Preface

Thank you very much for purchasing A&D's ADSD-S series servo products. This manual provide related contents on how to use our ADSD-S servo drive and ADSM-S motor. It includes:

1. Installation of AC servo drives and motors
2. Configuration and wiring
3. Trial run steps
4. Control functions and adjusting methods of servo drives
5. Parameter settings
6. Inspection and maintenance
7. Troubleshooting
8. Application examples

Who should use this manual :
1. Those who are responsible for designing.
2. Those who are responsible for installing or wiring.
3. Those who are responsible for operating or programming.
4. Those who are responsible for maintaining or troubleshooting.

Before using the product, please read this user manual thoroughly to ensure correct use and store this manual in a safe and handy place for quick reference whenever necessary. Besides, please observe the following precautions:

1. Install the product in a clean and dry location free from corrosive and inflammable gases or liquids.

2. Do not connect a commercial power supply to the U, V, W terminals of motor. Failure to observe this precaution will damage either the Servo motor or drive.

3. Ensure that the motor and drive are correctly connected to a ground.
4. Do not attach, modify and remove wiring when power is applied to the AC servo drive and motor.
5. Before starting the operation with a mechanical system connected, make sure the emergency stop equipment can be energized and work at any time.
6. Do not touch the drive heat sink or the servo motor during operation. Otherwise, it may result in serious personnel injury

If you have other questions , Please consult our distributors or our customer services center.

safety precautions:

Carefully note and observe the following safety precautions when receiving, inspecting, installing, operating, maintaining and troubleshooting.

Receiving inspecting

⚠ attentioin	☆	In order to prevent fire hazard and accidents, please form the wiring by the cable specifications outlined in this user manual.

Installation

⚠ attention	☆	Do not use the product in a wet location or where have corrosive and inflammable gases or liquids. Failure to observe this caution may result in electric shock, fire, or personal injury.

Wiring

⚠ warrning	☆	The drive and motor's grounding terminal should correctly connect to the ground according country electrical safty requirements. Failure to observe this caution may result in electric shock, fire, or personal injury.
⚠ attention	☆	Do not connect any power supplies to the U, V, W terminals. Failure to observe this precaution may result in serious injury, damage to the drive or fire.
	☆	Ensure that all screws, connectors and wire terminations are secure on the power supply, servo drive and motor. Failure to observe this caution may result in damage, fire or personal injury.

Operation

⚠ warrning	☆	In order to prevent accidents, the initial trial run for servo motor should be conducted under no load conditions (separate the motor from its couplings and belts).
	☆	Do not approach or touch any rotating parts (e.g. shaft) while the motor is running. Failure to observe this precaution may cause serious personal injury.
	☆	Before starting the operation with a mechanical system connected, change the drive parameters to match the user-defined parameters of the mechanical system. Starting the operation without matching the correct parameters may result in servo drive or motor damage, or

damage to the mechanical system.

☆ Ensure that the emergency stop equipment or device is connected and working correctly before operating the motor that is connected to a mechanical system.

☆ Do not touch either the drive heat sink during operation as they may become hot and personal injury may result.

Maintenance and Inspection

⚠ warrning

☆ Do not touch any internal or exposed parts of servo drive and servo motor as electrical shock may result.

☆ Do not remove the operation panel while the drive is connected to an electrical power source otherwise electrical shock may result.

☆ Wait at least 5 minutes after power has been removed before touching any drive or motor terminals as an electrical charge may still remain in the servo drive and servo motor with hazardous voltages even after power has been removed.

☆ Do not disassemble the servo drive or motor as electric shock may result. otherwise electrical shock personal injury may result.

☆ Do not connect or disconnect wires or connectors while power is applied to the drive and motor. otherwise electrical shock personal injury may result.

Main Circuit Terminal Wiring

⚠ attention

☆ Please perform the wiring after the terminal blocks are all removed from the drive.

☆ Insert only one wire into one terminal on the terminal block.

☆ When inserting wires, please ensure that the conductors are not shorted to adjacent terminals or wires.

Main Circuit Terminal Wiring

⚠ attention

☆ Do not install the moter power cables and encoder cables tegother, install the encoder cables in a separate conduit from the motor power cables to avoid signal noise. Separate the conduits by 30cm above.

☆ Use multi-stranded twisted-pair wires or multi-core shielded-pair wires for signal, encoder (PG) feedback cables. The maximum length of command input cable is 3m and the maximum length of encoder (PG) feedback cables is 20m.

☆ As a charge may still remain in the drive with hazardous voltages even after power has been removed, be sure to wait at least 5 minutes after power has been removed before performing any wiring and/or inspection.

☆ It is not recommended to frequently power the drive on and off. Do not turn the drive off and on more than once per minute as high charging currents within the internal capacitors may cause damage(within 0.2 minutes).

Servo motor perform trial run seperately

⚠ attention

☆ Please perform trial run without load first and then perform trial run with load connected. After the servo motor is running normally and regularly without load, then run servo motor with load connected. Ensure to perform trial run in this order to prevent unnecessary danger.

Servo motor and mechanical system trial run in team

⚠ attention

☆ In order to prevent accidents, the initial trial run for servo motor should be conducted under no load conditions (separate the motor from its couplings and belts),that mean, just let the motor work separately, do not operate the servo motor while it is connected to its mechanical system,because connecting the motor to its mechanical system may cause damage or result in personal injury during the trail run.

Contents

AD SD - S 2 1- 4.0K XX

standby

Company:A&D

Servo driver

Series: S: AS synchronous
AS :AC asynchronous

Voltage grade: 2 220v
3 380v

output power 0.2k   0.2kw
0.4k   0.4kw
0.75   0.75kw
1.5k   1.5kw
2.2k   2.2kw

1-1phase
3-phase

Chapter 1   Unpacking Check and Model Explanation

1-1 Unpacking Check

In case of any parts missing during purchasing or shipping, after receiving servo drive, please check for the following:

Check item	description
Ensure that the product is what you have ordered.	Please refer to Section 1.2 for details about the model explanation
Ensure that the servo motor shaft rotates freely.	Rotate the motor shaft by hand; a smooth rotation will indicate a good motor. However, a servo motor with an electromagnetic brake can not be rotated manually.
Check for damage.	Visual inspect the unit to insure it was not damaged during shipment.
Check for loose screws.	Visual inspect if there are screws loose or loosen off.

If any problem mentioned above happened, please inform the distributor whom you purchased the product from or our company.

A complete and workable AC servo system should be including the following parts:

(1) Servo drive and Servo motor.

(2) One power cable, which is used to connect servo motor and U, V, W terminals of servo drive. This power cable is with one green grounding cable. Please connect the green grounding cable to the ground terminal of the servo drive.

(3)One encoder cable, which is used to connect the encoder of servo motor and CN2 terminal of servo drive.

(4)Connector CN1: 44 PIN Connector.

(5)Connector CN2: 15 PIN Connector.

(6)Connector CN3: 8 PIN Connector

1-2 Model Explanation

1-2-1 Servo Drive Nameplate Explanation

AD SD - S 2 1- 4.0K XX

- Company:A&D
- Servo driver
- Series: S: AS synchronous
  AS :AC asynchronous
- Voltage grade: 2 220v
  3 380v
- standby
- output power 0.2k   0.2kw
  0.4k   0.4kw
  0.75   0.75kw
  1.5k   1.5kw
  2.2k   2.2kw
- 1-1phase
  3-phase
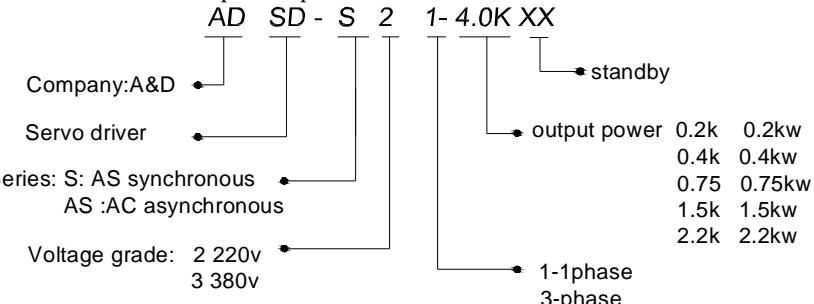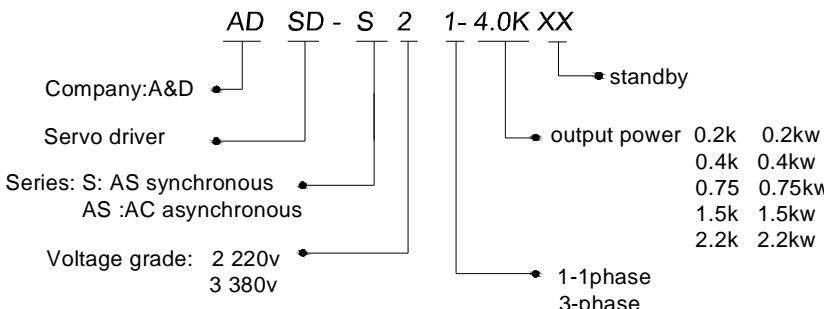
1-2-2 Servo Motor nameplate explanation

AD SM-S 110-040 M 20 D K Z

- **A&D**
- **Servo motor**
- **Asynchronors series**
- **Machine seat**
  - **110：110 series**
  - **130：130 series**
  - **150：150 series**
- **Rated torque**
  - **020：2N.m   040：4N.m**
  - **077：7.7N.m   100：10N.m**
  - **150：15N.m   180：18N.m**
  - **230：23N.m   270：27N.m**
- **Motor inertia**
  - **L：low   M：middle**
- **Rated speed**
  - **15:1500rpm   20:2000rpm**
  - **25:2500rpm   30:3000rpm**
- **Coder resolution**
  - **D：2500 line drive**
  - **T：2000 line drive**
- **Shaft type**
  - **K：with key**
  - **default：without**
- **Electromagnetic brake**
  - **Z：with brake**
  - **default：without**

1-2-3 Servo Drive and Servo Motor Combinations

power	Servo Drive model	Servo Motor model
400W	ADSD-S23-0.4K	ADSM-S80-013M30
		ADSM-S80-024M30
750W	ADSD-S23-0.75K	ADSM-S80-033M30
		ADSM-S110-020M30
		ADSM-S130-040M25
		ADSM-S130-050M20
1500W	ADSD-S23-1.5K	ADSM-S110-040M30
		ADSM-S130-050M25
		ADSM-S110-060M20
		ADSM-S110-050M30
		ADSM-S130-060M25
		ADSM-S110-060M30
		ADSM-S130-077M20
		ADSM-S130-077M25
		ADSM-S130-100M15
2200W	ADSD-S23-2.2K	ADSM-S130-077M30
		ADSM-S130-100M25
		ADSM-S130-150M15
4000W	ADSD-S23-4.0K	ADSM-S130-150M15
		ADSM-S150-150M25
		ADSM-S150-180M20
		ADSM-S150-230M20
		ADSM-S150-270M20

