Operation Manual

BLFOC Low Voltage

Ver: 2023.12

safety precautions

The following symbols are used in this instruction manual for safety-related contents. Please be sure to observe the safety marking instructions, which are the main contents.

Danger **Indicates that when used incorrectly, it will cause danger and result in injury or death.**

Attention **Indicates that when used incorrectly, it will create a hazard, resulting in personal injury and possible damage to the equipment.**

Prohibition **Indicates behavior that is strictly prohibited and may result in damage to the equipment or render it inoperable.**

1. Occasions for use

Danger

- It is prohibited to use the product in flammable and explosive places, which may cause injury or fire.
- It is prohibited to use the product in places with high humidity, direct sunlight, dust, salt and metal powder.

2. Wiring

Danger

- Different drives or motors have different power requirements, please follow the nameplate of the drive or motor to access the appropriate power
- The DC input must be differentiated between positive and negative polarity of the power supply, otherwise it may cause damage to the motor or fire.
- When connecting the drive control terminals, please follow the port definition in the manual to connect the wires correctly, otherwise it may cause damage to the motor driver or malfunction and lead to accidents.
- Do not connect the manufacturer's program update port to any cable, as this may cause damage to the driver or motor chip.

3. Operation

Attention

- Before starting operation, make sure that you can stop the machine at any time in case of an accident.
- Separate the servo motor from the machine during test operation. Confirm the movement before mounting the motor on the machine. Make sure that the power input to the driver is stable before operation, otherwise the driver may be abnormally driven.
- Do not turn the power on and off too often, as this may cause the drive to overheat internally.

4. Running

Prohibition

- When the equipment is in operation, it is forbidden to touch any of the rotating parts, otherwise it may cause injury or death.
- When the equipment is running, it is forbidden to touch the drive and motor at will, otherwise it will cause electric shock or burns.
- When the equipment is running, it is prohibited to drag the motor cable, otherwise the motor will be abnormal.

5. inspection and maintenance

Prohibition

- It is prohibited to disassemble the drive or motor for repair by yourself.
- Violent assembly of the motor is prohibited, otherwise the motor will be damaged.
- Do not touch the driver or the inside of the motor as this may cause electric shock. It is prohibited to carry out wiring, maintenance and repair operations under the energized state.

Catalog

Chapter I. Product Introduction

1.1-Servo drive technical specifications

First of all, thank you for using our BLFOC low voltage series products!

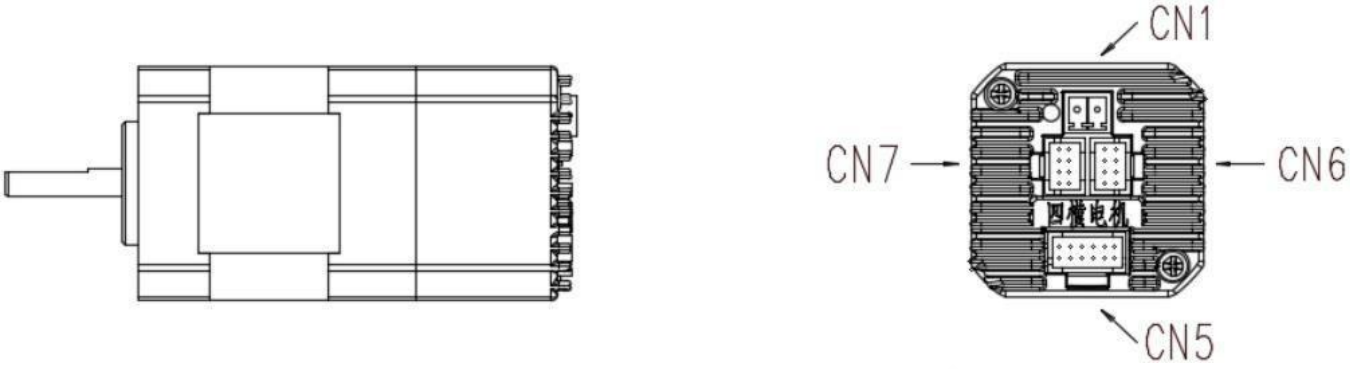
BLFOC series is a high-performance, low-energy consumption motor product independently developed by our company according to the market orientation, which has excellent performance in the automation field of medical equipment, precision instruments, food packaging, 3C assembly, etc., and helps the automation industry to develop intelligently.

The main advantages of this is reflected in the strong stability, high positioning accuracy, fast motor response, overload capacity, and low noise, low heat, fine structure, practical and rich functionality, simple and convenient application. Specific technical specifications see the following table ↓

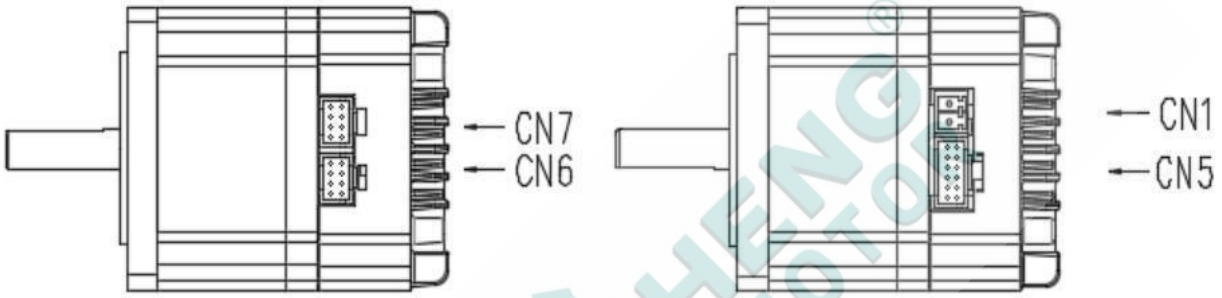
Input power		The permissible input voltage varies with different models of BLFOC series motor drives, please refer to the motor drive specifications for details. If the product is used with DC power input, pay attention to the positive and negative polarity of the power supply.
the environment in which it is used	Temperature	Working:0℃~55℃ Storage:-20℃~+80℃
	Humidity	Less than 90% (no condensation)
control methods		① Speed control ② torque control ③ position control ④Communication control
control characteristics		Speed frequency response:≥200Hz
		Speed Fluctuation Rate:<±0.03(Load 0~100%):<±0.02×(0.9~1.1)Supply Voltage
		Received pulse frequency ≤100kHz
control inputs		01、Servo enable;02、Alarm clear;03、Multi-segment enable;04、Multi-segment select 1;05、Multi-segment select 2. 06, Forward overtravel; 07, Reverse overtravel; 08, Positive rotation point movement;. 09. Reverse point movement. 10. Home switch 11、Home enable;12、Emergency stop;13、Pulse prohibit. 14. Positional deviation removal; and
control outputs		01, servo ready for output ;) 02. Position the finished output; 03. Fault alarm output 04、Home confirmation return to zero output; 05、Electrical confirmation return to zero output; 06、Torque arrival output. 07. Speed to reach the output.
position control		Pulse mode: Pulse + direction; A + B orthogonal pulse; Double pulse (CW/CCW) The default electronic gear ratio is 131072 : 1000, i.e. 1000 pulses per revolution Maximum pulse reception frequency <= 100KHZ
		Internal 4 position mode: 1, single cycle operation; 2, automatic cycle operation; 3, multi-segment DI switching operation
		Communication control mode:RS485+ Modbus_Rtu control corresponding to the address of the communication location
Speed control		Internal 4 speed modes: 1, single-cycle operation; 2, auto-cycle operation; 3, multi-speed DI switching operation
		Communication control mode:RS485+ Modbus_RTU control corresponding to the communication speed address
torque control		Communication control mode:RS485+ Modbus_RTU control corresponding to the communication torque address
acceleration and deceleration functions		Acceleration/deceleration time:1~65535 ms(0 r/min ~ 1000 r/min)
monitoring function		Current speed, DI input, DO output, current position, command input pulse accumulation, average load factor, position deviation count, Motor phase current, bus voltage value, module temperature, alarm record, command pulse frequency corresponding to rotational speed, operating status, etc
protection functions		Main power over-voltage and under-voltage, overspeed, over-current, overload, encoder abnormality, position over-difference, blocking, parameter abnormality, etc
Return-to-origin function		13 ways to autonomously (search) back to the home position, as well as a home position offset function.
RS485 Function		Follows standard Modbus-RTU protocol One-part-two communication interface, convenient for networking and parallel connection
Gain adjustment		manual adjustment internal rigidity scale adjustments

1.2-Low Voltage DC One-Piece Series Motor Hardware Interfaces

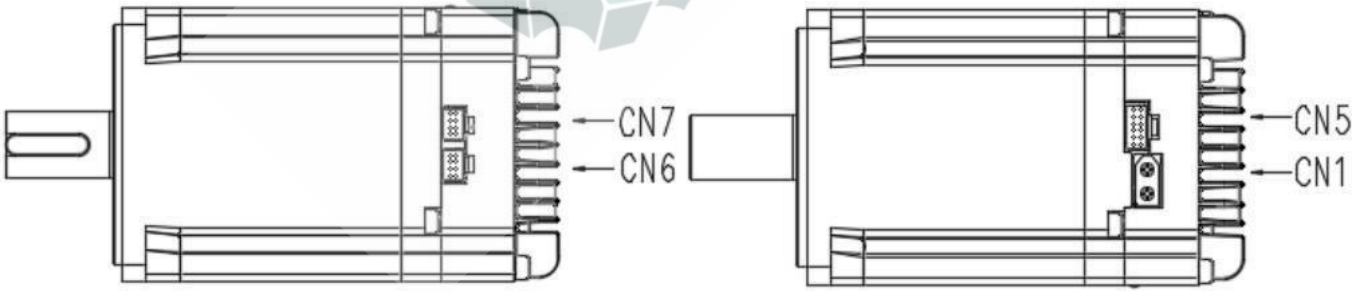
1) All-in-one Model:MD42 Terminal Interface Diagram



2) All-in-one Model:MD57, MD60 Terminal Interface Diagram



3) All-in-one Model:MD80, MD86 Terminal Interface Diagram



Note: Products are being updated continuously, please check the official website of our company for the models not included in this manual.

- Low-voltage DC one-piece interface definition that

MD42
MD57

CN1

Terminal number	name	Function	
1	GND	DC power ground	Voltage DC 24-36V, depending on the actual motor voltage;
2	DC+	DC power supply positive pole	

MD60

CN1

Terminal number	name	Function	
1	GND	DC power supply ground	voltage DC24-48V, depending on the actual motor voltage;
2	DC+	DC power supply positive pole	

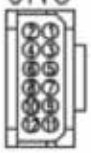
MD80
MD86

CN1

Terminal number	name	Function	
1	GND	DC power ground	Voltage: DC 36-60V, depending on the actual motor voltage;
2	DC+	DC power supply positive pole	

Universal

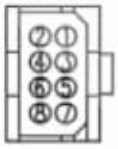
CN5



Terminal number	name	Function	
1	DO1+	REDY servo is ready by default at the factory	
2	DO1-		
3	DO2+	Factory default ALM alarm fault output	
4	DO2-		
8	DI1		
5	DI2	Factory default ALM-R alarm fault reset	
6	DI3	Factory default E-STOP external emergency stop	
7	DIC	The common terminal of the input terminal should be connected to DC 12~24V (common anode NPN connection) or 0V (common cathode PNP connection), with a current of 100mA.	
9	YOU+		DC5-24V Adaptive
10	YOU-		
11	PULSE+		
12	PULSE-		

Universal

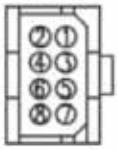
CN6



Terminal number	name	Function
1	485A/T	485 communication terminal
2	NC	reserved
3	485B/T	485 Communication Negative End
4	NC	reserved
5	GND	communication public area
6	NC	reserved
7	NC	reserved
8	NC	reserved

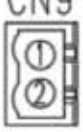
Universal

CN7



MD80
MD86

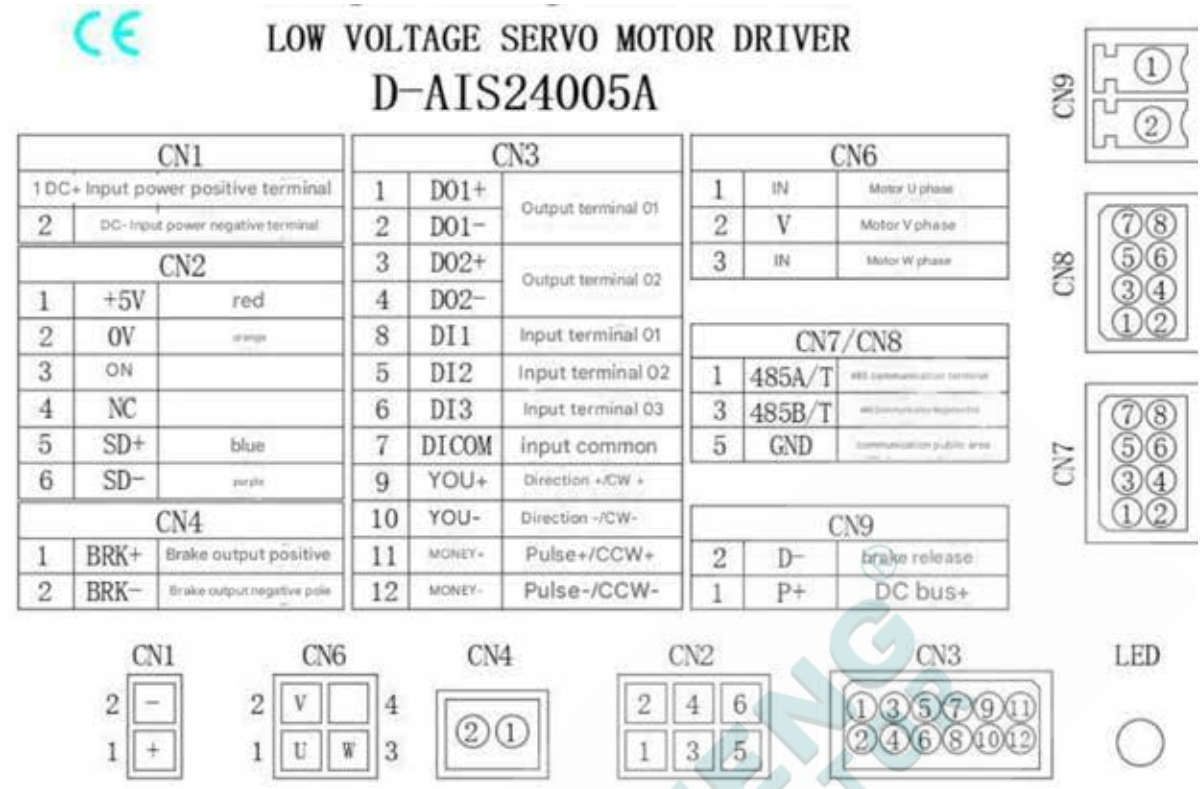
CN9



Terminal number	name	Function	
1	D-	brake release	Connect brake bleeder resistor
2	P+	DC bus	

