Preface

Thank you for purchasing the SV100 series Servo Drive developed by our company.

This user manual describes how to properly use the SV100 series servo drive. Please carefully read and master the user's manual before proper use.

Unpacking Inspection Cautions:

1. Whether the product is damaged;

2. Whether the nameplate of model and Serve drive ratings are consistent with your order.

3.Whether the box contains the Serve drive , certificate of conformity, user manual and warranty card.

If you find any omission or damage, contact our company or your supplier immediately.

Cautions

- For the details of illustrating products, the diagram of this manual is sometimes in the status of removing the cover or safety cover. To use this product, please make sure install the cover or housing as required and operate in accordance with manual instructions.
- The diagrams in this manual is only for illustration, it may have sightly difference with the product that you ordered.
- This instructions are subject to change, without notice, due to product upgrade, specification as well as efforts to increase the accuracy and convenience of the manual.
- Please contact district agent or all SINOVO customer service center directly for the damaged or missing parts and need to order the Manuals.
- If you have any confusion when refering the manual during operation, please contact SINOVO Customer Service Center.

Customer Service：400-8818-689

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Chapter 1

Safety and Cautions

1. 1 Safety and Cautions Definition

Read this manual carefully so that you have a thorough understanding. Installation, commissioning or maintenance maybe performed in conjunction with this chapter. Our company will assume no ability and responsibility for any injury or loss caused by improper operation.

Warning Warning: Operations which are not performed comply with the requirements may cause severe hurt or even death.

Cautious Cautious: Operations which are not performed comply with the requirements may cause machine damaged or personal injury.

Note Note: Operations which are not performed comply with the requirements may cause personal injury or property damage.

1.2 Safety Cautions

Warning

- Servo drive has power supply input AC220V and AC380V , please use isolation transformer before running.
- Please consider safety protection measure in design and assemble when use the product for avoidance of accidents.
- Before disassembling servo drive, be sure to disconnect the power supply over 2 minutes
- Servo drive terminal U, V, W must match with motor terminal U, V, W.
- Servo drive terminal PE must reliable grounded with other appliance PE.
- Output signal external relay must be connected flyback diode at relay both ends.
- Do not off and on servo drive power supply frequently.
- Do not use again damage or alarm failure servo drive.
- Please use the servo drive and serve motor with the instructed combination mode.
- Choose servo motor rated torque must greater than the effective continuous load torque.
- Do not touch the radiator and motor of the servo drive during the drive running.

Catious

- Must install the equipment on sufficient protection level control cabinet.
- Must install the equipment on the environment with no strong electromagnetic interference.
- Must have good heat dissipation conditions.
- Never expose the product to an environment containing moisture, corrosive gas, or flammable gas.
- Never expose the product to an environment containing dust, acid, alkali gas and explosive gas.

Note

- Do not use for harmful to personal safety system in design and manufacturer of the product.
- Must sure be carried out according to the requirement of storage and transportation.
- Do not withstand external impact, vibration and concussion.
- Only qualified electricians are allowed to inspect the servo drive.

Chapter 2

Product Information

2.1 Product Introduction

Modern industrial automation technology is the key technology in the information society, and AC servo technology is the core technology of automation technology. Since the early 70's develop to so far, technology has become increasingly successful, and performance continues to improve. Now it is widely used in CNC machine tools, print packaging machine, textile machine, solar energy, wind energy, automated production lines, robots and all kinds of non-standard machines and other automation areas.

With the development of AC servo technology, the application of modern servo technology will greatly improve the production efficiency, improve product quality and economic benefits.

The drive is a new generation of digital AC Servo Drive for the company independent research and development, it mainly adopts the latest digital signal processor DSP technology and the operation and control unit programming FPGA technology as the core, IPM and intelligent power module has fast response speed, perfect protection and high reliability series of advantage of automatic machine. It is suitable for high precision, automation production line, green energy, machine manufacturing, robots and other industrial automation field.

The drive as a new generation full digital AC servo drive, with high integration, small installation size, which is industrial automation production energy saving, high efficiency ideal product.

2.2 Product Feature

Compared with the traditional servo drive, the serve has the following advantages:

- Motor power adapt to 220V power input 50W ~ 2.6KW, 380V power input 2.6KW ~ 11KW;
- With torque, speed, position, point to point positioning and hybrid switching function;
- Position control, speed control, torque control, general IO control and JOG multi-control methods;
- Built in brake system, which can meet the requirement of large load;
- Built in 4 position positioning control instructions, free planning point to point positioning control;
- Servo machine comes with encoder, and the position signal is fed back to the servo drive, with the open-loop po sition controller compose semi-closed-loop control system;
- The speed ratio is 1:5000, and it has stable torque characteristics from low speed to high speed;
- The maximum speed of the servo motor can be up to 6000rpm;
- Control position accuracy + 0.01%;
- compared with traditional SPWM, the SPWM switch device can reduce the number of 1/3, the utilization of DC voltage can be increased by 15%, get a better harmonic suppression effect, and easy to realize digital control.
- 300% overload capacity, with load capacity;
- Wide power adapt range: for example AC220V , AC 220V ± 20%;
- Perfect protection function: overcurrent, overvoltage, overheating and encoder failure;
- Multiple dispaly functions: including motor speed, motor current, motor position, position deviation, pulse number, pulse frequency, linear speed, input and output interface diagnosis, historical alarm records.

2.3 Technical Specification

Item	Specification					
Input power supply	AC220V -15% ~ +15%					
Drive current	10A	20A	30A	50A	75A	100A
Adaptable motor	≤0.2KW	≤1.2KW	≤2.6KW	≤3.8KW	≤5.5KW	≤7.5KW1
Input power supply	AC380V -10% ~ +10%					
Drive current	25A		50A		75A	
Adaptable motor	≤3.7KW		≤7.5KW		≤11KW	
Operating temperature	Operating : 45℃ Storage : -40℃ ~ 55℃					
Relative humidity	Relative humidity 40%~80% non condensing					
Atmosphere	86-106kpa					
Control Way	①Position control ②JOG control ③Speed control ④Torque control ⑤Position and speed control ⑥Internal pulse control ⑦IO control ⑧Position and torque control					
Pulse command	①Pulse+Position		②CW+CCW pulse		③Two-phase AB orthogonal pulse	
Control accuracy	0.01%					
Respond frequency	≤200Hz					
Pulse frequency	≥500kHz					
Speed ratio	1 : 5000					
Regenerative braking	Built-in					
Electronic gear	1/30000 ~ 30000/1					
Overload capacity	≥300%					
Feedback pulse	2500p/r					
Display function	Motor speed, motor current, motor torque, motor position, position deviation, command pulse number, pulse frequency, linear speed, input and output diagnostics					
Production function	Speed, overcurrent, overvoltage, undervoltage, overload, tolerance, encoder failure, high temperature，internal chip failure, module failure					

Chapter 3

Installation requirement

Note

- Only those who are trained and qualified professionals can operate the work described in this chapter. Please operate according to the section of "pay attention to security matters", failure to these may cause personal injury or damage to equipment.
- Connect the input power lines tightly and permanently. And ground the device with proper techniques.
- Even when the drive is stopped, dangerous voltage is present at the terminals:
  -Power terminals: R,S,T,P,P+,P-, PB
  -Motor connection terminals: U,V and W
- Wait for 10 minutes to let the controller discharge and then begin the installation.
- Minimum cross-sectional areas of the grounding conductor should be equal to or greater t han the power supply cable cross-sectional area.

3.1 Installation Occasion

3.1.1 Installation of Electrical Control Cabinet

The drive service life directly relate to the ambient temperature. The heating of the electrical equipment in the electric control cabinet and the heat dissipation condition in the control cabinet will affect the temperature around the servo drive, therefore, considering the chassis design, should consider the cooling of the driver and the control cabinet configuration, in order to ensure the servo drive ambient temperature below 55℃ and relative humidity below 95%. Long term working temperature under 45℃.

3.1.2 Heating Device of the Servo Drive

Servo drive running under high temperature will shorten their life and prone to breakdown. So should ensure serve drive around ambient below 55 ℃ in the thermal convection and thermal radiation condition.

3.1.3 The Vibration Device of the Servo Drive

Using various anti-vibration measure to ensure servo drive is not affected by vibration, vibration ensure under 0.5G (4.9m/s2).

3.1.4 Using Servo Drive under Harsh Environment

Using servo drive under harsh environment, it exposure to corrosive gases, moisture, metal dust, water and liquid processing will cause the drive failure. when install servo drive, it must be take protective measure to ensure the drive working environment.

3.1.5 Interference Device of the Servo Drive

When there is an interference device around the servo drive, there is a great influence on the power supply line and the control line of the servo drive, and easy to make malfunction. It can be added noise filter and other anti-jamming measures to ensure the normal operation of the drive. Note that after adding the noise filter, the leakage current will increase, in order to avoid this situation, you can use isolation transformer. Specially attention to the drive control signal line easy to be interference, there must be a reasonable alignment and shielding measure.

