

Preface

Thank you for purchasing YD8200 series servo drive ! !

Data no: 16025807

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Version: 108

YD8200 series general-purpose servo drive is a high performance medium and small power AC servo unit developed by Fengdian electric company, this series adopts advanced DSP chip for motor control, IPM power module, which has the characteristics of high integration, small volume, perfect protection and high reliability. With abundant digital and analog interface, it can support a variety of host control devices, support MODBUS communication protocol, and facilitate networking. The optimized PID control algorithm realizes the full digital control of torque, position and speed with high precision and fast response. YD8200 series uses 17 bit、23 bit encoders and 1024~10000 line incremental encoders to meet different cost and performance requirements which can be widely used in the numerically controlled machine tools, printing and packaging machinery, textile machinery, robot automatic production line and other automation fields.

This manual is an attachment sent randomly, Please keep it properly.

Since Fengdian electric is committed to the development and improvement of products and products documents, this manual will be updated without notice.

Latest updates and additional information are available at www.fd-elec.com

Safety Information

Safety Definitions:In this manual, safety Information fall into the following two categories



Danger: The label indicates that a failure to follow instructions can result in serious injury or even death.



Caution: The label indicates that a failure to follow instructions can result in moderate or slight injury and device damage.

Please read this chapter carefully before system installation, debugging and maintenance and always follow the safety precautions below during operation. Fengdian will not undertake any damage or loss caused by a failure to follow the instructions.

Safety

Precautions

Before Power-on:



Caution

- 1 .Verify that input voltage is identical to the rated voltage of servo drive, input terminals R,S and T and output terminals U, V or W are correctly connected, there are no shortcircuit phenomena for the wiring of servo drive and its peripheral circuits, and all wires are in good connection. Otherwise, this may result in servo drive damage.
- 2.Never perform voltage withstanding test on servo drive, because it has been done at thefactory. Otherwise, this may result in accident.



Caution

- 1.The front cover of inverter must be closed before inverter is powered on. Otherwise, itmay result in an electric shock.
2. The wiring of all peripherals must be conducted in accordance with the guidance of thismanual. Otherwise, it may result in an electric hazard.

After Power-on:



Danger

1. Do not touch servo drive or its peripheral circuits with wet hands to avoid the electricshock.
2. If the indicator is off or the keypad does not display any information after power-on, please cut off the power supply immediately. Never touch any terminal of R, S or T of servo drive or the connecting terminals with hands or a screw driver, or else an electricshock accident may occur. Contact our customer service personnel immediately after cutting off the power.
3. After being powered on, servo drive will automatically check the safety of the external strong circuit automatically. Therefore, do not touch wiring terminal U, V or W of servodrive or the wiring terminal of the motor with bare hands, otherwise it will result in electricshock.



Caution

1. If you need to check parameter settings, be careful of personal safety when the motor is running so as to avoid accidents.
2. Do not change default parameter setting without approval to avoid damage.

During Operation:



Danger

1. Never touch cooling fan, heat sink or discharge resistor with bare hands for checking temperature, which may result in burning!
2. Only qualified technicians are allowed to detect signal during operation so as to prevent personal injury or device damage.



Caution

1. Prevent any foreign items from being dropped into the device during operation, so as to avoid damage to the device.
2. Do not control the start/stop of servo drive by ON/OFF of the contactor so as to avoid damage to the device.
3. Do not contact the rotating shaft of the motor on running so as to prevent personal injury.

Maintenance:



Danger

1. Maintain and inspect the device only after servo drive is powered off to avoid electricshock.
2. Maintain and inspect servo drive only after its main circuit is powered off and CHARGE indicator is off. Otherwise, the residual electric charge of capacitor may result in personal injury.
3. Maintenance and inspection can be performed by well-trained technicians only, so as to avoid

personal injury or device damage.

4. Parameter setting is required if inverter has been replaced. Plug-in & plug-out should be performed after power-off.

Chapter1 Wiring

1.1 Main circuit terminal wiring

Main circuit(Strong electric part)terminals are shown below.



Upper left main circuit terminal is suitable for 220V full series driver and 380V driver below 2.2KW power range



Upper right main circuit terminal is suitable for 380V driver above 2.2KW power range

1.1.1

Main circuit(Strong electric)terminal Introduction

Terminals markings	Terminal name	Terminal Function	
L1、L2	Control power supply input terminals	1 -phase input which is consistent with the main circuit power supply voltage level	
R、S、T	Main circuit AC power input terminals	YD8200-0R7-23	R、T 1 -phase 220V input
		YD8200-1R5-23	
		YD8200-2R0-23	
		YD8200-3R0-43 YD8200-5R5-43 YD8200-7R5-43	3-phase 380V input
P+、D、C	External braking resistor connection terminals	Default connection between D and P +. When the braking is insufficient, please keep P +, D circuit open, and connect an external braking resistor between the P + and C.	
P+、 Θ	DC bus terminal	DC bus terminal of servo drive. It can be shared when multi-parallel.	

U、V、W	Servo moto terminals	Connection terminals of the servo motor and they are connected to U, V, W of the motor
PE	Ground	Connected to the ground terminal of power supply and the ground terminal of motor.

Tables 1-1Servo drive main circuit terminal Introduction

1.1.2 Power Wiring

Servo drive power connection is divided into 1 -phase and 3-phase. 1 -phase only for the drives with output current 7.6A and less than 7.6A

1-phase power supply wiring (rated output current $\leq 7.6A$)

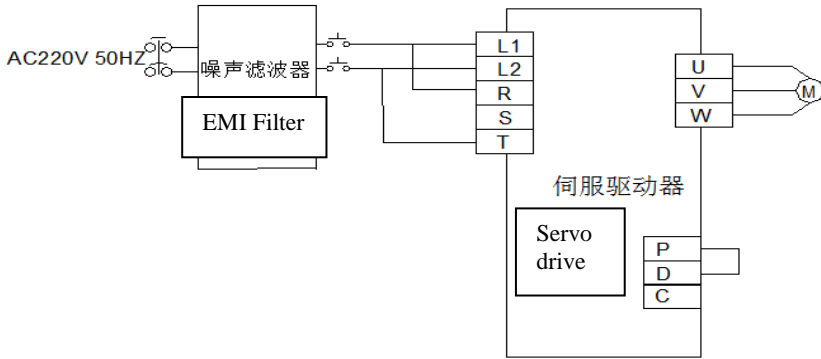


Figure1-1 1 -phase power supply wiring diagram

3-phase power supply wiring (all series are applicable)

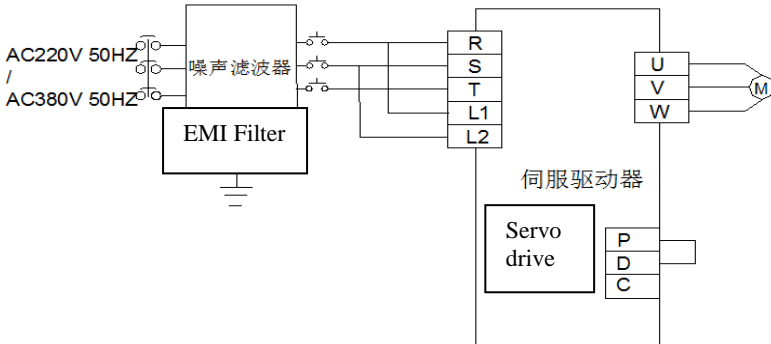
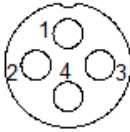


Figure 1-2 3-phase power supply wiring diagram

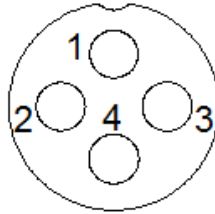
1.1.3 Connector specification of motor power cables

Table 1-2 motor servo motor power cable connection side terminals



快速接头-2*2PA

AMP Connector-2*2PA



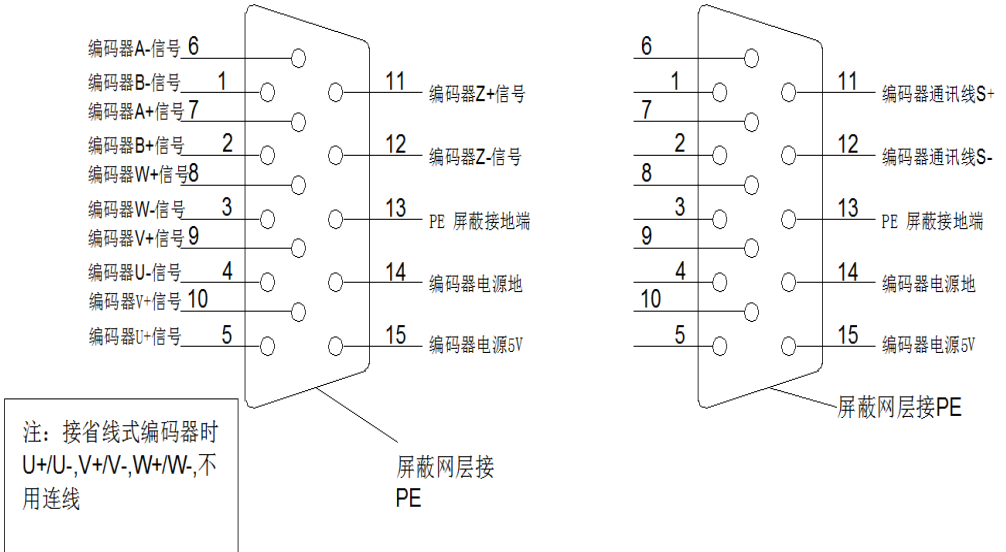
军规接头-20-18S

MilitaryConnector-20-18S

Connector Name	U	V	W	PE
Quick Connector-2*2PA	2	3	4	1
MilitaryConnector-20-18S	2	3	4	1

1.2 CN1 encoder signal terminal

1.2.1



非省线增量式编码器端子定义

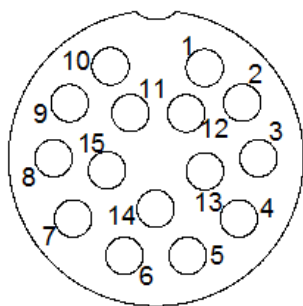
17位/B2编码器端子定义

Encoder terminal definition drive-side

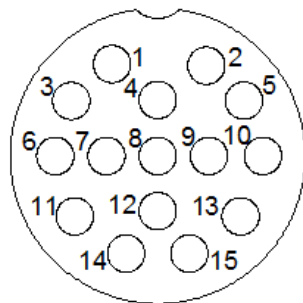
CN1 Encoder terminal definition

Figure1-4 CN1terminal welding pin distribution

1.2.2 Encoder terminal definition of servo motor side



快速接头



军规接头-20-18S

Figure 1-5 Encoder connector pin distribution

表 1-3 2500pprnon-wire-saving encoder cable pin connection

Function Description	Drive side DB15		Servo motor side	
			AMP plug	Aviation plug
	Signal name	Pin	Pin	Pin
Encoder signal B-	B-	1	8	8
Encoder signal B+	B+	2	5	5
Encoder signal W-	W-	3	15	15
Encoder signal U-	U-	4	13	13
Encoder signal U+	U+	5	10	10
Encoder signal A-	A-	6	7	7
Encoder signal A+	A+	7	4	4
Encoder signal W+	W+	8	12	12
Encoder signal V+	V+	9	11	11
Encoder signal V-	V-	10	14	14
Encoder signal Z+	Z+	11	9	9
Encoder signal Z-	Z-	12	6	6
Shielding layer PE	PE	13	1	1
Encoder power supply ground	GND	14	3	3
Encoder power supply 5V	5V	15	2	2

17 bit /B2 Encoder Pin Definition

Function Description	Drive side DB15		Servo motor side	
			AMP plug	Aviation plug
	Signal name	Pin	Pin	Pin
Shielding layer PE	PE	Shell	1	1
Encoder power supply 5V	5V	15	2	2
Encoder power supply ground	GND	14	3	3
Positive terminal of serial signal S+	S+	11	9	9
Negative terminal of serial signal S-	S-	12	6	6
Positive terminal of external battery V+	V+	-	-	-
Negative terminal of external battery V-	V-	-	-	-

Remark for servo wiring:

- 1) Make sure the drive and the motor shielded layer are grounded; otherwise it will cause the drive error.
- 2) Do not confuse GND and PE.
- 3) Be sure that the differential signal can match the two cables of a twisted pair. For example, A + and A- is a set of differential signal, you should use a twisted pair.
- 4) **Encoder cable routing must be separated from the power cable routing by at least 30cm or more, Especially when the length of the cable exceeds 10 meters.**

1.3 CN2 Control signal terminal

1.3.1 Digital inputs\out put terminal description

Using the DB44 socket, CN2 signal terminal provides signals for communication with upper computer. Signals include:

- 8 programmable digital inputs
- 5 programmable digital output
- 2 analog inputs
- 2 analog output
- command pulse input
- ABZ encoder signal output