1-3 parts of Servo Drive
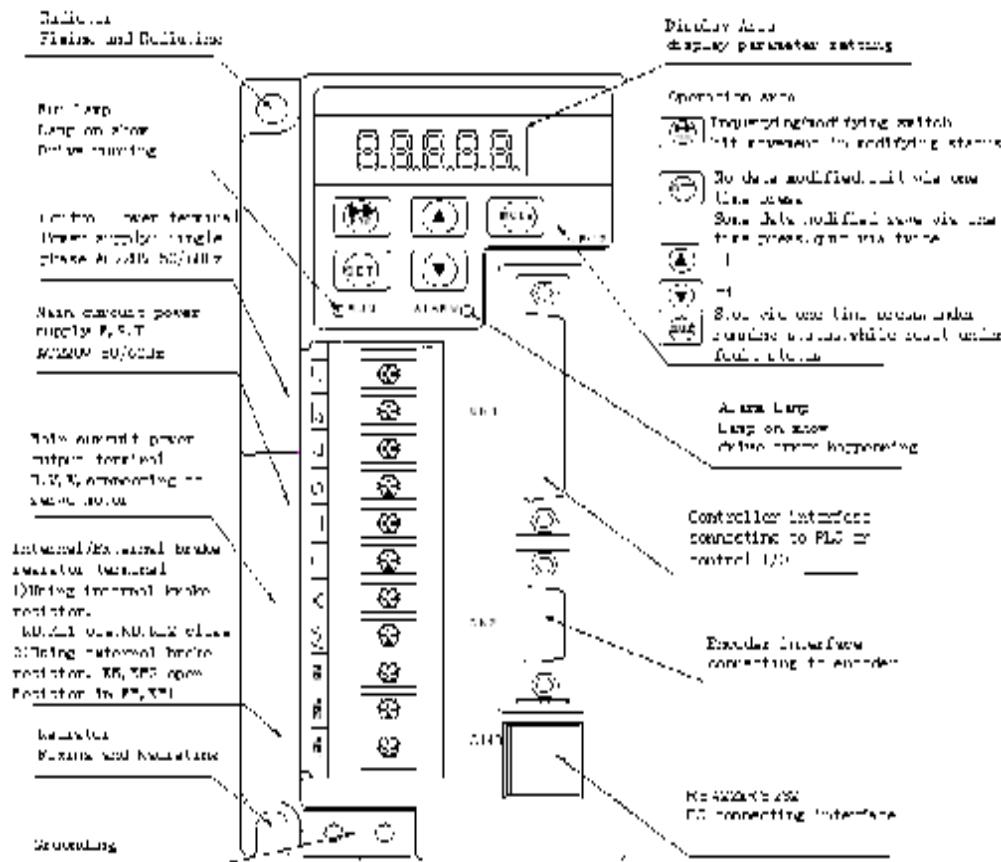
1-4 Servo Drive operation mode

This servo drive can provide multiple operation modes for user's option as follows:

Mode		Mode Code	Description
single mode	External Position Control	P	Position control for the servo external pulse command.
	Internal Position Control	Pi	Position control for the servo motor is achieved commands stored within the servo controller. Ex the 8 positions is via Digital Input (DI) signals.
	Speed Control	S	Speed control for the servo motor can be achieved via parameters set within the controller or from an external analog -12 ~ +12 V command. Control of the internal speed parameters is via the Digital Inputs (DI). (A maximum of three speeds can be stored internally).
	internal Speed Control	Si	Speed control for the servo motor is only achparameters set within the controller. Control of speed parameters is via the Digital Inputs (DI of three speeds can be stored internally).
	Torque Control	T	Torque control for the servo motor can be achieved via parameters set within the controller or from an external analog -12 ~ +12 V command. Control of the internal torque parameters is via the Digital Inputs (DI).
	Internal Torque Control	Ti	Torque control for the servo motor is only achieved via parameters set within the controller. Control of the internaltorque parameters is via the Digital Inputs (DI).
	Index mode		Controller accept external DI signal and perform index mode control according the setting parameter.
Dual mode		P-S	Either P or S control inputs (DI)
		P-T	Either P or T control mode can be selected via the Digital Inputs (DI)

	Pi-S	Either Pi or S control mode can be selected via the Digital Inputs (DI)
	Pi-T	Either Pi or T control mode can be selected via the Digital Inputs (DI)
	S-T	Either S or T control mode can be selected via the Digital Inputs (DI)

The above control modes can be accessed and changed via by parameter B01. If the control mode is changed, switch the drive off and on after the new control mode has been entered.

Chapter 2   Installation

2-1 Safty and Precautions

Please pay close attention to the following installation notes:

1) Do not bend or strain the connection cables between servo drive and motor.

2) When mounting servo drive, make sure to tighten screws to secure the drive in place.

3) If the servo motor shaft is coupled directly to a rotating device ensure that the alignment specifications of the servo motor, coupling, and device are followed.

4) If the length of cable connected between servo drive and motor is more than 20m, please increase the wire gauge of the encoder cable and motor connection cable (connected to U, V, W terminals).

5) Make sure to tighten the screws for securing motor.

The product should be kept in the shipping carton before installation. In order to retain the warranty coverage, the servo drive should be stored properly when it is not to be used for an extended period of time. Some storage suggestions are:

2-2 Storage conditions

◻Store in a clean and dry location free from dust.

◻Store within an ambient temperature range of -20°C to +65°C.

   Store within a relative humidity range of 0% to 95% and non-condensing.

◻Do not store in a place subjected to corrosive gases and liquids.

   Correctly packaged and placed on a solid surface.

2-3 Installation conditions

The ambient temperature of servo drive for long-term reliability should be within under -10℃~55℃.If the ambient temperature of servo drive is greater than 45℃ , please install the drive in a well-ventilated location and do not obstruct the airflow for the cooling fan.

If they are installed in a control panel, please ensure sufficient space around the units for heat dissipation. Pay particular attention to vibration of the units and check if the vibration has impacted the electric devices in the control panel. What's more,please observe the following precautions when selecting a mounting location:

Do not mount the servo drive or motor adjacent to heat-radiating elements or under high temperature.

Avoid droping water,steam,dust or oil.

Prohibit use in dangerous environment where is subject to inflammable or combustible or explosive gas or liquid.

Do not mount the servo drive or motor in a location subjected to airborne dust or metallic particles.

Do not mount the servo drive or motor in a location where vibration and shock will exceed specification.

Do not mount the servo drive or motor in a location where it will be subjected to high levels of electromagnetic radiation.

The ambient temperature of servo motor for long-term reliability should be within under 0℃~40℃.

please observe the following precautions:

Do not mount the motor adjacent to heat-radiating elements or under high temperature,

Avoid droping water , steam , dust or oil.

Prohibit use in dangerous environment where is subject to inflammable or combustible or explosive gas or liquid.

Do not mount the servo drive or motor in a location subjected to airborne dust or metallic particles.□

2-4 **Installation Procedure and Minimum Clearances**

Important Attentions:

Please follow the guidelines in this manual when installing the servo drive and motor. Incorrect installation may result in a drive malfunction or premature failure of the drive and or motor. The servo drive should be mounted perpendicular to the wall or in the control panel. In order to ensure the drive is well ventilated, ensure that the all ventilation holes are not obstructed and sufficient free space is given to the servo drive. Do not install the drive in a horizontal position or malfunction and damage will occur.
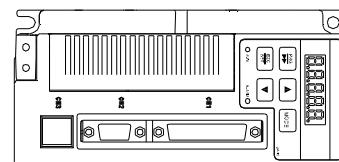
Installation Procedure：

In order to help the cooling fan subject to a lower wind block so as to discharge the heat more effectively, we suggest users to observe below minimum installation clearance.
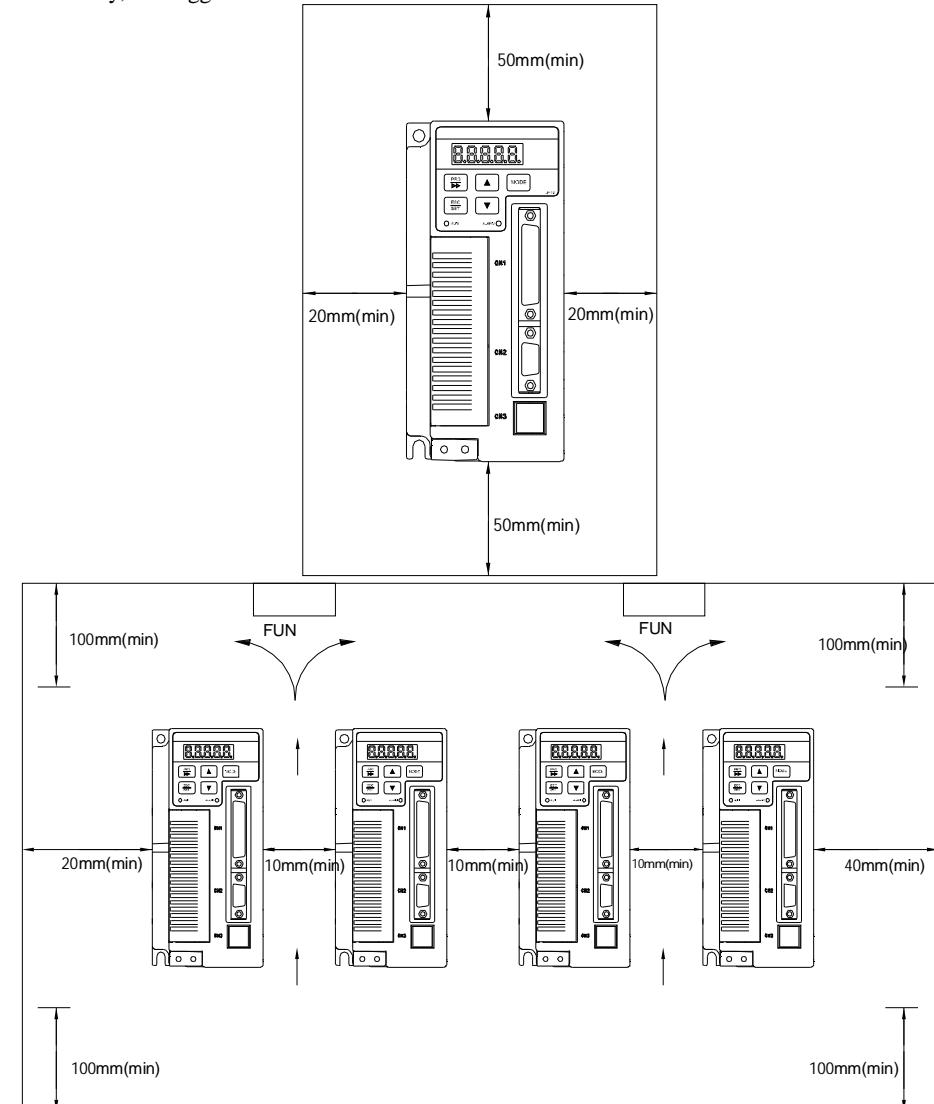
Chapter 3 Connections and Wiring

This chapter provides information on wiring ADSD-S series servo products, the descriptions of I/O signals and gives typical examples of wiring diagrams.