3.2 Drive Installation

Note

- Servo drive must be installed in a well protected electric cabinet;
- Servo drive must be installed in the specified direction and spacing, and ensure good heat dissipation condition.
- Can not be installed on combustible object to prevent fire.

3.2.1 Installation Environment

1) Protection

Servo drive itself without protection and must be installed in a well-protected cabinet and prevent contact with corrosive, flammable gases and prevent conductive objects, metal dust, oil mist and liquid enter the interior.

2) Temperature

Ambient temperature 0~55 ℃, and the safe running temperature below the 45 ℃ for a long time, and the good heat dissipation condition should be ensured. The relative humidity less than 95%.

3) Vibration and Shock

The drive should be installed to avoid vibration, vibration control measure to be taken below 0.5 (4.9m / S2), the drive should not be subject to stress and shock.

3.2.2 Ventilation Interval

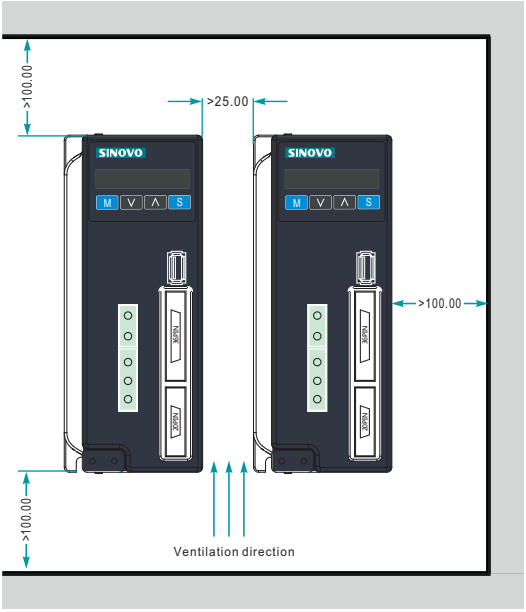


Figure 3-1

3.2.3 Installation Method

1) Installation direction: the normal installation direction of the Servo Drive is vertical;
2) Mounting and fixing: tighten two M5 fastening screws on the servo drive;
3) Ventilation and cooling: natural cooling mode, the electrical control cabinet must be installed cooling fan to ensure natural ventilation.

Note

- When disassembling and assembling the pulley, the motor or the motor draft can not be knocked down to prevent damage to the encoder.
- The motor can not withstand large axial, radial load. It is recommended to use flexible coupling connect the load.
- Fix motor with a loose bezel fasten to prevent motor loosen.

3

3.2.4 Installation Size

Output power ≤1.0KW installation size：168x136.20x69.

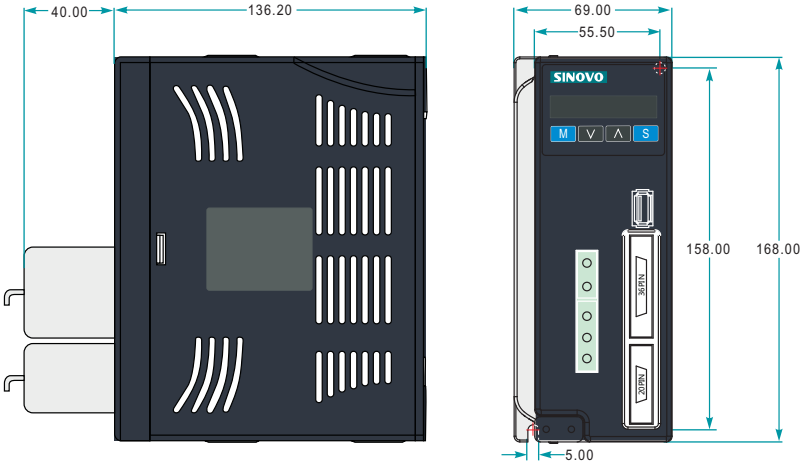


Figure 3-2

Chapter 4

Wiring Instruction

Warning

- Servo drive has power supply input AC220V，please use isolation transformer before running.
- Servo drive terminal U, V, W must match with motor terminal U, V, W.
- Please consider safety protection measure in design and assemble when use the product for avoidance of accidents.
- Servo drive and motor must be reliable grounded.
- Before disassembling servo drive, be sure to disconnect the power supply over 2 minutes.

4.1 Standard Wiring

AC servo drive wiring is related to the use of the motor and the control mode.

General connection line :

1. Encoder and controller line choose shield stranded wire in order to reduce the circuit interference line requirement cable connection as short as possible. It must connected to shield(PE), the general use of the occasion can be connected to 10 meters, above 10 Meters is not recommended;

2. Connect the power line choose can match with motor current specification, and line insulation level is greater than the motor itself. It must connect the shield wire (PE), the general situation can be connected to 10 meters, above 10 meters is not recommended;

Minimum requirements :

3. Three phase voltage requirement plus reactor;

4. Single phase power supply require plus isolation transformer .

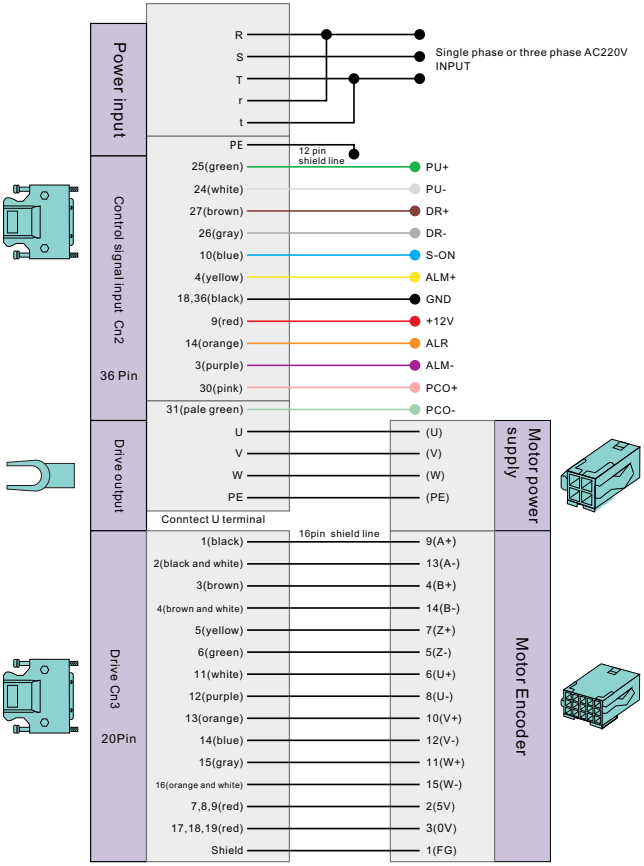


Figure 4 - 1 SV100-2T-20A Match with Below 750W Motor Wiring Diagram

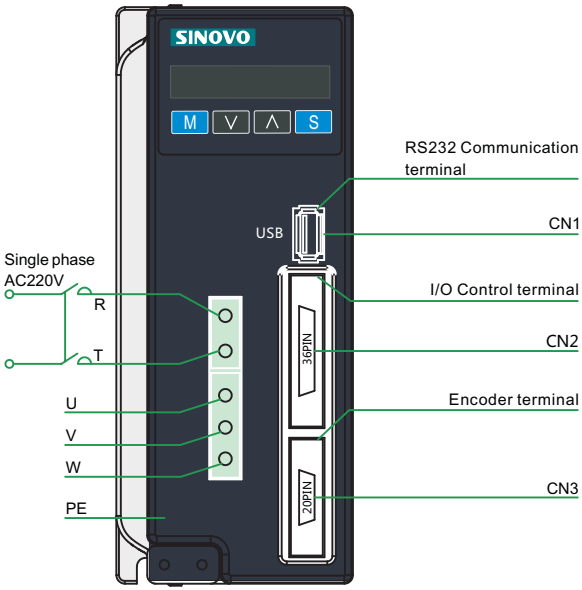


Figure 4 - 2 SV100-2T-20A

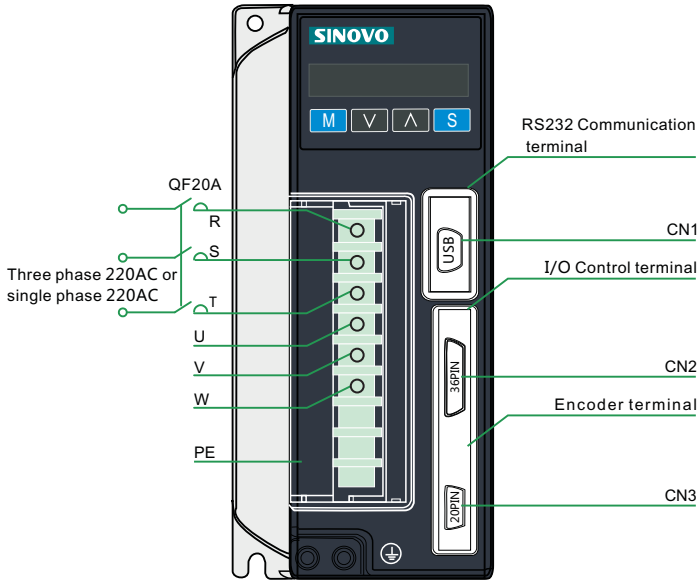


Figure 4 - 3 SV100-4T-30A/50A

4.1.1 Typical Wiring Diagram

1) Installation direction: the normal installation direction of the Servo Drive is vertical;

2) Mounting and fixing: tighten two M5 fastening screws on the servo drive;

3) Ventilation and cooling: natural cooling mode, the electrical control cabinet must be installed cooling fan to ensure natural ventilation.

