault DO action selection during fault automatic reset	0: No action 1: Action	1	0	☆
PnC. 11	Fault	0.1s~100.0s	0.1s	1.0s	☆

function code	name	range	Minimum unit	default	change
	automatic reset interval				
PnC.12	reserve				
PnC.13	Output phase loss protection selection	0: Disable 1: Enable	1	1	☆
PnC.14	Fault protection action selection 1	Units: Motor overload (Er011) 0: Free stop 1: Stop according to the stop mode 2: Continue to run Tens: Reserved Hundreds: Output phase loss (Er013) Thousands: External fault (Er015) Ten thousand: Communication abnormality (Er016)	11111	00000	☆
PnC.15	Fault protection action selection 2	Units: Encoder fault (Er020) 0: Free stop Tens: Function code read/write abnormality (Er021) 0: Free stop 1: Stop according to the stop mode Hundreds: Reserved Thousands: Motor overheating (Er025)	11111	00000	☆

function code	name	range	Minimum unit	default	change
		Ten thousand: Reserved			
PnC.16	Fault protection action selection 3	Units: User-defined fault 1 (Err27) 0: Free stop 1: Stop according to the stop mode 2: Continue to run Tens: User-defined fault 2 (Err28) 0: Free stop 1: Stop according to the stop mode 2: Continue to run Hundreds: Reserved Thousands: Load loss (Err30) 0: Free stop 1: Deceleration stop 2: Decelerate to 7% of the rated speed of the motor and continue to run, automatically restore to the set speed when there is no load loss Ten thousandths: Reserved	11111	00000	☆
PnC.17	Fault protection action selection 4	Units: Too large speed deviation (Err42) 0: Free stop 1: Stop according to the stop method 2: Continue to run Tens: Motor overspeed	11111	00000	☆

function code	name	range	Minimum unit	default	change
		(Err43) Hundreds: Reserved			
PnC.18	reserve	—	—	—	●
PnC.19	reserve	—	—	—	●
PnC.20	reserve	—	—	—	●
PnC.21	Fault-related speed selection	0: Run at the current operating speed 1: Run at the set speed 2: Run at the upper speed limit 3: Run at the lower speed limit 4: Run at the abnormal backup speed	1	0	☆
PnC.22	Abnormal standby speed setting	60.0%~100.0% (Current target speed)	0.1%	100.0%	☆
PnC.23	Motor temperature sensor type	0: No temperature sensor 1: Reserved 2: Reserved 3: KTY84	1	3	☆
PnC.24	Motor overheat protection threshold	0°C ~ 200°C	1°C	110°C	☆
PnC.25	Motor overheat warning threshold	0°C ~ 200°C	1°C	90°C	☆
		0: invalid			

function code	name	range	Minimum unit	default	change
PnC. 26	Momentary stop action selection	1: Decelerate according to deceleration time 1 2: Decelerate according to deceleration time 2 3: Decelerate according to deceleration time 3 4: Decelerate according to deceleration time 4 5: Decelerate according to the current deceleration time 6: Automatic deceleration	1	0	☆
PnC. 27	Automatic deceleration and switching speed point when stopping	0.0Hz~Maximum speed	0.1Hz	90.0Hz	☆
PnC. 28	Instantaneous power failure voltage recovery judgment time	0.00s~100.00s	0.01s	0.50s	☆
PnC. 29	Momentary power failure judgment voltage	60.0%~100.0% (Standard bus voltage)	0.1%	80.0%	☆
PnC. 30	Load drop protection option	0: Invalid 1: Valid	1	0	☆
PnC. 31	Load drop detection level	0.0~100.0%	0.1%	10.0%	☆
PnC. 32	Load drop detection time	0.0~60.0s	0.1s	1.0s	☆
PnC. 33	reserve				
PnC. 34	Over speed detection	0.0%~50.0% (Maximum speed)	0.1%	20.0%	☆

function code	name	range	Minimum unit	default	change
	value				
PnC.35	Over speed detection time	0.0s~60.0s	0.1s	5.0s	☆
PnC.36	Speed deviation too large detection value	0.0%~50.0% (Maximum speed)	0.1%	20.0%	☆
PnC.37	Speed deviation too large detection time	0.0s~60.0s	0.1s	0.0s	☆