1.3-Low Voltage DC Brushless Split Drive Hardware Interface

1) Driver Model:BLFOC-4815A Terminal Interface Diagram

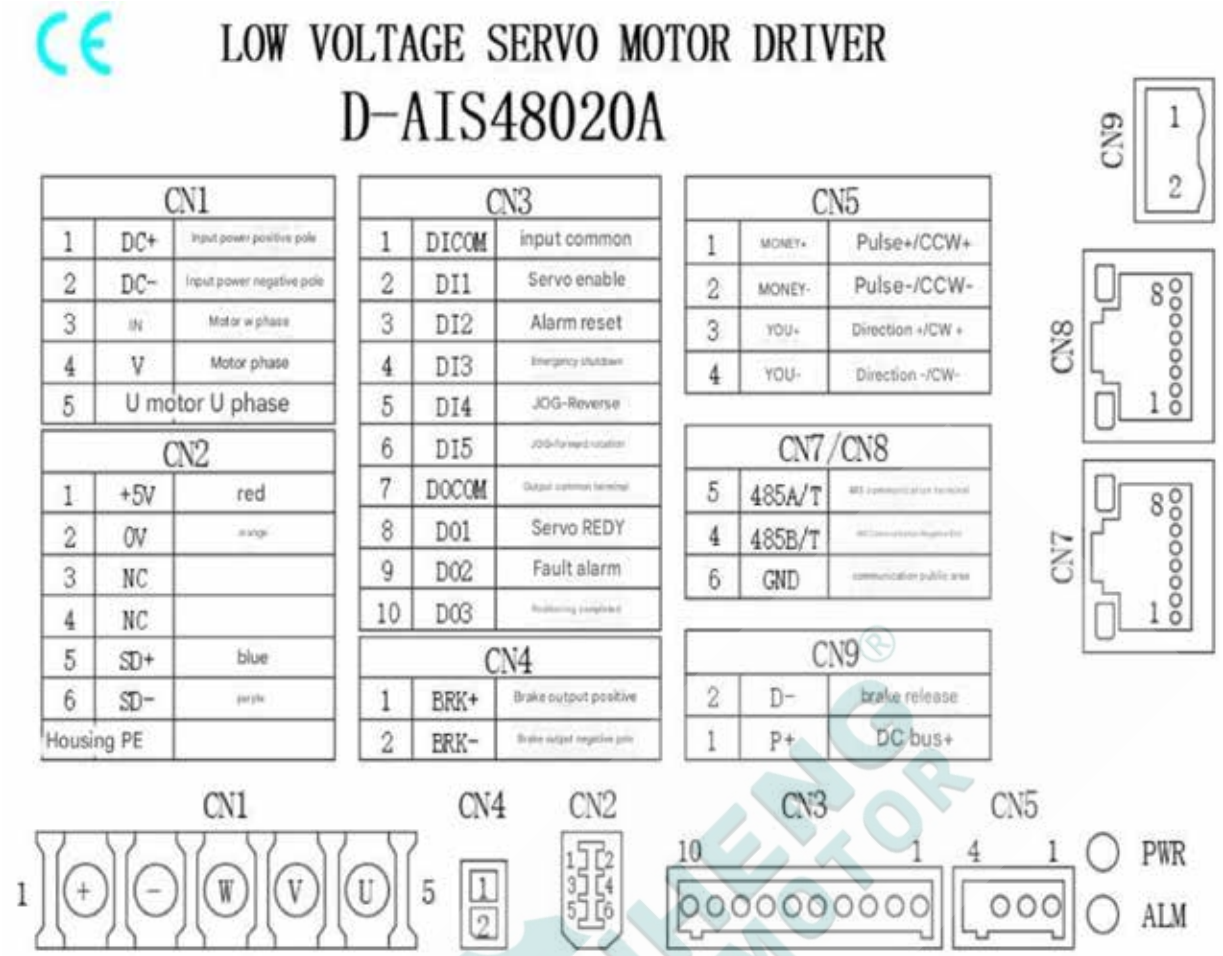


- DI/DO Low Voltage DC Split Interface Factory Default Definition

Input terminals	terminal serial number	Functional Description	function symbols
DI_COM	CN3/7	Input Common	COM
DI1	CN3/8	Servo Enable	SON
DI2	CN3/5	Alarm reset	ALM_RST
DI3	CN3/6	Emergency shutdown	E_STOP

Output terminals	terminal serial number	Functional Description	function symbols
DO1+	CN3/1	Servo ready	READY
DO1-	CN3/2		
DO2+	CN3/3	Fault Alarm Output	ALM
DO2-	CN3/4		

2) Drive Model:D-AISXX010A/D-AISXX020A/D-AISXX030A/D-AISXX040A//D-AISXX060A terminal interface diagram



- DI/DO Low Voltage DC Split Interface Factory Default Definition

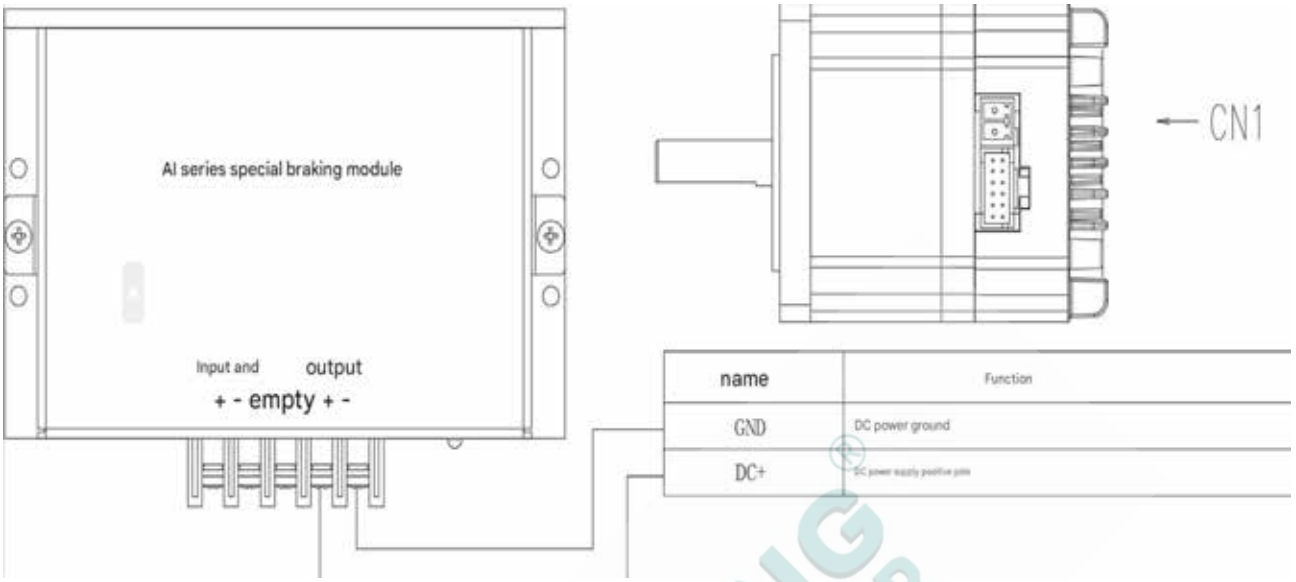
Input terminals	terminal serial number	Functional Description	function symbols
DI_COM	CN3/1	Input Common	COM
DI1	CN3/2	Servo Enable	SON
DI2	CN3/3	Alarm reset	ALM_RST
DI3	CN3/4	Emergency shutdown	E_STOP
DI4	CN3/5	Positive rotation at the point	JOG+
DI5	CN3/6	Tap to reverse	JOG-

Output terminals	terminal serial number	Functional Description	function symbols
DO_COM	CN3/7	Output Common	COM
DO1	CN3/8	Servo ready	READY
DO2	CN3/9	Alarm output	ALM
DO3	CN3/10	Positioning complete	COIN

1.4-Low-voltage DC motor-driven brake release

- Specialized brake modules

Integrated series motors do not have an external braking relief resistor interface, when the load inertia is large, it is recommended to purchase our AIS special braking module to ensure the quality of the bus voltage. The external DC power supply is connected to the input +- port of the braking module, and the output +- port of the module is connected to the power supply interface of the motor.



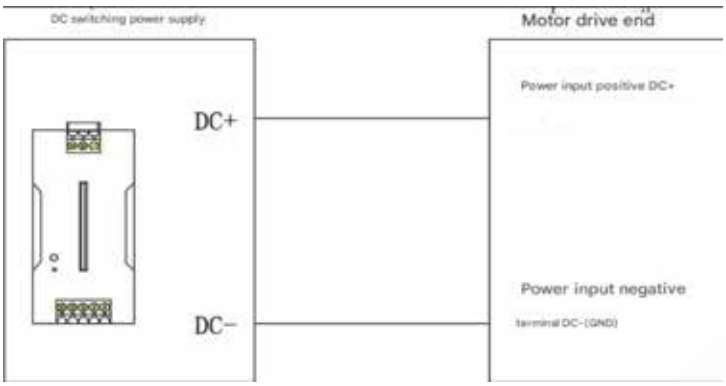
- Low Voltage DC External Brake Relief Resistor

Split Drive CN9 Interface Drain Braking Resistor Selection Specification Reference Table

Split drive models that	Rated output current	External Braking Resistor Resistance Requirements	External braking resistor power
D-AIS24005A	05A	10 ohm-20 ohm range	Greater than 100W
D-AIS48010A	10A	10 ohm-20 ohm range	Greater than 100W
D-AIS48020A	20A	05 ohm - 10 ohm range	Greater than 200W
D-AIS48040A	40A	05 ohm - 10 ohm range	Greater than 200W
D-AIS48060A	60A	05 ohm - 10 ohm range	Greater than 200W

Chapter II Standard Wiring Diagrams

2.1 - DC Product Power Supply Wiring

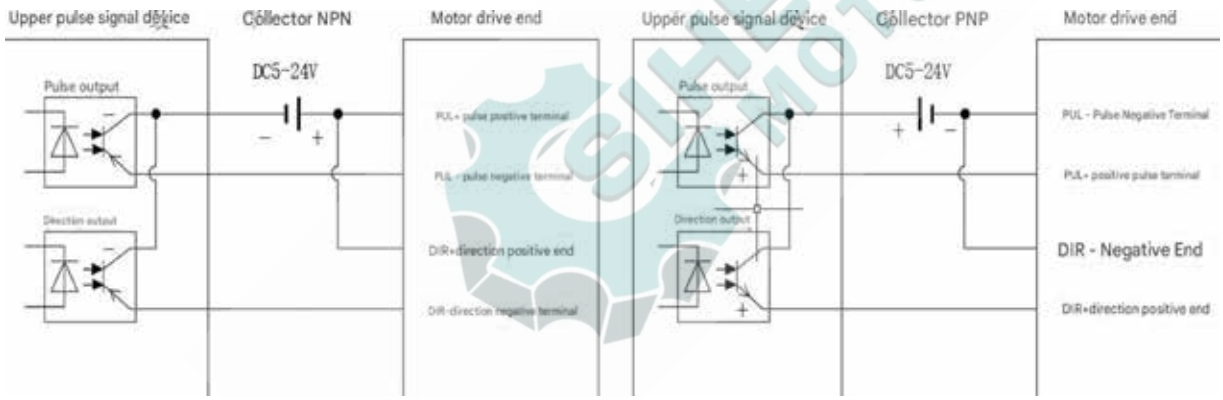


Note 1: Power input terminals are strictly differentiated between positive and negative poles, the input voltage range of different models may not be the same, please refer to the previous section on the corresponding model hardware interface reference wiring.

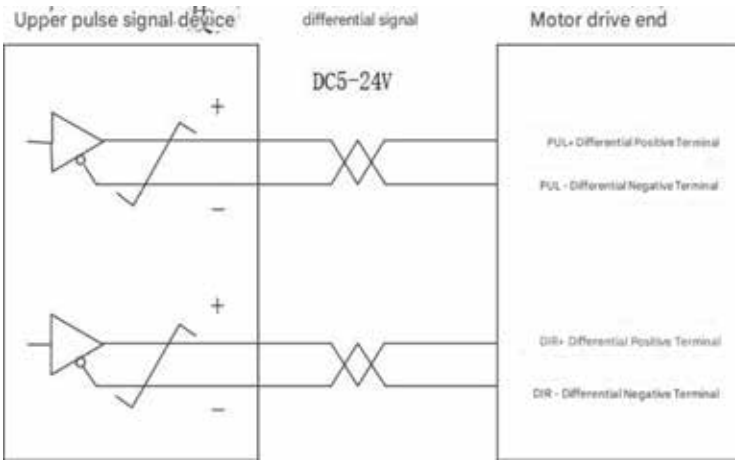
Note 2: This product has a certain overload capacity, elected to match the external DC switching power supply power supply should be greater than the rated current of the product 1.5 times the output capacity. The rated current of the product is marked on the nameplate.

2.2-High-Speed Pulse Signal Wiring

- open collector wiring



- Differential signal wiring



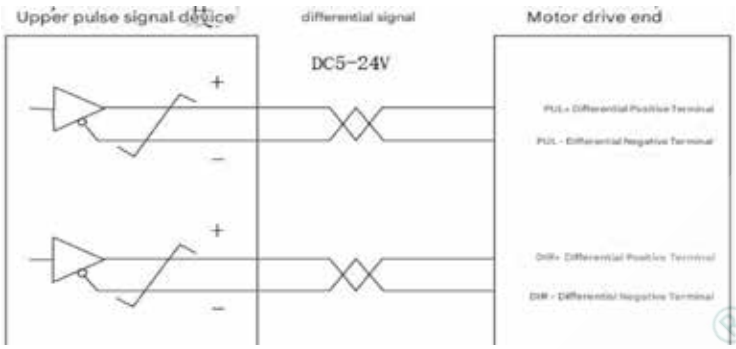
Note 1: For different motor drives, the location of the pulse input terminals may not be the same, please refer to the description of the hardware interface of the corresponding model in the previous section.
Note 2: This product supports 5-24V wide voltage pulse input, the maximum receiving pulse frequency is 100KHZ, the upper pulse device note that the control frequency is limited to 100K.

Otherwise, the driver will easily lose pulses, resulting in abnormal positioning.

Note 3: It is recommended to use twisted shielded wire for the pulse control line, and do not lay in the same line with strong interference, which can effectively shield the external strong magnetic interference; Note 4: The above pulse wiring should be consistent with the parameters of the H05-15, H05-15 factory default pulse + direction of the command form.

2.3-DI and DO Signal Wiring

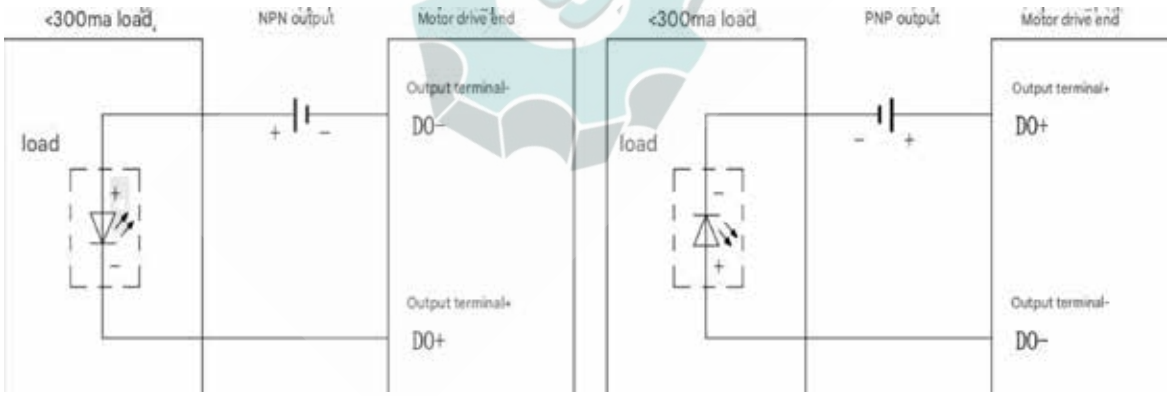
- DI input terminal wiring



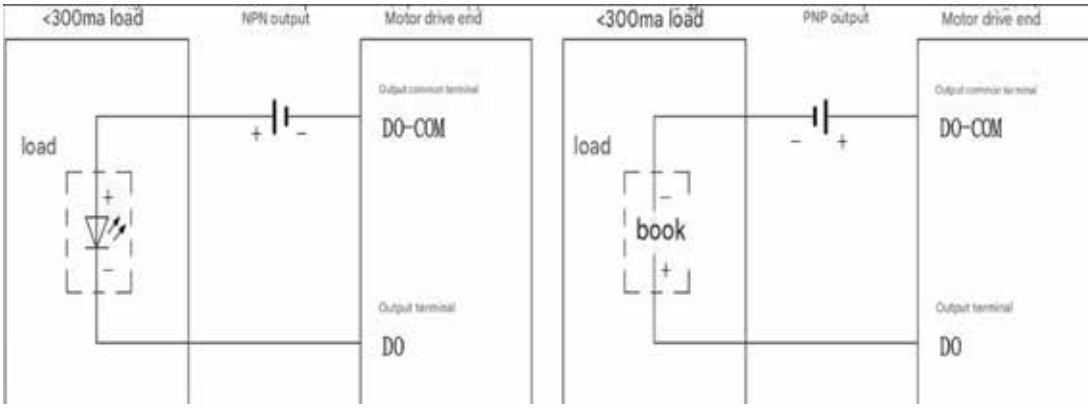
Note 1: Input terminal voltage receiving range DC12-24V, too high voltage may cause internal optocoupler isolation damage.
Note 2: Each DI can be freely assigned to a different function (refer to section 4.3 DIDO Parameters), but it is not possible to assign more than one DI to the same function.
Note 3: Select NPN type connection for low level output when controlling DI port operation; select PNP type connection for high level output when controlling DI port operation; Note 4: The signal width of input terminal should be >5ms, otherwise it will be regarded as invalid signal.