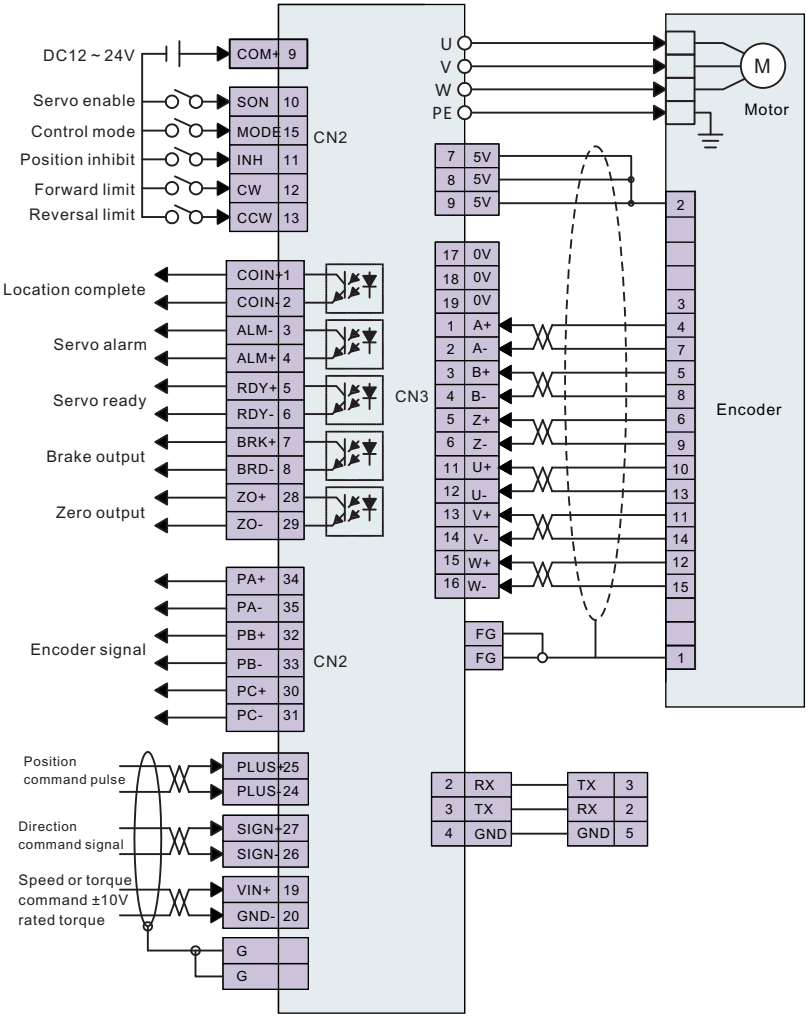


Figure 4 - 4

Note: When external PLC signal input, SING + and PLUS + internal through 2K resistor and 16,17 pin connected, then 25,27 pin must be vacant!

4.1.2 With all Kinds of Common Motor Wiring

- The connection of 4 PE(P31 = 4) power line with the South Korea LS motor control wiring connection is the PE / U / V / W corresponding to the 1 terminal PE / 2 terminal V / 3 terminal U / 4 terminal W.

  The encoder is connected as defined;

- With SINOVO, Wuhan Huada 4 pole motor control wiring diagram 4-4.

4.2 Wiring

4.2.1 Power Supply Wiring Terminal

- R, S, T, PE, U, V, W terminal wire diameter must ≥1.5mm² (AWG14 - 16) ;
- The drive wiring terminal adopt JUT-2.5 - 4 cold pressed terminal and sure to connect firmly.
- It should be used three phase isolation transformer power supply to reduce the possibility of motor wounding. It is best to add noise filter between the city and the isolation transformer to improve the anti-interference ability of the system.
- Please install non fuse (NFB), circuit breaker, so that when the driver fails to cut off the external power supply.

4.2.2 Control Signal CN2 Terminal and Feedback Signal CN3 Terminal

- Wire diameter: Using shield cable(best select double twisted shielded cable) , wire diameter ≥0.10 mm², the shield must be connected to the PE terminal;
- Cable length: Cable length as short as possible, control signal CN3 cable not exceeding 5 meters, feedback signal CN1, cable length not exceeding 10 meters;
- Wiring: Keep away from power line wiring to prevent interference
- Please install the surge absorber on the inductive element (coil) in the relevant line: DC coil reverse parallel freewheeling diode, AC coil parallel resistance absorption absorption circuit.

4.3 Terminal Function

4.3.1 Power Supply Terminal

Pin	Signal	Name	Function
1	R	Three phase or single phase main power supply	AC220V or AC380V 50HZ can't connect with motor 's U, V, W
2	S		
3	T		
4	PE	Earthing	Connect with main power supply earthing
5	U	Servo motor	Must connect with motor 's U, V, W
6	V		
7	W		
8	PE	Earthing	Connect with the shell of motor
09	r	AC380V drive terminal isvalid: control power supply	Control power supply 220V/50HZ
10	t		
11	PE	Earthing	Connect with power supply earthing

Note : When adopt AC220V power supply drive, 9,10, 11 terminal is empty, invalid!

4.3.2 Control Signal Input and Output Terminal

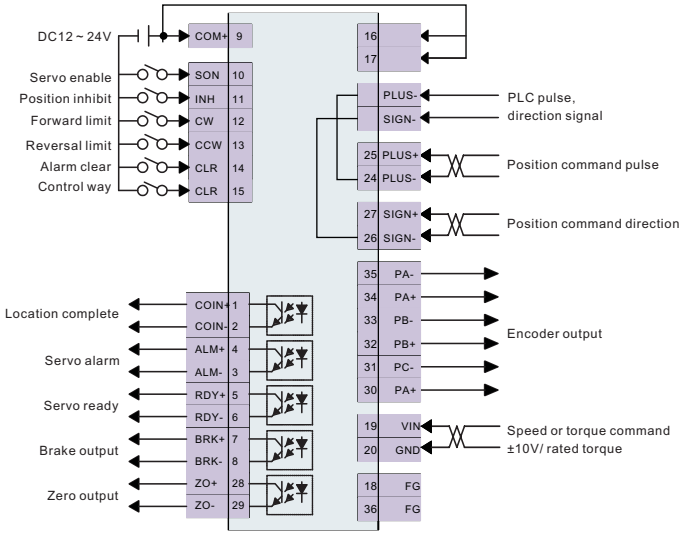


Figure 4 - 5

CN2 Terminal Pin Description

Pin	Name	Signal	I/O	Function
1	Location complete	COIN+	Output	① When the position deviation is less than the setting range, the output is valid ; ② Internal pulse running over output is valid; ③ When the torque reach setting percent, it output. ; • Parameter P7, P46, P49 set the above function.
2	Location complete	COIN-	Output	
3	Servo alarm	ALM-	Output	Servo alarm output valid
4	Servo alarm	ALM+	Output	
5	Servo ready +	SRDY+	Output	Servo ready no fault alarm, the output is valid
6	Servo ready -	SRDY-	Output	
9	Input signal power +	INCOM+	Input	Input terminal power supply positive pole used to drive the input terminal optocouplerDC12～24V, Current≥100mA

Pin	Name	Signal	I/O	Function
10	Servo enable	EN	Input	Servo drive has power supply input AC220V and AC380V , please use isolation transformer before running. Please consider safety protection measure in design and assemble when use the product for avoidance of accidents • Setting P6=1 shield this function; • Note1 : Before from EN OFF to EN ON, the motor must be stationary; • Note 2 : After to EN ON, at least wait 50ms then enter command.
11	Instruction pulse inhibit	INTH	Input	Position command pulse inhibit input terminal, parameter P49 set this function, parameter P49 is: 0 : Invalid, INTH signal is not detected; 1 : Detect INTH signal valid; 2 : Detect INTH signal valid and clear surplus pulse.
12	Forward limit	CW	Input	Motor forward limit input signal, parameter P48=1 set this function,P48=2 no alarm
13	Reversal limit	CCW	Input	Motor reversal limit input signal, parameter P48=1 set this function,P48=2 no alarm
14	Alarm clear	CLR	Input	External input clear servo alarm status and record
15	Control way or function selection	MODE	Input	①Position and speed function selection, valid select speed control , P7 set this function; ②Internal speed selection, valid select internal speed P13 set the internal speed; ③Internal pulse mode start signal P7=4 set this function.
16	Signal common port		Input	External PLC pulse input signal is valid
17	Signal common port		Input	
18	AGND	GND	Input	In the external speed or torque command, Vin external 0 ~ ± 10V input
19	Analog input	Vin	Input	
20	Input common ground	COM-	Input	
22	Output common ground	OUTCOM	Input	