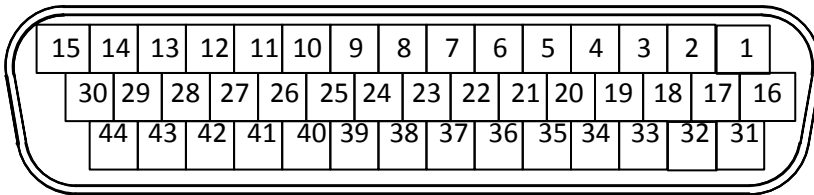


Figure 1-6 Drive control circuit terminal position and pin assignment

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
OB	OZ	DI1	DI3	DI5	DI7	SS	DO1	DO1	DO2	DO2	DO3	DO3	SING	SIGN-
30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
OB	OZ	DI2	DI4	DI6	DI8	SS	DO5	DO5	DO4	DO4	PULSE	PULSE	PULL-	PULL-
-	44	43	42	41	40	39	38	37	36	35	34	33	32	31
-	OA	OA	AI2	AI1	AO	AO	AGN	AGN	+12	CO	CO	CO	+24	+24

Table 1-4 Drive control circuit terminal correspondence

Signal	Pin	Function description
SIGN-	1	Position direction command -
SIGN+	2	Position direction command +
DO3+	3	Digital output 3 positive terminal
DO3-	4	Digital output 3 negative terminal
DO2+	5	Digital output 2 positive terminal
DO2-	6	Digital output 2 negative terminal
DO1+	7	Digital output 1 positive terminal
DO1-	8	Digital output 1 negative terminal
SS	9/24	Digital input COM terminal (COM power/COM ground)
DI7	10	Digital input 7

DI5	11	Digital input5
DI3	12	Digital input3
DI1	13	Digital input1
OZ-	14	Encoder Z pulse deviation negative output
OB+	15	Encoder B pulse deviation positive output
PULL-PH	16	command pulse input external power supply(Internal connection to PULL-SH, detachable)
PULL-SH	17	command pulse direction external power supply(Internal connection to PULL-SH, detachable)
PULSE-	18	Position direction command
PULSE+	19	Position pulse command +
DO4-	20	Digital output 4 negative terminal
DO4+	21	Digital output 4 positive terminal
DO5-	22	Digital output 5 negative terminal
DO5+	23	Digital output 5 positive terminal
DI8	25	Digital input 8
DI6	26	Digital input6
DI4	27	Digital input4
DI2	28	Digital input2
OZ+	29	Encoder Z pulse deviationpositive output
OB-	30	Encoder B pulse deviation negative output
24V	31/32	+24V Power supply output
COM	33/34/35	+24VPower supply ground
12V	36	+12V Power supply output
AGND	37/38	Analog input/output signal ground、+12VPower supply
MON1	39	Analog output 1
MON2	40	Analog output 2
AI1	41	Analog input1
AI2	42	Analog input2
OA-	43	Encoder A pulse deviation negative output
OA+	44	Encoder A pulse deviation positive output

Table 1-5 Drive control circuit terminal correspondence

1.3.2 Digital input (DI) function definition table

Input Signal Function Description					
Set value	Name	Function	Describe	Triggermode	Running mode
0	Disabled	Terminal invalid			
1	S-ON	Servo enable	ON- Servo motor power enable OFF- Servo motor cancel enabled	Level triggered	P S T
2	ALM-RST	Alarm and fault reset	ON- If the abnorm have been solved fault can be reset.	Edge triggered	P S T
3	P-CLR	Position control pulse deviation counter clear	See P1 -25 for definition of trigger	Edge / level triggered	P
4	DIR-SEL	Speed command direction selection	ON- Instruction in the oppositedirection OFF- Default command direction	Level triggered	P S T
5	CMD0	Internal command bit0	When works in position controlmode, it is location multi-segment switching function signal; When works in speed controlmode, it is speed multi-segmentswitching function signal;	Level triggered	PS
6	CMD1	Internal command bit1		Level triggered	PS
7	CMD2	Internal command bit2		Level triggered	PS
8	CMD3	Internal command bit3		Level triggered	PS
9	CTRG	Internal command trigger	Multi- segment position triggercondition	Edge triggered	PS
10	MSEL	Control mode switching	Used for mixed control modeswitch	Level triggered	PST
11	ZCLAMP	Analog speed command zero fixed enable	ON- Zero fixed function enabled OFF- Zero fixed function disenabled	Level triggered	S
12	INHIBIT	Pulse inhibit	ON- Prohibit command pulseinput OFF- Allow command pulseinput	Level triggered	P
13	P-OT	Forward driving inhibit	OFF- Prohibit forward drive ON- Allow forward drive	Level triggered	PST

14	N-OT	Reverse driving inhibit	OFF- Prohibit Reverse driving ON- Allow reverse drive			Level triggered	PST
15	JOGCM D+	Forward Jog	ON- Input in accordance with the given instruction OFF- Stop input running instruction			Level triggered	S
16	JOGCM D-	Reverse Jog	ON- Input in accordance with the given instruction OFF- Stop input running instruction			Level triggered	S
17	GAINSW L	High-low speed PI switching	ON-Low speed PI mode OFF-High speed PI mode			Level triggered	S
18	GNUM0	Electronic gear ratio numerator selection 0	GNU M1	GNU M0	Code	Level triggered	P
19	GNUM1	Electronic gear ratio numerator select 1	0	0	P1-18		
			0	1	P1-20		
			1	0	P1-21		
			1	1	P1-22		
20	SHOM	Origin return function	ON-Origin return function enable			Edge triggered	PST
21	ORGP	Origin return signal	ON-The origin signal has been searched and set by parameter P9-03			Level triggered	PST

1.3.3 Digital Output (DO) function definition table

Output Signal Function Description

Set value	Name	Function	Describe	Runningmode
0	Disabled	Terminal is invalid		
1	S-ON+-	Servo enable	ON-Servo motor enable OFF-Servo motor not enabled	P S T
2	S-RDY+-	Servo ready	Valid - servo ready, can receive S-ON instruction Invalid - Servo not ready, cannot receive S-ON instruction	PST
3	BK+-	Brake control	Valid - Release holding brake Invalid - Closed holding brake	PST
4	TGON+-	Motor rotation	Valid - The motor is rotating Invalid - The motor stop rotating	P S T
5	ZERO+-	Motor zero speed	Valid - Motor speed is zero Invalid - Motor speed is not zero	P S T
6	TCMP+-	Torque arrival	When works in torque control,the absolute value of the difference between the servo motor torque and the torque command is less than the value as P1 -39 set.	T
7	V-CLS+-	Speed approaching	when works in speed control, the absolute value of the difference between the actual motor speed and the speed command is less than the value as P1 -33 set.	S
8	V-CMP+-	Speed arrival	when works in speed control mode, the absolute value of the difference between the actual motor speed and the speed command is less than the value as P1 -34 set.	S
9	PNEAT+-	Position approaching	when works in position control mode, the position deviation pulse number is less than positioned close approaching width as P1 -23 set.	P
10	COIN+-	Position arrival	when works in position control mode, the position deviation pulse number is less than positioned close approaching width as P1 -24 set.	P
11	C-LT+-	Torque limit signal	Valid - Motor torque is limited Invalid - Motor torque is not limited	P S
12	V-LT+-	Speed limit signal	Valid - Motor speed is limited Invalid - Motor speed is not limited	T
13	WARN+-	Warning output	Valid: Warning things occur	PST
14	ALM+-	Fault output	Valid: Fault event occur	PST
15	PCMDOK+-	Internal position instruction accomplished	When the internal position instruction or internal command stops, the delay is set by P1 -44 to output the signal. This function without output if motor not enabled.	P
16	HOME+-	Origin return signal	Valid: 1. Origin return accomplished, output signal Invalid: Origin return not accomplished, no output signal	PST

1.3.4 Digital input wiring

The digital input terminals (DI) of YD8200 series servo drive adopt full bridge rectifier circuit. The current through the terminal can be positive (NPN mode), or negative (PNP mode).

Here is an example of DI1, The interface circuitry of DI1 ~ DI8 is the same.

1) When host device is relay output:

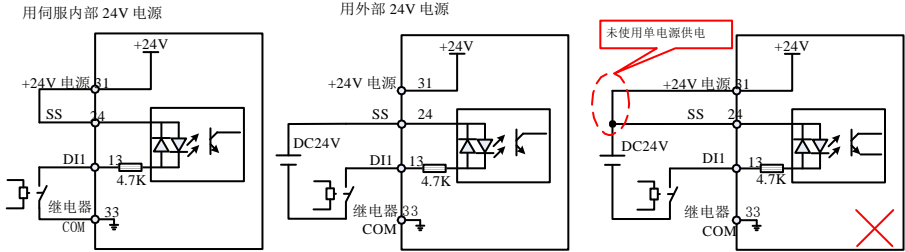


Figure 1-7 Digital input terminal wiring when host device is relay output

Remark: This manual defaults are as followed:

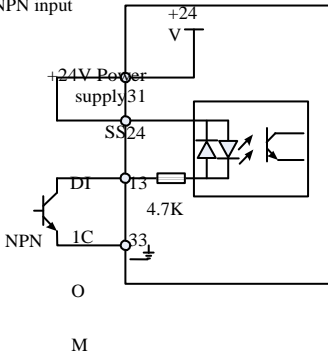
SS terminal use 24 pin, users can also use 9 pin

COM terminal use 33 pin, users can also use 9 pin 34/35 pin

Servo internal +24V use 31 pin, users can also use 9 pin 32 pin

2) When host device is NPN open collector output:

Servo internal 24V power supply Servo drive
NPN input



Servo external 24V power supply Servo drive

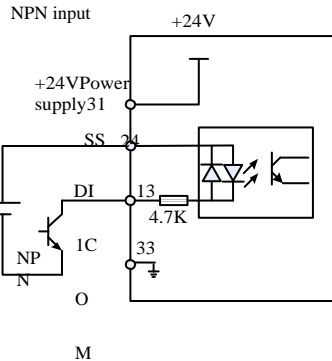


Figure 1-8(a) Digital input terminal wiring when host device is NPN open collector output

3) When host device is PNP open collector
output:

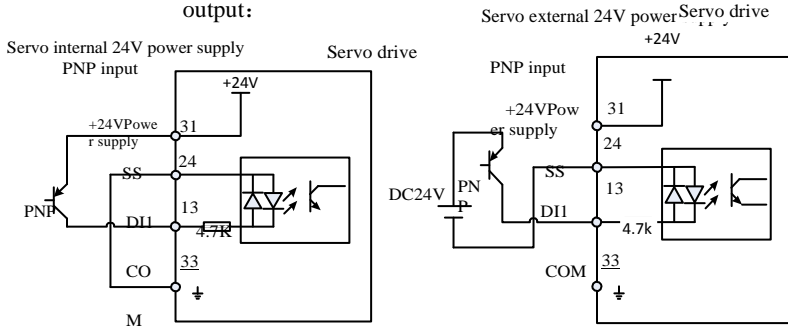


Figure 1-8(b) Digital input terminal wiring when host device is PNP open collector

Remark: output

1、Be sure that the 24V and SS terminals are not connected when using an external powersupply.

2、PNP and NPN input cannot be used mixedly.

1.3.6 Digital output wiring

Here is an example of DO1. The interface circuitry of DO1 ~ DO5 is the same.