Pnd 10-point VF curve parameter group

Pnd. 00	10-point built-in curve selection	0: For 250W motor 2: For 500W motor	1	0	★
Pnd. 01	Switch between no-load curve and full-load curve	0: Use no-load curve 1: No-load and full-load curves automatically switch according to current 2: Use full-load curve	1	0	★
Pnd. 02	10-point VF curve frequency point 1	0.0~Pnd. 05	0.1Hz	Automatic refresh	★
Pnd. 03	10-point VF curve no-load voltage point 1	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 04	10-point VF curve full load voltage point 1	0.0%~100.0%	0.1%	Automatic refresh	★

function code	name	range	Minimum unit	default	change
Pnd. 05	10-point VF curve frequency point 2	Pnd. 02～Pnd. 08	0. 1Hz	Automatic refresh	★
Pnd. 06	10-point VF curve no-load voltage point 2	0. 0%～100. 0%	0. 1%	Automatic refresh	★
Pnd. 07	10-point VF curve full load voltage point 2	0. 0%～100. 0%	0. 1%	Automatic refresh	★
Pnd. 08	10-point VF curve frequency point 3	Pnd. 05～Pnd. 11	0. 1Hz	Automatic refresh	★
Pnd. 09	10-point VF curve no-load voltage point 3	0. 0%～100. 0%	0. 1%	Automatic refresh	★
Pnd. 10	10-point VF curve no-load voltage point 3	0. 0%～100. 0%	0. 1%	Automatic refresh	★
Pnd. 11	10-point VF curve no-load voltage point 3	Pnd. 08～Pnd. 14	0. 1Hz	Automatic refresh	★
Pnd. 12	10-point VF curve no-load voltage point 4	0. 0%～100. 0%	0. 1%	Automatic refresh	★
Pnd. 13	10-point VF curve full load voltage point 4	0. 0%～100. 0%	0. 1%	Automatic refresh	★
Pnd. 14	10-point VF curve	Pnd. 11～Pnd. 17	0. 1Hz	Automatic refresh	★

function code	name	range	Minimum unit	default	change
	frequency point 5				
Pnd. 15	10-point VF curve no-load voltage point 5	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 16	10-point VF curve full load voltage point 5	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 17	10-point VF curve frequency point 6	Pnd. 14~Pnd. 20	0.1Hz	Automatic refresh	★
Pnd. 18	10-point VF curve no-load voltage point 6	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 19	10-point VF curve full load voltage point 6	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 20	10-point VF curve frequency point 7	Pnd. 17~Pnd. 23	0.1Hz	Automatic refresh	★
Pnd. 21	10-point VF curve no-load voltage point 7	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 22	10-point VF curve full load voltage point 7	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 23	10-point VF curve frequency	Pnd. 20~Pnd. 26	0.1Hz	Automatic refresh	★

function code	name	range	Minimum unit	default	change
	point 8				
Pnd. 24	10-point VF curve no-load voltage point 8	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 25	10-point VF curve full load voltage point 8	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 26	10-point VF curve frequency point 9	Pnd. 23~Pnd. 29	0.1Hz	Automatic refresh	★
Pnd. 27	10-point VF curve no-load voltage point 9	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 28	10-point VF curve full load voltage point 9	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 29	10-point VF curve frequency point 10	Pnd. 26~Rated frequency	0.1Hz	Automatic refresh	★
Pnd. 30	10-point VF curve no-load voltage point 10	0.0%~100.0%	0.1%	Automatic refresh	★
Pnd. 31	10-point VF curve Full load voltage point 10	0.0%~100.0%	0.1%	Automatic refresh	★
PnF. 01	Motor Type	702: 702 motor 803: 803 motor		702	★
PnF. 02	Temperature	1: Alarm 0: No alarm		1	★

function code	name	range	Minimum unit	default	change
	sensor not connected alarm				
Fn2 Motor 1 parameter group					
Fn2.00	Motor Type Selection	0: Asynchronous motors	1	0	★
Fn2.01	Motor rated power	0.1kW~630.0kW	0.1kW	Model confirmation	★
Fn2.02	Motor rated voltage	0V~1140V	1V	Model confirmation	★
Fn2.03	Motor rated current	0.01A~655.35A	0.01A	Model confirmation	★
Fn2.04	Motor rated frequency	0.0Hz~Fn2.05	0.1Hz	Model confirmation	★
Fn2.05	Motor rated speed	0rpm~65535rpm	1rpm	Model confirmation	★
Fn2.06	Stator resistance of asynchronous motor	0.001Ω~65.535Ω	0.001 Ω	Model confirmation	★
Fn2.07	Asynchronous motor rotor resistance	0.001Ω~65.535Ω	0.001 Ω	Model confirmation	★
Fn2.08	Asynchronous motor leakage inductance	0.01mH~655.35mH	0.01mH	Model confirmation	★
Fn2.09	Asynchronous motor mutual inductance	0.1mH~6553.5mH	0.1mH	Model confirmation	★

function code	name	range	Minimum unit	default	change
Fn2.10	Asynchronous motor no-load current	0.01A~Fn2.03	0.01	Model confirmation	★
Fn2.37	Tuning selection	0: No operation 1: Asynchronous motor static tuning 2: Asynchronous motor complete tuning	1	0	★