Pin	Name	Signal	I/O	Function	
24	Pulse signal -	PULSE-	Input	External position control instruction, parameter P34 setting mode 0:Pulse+Sign pulse + direction 1:CW+CCW Forward and reversal control 2:A+B 90° quadrature pulses Note: When external PLC signal input, SING + and PLUS + internal has passed 2K resistor Connect with 16, 17 pin, 25, 27 pin must be vacant!	
25	Pulse signal +	PULSE+	Input		
26	Direction signal -	SIGN-	Input		
27	Direction signal +	SIGN+	Input		
28	Encoder Z signal	ZO+	Output	Encoder zero signal output open collector output, the ground side is OUTCOM	
29	Encoder Z signal	ZO-	Output		
30	Encoder Z signal +	PC+	Output	Motor encoder Z signal output	
31	Encoder Z signal -	PC-	Output		
32	Encoder B signal +	PB+	Output	Motor encoder B signal output	Output AB phase frequency signal, setting by parameter P47
33	Encoder B signal -	PB-	Output		
34	Encoder A signal +	PA+	Output	Motor encoder A signal output	
35	Encoder A signal -	PA-	Output		

4.3.3 Encoder Feedback Signal Terminal

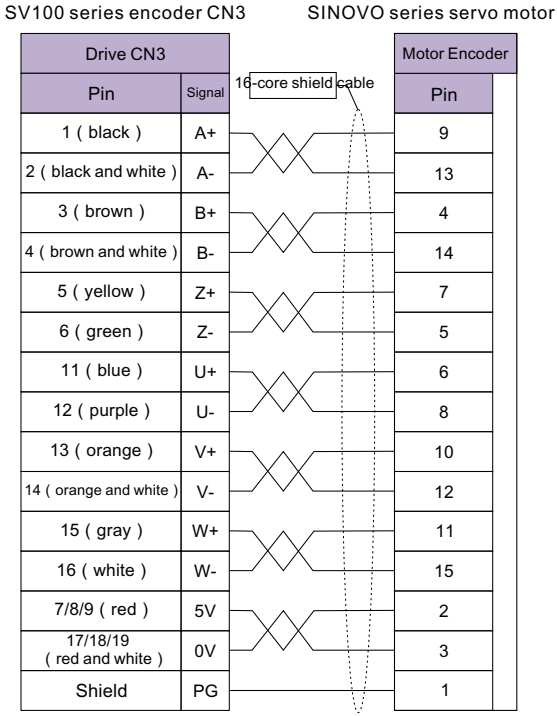


Figure 4 - 6 Cn3 External Wiring Instruction

CN3 Terminal Pin Description

NO.	Code	Name	Description	NO.	Code	Name	Description
1	Black	A+	PG input A phase	11	Blue	U+	PG input U phase
2	Black and white	A-	PG input /A phase	12	Purple	U-	PG input /U phase
3	Brown and white	B+	PG input B phase	13	Orange	V+	PG input V phase
4	Brown and white	B-	PG input/B phase	14	Orange and white	V-	PG input /V phase
5	Yellow	C+	PG inputC phase	15	Gray	W+	PG input W phase
6	Green	C-	PG input/C phase	16	White	W-	PG input /W phase
7	Red	5V	PG power supply+5V	17	Red and white	0V	PG power supply 0V
8				18			
9				19			
10	NC	NC	NC	20	NC	NC	NC

4.4 Input and Output Interface Principle

4.4.1 DI/DO EN, MODE, INTH, CW, CCW, CLR Input Interface

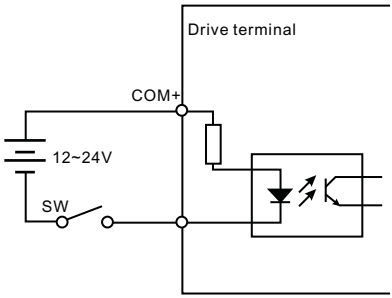


Figure 4 - 7 DI Interface

1) Providing power supply by the user, DC12 ~ 24V，current ≥100mA.

2) Note: If the current polarity reversed, the servo drive will not work properly.

4.4.2 DI/DO SRDY，ALM, BRAKE, COIN, ZO Output Interface

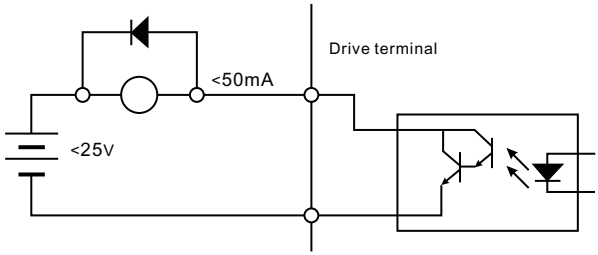


Figure 4 - 8 DO Interface

1) Provide for power supply by the user, however, if the current polarity reversed, the servo drive will not work properly;

2) Output form is open collector, ZO, SRDY, COIN and ALM signal max. current is 20mA;

3) BRAKE signal max. current is 50mA，so BRAKE can direct drive relay;

4) OZ, SRDY, COIN and ALM signal can't drive relay;

5) External power supply max. voltage 25V. Therefore, DO signal load must meet this limit requirement. If over limit requirement or output direct connect with power supply that will lead servo drive damaged.

6) If it is relay inductive load, it is necessary to reverse the freewheeling diode at both ends of the load. If the freewheeling diode is reversed, the servo drive will be damaged.

4.4.3 Pulse Signal Input Interface

A) Differential Drive Mode of Pulse Signal Input Interface

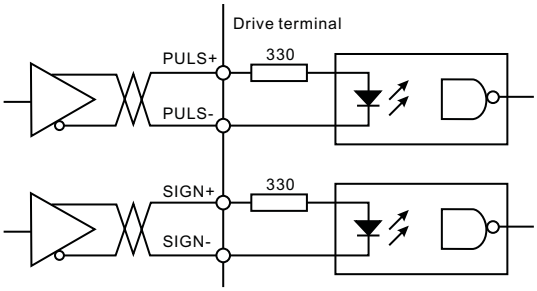


Figure 4 - 9

B) Single-ended Drive Mode of Pulse signal Input Interface

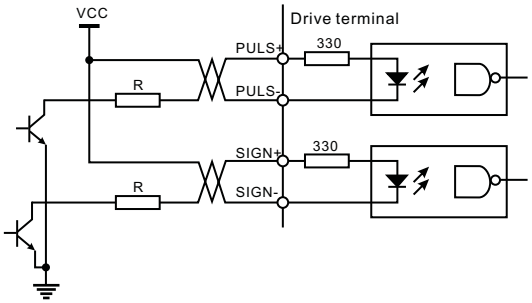


Figure 4 - 10

C) Servo Motor Photoelectric Encoder Input Interface

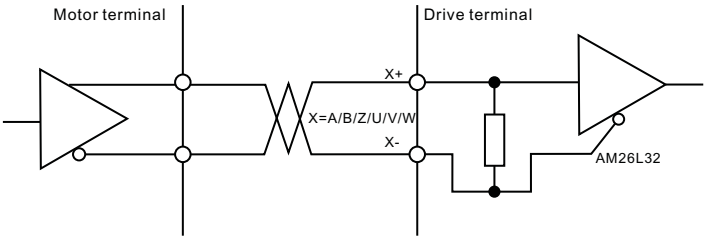


Figure 4 - 11

1) In order to transmit the pulse signal correctly, it is recommended to use differential drive mode;

2) Under the differential drive mode, using AM26LS31, MC3487 or similar RS422 line driver

3) With single-ended drive, the operating frequency will be reduced. According to the pulse input circuit, drive current 10 ~ 15mA, limit external power supply maximum voltage 25V condition, determine the value of resistance R value. Empirical data:

VCC = 24V , R = 1.3 ~ 2k ; VCC = 12V ,

R = 510 ~ 820Ω ; VCC = 5V , R = 82 ~ 120Ω ;

4) When using single drive mode, external power supply is provided by the user. Power polarity can not be reversed, otherwise it will lead to servo drive damage;

5) Pulse input mode see the following table, and require pulse frequency ≤ 500kHz.