- DO Output Terminal Wiring

1、MD series one-piece



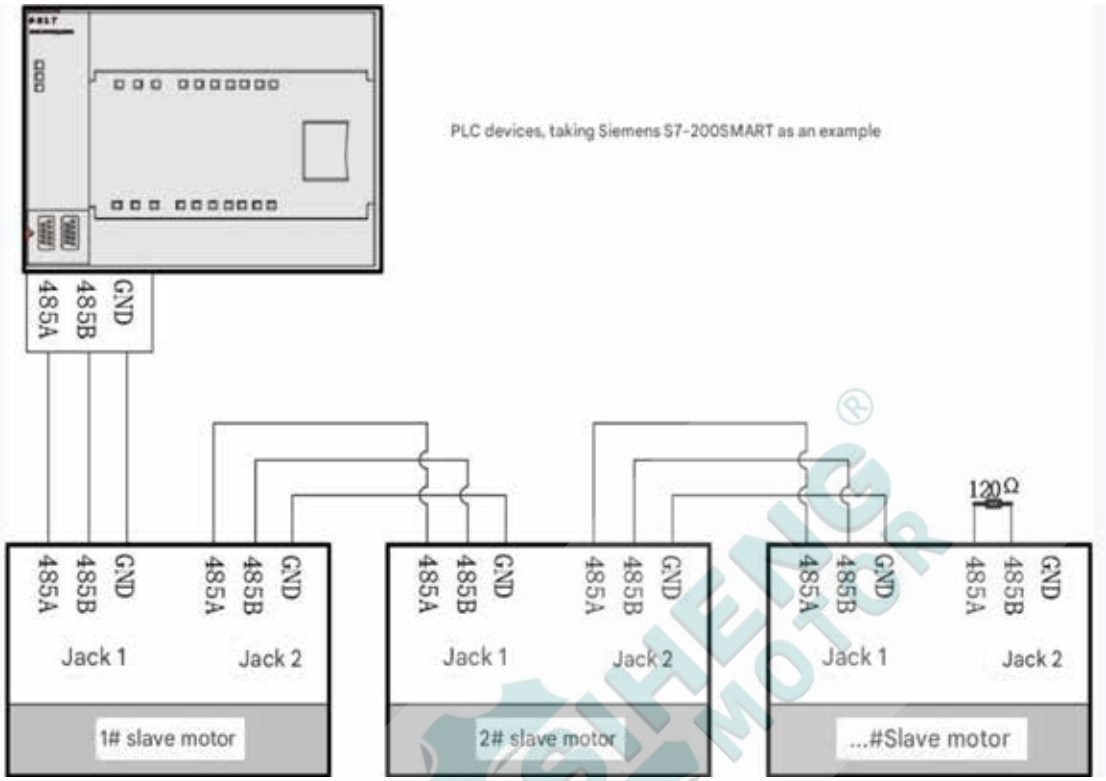
2、D Series Split Drive



Note 1: The maximum driving capacity of the output terminals is <300ma, if large loads are to be driven, please use an intermediate relay. Note 2: Each DO can be freely assigned to a different function (see section 4.3 DIDO parameters).
Note 3: Select NPN type connection for low level output when the control DO port operates; select PNP type connection for high level output when the control DO port operates.

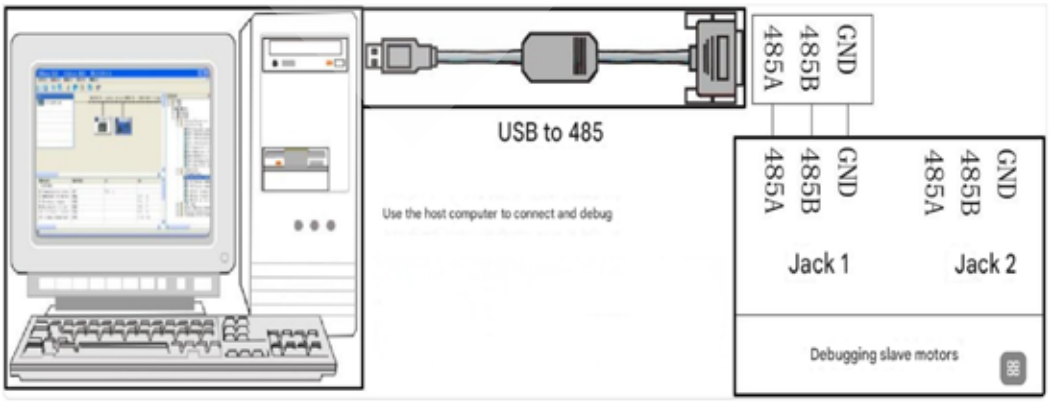
2.4-RS485 Communication Wiring

- Multi-slave connections



Note 1: For multi-slave connection, if the communication signal is noisy, it is recommended to add a 120-ohm terminating resistor on the last slave to ensure the communication quality; Note 2: Communication-related reading (Chapter 4.9 RS485 related parameters)

- The OP debugging connection



Note 1: Usually there is no direct 485 interface on the computer, you need to convert USB to 485 to connect the slave motor driver. Note 2: We can download the PC debugging software from our website, which is convenient for users to debug.

Chapter III. Control flow charts

3.1-Control Flowchart

The system is set up in a tree structure, expanding branches step by step, please refer to the following table for the design when applying the product; the system structure is from left to right →>

<table>
<tr><td rowspan="6">control mode selection
H02_00</td><td rowspan="3">=0
Speed control</td><td rowspan="3">Speed command selection
H06_02 (Option)
↓
H06-00 (primary)
H06-01 (secondary)</td><td>Command source = 0 Sourced from internal parameters</td><td colspan="2">H06_03 Setting speed
DI association SON enable control start/stop</td></tr>
<tr><td rowspan="2">Source of instruction = 5
Sourced from internal multiband speeds</td><td rowspan="2">H12_00 Multi-speed operation mode selection</td><td>=0
single-cycle operation</td></tr>
<tr><td>=1
The cycle is running</td></tr>
<tr><td>JOG Speed Control</td><td colspan="2">H06_04 Setting speed
DI association JOGCMD±pointing operation</td></tr>
<tr><td rowspan="5">=1
position control</td><td rowspan="5">position command selection
H05_00</td><td rowspan="3">=0
originating from pulse control</td><td rowspan="3">H05_15
Pulse command pattern selection</td><td>=0
pulse+direction positive logic</td></tr>
<tr><td>=1
pulse+direction negative logic</td></tr>
<tr><td>=2
AB Phase Pulse</td></tr>
<tr><td rowspan="2">=2
derived from multi-segment control</td><td rowspan="2">H11_00
Multi-segment operation mode selection</td><td>=3
CW/CCW Double Pulse</td></tr>
<tr><td>=0
single-cycle operation</td></tr>
<tr><td>=1
The cycle is running</td></tr>
<tr><td>=2
torque control</td><td>torque command selection
H07_02 (selection)
↓
H07-00 (primary)
H07-01 (secondary)</td><td>Command source = 0 derived from internal parameters</td><td colspan="2">H07_03 Setting torque; H07_19 Setting forward max. speed; H07_20 Setting reverse max. speed
DI association SON enable control start/stop</td></tr>
</table>

Chapter IV. Parametric Functions

Parameter Notes:

- In the parameter list "Applicable modes" P for position mode, S for speed mode, T for torque mode.
- Some parameters need to disable the motor to change, or need to be restarted after changing, please pay attention to the "modification mode" and "effective mode" in the parameter table.
- For communication access or control parameters, please note the "Data type" and "Parameter setting range" in the parameter table.

4.1-Drive motor parameters (H00~H01)

H00_00	Functional Description	Motor no		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	-
	parameter range	0	1073741824	mode of entry into force	Power failure and reboot	applying the model	P/S/T	data type	UInt32
Manufacturer's parameter, the manufacturer's number is different for different motors, it needs the manufacturer's authority to modify, the user should not modify it.									

H00_08	Functional Description	Motor encoder zero state		Modify the way in which	Display	factory value	manufacturer's registration	Unit	-
	parameter range	0	1	mode of entry into force	-	applying the model	P/S/T	data type	Uint16
Manufacturer's parameters, motor encoder assembly zeroing use, display parameters can not be changed.									

H00_11	Functional Description	motor rated current		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	0.01A
	parameter range	0	65535	mode of entry into force	Power failure and reboot	applying the model	P/S/T	data type	Uint16
Manufacturer's parameters, the rated current of different motors is different, need the manufacturer's authority to modify, the user should not modify.									

H00_14	Functional Description	motor rated speed		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	rpm
	parameter range	0	6000	mode of entry into force	Power failure and reboot	applying the model	P/S/T	data type	Uint16
Manufacturer's parameters, the rated speed of different motors is different, need the manufacturer's permission to modify, the user should not modify.									

H00_15	Functional Description	Maximum motor speed		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	rpm
	parameter range	0	6000	mode of entry into force	Power failure and reboot	applying the model	P/S/T	data type	Uint16
Manufacturer's parameter, the maximum speed of different motors is different, need the manufacturer's authority to modify, the user should not modify; this parameter as the maximum speed of the motor limit, and the highest priority.									

H00_28	Functional Description	motor encoder offset		Modify the way in which	Display	factory value	manufacturer's registration	Unit	-
	parameter range	0	999999999	mode of entry into force	-	applying the model	P/S/T	data type	Uint32
Manufacturer's parameters for zeroing the motor encoder, cannot be changed by the user.									

H00_43	Functional Description	Maximum motor current		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	0.01A
	parameter range	0	65535	mode of entry into force	Power failure and reboot	applying the model	P/S/T	data type	Uint16
Manufacturer's parameters, different motors can accept different maximum current, set an illegal value will lead to motor heating or damage, need the manufacturer's permission to modify, the user should not modify. Limit current output = limit torque output; this parameter is valid with H07_09/H07_10 and manufacturer's parameter H01_03 as the maximum current output limit of the actual motor, whichever is lower.									

H01_00	Functional Description	MCU Software Version Number		Modify the way in which	Display	factory value	-	Unit	-
	parameter range	0	65535	mode of entry into force	-	applying the model	P/S/T	data type	Uint16
Manufacturer's parameters, software version number; display parameters cannot be changed.									
H01_02	Functional Description	drive letter		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	-

	parameter range	0	65535	mode of entry into force	Power failure and reboot	applying the model	P/S/T	data type	Uint16
Manufacturer's parameter, the manufacturer's number of different drives is different, you need the manufacturer's authority to modify, the user should not modify.									

H01_03	Functional Description	Maximum drive current		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	0.01A
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Manufacturer's parameters, different drives can output different maximum current, set an illegal value will lead to motor heating or damage, need the manufacturer's permission to modify, the user should not modify. Limit current output = Limit torque output; this parameter is the same as H07_09/H07_10 and the manufacturer's parameter H00_43, as the maximum current output limit of the actual motor, take the lower valid one.									

H01_05	Functional Description	driver current sampling resistor		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	mΩ
	parameter range	5	65535	mode of entry into force	Powering up again	applying the model	P/S/T	data type	Uint16
Manufacturer's parameters, the current sampling resistance of different drivers is different, need the manufacturer's permission to modify, the user should not modify.									

H01_06	Functional Description	driver current amplifier input resistance		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	Ω
	parameter range	500	65535	mode of entry into force	Powering up again	applying the model	P/S/T	data type	Uint16
Manufacturer's parameters, the current amplifier input resistance of different drivers is different, need the manufacturer's permission to modify, the user should not modify.									

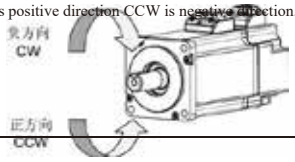
H01_07	Functional Description	driver current amplifier feedback resistor		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	Ω
	parameter range	500	65535	mode of entry into force	Powering up again	applying the model	P/S/T	data type	Uint16
Manufacturer's parameter, the feedback resistance of current amplifier is different for different drivers, it needs manufacturer's authority to modify, users should not modify it.									

H01_08	Functional Description	drive temperature alarm threshold		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	C°
	parameter range	40	100	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Manufacturer's parameter, as the drive overheating protection threshold, requires manufacturer's authority to modify, the user should not modify. If the set value is exceeded, the motor overheating fault alarm ER.650 will occur.									

H01_09	Functional Description	drive bus voltage attenuation factor		Modify the way in which	Enable Disconnect	factory value	manufacturer's registration	Unit	-
	parameter range	10	65535	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Manufacturer's parameters, need manufacturer's permission to modify, the user should not modify.									

4.2 - Basic control parameters (H02)

H02_00	Functional Description	control mode selection		Modify the way in which	Enable Disconnect	factory value	1	Unit	-
	parameter range	0	6	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: Speed mode (refer to subsection 4.5/Speed control parameters). Setting 1: Position mode (refer to section 4.4 Position control parameters); Setting 2: Torque mode (refer to section 4.6 Torque control parameters); Setting 3: Position mode (refer to section 4.4 Position control parameters); Setting 4: Torque mode (refer to section 4.6 Torque control parameters); Setting 5: Torque mode (refer to section 4.6 Torque control parameters).									

H02_02	Functional Description	rotation direction selection		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	Power failure and reboot	applying the model	P/S/T	data type	Uint16
Set 0: CCW is positive direction CW is negative direction; Set 1: CW is positive direction CCW is negative direction. 									

H02_05	Functional Description	Enable OFF Stopping mode selection		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	2	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: free stop, keep free state after stopping; set 1: zero speed stop, keep free state after stopping; set 1: zero speed stop, keep free state after stopping; set 0: free stop, keep free state after stopping; set 1: zero speed stop, keep free state after stopping. Set 2: Zero-speed shutdown, DB state after shutdown (damping state after OFF is enabled, recommended for vertical loads); Set 2: Zero-speed shutdown, DB state after shutdown (damping state after OFF is enabled, recommended for vertical loads).									

H02_30	Functional Description	user passwords		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
The user password is set to operate only when the manufacturer modifies special parameters.									

H02_31	Functional Description	initialization of system parameters		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	5	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: no effect. Set 1:Restore user-related factory parameters; Set 2:Clear H0B_33 fault record. Set 3: Restore motor and drive factory registration parameters (requires factory authorization). Set 4: Restore all parameters of special old version. After this operation, you need to re-match the motor drive parameters, you need to enter the password again to reset option 3; Set 5: Restore all system parameters. After this operation, it is necessary to re-match the motor drive parameters, and it is necessary to enter the password again to reset option 3; Set 5: Restore all system parameters. Note: Normal use of option 1 to restore the parameters set by the user can be; system parameters to initialize the function of option 3/4/5, non-manufacturers of technical personnel do not use.									

4.3-DI/DO parameters (H03~H04)

Input Terminal DI Function Options Table		
InFun sets the value	**Symbol**	**Corresponding functions**
1	SON	Servo motor enable
2	ALM_RST	Fault alarm reset
6	CMD1	Multi-segment operation command switching 1
7	CMD2	Multi-segment operation command switching 2
14	P_OT	Positive overtravel switch
15	N_OT	Reverse overtravel switch
18	JOG_CMD+	velocity positive pointwise motion
19	JOG_CMD-	Velocity Reverse Tap
28	PosInSen	Multi-segment position run command enable
31	Home_Switch	External home switch
32	Homeing_Start	The origin reversion enables
34	EmergencyStop	Emergency shutdown
35	ClrPosErr	Clear the position deviation counter
37	PulseInhibit	Pulse command prohibited
41	Home_Record	Setting the current position as the origin (zero position)
Note: InFun option (one DI function option can only be associated with one DI terminal, and cannot be assigned repeatedly, otherwise the DI duplicate assignment fault alarm ER.130 will occur.)		

H03_02	Functional Description	DI1 Terminal function selection		Modify the way in which	Running setup	factory value	1	Unit	-
	parameter range	0	41	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Factory default association:InFun1 Servo enable. If you need to change the associated function, refer to the "Input Terminal DI Function Options Table".									
H03_03	Functional Description	DI1 Terminal Logic Selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16

Set 0: indicates that the signal is on and off (positive logic input).
Set 1: Indicates that the signal is valid for disconnection and invalid for conduction (inverse logic input).