Fn4 Auxiliary function parameter group

Fn4.00	reserve				
Fn4.01	reserve				
Fn4.02	reserve				
Fn4.03	Acceleration time 2	0.0s~6500.0s	0.1s	Model confirmation	★
Fn4.04	Deceleration time 2	0.0s~6500.0s	0.1s	Model confirmation	★
Fn4.05	Acceleration time 3	0.0s~6500.0s	0.1s	Model confirmation	★
Fn4.06	Deceleration time 3	0.0s~6500.0s	0.1s	Model confirmation	★
Fn4.07	Acceleration time 4	0.0s~6500.0s	0.1s	Model confirmation	★
Fn4.08	Deceleration time 4	0.0s~6500.0s	0.1s	Model confirmation	★
Fn4.09	Jump speed 1	0.00Hz~Maximum speed	0.01Hz	0.00Hz	★
Fn4.10	Jump Speed 2	0.00Hz~Maximum speed	0.01Hz	0.00Hz	★
Fn4.11	Jump speed	0.00Hz~Maximum speed	0.01Hz	0.01Hz	★

function code	name	range	Minimum unit	default	change
	range				
Fn4. 12	Forward and reverse dead time	0.0s~3000.0s	0.1s	0.0s	☆
Fn4. 13	Inversion of Control	0: Allow reversal 1: Disable reversal	1	0	☆
Fn4. 14	The speed is lower than the lower limit speed.	0: Run at the lower speed limit 1: Stop 2: Run at zero speed	1	0	☆
Fn4. 15	Droop control	0.0Hz~100.0Hz	0.1Hz	0.0Hz	☆
Fn4. 16	Set the cumulative power-on arrival time	0h~65000h	1h	0h	☆
Fn4. 17	Set the cumulative running arrival time	0h~65000h	1h	65000h	☆
Fn4. 18	Start protection selection	0: No protection 1: Protection	1	0	☆
Fn4. 19	Speed detection value (FDT1)	0.00Hz~Maximum speed	0.01Hz	50.00Hz	☆
Fn4. 20	Speed detection hysteresis value (FDT1)	0.0%~100.0% (FDT1 Level)	0.1%	5.0%	☆
Fn4. 21	Speed reaches detection width	0.0%~100.0% (Maximum speed)	0.1%	0.0%	☆

function code	name	range	Minimum unit	default	change
Fn4. 22	Is the jump speed effective during acceleration and deceleration ?	0: Invalid 1: Valid	1	0	☆
Fn4. 23	Cumulative running time reaches action selection	0: Continue to run 1: Fault prompt	1	0	★
Fn4. 24	Accumulated power-on time reaches action selection	0: Continue to run 1: Fault prompt	1	0	★
Fn4. 25	Acceleration time 1/2 switching speed point	0.00Hz～Maximum speed	0.01Hz	0.00Hz	☆
Fn4. 26	Deceleration time 1/2 switching speed point	0.00Hz～Maximum speed	0.01Hz	0.00Hz	☆
Fn4. 27	Terminal jog priority	0: Invalid 1: Valid	1	0	☆
Fn4. 28	Speed detection value (FDT2)	0.00Hz～Maximum speed	0.01Hz	50.00Hz	☆
Fn4. 29	Speed detection hysteresis value (FDT2)	0.0%～100.0% (FDT2 level)	0.1%	5.0%	☆

function code	name	range	Minimum unit	default	change
Fn4. 30	Arbitrary arrival speed detection value 1	0.00Hz~Maximum speed	0.01Hz	50.00Hz	☆
Fn4. 31	Arbitrary arrival speed detection range 1	0.0%~100.0% (Maximum speed)	0.1%	0.0%	☆
Fn4. 32	Arbitrary arrival speed detection value 2	0.00Hz~Maximum speed	0.01Hz	50.00Hz	☆
Fn4. 33	Arbitrary arrival speed detection range 2	0.0%~100.0% (Maximum speed)	0.1%	0.0%	☆
Fn4. 34	Zero current detection level	0.0%~300.0% 100.0% No output when the motor stops at rated current	0.1%	5.0%	☆
Fn4. 35	Zero current detection delay time	0.01s~600.00s	0.01s	0.10s	☆
Fn4. 36	Software overflow point	0.0% (No detection) 0.1%~300.0% (Motor rated current)	0.1%	200.0%	☆
Fn4. 37	Software overcurrent detection delay time	0.00s~600.00s	0.01s	0.00s	☆
Fn4. 38	Arbitrary current 1	0.0%~300.0% (Motor rated current)	0.1%	100.0%	☆
Fn4. 39	Arbitrary current 1 width	0.0%~300.0% (Motor rated current)	0.1%	0.0%	☆
Fn4. 40	Arbitrary	0.0%~300.0% (Motor rated	0.1%	100.0%	☆