3-1 peripheral devices connect with main circuit

3-1-1 CONNECTING TO PERIPHERAL DEVICES
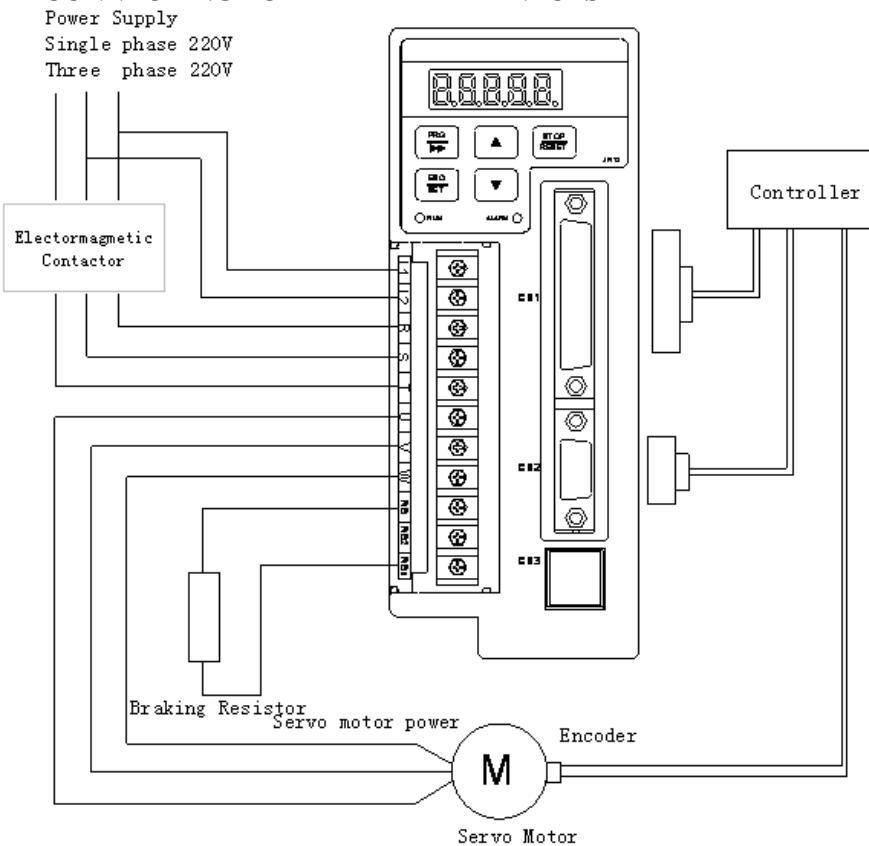
Safty precautions:

1. Check if the wiring of control circuit power (L1, L2) and main circuit power (R, S, T) are correct.

2. Check if the phase of U,   V,   W cables is connected correctly.

3. When using an external resistor, connect it to RB and RB1, and ensure an open circuit between RB and RB2. When using an internal resistor, ensure the circuit is closed between RB and RB2, and the circuit is open between RB and RB1.

4. If a fault or emergency stop occurs, using ALARM or WARN output can control electromagnetic contactor and cut off the power of the servo drive.

3-1-2 CONTROL CIRCUIT TERMINALS

Terminal Identification	Terminal description	Functions
L1,L2	control circuit input terminals	connect to Single-Phase AC power
R,S,T	main circuit input terminals	connect to 3-phase AC power
U,V,W	main circuit output terminals	connect to motor power imput terminal
RB,RB1, RB2	conncetion point for breaking resistance	When using an internal resistor, ensure the circuit is closed between RB and RB2, and the circuit is open between RB and RB1; When using an external resistor, connect it to RB and RB1, and ensure an open circuit between RB and RB2.
CN1	servo drive terminal	connecto to controller
CN2	encoder terminal	connector to encoder
CN3	communication terminal	connctor to PC

Wiring connection should pay close attention to follows:

1) As a residual hazardous voltage may remain inside the drive, please do not immediately touch any of the "power" terminals (R, S, T, U, V, & W) and/or the cables connected to them after the power has been turned off and the charge LED is lit

2) The cables connected to R, S, T and U, V, W terminals should be placed in separate conduits from the encoder or other signal cables. Separate them by at least 30cm.

3) If the encoder cable is too short, please use a twisted-shield signal wire with grounding conductor. The wire length should be 20m or less. For lengths greater than 20m , the wire gauge should be doubled in order to lessen any signal attenuation.

3-1-3 POWER SUPPLY CONNECTIONS FOR CONTROL CIRCUIT

Servo drives wiring conections include single phase connection and three phase connection. Single phase connection can only fit for the unit whose power is undedr 1KW. In below drawing, Power ON is on "a" position, OFF and Processing is on "b"position. 1MC/x is electromagnetic contcactingt coil, 1MC/a is self-protection power, 1MC is main circuit interface.

Three phase connection fit for unit whose power is 1KW or above
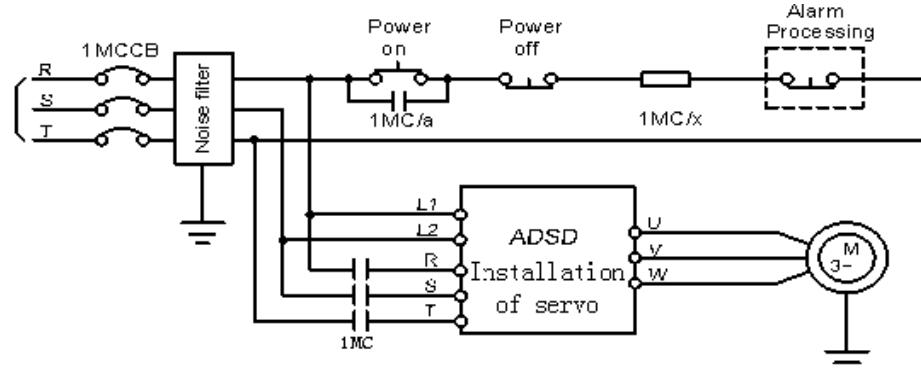
Single phase connection fit for unit whose power is under 1KW
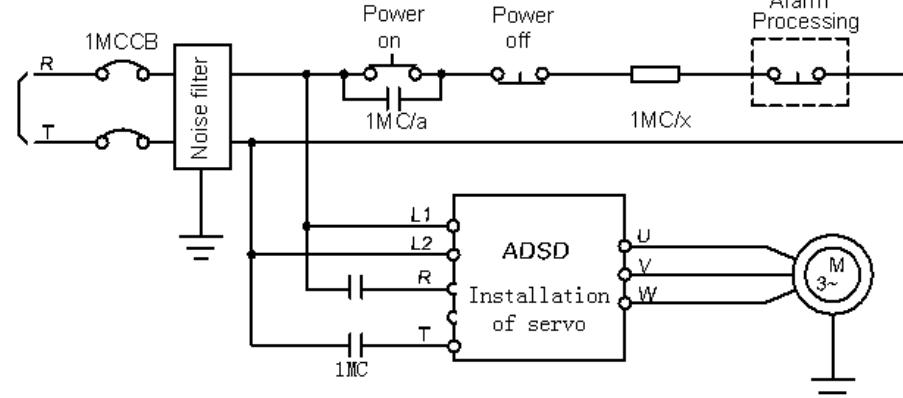
3-2 Input / Output Interface Connector CN1

CN1   Terminal Signal Identification
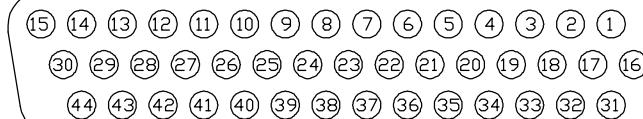
General signal

Signal	Signal code	Pin No.	Function
Analog Signal Input	VI1	40	Speed analog imput signal
	VI2	41	Torque analog imput signal
Analog Monitor Output	M2	36	the MON1 and MON2 can be assigned drive and motor parameters that can be monitored via an analogue voltage.
	M1	37	
Position Pulse output	OA+	10	The motor encoder signals are available through the terminals. The encoder output pulse count can be set via parameter.
	OA-	11	
	OB+	12	
	OB-	13	
	OZ+	14	
	OZ-	15	
Position Pulse input	P+	34	input pulse
	P-	35	
	N+	32	input pulse sign
	N-	33	
Power	+24V	42,43,44	supply 24V suource
	COM	28,29,30	24V ground
Power	+12V	38	+12V source
	-12V	39	-12V source
	12VGND	25,26,27	+12V/-12V ground

DI signal

signal	signal code	Pin No.	Function
DI	DI1	16	External terminal input 1.
	DI2	1	External terminal input 2.
	DI3	17	External terminal input 3.
	DI4	2	External terminal input 4.
	DI5	18	External terminal input 5.
	DI6	3	External terminal input 6.
	DI7	19	External terminal input 7.
	DI8	4	External terminal input 8.

DO signal

signal	signal code	Pin No.	Function
DO	DO1+	24	External terminal input 1+
	DO1-	9	External terminal input 1-
	DO2+	23	External terminal input 2+
	DO2-	8	External terminal input 2-
	DO3+	22	External terminal input 3+
	DO3-	7	External terminal input 3-.
	DO4+	21	External terminal input 4+
	DO4-	6	External terminal input 4-.
	DO5+	20	External terminal input 5+.
	DO5-	5	External terminal input 5-.

3-3 CN2 encoder signal connections

CN2 interface signal description
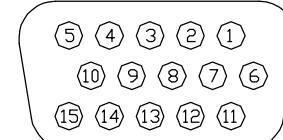
Signal Identification	Footnote	function
A+	7	Encoder A +phase input
A-	8	Encoder A - phase input
B+	9	Encoder B +phase input
B-	10	Encoder B- phase input
Z+	15	Encoder Z +phase input
Z-	14	Encoder Z - phase input
U+	5	Encoder U +phase input
U-	4	Encoder U - phase input
V+	3	Encoder V +phase input
V-	2	Encoder V - phase input
W+	1	Encoder W - phase input
W-	6	Encoder W - phase input
+5V	13	Encoder using 5V source
GND	11,12	Encoder using 5V ground source

3-4 CN3 communication signal connection

CN3 interface signal description
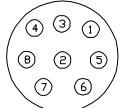
Signal	Pin No.	functions
R1+	8	Controller termimal data receiving line drive + terminal
R1-	7	Controller termimal data receiving line drive - terminal
T1-	6	Controller termimal data sending line driver - terminal
T1+	5	Controller termimal data sending line driver + terminal
RX232	4	
TX232	3	
GND	1,2	ground signal

3-5 interface circuit

3-5-1 input switching interface

using servo drive internal source

interface drawing
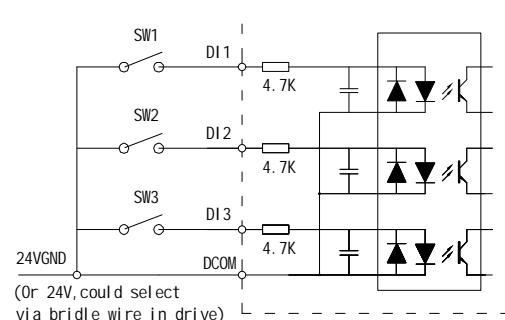
3-5-2 output switching interface

（1）using external source

（2）using servo drive internal source

driving relay

Driving LED
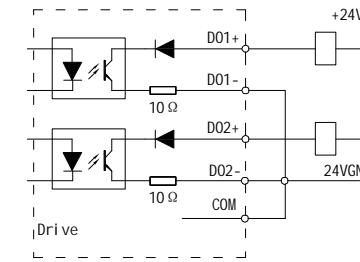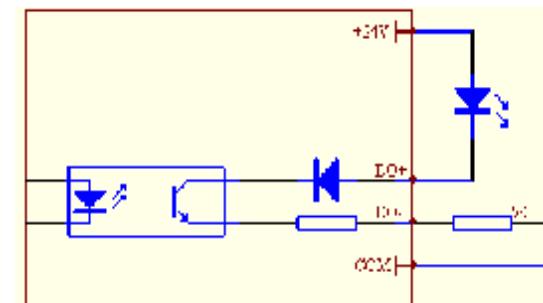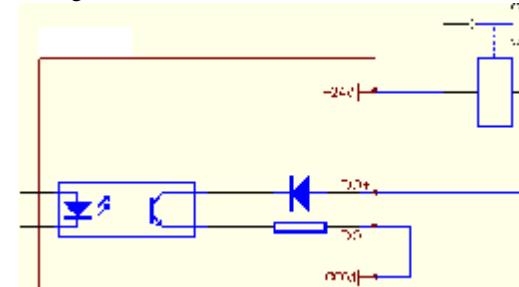
NOTE: the 24V AD source can either be supplied by servo dirver or external source.