H03_04	Functional Description	DI2 terminal function selection		Modify the way in which	Running setup	factory value	2	Unit	-
	parameter range	0	41	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Factory default association:InFun2 Alarm reset. If you need to change the associated function, refer to the "Input Terminal DI Function Options Table".									

H03_05	Functional Description	DI2 terminal logic selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 0: indicates that the signal is on and off (positive logic input). Set 1: Indicates that the signal is valid for disconnection and invalid for conduction (inverse logic input).									

H03_06	Functional Description	DI3 Terminal Function Selection		Modify the way in which	Running setup	factory value	34	Unit	-
	parameter range	0	41	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Factory default association:InFun34 Emergency stop. If you need to change the associated function, refer to the "Input Terminal DI Function Options Table".									

H03_07	Functional Description	DI3 terminal logic selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: indicates that the signal is on and off (positive logic input). Set 1: Indicates that the signal is valid for disconnection and invalid for conduction (inverse logic input).									

H03_08	Functional Description	DI4 Terminal Function Selection		Modify the way in which	Running setup	factory value	18	Unit	-
	parameter range	0	41	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Factory default association:InFun18 Speed Positive Punctuation. If you need to change the associated function, refer to the "Input Terminal DI Function Options Table".									

H03_09	Functional Description	DI4 Terminal Logic Selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: indicates that the signal is on and off (positive logic input). Set 1: Indicates that the signal is valid for disconnection and invalid for conduction (inverse logic input).									

H03_10	Functional Description	DI5 Terminal Function Selection		Modify the way in which	Running setup	factory value	19	Unit	-
	parameter range	0	41	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Factory default association:InFun19 Velocity Negative Punctuation. If you need to change the associated function, refer to the "Input Terminal DI Function Options Table".									

H03_11	Functional Description	DI5 Terminal Logic Selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: indicates that the signal is on and off (positive logic input). Set 1: Indicates that the signal is valid for disconnection and invalid for conduction (inverse logic input).									

Output Terminal DO Function Options Table		
OutFun Set value	**Symbol**	**Corresponding functions**
1	S_RDY	Servo ready
5	COIN	Positioning the completed output
11	ALM	Fault Alarm Output
16	Home_Attaion	Home return to zero completes the output
17	ElecHomeAttain	The electrical return to zero completes the output that
18	ToqReach	torque reaches the output
19	V-Arr	speed to reach the output

H04_00	Functional Description	DO1 Terminal function selection		Modify the way in which	Running setup	factory value	1	Unit	-
	parameter range	0	24	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Factory Default Association:OnFun1 Servo ready;. If you need to change the associated function, refer to the "Output Terminal DO Function Options Table".									

H04_01	Functional Description	DO1 Terminal Logic Selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: When the signal is valid, the optocoupler conducts (positive logic output). Set 1: When the signal is valid, the optocoupler turns off (inverse logic output).									

H04_02	Functional Description	DO2 Terminal Function Selection		Modify the way in which	Running setup	factory value	11	Unit	-
	parameter range	0	24	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Factory default association:OnFun11 Fault alarm output. If you need to change the associated function, refer to the "Output Terminal DO Function Options Table".									

H04_03	Functional Description	DO2 Terminal Logic Selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: When the signal is valid, the optocoupler conducts (positive logic output). Set 1: When the signal is valid, the optocoupler turns off (inverse logic output).									

H04_04	Functional Description	DO3 Terminal Function Selection		Modify the way in which	Running setup	factory value	5	Unit	-
	parameter range	0	24	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Factory default association:OnFun5 Positioning completion output. If you need to change the associated function, refer to the "Output Terminal DO Function Options Table".									

H04_05	Functional Description	DO3 Terminal Logic Selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: When the signal is valid, the optocoupler conducts (positive logic output). Set 1: When the signal is valid, the optocoupler turns off (inverse logic output).									

H04_06	Functional Description	DO4 Terminal Function Selection		Modify the way in which	Running setup	factory value	18	Unit	-
	parameter range	0	24	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Factory default association:OnFun18 Torque arrival output. If you need to change the associated function, refer to the "Output Terminal DO Function Options Table".									

H04_07	Functional Description	DO4 Terminal Logic Selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: When the signal is valid, the optocoupler conducts (positive logic output). Set 1: When the signal is valid, the optocoupler turns off (inverse logic output).									

H04_08	Functional Description	DO5 Terminal Function Selection		Modify the way in which	Running setup	factory value	19	Unit	-
	parameter range	0	24	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Factory default association:OnFun19 Speed arrival output. If you need to change the associated function, refer to the "Output Terminal DO Function Options Table".									

H04_09	Functional Description	DO5 Terminal Logic Selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Set 0: When the signal is valid, the optocoupler conducts (positive logic output). Set 1: When the signal is valid, the optocoupler turns off (inverse logic output).									

4.4 - Position control parameters (H05)

H05_00	Functional Description	source of positional instructions		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	2	mode of entry into force	with immediate effect	applying the model	P	data type	Uint16
When H02_00=1 (position control mode). Set 0: Pulse command (the external controller outputs a high-speed pulse string, which is input to the motor driver to control the motor positioning and rotation, and the input pulse pattern is set by H05-15) Set 2: Multi-segment position command (set by the internal multi-segment position parameter to control the motor rotation, and refer to the internal multi-segment position parameter of H11 group)									

H05_04	Functional Description	Position command low-pass filtering time constant		Modify the way in which	Enable Disconnect	factory value	0	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	P	data type	Uint16
Sets the first-order low-pass filtering time constant for position commands. Setting this parameter will result in an increase in the latency of the positioning response but will have no effect on the amount of displacement (total number of position commands). When the external controller does not have a pulse acceleration and deceleration function, and the motor impact is relatively large, you can increase the value of this parameter to indirectly achieve the effect of passive hysteresis.									

H05_07	Functional Description	Electronic tooth number ratio 1 (molecule)		Modify the way in which	Enable Disconnect	factory value	131072	Unit	-
	parameter range	0	1073741824	mode of entry into force	with immediate effect	applying the model	P	data type	Uint32
Setting the electronic gear ratio numerator for position commands, BLFOC motor encoder resolution 131072. l When the numerator of the electronic gear ratio is fixed to the resolution of the motor, the value of the parameter of the electronic gear ratio denominator (H05-09) is the number of pulse commands required for one revolution of the motor. l When the numerator of the electronic gear ratio is not fixed to the motor resolution, the motor gear ratio calculation method: Example 1: It is known that the motor drives the screw through the coupling to carry out linear motion, the pitch of the screw is 10mm, and it is required that 1 pulse unit corresponds to 0.01mm. Calculations : □ = □□□□□ × .□□ $\frac{B}{A} = \frac{131072}{1000}$ Electronic gears numerator = 131072 denominator = 1000 □□ × □□ $\frac{A}{5} \quad \frac{}{60}$ $\frac{B}{A} = \frac{131072}{15000}$ Electronic gears numerator = 131072 denominator = 15000									

H05_09	Functional Description	Electronic Tooth Ratio 1 (Denominator)		Modify the way in which	Enable Disconnect	factory value	1000	Unit	-
	parameter range	0	1073741824	mode of entry into force	with immediate effect	applying the model	P	data type	Uint32
Setting the electronic gear score for position commands, factory default 1000, which means that 1 revolution of the motor requires 1000 pulse command inputs. When the numerator of the electronic gear ratio (H05-07) is fixed to the resolution of the motor, the value of the parameter of the electronic gear ratio numerator is the number of pulse commands required to rotate the motor by 1 revolution; the value of the parameter of the electronic gear ratio numerator is the number of pulse commands required to rotate the motor by 1 revolution.									

H05_15	Functional Description	the pulse command form		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	3	mode of entry into force	Power failure and reboot	applying the model	P	data type	Uint16
Set 0: pulse + direction positive logic (high-speed pulse string control motor rotation, direction signal OFF for the CW direction, direction signal ON for the CCW direction); Set 1: pulse + direction negative logic (high-speed pulse string control motor rotation, direction signal OFF for the CCW direction, direction signal ON for the CW direction); Set 2: A/B-phase quadrature pulse 4 times (A-phase ahead of the B-phase 90° motor positive rotation, B-phase ahead of the A-phase 90° motor reversal); Set 2: A/B-phase quadrature pulse 4 times (A-phase ahead of the B-phase 90 ° motor Set 3: CW/CCW double pulse (CCW pulse receives CW pulse to turn the motor forward, and CW pulse receives CCW pulse to turn the motor reverse).									

H05_21	Functional Description	locating the completion threshold		Modify the way in which	Running setup	factory value	92	Unit	encoder units
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	P	data type	Uint16
Set positioning completion threshold, motor position deviation value < positioning completion threshold, OutFun5(COIN) positioning completion signal COIN is valid. The positioning completion signal COIN is only valid in the position mode and in the motor enable state.									

H05_30	Functional Description	Home return enable control		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	8	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

Setting the home reset mode and the source of the trigger signal.

Setting values	Trigger signal	The origin resumption model	Remarks
0	Close the origin reversion	-	-
1	Enable home return via DI(Homeing_Start)	Origin search	The signal is valid when the motor is enabled
2	Enable electrical return to zero via DI(Homeing_Start)	Electrical return to zero	The signal is valid when the motor is enabled
3	Automatic home return after power-on enable	Origin search	Re-energize, the first enable signal is valid
4	Communication control (H05_30 write 4) enables home return	Origin search	The command is valid when the motor is enabled
5	Communication control (H05_30 Write 5) enable electrical return to zero	Electrical return to zero	The command is valid when the motor is enabled
6	Communication control (H05_30 Write 6) triggers the current position as the home position	After successful triggering, set the current position H0B-07 to 0.	
8	Trigger current position as origin via DI(HomeRecord)	After successful triggering, set the current position H0B-07 to 0.	

Note 1: For communication control (H05_30 Write 4/H05_30 Write 5/H05_30 Write 6), H05_30 is automatically set to 0 after the command is executed, and communication control commands should not be sent cyclically.

H05_31	Functional Description	The origin resumption model		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	16	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

Sets the initial direction of the motor, the deceleration point, and the home position during the home search

Setpoint	Search directions	Deceleration point	Origin	process steps
0	Positive	Home switch	Home switch	The motor first searches for the home switch at high speed in the set direction, and starts to run at low speed to disengage from the rising edge of the home switch signal, disengages to the falling edge of the home switch signal, changes direction and searches for the rising edge of the home switch signal at low speed, and stops immediately when it encounters the rising edge of the home switch signal, and returns to zero successfully.
1	Reverse	Home switch	Home switch	
2	Positive	Motor Z letter 号	Motor Z signal	The motor firstly searches the Z-phase at high speed in the set direction, starts commutation operation at low speed when it encounters the rising edge of the Z-phase signal, and stops immediately when it encounters the rising edge signal of the other side of the Z-phase, and returns to zero successfully.
3	Reverse	Motor Z letter 号	Motor Z signal	
4	Positive	Home switch	Motor Z signal	The motor firstly searches for the home switch at high speed in the set direction, then starts to commute at low speed to disengage from the rising edge of the home switch signal, and then commutes again at low speed to search for the rising edge of the home switch signal, and then stops immediately when it meets the rising edge of the home switch signal at the Z signal, and then returns to zero successfully.
5	Reverse	Home switch	Motor Z signal	
6	Positive	Forward overtravel	Forward overtravel	The motor firstly searches for the home switch at high speed in the set direction, then starts to commute at low speed to disengage from the rising edge of the forward overtravel switch signal, and disengages from the falling edge of the forward overtravel switch signal, and then commutes again at low speed to search for the rising edge of the forward overtravel switch signal, and stops immediately when it encounters the rising edge of the forward overtravel switch signal, so that the return to zero is successful.
7	Reverse	Reverse overtravel	Reverse overtravel	
8	Positive	Forward overtravel	Motor Z signal	The motor firstly searches for the forward overtravel switch at high speed in the set direction, encounters the rising edge of the forward overtravel switch signal and starts to decelerate and commutate to run away from it, and runs away from it to the falling edge of the signal of the forward overtravel switch and continues to run until the motor stops at Z, and the return to zero is successful.
9	Reverse	Reverse overtravel	Motor Z signal	
10	Positive	Mechanical Limit Bits	Mechanical Limit Bits	The motor firstly searches the mechanical limit position with the set direction and torque (H05_56 set torque) at low speed, and encounters the mechanical limit position against the blocking rotation and the torque reaches the upper limit of the torque limit of the touch-stop return to zero and keeps the default time, the motor stops immediately and the return to zero is successful.
11	Reverse	Mechanical Limit Bits	Mechanical Limit Bits	
12	Positive	Mechanical Limit Bits	Motor Z signal	The motor first searches for the mechanical limit position at low speed in the set direction and torque (H05_56 set torque), encounters the mechanical limit position against the blocking rotation and the torque reaches the upper limit of the torque limit of the touch-stop return to zero, and maintains the default time the motor reverses the operation to the Z signal of the motor and stops immediately, and the return to zero is successful.
13	Reverse	Mechanical Limit Bits	Motor Z signal	
14	Positive			The motor returns at high speed in the set direction to the zero position within a single revolution of the motor
15	Reverse			

		Single-turn zero return operation.	predetermined by the user, ignoring the number of revolutions data. The current position is cleared to zero after arrival.
16	Nearby		The motor returns at high speed in the direction of proximity to a user pre-determined zero position within a single revolution of the motor.

Note 1: Please associate the DI function option corresponding to the deceleration point, home switch and positive/negative overtravel switch used in the selected mode, otherwise the alarm ER.601 Zero return failure will occur; Note 2: If the deceleration point of the selected mode is the home switch and is associated with the positive/negative overtravel switch DI, the motor will automatically change direction and continue searching when it encounters the overtravel switch in the searching path; Note 3: The high speed searching speed is set by the parameter H05_32, and the low speed searching speed is set by the parameter H05_33; Note 4: The searching speed is set by the parameter H05_35, and the low speed searching speed is set by the parameter H05_34 Note 3: In the process steps, the high-speed search speed is set by parameter H05_32, and the low-speed search speed is set by parameter H05_33.
Note 4: If the home position is not found within the parameter time H05_35, the alarm ER.601 Zero timeout will occur.

Note 5: After successful home return, DO function (OutFun16-HomeAttain) home return to zero completion output is valid, after enabling OFF, home return to zero completion output is invalid; Note 6: Home return function is valid in position mode; when currently running in position mode internal multi-segment control, you need to release the multi-segment enable signal first.

H05_32	Functional Description	High-speed search for home switch signal speed		Modify the way in which	Running setup	factory value	100	Unit	rpm
	parameter range	0	3000	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16
1:Setting the high speed search speed setting for the home return process; 2:Starting the speed setting for the electrical return to zero.									

H05_33	Functional Description	low search home switch signal speed		Modify the way in which	Running setup	factory value	100	Unit	rpm
	parameter range	0	100	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16
Set the low speed search speed setting for the home return process; the lower the setting value, the higher the accuracy of searching the home point. If the selected home return mode deceleration point machine is the limit position of the instrument (blocking to zero), the motor will always run at a low speed until the home return is successful; the motor will run at a low speed until the home return is successful.									

H05_34	Functional Description	Acceleration and deceleration times while searching for the origin		Modify the way in which	Enable Disconnect	factory value	200	Unit	ms
	parameter range	0	200	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16
Set the time for the motor to change speed from 0-1000rpm when the home return mode is set, and the value of this parameter can be increased appropriately when the motor shock of the home return is large.									

H05_35	Functional Description	origin search timeout time		Modify the way in which	Enable Disconnect	factory value	60000	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16
Sets the maximum allowable time for home return. If the home point is not found within the time range of this parameter, alarm ER.601 Home Return Timeout is generated.									

H05_36	Functional Description	Mechanical origin offset		Modify the way in which	Enable Disconnect	factory value	0	Unit	Instruction unit
	parameter range	-99999999	9999999999	mode of entry into force	with immediate effect	applying the model	P	data type	Int32
Set the offset position after home return, and continue to execute the offset position action after successful home return. If H05_36 home position offset = 0, the electrical zero position is the same as the home position, the absolute position of the current motor H0B_07 is automatically cleared to 0 after the home position is restored to zero successfully, and the electrical zero position is returned to the home position. If H05_36 home position offset ≠ 0, the electrical zero position is equal to the home position offset. After the home return to zero is successful, the motor continues to travel to the offset position and then stops, the current absolute motor position H0B_07 is the home offset position, return to electrical zero position is to return to the home offset position. If the home return mode H05_31=14/15/16, the motor returns to the position within a single revolution when the electrical return of a single revolution occurs, and the mechanical home offset is invalidated, then the motor returns to the position within a single revolution. If the home return mode H05-31=6/7/10/11 and H05-36 sets the mechanical home offset (positive value=positive direction; negative value=negative direction), when the offset value is the same as the home return direction, the alarm ER.668 will be raised and the motor will not execute the action.									