Pulse command		P34 Setting Value
	CW CCW	
Pulse+Sign	PULS SIGN	0
CW+CCW pulse	PULS SIGN	1
A+BW pulse 90° Orthogonal pulse	PULS SIGN	2

Pulse Input Mode

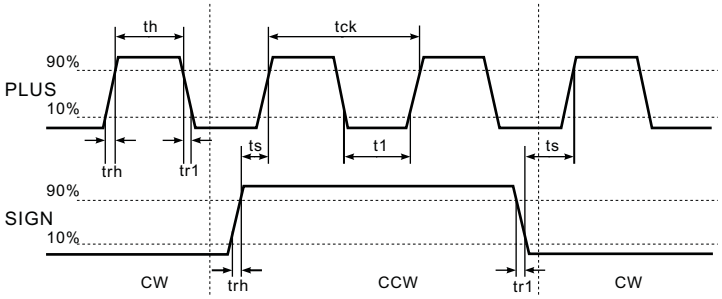


Figure 4 - 12
Pulse + Sign Input Interafce Timing Diagram (Pulse Frequency ≤500kHz)

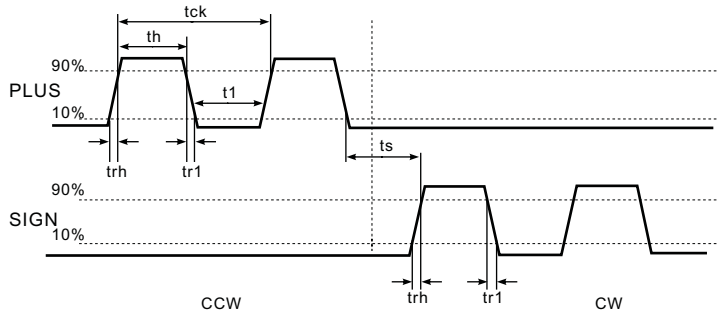


Figure 4 - 13
CW+CCW Pulse Input Interface Timing Diagram (Pulse Frequency≤500kHz)

Pulse Input Timing Parameter Table

Parameter	Differential Drive Input	Single-ended Drive Input
tck	>2uS	>5uS
th	>1uS	>2.5uS
tl	>1uS	>2.5uS
trh	<0.2uS	<0.3uS
trl	<0.2uS	<0.3uS
ts	>1uS	>2.5uS
tqck	>8uS	>10uS
tqh	>4uS	>5uS
tql	>4uS	>5uS
tqrh	<0.2uS	<0.3uS
tqrl	<0.2uS	<0.3uS
tqs	>1uS	>2.5uS

Chapter 5

Parameter Description

NOTE

- The person who makes the parameter adjustments must understand the meaning of the parameter, the incorrect setting may cause damage to the device and the personnel damage.
- In addition to the P1 and P3 parameters, all parameter adjustments should be performed while the servo motor is stopped.

5.1 Parameter Description

No.	Name	Description	Range	Default Value		
				10A	20A	30A
P1	Parameter password	① Prevent parameters were modified by mistake. After the password is set, you must enter a password 1 before you modify the parameters. ② Don't need to enter the password to modify the parameters when the password is "6666"; ③ You can modify P3 parameter without password.	1~9999	0	0	0
P2	Software version No.	Displays the current software version number and can be viewed and cannot be modified. 1.0 is represented as 10	1.0~9.9	13	13	13
P3	Display	0：Display the motor speed(r/min) 1：Display the motor current (A) 2：Display the torque of motor (Nm) 3：Display the current position of the motor (pulse) 4：Display the following error (pulse) 5：Display the input pulse frequency(kHz) 6：Display the position input pulse count low 5 bits 7：Display the position input pulse count high 5 bits 8：Display the position feedback pulse count low 5 bits 9：Display the position feedback pulse count high 5 bits 10：Display the line speed (mm/min)	0~10	0	0	0
P4	Check the fault alarm record	Check the fault alarm record: in according to fault state, press the UP, you can view multiple alarm record.		0	0	0
P5	Default parameter	Set to 1: Restore the system defaults			0	0
P6	Whether external EN is valid	0: Valid, to detect EN signal 1: Invalid, do not detect EN signal	0~1	1	1	1
P7	Control mode	0：Position control mode, external input pulse signal, P34 set input pulse mode 1：Speed control mode, external input 0~ ± 10V control speed 2：Torque control mode, external input 0~ ± 10V control torque (*) 3：Jog：Press UP,DOWN, forward & reverse running 4：Position control mode, internal given (*) 5：Speed control mode, internal given 6：Torque control mode, internal given 7：Automatic forward & reverse rotation mode, aging test	0~7	0	0	0

No.	Name	Description	Range	Default Value		
				10A	20A	30A
P8	Proportional gain of current loop	① Set the proportional gain of current loop ② The larger the set value, the faster the current gain ③ The value can be Increases when the motor is vibrating or howling ④ Reduces the value when using a small motor and overheating	0~1000	320	420	380
P9	Integral gain of current loop	① The greater the set value, the higher the integral gain, the stronger the rigidity, the easier to vibrate. ② The larger the load, the smaller the set value should be. ③ In the case of no oscillation, the greater the value is better.	0~1000	10	0	5
P10	Internal torque given value	For example: 1 indicates the torque of 0.1Nm	-10.0~10.0	1	1	1
P11	Proportional gain of speed loop	① The larger the set value, the higher the gain, the stronger the rigidity, the greater the noise. ② The greater the load, the bigger the value should be. ③ In the case of no noise, the greater the value is better.	0~10000	800	1200	1600
P12	Integral gain of speed loop	① The greater the set value, the higher the integral gain, the stronger the rigidity, the easier to vibrate. ② The greater the load, the bigger the value should be. ③ In the case of no noise, the greater the value is better.	0~10000	0	100	40
P13	Internal speed given value	For example, 1 means 1 RPM	0~6000	0	0	0
P14	Proportional gain of position loop	① Proportional gain of given position loop ② The smaller the value is stable, but the rigidity is worse ③The larger the value, the faster the position control, the smaller the following counting deviation, the stronger the rigidity, but the easy oscillation or overshoot ④ In the case of no noise, the greater the value is better.	0~1000	400	540	400
P15	Speed feed-forward gain of position loop	The greater the value, the smaller the position following deviation	0~1000	640	640	640
P16	Acc. speed feed-forward gain of position loop	The greater the value, the smaller the position overshoot	0~100	0	40	10

No.	Name	Description	Range	Default Value		
				10A	20A	30A
P17	AD Sampling Auto-correction drift permits	1: Automatic correction of drift markers The use of external analog control, correction of 0 drift, the first time and the motor is recommended to connect. Find the original point first after power on, and then correcting!	0	0	0	0
P18	The drift amount of Iv	Correction of 0 Drift of phase Iv current (read only)	0	x	x	x
P19	The drift amount of Iw	Correction of 0 Drift of phase Iw current (read only)	0	x	x	x
P20	The drift of external given voltage of speed or torque	Correction drift of external given voltage of speed or torque (Read only)	0	x	x	x
P21	Acc. ramp slope of speed mode	The greater the value, the shorter the time to accelerate to the given speed	0~1000	1	1	1
P22	Dec. ramp slope of speed mode	The greater the value, the shorter the time to decelerate to the given speed	0~1000	1	1	1
P23	Position command pulse frequency division molecule	① Number of motor pulses per rotating=10000x Division denominator/division molecule ② Electronic gear G= molecule/denominator1/30000<G<30000	0~10000	1	1	1
P24	Position command pulse frequency division denominator		0~30000	1	1	1
P25	Allowed to modify electronic gear	0：Invalid 1：Allowed to modify electronic gear (This setting is valid without a power outage)	0~1000	10	0	5
P26	Speed limit of torque loop	Limiting the speed of the motor in torque mode	0~3000	3000	3000	2500
P27	Rated Current of motor	Determined by the rated current of the motor; 1 represents 0.1A,28 represents 2.8A	0~40A	14	28	50
P28	Rated speed of motor	Determined by the rated speed of the current motor, unit: r/min	0~6000	3000	3000	2500
P29	Rated torque of motor	Determined by the rated torque of the current motor，1 represents 0.001NM，2 represents 0.002NM	0~10000	800	1300	4000
P30	Number of motor encoder lines	Set according to encoder value of motor		2048	2500	2500
P31	Motor pole logarithm	Set according to default value of motor manufacturer		4	4	4
P32	Motor encoder type	0：Incremental, with U\V\W signal lines 1：Incremental, without U\V\W signal lines（*） 2： Absolute encoder（*）	0~2	0	0	0