function code	name	range	Minimum unit	default	change
	current 2	current)			
Fn4. 41	Arbitrary current 2 width	0.0%~300.0% (Motor rated current)	0.1%	0.0%	☆
Fn4. 42	reserve				
Fn4. 43	reserve				
Fn4. 44	reserve				
Fn4. 45	A I input voltage protection value lower limit	0.00V~Fn4. 46	0.01V	3.10V	☆
Fn4. 46	A I input voltage protection value upper limit	Fn4. 45~10.00V	0.01V	6.80V	☆
Fn4. 47	Module temperature reaches	0°C ~100°C	1°C	75°C	☆
Fn4. 48	reserve				
Fn4. 49	reserve				
Fn4. 50	reserve				
Fn4. 51	reserve				
Fn4. 52	reserve				
Fn4. 53	reserve				
Fn4. 54	Auxiliary speed source Y range selection when superimposed	0: relative to maximum speed 1: relative to speed source X	1	0	☆
Fn4. 55	Auxiliary speed source Y range when superimposed	0%~150%	1%	100%	☆
Fn4. 56	reserve				

function code	name	range	Minimum unit	default	change
Fn4.57	Auxiliary speed source bias selection	0	0	0	●
Fn4.58	Auxiliary speed source bias speed during superposition	0.0Hz~Maximum speed Pn2.05	0.1Hz	0.0Hz	☆
Fn4.59	Digital setting speed stop memory selection	0: Do not remember 1: Remember	1	1	★
Fn4.60	Acceleration and deceleration time unit	0: 1 second 1: 0.1 second 2: 0.01 second	1	1	★
Fn4.61	Acceleration/ deceleration time reference speed	0: Maximum speed (Pn2.05) 1: Set speed 2: 100Hz	1	0	★
Fn4.62	Speed command resolution	1: 0.1Hz 2: 0.01Hz When changing the decimal point of the speed command, please pay attention to changing the maximum speed, upper speed limit, etc.	1	1	★
Fn4.63	Speed command UP/DOWN standard during operation	0: Running speed 1: Setting speed	1	1	★

function code	name	range	Minimum unit	default	change
Fn6 A I multi-point curve parameter group					
Fn6.00	Curve 4 Minimum Input	-10.00V～Fn6.02	0.01V	0.00V	☆
Fn6.01	Curve 4 Minimum input corresponding setting	-100.0%～+100.0%	0.1%	0.0%	☆
Fn6.02	Curve 4 Inflection Point 1 Input	Fn6.00～Fn6.04	0.01V	3.00V	☆
Fn6.03	Curve 4 Inflection point 1 Input corresponding setting	-100.0%～+100.0%	0.1%	30.0%	☆
Fn6.04	Curve 4 Inflection Point 2 Input	Fn6.02～Fn6.06	0.01V	6.00V	☆
Fn6.05	Curve 4 Inflection Point 2 Input Corresponding Setting	-100.0%～+100.0%	0.1%	60.0%	☆
Fn6.06	Curve 4 Maximum Input	Fn6.06～+10.00V	0.01V	10.00V	☆
Fn6.07	Curve 4 Maximum input corresponding setting	-100.0%～+100.0%	0.1%	100.0%	☆

function code	name	range	Minimum unit	default	change
Fn6. 08	Curve 5 Minimum Input	-10. 00V~Fn6. 10	0. 01V	. 10. 00V	☆
Fn6. 09	Curve 5 Minimum input corresponding setting	-100. 0%~+100. 0%	0. 1%	. 100. 0%	☆
Fn6. 10	Curve 5 Inflection Point 1 Input	Fn6. 08~Fn6. 12	0. 01V	. 3. 00V	☆
Fn6. 11	Curve 5 Inflection point 1 Input corresponding setting	-100. 0%~+100. 0%	0. 1%	. 30. 0%	☆
Fn6. 12	Curve 5 Inflection Point 2 Input	Fn6. 10~Fn6. 14	0. 01V	3. 00V	☆
Fn6. 13	Curve 5 Inflection point 2 Input corresponding setting	-100. 0%~+100. 0%	0. 1%	30. 0%	☆
Fn6. 14	Curve 5 Maximum Input	Fn6. 12~+10. 00V	0. 01V	10. 00V	☆
Fn6. 15	Curve 5 Maximum input corresponding setting	-100. 0%~+100. 0%	0. 1%	100. 0%	☆
Fn6. 24	AI Setting Jump Point	-100. 0%~100. 0%	0. 1%	0. 0%	☆