3-5-3 analog input interface
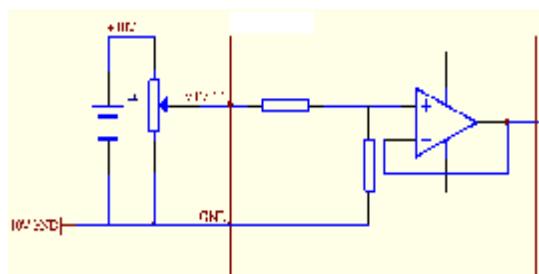
3-5-4 **analog output interface**
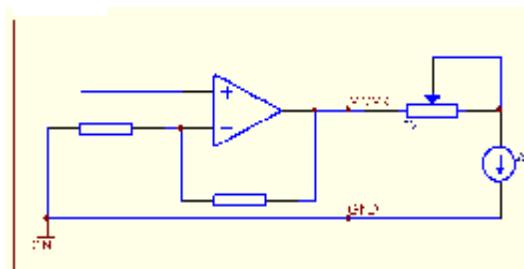
3-5-5 Pulse input interface

(1) Line Drive input
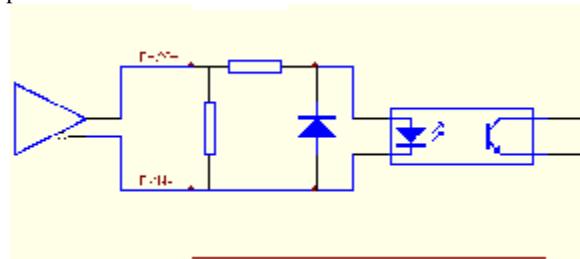
(2) Collector input
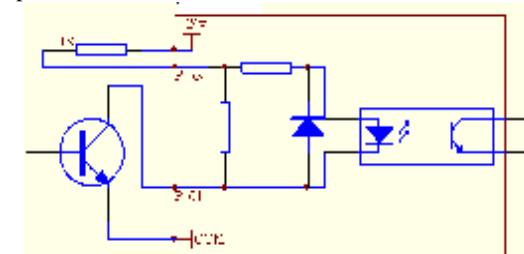
3-5-6 Pulse output interface

Line Drive Output
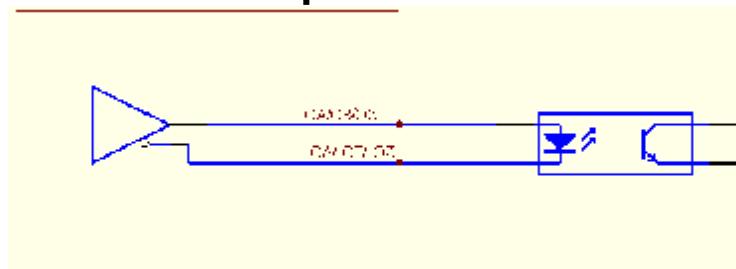
3-6 standard connection
3-6-1 P position pulse control mode
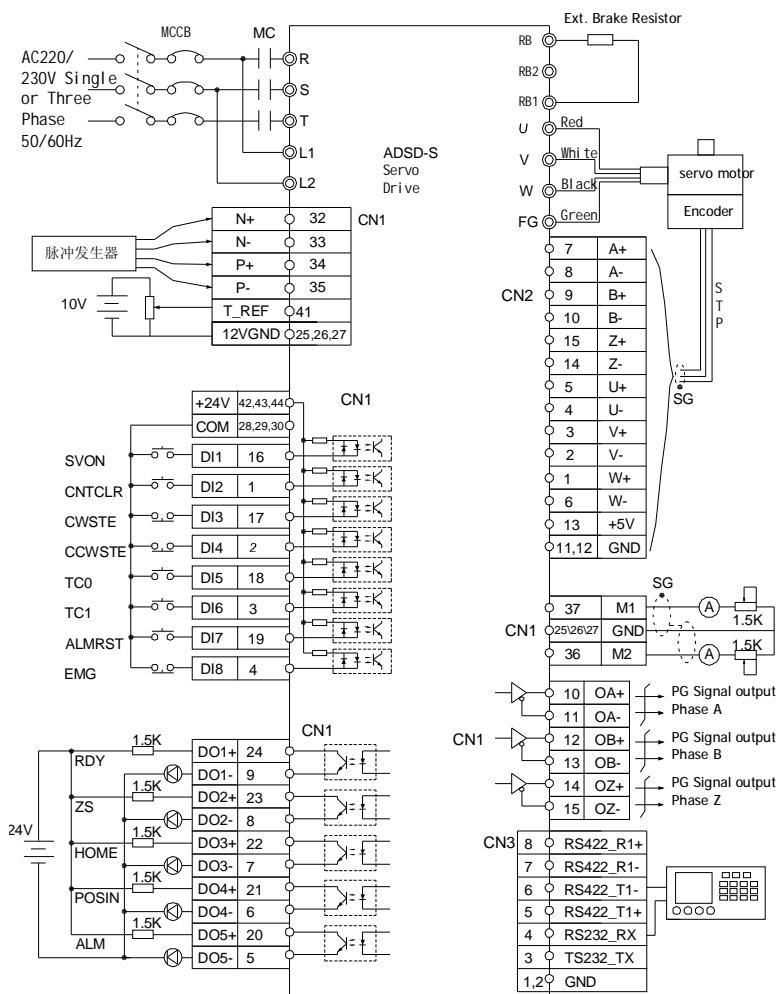
3-6-2 Pi internal position control mode
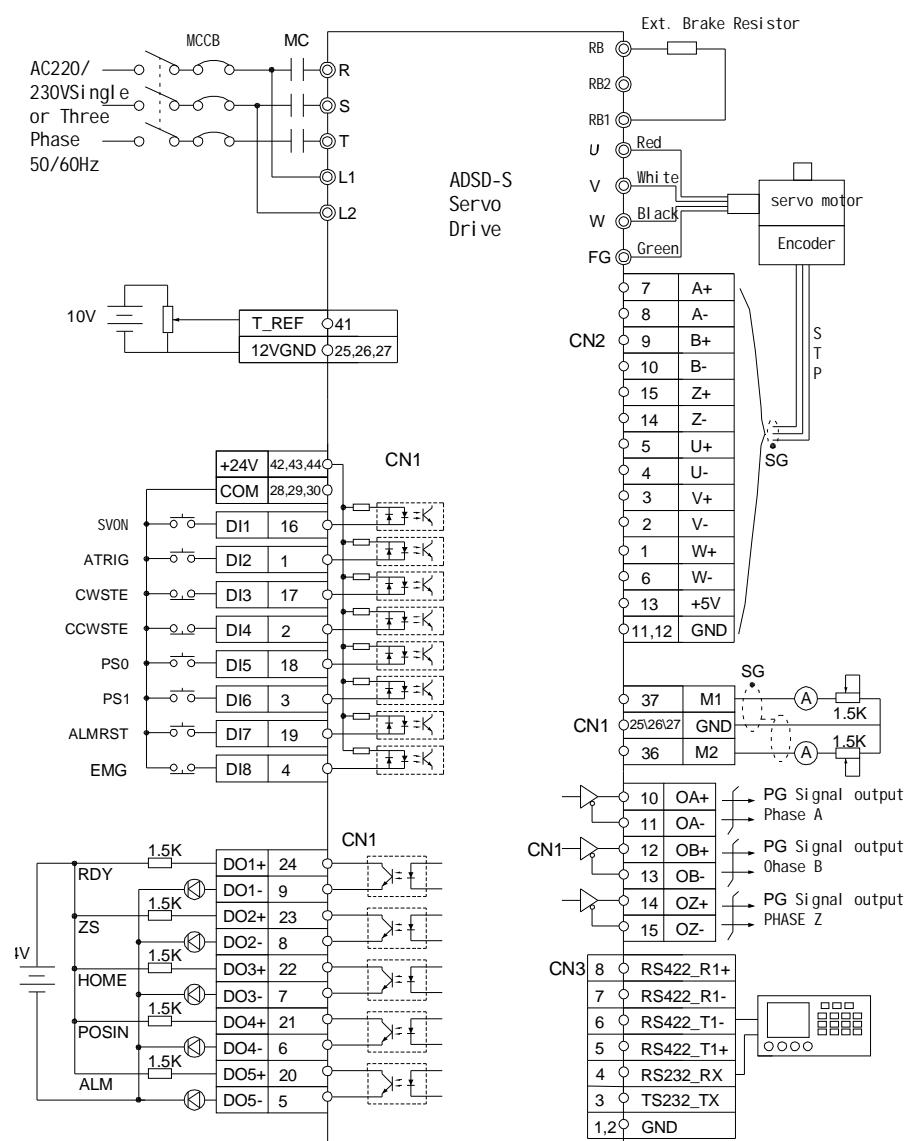
3-6-3 S/Si speed control mode

AC220/230V Single or Three Phase 50/60Hz

MCCB MC

ADSD-S **Servo Drive**

R, S, T, L1, L2

Ext. Brake Resistor

RB, RB2, RB1, U Red, V White, W Black, FG Green

servo motor
Encoder

10V

CN1		
V_REF	40	
12VGND	25,26,27	
T_REF	41	
12VGND	25,26,27	

CN2

7	A+
8	A-
9	B+
10	B-
15	Z+
14	Z-
5	U+
4	U-
3	V+
2	V-
1	W+
6	W-
13	+5V
11,12	GND

S T P

SG

	+24V	42,43,44	CN1
	COM	28,29,30	
SVON	DI1	16	
TRQLM	DI2	1	
CWSTE	DI3	17	
CCWSTE	DI4	2	
SPD0	DI5	18	
SPD1	DI6	3	
ALMRST	DI7	19	
EMG	DI8	4	