No.	Name	Description	Range	Default Value		
				10A	20A	30A
P33	Max. speed of motor	Set max. speed of motor	0~6000	3000	3000	2500
P34	Instruction input pulse mode	0：Pulse+Sign pulse and direction 1：CW+CCW forward and inverse control 2：A+B 90° quadrature pulse	0~2	0	0	0
P35	Max. speed in jogging mode	In the jogging mode, the long press UP and DOWN keys, the motor running at the highest speed.	-6000~6000	3000	3000	2500
P36	The origin search function	When set to 1, indicates the start of the origin automatic search function. The motor can stop at the origin of 1 rpm (Z phase) position, this function is used to adjust the motor shaft and mechanical position. It must be in the P7=0, and the electric motor without rotation, no load operation!	0~2	0	0	0
P37	Servo motor encoder Position 0-point offset	After performing the automatic search origin function, the parameter is used to store the relative position of the origin (the parameter is read-only and do not have to be modified)	Random number	0	0	0
P38	Whether to detecte encoder alarm	0：Yes 1：No	0~1	0	0	0
P39	Reverse of motor direction	0：Don't reverse when P7=0； 1：Reverse when P7=0 or 1； 2：When P7=1 or 5，the motor direction is controlled by the CW and CCW，and it is irrelevant to the sign of the input voltage;	0~2	0	0	0
P40	Driver alarm overload percentage	The driver alarms ER0-10 when the load exceeds P40 percent of the rated torque of the motor	1～600%	50	50	50
P41	Positioning completion Range	The position completes COIN output when the deviation count is less than or equal to this value	0~1	0	0	0
P42	Position out-of-tolerance detection range	When the deviation count is greater than this value, the position ultra difference alarm.	0~30000	1	1	1
P43	Is the position ultra difference alarm vialid?	0：Valid 1：Invalid	0~1	1	1	1
P44	Whether to allow aserial port communication signal	0: Don't allow 1: Allow		0	0	0
P45	Baud rate of serial communication	4800、9600、14400、19200		9600	9600	9600
P46	Percentage of torque control	Torque control reaches this percentage when output COIN Signal (*)	1～100%	100	100	100

No.	Name	Description	Range	Default Value		
				10A	20A	30A
P47	Number of frequency division of encoder	a) Encoder outputs A, B signal frequency division, phase 90 degrees orthogonal signal output. b) 0 and 1 for not frequency division	0~127	0	0	0
P48	Set servo limit Signal CW, CCW is valid or invalid	0：Invalid，don't detection CW and CCW signal 1：Detection CW and CCW signal. When CW is valid, the motor is forward limited; When CCW is valid, the motor is reversed limited, so need to alarm. 2：When detection CW、CCW is valid, no alarm, but the motor is stopped.	0~2	0	0	0
P49	Set servo input signal INTH valid or invalid	0：Invalid，don't detection INTH signal 1：Detection INTH signal is valid. Don't remove residual pulses 2：Detection INTH signal is valid or P7=0 torque reaches P46 output COIN signal and remove residual pulses	0~2	0	0	0
P50	JOG forward and reverse running time	JOG or aging test, automatic forward and reverse running time (in seconds)	0~30000	30	30	30
P51	Whether the alarm lock shaft	Does the Servo Drive lock the motor after the alarm? 0 - no、1 - yes	0~1	0	0	0
P52	Analog input voltage ratio	When P=1/2, Vin=Analog voltage value actual control voltage V = Vin*P52/10； This parameter is mainly for the occasion that the max. value of VIN is less than 10V	0~2	10	10	10

Note: (*) in a table reserved for subsequent refinement or reserved unction. (*) in the following chapter label as the same specification.

5.2 Precautions of Parameters Setting

NOTE

- Recommend all parameters are setting and modifying in the motor stationary state;
- In the implementation of the automatic origin search function (P36=1), the Servo Drive has been in the stop state after power on. The motor will automatically rotate and the rotation range must be less than one circle. Parameters must be written to the EEPROM for long-term preservation. The Offset stored in the P37 parameter.

NOTE

- The function of automatic origin is required before the correction of zero drift implemented.Parameters must be written to the EEPROM for long-term preservation. The Offset stored in the P37 parameter. Drift amount of Iv stored in parameter P18. Drift amount of Iw stored in parameter P19.
- After the drive is powered off, you must wait for more than 60 seconds to power on again.

5.3 Calculation Method of Electronic Gear Ratio

When the driver is used in CNC system, the electronic gear ratio in parameter P23 and P24 calculation method is as follows:

$$\frac{P23}{P24}=\frac{CMX}{CDV}$$

Note: The following are the symbols used to calculate the electronic gear ratio:

Pb : Ball screw feed (mm) n : Mechanical transmission deceleration ratio

Pt : Servo motor encoder resolution (pulse/resolution) $\triangle e°$: Corresponding feed per pulse (mm/pulse)

$\triangle S$: Corresponding feed per revolution of motor (mm/revolution) $\triangle \theta°$: Corresponding feed per pulse (°/pulse)

$\triangle \theta$: Motor corresponding angle of each revolution (°/revolution)

(a) Example of a screw guide: 1 pulse equivalent to 0.01mm feeding:

Mechanical specifications:

Ball screw feeding: Pb=10 (mm)

Deceleration ratio: n=1/2

Servo motor / Encoder resolution: Pt=10000 (pulse/resolution)

$$\frac{P23}{P24}=\frac{CMX}{CDV}=\Delta e°\cdot\frac{Pt}{\Delta S}\quad \Delta e°\cdot\frac{Pt}{n\cdot Pt}=0.01\cdot\frac{10000}{\frac{1}{2}\cdot 10}=\frac{20}{1}$$

(b) Example of conveyor belt setting: 1 pulse equivalent to 0.01 °

Turntable：360°/rev

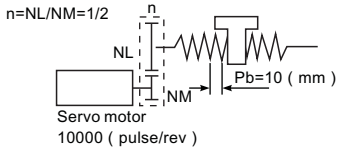
Deceleration ratio: n=1/3

Servo motor encoder

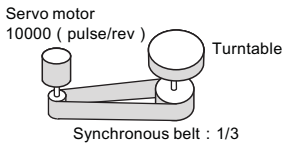
Resolution ratio: Pt=10000 (pulse/resolution)

$$\frac{P23}{P24}=\frac{CMX}{CDV}=\Delta\theta°\cdot\frac{Pt}{\Delta\theta}=0.01\cdot\frac{10000}{\frac{1}{3}\cdot 360}=\frac{5}{6}$$

If the value of the CMX or CDV exceeds the set range, the two value must be used reduce fractions until two values are within the set range, rounding the decimal point.



(a)



(b)

5

Chapter 6

Error alarm

NOTE

- Driver and motor power off at least 2 minutes before touching the driver and motor to prevent people from electric shocks;
- After the drive fails alarm, you must troubleshoot the alarm code before you can put it into use;
- When an error alarm occurs, the ER0-XX is displayed and blinking, XX is the alarm code;
- Set the P4 = 1, press "UP" button to view history in order to analyze the cause of alarm;
- After the alarm has occurred, you can operate the driver to view and modify the parameters.

Alarm List

Alarm Code	Alarm Content	Cuase
ER0-00	Abnormal CPU	
ER0-01	Motor speed is too high	1) Run speed is too fast; 2) Input pulse frequency is too high; 3) Electronic gear ratio is too big; 4) The instability of servo system causes overshoot; 5) Circuit board failure.
ER0-02	Main circuit power supply voltage is too high	1) The power supply voltage is too high (exceed+20%) ; 2) Braking resistance wiring disconnect; 3) Internal regenerative braking transistor is bad; 4) Internal regenerative braking loop capacity is too small; 5) Circuit board failure.
ER0-03	The main circuit power supply voltage is too low or the driver temperature is too high	1) The power supply voltage is too low (under-20%7) ; 2) Temporary power outage over 200mS; 3) Power boot loop failure; 4) Circuit board failure; 5) Temperature of driver is too high.
ER0-04	Out-of-tolerance alarm	1) Mechanical stuck; 2) The input pulse frequency is too high; 3) Encoder 0-point has changed; 4) Encoder connection errors; 5) Position loop gain P14 is too small; 6) Insufficient torque; 7) P42 parameter setting is too small ; 8) P43=1 Shielding this function will not alarm;
ER0-05	(*)	(*)
ER0-06	Driver write EEPROM failure	EEPROM chip is bad and need to replace
ER0-07	CW motor Clockwise limit	Hit the Clockwise limit switch, you can set the parameter P48=0 shielding this function or reverse rotation motor or increase the P41 parameters, P48=2 do not alarm.
ER0-08	CCW motor Counter Clockwise limit	Hit the Counter Clockwise limit switch, you can set the parameter P48=0 shielding this function or reverse rotation motor , P48=2 do not alarm.
ER0-09	Encoder failure	1) The encoder is damaged; 2) The encoder wiring is damaged or broken.; 3) P38=1 Shielding this function will not alarm; 4) The encoder cable is too long, causing the encoder voltage to be low.
ER0-10	Excessive current	1) Hort-circuit among U, V and W of motor cable; 2) Pe bad grounding; 3) Motor insulation damage; 4) Under the heavy load; 5) More than 300% rated current over 100 ms; 6) More than 30% rated current over 15s continuously; 7) The gain parameter is improperly set. Reducing the current loop gain by turning down the P8 parameter value; 8) Circuit board failure.