H05_58	Functional Description	Touch-stop return to zero torque limit		Modify the way in which	Running setup	factory value	1000	Unit	0.10%
	parameter range	0	3000	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16
Setting the home return mode (H05_31=10/11/12/13) blocking the maximum torque limit of positive and negative torque in the process of stopping and returning to zero; it must be ensured that the set torque can drive the load movement.									

4.5 - Speed control parameters (H06)

H06_02	Functional Description	Speed command selection		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16
When H02_00=0 Speed control mode. Set 0: from the H06_03 value; set 1: from the internal multispeed setting (refer to subsection 4.10/Internal multispeed parameters).									

H06_03	Functional Description	The speed command communication setup value that		Modify the way in which	Running setup	factory value	200	Unit	rpm
	parameter range	-6000	6000	mode of entry into force	with immediate effect	applying the model	S	data type	Int16
When H06_02=0, this parameter sets the motor speed.									

H06_04	Functional Description	JOG Pointing Speed Setting Value		Modify the way in which	Running setup	factory value	100	Unit	rpm
	parameter range	0	6000	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16
This parameter is used to set the JOG operation speed when InFun18 (JOG_CMD+) or InFun19 (JOG_CMD-) is selected for the DI function of group H03.									

H06_05	Functional Description	speed command acceleration ramp time constant		Modify the way in which	Running setup	factory value	0	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16
Setting the acceleration time of the motor from 0-1000rpm in speed mode (the acceleration and deceleration times of the internal multispeed are determined by the parameters of the H12 group and are not related to this parameter).									

H06_06	Functional Description	Speed command deceleration ramp time constant		Modify the way in which	Running setup	factory value	0	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16
Setting the deceleration time of the motor from 1000-0rpm in the speed mode; the acceleration and deceleration time of the multispeed within the speed mode is determined by the parameters of the H12 group and has nothing to do with this parameter.									

H06_18	Functional Description	velocity reaches the signaling threshold		Modify the way in which	Running setup	factory value	1000	Unit	rpm
	parameter range	10	6000	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Setting the speed condition for the arrival of the rotational speed. When the actual speed of the motor after filtering >= the set value, the judgment speed to reach, OutFun19 (V-Arr) speed to reach the signal is valid; otherwise, speed to reach the signal is invalid.									

4.6 - Torque control parameters (H07)

H07_03	Functional Description	torque command communication set value		Modify the way in which	Running setup	factory value	0	Unit	0.10%
	parameter range	-3000	3000	mode of entry into force	with immediate effect	applying the model	T	data type	Int16
When H02_00=2 (torque control mode); set the torque limit of positive and negative direction output when the motor is running, the limit torque output is equal to the limit current output; 100.0%=motor 1 times the torque (motor 1 times the torque=motor rated torque and motor rated current). This parameter, together with H07_09/H07_10 and the manufacturer's parameter H00_43/H01_03, serves as a limit for the actual maximum motor current output, whichever is lower.									

H07_05	Functional Description	Torque command filtering time constant		Modify the way in which	Running setup	factory value	79	Unit	0.01ms
	parameter range	0	3000	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Setting the torque command low-pass filtering time makes the torque command run smoother and reduces vibration. Too large a setting will reduce the responsiveness of the motor.									
H07_09	Functional Description	positive internal torque limit		Modify the way in which	Running setup	factory value	3000	Unit	0.10%
	parameter range	0	4000	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Sets the torque limit for positive output during motor operation, valid in any mode. 100.0% = motor 1x torque (motor 1x torque = rated motor torque and rated motor current). Limit torque output = limit current output, this parameter and the manufacturer's parameter H00_43/H01_03 are both used as the actual maximum current output limit of the motor, whichever is lower.									
H07_10	Functional Description	negative internal torque limit		Modify the way in which	Running setup	factory value	3000	Unit	0.10%
	parameter range	0	4000	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Setting the torque limit of negative direction output when the motor is running, independent of the mode; limiting the torque output is equal to limiting the current output. 100.0% = motor 1x torque (motor 1x torque = rated motor torque and rated motor current). Limit torque output = limit current output, this parameter and the manufacturer's parameter H00_43/H01_03 are both used as the actual maximum current output limit of the motor, whichever is lower.									

	Functional	torque control forward speed limit value	Modify the way	Running setup	factory value	3000	Unit	rpm

H07_19	Description			in which					
	parameter range	0	6000	mode of entry into force	with immediate effect	applying the model	T	data type	UInt16
Limit the maximum forward speed of the motor when setting the torque mode, and the speed limit must be set when torque control, to avoid unlimited speed increase of light-loaded motors, which leads to over-speed flying. When the load is less than the torque output, the motor will accelerate in the direction of the torque output, and when it reaches the speed limit or the output torque is not enough to support further acceleration, the motor will stop accelerating and the speed will fluctuate according to the load fluctuation. When the load is approximately equal to the torque output, the motor will stop. When the load is greater than the output torque, the motor will be dragged in reverse rotation to apply torque with reverse damping.									

H07_20	Functional Description	Negative speed limit value for torque control		Modify the way in which	Running setup	factory value	3000	Unit	rpm
	parameter range	0	6000	mode of entry into force	with immediate effect	applying the model	T	data type	UInt16
Limit the maximum speed of motor reverse when setting the torque mode, the speed limit must be set when torque control, to avoid the light load motor unlimited speed leading to overspeed flyer. The process principle is the same as H07_19 Torque Control Forward Speed Limit.									

H07_21	Functional Description	torque reaches the reference value		Modify the way in which	Running setup	factory value	0	Unit	0.10%
	parameter range	0	3000	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
The H0B_02/H07_21/H07_22/H07_23 parameters are used as valid conditions for the torque arrival output OutFun18(ToReach), with the following relationship:: Actual torque (H0B_02),Torque arriving at reference value (H07_21),Torque arriving at valid value (H07_22),Torque arriving at invalid value (H07_23);When actual torque>=torque arriving at reference value+torque arriving at valid value;Moment arriving at the output OutFun18(ToReach) is valid. When actual torque < Torque Reach Reference + Torque Reach Invalid; Torque Reach Output OutFun18(ToReach) is invalid.									

H07_22	Functional Description	The torque reaches the rms value		Modify the way in which	Running setup	factory value	200	Unit	0.10%
	parameter range	0	3000	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Valid conditions for torque reach output OutFun18(ToReach).									

H07_23	Functional Description	The torque reaches the invalid value		Modify the way in which	Running setup	factory value	100	Unit	0.10%
	parameter range	0	3000	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16
Invalid condition for torque reach output OutFun18(ToReach).									

4.7 - Performance and protection parameters (H08~H09~H0A)

H08_00	Functional Description	Velocity loop gain		Modify the way in which	Running setup	factory value	200	Unit	0.1Hz
	parameter range	1	20000	mode of entry into force	with immediate effect	applying the model	P/S	data type	Uint16
Setting the speed loop gain determines the maximum frequency of the speed command to be followed by the speed loop. If no noise or vibration occurs in the motor, increase the value of this parameter appropriately to speed up the positioning time and followability; if noise or vibration occurs, decrease the value of this parameter.									
H08_01	Functional Description	velocity loop integration time constant		Modify the way in which	Running setup	factory value	1000	Unit	0.01ms
	parameter range	15	51200	mode of entry into force	with immediate effect	applying the model	P/S	data type	Uint16
Setting the speed loop integration time constant eliminates speed loop deviation. Reducing the setting value can strengthen the integrating effect and speed up the positioning time, but the setting value is too small to cause motor and mechanical vibration.									

H08_02	Functional Description	position loop gain		Modify the way in which	Running setup	factory value	100	Unit	0.1Hz
	parameter range	0	20000	mode of entry into force	with immediate effect	applying the model	P	data type	Uint16
Setting the position loop gain determines the maximum frequency of the speed command that the position loop follows. In the case of the motor does not occur noise, vibration, an appropriate increase in the value of this parameter, can speed up the positioning time and improve the motor static resistance to external disturbances; set the value is too large may lead to system instability vibration should be reduced the value of this parameter.									

H08_15	Functional Description	load moment of inertia ratio		Modify the way in which	Running setup	factory value	0	Unit	0.01 times
	parameter range	0	12000	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16

Set the mechanical load inertia ratio relative to the motor's own inertia; H08_15=0 means that the motor is not loaded; H08_15=1 means that the load inertia and the motor inertia are equal; H08_15=1 means that the load inertia and the motor inertia are equal.

For high inertia loads, increase the value of this parameter first and then adjust the gain.

H09_00	Functional Description	self-adjusting mode selection		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 0: the automatic adjustment of the parameter is invalid (standard rigidity table), the gain parameter is adjusted manually. Provision 1: Use of standardized rigidity tables with automatic gain adjustment based on the rigidity table rating.									

H09_01	Functional Description	rigidity class selection		Modify the way in which	Running setup	factory value	10	Unit	-
	parameter range	0	41	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
When H09_00=1, set the motor rigidity according to the rigidity table level, the higher the rigidity level, the stronger the gain, the faster the response, but too strong rigidity back to cause vibration.									

H0A_04	Functional Description	motor overload protection gain		Modify the way in which	Enable Disconnect	factory value	100	Unit	%
	parameter range	10	3000	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
By setting the value of this parameter, it is possible to determine the time for the motor overload fault alarm ER.620 to sound; 100% is equal to approx. 10S and varies for different motors; the time for the motor overload fault alarm ER.620 to sound is determined by setting the value of this parameter. Setting this parameter should be determined by the actual heating of the motor, too large a value of the motor will cause the motor to exceed its own torque for a long time without overloading the alarm leads to motor temperature is too high.									

H0A_10	Functional Description	Position deviation too large fault threshold		Modify the way in which	Running setup	factory value	1048576	Unit	encoder units
	parameter range	1	1073741824	mode of entry into force	with immediate effect	applying the model	P	data type	UInt32
Set the alarm threshold for excessive position deviation overload in position mode; default 131072*8=1048576, exceeding 8 turns alarms excessive position deviation. If the actual motor position deviates from the commanded position by more than the value of this parameter, a fault alarm ER.B00 will occur.									

H0A_26	Functional Description	motor overload shield enable		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 0: open motor overload detection alarm. Set 1: Shielded motor overload detection alarm, overloaded motor automatically run at reduced current.									

H0A_36	Functional Description	absolute encoder fault shielding options		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	3	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 0: Normal application of multi-turn absolute encoder; Set 1: Overflow detection of shielding number of turns; Set 0: Normal application of multi-turn absolute encoder; Set 1: Overflow detection of shielding number of turns. Set 2: Masked battery status detection Set 3: Shield overflow detection + battery status detection.									

4.8-Monitoring of read-only parameters (H0B)

H0B_00	Functional Description	actual motor speed		Modify the way in which	Display	factory value	-	Unit	rpm
	parameter range	-9999	9999	mode of entry into force	-	applying the model	-	data type	Int16
Displays the filtered real-time speed of the motor. **All display parameters of group H0B can only be read by communication and cannot be changed (written).**									

H0B_02	Functional Description	internal real-time torque commands		Modify the way in which	Display	factory value	-	Unit	0.10%
	parameter range	-32767	32767	mode of entry into force	-	applying the model	-	data type	Int16
Display real-time internal torque output, 100.0% corresponds to the rated torque of the motor.									

H0B_03	Functional Description	Input signal (DI signal) monitoring		Modify the way in which	Display	factory value	-	Unit	-
	parameter range	0	65535	mode of entry into force	-	applying the model	-	data type	UInt32
Decimal display of hardware DI port status;; e.g. if DI1 and DI3 are valid and the rest of the DOs are invalid, then the binary is 00000101, and H0B_05 is displayed as 5 (decimal).									

H0B_05	Functional Description	Output signal (DO signal) monitoring		Modify the way in which	Display	factory value	-	Unit	-
	parameter range	0	65535	mode of entry into force	-	applying the model	-	data type	UInt16
Decimal display of hardware DO port status;; For example, if DO1 and DO2 are valid and the rest of the DOs are invalid, then the binary is 00000011, and H0B_05 is displayed as 3 (decimal).									

H0B_07	Functional Description	Absolute position counter (32-bit decimal display)		Modify the way in which	Display	factory value	-	Unit	Instruction unit
	parameter range	-99999999	9999999999	mode of entry into force	-	applying the model	-	data type	Int32
Display the real-time absolute position of the motor (command pulse unit); the current position will be cleared to zero after the home position is successfully restored; the current position will be cleared to zero after the home position is successfully restored.									

H0B_11	Functional Description	Input the speed information corresponding to the position comm		Modify the way in which	Display	factory value	-	Unit	rpm
	parameter range	-6000	6000	mode of entry into force	-	applying the model	-	data type	Int16
The speed information corresponding to the command pulse input frequency is displayed, independent of the enable; this parameter can be used to test whether the external command pulse frequency is correct when the parameter is turned OFF.									

H0B_12	Functional Description	average load factor		Modify the way in which	PST	factory value	-	Unit	0.10%
	parameter range	0	5000	mode of entry into force	-	applying the model	-	data type	UInt16
Displays the average motor load as a real-time percentage of the motor's rated torque, with 100.0% corresponding to the motor's rated torque; low hysteresis.									

H0B_13	Functional Description	Input command pulse counter (32-bit decimal display)		Modify the way in which	Display	factory value	-	Unit	Instruction unit
	parameter range	-99999999	9999999999	mode of entry into force	-	applying the model		data type	Int32
Display the number of command pulse inputs to be added or subtracted according to the direction, independent of the enable; this parameter can be used to test whether the number of external command pulse inputs is correct or not when the parameter is turned OFF; the number of external command pulse inputs to be added or subtracted according to the direction.									

H0B_15	Functional Description	encoder position deviation counter (32-bit decimal display)		Modify the way in which	Display	factory value	-	Unit	encoder units
	parameter range	-99999999	9999999999	mode of entry into force	-	applying the model	-	data type	Int32
Displays the real-time deviation of the motor's current position from the commanded position.									

H0B_24	Functional Description	RMS phase current		Modify the way in which	Display	factory value	-	Unit	0.01A
	parameter range	0	10000	mode of entry into force	-	applying the model	-	data type	UInt16
Display the real-time output phase current value of the motor.									
H0B_26	Functional Description	The value of the bus voltage		Modify the way in which	Display	factory value	-	Unit	0.1V

	parameter range	0	10000	mode of entry into force	-	applying the model	-	data type	UInt16
Displays the drive's real-time input bus voltage; can be used to monitor the stability of the external power supply input voltage.									

H0B_27	Functional Description	module temperature values		Modify the way in which	Display	factory value	-	Unit	C°
	parameter range	0	100	mode of entry into force	-	applying the model	-	data type	UInt16
Displays the current drive MOS real-time temperature value.									

H0B_33	Functional Description	Fault logging		Modify the way in which	Running setup	factory value	0	Unit	First n failures
	parameter range	0	9	mode of entry into force	with immediate effect	applying the model	-	data type	UInt16
Used to set the last 10 faults of the motor; if there is no fault record, it will not be displayed; set 0:H0B_34 to display the current fault information; set 0:H0B_34 to display the current fault information; set 0:H0B_34 to display the current fault information. Set 1:H0B_34 Display last fault information;Set Set 9:H0B_34 to display the last 9 fault messages.									

H0B_34	Functional Description	selected number of fault codes		Modify the way in which	Display	factory value	-	Unit	-
	parameter range	0	65535	mode of entry into force	-	applying the model	-	data type	UInt16
Display the fault information selected by H0B_33, default display the current fault, if there is no fault record, it will not be displayed.									

H0B_70	Functional Description	Absolute encoder revolution data		Modify the way in which	Display	factory value	-	Unit	r
	parameter range	-32768	32767	mode of entry into force	-	applying the model	-	data type	Int16
Display absolute encoder rotational data, single-turn absolute motor power on the number of turns data is automatically cleared; multi-turn absolute motor turns are memorized.									