function code	name	range	Minimum unit	default	change
Fn6.25	A I Set jump range	0.0%~100.0%	0.1%	0.5%	★
Fn9 VF control parameter group					
Fn9.00	VF curve setting	0: Straight line VF curve 1: 3-point VF curve (Fn9.03-Fn9.08 setting) 9: 10-point VF curve (Pnd group parameter setting)	1	0	★
Fn9.01	Torque boost	0.0%: (automatic) 0.1%~30.0%: (manual)	0.1%	4.0%	★
Fn9.02	Torque boost cut-off frequency	0.0Hz~Maximum frequency	0.1Hz	10.0Hz	★
Fn9.03	Three-point VF curve frequency point 1	0.0Hz~Fn9.05	0.1Hz	0.0Hz	★
Fn9.04	Three-point VF curve voltage point 1	0.0%~100.0%	0.1%	0.0%	★
Fn9.05	Three-point VF curve frequency point 2	Fn9.03~Fn9.07	0.1Hz	0.0Hz	★
Fn9.06	Three-point VF curve voltage point 2	0.0%~100.0%	0.1%	0.0%	★
Fn9.07	Three-point VF curve frequency point 3	Fn9.05~Motor rated frequency (Fn2.04)	0.1Hz	0.0Hz	★
Fn9.08	Three-point VF curve voltage point 3	0.0%~100.0%	0.1%	0.0%	★

function code	name	range	Minimum unit	default	change
Fn9. 09	Slip compensation coefficient	0.0%~200.0%	0.1%	0.0%	☆
Fn9. 10	VF overexcitation gain	0~200	1	64	☆
Fn9. 11	Oscillation suppression gain	0~100	1	Model confirmation	☆
Fn9. 12	Oscillation suppression mode selection	Units: Whether 5-stage modulation is enabled 0: Disabled 1: Enabled Tens: Whether it depends on motor parameters 0: Not dependent 1: Dependent	11	00	☆
FnA Start-Stop Control Parameter Group					
FnA. 00	Startup method	0: Direct start 1: Speed tracking restart 2: Asynchronous motor pre-excitation start	1	0	☆
FnA. 01	Speed tracking mode	0: Start from stop speed 1: Start from zero speed 2: Start from maximum speed	1	0	★
FnA. 02	Speed tracking speed	1~100	1	20	☆
FnA. 03	Startup speed	0.0Hz~100.0Hz	0.1Hz	0.0Hz	☆
FnA. 04	Start speed holding time	0.0s~100.0s	0.1s	0.0s	★

function code	name	range	Minimum unit	default	change
FnA. 05	Starting DC braking/pre-excitation current	0%~100%	1%	0%	★
FnA. 06	Start DC braking/pre-excitation time	0.0s~100.0s	0.1s	0.0s	★
FnA. 07	Acceleration and deceleration method	0: Linear acceleration/deceleration 1: S-curve acceleration/deceleration A 2: S-curve acceleration/deceleration B	1	0	★
FnA. 08	S curve start time ratio	0.0%~(100.0% FnA. 09)	0.1%	30.0%	★
FnA. 09	S curve end period time ratio	0.0%~(100.0% FnA. 08)	0.1%	30.0%	★
FnA. 10	Shutdown mode	0: deceleration stop 1: free stop	1	0	☆
FnA. 11	DC braking start speed at shutdown	0.0Hz~Maximum speed	0.1Hz	0.0Hz	☆
FnA. 12	DC braking waiting time	0.0s~100.0s	0.1s	0.0s	☆
FnA. 13	DC braking current at shutdown	0%~100%	1%	0%	☆
FnA. 14	DC braking time at shutdown	0.0s~100.0s	0.1s	0.0s	☆
FnA. 15	Braking rate	0%~100%	1%	100%	☆
FnC AI Calibration Parameters Group					
FnC. 00	A I Measured	0.500V~4.000V	0.001V	Factory	☆

function code	name	range	Minimum unit	default	change
	voltage 1			calibration	
FnC. 01	A I Sample voltage 1	0.500V~4.000V	0.001V	Factory calibration	☆
FnC. 02	A I Measured voltage 2	6.000V~9.999V	0.001V	Factory calibration	☆
FnC. 03	A I Sample voltage 2	6.000V~9.999V	0.001V	Factory calibration	☆
FnC. 04	reserve				
FnC. 05	reserve				
FnC. 06	reserve				
FnC. 07	reserve				
FnC. 08	reserve				
FnC. 09	reserve				
FnC. 10	reserve				
FnC. 11	reserve				
FnC. 12	A0 ideal voltage 1	0.500V~4.000V	0.001V	Factory calibration	☆
FnC. 13	A0 measured voltage 1	0.500V~4.000V	0.001V	Factory calibration	☆
FnC. 14	A0 ideal voltage 2	6.000V~9.999V	0.001V	Factory calibration	☆
FnC. 15	A0 measured voltage 2	6.000V~9.999V	0.001V	Factory calibration	☆

function code	name	range	Minimum unit	default	change
				on	
FnC. 16	reserve				
FnC. 17	reserve				
FnC. 18	reserve				
FnC. 19	reserve				
dn0 monitoring parameter group					
dn0. 00	Operating speed (Hz)		0. 1Hz		●
dn0. 01	Set speed (Hz)		0. 1Hz		●
dn0. 02	Bus voltage (V)		0. 1V		●
dn0. 03	Output voltage (V)		1V		●
dn0. 04	Output current (A)		0. 01A		●
dn0. 05	reserve				●
dn0. 06	Output torque (%)		0. 1%		●
dn0. 07	reserve		1		●
dn0. 08	reserve		1		●
dn0. 09	A I voltage (V)		0. 01V		●
dn0. 21	A I Voltage before correction		0. 001 V		●
dn0. 29	Encoder feedback frequency		0. 1Hz		●
dn0. 30	Main speed X display		0. 1Hz		●