CN1

37	M1
25\26\27	GND
36	M2

SG A 1.5K A 1.5K

CN1

10	OA+	PG Signal output Ohase A
11	OA-	
12	OB+	PG Signal output Phase B
13	OB-	
14	OZ+	PG Signal output Phase Z
15	OZ-	

24V

	RDY	1.5K	DO1+	24	CN1
	RDY		DO1-	9	
	ZS	1.5K	DO2+	23	
	ZS		DO2-	8	
	ARRV	1.5K	DO3+	22	
	ARRV		DO3-	7	
	BRK	1.5K	DO4+	21	
	BRK		DO4-	6	
	ALM	1.5K	DO5+	20	
	ALM		DO5-	5	

CN3

8	RS422_R1+
7	RS422_R1-
6	RS422_T1-
5	RS422_T1+
4	RS232_RX
3	TS232_TX
1,2	GND

3-6-4 T/Ti torque control mode

AC220/230V Single or three Phase 50/60Hz

MCCB MC

ADSD-S **Servo Drive**

R, S, T, L1, L2

Ext. Brake Resistor

RB, RB2, RB1, U Red, V White, W Black, FG Green

servo motor
Encoder

10V

	V_REF	40	CN1
	12VGND	25,26,27	
	T_REF	41	
	12VGND	25,26,27	

CN2

7	A+
8	A-
9	B+
10	B-
15	Z+
14	Z-
5	U+
4	U-
3	V+
2	V-
1	W+
6	W-
13	+5V
11,12	GND

S T P

SG

	+24V	42,43,44	CN1
	COM	28,29,30	
SVON	DI1	16	
SPDLM	DI2	1	
CWSTE	DI3	17	
CCWSTE	DI4	2	
TC0	DI5	18	
TC1	DI6	3	
ALMRST	DI7	19	
EMG	DI8	4	

CN1

37	M1
25\26\27	GND
36	M2

SG A 1.5K A 1.5K

CN1

10	OA+	PG Signal output PhaseA
11	OA-	
12	OB+	PG Signal output Phase B
13	OB-	
14	OZ+	PG Signal output Phase Z
15	OZ-	

24V

	RDY	1.5K	DO1+	24	CN1
	RDY		DO1-	9	
	ZS	1.5K	DO2+	23	
	ZS		DO2-	8	
	ARRV	1.5K	DO3+	22	
	ARRV		DO3-	7	
	BRK	1.5K	DO4+	21	
	BRK		DO4-	6	
	ALM	1.5K	DO5+	20	
	ALM		DO5-	5	

CN3

8	RS422_R1+
7	RS422_R1-
6	RS422_T1-
5	RS422_T1+
4	RS232_RX
3	TS232_TX
1,2	GND

3-7 servo motor connection

Motor wiring socket	Wiring	U				V				W				FG	
	Socket no.	2				3				4				1	
Encoder socket	Signal	5V	0V	A+	A-	B+	B-	Z+	Z-	U+	U-	V+	V-	W+	W-	FG
	Socket no.	2	3	4	7	5	8	6	9	10	13	11	14	12	15	1
Break unit	Socket no.	1				2				3					
	Power	24VDC(-15%~+10%)								FG					

Chapter 4   Display and Operation

This chapter describes ADSD-S servo drive panel display and the basic operation of the digital keypad.

4-1 display and operation

4-1-1 parts of the Digital Keypad

| Name	Function
Main Display Arear	The Display (5-digit, 7-step display panel) shows the monitor codes, parameter settings.
PRG/>> SHIFT Key	SHIFT key can scrolls through parameter groups. It can move the cursor to the left and then change parameter settings by using arrow keys.
SET Key.	SET key can execute the function to RAM. SET key + Mode key can execute the function to RAM＋E^{2}PROM.
UP and DOWN arrow Key.	UP　　+1 DOWN　　-1 UP +MODE　　+10 DOWN +MODE　　-10
MODE Key	Pressing MODE key can enter or exit different parameter groups, and switch between Monitor mode and Parameter mode.
RUN	Run indication light, the light ON is mean the servo drive is working.
ALARM	Alarm indication light. The light ON is meaning fault occurred.

4-1-2 Display parameter Flowchart
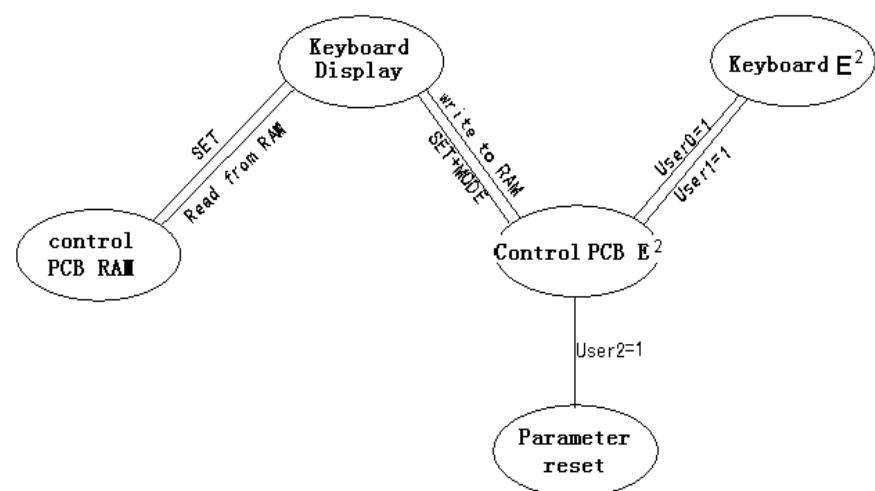

4-1-3 parameter setting description

LED display	Description
	Showing that the current value is 16 M (the black dot means 16 M)
	Showing that the current value is 10 M

4-1-4 keyboard operation

ADSD-S servo drive works according multi-level menu, the first level is main menu, which including seven kinds of parameters: monitoring parameter, fault parameter ,basic parameter, high-level parameter, system parameter, factory parameter, user parameter. The operation procedure of these parameters is as follows:
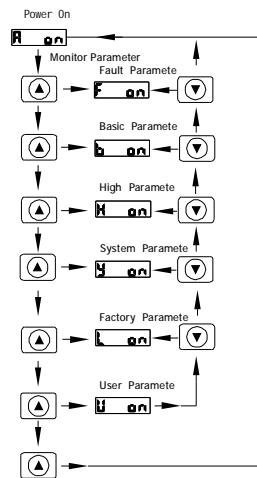

Letter A stands for monitoring parameters. Each monitoring parameter can be setted according below operation procedure.you can set 22 kinds of different monitoring parameters according your choosed software version, speed command, analog command, moter feedback pulse, commanded pulse, differential value, torque value, moter control mode, DC bus voltage and alarm code.
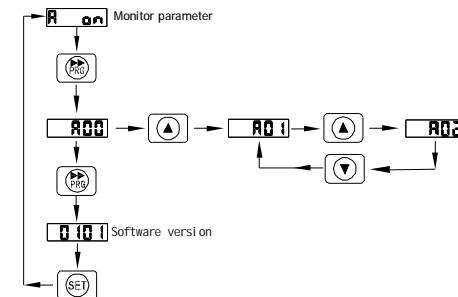
mornitoring parameter list:

No	E^2	RAM	parameter name	function
A00		0000H	VER	Firmware version
A01		0001H	ALM_FLG	Drive fault alarm code
A02		0002H	ALM_FLG1	Drive fault alarm code 1
A03		0003H	SPD_FB_H	Motor speed feedback
A04		0004H	SPD_CMD	Speed command
A05		0005H	SPD_REF	Analog speed reference input
A06		0006H	POS_FB_H	Motor feedback pulse NO.
A07		0006H	POS_FB_L	
A08		0007H	POS_CMD_H	Position command pulse NO.
A09		0007H	POS_CMD_L	
A10		0008H	POS_ERR_H	Position command and feedback warp
A11		0008H	POS_ERR_L	
A12		0009H	TRQ_CMD	Torque command
A13		000AH	TRQ_REF	Analog torque reference
A14		000BH	TRQ_FB	Actual torque
A15		000CH	DC_V	Main circuit voltage
A16		000DH	IN_ST	Input status
A17		000EH	OUT_ST	Output status
A18		000FH	MODE	Control mode
A19		0010H	SV_ON	Servo on mark
A20		0011H	CPLD ver	CPLD version
A21		0012H	IU_FB	IU Feedback current instant value
A22		0013H	IV_FB	IV Feedback current instant value

Parameters whose name is with initial letter B is called basic paraters. You can set the
parameters according below setting steps, after set, you should repower the unit to make the
parameters working. The details of the parameters definition is stated in following description.
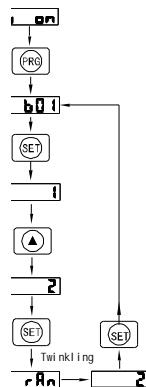
Other parameters can be set according above setting procedure.

4-2 user parameter

user parameeter					
No.	Contain	description	upper limitation	Lower limitation	factory setting
U00	driver->key	0	no function	1	0	0
		1	Control EEPROM,store data to kekboard EEPROM			
U01	key->driver	0	no function	1	0	0
		1	Keyboard EEPROM,store data to control EEPROM.			
U02	Reset factory	0	no function	1	0	1
		1	low inertia parameter			
		2	medium inertia parameter			
U03	paramters group shielded.	0bit	shielded,mortoring parameters group.	3Fh	0	0
		1bit	shielded, fault parameter group			
		2bit	shielded,basic,parameter group			
		31bit	shielde,high-level parameter group			
		4bit	shielded,system parameter group			
		5bit	shielded,factory parameter group			
U04	User password	setting correct passwork,permit to modify parameters.	FFFFh	0	FFFF