Alarm Code	Alarm Content	Cuase
ER0-11	Module failure	1) Excessive current; 2) The voltage is too low; 3) Motor insulation damage; 4) Improper setting of gain parameters; 5) Under the heavy load; 6) The temperature is too high; 7) Module danage; 8) Being disturbed; 9) Motor cable U,V and W are short circuit;
ER0-12	Motor overload alarm	The driver alarm when the overload exceeds the P40 percentage of the motor rated torque.

Chapter 7

Parameter Display and Settings

7.1 Display of Driver

The servo system panel consists of 6 LED digital tube display and 4 keys. Digital works to display the various states and parameters of the servo system; Press the key to set up and consult the system parameters. Digital works to display the various states and parameters of the servo system; Press the key to set up and consult the system parameter.

The normal display of the servo system has the following 12 ways:

01) Dispaly motor speed: parameter P3=0, unit : r/min 

02) Dispaly motor speed: parameter P3=1 , unit : A 

03) Dispaly motor torque: parameter P3=2 , unit : Nm 

04) Dispaly motor position: parameter P3=3 , unit : pulse 

05) Dispaly position follow error: parameter P3=4, unit: pulse 

06) Input pulse frequency: parameter P3=5 , unit : kHz 

07) Input pulse low 4 bits: parameter P3=6 , unit: pulse 

08) Input pulse high 4 bits: parameter P3=7 , unit : x10000pulse 

09) Motor feedback pulse low 4 bits: parameter P3=8 , unit : pulse 

10) Motor feedback pulse high 4 bits: parameter P3=9 , unit : x10000pulse 

11) Motor line speed: parameter P3=10 , unit : mm/min , one input pulse is 0.001mm. 

7.2 keypad Operation

The servo system panel consists of 6 LED digital tube display and 4 keys “↑”、“↓”、“M”、“S”, which works to display the various states and set-up parameters, etc. Keys’ function are as follows:

“↑” : Parameter No., value increment, or JOG mode motor forward running;

“↓”: Parameter No., value reduction, or JOG mode motor reversal;

“ M” : Function selection, or the current number of the cursor moves left;

“ S ”: Function confirmation, or data entry confirmation.

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In the normal display mode: Press the "Mode" key to enter the recycling choice of the three functional items (① "parameters", ② "parameter write", ③ "parameter initialization").

Press the "↑" key in the selection process to return the display status.

①“parameter”: P1 ~ P56 

②“parameter write” 

③“parameter initialization” 

NOTE

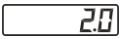
- When the parameter P1 is transferred, only "0" is displayed, the system password is not displayed;
- The data entered is not valid when the password is not entered, and returns the display.

7.3 Parameter Setting

7.3.1 Parameter setting

①In normal display mode: Press "Mode" to enter ① “parameters" 

② Press "↑" or "↓" key to select the parameter number you want to modify, press "S" 

③ Press "↑" value automatically add 1, press "↓" key value automatically minus 1, press "M" Key current number (decimal position) to move left, press "S" Key data confirmation.↑" 

NOTE

- When the parameter P1 is transferred, only "0" is displayed, the system password is not displayed;
- The data entered is not valid when the password is not entered, and returns the display.

7.3.2 Password input and modifications

Every time the system parameter settings must first enter the system password, input parameter P1 that is to enter the system password, when the password is correct, the other parameters can be set, otherwise you cannot set the other parameters.

The modification of password must enter the original password first, and then set the parameter P1. If the user forgets the system password, please contact the supplier;

When the password is set to "6666", the parameter can be modified the next time and you do not enter a password.

7.3.3 Parameter write

In the display state, press the “Mode” key to enter  ②“Parameter write” paramater write into state. Parameter writes must be performed when a user modified parameter needs to be saved for a long time. Press “S” key for three seconds, the parameters will be written to the internal EEPROM and later display:  . At this time, press the "S" Key to return.

7.3.4 Parameter initialization

In the display state, press the “Mode” key to enter  “parameter initialization" . Press ' S ' key for three seconds when the user needs to tune into the system parameter, parameters other than passwords are initialized to the system factory value, but not write in the internal EEPROM. When to write, you must have parameter writes. At this time, press the "S" Key to return.

Chapter 8

Running and Debugging

Note

- Servo drive terminal PE must reliable grounded with other appliance PE.
- Do not off and on servo drive power supply frequently.
- Do not use again damage or alarm failure servo drive.
- Please use the servo drive and serve motor with the instructed combination mode.
- Choose servo motor rated torque must greater than the effective continuous load torpue.
- Do not touch the radiator and motor of the servo drive during the drive running.

8.1 Power Supply Sequence

Servo system is composed for 6 LED digital tube display and 4 keys, which can be used to display the various states and parameters of the servo system.

Servo system is displayed in the following 12 ways:

8.1.1 Power Supply Connection

Power supply connection please refer to figure 7-1 and connect the power supply in the following order:

1) The power supply is connected to the main circuit power input terminal (R, S, T);

2) After power supply ON, it is delayed by 1.5 seconds, SRDY valid. In this case, the servo EN signal can be detected, the servo enable function and drive output valid, and the motor is energized in the power state. It is detected that the servo enable invalid or alarm, the motor drive circuit turned off, and the motor in a free state;

3) When the servo enable is connected with the power supply, the motor drive circuit is connected after about 1.5 seconds.

4) Turn on the power supply frequently, it may damage the soft start circuit and energy consumption brake circuit, switch off the frequency is best limited to 5 times per hour, and less than 30 times a day. If the drive or motor overheating, after the cause of the fault is excluded, it also need 30 minutes cooling then can re-turn on the power.

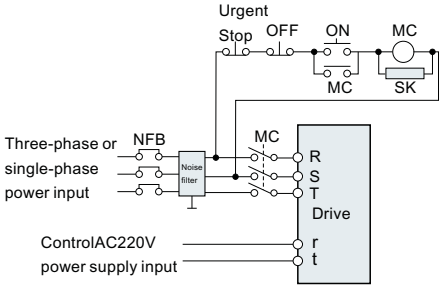


Figure 8 - 1

8.1.2 Power Supply Sequence

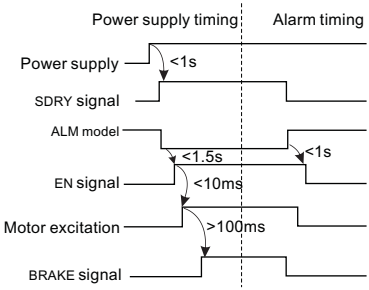


Figure 8 - 2

8.2 The Use of Mechanical BRAKE

The mechanical brake is used to lock the vertical or inclined working platform connected with the motor so as to prevent the motor from falling after power failure.

Use the drive BRAKE signal to control the intermediate relay and start the brake power by the relay (brake power supplied by the user). BRAKE signal valid after the drive motor excitation power supply delay time 10 seconds. The drive automatically disconnect the BRAKE signal delay time 100ms and then disconnect the motor excitation power supply.

When install this signal, the brake power must have sufficient capacity, and must be used as a freewheeling diode surge absorber, see below figure:

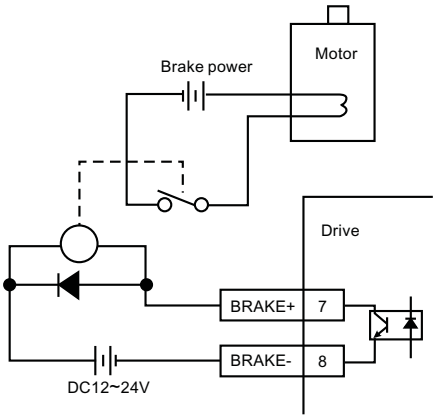


Figure 8 - 3

8.3 Running

8.3.1 Check before Running

After installation and connection, check the following items before power on:

- Is the power supply terminal connected correctly and reliably?
- Is the power supply and motor line short circuit or ground?
- Is the control signal terminal properly connected, and the polarity and size of the power supply is correct?
- Is the drive and motor securely fixed?
- Is the motor shaft connect the load?

8.3.2 Servo System JOG Control

When system parameter P7=3, the servo system is JOG control mode.

Press "↑" servo motor forward, the key lift and motor stop. Running speed is determined by parameter P35 setting value.

Press "↓" servo motor reversal, the key lift and motor stop. Running speed is determined by parameter P35 setting value.