H0B_71	Functional Description	Position of the absolute encoder within 1 revolution		Modify the way in which	Display	factory value	-	Unit	encoder units
	parameter range	0	2147483647	mode of entry into force	-	applying the model	-	data type	UInt32
Display of absolute encoder position data within a single revolution, AIMtor motor 1 revolution interpolation 131072.									

H0B_77	Functional Description	Absolute encoder absolute position (low 32-bit)		Modify the way in which	Display	factory value	-	Unit	encoder units
	parameter range	-99999999	9999999999	mode of entry into force	-	applying the model	-	data type	Int32
Display multi-turn absolute motors based on absolute encoder position 32 bits lower; single-turn absolute motors power on the number of revolutions data is automatically cleared, multi-turn absolute motors revolutions are memorized.									

H0B_79	Functional Description	Absolute encoder absolute position (High 32-bit)		Modify the way in which	Display	factory value	-	Unit	encoder units
	parameter range	-99999999	9999999999	mode of entry into force	-	applying the model	-	data type	Int32
Display multi-turn absolute motors based on absolute encoder position 32 bits high; single-turn absolute motors power on the number of revolutions data is automatically cleared, multi-turn absolute motors revolutions are memorized.									

4.9-RS485 communication and functional parameters (H0C)

H0C_00	Functional Description	servo axis address		Modify the way in which	Running setup	factory value	1	Unit	-
	parameter range	1	247	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Setting the servo axis address. BLFOC supports broadcast mode (the host can only write to the slave via broadcast mode, the slave will execute according to the command received from the master but will not return the data); when a host controls more than one slave, it is necessary to ensure that each slave has a unique axial address, which can not be repeated, or it will lead to communication failure.									
H0C_02	Functional Description	serial port baud rate setting		Modify the way in which	Running setup	factory value	5	Unit	-
	parameter range	0	6	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	Uint16

Set the baud rate of servo axis communication, factory default 57600.

The baud rate of the servo axis must be the same as the baud rate of the host computer, otherwise the communication cannot be established.

Setting values	baud rate	Remarks
0	2400kbp/s	The lower the baud rate, the slower the communication speed and the less susceptible it is to external signals. It is recommended to use a high baud rate when connecting to the manufacturer's host computer debugging software for smoother operation.
1	4800kbp/s	
2	9600kbp/s	
3	19200kbp/s	
4	38400kbp/s	The higher the baud rate, the faster the communication speed and the relative vulnerability to external signal interference. It is recommended to use low baud rate to ensure communication stability in case of electromagnetic harshness or long distance communication.
5	57600kbp/s	
6	115200kbp/s	

H0C_03	Functional Description	MODBUS Data Format		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	3	3	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set the servo axis communication data verification method; keep the servo axis Modbus data format consistent with that of the host computer. Set 3: no parity, 1 end bit.									

H0C_13	Functional Description	MODBUS communication write change or not New to EEPROM		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Parameter values changed using communication are saved in the temporary storage area to take effect, after power failure the parameter will be restored to the value before the change, this parameter determines whether or not the modified parameter values will be saved permanently. Set 1: save the parameter changed by communication into EEPROM, the parameter will be set to 0 automatically after successful saving; Set 1: save the parameter changed by communication into EEPROM, the parameter will be set to 0 automatically after successful saving.									

4.10 - Auxiliary function parameters (H0D)

H0D_00	Functional Description	software reset		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 1: motor system software reset and restart, similar to the effect of power failure restart; automatically set to 0 after successful reset.									

H0D_01	Functional Description	Fault reset		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 1: reset the drive fault alarm status (some fault alarms do not support fault reset, you need to check the cause and restart after power failure).									

H0D_05	Functional Description	Emergency shutdown		Modify the way in which	Running setup	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 0; release emergency stop. Set 1: Internal emergency stop, the motor stops immediately after the emergency stop to keep the position locked.									

H0D_20	Functional Description	Absolute encoder reset enable		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	2	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 0; no effect. Set 1: Reset absolute encoder internal error message; Set 2: Reset absolute encoder internal error message; Set 3: Reset absolute encoder internal error message. Set 2: Reset absolute encoder internal error message + clear multiturn data; Set 2: Reset absolute encoder internal error message + clear multiturn data.									

4.11 - Internal multiband parameters (H11)

H11_00	Functional Description	Multi-stage position operation mode		Modify the way in which	Enable Disconnect	factory value	1	Unit	-
	parameter range	0	5	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

When H02_00=1 selects the position control mode and H05_00=2 selects that the position instruction is derived from multi-segment, set the multi-segment operation mode in the table below.

Setting values	mode of operation	Remarks
0	Single-cycle end-of-operation shutdown	Run 1 round to stop, multi-segment enable level is valid to start running; segment number from the first segment automatically incremental run to the end of the end Segment, wait time can be set between segments; multi-segment bit enable OFF, forced stop.
1	Cyclic operation	Cyclic operation, operation starts when the multi-segment enable level is active; the segment number is automatically incremented from the first segment to the end segment, the end After the wait time for the segment execution, it automatically repeats from the first segment; the multi-segment bit is enabled OFF to force stopping.
2	DI switching operation	To set up DI switching operation, there must be at least one DI associated with the multi-stage operation command switching. InFun6(CMD1) InFun7(CMD2) is a multi-segment switching instruction 1,2; The number of operating segments (position/speed/acceleration/deceleration presetting within the segment) is determined by the DI terminal combination logic. There is no waiting time between segments, depending on the timing of the call; each time the logic of the DI terminal is determined, it requires a multi-segment bit enable rising edge trigger to start operation. The combination logic of the DI terminals is described in Note 2 below.

Note 1: All multi-segment operation modes must associate an InFun28(PosInSen) multi-segment enable with the DI; Note 2: The DI switching operation combination logic is shown in the following table:

Multi-segment switching command 1 (CMD1)	Multi-segment switching command 2 (CMD2)	Multi-segment enable (PosInSen)	Running position segments
OFF	OFF	OFF→ON	Paragraph 1
ON	OFF	OFF→ON	Paragraph 2
OFF	ON	OFF→ON	Paragraph 3
ON	ON	OFF→ON	Paragraph 4

H11_01	Functional Description	the number of end segments of the bit shift instruction		Modify the way in which	Enable Disconnect	factory value	1	Unit	-
	parameter range	1	4	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

Setting the total number of multi-segment operation segments, different segments can be set to different displacements, speeds, acceleration and deceleration times.

When the multi-segment operation mode ≠ 2, the multi-segment segment number is automatically switched in increasing order, and the switching sequence is 1,2.H11_01 terminal segment.

H11_02	Functional Description	Residual treatment		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P	data type	Uint16

When multi-segment operation mode = 0/1, if the mode is switched or the multi-segment enable signal changes from ON to OFF during multi-segment operation, the operation is suspended and the processing mode is re-run; Setting 0: Continuing to run the remaining number of segments from the last time, if the last operation is paused in the middle of the second segment, the re-run will discard the balance of the second 2 segments, and the operation will be continued from the third segment; Setting 0: Continuing to run the remaining number of segments from the last time; If the last operation is paused in the middle of the second segment, the re-run will discard the balance of the second segment and continue to run from the third segment.

Set 1: Re-run from the first segment, if the previous run was paused in the middle of the second segment, the re-run will discard the remaining segments and re-run from the first segment.

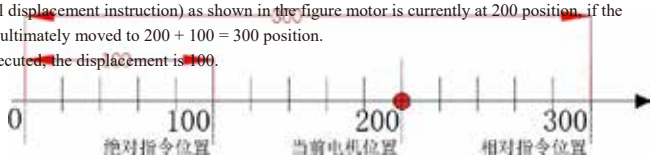
H11_04	Functional Description	Bit Shift Instruction Type Selection		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	1	mode of entry into force	with immediate effect	applying the model	P	data type	Uint16

Set 0: Relative displacement instruction (incremental displacement instruction based on current position)

Set 1: absolute displacement instruction (based on the coordinate zero position (origin) for incremental displacement instruction) as shown in the figure motor is currently at 200 position, if the implementation of the relative position instruction, the amount of displacement is 100, then the motor ultimately moved to 200 + 100 = 300 position.

As shown in the figure, the motor is currently at position 200, if the absolute position instruction is executed, the displacement is 100.

Then the motor will finally move to position 0+100=100.



	Functional	Sequential Mode Run Start Segment		Modify the	Enable	factory value	0	Unit	-

H11_05	Description	Selection		way in which	Disconnect				
	parameter range	0	4	mode of entry into force	with immediate effect	applying the model	P	data type	Uint16
When H11_00=3 sequential operation, H11_05=0: indicates that the sequential operation runs from segment 1 to the end of the terminal segment after the end of a single cycle. When H11_00=3 sequential operation, H11_05≠0: it means that the sequential operation runs from segment 1 to the end segment, and then continues cyclic sequential operation with the number of segments set in this parameter as the starting segment.									

H11_12	Functional Description	Paragraph 1 displacement of the movement		Modify the way in which	Running setup	factory value	1000	Unit	Instruction unit
	parameter range	-10000000	10000000	mode of entry into force	with immediate effect	applying the model	P	data type	Int32
When H11_04=0 relative displacement command, set the relative displacement increment of the 1st stage of multi-stage position movement; the direction of motor movement depends on the set positive and negative numbers. When H11_04=1 absolute displacement instruction, set the first segment of the multi-segment position to move the target position, the direction of movement of the motor depends on the current position and the direction of the target position coordinates; the following other segments of the same reason.									

H11_14	Functional Description	Maximum operating speed for segment 1 displacement		Modify the way in which	Running setup	factory value	200	Unit	rpm
	parameter range	1	6000	mode of entry into force	with immediate effect	applying the model	P	data type	Uint16
Setting the maximum speed for the 1st position operation; when the displacement is very small, the motor starts to decelerate during acceleration and the stopping position is reached, so the maximum speed will not be reached in practice. The same applies to the other paragraphs below.									

H11_15	Functional Description	Displacement acceleration and deceleration times for segment 1		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	P	data type	Uint16
Set the acceleration time from 0-1000rpm and the deceleration time from 1000-0rpm for the 1st position operation; the same applies to the other segments below. The same applies to the other paragraphs below.									

H11_16	Functional Description	Waiting time after completion of segment 1 displacement		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	10000	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16
Setting the delay time for stopping at the end of execution of the first position, and then executing the next position. This parameter is invalid when H11_00=2 (DI switching operation) and H11_00=3 (sequential operation); the same applies to the following segments.									

H11_17	Functional Description	Paragraph 2 displacement of the movement		Modify the way in which	Running setup	factory value	1000	Unit	Instruction unit
	parameter range	-10000000	10000000	mode of entry into force	with immediate effect	applying the model	P	data type	Int32

H11_19	Functional Description	Maximum operating speed for segment 2 displacements		Modify the way in which	Running setup	factory value	200	Unit	rpm
	parameter range	1	6000	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

H11_20	Functional Description	Displacement acceleration and deceleration times for segment 2		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

H11_21	Functional Description	Waiting time after completion of segment 2 displacement		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	10000	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

H11_22	Functional Description	Paragraph 3 shifted displacement		Modify the way in which	Running setup	factory value	1000	Unit	Instruction unit
	parameter range	-10000000	10000000	mode of entry into force	with immediate effect	applying the model	P	data type	Int32

H11_24	Functional Description	Maximum operating speed for segment 3 displacements		Modify the way in which	Running setup	factory value	200	Unit	rpm
	parameter range	1	6000	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

H11_25	Functional Description	Displacement acceleration and deceleration times for segment 3		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16
H11_26	Functional Description	Waiting time after completion of segment 3 displacement		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	10000	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

H11_27	Functional Description	Paragraph 4: Shifting displacements		Modify the way in which	Running setup	factory value	1000	Unit	Instruction unit
	parameter range	-10000000	10000000	mode of entry into force	with immediate effect	applying the model	P	data type	Int32

H11_29	Functional Description	Maximum operating speed for segment 4 displacements		Modify the way in which	Running setup	factory value	200	Unit	rpm
	parameter range	1	6000	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

H11_30	Functional Description	Displacement acceleration and deceleration times for segment 4		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

H11_31	Functional Description	Waiting time after completion of paragraph 4 displacement		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	10000	mode of entry into force	with immediate effect	applying the model	P	data type	UInt16

4.10 - Internal multiband speed parameters (H12)

H12_00	Functional Description	Multi-stage speed command operation mode		Modify the way in which	Enable Disconnect	factory value	1	Unit	-
	parameter range	0	2	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16

When H02_00=0 selects the position control mode and H06_00=1 selects the speed command from multispeed, set the multispeed operation mode in the table below.

Setting values	mode of operation	Remarks
0	Single-cycle end-of-operation shutdown	Run 1 round to stop, servo enable level is valid to start running; segment number from the first segment automatically incremental operation to the end of the segment, the Each running time can be set; if the servo is turned OFF, the motor stops in the OFF mode set in H02_05.
1	Cyclic operation	Cyclic operation, servo enable level is valid to start running; segment number from the first segment automatically incremental operation to the end of the segment, each segment operation The running time can be set; after the end section running time is finished, the cycle will be repeated from the first section automatically; servo enable OFF, the motor stops in the OFF mode set in H02_05.
2	DI switching operation	To set up DI switching operation, there must be at least one DI associated with the multi-stage operation command switching. InFun6(CMD1) InFun7(CMD2) is a multi-segment switching instruction 1,2; The number of segments to be run is determined by the DI terminal combination logic (speed within segment/segment run time). Each time the DI terminal logic is determined and the servo is enabled, the corresponding segment operation is switched immediately.

Note 1: The logic of the DI switching operation combination is shown in the following table:

Multi-segment switching command 1 (CMD1)	Multi-segment switching command 2 (CMD2)	Enable (SON)	Running speed segments
OFF	OFF	ON	Paragraph 1
ON	OFF	ON	Paragraph 2
OFF	ON	ON	Paragraph 3
ON	ON	ON	Paragraph 4

H12_01	Functional Description	Speed command end segment selection		Modify the way in which	Enable Disconnect	factory value	4	Unit	-
	parameter range	1	4	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16
Setting the total number of multispeed running segments, different segments can be set to different running speeds and running time. When the multi-segment operation mode ≠ 2, the multi-segment speed section number is automatically switched in increasing order, and the switching sequence is 1,2.H12_01 terminal section.									

H12_03	Functional Description	Acceleration time		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16
Set the acceleration time from 0-1000rpm; when switching between segments, the motor automatically accelerates and decelerates smoothly; common to all segments.									

H12_04	Functional Description	Deceleration time		Modify the way in which	Running setup	factory value	10	Unit	ms
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16
Setting the acceleration time of 1000-0rpm; when switching from segment to segment, the motor automatically accelerates and decelerates smoothly; common to all segments.									

H12_20	Functional Description	Paragraph 1 speed comm		Modify the way in which	Running setup	factory value	0	Unit	rpm
	parameter range	-6000	6000	mode of entry into force	with immediate effect	applying the model	S	data type	Int16
Sets the maximum speed at which the first speed is executed; the direction of movement of the motor depends on the set number; the same applies to the other following speeds.									

H12_21	Functional Description	The running time of the first instruction		Modify the way in which	Running setup	factory value	50	Unit	0.1s
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16
Set the time to execute the first speed run; the run is completed when the time is reached; the same applies to the following other segments.									

H12_23	Functional Description	The 2nd speed comm		Modify the way in which	Running setup	factory value	100	Unit	rpm
	parameter range	-6000	6000	mode of entry into force	with immediate effect	applying the model	S	data type	Int16

H12_24	Functional Description	Running time of the 2nd instruction		Modify the way in which	Running setup	factory value	50	Unit	0.1s
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16

H12_26	Functional Description	Paragraph 3 of the speed comm		Modify the way in which	Running setup	factory value	300	Unit	rpm
	parameter range	-6000	6000	mode of entry into force	with immediate effect	applying the model	S	data type	Int16

H12_27	Functional Description	Running time of the 3rd instruction		Modify the way in which	Running setup	factory value	50	Unit	0.1s
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16

H12_29	Functional Description	Paragraph 4 of the speed comm		Modify the way in which	Running setup	factory value	500	Unit	rpm
	parameter range	-6000	6000	mode of entry into force	with immediate effect	applying the model	S	data type	Int16

H12_30	Functional Description	Running time of the 4th instruction		Modify the way in which	Running setup	factory value	50	Unit	0.1s
	parameter range	0	65535	mode of entry into force	with immediate effect	applying the model	S	data type	UInt16

Chapter V 485 Communication Function

5.1-Introduction of communication protocols

The servo drive is embedded with standard Modbus RTU communication protocol, which supports the operation of Modbus RTU master to read and write single and multiple parameters. When the controller with Modbus protocol is successfully connected with the servo drive, the controller can directly set parameters, monitor and read the servo drive and other operations. When the servo drive is in communication control mode, the controller can modify the position, speed and torque operation command parameters in real time to change the motor operation position, speed and torque.