Chapter 5 Trial Run and TuningProcedure

```
                    ┌──────────────┐
                    │    Start     │
                    └──────┬───────┘
                           ▼
                    ┌──────────────┐
                    │ Motor unload │
                    └──────┬───────┘
                           ▼
                    ┌──────────────┐
                    │ Model confirm│
                    └──────┬───────┘
                           ▼
      ┌────────────────────────────────────────┐
      │ motor and drive peripheral   connection│
      │ confirm                                 │
      └────────────────────┬───────────────────┘
                           ▼
                  ┌─────────────────┐
                  │ Confirm control │
                  └────────┬────────┘
                           ▼
                  ┌─────────────────────┐
                  │ Setting I/O interface│
                  └────────┬────────────┘
                           ▼
                  ┌────────────────────────┐
                  │ Setting motor's parameters│
                  └────────┬───────────────┘
                           ▼
      ┌────────────────────────────────────────┐
      │ Set the gain parameters corresbonding  │
      │ with the control mode to a proper      │
      │ value(aviode o limitation)             │
      └────────────────────┬───────────────────┘
                           ▼
                  ┌─────────────────┐
                  │ Power on running│
                  └─────────────────┘
```
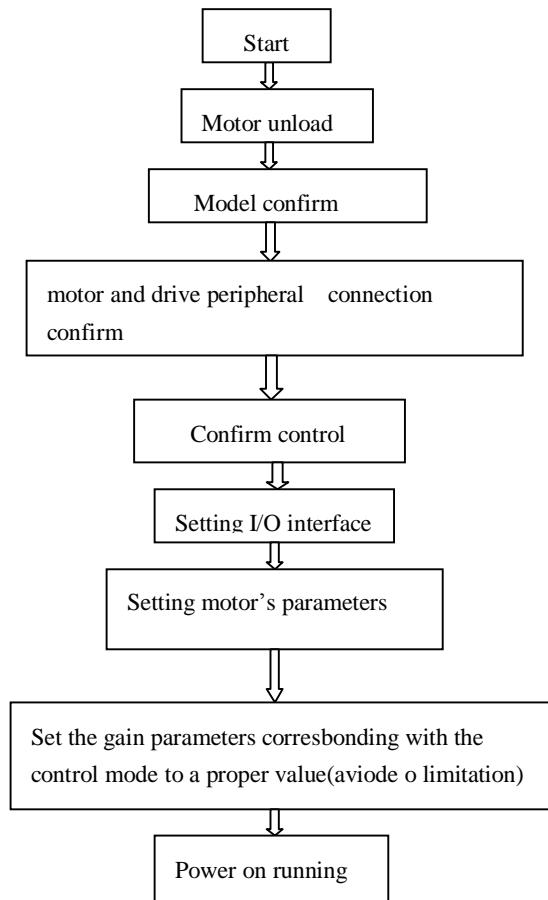
5-1 Inspection without load

In order to prevent accidents and avoid damaging the servo drive and mechanical system, the trial run should be performed under no load condition (no load connected, including disconnecting all couplings and belts). Do not run servo motor while it is connected to load or mechanical system because the unassembled parts on motor shaft may easily disassemble during running and it may damage mechanical system or even result in personnel injury. After removing the load or mechanical system from the servo motor, if the servo motor can runs normally following up the normal operation procedure (when trial run without load is completed), then the users can connect to the load and mechanical system to run the servo motor.

□ *In order to prevent accidents, the initial trial run for servo motor should be conducted under no load conditions(separate the motor from its couplings and belts).*

□ *Caution: Please perform trial run without load first and then perform trial run with load connected. After the servo motor is running normally and regularly without load, then run servo motor with load connected. Ensure to perform trial run in this order to prevent unnecessary danger.*

After power in connected to AC servo drive, the charge LED will light and it indicates that AC servo drive is ready. Please check the followings before trial run：

Inspection before operation (Control power is not applied)	□ Inspect the servo drive and servo motor to insure they were not damaged. □ To avoid an electric shock, be sure to connect the ground terminal of servo drive to the ground terminal of control panel. □ Before making any connection, wait 10 minutes for capacitors to discharge after the power is disconnected, alternatively, use an appropriate discharge device to discharge. □ Ensure that all wiring terminals are correctly insulated. □ Ensure that all wiring is correct or damage and or malfunction may result. □ Visually check to ensure that there are not any unused screws, metal strips, or any conductive or inflammable materials inside the drive. □ Never put inflammable objects on servo drive or close to the external regenerative resistor. □ Make sure control switch is OFF. □ If the electromagnetic brake is being used, ensure that it is correctly wired. □ If required, use an appropriate electrical filter to eliminate noise to the servo drive. □ Ensure that the external applied voltage to the drive is correct and matched to the controller.

| | | Inspection during operation (Control power is applied)） | □ Ensure that the cables are not damaged, stressed excessively or loaded heavily.
When the motor is running, pay close attention on the connection of the cables and notice that if they are damaged, frayed or over extended.
□ Check for abnormal vibrations and sounds during operation. If the servo motor is vibrating or there are unusual noises while the motor is running, please contact the dealer or manufacturer for assistance.
□ Ensure that all user-defined parameters are set correctly. Since the characteristics of various machinery equipment are different, in order to avoid accident or cause damage, do not adjust the parameter abnormally and ensure the parameter setting is not an excessive value.
□ Ensure to reset some parameters when the servo drive is off (Please refer to Chapter 7). Otherwise, it may result in malfunction.
□ If there is no contact sound or there be any unusual noises when the relay of the servo drive is operating, please contact your distributor for assistance or contact with Delta.
□ Check for abnormal conditions of the power indicators and LED display. If there is any abnormal condition of the power indicators and LED display, please contact your distributor for assistance or contact with Delta. |

5-2 Main parameter setting

5-2-1 Control mode confirmation

Before operation, system control mode should be confirmed. Set the control mode by setting B01(Control mode)

b01	11	0101H	CTRL_MOD	Control Mode	—	1	0~8

There are 6 single control modes and 6 dual control modes, besides,also some special mode(for special toe index mode（can be used for rotation table control）

| Value	Control mode	Mode instruction
0	T Analog Torque control	Torque control for the servo motor can be achieved via parameters set within the controller or from an external analog -10 ~ +10 Vdc command. Control of the internal torque parameters is via the Digital Inputs (DI). (A maximum of three torque levels can be stored internally).
1	S-External Speed control	Speed control for the servo motor can be achieved from an external analog -10 ~ +10 Vdc command only. Control of the internal speed parameters is via the Digital Inputs (DI). (A maximum of three speeds can be stored internally).
2	P External Position Control	Position control for the servo motor is achieved via an external pulse command.
3	P/S	Switch via input signal MODE status	OFF:P MODE	ON:S MODE
4	P/T	Switch via input signal MODE status	OFF:P MODE	ON:T MODE
5	S/T	Switch via input signal MODE status	OFF:S MODE	ON:T MODE
6	Pi-Internal Position Control	Position control for the servo motor is achieved via by 8 commands stored within the servo controller. Execution of the 8 positions is via Digital Input (DI) signals. Can choose the running sequence via parameter setting.
7	Si-Internal Speed control	Speed control for the servo motor can be achieved via parameters set within the controller o. Control of the internal speed parameters is via the Digital Inputs (DI). (A maximum of three speeds can be stored internally).
8	Ti Internal torque control	Torque control for the servo motor is only achieved via parameters set within the controller. Control of the internal torque parameters is via the Digital Inputs (DI). (A maximum of three torque levels can be stored internally).
9	Pi/S	Either Pi or S control mode can be selected via the input signals MODE.	OFF:Pi MODE	ON:S MODE
10	Pi/T	Either Pi or T control mode can be selected via the input signals MODE.	OFF:Pi MODE	ON:T MODE
11	Toe index	Control mode for turning charactor，according to input terminal commands, to proceed with graduation orientation control.

5-2-2 I/O Interface defination

I/O Interface defination，define DI1~DI8 input interface needed through high parameter H14～H17（including SVON, ALMRST、CW/CCW prohibited），H18～H20output interface defination（Including RDY、SVON、ALM）。

H14	5B	040EH	DI2-DI1	Input terminal DI2,DI1 defination		0601H	0~FFFFH
H15	5C	040FH	DI4-DI3	Input terminal DI4,DI3 defination		0B0AH	0~FFFFH
H16	5D	0410H	DI6-DI5	Input terminal DI6,DI5 defination		0D0CH	0~FFFFH
H17	87	0411H	DI8-DI7	Input terminal DI8,DI7 defination		0208H	0~FFFFH

<center>Input function definition chart</center>

symbol	Set value	Function instruction
P/PI	00H	Switch on, speed loop is ratio tache,else ratio intergral tache.
SVON	01H	Switch on,servo enable
ALMRST	02H	Alarm reposition. After alarm,alarm reason removed, then switch it on,it shows alarm signal removed.
MODE	03H	Mode selection under dual mode: OPEN,select MODE1;SHORT,select MODE2
DIR_REV	04H	Command input reverse control,Under internal position resgister andSpeed&torque mode, after it switches on,input commands turn to reverse.
GAIN_CHG	05h	Plus switch。Under speed&postion mode, after switch on, plus turns to Primary plus* changing ratio.
TRQLM	06H	Under speed or postion mode,it switch on，Motor torque will be confined.，Torque confine command selection： OPEN—internal register（4FH,50H），SHORT—external torque analog commands.
SPDLM	07H	Speed confine commands selection: Under torque mode, switch on, motor speed will be confined. Confine speed commands will be internal resigster or external analog voltage commands. OPEN—internal register（44H），SHORT—external speed analog command
EMG	08H	Switch on，motor urgency stop.
SV_LOCK	09H	Servo lockup,apply Pt,Pr，S，Sz
CWSTE	0AH	Reverse forbidden limitation
CCWSTE	0BH	FWD forbidden limitation
SP0	0CH	Internal speed command selection

SP1	0DH	
DISPN	0EH	Under position mode，switch on，external pulse input invalid
ORG_ST	0FH	Switch on，origin searching function will be activated
ORG_SW	10H	When origin searching, switchon, motor speed-down, regress to origin according to parameter regress mode.
TC0	11H	Internal torque command selection
TC1	12H	
JOGU	13H	Switch on,motor FWD inching, inching speed parameter is JOG_SP(56H)
JOGD	14H	Switch on, motor reverse inching
HOLD	15H	Under internal position register mode,switch on,motor stops.
POSU	16H	Under internal position register mode,switch on，run to next internal register position command.
POSD	17H	Under internal position register mode,switch on，run to next internal register position command.
POSR	18H	Under internal position register mode,switch on，back to first internal register position command.
ATRIG	19H	Under internal register mode，after setting internal position control commands(POS0~2)，switch on will trigger motor to move according to internal position control register command.，after digital output 0 speed signal（ZSPD=1）Then incept next trigger internal position command
POS_AUTO	1AH	Under internal position register mode,switch on，will auto-move according to internal position control register commands,moving spacing time refers to POST0~POST7,moving speed refers to POSV0~POSV7 将
PS0	1BH	Internal register postion command selection

Position command	PS2	PS1	PS0	ATRIG	Corresponding parameter
Positon register 0	0	0	0	↑	H42
					H43

	PS1	1CH	Positon register 1	0	0	1	↑	H44
								H45
			Positon register 2	0	1	0	↑	H46
								H47
			Positon register 3	0	1	1	↑	H48
								H49
			Positon register 4	1	0	0	↑	H50
								H51
	PS2	1DH	Positon register 5	1	0	1	↑	H52
								H53
			Positon register 6	1	1	0	↑	H54
								H55
			Positon register 7	1	1	1	↑	H56
								H57

| | ZCLAMP | 1FH | When speed is under zero-speed set value(B38),this signal ON,motor stops. |
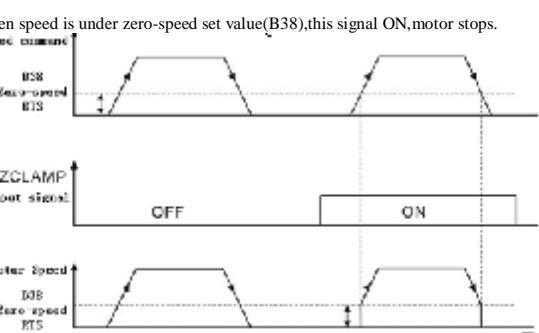
	TB0	20H	Toe index selection input：TB0—bit0; TB1—bit1; TB2—bit2; TB3—bit3;
	TB1	21H	TB4—bit4;
	TB2	22H	
	TB3	23H	
	TB4	24H	
	CTRIG	25	Internal spring,used for graduation

H18	5E	0412H	DO2-DO1	Output terminal DO2,DO1 defination		0100H	0~FFFFH
H19	5F	0413H	DO4-DO3	Output terminal DO4,DO3 defination		0502H	0~FFFFH
H20	60	0414H	DO5	Output terminal DO5 defination		0003H	0~FFFFH

Output function chart defination

Symbol	Set value	Function instruction
RDY	0	Control power and main power ready, if no fault, RDY switch on
SON	1	Servo enable, if no fault, SON switch on
ZS	2	Motor speed<zero speed, ZS switch on
ARRV	3	Motor speed> setting target speed, ARRV switch on
TLM	4	Torque is confined, TLM switch on
ALM	5	Alarm accur, ALM switch on
BRK	6	Electromagnet brake on
HOME	7	Origion regress
POSIN	8	Under position control mode,when error pulse NO.< setting position range,POSIN switch on

5-2-3 Motor parameter setting

Firstly set motor basic parameter to system parameter according to servo motor fixed, e.g.