function code	name	range	Minimum unit	default	change
dn0.31	Auxiliary speed Y display		0.1Hz		●
dn0.32	View the value of any memory address		1		●
dn0.33	Synchronous machine rotor position		0.0 °		●
dn0.34	Motor temperature value				●
dn0.35	Target torque (%)		0.1%		●
dn0.36	Resolver position		1		●
dn0.37	Power factor perspective		0.1 °		●
dn0.38	ABZ position				●
dn0.41	DI input status intuitive display				●
dn0.42	DO input status intuitive display				●
dn0.43	DI function status intuitive display 1				●
dn0.44	DI function status intuitive display 2				●
En0 The most recent fault record parameter group					
En0.00	The most recent fault type	0: No fault 1: Reserved 2: Acceleration overcurrent (ERR02)	—	—	●

function code	name	range	Minimum unit	default	change
		3: Deceleration overcurrent (ERR03) 4: Constant speed overcurrent (ERR04) 5: Acceleration overvoltage (ERR05) 6: Deceleration overvoltage (ERR06) 7: Constant speed overvoltage (ERR07) 8: Reserved 9: Undervoltage fault (ERR09) 10: Driver overload (ERR10) 11: Motor overload (ERR11) 12: Reserved 13: Output phase loss (ERR13) 14: Module overheating (ERR14) 15: External fault (ERR15) 16: Communication abnormality (ERR16) 17: Reserved 18: Current detection fault (ERR18) 19: Motor tuning fault (ERR19) 20: Encoder fault (ERR20) 21: Parameter read and write abnormality (ERR21) 22: Driver hardware fault (ERR22) 23: Motor short circuit to ground fault (ERR23) 24: Reserved (ERR24)			

function code	name	range	Minimum unit	default	change
		25: Reserved (ERR25) 26: Reserved (ERR26) 27: User-defined fault 1 (ERR27) 28: User-defined fault 2 (ERR28) 29: Reserved (ERR29) 30: Load loss (ERR30) 31: PID feedback loss during operation (ERR31) 40: Fast current limiting timeout fault (ERR40) 41: Motor switching fault during operation (ERR41) 42: Too large speed deviation (ERR42) 43: Motor overspeed (ERR43) 45: Motor overtemperature (ERR45) 51: Initial position error (ERR51)			
En0.01	Speed at the time of the most recent failure	—	—	—	●
En0.02	Current at the most recent fault	—	—	—	●
En0.03	Bus voltage at the time of the most recent fault	—	—	—	●
En0.04	Input terminal status at the most recent fault	—	—	—	●

function code	name	range	Minimum unit	default	change
En0.05	Output terminal status at the most recent fault	—	—	—	●
En0.06	Drive status at the time of the most recent fault	—	—	—	●
En0.07	The time of the most recent fault (starting from the current power-on)	—	—	—	●
En0.08	Time of the most recent fault (starting from operation)	—	—	—	●
En1 Previous fault record parameter group (same as En0 parameter group)					
En2 The previous two fault record parameter group (same as En0 parameter group)					
En3 The first three fault records parameter group (same as En0 parameter group)					
En4 The first four fault records parameter group (same as En0 parameter group)					

Chapter 8 Communication Instructions

DIL500 series drivers provide RS485 communication interface and support MODBUS communication protocol. Users can realize centralized control through computer or PLC, set driver operation command, modify or read function code parameters, read driver working status and fault information, etc.

8.1 Contents of the protocol

The serial communication protocol defines the information content and format used in serial communication. These include: host polling (or broadcasting) format; host encoding method, including: function code for required action, transmission data and error checking, etc. The response of the slave also adopts the same structure, including: action confirmation, return data and error checking, etc. If the slave makes an error when receiving information, or cannot complete the action required by the host, it will organize a fault message as a response to the host.

8.2 Application

The drive is connected to a "single master and multiple slaves" PC/PLC control network with RS485 bus.

8.3 Bus structure

(1) Interface mode

RS485 hardware interface

(2) Transmission mode

Asynchronous serial, half-duplex transmission mode. At the same time, only one of the host and the slave can send data and the other can only receive data. During the serial asynchronous communication process, data is sent frame by

frame in the form of messages.

(3) Topology

Single host and multiple slave system. The setting range of the slave address is 1~247, and 0 is the broadcast communication address. The slave address in the network must be unique.