The acceleration time constant of the JOG control is adjusted by the parameter P21; the JOG control deceleration time constant is adjusted by the parameter P22

8.3.3 Position Control of Servo System

When system parameter P7=0, the servo system control mode is external pulse input position. Running speed is determined by output pulse frequency, running direction is determined by input direction and P39, and the pulse mode is set by P34.

When the system parameter P7=4, the servo system is internal pulse given position control.

8.3.4 Speed Control of Servo System

When system parameter P7=1, the control mode of servo system is external analog voltage given speed. The running speed is determined by the voltage of the Vin1, which is determined by the symbol of Vin1 and P39. When P39=2, the direction is determined by CW, CCW. CW and CCW are forward and reverse torque. When the input voltage is 10V, the torque is maximum speed;

When system parameter P7=5,7, the control mode of servo system is internal given speed. The running speed is determined by the value of P13, and the direction is determined by the sign of the value;

Speed control of the zero drift through the parameter P17, P20 adjustment, which is to make the motor speed is 0 when the input voltage is 0V;

Speed control acceleration time constant is adjusted by parameter P21. And the speed control deceleration time constant is adjusted by parameter P22.

8.3.5 Torque control of Servo System (*)

When system parameter P7=2, the servo control mode of servo system is external analog voltage given torque. The torque is determined by the voltage of the Vin1. Direction is determined by Vin1 sign and P39, when P39=2, the direction is determined by CW, CCW. CW and CCW are forward and reverse torque. When the input voltage is 10V, it is maximum torque, highest speed specified by internal speed P26.

8

Speed control of the zero drift through the parameter P17, P18, P19 adjustment, which is to make the motor output torque is 0 when output voltage is 0V.

Output COIN signal when the output torque reach parameter P29 of the percentage of P46. . COIN pulse signal, width 10ms;

Alarm output when P7=2,6 COIN torque reach the percentage of P40 setting.

8.4 Debugging

Note
◆ Incorrect parameter setting may cause device failure and accident, before starting should confirm the correctness of the parameter. ◆ It is recommended to carry out no-load debugging, and then load debugging.

8.4.1 Origin of Motor Encoder

When the servo system is powered on, the motor will automatically run for less than one week when the motor is not running. The servo drive will automatically search for the origin of the motor (mechanical zero).

8.4.2 Gain and Rigidity Debugging

Current loop proportional gain parameter P8 : the greater of the setting value, the faster of the current gain. This value can be increased when vibration, and can be reduced when using a small inertia motor and overheating; in addition to the high requirement, this value is not easy to change;

Speed loop proportional gain parameter P11: the greater of the setting value, the higher of the gain. But the greater of the noise, the greater of the load, and the setting value should be more greater. In the absence of noise, the greater of the value will be better;

Position loop proportional gain parameter P14: the smaller of the value, the more stable, but the worse of the rigidity. The larger of the value, the faster of the position control. With smaller of the count deviation, the stronger of the rigidity, but easy to oscillate or overshoot. In the absence of oscillation and overshoot, the greater of the value will be better;

Position feedforward gain parameter P15 : the greater of the setting value, the higher of the gain, and stronger of the rigidity, but easy to oscillation. The greater of the load, and the setting value should be smaller. In the absence of oscillation, the greater of the value will be better.

8.4.3 Position Resolution and Electronic Gear Setting

Position resolution (a pulse stroke) is determined by the number of feedback pulse per revolution of the servo motor and the number of Pt pulse per revolution of the encoder, which can be expressed as follows:
:

$$\triangle 1 = \frac{\triangle S}{Pt}$$

In type:

ΔI : A pulse stroke (mm) ;

ΔS : Servo motor per revolution (mm/rev) ;

Pt : Encoder feedback pulse per revolution (pulses / rev).

Because there are quadruplicated frequency circuit, Pt=4x , C is the number of rotation per encoder. In this system, C = 2500 line / rev.

Pt＝10000pulse／rev

Command pulse is multiplied by the electronic gear ratio G after the conversion into the position control, so a command pulse stroke is expressed as:

$$\Delta 1^{*} = \frac{\Delta S \times G}{Pt}$$

In type: $G = \frac{\text{Command pulse frequency division}}{\text{Command pulse frequency denominator}}$

When the drive is used in the CNC system, the parameters P23 and P24 are calculated asfollows:

$$\frac{P23}{P24} = \frac{\text{Mechanical reduction ratio} \times \text{System pulse equivalent} \times 1000}{\text{Screw pitch (mm)}}$$

The pulse equivalent of the general numerical control system is: 0.001mm.

8.4.4 Servo Start and Stop Characteristic of Debugging

The start and stop characteristic of the servo system is the acceleration and deceleration time, which is determined by the load inertia and the start and stop frequency, but also by the performance of the Servo Drive and servo motor. Frequent start and stop, over short acceleration and deceleration time and over load inertia lead to drive and motor overheating, the main circuit over voltage alarm must be adjusted according to the actual situation.

1) Load Inertia and Start-Stop Frequency

It need to be confirmed whether in the allow frequency range when use in the start-stop and high frequency situation. The permissible frequency range varies depending on the motor type, capacity, load inertia, and motor speed. Under the condition that the load inertia is m times motor inertia, the start and stop frequency of the servo motor and the recommended acceleration and deceleration time are as follows :

Load Inertia Multiple	Allowable Start-stop Frequency
m≤3	> 100 times/min : Acceleration / deceleration time constant 500 or less
m≤5	60 ~ 100 times/min : Acceleration / deceleration time150 or smaller
m > 5	< 60 times/min: Acceleration / deceleration 50 or smaller

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2) Influence of Servo motor

Different types of servo motors permitted to start-stop frequency and deceleration time with the load conditions, running time, Of load rate, environmental temperature and other factors, please refer to the Motor manual, adjusted according to specific circumstances, so as to avoid the overheat alarm or affect the service life.

3) Method of Adjustment

The general load inertia should be within 5 times the inertia of the motor rotor, under the heavy load inertia, may often occur in deceleration when the main circuit over-voltage or abnormal braking. This can be handled by the following methods:

- Increase the acceleration and deceleration time, you can set a larger value, and then gradually reduce to the appropriate value
- Reduce the internal torque limit value, also reduce the current limit value
- Reduce the maximum speed of the motor
- Replace a motor with bigger power and bigger inertia

Chapter 9

Data Communication

9.1 Communication Line Connection

USB plug use standard RS-232 software protocol on the drive, the definitions of the drive head:

1 RS-232 interface (USB PIN) for 2(RXD) ，3(TXD)，4(GND) and shell PE;

2 PC RS-232 for2(RXD) ，3(TXD)，5(GND)and shell PE;

3 Connect the computer as shown below:

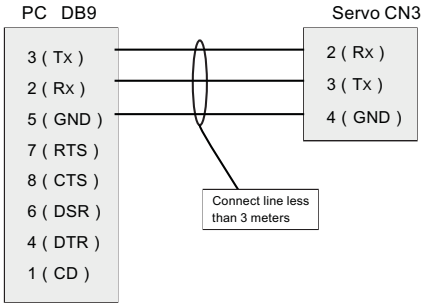

Figure 9 - 1

9.2 Software System Operation Instruction

9.2.1 The main interface of the software

Figure 9 - 2

9.2.2 System Parameter Setting

Figure 9 - 3

No.	Name	Function	Range	Default Value
P1	Parameter password	To prevent the parameters are mistakenly modified, after set password, each time you modify the parameter, at first must enter the password, and password is set to 666, in the future change the parameter without enter the password and modify the P3 parameter can not enter the password.	1 ~ 9999	1

9.3 Installation of Communication Software

Note: This software is not installed. Please install the MSCOMM control before using the software.

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Warranty Agreement

① The warranty period of the product is 18 months (refer to the bar code on the equipment body). During the warranty period , if the product fails or damaged under the condition of normal use by following the instruction, we will be responsible for free maintenance.

② Within the warranty period , maintenance will be charged for the damages caused by the following reasons :

✧ The damage caused by improper use or repair/modification without prior permission.

✧ The damage caused by fire , flood , abnormal voltage , other natural disasters and second disaster.

✧ The hardware damage caused by artificial falling or transportation after purchase.

✧ The damage caused by the improper operation.

✧ The damage or failure caused by the trouble out of the equipment (e.g. : External device)

③ If there is any failure or damage to the product, please fill in the information of the Product Warranty Card in details correctly.

④ The maintenance fee is charged according to the newly adjusted Maintenance Price List of our company .

⑤ In general , the warranty card will not be re-issued. Please keep the card and present it to the maintenance personnel when asking for maintenance .

⑥ If there is any problem during the service , please contact the agent of our company or our company directly .

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Service Department

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Product Warranty Card

Customer information	**Add. of corporation:**	
	Name of corporation:	**Contact person:**
	P.C.:	**Tel.:**
Product information	**Product model:**	
	Body bar code:	
	Name of agent:	
Failure information	**(maintenance time and content):** **Maintenance personnel:**	