The parameter function number of the drive corresponds to the Modbus address of the device in the following table

parameter function number		Calculation	Modbus Address
hexadecimal	Octal	(hexadecimal group number) x 256 + (decimal group number)	Octal
H02	00	02 (02)×256 + 00	512
H0C	12	0C(12)×256 + 13	3085
H11	04	11(17)×256 + 04	4356
Parameter function group number (hexadecimal) x 256 + address number within parameter group (decimal) = Modbus register control address (decimal)			

Modbus RTU protocol has a variety of bus commands, the servo drive supports the most commonly used three kinds of function code commands (03H/06H/10H), these three kinds of function code commands can satisfy the controller to the full range of servo drive control.

1:communication Read/write Parameter Data Length

Modbus registers are 16-bit data length, when using Modbus commands, pay attention to the data type of access parameters. The data type of parameter is UInt16, Int16 should use function code 03H to read, 06H to write.

If the parameter data type is UInt32, Int32, or more than one parameter is read or written in succession, the function code 03H Read, 10H Write should be used.

2:03H(read Single Register)

If only one parameter is read, the start address of the register is the register address of the parameter. The return data is the corresponding data of the parameter; Example: The host sends the following request data frame to read the data of H0B_00 (current motor speed), which is a parameter of the drive with communication address station number 01. H0B_00 register address is 0B00H; read the number of registers for 1 (data type Int16); send request pin ↓.

Slave address	function codes	register start Addresses are high	register start Address Low	registers to be read High volume	registers to be read Low volume	CRC calibration Highs	CRC calibration Low
01H	03H	0BH	00H	00H	01H	86H	2EH

Assuming that the current speed of the motor is 0, the drive correctly returns the answer pin as ↓ to return the start address data for H0B_00 data; ↓ to return the start address data for H0B_00 data.

Slave address	function codes	Returning data the length of the byte count	Returns the starting address The data is high	Returns the starting address The data is low	CRC calibration Highs	CRC calibration Low
01H	03H	02H	00H	00H	B8H	44H

3:06H (Write Single Register)

Use 06H function code to write only one 16-bit data length parameter, the start address of the register is the register address of the parameter, the driver will change the value of this parameter to the data to be written after receiving the request data frame successfully.

Example: The host sends the following request data frame, the drive communication address station number 01, parameter number H02_00 (control mode selection) write data 1. H02_00 register address 0200H; write data 1, data type Int16; send request pin ↓

Slave address	function codes	register start Addresses are high	register start Address Low	Write to register The data is high	Write to register The data is low	CRC calibration Highs	CRC calibration Low
01H	06H	02H	00H	00H	01H	49H	B2H

After a successful write the drive correctly returns the value of the answer pin as ↓H0B_00 will be changed to 1;.

Slave address	function codes	register start Addresses are high	register start Address Low	has received the register The data is high	the number of received registers According to the low level	CRC calibration Highs	CRC calibration Low
01H	06H	02H	00H	00H	01H	49H	B2H

4:03H (read Multiple Consecutive Registers)

Some parameters of the parameter table have 32-bit data type, and some parameters have jumps between them, such as the next parameter of H0B_00 is H0B_02, if you want to read multiple parameters consecutively, you need to use 03H to read multiple 16-bit registers consecutively. To read multiple parameters consecutively, you need to use 03H function code to read multiple 16-bit registers consecutively. When you use 03H to read multiple parameters consecutively, the start address of the register is the register address of the first parameter. The order of returning consecutive data is 1st parameter data → 2nd parameter data → Nth parameter data; the system automatically shifts the order according to the 1st parameter data returned, and the amount of returned data depends on the number of registers read.

Example: The host sends the following request data frame to read the three parameter data of the drive with communication address station No. 01, parameter No. H0B_02 (real-time motor torque) and its next parameter H0B_03 (input DI monitoring) and its next parameter H0B_05 (output DO monitoring).

The register address of the starting parameter H0B_02 is 0B02H; the parameter data type is H0B_02(Int16),H0B_03(UInt32) ,H0B_05(UInt16), the number of registers read according to the parameter data type is 4; send the request pin ↓.

Slave address	function codes	register start Addresses are high	register start Address Low	registers to be read High volume	registers to be read Low volume	CRC calibration Highs	CRC calibration Low
01H	03H	0BH	02H	00H	04H	E7	ED

Assuming the current parameter value H0B_02=100,H0B_03=1,H0B_05=3, the driver correctly returns the answer pin as ↓.

Slave address	functio n codes	Returns the data byte Length	Returns the high bit of the start address data	Returns the start address data low bit	Returns the starting address +1 data Highs	Returns the starting address +1 number According to the low level	Returns the starting address +2 data Highs	Returns the starting address +2 data Low	Returns the starting address +3 data Highs	Returns the starting address +3 data Low	CRC Calibrati on high	CRC Checksu m Low
01H	03H	08H	00H	64H	00H	01H	00H	00H	00H	03H	A1H	D0H
			H0B_02 Parameter Return Value		H0B_03 Parameter Return Value (Lower 16 bits first, upper 16 bits second)				H0B_05 Return Value			

5:10H (write Multiple Consecutive Registers)

Some parameters of the parameter table have 32-bit data type, and some parameters have jumps between them, such as the next parameter of H05_04 is H05_07, if you want to write multiple parameters consecutively, you need to use the 10H function code to write consecutive 16-bit registers. To write multiple parameters consecutively, you need to write multiple 16-bit registers consecutively using the 10H function code. When reading multiple parameters consecutively using the 10H function code, the start address of the register is the register address of the first parameter. The order of writing consecutive data is 1st parameter data → 2nd parameter data → Nth parameter data; the system automatically shifts the order of writing data according to the 1st parameter data received; the system automatically shifts the order of writing data according to the 1st parameter data received.

Example: The host sends the following request data frame, writing the drive's communication address station number 01, parameter number H11_12 (segment 1 displacement) to 1000 and its next parameter H11_14 (segment 1 maximum velocity) to 200.

The register address of the starting parameter H11_12 is 110CH; the parameter data type is H11_12(Int32),H11_14(UInt16); the number of registers written according to the parameter data type is 3; send request pin ↓.

Slave addre ss	functi on codes	Register start address Highs	register start address low	Write register number high	Write register number low	the number of bytes written	Start address data high	Start address data low bit	Starting address +1 The data is high	Starting address +1 The data is low	Starting address +2 The data is high	Starting address +2 The data is low	CRC Calibrati on high	CRC Checksu m Low
01H	10H	11H	0CH	00H	03H	06H	03H	E8H	00H	00H	00H	C8H	F7H	65H
							H11_12 Data written				H11_14 Data			

After a successful write the driver correctly returns the answer pin as ↓ The value of H11_12 will be changed to 1000; the value of H11_14 will be changed to 200.

From the station Address	function codes	register start Addresses are high	register start Address Low	the number of received registers Volume high	the number of received registers Volume low	CRC calibration Highs	CRC calibration Low
01H	10H	11H	0CH	00H	03H	45H	37H

6:communication error code

If the master sends an incorrect data frame during communication or the slave servo receives an error message from the master due to interference, the slave will return an error data frame in the following format

Slave address	Functional error code	Error number	CRC Checksum High	CRC Checksum Low
returned based on the actual station number of the communication	(when using code 03H) = 83H (when using code 06H) = 86H (when using 10H code) = 90H	(Function code error) =01H (Parameter address error)=02H (CRC check error)=04H	Based on the test sum of the first three byte values	

5.2 - Communication Control Program

1:communication Control Speed Operation

First of all, use the upper computer debugging software to set the following parameters in advance

parameter number	Setting values	Functional Description	Modify the way in which	mode of entry into force	parameter range	data type
H02_00	0	Control mode selection: speed control	Enable Disconnect	with immediate effect	0~2	UInt16
H03_02	1	DI1 association: servo enable control	Running setup	with immediate effect	0~41	UInt16
H03_03	0	DI1 Logic select: on active, positive logic	Running setup	with immediate effect	0~1	UInt16
H04_00	19	DO1 association: speed arrival output	Running setup	with immediate effect	0~19	UInt16
H04_01	0	DO1 Logic selection: conductive output when signal is valid, positive logic	Running setup	with immediate effect	0~1	UInt16
H06_02	0	Speed command source: internal speed comm	Enable Disconnect	with immediate effect	0~1	UInt16
H0C_13	1	Parameters are saved to EEPROM, automatically set to 0 after success; power off hold	Running setup	with immediate effect	0~1	UInt16

The communication then controls the following parameter table objects

parameter number	Functional Description	Modify the way in which	mode of entry into force	parameter range	Unit	data type
H06_03	Setting the speed command communication setting value for running	Running setup	with immediate effect	-6000~6000	rpm	Int16
H06_05	Set the acceleration time for the speed run	Running setup	with immediate effect	0~65535	ms	UInt16
H06_06	Set the deceleration time for the speed run	Running setup	with immediate effect	0~65535	ms	UInt16
H06_18	velocity reaches the signaling threshold	Running setup	with immediate effect	10~6000	rpm	UInt16
H03_03	Set 1 to enable motor running; set 0 to stop motor or DI1 external signal to control motor running and stopping.	Running setup	with immediate effect	0~1	-	UInt16

Note: Servo enable in this control scheme is the switch to enable the motor, but also the switch to start the speed operation; if the running process is interrupted to open the enable, the motor will be in accordance with

H05_05 Parameterization of the method of stopping .

If the current actual motor speed H0B_00>=H06_18 ,DO1 speed arrival output is valid.

2:Communication Control Position Operation

First of all, use the upper computer debugging software to set the following parameters in advance

parameter number	Setting values	Functional Description	Modify the way in which	mode of entry into force	parameter range	data type
H02_00	1	Control mode selection: position control	Enable Disconnect	with immediate effect	0~2	UInt16
H03_02	1	DI1 association: servo enable control	Running setup	with immediate effect	0~41	UInt16
H03_03	0	DI1 Logic select: on active, positive logic	Running setup	with immediate effect	0~1	UInt16
H03_04	28	DI2 association:Multi-segment operation enable	Running setup	with immediate effect	0~41	UInt16
H03_05	0	DI2 Logic Selection: On Active, Positive Logic	Running setup	with immediate effect	0~1	UInt16
H04_00	5	DO1 association: positioning completed	Running setup	with immediate effect	0~19	UInt16
H04_01	0	DO1 Logic selection: conductive output when signal is valid, positive logic	Running setup	with immediate effect	0~1	UInt16
H05_00	2	Position instruction source: internal multi-segment bit instruction	Enable Disconnect	with immediate effect	0~1	UInt16
H11_00	0	Multi-segment operation mode: end of single-cycle operation	Enable Disconnect	with immediate effect	0~3	UInt16
H11_01	1	Bit shift instruction end segment: only 1 segment is run at a time.	Enable Disconnect	with immediate effect	1~4	UInt16
H0C_13	1	Parameters are saved to EEPROM, automatically set to 0 after success; power off hold	Running setup	with immediate effect	0~1	UInt16

The communication then controls the following parameter table objects

parameter number	Functional Description	Modify the way in which	mode of entry into force	parameter range	Unit	data type
H05_21	locating the completion signal threshold	Running setup	with immediate effect	0~65535	Encoder	UInt16
H11_04	Set 0 relative displacement; set 1 absolute displacement	Running setup	with immediate effect	0~1	-	UInt16
H11_12	Sets the running displacement of	Running setup	with immediate effect	-9999999~9999999	p	Int32
H11_14	Setting the speed of the run	Running setup	with immediate effect	0~6000	rpm	UInt16
H11_15	Setting the acceleration and deceleration times for running	Running setup	with immediate effect	0~65535	ms	UInt16
H03_03	Set 1 motor enable on; set 0 motor enable off or DI1 external signal to control motor enable on/off.	Running setup	with immediate effect	0~1	-	UInt16
H03_05	Set 1 to start operation of multi-segment; set 0 to stop multi-segment or DI2 external signal to control multi-segment start/stop.	Running setup	with immediate effect	0~1	-	UInt16

Note: Multi-segment enable is similar to multi-segment run switch, the motor will start to run according to the set position and speed when the multi-segment enable is on, and the motor will stop automatically at the end of the run; the motor needs to turn on the multi-segment enable again when it is running again. If the multi-stage enable is disconnected during operation, the motor will stop immediately.

If the current value of the deviation counter H0B_15<H05_21, the DO1 positioning completion output is valid.

3:communication Control Torque Operation

First of all, use the upper computer debugging software to set the following parameters in advance

parameter number	Setting values	Functional Description	Modify the way in which	mode of entry into force	parameter range	data type
H02_00	2	Control mode selection: torque control	Enable Disconnect	with immediate effect	0~2	UInt16
H03_02	1	DI1 association: servo enable control	Running setup	with immediate effect	0~41	UInt16
H03_03	0	DI1 Logic select: on active, positive logic	Running setup	with immediate effect	0~1	UInt16
H04_00	18	DO1 association: torque arrival output	Running setup	with immediate effect	0~19	UInt16
H04_01	0	DO1 Logic selection: conductive output when signal is valid, positive logic	Running setup	with immediate effect	0~1	UInt16
H0C_13	1	Parameters are saved to EEPROM, automatically set to 0 after success; power off hold	Running setup	with immediate effect	0~1	UInt16

The communication then controls the following parameter table objects

parameter number	Functional Description	Modify the way in which	mode of entry into force	parameter range	Unit	data type
H07_03	Setting the torque command communication setting value for the running	Running setup	with immediate effect	-3000~3000	0.1%	Int16
H07_19	Setting the forward maximum speed limit for torque operation	Running setup	with immediate effect	0~6000	rpm	UInt16
H07_20	Setting the reverse maximum speed limit for torque operation	Running setup	with immediate effect	0~6000	rpm	UInt16
H07_21	Setting the torque to reach the reference value	Running setup	with immediate effect	0~3000	0.1%	UInt16
H07_22	Setting the torque to reach the rms value	Running setup	with immediate effect	0~3000	0.1%	UInt16
H07_23	Set the torque to reach the invalid value	Running setup	with immediate effect	0~3000	0.1%	UInt16
H03_03	Set 1 to enable motor run; set 0 to motor stop or DI1 external signal to control motor run and stop.	Running setup	with immediate effect	0~1	-	UInt16

Note: Servo enable in this control scheme is the switch to enable the motor, and also the switch to start torque running; if the running process is interrupted to turn on the enable, the motor will be in accordance with

H05_05 Parameterization of the method of stopping .

If the current actual motor torque H0B_02>=(H07_21+H07_22) DO1 Torque arrival output is valid; if the current actual motor torque H0B_02< (H07_21+H07_23) DO1 Torque arrival output is invalid.

Chapter 6: Applications of Multiturn Absolute Value Systems

6.1 - Introduction to the application of multi-turn absolute value systems

The use of multi-turn absolute system applications, the need to match the motor installed multi-turn absolute encoder, multi-turn absolute encoder that detects the position of the motor within a week of rotation is also counted on the number of revolutions of the motor, the maximum recordable range of -32768-32767 revolutions.

Multi-turn absolute encoders require an external uninterruptible power supply in order not to lose position data. Power is supplied to the encoder from the drive via the encoder extension cable when the servo drive is energized, and from the battery on the encoder extension cable when the drive is de-energized; battery life is recommended to be no more than 2 years.

6.2-Fault codes ER.731/ ER.730/ ER.735

ER.731 (Battery failure of multi-turn absolute encoder) reminds the user that the multi-turn absolute encoder has been disconnected from the power supply and the number of recorded revolutions has been lost, and that it is necessary to reset the encoder, H0D_20=2, and to reconfirm the position of the coordinates if absolute positioning is used; ER.731 (Battery failure of multi-turn absolute encoder) reminds the user of the need to reset the encoder if the absolute positioning is used.

ER.731 (Multiturn absolute encoder battery failure) occurs in the following cases

1: When connecting the motor, the drive and the extension cable, power up the drive, the drive will alarm ER.731.

2: If the battery is forcibly replaced when the drive is de-energized, or if the extension cable from the battery to the motor encoder is disconnected, the drive will alarm ER.731.