1) When host device is relay input:

When using internal power supply

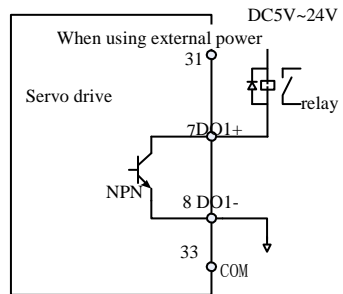
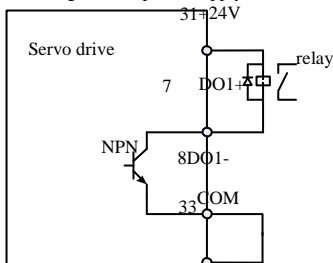


Figure 1-9(a) Correct digital input wiring when host device is relay output

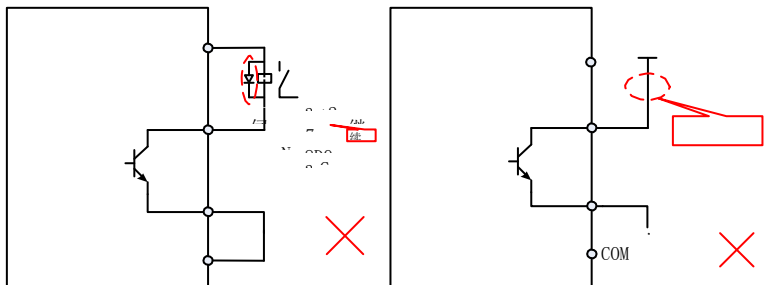


Figure 1-9(b) incorrect digital input wiring when host device is relay output

2) When the host device is optocoupler input

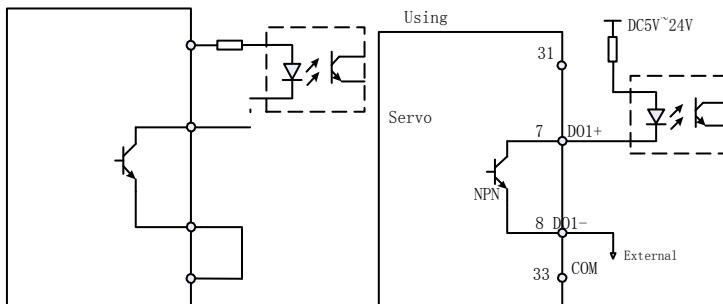


Figure1-10 (a) correct digital input wiring when the host device is optocoupler input

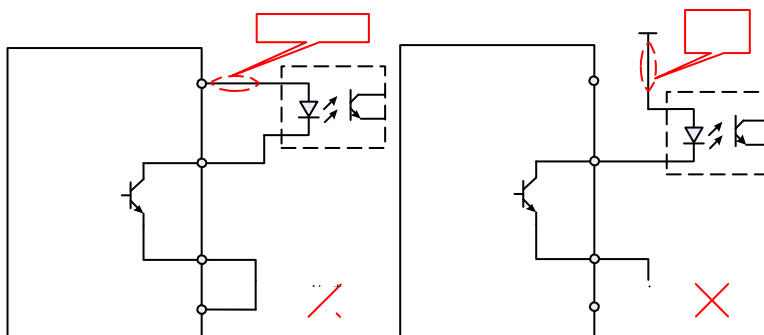


Figure 1-10 (b) incorrect digital input wiring when the host device is optocoupler input

Remark: The maximum allowable voltage, current capacity of servo drive internal optocoupler output circuit is as followed:

Voltage: DC30V(maximum)

Current: DC 50mA (maximum)

If driving the inductive loads (relay, contactor), a surge voltage absorption circuit should be added; such as RC absorption circuit (the leakage current should be less than the holding current of contactor or relay) varistor, or freewheeling diode (for DC circuit, check the polarity during installation). The element of snubber circuit should be closed to the relay or contactor.

1.3.7 Analog input terminal wiring

Table 1-6analog input terminal description

Signal name	Function	Pin	Function describe
Analog	AI1	41	Voltage analog input
	AI2	42	
	AGND	37/38	Analog input ground

V-REF、T-REFgenerally used for speed and torque analog signal input.

Input voltage range: $-10V \sim +10V$, resolution 12 bit;

Maximum allowable voltage: $\pm 12V$;

Input impedance: 10K;

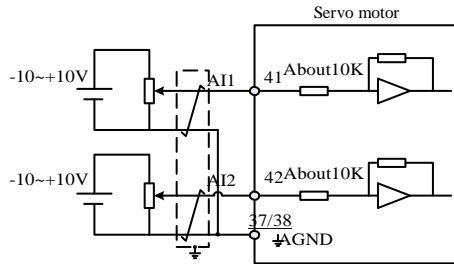


Figure1-11Analog input terminal wiring diagram

1.3.8 Position command input signal

Describe for position command pulse input signal, the instruction symbol input signal terminal of CN2 are as followed.

Table 1-7position pulse input signal specifications

Signal name		Pin	Function		
Position instruction	PULSE+	19	Pulse command input:	Input pulseshape: Direction + pulse A, B phase orthogonal pulse CW/CCW pulse	
	PULSE-	18			
	SIGN+	2			
	SIGN-	1	Differential Input		
			Open collector input		
	PULL-PH	16	External power input interface of command pulse		
	PULL-SH	17			
COM	33	24V power supply ground			

Pulse command can be input by open collector input or differential input. The maximum differentia input pulse wave is 500Kpps, maximum open collector input pulse wave is 200Kpps.

Different forms of command input pulse has different timing parameters, see section table 1-7 and table 1-8 for detail

Table 1-7 different command pulse timing table

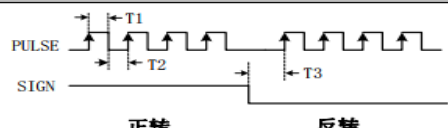
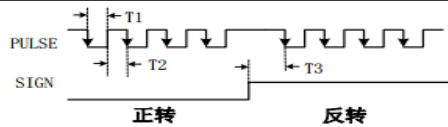
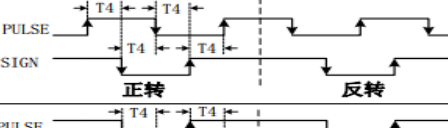
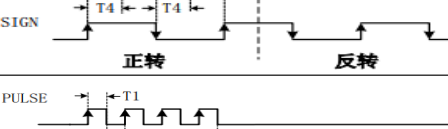
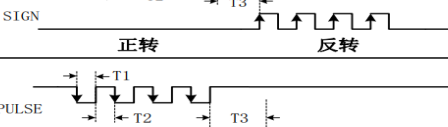
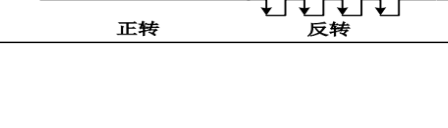
脉冲指令形式	逻辑状态	脉冲波形
脉冲+方向	P1-02=0 正逻辑	 <p>正转 反转</p>
	P1-02=1 负逻辑	 <p>正转 反转</p>
两相正交脉冲 (4 倍频)	P1-02=2 正逻辑	 <p>正转 反转</p>
	P1-02=3 负逻辑	 <p>正转 反转</p>
CCW/CW 脉冲	P1-02=4 正逻辑	 <p>正转 反转</p>
	P1-02=5 负逻辑	 <p>正转 反转</p>

Table 1-8 Pulse input time parameter

Pulse mode	Maximum input frequency	The minimum allowable width				Voltage
		T1	T2	T3	T4	
Differential	500Kpps	1us	1us	2us	0.5us	5V
Open collector	200Kpps	2.5us	2.5us	5us	1.25us	24V(MAX)

1.3.8.1 Position instruction pulse differential input mode

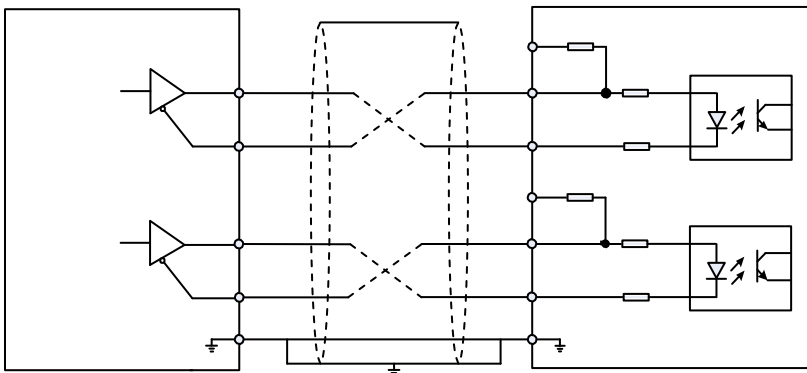


Figure 1-12 Position instruction pulse differential input mode wiring

Please ensure " $2.8V \leq (H \text{ level} - L \text{ level}) \leq 3.7V$ ", otherwise the servo drive input pulse will be unstable. It will result in the following situations:

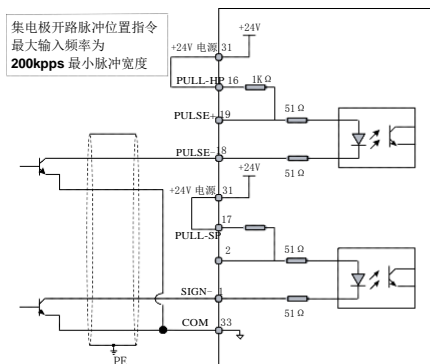
Missing pulse when enter instruction pulse.

The instruction is opposite when enter instruction direction

1.3.8.2 Position instruction pulse differential input mode Instruction direction

When using the servo internal 24V power supply

使用伺服驱动器内部 24V 电源 NPN 接法 伺服驱动器



使用伺服驱动器内部 24V 电源 PNP 接法 伺服驱动器

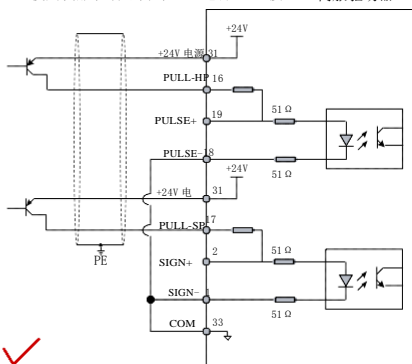


Figure 1-13 open collector pulse input command wiring diagram (using the servo internal 24V)

When using the servo external 24V power supply

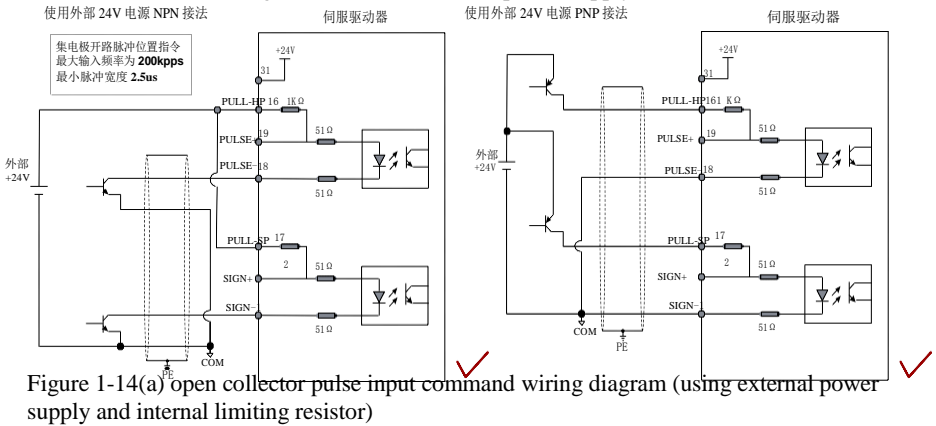


Figure 1-14(a) open collector pulse input command wiring diagram (using external power supply and internal limiting resistor)

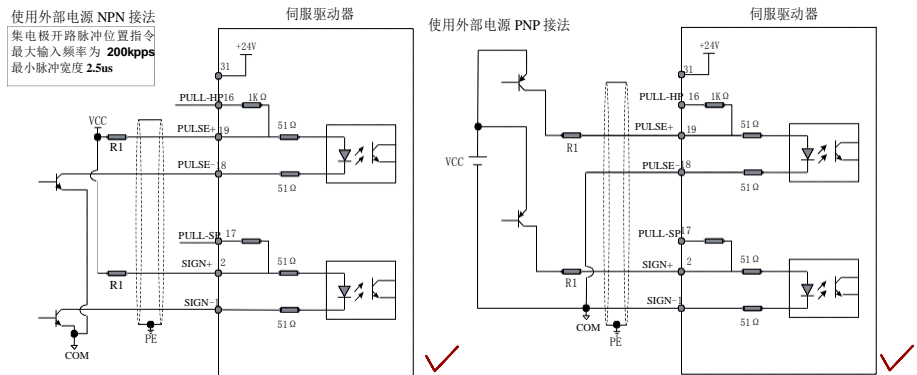


Figure 1-14(b) open collector pulse input command wiring diagram (using external power supply and external limiting resistor)

Selection of limit resistor

R1 is as follows:

$$R1 = \frac{V_{CC}}{5} \times 1.1 \times 10mA$$

The selection of resistor R1

is satisfied:

$$R1 \geq 200$$

Recommended resistance for R1:

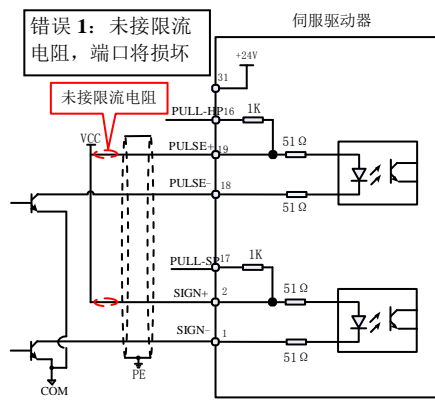
VCC voltage	R1 resistance	R1 power
24V	2.0K	0.5W
12V	0.8K	0.5W

Remark:

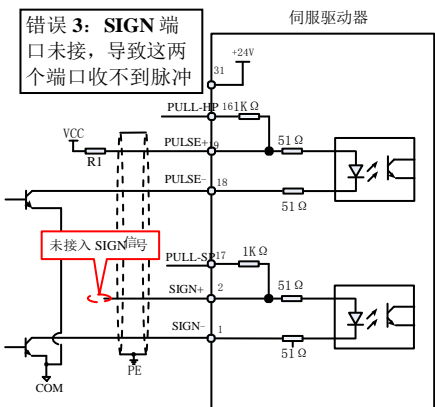
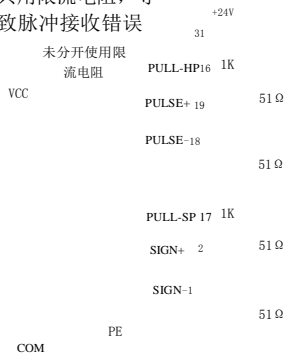
- 1) Make sure a pair of differential signals is connected with a twisted two cable
- 2) Encoder cable routing must be separated from the power cable routing by at least 30cm or more.