8.4 Protocol Description

The DiL500 series drive communication protocol is an asynchronous serial master-slave ModBus communication protocol. Only one device (host) in the network can establish a protocol (called "query/command"). Other devices (slaves) can only respond to the host's "query/command" by providing data, or take corresponding actions according to the host's "query/command". The host here refers to a personal computer (PC), industrial control equipment or programmable logic controller (PLC), etc., and the slave refers to the drive. The host can communicate with a slave individually, and can also publish broadcast information to all lower-level slaves. For the host "query/command" accessed individually, the slave must return a message (called a response). For the broadcast information sent by the host, the slave does not need to feedback the response to the host.

8.5 Communication data structure

The ModBus protocol communication data format of the drive is as follows:

Using RTU mode, message transmission must start with a pause interval of at least 3.5 character times. This is easiest to achieve with a variety of character times at the network baud rate. The first field transmitted is the device address. The transmission characters that can be used are hexadecimal 0...9, A...F. Network devices continuously detect the network bus, including the pause interval. When the first field (address field) is received, each device decodes it to determine whether it is sent to itself. After the last transmission character, a pause of at least 3.5 character times marks the end of the message. A new message can start after this pause.

The entire message frame must be transmitted as a continuous stream. If there is a pause time of more than 1.5 character times before the frame is completed, the receiving device will refresh the incomplete message and assume that the next byte is the address field of a new message. Similarly, if a new message starts within less than 3.5 character times after the previous message, the receiving device will think it is a continuation of the previous message. This will cause an error because the value in the last CRC field cannot be correct.

RTU frame format:

START	3.5 characters time
ADR	1~247
CMD	03: Read slave parameters; 06: Write slave parameters
DATA (N-1)	
DATA (N-2)	
.....	Data content: Function code parameter address, number of function code parameters, function code parameter value, etc.
DATA0	
CRC CHK HIGH	
CRC CHK LOW	CRC
END	3.5 characters time

CMD (command instruction) and DATA (data word description)

Command code: 03H, read N words (up to 12 words can be read)

For example: the starting address F002 of the drive with slave address 01 reads 2 consecutive values

Host command information

ADR	01H
CMD	03H
Start add high	F0H
Start add low	02H
Register number high	00H
Register number low	02H
CRC CHK low	CRC CHK
CRC CHK high	

Slave response information

When the ones digit of PnA.06 is set to 0:

ADR	01H
CMD	03H
Byte number high	00H
Byte number low	04H
F002H high	00H
F002H low	00H
F003H high	00H
F003H low	01H
CRC CHK low	CRC CHK

CRC CHK high

Command code: 06H, 07H, write a word (Word), 06H command writes the function code and saves it after power off, 07H command writes the function code and does not save it after power off

For example: write 5000 (1388H) to the F203H address of the slave address 02H drive

Host command information

ADR	02H
CMD	06H
Data addr high	F2H
Data addr low	03H
Data content high	13H
Data content low	88H
CRC CHK low	CRC CHK
CRC CHK high	

Slave response information

ADR	02H
CMD	06H
Data addr high	F2H
Data addr low	03H
Data content high	13H
Data content low	88H
CRC CHK low	CRC CHK
CRC CHK high	

Verification method——CRC verification method : CRC(Cyclical Redundancy Check)

Using the RTU frame format, the message includes an error detection field based on the CRC method. The CRC field detects the content of the entire message. The CRC field is two bytes, containing a 16-bit binary value. It is calculated by the transmitting device and added to the message. The receiving device recalculates the CRC of the received message and compares it with the value in the received CRC field. If the two CRC values are not equal, it means that there is an error in the transmission.

The CRC is first stored in 0xFFFF, and then a process is called to process the consecutive 8-bit bytes in the message with the value in the current register. Only the 8-bit data in each character is valid for CRC, and the start bit, stop bit and parity bit are invalid.

During the CRC generation process, each 8-bit character is individually XORed with the register content, and the result is moved towards the least significant bit, and the most significant bit is filled with 0. The LSB is extracted for detection. If the LSB is 1, the register is individually XORed with the preset value. If the LSB is 0, it is not performed. The whole process is repeated 8 times. After the last bit (the 8th bit) is completed, the next 8-bit byte is individually XORed with the current value of the register. The final value in the register is the CRC value after all bytes in the message are executed.

When CRC is added to the message, the low byte is added first, then the high byte. The CRC simple function is as follows:

```
unsigned int crc_chk_value(unsigned char *data_value,unsigned char length)

{
    unsigned int crc_value=0xFFFF;
    int i;
    while(length--)
    {
        crc_value^=*data_value++;
        for(i=0;i<8;i++)
        {
            if(crc_value&0x0001)
            {
                crc_value=(crc_value>>1)^0xa001;
            }
            else
            {
                crc_value=crc_value>>1;
            }
        }
    }
    return(crc_value);
}
```

Address definition of communication parameters

This part is the content of communication, which is used to control the operation of the drive, the state of the drive and the setting of related parameters.