3: The battery connected to the encoder is damaged and cannot continue to supply power to the motor encoder,
the drive will alarm ER.731; ensure that the battery can normally supply power to the multi-turn absolute
encoder and then perform the H0D_20=2 reset operation; the drive will alarm ER.731; the drive will alarm
ER.731; ensure that the battery can normally supply power to the multi-turn absolute encoder.

H0D_20	Functional Description	Absolute encoder reset enable		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	2	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 0; no effect. Set 1: Reset absolute encoder internal error message; Set 2: Reset absolute encoder internal error message; Set 3: Reset absolute encoder internal error message. Set 2: Reset absolute encoder internal error message + clear multiturn data; Set 2: Reset absolute encoder internal error message + clear multiturn data.									

ER.730 (Multi-turn Absolute Encoder Battery Warning) reminds the user to replace the battery when the detected battery voltage is less than 3.0V, otherwise the encoder data may be lost; refer to the next subsection for the procedure of replacing the battery. When the battery is replaced correctly without affecting the recorded lap data, this warning will be automatically canceled without resetting the encoder; incorrect replacement of the battery will result in a power failure of the multiturn absolute encoder and loss of the recorded lap data will be reported to the driver in ER.731.

ER.735 (Multi-turn absolute encoder overflow), when the encoder multi-turn data is greater than 32767 turns or reversed less than -32768 will be alarmed; if the multi-turn absolute motor is applied in the linear continuous rotation, after a period of time, the number of rotations will always be more than the upper limit of the multi-turn absolute encoder can be counted or the lower limit can be shielded from the number of overflow through the H0A_36=1 Fault alarm.

H0A_36	Functional Description	absolute encoder fault shielding options		Modify the way in which	Enable Disconnect	factory value	0	Unit	-
	parameter range	0	3	mode of entry into force	with immediate effect	applying the model	P/S/T	data type	UInt16
Set 0: Normal application of multi-turn absolute encoder; Set 1: Overflow detection of shielding number of turns; Set 0: Normal application of multi-turn absolute encoder; Set 1: Overflow detection of shielding number of turns. Set 2: Masked battery status detection Set 3: Shield overflow detection + battery status detection.									

Note: When matching the multi-turn absolute value of the motor, but do not use its absolute value function, only as an incremental motor to use, can not be equipped with batteries need H0A_36=2 shielded battery status detection. It is also possible to not need lap overflow detection H0A_36=3 to shield lap overflow detection + battery status detection.

6.3-Remarks on Replacing Absolute Encoder Batteries

- When do I need to replace the encoder battery?

1: If the encoder cable is not disassembled during normal use of the servo, the alarm ER.730 indicates a battery warning, reminding the user to replace the encoder in time. Otherwise, the position data recorded by the encoder may be lost.

2: servo normal use, and no disassembly of the encoder cable, if the alarm ER.731, said battery failure, remind the user must replace the encoder battery, the encoder position data has been lost.

3: The encoder battery should be replaced immediately if there is any leakage, damage or bulging of the encoder battery, so as to prevent the loss of battery power, which will lead to the loss of the encoder position data.

- Steps for the correct replacement of encoder batteries

1: Ensure that the drive is energized and the encoder cable is properly connected to the drive.

2:The drive is disconnected from the enable, open the cover of the battery compartment under non-operating condition, take out the old batteries and install the new batteries.

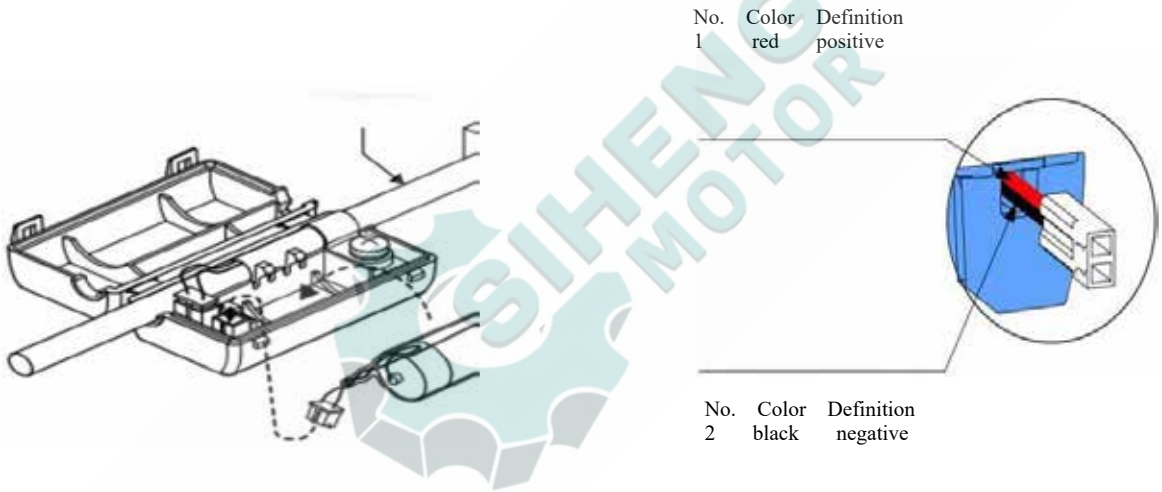
3: Replacement completed, ER.730 is automatically deactivated indicating that the encoder position data has not been lost.

- Caution:

1:Battery specification is recommended: 3.6V 2500mAh.

2: Installation of new batteries, pay attention to distinguish between positive and negative battery, generally red positive, black negative. Reverse positive and negative poles may cause damage to the motor encoder.

3: incorrect replacement of the battery caused by the encoder abnormal power loss, resulting in the loss of position data alarm ER.731 Battery failure, to restore the connection needs to reset the encoder H0D_20 = 2, if you use the absolute value of the positioning need to reconfirm the coordinate position.



Chapter VII. Fault Alarms and Handling

7.1-Status lights and alarm messages

AIMtor series products have a variety of alarm protection functions, in the absence of display panel models, through the body of the status indicators to indicate specific fault information, but also can be connected to the host computer debugging software to view more detailed alarm information, according to the alarm information obtained to investigate the corresponding causes of alarms and solve the problem.

1. Status Indicator

AIMtor series products in the models without display panel status indicator is divided into green running indicator, and red fault indicator, blinking frequency of 0.5HZ.

Status Indicator Meter

Green indicator light	Information	-	Reason
Flashing	Motor enable ON	-	The drive is powered up and the motor is enabled.
Often bright	Motor enable OFF Medium	-	The drive is powered up, but the motor is not enabled.
permanent extinction	Drive not powered up or drive failure, see table below	-	The drive is not powered up or the drive is powered up but there is a fault alarm and the red light is flashing.

2:Fault alarm and processing

- In order to differentiate between the observational discriminability of the red fault indicator blinking once and continuous blinking, the red fault indicator is alarmed from the second blink.
- In the model without display panel, through the red indicator to indicate the common fault alarm status, other alarms can not be individually indicated need to be connected to the host computer software to monitor the more detailed and comprehensive alarm information.
- Warning reminder type, no fault signal output, warning conditions do not hold, automatically lift the warning, no need for fault reset.
- Alarm fault type, will output fault signal, need fault reset to release the fault.

Fault Alarm Meter

Red finger Lights	Alarm warning Information	Alarm warning Code	Type	Alarm warning Principle	possible causes	Solutions
Flashing 2 times	The location is super bad	ER.B00	Fault Alarm	Position deviation greater than H0A-10 in position control mode Threshold	Motor blocking due to mechanical factors	Checking mechanical factors to ensure the smooth functioning of machinery
					The motor does not respond to higher input pulse frequencies	Reduce the input pulse frequency.
					Acceleration and deceleration are too fast when starting and stopping or commutation of the motor The motor is not responding	Increase in acceleration and deceleration time.
					The motor size is too small, and the torque is not enough, resulting in a large position following error	Motor selection increased
					Low servo drive gain, sluggish motor response	Increase the value of the gain parameter.
					Driver UVW output out of phase or encoder disconnected	checking the cable connections
					Large load inertia, untimely motor response	Increase the H0A-10 threshold as appropriate.
Flashing 3 times	driver overvoltage	ER.400	Fault Alarm	the input voltage exceeds the permissible value	unstable input power supply	Stabilizing the quality of the input power supply
					Large load inertia and regenerative energy generated by the motor when starting and stopping, resulting in high bus voltage	Increase the acceleration and deceleration time for smooth starting and stopping Adding regenerative braking resistors to absorb regenerative energy
	drive undervoltage	ER.410	Fault Alarm	the input voltage is lower than the permissible value	unstable input power supply	Stabilizing the quality of the input power supply
					Input power is low, resulting in insufficient power to operate the load, and the voltage is pulled down	Increasing the power of the input power supply
Red finger Lights	**Alarm warning Information**	**Alarm warning Code**	**Type**	**Alarm warning Principle**	**possible causes**	**Solutions**

Flashing 4 times	motor overload drive overload	ER.620	Fault Alarm	overload energy exceeding the permissible value of the system	The load is too heavy, the motor running torque exceeds the rated torque for a long time	Motor selection increased
					start-stop commutation is too frequent or the load inertia is high	Increase the acceleration and deceleration time for smooth starting and stopping
					The motor is blocked due to mechanical factors resulting in excessive load during operation	Checking mechanical factors to ensure the smooth functioning of machinery
					Inadequate gain adjustment or excessive rigidity, resulting in uncontrolled torque output	Rationalizing the gain
					Driver UVW output out of phase or encoder disconnected	checking the cable connections
	The motor is blocked	ER.630	Fault Alarm	with motion commands without motion feedback	Motor blocking due to mechanical factors	Checking mechanical factors to ensure the smooth functioning of machinery
					Driver UVW output out of phase or encoder disconnected	checking the cable connections
	drive hardware overcurrent	ER.201	Fault Alarm	output current exceeds the hardware or software range	Inappropriate gain adjustment or too much rigidity, resulting in uncontrolled current output	Rationalizing the gain
					Driver UVW output out of phase or encoder disconnected	checking the cable connections
	driver software overcurrent	ER.207	Fault Alarm		instantaneous and sudden changes in load	Checking mechanical factors to ensure the smooth functioning of machinery
					Shorted drive output, shorted UVW cable	Check drive outputs, measure motor cables
					damaged drive or shorted motor coils	Check the motor coil to make sure it is not short-circuited
Flashing 5 times	Motor overspeed	ER.500	Failure Alarm	motor running speed Great value	the actual motor speed exceeds the maximum permissible value	Reducing the speed of movement
Flashing 6 times	high motor and drive temperatures	ER.650	Fault Alarm	drive temperature detection exceeds the allowable value	High ambient temperatures	Increased environmental cooling measures
					After overloading, repeated full load operation by power off reset and restart	Increase the size of the motor to avoid full-load operation
					The motor overheats as a result of prolonged full-load operation	
Flashing 7 times	The need to power down and reboot the sen Number (warning)	ER.941	Warning Alert	reminding the user of the parameter values after powering up again before it takes effect	Alerting the user to a change in a parameter that needs to be energized again for it to take effect	After confirming that the modified parameter is the desired value, save it permanently and reboot after power off and the parameter is born The warning is automatically lifted
Flashing 8 times	Return-to-origin mismatch	ER.668	Fault Alarm	Mismatch in the way back to the origin	Home return mode H05-31 selects 14/15/16 turns for electrical return to zero, while H05-30 selects home return control.	If H05-31 single-turn zero return method. H05-30 Electrical return-to-zero trigger should be selected.
					Home return mode H05-31 Selection 6/7/10/11,H05-36 Mechanical home offset positive or negative direction error,(positive value=positive direction, negative value=negative direction)	Modify the direction of the H05-36 parameter home offset value. to offset the position of the motion in the correct direction
					Home return mode H05-31 Selected to include an external home switch condition or overtravel limit switch condition without associating the condition to the corresponding physical DI pin.	Assign the corresponding DI function to the physical DI input port according to the origin reset mode selected in H05-31.
					The external home switch and over-travel limit switch signals are turned on at the same time or the positive and negative over-travel limit signals are turned on at the same time during the return to zero	Check external home switch or POT/NOT whether the limit switches are conducting at the same time
Red finger Lights	**Alarm/Police information**	**Alarm warning Code**	**Type**	**Alarm/Warning Principle**	**possible causes**	**Solutions**
				Origin reversion	If the home position is far away from the home position when using the home position reversion function and the home position is not found within the specified time, the home position is not	Increase H05_33/ H05_34 origin search speed to find the origin within the specified time.

Flashing 8 times	Return-to-origin timeout	ER.601	Fault Alarm	exceeded H05_35 Limit time without finding origin	found within the specified time	
					No signal from the external home switch or deceleration point, resulting in a constant failure to find the home position	Check the external home switch or deceleration point switch whether the signal is normal
					When using Z-phase return to zero, a limit is encountered that causes a logic conflict and the home position is never found.	Check that the POT/NOT position of the limit switches is reasonable and change the limit switch mounting position.
Flashing 9 times	encoder failure	ER.A33	Fault Alarm	encoder communication failure	The encoder signal is not recognized by the drive due to a broken or not properly contacted encoder cable	Check the encoder connection cable Check the encoder connection port
					the encoder is faulty or damaged	Replace the motor encoder
					External interference with the encoder wire; causing the drive to not recognize the encoder signal	Motor drive properly grounded, encoder wire cables are laid isolated from high-current high-power sources
Flashing 10 times	EEPROM Parameter error	ER.101	Fault Alarm	EEPROM	The system detects very frequent parameter changes written to the EEPROM over a short period of time.	Check the communication method to modify the parameters, to avoid repeating the permanent preservation of the parameters written EEPROM
					An abnormality in an internal parameter	need to restore all factory settings
					Hardware EEPROM Chip Damage	replacement hardware
Flashing 11 times	MCU program Sequential anomalies	ER.105	Failure Alarm	internal program operations Abnormal	Internal watchdog trigger	Power Failure Restart Recovery, Power Failure Restart Unresolved never need to be returned to the factory for testing
Flashing 12 times	other alarms or warnings	ER.730	Warning Alert	encoder battery warning	Motors with multi-turn absolute encoders, external supply battery voltage below 3.0V Note: This warning message, fault signal is not output	Replace the encoder batteries in time to ensure that the power Battery voltage greater than 3.0V, please refer to Chapter 6 for details.
		ER.731	Fault Alarm	encoder battery failure	Motors using multi-turn absolute encoders, where the encoder has been de-energized, resulting in a loss of position turns	Check encoder battery supply cable, check encoder battery, check encoder battery, check encoder battery, check encoder battery, check encoder battery. Referring to section VI for details
		ER.735	Fault Alarm	Multi-turn absolute value circle overflow	Motors with multi-turn absolute encoders, where the number of revolutions counted is greater than 32767 revolutions forward or less than -32768 revolutions reverse	Avoiding lap counts that are out of range This alarm can be blocked in case of continuous rotation, please refer to chapter 6 for details
		ER.950	Warning Reminder	Positive overtravel POT Connecting	Alerts the forward overtravel POT limit signal to turn on, which will limit forward motion.	This warning is automatically deactivated when the positive overtravel POT limit signal is disconnected.
		ER.952	Warning Reminder	Negative overtravel NOT	Alerts the negative overtravel POT limit signal on, which will limit the negative motion.	Negative overtravel NOT This warning is automatically deactivated when the limit signal is deactivated.
		ER.130	Failure Alarm	DI terminal function Duplicate assignments	Assigns the same DI input function to more than one DI terminals, resulting in duplicate assignments	Reassign the DI function to associate an input terminal
		ER.900	Warning Alert	The emergency stop signal is in effect	DI function Emergency Stop associated DI turn-on validation	This warning is automatically canceled if the DI associated with the emergency stop is disconnected.
					The internal emergency stop of the host computer is switched on	The internal emergency stop disconnection of the host computer, this The warning is automatically lifted
		ER.234	Failure Alarm	Motor Flyer	Rapid movement of the motor shaft is detected during initialization, posing a potential problem.	Ensure that the motor shaft is free from external drying when powering up disturbed and brought to a standstill
		ER.102	Failure Alarm	of the parameter EEPRM Exception	The manufacturer's parameters are not registered Hardware EEPROM Chip Damage	Motor driver not registered, return to factory registered hardware EEPROM chip
		Er.104	Failure Alarm	The parameter area of the note EEPRM Exception		