- 3) **The pulse input interface is not shielded input interface. In order to reduce noise, we recommend the ground output signal of the uppercomputer the ground output signal of the servo drive should be connected together.**

Examples of typical wrong wiring



**错误 2: 多个端口
共用限流电阻, 导
致脉冲接收错误**



**错误 4: 端口接
错, 导致端口烧损**

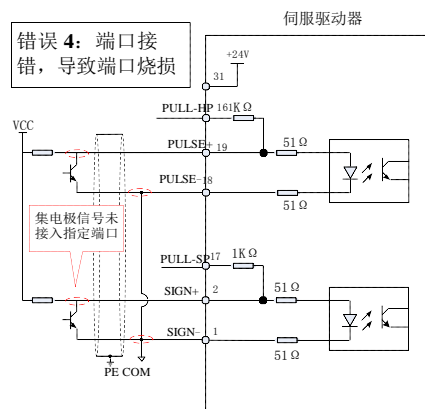


Figure 1-15 4 typical wiring errors

1.3.9 Encoder signal output circuit

Table 1-9 Encoder output signal description

Signal name	Pin	Function	
OA+	44	A Phase output signal	A,B orthogonal frequency pulse output signal
OA-	43		
OB+	15	B Phase output signal	
OB-	30		
OZ+	29	Z Phase output signal	Origin pulse output signal
OZ-	14		

Encoder circuit output differential signals by a differential drive. Generally, it will provide a feedback signal when the drive and the host device constituting the position control system. In the upper computer device, please use a differential or optocoupler receive. The maximum output current is 20mA.

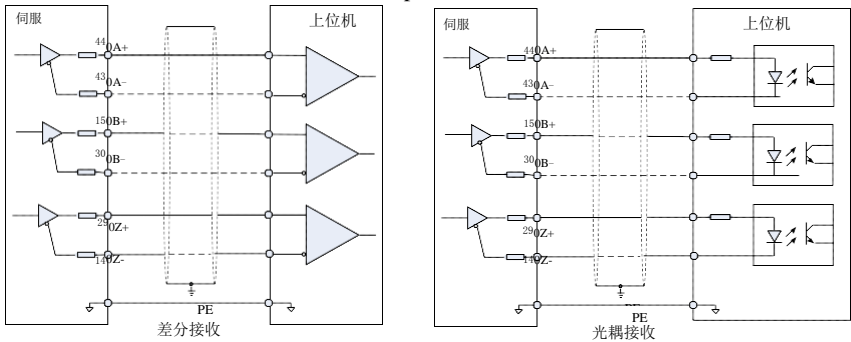


Figure 1-16 frequency division output wiring diagram

Remark: Be sure that the signal ground of the upper computer should be connected with the COM of the driver, and shielded twisted-pair cables should be used to reduce noise. The maximum withstand voltage of drive internal transistor is DC 30V, and the maximum allowable input current is 40mA.

1.4 CN3 communication terminal wiring

Drive is connected with the upper computer by CN3. Users can operate the drive by MODBUS communication, RS485 can support multiple drives simultaneously online.

Table 1-10 Communication Connector Pin Description

Signal name	Pin	Function
S+	5	RS485 communication port 1
S-	4	
CANL	8	CAN bus (not opened)
CANH	9	
GND	1	Power ground

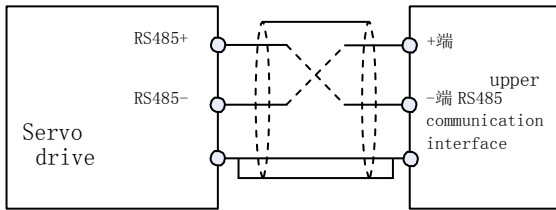
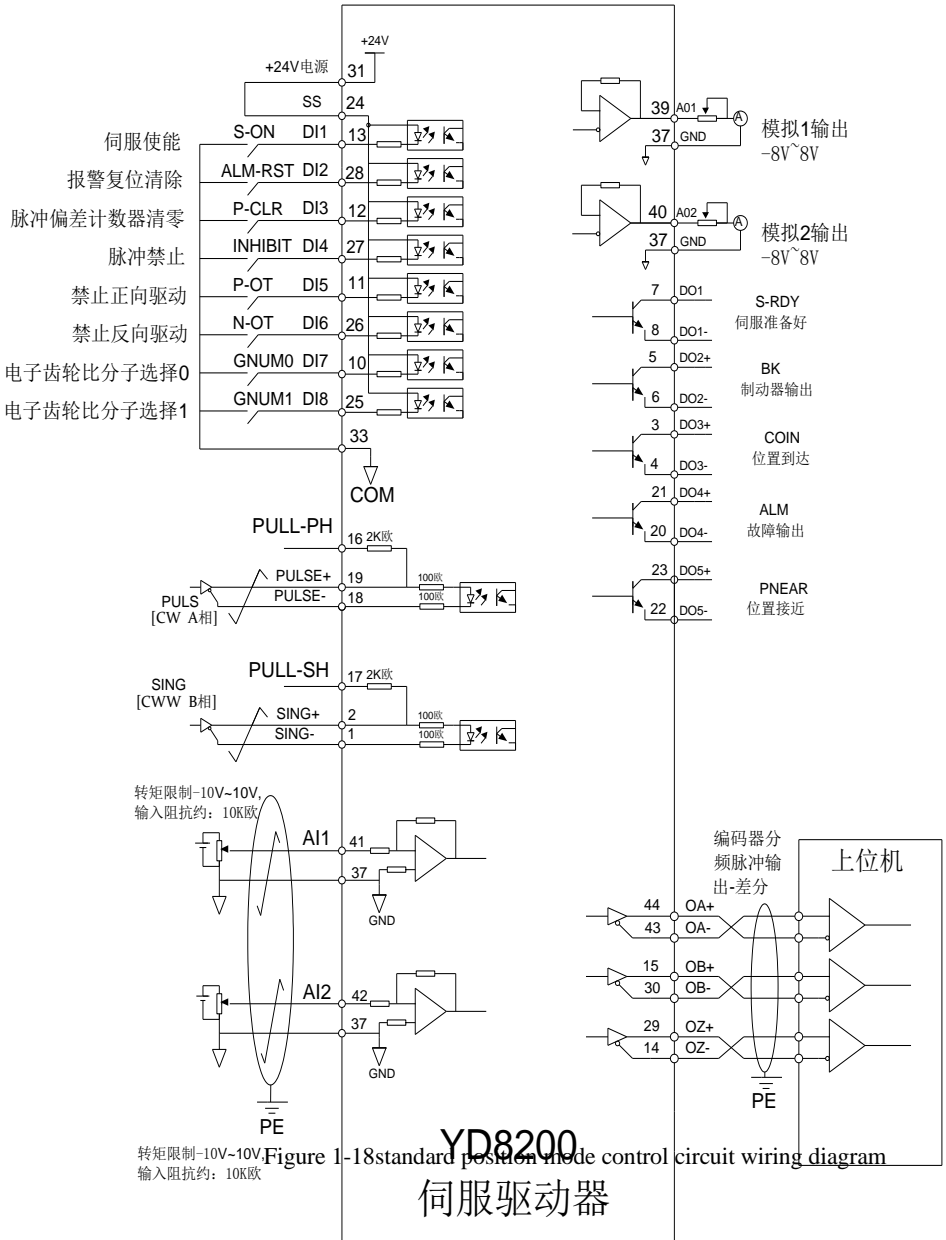


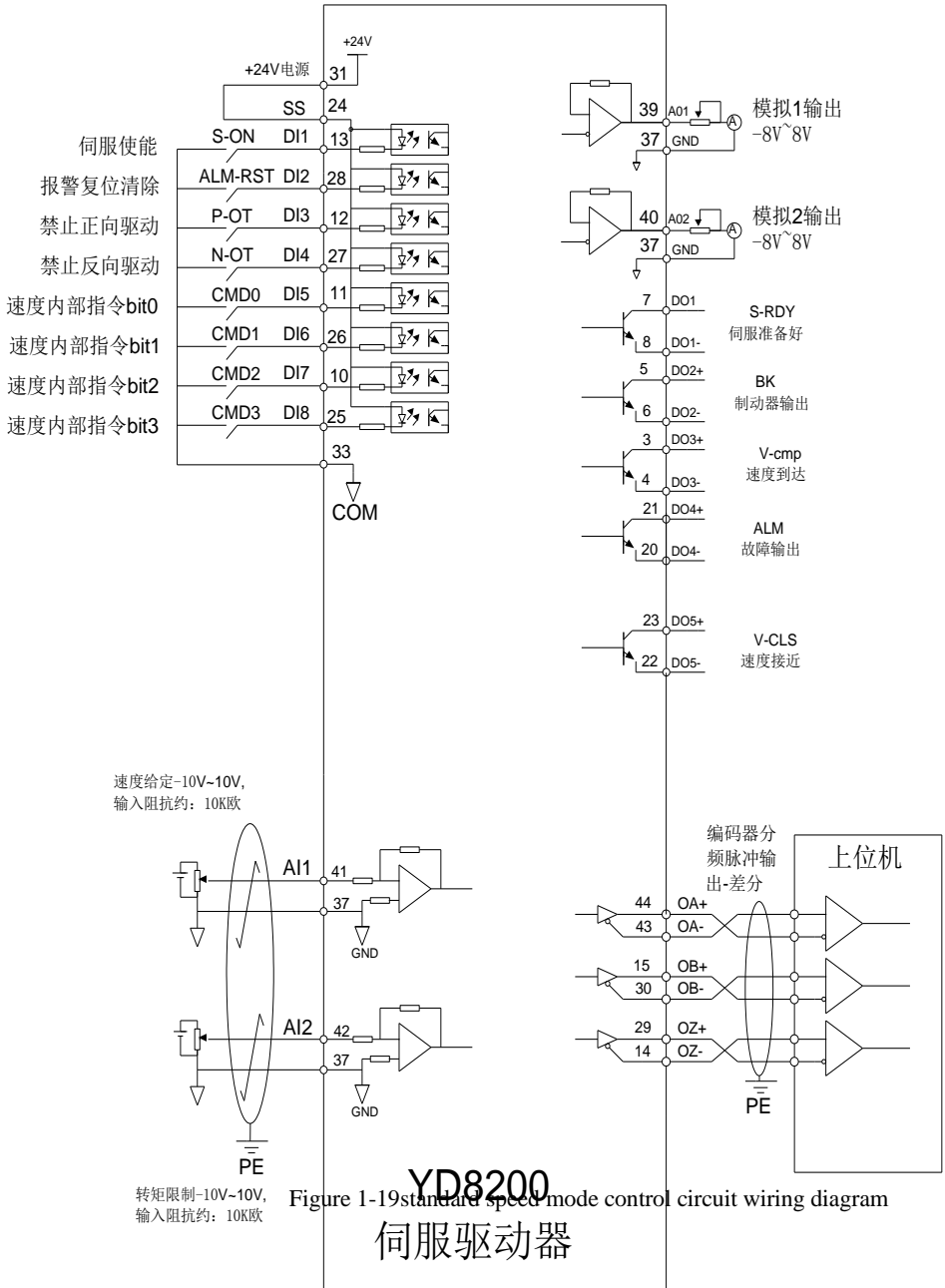
Figure 1-17 Communication terminal wiring diagram