Read and write function code parameters (some function codes cannot be changed and are only for manufacturers) :

Function code parameter address marking rules:

Use function code group number and label as parameter address representation rules:

High bytes: F0~FF(Pn 组)、A0~AF(Fn 组)、70~7F(U 组) 、D0~D1(dn 组) 、E0~E4(En 组)

Low bytes: 00~FF

exp: Pn2.16, The address is represented by F210;

Notice:

PnF group: parameters cannot be read or changed; some parameters cannot be changed when the drive is in operation; some parameters cannot be changed regardless of the state of the drive; when changing function code parameters, pay attention to the parameter range, unit, and related instructions.

In addition, since EEPROM is frequently stored, it will reduce the service life of EEPROM. Therefore, some function codes do not need to be stored in communication mode, and only the value in RAM can be changed.

If it is a Pn group parameter, to implement this function, just change the high F of the function code address to 0.

The corresponding function code address is expressed as follows:

High byte: 00~0F

Low byte: 00~FF

For example: Function code Pn2.16 is not stored in EEPROM, and the address is expressed as 0210;

This address indicates that it can only write to RAM, not read, and it is an invalid address when reading.

For all parameters, command code 07H can also be used to implement this function.

Stop/Run parameters section:

Parameter address	Parameter Description
1000	Communication setting value (-10000~10000) (decimal)
1001	Operating frequency
1002	Bus voltage
1004	Output Current
1009	D0 output flag

Note: The communication setting value is a percentage of the relative value, 10000 corresponds to 100.00%, -10000 corresponds to -100.00%.

For frequency dimension data, the percentage is the percentage relative to the maximum frequency (Pn2.05);

Control command input to the drive: (write only)

Cmd address	Function
2000	0001: CW operation
	0002: CCW operation
	0003: cw jog

	0004: CCW jog
	0005: free stop
	0006: Deceleration stop
	0007: Fault reset

Read drive status: (read only)

Status word address	Status word function
3000	0001: CW RUN
	0002: CCW
	0003: STOP

Drive fault description::

Drive fault address	Drive fault information
8000	0000: No fault 0001: reserve 0002: Accelerating overcurrent 0003: Deceleration overcurrent 0004: Constant speed overcurrent 0005: Accelerating overvoltage 0006: Overvoltage during deceleration 0007: Overvoltage during constant speed 0009: Undervoltage fault 000A: Driver overload 000B: Motor overload 000D: Output phase loss 000E: Overheat

	000F: External fault 0010: Communication abnormality 0012: Current detection fault 0015: Parameter read and write abnormality 0016: Driver hardware fault 0017: Motor short circuit to ground fault 001B: User-defined fault 1 001C: User-defined fault 2 0028: Fast current limiting timeout fault 0029: Motor switching fault during operation 002A: Too large speed deviation 002B: Motor overspeed 002D: Motor overtemperature
--	--

Communication fault information description data (fault code) :

Communication fault address	Fault Function Description
8001	0000: No fault 0001: Password error 0002: Command code error 0003: CRC check error 0004: Invalid address 0005: Invalid parameter 0006: Parameter change is invalid 0007: System locked 0008: EEPROM operation in progress

PnA 组通讯参数说明

PnA. 00	Communication type		default	0
	range	0	485	
		1	rev	
		2	Rev	
		3	Rev	

	4	rev
--	---	-----

PnA. 01	Baud rate	default	6005
	range	个位: MODBUS 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS	
		Tens: Reserved	
		Hundreds place: Reserved	
		Thousands: Reserved	

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

PnA. 02	Data Format	default	0
	range	0	No check: data format <8,N,2>
		1	Even check: data format <8,E,1>
		2	Odd parity: data format <8,0,1>
		3	No check: data format <8-N-1>

The data format set by the host computer and the driver must be consistent, otherwise, communication cannot be carried out.

PnA. 03	Local address		default	1
	range	1~247, 0 is the broadcast address		

When the local address is set to 0, it is the broadcast address, which realizes the host computer broadcast function.

The local address is unique (except for the broadcast address), which is the basis for realizing point-to-point communication between the host computer and the driver.。

PnA. 04	Response delay		defaule	2ms
	range	0~20ms		

Response delay: refers to the interval between the end of driver data reception and the sending of data to the upper computer. If the response delay is less than the system processing time, the response delay is based on the system processing time. If the response delay is longer than the system processing time, the system will wait after processing the data until the response delay time is up before sending data to the upper computer.

PnA. 05	Communication timeout		default	0.0 s
	range	0.0 s (invalid), 0.1~60.0s		

When this function code is set to 0.0 s, the communication timeout parameter is invalid.

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

PnA. 06	Data transfer format selection		default	01
	range	Units: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol		
		Tens: reserved		

PnA.06=01: Select the standard MODBUS protocol.

PnA.06=00: When reading a command, the slave returns one more byte than the standard MODBUS protocol. For details, refer to the "5 Communication Data Structure" section of this protocol.