Current ratio coefficient Y13（Set the calculation according to module currentand motor rated current Y13=256*module current crest value/motor rated current/1.414）

Motor pulse NO. per revolution Y14(Set according to coder pulse NO. per revolution)

Motor poles Y15（according to motor nameplate）

Electric angle biasing Y18（Offset angle between phase Z and phase U /360*2048;）、

A/D speed input limit Y19（4000H corresponding 3000rpm）

Above paramters must be confirmed correct before run, or else faulse alarm will occur.

Confirmation parameter correct must be after restarting control power on drive.

5-2-4 Corresponding parameter set for each control mode

According to control mode set, need to set according parameter while trial run.

now introduce several frequency-used modesas below

5-2-4-1 Position control mode.

The position control mode (P or Pi mode) is usually used for the applications requiring precision positioning, such as industry positioning machine, indexing table etc. It supports two kinds of command sources in position control mode. One is an external pulse train(P:Position Terminals, External Position Control) and the other is internal parameter(Pi：Position Register, i.e. internal parameters H41~H43, Internal Position Control). The external pulse train with direction which can control the rotation angle of servo motor. The max. input frequency for the external pulse command is 500Kpps and it is equal to rotation speed of 3000r/min. In order to provide a convenient position control function, AD servo drive provides eight internal preset parameters for position control. There are two setting methods of internal parameters, one is to set different position command into these eight internal parameters before operation and then use POS0~POS2 of DI signals of CN1 to perform positioning control. The other setting method is to use serial communication to change the setting value of these

eight internal parameters.

Positon control structure as below：

To make the servo motor and load operate more smoothlyoop gain and feed forward compensation.
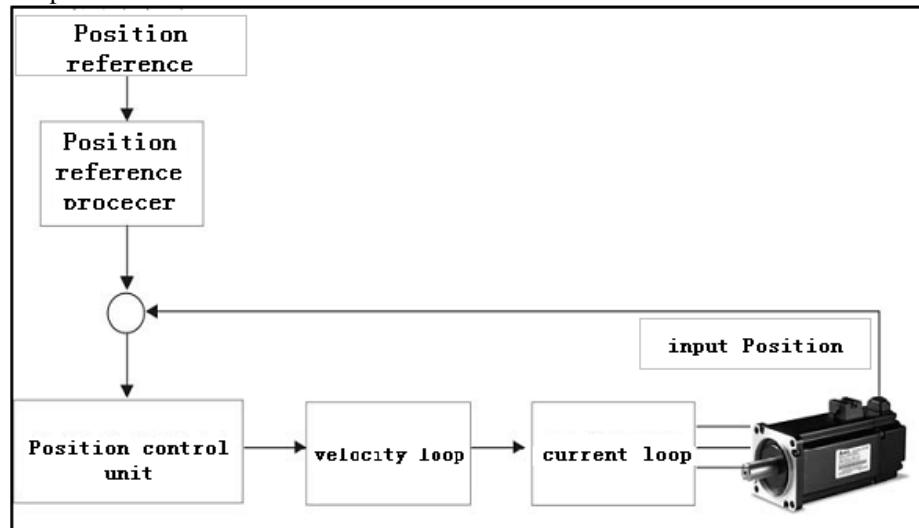
The position control mode includes P and Pi: The command source of P mode is external pulse train input form terminals. The command sources of Pi mode are H41~H73 built-in parameters.

Under postion control mode, below parameter needs to be set（Take external position as example）

（a） Pulse input style setting，

	10	0100H	PMOD	Pulse intput style	—	0	0~4
	0：CW/CCW Pulse（rising edge） 1：Pulse and sign（rising edge）						
	2：AB Phase pulse 3：CW/CCW Pulse（trailing edge） 4：Pulse and sign（trailing edge）						
	e.g（positive logic）						
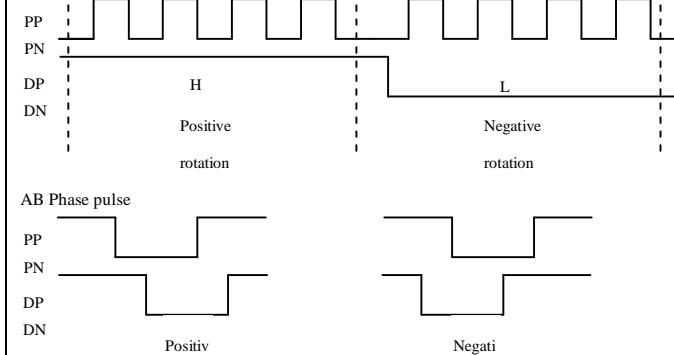
（b） Electronic Gear Ratio

b02	12	0102H	GRN	Electronic Gear Ratio molecular	—	1	1~32767
	1⁄50≦（GRN / GRM）≦200，Set the denominator of position command pulse rotio under absolute mode,electronic gear ratio must be 1						
b03	13	0103H	GRM	Electronic Gear Ratio denominator	—	1	1~32767
	1⁄50≦（GRN / GRM）≦200，Set the denominator of position command pulse rotio under absolute mode,electronic gear ratio must be 1						

（c） position deviation setting during control

b04	14	0104H	POS_COIN_H	Position coincidence pulse	Pulse	0	0~0
b05	15	0104H	POS_COIN_L	Position coincidence pulse	Pulse	20	0~50000
	Set Position coincidence pulse range When pulse warp absolute value<b05，Position-fix signal output						
b06	16	0105H	POS_LMP_H	CCW max warp pulse NO.	Pulse	7H	0~7H
b07	17	0105H	POS_LMP_L	CCW max warp pulse NO.	Pulse	0A120H	0~0FFFFH 1~500000
	When wap of command position and actual positon >b07, servo drive gives over-position warp alarm						
b08	18	0106H	POS_LMN_H	CW max warp pulse NO.	Pulse	0FFF8H	8000~0FFFFH
b09	19	0106H	POS_LMN_L	CW max warp pulse NO.	Pulse	5EE0H	0~0FFFFH (-500000~-1)

| | | | | When command and actual position warp>b09,servo drive gives over-position warp alarm | | | | |

（d） Positon loop parameter set

b10	1A	0107H	KPP	Position loop proportional gain	1/s	10	1~500
				Set according to concrete servo drive system and loads condition,set value is bigger, response faster;too big value arouse oscillating			
b11	1B	0108H	KPF	Position loop feed forward proportional gain	%	0	0~100
				Set according to concrete servo drive system and loads condition,set value is bigger, response faster;too big value arouse oscillating			
b13	1D	010AH	PFLT_TM	Position loop feed forward smooth filtering time constant	ms	0	0~10000
				Set position command filtering time constant			
b14	1E	010BH	PFFLT_TM	Position loop smooth filtering time constant	ms	10	0~10000

When Position loop proportional gain(KPP) is too big, position open loop bandwith rises to reduce phase limit, then motor roter will oscillate. KPP must be reduced till rotor stop pscillating. When external torque joins, too low KPP can't meet reasonable position following warp requirement.Then feed forward gain b11 can reduce position dynamic following warp.
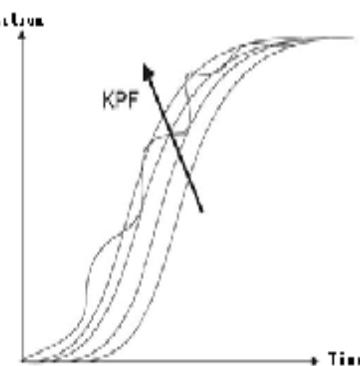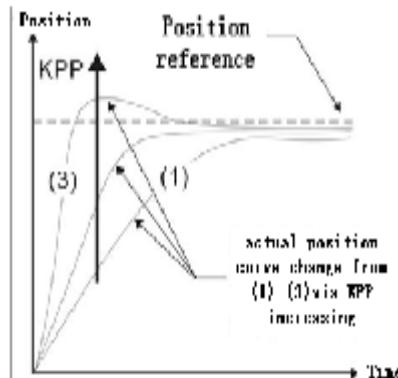
（e） Speed loop parameter set

b28	2A	0203H	DFLT	Velocity loop default low pass filtering time constant	0.1ms	0	0~10000
				Speed default low pass filtering time constant，valid when ACCEL_MODE=0			
b32	2E	0207H	KVD	Velocity loop integral time constant	0.1ms	0	1~1000
				Velocity loop integral time constant，set value is bigger, response faster;too big value arouse oscillating			
b36	32	020BH	KVP	velocity loop proportional gain	%	60	10~3000
				Set velocity loop proportional gain set value is bigger, response faster;too big value arouse oscillating Under the condition that system does not produce oscillating，set as big as possible Set according to concrete servo drive system and loads condition,			
b37	33	020CH	KVI	Velocity loop integral time constant	ms	33	1~1000

Note：1、Debug the speed loop first, and then debug the position loop while debugging.

2、 Try your best to increase speed loop plus till there is no adnormal libration or noise, and speed is stable on the load(motor).

3、 Try your best to increase speed loop plus，till there is no adnormal libration or noise, and speed is stable on the load(motor)，to ensure the load has good tailing character under the system running.