1.5 Standard wiring diagram for control circuit

1.5.1 Position control mode standard wiring diagram



1.5.2 Speed Control Mode Standard Wiring Diagram



1.5.3 Torque Control Mode Standard Wiring Diagram

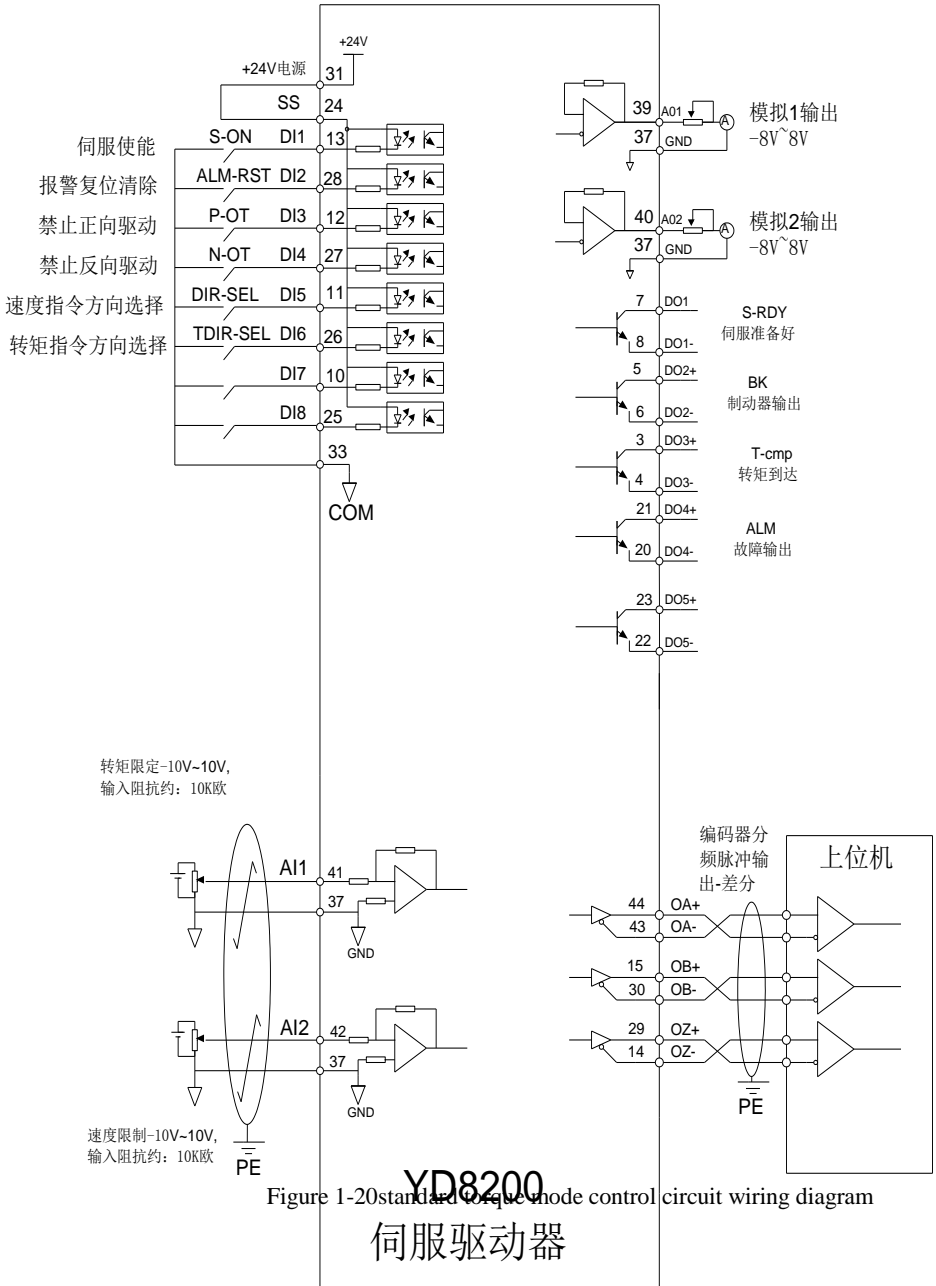


Figure 1-20 standard torque mode control circuit wiring diagram

Charter 2 Display and operation

2.1 Display and key operation

Exterior

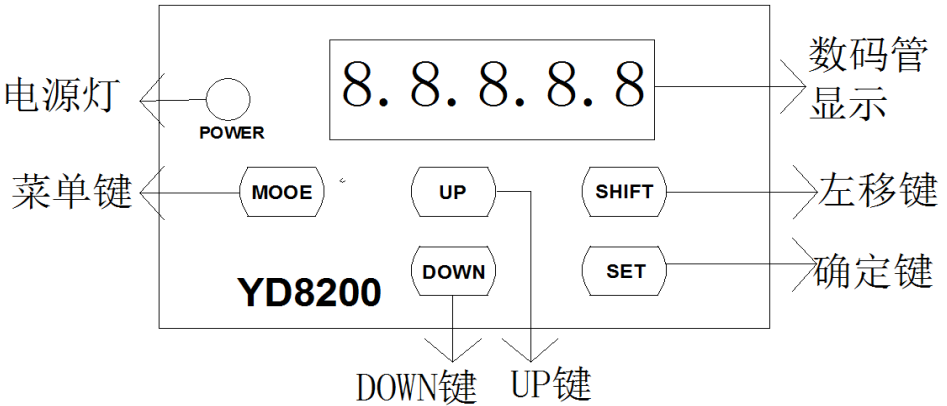


Figure 2-1 Panel operation flow

2.2 Display and operation mode

There are 5 display and operation mode for YD8200 servo drive

Component	Name	Function
Digital display tube	Indicator	Five groups of seven-segment LED digital tubes are used to display monitoring values, parameter values and set values
MODE	MODE Key	Enter or exit parameter group selection mode
SHIFT	Shift key	To correct higher character values by left shift in setting mode
UP	UP Key	Change parameter code, group code, parameter code or setting value
DOWN	DOWN Key	Change parameter code, group code, parameter code or setting value
SET	SET Key	Setting display and storage, Entry intergroup mode or parameter setting mode

2.3 Parameter setting Description

- 1) When the drive is powered on, the digital tube display the default monitor code for one second, then work in monitor mode.
- 2) In monitor mode, pressing UP or DOWN key to change the monitored parameter code, then press the SET key to monitor selected parameter code. If there is no key operation, it will monitor selected parameter code automatically after one minute.
- 3) In monitor mode, pressing MODE key to entry parameter group selection mode, then press UP/DOWN key to change parameter group, press MODE key to exit parameter group

selection mode and back to monitor mode.

- 4) In parameter code selection mode, pressing UP or DOWN key can change the value of last two code to change parameter code, then press the SET key immediately to enter the parameter setting mode and display the value of the parameter code.
- 5) In the parameter setting mode, use UP / DOWN key to set parameter. When pressing left key the blinking character will shift left, it is easy and quickly to modify the value of the parameter high bit.
- 6) After setting the value, press SET key to store or execute a command.

Charter 3 Running and debugging

Before connecting the load, according to the commands in this manual, make sure that the motor running normally, then you can connect themotor with load.Usually a servo drive can be put into using after the following tests.

- 1) Wiring, checking.
- 2) Drive power on, adjust the parameters.
- 3) No-load running.
- 4) Control function debugging.

Strongly recommended: please make sure that the motor running normally without load at first, then connect the motor with load to avoid unnecessary danger!

3.1 Drive power on

3.1.1 Before power on

- 1) Check whether drive and motor are matched (check their specifications).
- 2) R,S,T and U,V,W,cannot connect conversely, and check whether these terminals are loose.
- 3) U, V, W of the motor must be correctly connected to the U, V, W of the drive.
- 4) Check whether the input voltage is corresponding with the nameplate or panel of drive.
- 5) Encoder terminal should be connected correctly.
- 6) The servo motor and driver should be well grounded.

3.1.2 Power-on timing

- 1) Please refer to Chapter 3 to ensure correct power-on timing.

3.2 Trial running

3.2.1 Parameters setting

Parameter	Name
P8-02	JOG function open
P8-03	JOG speed setting

Cancel the servo enable, and then enter the JOG mode to operate in the following diagram.

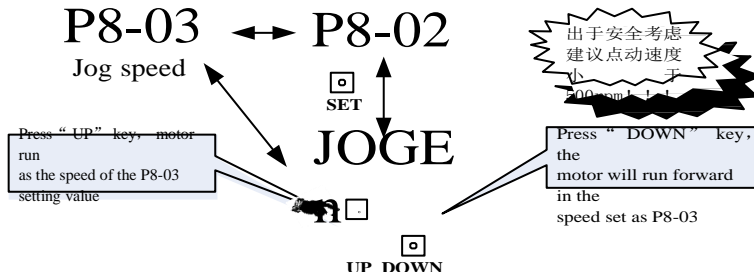


Figure 3-1JOG Operation

If the motor runs normally then you can do next step.If they did not run normally, please check the system wiring, including UVW phase sequence of motor control wiring, the encoder wiring. Repeat the above steps. If it still cannot run normally, please contact the manufacturer to solve it.

Charter 4 Function Parameters

4.1 Function parameters define

Function parameters are divided into the following 9 groups. The first code after starting code P is the group number. The next twoparameters is the group internal number.

The address is consisted of the group parameters and group internal parameters. 功能参数

The functionalgroups are defined as follows:

- P0-xx group: Monitoring parameters
- P1-xx group: Basic parameters
- P2-xx group: Internal multisegment position control parameters
- P3-xx group: Internal multi segment speed control parameters
- P4-xx group: Torque control parameters
- P5-xx group: Gain tuning parameters
- P6-xx group: Input / output setting parameters
- P7-xx group: Communication parameters
- P8-xx group: Auxiliary function parameters
- P9-xx group: Origin return function parameters

Function parameter set attribute description:

- (○): Set at any time, take effect immediately
- (●): Set at any time, take effect when repower
- (☆): Set at any time, take effect when repower
- (□): Set when stop, take effect immediately
- (■): Set when stop, take effect when repower
- (▲): Read only, cannot set

Control mode description:

- P—Position control mode
- S—Speed control mode
- T—Torque control mode

4.2 Function parameter list

4.2.1 P0 group-Monitoring parameters

Param eters	Function	Initial value	Unit	Applica ble control mode			Pr op er ty	Communicatio n Address
				P	S	T		
P0-00	Low 16 bit real time position of motor single circle	0	ppr	√	√	√	▲	0000H
P0-01	High 16 bit real time position of motor single circle	0	ppr	√	√	√	▲	0001H
P0-02	Motor multi circle position value	0	rpm	√	√	√	▲	0002H
P0-03	Motor speed	0	rpm	√	√	√	▲	0003H
P0-04	Output torque	0	%	√	√	√	▲	0004H
P0-05	Current electric angle	0	°	√	√	√	▲	0005H
P0-06	Bus voltage value	0	V	√	√	√	▲	0006H
P0-07	Effective current value	0	A	√	√	√	▲	0007H
P0-08	DI input status (hexadecimal display)	0	-	√	√	√	▲	0008H
P0-09	DOoutput status (hexadecimal display)	0	-	√	√	√	▲	0009H
P0-10	Pulse deviation	0	ppr	√			▲	000AH
P0-11	Total collected external pulse	0	ppr	√			▲	000BH
P0-12	Total collected external circles	0	rev	√			▲	000CH
P0-13	Not used	0	-	√	√	√	▲	000DH
P0-14	Not used	0	-	√	√	√	▲	000EH
P0-15	AI1 voltage value	0	V	√	√	√	▲	000FH
P0-16	AI2 voltage value	0	V	√	√	√	▲	0010H
P0-17	Driver temperature	0	°C	√	√	√	▲	0011H
P0-18	Software version number	-	-	√	√	√	▲	0012H
P0-19	Display P1 -45 faultcodes	-	-	√	√	√	▲	0013H
P0-20	Speed when P1 -45 failure occurs	0	rpm	√	√	√	▲	0014H
P0-21	Bus voltage when P1 -45 fault occurs	0	V	√	√	√	▲	0015H
P0-22	Effective current when P1 -60 fault occurs	0	A	√	√	√	▲	0016H
P0-23	Low 16 bit of motor feedback pulsesnumber	0	ppr	√	√	√	▲	0017H
P0-24	High 16 bit of motor feedback pulsesnumber	0	ppr	√	√	√	▲	0018H
P0-25 ~ P0-29	Not used	0	-	√	√	√	▲	0019H ~ 001DH

4.2.2 P1 group - Basic control parameters

Param eters	Function	Initial value	Unit	Applica ble control mode			Pr op er ty	Commun ica tion address
				P	S	T		
P1-00	Control mode selection: 0- Speed control mode 1- Position control mode 2- Torque control mode 3- Speed position switching mode 4- Torque speed switching mode 5- Position torque switching mode	1	-	√	√	√	□	0100H
P1-01	Position command source selection: 0-external pulse command (Pt) 1-internal multiple command(Princrement) 2-internal multiple command(Pr absolute formula)	0	-	√			□	0101H
P1-02	External pulse command input form: 0-Pulse + direction, positive logic 1-Pulse + direction, negative logic 2-Two phase orthogonal pulse (4timesof frequency), positive logic 3-Two phase orthogonal pulse (4timesof frequency), negative logic 4-CCW/CW pulse, positive logic 5-CCW/CW pulse, negative logic	0	-	√			■	0102H
P1-03	Multi-segment positioncommandexecution mode 0-From pr1 to pr16, cycle 1-From pr1 to pr16, not cycle DI terminal CTRG can trigger cycle again 2-ExternalDI multi-segment speed switch,DI terminal CTRG effectively switchable	0	-	√			□	0103H

Parameters	Function	Initial value	Unit	Applicable control mode			Property	Communication address
				P	S	T		
P1-04	Speed command source: 0-Internal digital given (P3-00 given) 1-Analog quantity 1 given(AI1) 2-Analog quantity 2 given(AI2) 3-Not used 4-Internal speedcommand switch 5-Point running (should make external JOG DI enable)	0	-		√		<input type="checkbox"/>	0104H
P1-05	Multi section speed command execution mode 0-Multi section speed automatic switching, cycle 1-Multi section speed automatic switch,not cycleDI terminal efficiency can be started again 2-Multi section speed external DI terminal switch	0	-		√		<input type="checkbox"/>	0105H
P1-06	Torque command source 0-Internal digital given (given byP4-00) 1-Analog value 1 given (AI1) 2-Analog value 2 given (AI2) 3-Not used	0	-			√	<input type="checkbox"/>	0106H
P1-07	Internal position command acceleration time T_{PACC}	100	ms	√			<input type="checkbox"/>	0107H
P1-08	Internal position command deceleration time T_{PDEC}	100	ms	√			<input type="checkbox"/>	0108H
P1-09	Internal position command S curvesmoothing time,whole linear acceleration and deceleration while T_{PL} is 0	10	ms	√			<input type="checkbox"/>	0109H
P1-10	External pulse command smoothingfilter time constant	0	ms	√			<input type="checkbox"/>	010AH
P1-11	Speed command acceleration time T_{SACC}	200	ms		√		<input type="checkbox"/>	010BH
P1-12	Speed command deceleration time T_{SDEC}	200	ms		√		<input type="checkbox"/>	010CH
P1-13	Speed command S curve smoothingtime whole linear acceleration and deceleration while T_{PL} is 0	50	ms		√		<input type="checkbox"/>	010DH

Parameters	Function	Initial value	Unit	Applicable control mode			Property	Communication address
				P	S	T		
P1-14	Speed command low-pass filter smoothing filter time constant	0	ms		√		□	010EH
P1-15	Analog speed command gain speed command=input voltage *VCM/10	3000	rpm		√		□	010FH
P1-16	Torque command low-pass smoothing constant	0	ms			√	□	0110H
P1-17	Analog torque command gain	100	%			√	□	0111H
P1-18	Electronic gear molecular 1	1	-	√			○	0112H
P1-19	Electronic gear denominator	1	-	√			○	0113H
P1-20	Electronic gear molecular 2	1	-	√			○	0114H
P1-21	Electronic gear molecular 3	1	-	√			○	0115H
P1-22	Electronic gear molecular 4	1	-	√			○	0116H
P1-23	Position approaching width	20	ppr	√			□	0117H
P1-24	Position complete width	10	ppr	√			□	0118H
P1-25	Action selection to remove position deviation by external DI signal 0-By high level of P-CLR 1-By falling edge of P-CLR 2-By rising edge of P-CLR 3-By low level of P-CLR	1	-	√			□	0119H
P1-26	Automatic selection of position deviation: 0-Automatically remove deviation when fault occurs or servo cancelable 1-Automatically remove deviation only when fault occurs 2-No automatically remove deviation	0	-	√			□	011AH
P1-27	Alarm threshold of position following deviation	65535	ppr	√			○	011BH
P1-28	Fault threshold of position following deviation	65535	ppr	√			○	011CH
P1-29	position deviation frequency doubling factor Deviation threshold=(P1-27/28)*P1-29	5	-	√			○	011DH
P1-30	Maximum speed setting	5000	rpm	√	√	√	□	011EH
P1-31	Zero speed signal output value	10	rpm	√	√	√	□	011FH
P1-32	Rotation signal output value	10	rpm	√	√	√	□	0120H
P1-33	Speed approaching threshold	100	rpm		√		□	0121H

Parameters	Function	Initial value	Unit	Applicable control mode			Property	Communication address
				P	S	T		
P1-34	Speed reach threshold	20	rpm		√		□	0122H
P1-35	Zero fixed value of analog speedcommand	10	rpm		√		□	0123H
P1-36	Forward maximum torque limit	300	%	√	√	√	○	0124H
P1-37	Reverse maximum torque limit	300	%	√	√	√	○	0125H
P1-38	Torque limit source selection 0-Internal limit(P1-36/P1-37) 1-Analog 1 limit, while limited by P1 -36, P1 -37 2-Analog 2 limit, while limited byP1-36 和 P1-37	0	-	√	√	√	□	0126H
P1-39	Torque reach threshold	2.0	%			√	□	0127H
P1-40	Stop mode selection 0-When servo OFF, free stopping 1-When servo OFF, stopping at zero speed	0	-	√	√	√	□	0128H
P1-41	Delay time of Servo ON-receive command	0	ms	√	√	√	○	0129H
P1-42	Delay Time of Servo OFF-brakingcommand	0	ms	√	√	√	○	012AH
P1-43	Closing speed of Servo OFF-braking command	100	rpm	√	√	√	○	012BH
P1-44	Internal position command completes output delay	0	ms	√			○	012CH
P1-45	Fault display options 0-The last fault 1-Before the latest fault 2-2 times before the latest fault 3-3 times before the latest fault	0	-	√	√	√	○	012DH
P1-46	System parameter initialization 0-No operation 1-Resume factory setting value 2-Clear the historical record	0	-	√	√	√	■	012EH
P1-47	User password	0	-	√	√	√	○	012FH
P1-48	Not used	0	-	√	√	√	○	0130H
P1-49	Switch selection of low frequency suppression	0	-	√	√		○	0131H
P1-50	Low frequency jitter suppression frequency	10.0	Hz	√	√		○	0132H
P1-51	Low frequency jitter damping coefficient	25	-	√	√		○	0133H
P1-52	Notch 1 frequency	4000	Hz	√	√	√	○	0134H

Parameters	Function	Initial value	Unit	Applicable control mode			Property	Communication address
				P	S	T		
P1-53	Notch 1 depth	1	-	√	√	√	○	0135H
P1-54	Notch 2 frequency	4000	Hz	√	√	√	○	0136H
P1-55	Notch 2 depth	1	-	√	√	√	○	0137H
P1-56	External pulse input filter width	2	20ns	√			○	0138H
P1-57	Motor pulse frequency division output	2500	ppr	√	√	√	○	0139H
P1-58	Z Pulse output width	1	500us	√	√	√	○	013AH
P1-59 ~ P1-63	Not used	0	-	√	√	√	○	013BH ~ 013FH

4.2.3 P2 group - Multi-position control parameters

Parameters	Function	Initial value	unit	Applicable control mode			Property	Communication address
				P	S	T		
P2-00	pulse cycle number of internal position command 1	1	rev	√			□	0200H
P2-01	pulse number of internal position command 1	0	ppr	√			□	0201H
P2-02	Moving speed of internal positioncommand 1	1000	rpm	√			□	0202H
P2-03	Waiting time after the completionofinternal position command 1	1.0	s	√			□	0203H
P2-04	pulse cycle number of internal position command 2	1	rev	√			□	0204H
P2-05	pulse number of internal position command 2	0	ppr	√			□	0205H
P2-06	Moving speed of internal positioncommand 2	1000	rpm	√			□	0206H
P2-07	Waiting time after the completionofinternal position command 2	1.0	s	√			□	0207H
P2-08	pulse cycle number of internal position command 3	0	rev	√			□	0208H
P2-09	pulse number of internal position command 3	0	ppr	√			□	0209H
P2-10	Moving speed of internal positioncommand 3	1000	rpm	√			□	020AH

Parameter s	Function	Initial valu e	unit	Applicable control mode			Property	Communication address
				P	S	T		
P2-11	Waiting time after the completion of internal position command 3	0	s	√			□	020BH
P2-12	pulse cycle number of internal position command 4	0	rev	√			□	020CH
P2-13	pulse number of internal position command 4	0	ppr	√			□	020DH
P2-14	Moving speed of internal position command 4	1000	rpm	√			□	020EH
P2-15	Waiting time after the completion of internal position command 4	0	s	√			□	020FH
P2-16	pulse cycle number of internal position command 5	0	rev	√			□	0210H
P2-17	pulse number of internal position command 5	0	ppr	√			□	0211H
P2-18	Moving speed of internal position command 5	1000	rpm	√			□	0212H
P2-19	Waiting time after the completion of internal position command 5	0	s	√			□	0213H
P2-20	pulse cycle number of internal position command 6	0	rev	√			□	0214H
P2-21	pulse number of internal position command 6	0	ppr	√			□	0215H
P2-22	Moving speed of internal position command 6	1000	rpm	√			□	0216H
P2-23	Waiting time after the completion of internal position command 6	0	s	√			□	0217H
P2-24	pulse cycle number of internal position command 7	0	rev	√			□	0218H
P2-25	pulse number of internal position command 7	0	ppr	√			□	0219H
P2-26	Moving speed of internal position command 7	1000	rpm	√			□	021AH
P2-27	Waiting time after the completion of internal position command 7	0	s	√			□	021BH
P2-28	pulse cycle number of internal position command 8	0	rev	√			□	021CH
P2-29	pulse number of internal position command 8	0	ppr	√			□	021DH

Parameters	Function	Initial value	unit	Applicable control mode			Property	Communication address
				P	S	T		
P2-30	Moving speed of internal position command 8	1000	rpm	√			□	021EH
P2-31	Waiting time after the completion of internal position command 8	0	s	√			□	021FH
P2-32	pulse cycle number of internal position command 9	0	rev	√			□	0220H
P2-33	pulse number of internal position command 9	0	ppr	√			□	0221H
P2-34	Moving speed of internal position command 9	1000	rpm	√			□	0222H
P2-35	Waiting time after the completion of internal position command 9	0	s	√			□	0223H
P2-36	pulse cycle number of internal position command 10	0	rev	√			□	0224H
P2-37	pulse number of internal position command 10	0	ppr	√			□	0225H
P2-38	Moving speed of internal position command 10	1000	rpm	√			□	0226H
P2-39	Waiting time after the completion of internal position command 10	0	s	√			□	0227H
P2-40	pulse cycle number of internal position command 11	0	rev	√			□	0228H
P2-41	pulse number of internal position command 11	0	ppr	√			□	0229H
P2-42	Moving speed of internal position command 11	1000	rpm	√			□	022AH
P2-43	Waiting time after the completion of internal position command 11	0	s	√			□	022BH
P2-44	pulse cycle number of internal position command 12	0	rev	√			□	022CH
P2-45	pulse number of internal position command 12	0	ppr	√			□	022DH
P2-46	Moving speed of internal position command 12	1000	rpm	√			□	022EH
P2-47	Waiting time after the completion of internal position command 12	0	s	√			□	022FH
P2-48	pulse cycle number of internal position command 13	0	rev	√			□	0230H

Parameter s	Function	Initial valu e	unit	Applicable control mode			Pro pert y	Commu nication address
				P	S	T		
P2-49	pulse number of internal position command 13	0	ppr	√			□	0231H
P2-50	Moving speed of internal position command 13	1000	rpm	√			□	0232H
P2-51	Waiting time after the completion of internal position command 13	0	s	√			□	0233H
P2-52	pulse cycle number of internal position command 14	0	rev	√			□	0234H
P2-53	pulse number of internal position command 14	0	ppr	√			□	0235H
P2-54	Moving speed of internal position command 14	1000	rpm	√			□	0236H
P2-55	Waiting time after the completion of internal position command 14	0	s	√			□	0237H
P2-56	pulse cycle number of internal position command 15	0	rev	√			□	0238H
P2-57	pulse number of internal position command 15	0	ppr	√			□	0239H
P2-58	Moving speed of internal position command 15	1000	rpm	√			□	023AH
P2-59	Waiting time after the completion of internal position command 15	0	s	√			□	023BH
P2-60	pulse cycle number of internal position command 16	0	rev	√			□	023CH
P2-61	pulse number of internal position command 16	0	ppr	√			□	023DH
P2-62	Moving speed of internal position command 16	1000	rpm	√			□	023EH
P2-63	Waiting time after the completion of internal position command 16	0	s	√			□	023FH

4.2.4 P3 group- Multi section speed control parameters

Parameter s	Function	Initial valu e	Unit	Applicable control mode			Pro pert y	Commu nication address
				P	S	T		
P3-00	Internal speed command register1	400	rpm		√		○	0300H

Parameter s	Function	Initial valu e	Unit	Applicable control mode			Pro pert y	Commu nication address
				P	S	T		
P3-01	Internal speed command 1 running time	1.0	s		√		□	0301H
P3-02	Internal speed command register2	0	rpm		√		○	0302H
P3-03	Internal speed command 2 running time	1.0	s		√		□	0303H
P3-04	Internal speed command register 3	0	rpm		√		○	0304H
P3-05	Internal speed command 3 running time	1.0	s		√		□	0305H
P3-06	Internal speed command register 4	0	rpm		√		○	0306H
P3-07	Internal speed command 4 running time	1.0	s		√		□	0307H
P3-08	Internal speed command register 5	0	rpm		√		○	0308H
P3-09	Internal speed command 5 running time	1.0	s		√		□	0309H
P3-10	Internal speed command register 6	0	rpm		√		○	030AH
P3-11	Internal speed command 6 running time	1.0	s		√		□	030BH
P3-12	Internal speed command register 7	0	rpm		√		○	030CH
P3-13	Internal speed command 7 running time	1.0	s		√		□	030DH
P3-14	Internal speed command register 8	0	rpm		√		○	030EH
P3-15	Internal speed command 8 running time	1.0	s		√		□	030FH
P3-16	Internal speed command register 9	0	rpm		√		○	0310H
P3-17	Internal speed command 9 running time	1.0	s		√		□	0311H
P3-18	Internal speed command register 10	0	rpm		√		○	0312H
P3-19	Internal speed command 10 running time	1.0	s		√		□	0313H
P3-20	Internal speed command register 11	0	rpm		√		○	0314H
P3-21	Internal speed command 11 running time	1.0	s		√		□	0315H
P3-22	Internal speed command register 12	0	rpm		√		○	0316H

Parameter s	Function	Initial valu e	Unit	Applicable control mode			Pro pert y	Commu nication address
				P	S	T		
P3-23	Internal speed command 12 running time	1.0	s		√		□	0317H
P3-24	Internal speed command register 13	0	rpm		√		○	0318H
P3-25	Internal speed command 13 running time	1.0	s		√		□	0319H
P3-26	Internal speed command register 14	0	rpm		√		○	031AH
P3-27	Internal speed command 14 running time	1.0	s		√		□	031BH
P3-28	Internal speed command register 15	0	rpm		√		○	031CH
P3-29	Internal speed command 15 running time	1.0	s		√		□	031DH
P3-30	Internal speed command register 16	0	rpm		√		○	031EH
P3-31	Internal speed command 16 running time	1.0	s		√		□	031FH

4.2.5 P4 group- Multi-torque control parameters

Parameter s	Function	Initial valu e	Unit	Applicable control mode			Pro pert y	Commu nication Address
				P	S	T		
P4-00	Internal digital torque command given	100	%			√	○	0400H
P4-01	Speed limit of torque control	1000	rpm			√	○	0401H
P4-02	Torque speed limit command Source 0-P4-01 given 1-Analog 1 given 2-Analog 2 given	0	-			√	□	0402H
P4-03	Torque speed limit command gain	3000	rpm			√	○	0403H
P4-04	Torque command compensation	0	rpm			√	○	0404H
P4-05 ~ P4-11	Not used	0	-			√	○	0405H ~ 040BH

4.2.6 P5 group- Gain tuning parameters

Parameter s	Function	Initial valu e	Unit	Applicable control mode			Pro pert y	Commu nication Address
				P	S	T		
P5-00	High speed position regulator proportionalgain	30.0	Hz	√	√	√	○	0500H
P5-01	Low speed position regulator proportionalgain	80.0	Hz	√	√	√	○	0501H
P5-02	Front position regulator feedforward gain	0	%	√	√	√	○	0502H
P5-03	Position feedforward smoothing time	5	Ms	√	√	√	○	0503H
P5-04	High speed regulator proportional gain	200.0	Hz	√	√	√	○	0504H
P5-05	High speed regulator integration timeconstant	15.0	ms	√	√	√	○	0505H
P5-06	Low speed regulator proportional gain	200.0	Hz	√	√	√	○	0506H
P5-07	Low speed regulator integration timeconstant	15.0	ms	√	√	√	○	0507H
P5-08	Speed regulator feedforward gain	0	%	√	√	√	○	0508H
P5-09	Speed feedforward smoothing time	5	Ms	√	√	√	○	0509H
P5-10	High-low speed PI switch condition selection 0-Invalid (default high-speed PI parameter) 1-External DI terminal GAINSWL switch 2-position deviation less than P5-11 parameter 3-Rotation speed less than P5- 11 parameter	0	-	√	√	√	□	050AH
P5-11	High-low speed PI switch time constant	30	ms	√	√	√	○	050BH
P5-12	High-low speed PI switch condition	10000	ppr/r pm	√	√	√	○	050CH
P5-13	Load inertia ratio	1.00	-	√	√	√	□	050DH
P5-14	Not used	0	-	√	√	√	○	050EH

4.2.7 P6 group- Digital input (DI) / output (DO) parameters

Para meter s	Function	Initi al valu e	Unit	Applicable control mode			Pro pert y	Commu nication Address
				P	S	T		

Parameter s	Function	Initial value	Unit	Applicable control mode			Property	Communication Address
				P	S	T		
P6-00	DI filter time	10	ms	√	√	√	○	0600H
P6-01	DI level logic(DI1-DI5) 0-Low level valid 1-High level valid	00000	-	√	√	√	○	0601H
P6-02	DI level logic(DI6-DI10) 0-Low level valid 1-High level valid	00000	-	√	√	√	○	0602H
P6-03	DI1 function code	1	-	√	√	√	□	0603H
P6-04	DI2 function code	2	-	√	√	√	□	0604H
P6-05	DI3 function code	3	-	√	√	√	□	0605H
P6-06	DI4 function code	4	-	√	√	√	□	0606H
P6-07	DI5 function code	5	-	√	√	√	□	0607H
P6-08	DI6 function code	6	-	√	√	√	□	0608H
P6-09	DI7 function code	7	-	√	√	√	□	0609H
P6-10	DI8 function code	8	-	√	√	√	□	060AH
P6-11	DI9 function code	9	-	√	√	√	□	060BH
P6-12	DI10 function code	10	-	√	√	√	□	060CH
P6-13	DO level logic(DO1-DO5) 0-Low level valid 1-High level valid	00000	-	√	√	√	○	060DH
P6-14	DO1 function code	1	-	√	√	√	□	060EH
P6-15	DO2 function code	2	-	√	√	√	□	060FH
P6-16	DO3 function code	3	-	√	√	√	□	0610H
P6-17	DO4 function code	4	-	√	√	√	□	0611H
P6-18	DO5 function code	5	-	√	√	√	□	0612H
P6-19	DO1 output delay shutdown	0	s	√	√	√	○	0613H
P6-20	DO2 output delay shutdown	0	s	√	√	√	○	0614H
P6-21	DO3 output delay shutdown	0	s	√	√	√	○	0615H
P6-22	DO4 output delay shutdown	0	s	√	√	√	○	0616H
P6-23	DO5 output delay shutdown	0	s	√	√	√	○	0617H
P6-24	AI1 blind adjustment	30	mV	√	√	√	○	0618H
P6-25	AI2 blind adjustment	30	mV	√	√	√	○	0619H

Parameter s	Function	Initial valu e	Unit	Applicable control mode			Pro pert y	Commu nication Address
				P	S	T		
P6-26	Not used	0	-	√	√	√	□	061AH
P6-27	AI1 bias adjustment	0	mV	√	√	√	○	061BH
P6-28	AI2bias adjustment	0	mV	√	√	√	○	061CH
P6-29	Not used	0	-	√	√	√	○	061DH
P6-30	AI1 filter time	10	ms	√	√	√	○	061EH
P6-31	AI2filter time	10	ms	√	√	√	○	061FH
P6-32	Not used	0	-	√	√	√	○	0620H
P6-33	AO1 bias adjustment	0	mV	√	√	√	○	0621H
P6-34	AO2 bias adjustment	0	mV	√	√	√	○	0622H
P6-35	AO1function plan	0	-	√	√	√	□	0623H
P6-36	AO2function plan	1	-	√	√	√	□	0624H
P6-37	AO1/AO2 output polarity selection 0-AO1 forward output AO2 forward output 1-AO1 reverse output AO2forward output 2-AO1forward output AO2 reverse output 3-AO1 reverse output AO2 reverse output	0	-	√	√	√	○	0625H
P6-38	Not used	0	-	√	√	√	○	0626H
P6-39	Not used	0	-	√	√	√	○	0627H

4.2.8 P7 group - Communication parameters

Para meter s	Function	Initi al valu e	Unit	Applicable control mode			Pro pert y	Commu nication Address
				P	S	T		
P7-00	Communication EEPROM storage selection 0-parameters written to EEPROM,power drop not disappear 1-parameters written to RAM,power drop disappear	0	-	√	√	√	○	0700H
P7-01	Not used	0	-	√	√	√	○	0701H

Parameter s	Function	Initial valu e	Unit	Applicable control mode			Pro pert y	Commu nication Address
				P	S	T		
~ P7-05								~ 0705H
P7-06	Communication 1 station code(0-Broadcast signal)	1	-	√	√	√	○	0706H
P7-07	Communication 1 transmission rate 0-2400 1-4800 2-9600 3-19200 4-38400	2	-	√	√	√	○	0707H
P7-08	Communication 1 data format 0-No parity 0+8+N+1 1-Odd parity 1+8+O+1 2-Even parity 1+8+E+1 3-No parity 0+8+N+2 4-Odd parity 1+8+N+2 5-Even parity 1+8+N+2	0	-	√	√	√	○	0708H
P7-09	Communication 1 overtime setting 0-Not initialize this function Not zero-Successfully report fault when Failure to communicate within set time	0	s	√	√	√	○	0709H
P7-10	Communication 1 reply delay time	0	ms	√	√	√	○	070AH
P7-11	Not used	0	-	√	√	√	○	070BH
P7-12	Not used	0	-	√	√	√	○	070CH
P7-13	Not used	0	-	√	√	√	○	070DH
P7-14	Not used	0	-	√	√	√	○	070EH

4.2.9 P8 group - Auxiliary function parameters

Para meter s	Function	Initi al valu e	Unit	Applicable control mode			Pro pert y	Commu nication Address
				P	S	T		
P8-00	Software reset 0-No operation 1-System software reset	0	-	√	√	√	□	0800H
P8-01	Fault reset 0-No operation 1-Fault reset	0	-	√	√	√	□	0801H
P8-02	Jog function (trial run), When	0	-	√	√	√	□	0802H

Parameter s	Function	Initial value	Unit	Applicable control mode			Property	Communication Address
				P	S	T		
	enter this function code, press UP key, the motor will runforward in the speed set as P8-03,and it will stop if loose UP key.When press Down key, the motorrund reversal in the speed set asP8-03, and it will stop if looseDown key.Press MODE key to cancel this function code. Jog will be invalid.							
P8-03	Jog speed	100	rpm	√	√	√	○	0803H
P8-04	Not used	0	-	√	√	√	□	0804H
P8-05	Internal ON command 0-Internal ON invalid,auto-zero after power on 1-Internal enableON	0	-	√	√	√	□	0805H
P8-06	Overheating warning point Remark:220Vdrive parameter invalid	80	℃	√	√	√	■	0806H
P8-07	Overheating fault point Remark:220Vdrive parameter invalid	90	℃	√	√	√	■	0807H
P8-08	Not used			√	√	√	□	0808H
P8-09	Fan control selection 0-Then fan is running when temperature is above 40 degrees 1-The fan is running after power Remark:220Vdrive parameter invalid	0		√	√	√	□	0809H
P8-10	Drive overload warning thresholdsetting	80	%	√	√	√	■	080AH
P8-11	Motor overload warning thresholdsetting	80	%	√	√	√	■	080BH
P8-12	Enabling conditions selection 0-Free stopping, start enable as condition of P8-13 1-Free stopping and zero speed stopping are both selected	0	-	√	√	√	□	080CH
P8-13	Enabling conditions 0-Start enable as time set in P8-14	3	-	√	√	√	□	080DH

Parameters	Function	Initial value	Unit	Applicable control mode			Property	Communication Address
				P	S	T		
	1-Start enable as speed set in P8-15 2-Start enable according to time and speed conditions 3-Immediately enable							
P8-14	After the S-OFF , S-ON effective	0.50	s	√	√	√	□	080EH
P8-15	Effective enable speed	20	rpm	√	√	√	□	080FH
P8-16	Default monitoring project selection	0	-	√	√	√	□	0810H
P8-17	Braking resistor value	Model determination	Ω	√	√	√	□	0811H
P8-18	Braking resistor capacity	Model determination	W	√	√	√	□	0812H
P8-19	Not used	0	-	√	√	√	○	0813H

4.2.10 P9group - origin return function parameters

Parameters	Function	Initial value	Unit	Applicable control mode			Property	Communication Address
				P	S	T		
P9-00	Back to zero failure alarm time 0-Function disable	0	s	√	√	√	○	0900H
P9-01	Origin triggered start mode 0-Disable origin return function 1-Power on, after servo enable originreturnautomatically 2-The SHOM function (terminal 20)trigger origin return	0	-	√	√	√	□	0901H
P9-02	Short distance moving mode of reaching origin 0-After finding reference origin, motorrun back in second section speed tosearching nearest Z-phase pulse as the	2	-	√	√	√	□	0902H

Parameter	Function	Initial value	Unit	Applicable control mode			Property	Communication Address
				P	S	T		
	mechanical origin. 1-After finding reference origin, motorrun in the same direction in second section speed to searching nearestZ-phase pulse as the mechanical origin. 2-According toP9-03							
P9-03	Origin detector type and directionsetting 0-Forward direction to search theorigin and regard P-OT input as coarsereference origin. 1-Reverse direction to search theoriginand regard N-OT input as coarsereference origin. 2-Forward direction to search theorigin andregard ORGP input as coarsereference origin. 3-Reverse direction to search theoriginandregard ORGP input as coarsereference origin. 4-Forward to search Z-phase pulseorigindirectly 5-Reverse to search Z-phase pulseorigindirectly	2	-	√	√	√	□	0903H
P9-04	Back to zero first section high speed	1000	rpm	√	√	√	○	0904H
P9-05	Back to zero second section low speed	50	rpm	√	√	√	○	0905H
P9-06	Origin return offset	0	rev	√	√	√	○	0906H
P9-07	Origin return offset pulse	0	ppr	√	√	√	○	0907H
P9-08	Not used			√	√	√	○	0908H
P9-09	Origin return acceleration and deceleration time	100	ms	√	√	√	○	0909H

Charter 5 Fault alarm and Treatment

5.1 Fault Diagnosis and Treatment

When a fault or alarm occurs, the servo drive will display“ErrXX”.Last fault can be viewed by P0-19.Fault display and treatment measures are as follows:

Err01: Hardware over current(not reset)

Err02: Hardware over voltage(not reset)

Err0C: Software over current(reset able)

Fault Causes	Check	Solution
	1 : Check the connection status	1 : Exclude short circuit condition and
Wiring error of the	Check the wiring order of motor	Re wiring based on the wiring order
Setting error of	Check if the set value is much greater	Resume defaulted setting, and then
Command changes	Check if the control input command	Fixed the change ratio of the input
External braking resistor is too small	Check if the external braking resistor	Use the braking resistor matched the specification and set the parameters of
Drive hardware fault	When all the above problems are excluded,the fault still occurs	Send back to the dealer or the factory for check

Err03: Memory Error(not reset)

Fault Causes	Check	Solution
Abnormal write of parameter data	Power off and restart, if the fault still exists	Replace the drive
Memory stored too frequently	Check the program of upper computer if the drive's EEPROM is frequently written.	Modify the program of upper computer, changed to RAM address in case it should be frequently written.

Err04: AD Initialization Fault(not reset)

Fault Causes	Check	Solution
rive hardware fault	Power off and restart, if the fault still	Send back to the dealer or the factory

Err05: Retrograde resistance Fault(not reset)

Fault Causes	Check	Solution
Braking resistor power is not enough, resistance value is too large	Check if the braking resistormeets the specification	Replace the brake resistor of the selected driver and adjust the P8-17 and P8-18 parameters
Drive hardware fault	Power off and restart, if the fault still	Send back to the dealer or the factory

Err06: AD Sampling Fault(not reset)

Fault Causes	Check	Solution
Sampling error during running	Power off and restart, if the fault still exists	Send back to the dealer or the factory for check

Err07: Encoder Error 1(not reset)

Fault Causes	Check	Solution
Initial limit errorafter	Check CN1 on the drive and the connector of	Re-install
Encoder wiring error	Check if the encoder wiring follows the	Wiring correctly
Encoder damaged	Exclude wiring problems, the fault still exists	Replace the motor

Err08: Encoder Error 2(not reset)

Fault Causes	Check	Solution
AB signal error of incremental encoder	Same with Err07	Same with Err07

Err09: Encoder Error 3(not reset)

Fault Causes	Check	Solution
Z signal error of incremental encoder	Same with Err07	Same with Err07

Err0A: Under voltage(not reset)

Fault Causes	Check	Solution
Main circuit input voltage is lower than the rated voltage value allowed	Check if main circuit input voltage and the wiring are normal	Check the mains supply wiring
No voltage on the input of the mains circuit	Check if the main circuit voltage is normal	Check the power supply switch
Power supply error	Check if the power is consistent	Use the correct power supply

Err0B: Overvoltage(not reset)

Fault Causes	Check	Solution
Main circuit input voltage is higher than the rated voltage	Check if the main circuit voltage is in the allowable range	Use the correct power supply
Power input error	Check if the power is consistent with	Use the correct power supply
Motor decelerates too fast	Check if the system inertia is too large and decelerates too fast	Increase the deceleration time, or use a suitable external braking resistor
Drive hardware fault	Measuring the main circuit voltage is in the allowable range, and the fault still occurs when the motor is not running	Send back to the dealer or the factory for check

Err0D/Err0E: Motor Overload / Drive Overload(reset able)

Fault Causes	Check	Solution
Continuous use above the rated load	1: Monitor P0-02 if it is continuously more than 100% 2: Monitor P0-05 if it is continuously more than the rated value	1: Increase motor capacity or reduce load 2: Increase drive capacity or reduce load
Motor, encoder wiring error	Check the U, V, W and encoder wiring	Correct wiring
Set control parameter improperly	1: if mechanical oscillates and the motor sounds abnormally	1: Adjust the position, velocity gain value
Drive or motor fault	Exclude above problems	Send back to the dealer or the factory for

Err10: Drive Overheat(reset able)

Fault Causes	Check	Solution
Ambient temperature is too	Check if the ambient temperature and	Improve the installation environment
Cooling fan of the drive is	Check if the cooling fan is running	Replace the fan which is not running
The cooling of servo drive is affected	1: Check if the drive installation follows the requirements 2: Check if the drive's heat sink is	1: Install the drive properly, refer to Chapter 2 2: Clean up the blockage

Err11: Input Phase side Loss(reset able)

Fault Causes	Check	Solution
Main circuit power is abnormal	Check if the R, S, T powercordis loose or just has three phase input	if three-phase power is normal,the fault still exists,Send back to the dealer or the factory forcheck

Err12: Overspeed(reset able)

Fault Causes	Check	Solution
UVW phase sequence error	Check if the phase sequence of UVW	Wiring as per correct phase sequence
Over-speed judgment parameter is not properly set	Check if over speed judgment parameter is too small	Set over-speed parameter parameter correctly
Speed input command	Check if input analog voltage signal is	Adjust the change ratio of the input
The encoder is interfered	Check if wiring is properly,the system is grounded or not	Adjust wiring, the system grounding reliably

Err13: Position Deviation is too large(reset able)

Fault Causes	Check	Solution
The value of position	Check if the parameter of P1-28/29 is	Increase the setting value of P1-28/29
Pulse command frequency is	Check the frequency of pulse command	Adjust the pulse frequency so that it is
Gain value is too small	Check if the setting value is appropriate	Set gain value correctly
Torque limit is too low	Check the torque limit value	Adjust torque limit value correctly
Load inertia is too large	Calculate the ratio of load inertia and	Reduce the load inertia or re-evaluate

Err14: Started speed is too high(reset able)

Fault Causes	Check	Solution
Started speed is too high	When servo on, motor running with external force	Stop or reduce motor running speed

Err15: inertia ratio learn failure (reset able)

Fault Causes	Check	Solution
inertia ratio learn failure	Learning time above 40S	Increase inertia ratio learning torque

Err16: 485 communication overtime (reset able)

Fault Causes	Check	Solution
communication overtime	The communication time of upper computer is too long, Wiring anomaly	Close overtime function or increase running time

Err17: Initial Point Return Failure(reset able)

Fault Causes	Check	Solution
P9-00 parameter setting	Check if P9-00 setting value is appropriate	Increase the value of P9-00
External input detector or limit switch fail	Check the external detector, limit switches and wires	Exclude fault

Err18: Serial communication error (not reset)

Fault Causes	Check	Solution
Hardware failure leads to chip error	Detect and reset control power supply	Power off and restart, if the fault still exists, contact the manufacturer

Err19: Internal chip communication error (Not reset)

Fault Causes	Check	Solution
Hardware failure leads to	Detect and reset control power supply	Power off and restart, if the fault still

Err1A: The battery of Encoder is low (Not reset)

Fault Causes	Check	Solution
The battery of encoder is lower than 2.8V	Measure the voltage value of the battery	Replace battery

Err1B: Encoder multi circle error(Not reset)

Fault Causes	Check	Solution
Working voltage of multi-cycle counter less than 1.7 V	Detect if external interference	Power off and restart

Err1C: Encoder counter error(Not reset)

Fault Causes	Check	Solution
Encoder multi circle counter	Detect if external interference	Power off and restart
Single circle counter deviation more than 0.35 °	Detect if external interference	Power off and restart

Err1D: Encoder overheat (Not reset)

Fault Causes	Check	Solution
Encoder temperature over	Check overload, airmoving devices	reduce temperature

Err1E: Encoder multi circle reset(Not reset)

Fault Causes	Check	Solution
Keep running circle over 65535	No	Power off and restart

Err1F: Encoder overspeed(Not reset)

Fault Causes	Check	Solution
Running speed over 6000rpm/min	Check if running speed is too fast	Reduce running speed

Err20: Drive hardware overload(reset able)

Fault Causes	Check	Solution
Longtime overload	Please refer to driver and motor overload treatment solution	Please refer to driver and motor overload treatment solution

Err21: Drive hardware over current (reset able)

Fault Causes	Check	Solution
Running current is too large	Please refer to Err01、Err0C treatment solution	Please refer to Err01、Err0C treatment solution

Err22: Drive hardware low voltage (auto reset)

Fault Causes	Check	Solution
Hardware detection undervoltage	Please refer to Err0A treatment solution	Please refer to Err0A treatment solution

Err23: Ground short circuit fault (Not reset)

Fault Causes	Check	Solution
Servo motor short circuit	Measure if UVW of motor power cables are short circuit to ground	Replace motor, if the fault still exists, contact the manufacturer
Servo motor power cables are short circuit to ground	Measure if UVW of motor power cables are short circuit to ground	Replace power cables, 仍有问题联系厂家

5.2 Alarm Diagnose and Treatment Measures

In case the digital operator reads error “ALEXX”_ALE’, but the motor does not stop running, it means that there is problem with the system. Please check the cause immediately, here below is the troubleshooting.

ALE02: Drive Overheating

Alarm Causes	Check	Solution
Ambient temperature is too high	Check if the temperature and humidity are in the permitted range	Improved servo drive cooling conditions, reduce the ambient temperature
Drive cooling fan damage	Check the cooling fan of the drive is	Replace the damaged fan
Servo drive or the the inlet and outlet of the fan is blocked	1: Check if the drive installation meets the requirements 2: Check if the heat sink of the drive is	1: Drive installation refers to Chapter2 2: Clean up the blockage
The servo drive fails		Power off and restart, if the fault still exists, replace the servo drive

ALE03: Motor Overload

Alarm Causes	Check	Solution
Motor load reaches at the overload warning threshold value set in P8-11	1: Refer to Err0D and Err0E 2: The setting value of P8-11 is too small	1: Refer to Err0D and Err0E 2: Increase the setting value of P8-13

ALE04: Drive Overload

Alarm Causes	Check	Solution
Drive load reaches at the overload warning threshold value set in P8-10	1: Refer to Err0D and Err0E 2: The setting value of P8-10 is too small	1: Refer to Err0D and Err0E 2: Increase the setting value of P8-10

ALE05: Excessive Position Deviation

Alarm Causes	Check	Solution
Alarm threshold value of	check if the parameters of P1-27/29 are	Increase the setting value of P1-27/29
Pulse command frequency is	Detect the frequency of pulse command	Adjust the pulse frequency so that it is
Setting gain value is too small	check the setting value is appropriate	Set gain value correctly
Torque limit is too low	check torque limit value	Adjust torque limit value correctly
Load inertia is too large	Calculate the ratio of load inertia and motor inertia	Reduce the load inertia or re-evaluate the motor capacity

ALE06: Forward Over Travel

Alarm Causes	Check	Solution
P-OT terminal is effective, and command is forward	check the position of forward limit switch	1: Release forward limit switch 2: Give reverse command
Servo system is unstable	check the setting value of control parameter and load inertia	Re-correct control parameters or re-evaluate the motor capacity

ALE07: Reverse over travel

Alarm Causes	Check	Solution
N-OT terminal is effective, and command is reverse	1: check the position of reverse limit switch	1: Release reverse limit switch 2: Give the forward command
伺服系统稳定度不够	check the setting value of control parameter and load inertia	Re-correct control parameters or re-evaluate the motor capacity

ALE08: The battery of Absolute Encoder is low

Fault Causes	Check	Solution
The battery of absolute encoder is lower than 3.1V	Measure the voltage value of the battery	Replace battery