5-2-4-2 Speed control mode

Speed control（e.g. External control mode as expample）

b28	2A	0203H	DFLT	Velocity loop default filtering time constant	0.1ms	0	0~10000
				Velocity loop default filtering time constant，speedup/down mode. Valid when （ACCEL_MODE）=0			
b29	2B	0204H	FLT	Velocity loop smooth low pass filtering time constant	ms	10	1~10000
				Velocity loop smooth low pass filtering time constant，speedup/down mode. Valid when （ACCEL_MODE）=1			
b30	2C	0205H	LNR	Beeline speedup time	ms	30	1~50000
				0~3000rpm beeline speed up/down time			

b31	2D	0206H	SLNR	S-curve speed up/down time constant	ms	100	1~50000
	Speed command S-shape curve speed up/down time constant,speed up/down mode（ACCEL_MODE）=3 时有效						
b32	2E	0207H	KVD	Velocity loop differential time constant	0.1ms	0	1~1000
	Velocity loop differential time constant，set value is bigger, response faster;too big value arouse oscillating						
b33	2F	0208H	SV1	S yielding point speed 1		0555H	-16384~16384 (0C000H~4000H)
	S-shape cruve flixion speed 1，4000Hà3000RPM，valid when ACCEL_MODE=3						
b34	30	0209H	SV2	S yielding point speed 2		3AABH	-16384~16384 (0C000H~4000H)
	S-shape cruve flixion speed 2，4000Hà3000RPM，valid when ACCEL_MODE=3						
b35	31	020AH	ACEL_MOD	Speedup/down mode		0	0~3
	Speed command speedup/down mode 0: Default 1:Smooth speed up/down 2:Beeline speed up/down , 3: S-curve speed up/down Smooth speed up/down Beeline speed up/down S-curve speed up/down Use default under positon mode，Use beeline under JOGrun						
b36	32	020BH	KVP	velocity loop proportional gain	%	60	10~3000
	Set velocity loop proportional gain .set value is bigger, response faster;too big value arouse oscillating。Under the condition that system does not produce oscillating，set as big as possible Set according to concrete servo drive system and loads condition						
b37	33	020CH	KVI	Velocity loop integral time constant	ms	33	1~1000

	set value is lower, response faster;too low value arouse oscillating Under the condition that system does not produce oscillating，set as low as possible Default ： ，when inertia is small: 33ms，when inertia is big:100ms						
b38	34	020DH	ZSPD	Zero-speed RTS	—	54	0~3000
	When motor speed < b38，output 0 speed signal 4000Hà3000RPM						
b39	35	020EH	G_SPD	External speed commands Scaling(10V conversion)		3121	100~30000
	4000000H*(K/3000)/21504，K=100～30000<3000>[rpm/10V]，（4000000H=4000h＊2^12） Speed corresponding with Analog voltage input 10V, setting the ratio.						
b40	36	020FH	SP_OFST	External speed command biasing		0	-9999~9999 (0D8F1H~270FH)
	21504/10*K/000 1. Set speed command offset voltage, set value=servo drive internal offset voltage 2.Speed command working voltage =speed command input voltage+offset voltage。						
b41	37	0210H	ASPD	Speed reach RTS		4000H	0~4000H
	When actual speed > b41, Speed coincedence signal output，4000Hà3000RPM						
b42	38	0211H	KVPR	velocity loop gain fluctuation ratio	%	100	10~1000
	According to gain switch condition（24H），to adjust velocity loop proportional gain fluctuation						
b43	39	0212H	KVPF	velocity loop feed forward gain	%	0	10~1000
	Set according to concrete servo drive system and loads condition,set value is bigger, response faster;too big value arouse oscillating						

5-2-4-3 Torque control mode

Set the babsic parameter B01 control mode as Torque control,then set torque control parameter accordingly as below:

b53	3F	0300H	TRQ_SW	Torque command selection		0	0,1
	External torque command input switch，0:Deffective 1:Effective Under torque control mode，it must be set to 1.Under speed control mode，when it is o，external input torque command ADL；When it set to 1,external input torque adds to actual torque command.						
b54	40	0301H	TFLT	Torque command input Filter time constant	ms	10	0~10000
	Torque command input smooth filter time constant						

b55	41	0302H	G_TRQ	External torque command Scaling(10V conversion)	—	1170	30~3000
				1800000H*(K/300)/21500，K=30～3000<300>[%/10V]　1170 input 10V, output torque is triple rated torque. Set conversion constant of torque command input voltage and output torque (Ratio to rated torque)。 At command voltage 10V,corresponding(output torque/rated torque) percentage to set this value [e.g.]At command voltage 10V,output torque=rated torque,input set value as 100。 [Note]Output torque must be less than 300% rated torque.				
b56	42	0303H	TRQ_OFST	Outer torque command offset		0	-3000H~3000H (0D000~3000H)
				1000Hà100% rating torque. Set torque command offset voltage. Set value=Servo drive internal torque offset voltage 　Output torque working voltage=torque command input voltage+offset voltage				
b57	43	0304H	TRQ_GSP	velocity loop gain under torque mode	%	100	10~1000
				RAM 的 T_GSP=SPD_STD×T_GSP /100/2⁴ Speed limitation control proportional gain under torque mode				
b58	44	0305H	TRQ_SPLM	Internal speed limit value		2AAAH	0~4000H
				Internal speed limit value setting under torque mode. AV only under torque control mode 4000Hà3000RPM				
b59	45	0306H	TRQ1	Internal torque command1		0	-3000H~3000H (0D000~3000H)
b60	46	0307H	TRQ2	Internal torque command 2		0	-3000H~3000H
b61	47	0308H	TRQ3	Internal torque command 3		0	-3000H~3000H

Set internal torque command value

Select via input terminal torque: 1、Torque selection2，to select internal torque 1、Internal torque2、Internal torque 3。

Control mode	Torque selection 2	Torque selection 1	Torque command
0（T）	OFF	OFF	External anolog
	ON	ON	Internal torque1
	ON	OFF	Internal torque2
	ON	ON	Internal torque3
3（Ti）	OFF	OFF	0
	OFF	ON	Internal torque1
	ON	OFF	Internal torque2

		1000Hà 100% rated torque					
b62	4A	0309H	FLG_T	Torque command selection		0	0, 1, 2, 3
				0：External analog/0 torque（control mode=0，external analog;　　When control mode=3,0 torque） 1：Internal torque command1 2：Internal torque command 2 3：Internal torque command 3 Note：When torque selection is included within external terminals, external input priority. Viz:torqueselection is determined by external input terminal ON or OFF				
b63		030AH	TSPLM_F	Speed limit selection		0	0,1
b64	4B	030BH	T_DIR	Torque direction selection		0	0,1
				BIT0: Speed confine selection(TSPLM_F) 　　0：Internal speed confine AV 　　　Speed limitation is 44H(TRQ_SPLM) set value 　1：External speed confine AV Speed limitation is external speed command analog input BIT1: Torque direction selection(T_DIR) 　0: Torque A/D positive CW 　1: Torque A/D positive CCW 　AV only to external analog torque command BIT2:Reserved				

5-2-4-4 Rotation table control mode

1、Parameter setting

❙　Control mode：11

b01	11	0101H	CTRL_MOD	Control mode	—	11	0~8

				Rotation table graduation parameter			
b59	45	0306H	TRQ1	Internal torque command1		1000H	-3000H~3000H (0D000~3000H)
H35	52	0422H	TB_MD	Rotation table control mode		0/1	
H36	AA	0423H	TB_NUM	Rotation table stations		2~32	2~32
H37	AB	0424H	TB_GRN	Rotation table gear ratio numerator		1~8	1~5000
H38	AC	0425H	TB_GRM	Rotation table gear ratio denominator		1~8	1~5000

H39	AD	0426H	TB_TM	Rotation table speed up/down time	10ms	10	0~10000
H40	AE	0427H	BLAS	Graduation control backlash compensation	Pulse	0	8000~7FFFH (-32768~32767)
H41	AF	0428H	POSS_MD	Position conmmands control mode		2/3/4	0~8

Input/Output IO setting

H14	5B	040EH	DI2-DI1	Input terminal DI2,DI1 defination		2401H	0~FFFFH
H15	5C	040FH	DI4-DI3	Input terminal DI4,DI3 defination		201FH	0~FFFFH
H16	5D	0410H	DI6-DI5	Input terminal DI6,DI5 defination		2221H	0~FFFFH
H17	87	04111H	DI8-DI7	Input terminal DI8,DI7 defination		0F10H	0~FFFFH
H18	5E	0412H	DO2-DO1	Input terminal DO2,DO1 defination		0100H	0~FFFFH
H19	5F	0413H	DO4-DO3	Input terminal DO4,DO3 defination		0803H	0~FFFFH
H20	60	0414H	DO5	Input terminal DO5 defination		0004H	0~FFFFH

2、 Action timing sequence diagram:
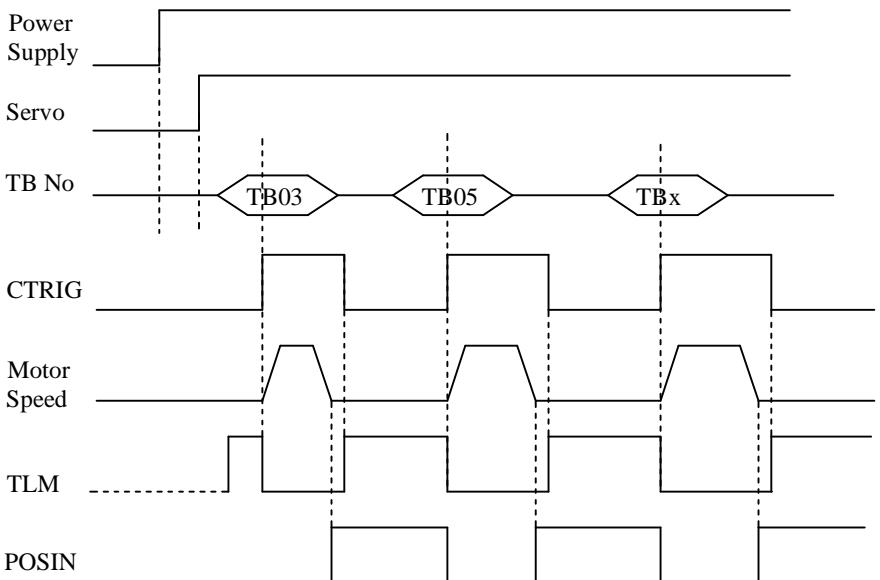
Remarks：

Power Supply : Servo input power supply

SVON：Servo enable（input commands）

TB NO：Graduation selection input（input commands）

CTRIG：Graduation spring（input commands）

Motor Speed ：Motor speed

TLM：Torque limited commands（output commands）

POSIN：Postion reach commands（output commands）

3、Instruction：

Parameter related：TRQ1(B59),SP1（B25）, TB_MD(H35), TB_NUM (H36), TB_GRN(H37), TB_GRM(H38), TB_TM(H39), BLAS(H40), POSS_MD(H41)。

1.）Motor controls the graduation begaining with the origin.

2.) Rotation table graduation can control motor rotor angle accurately, define station number of rotation table per cycle by TB_NUM, define periodic quantity by TB_GRN (rotation table gear ratio numerator)and TB_GRM (rotation table gear ratio denominator).Specific station of rotation table is defined by TB0~TB4 and

their assemble.　E.g.:

IF TB_GRN/ TB_GRM=1, one rotation of motor corresponding to one circle of

table,if TB_GRN/ TB_GRM=2, half a rotation corresponding to one circle,if

TB_GRN/ TB_GRM=1/2, two rotation corresponding to one circle,

3.）rotor angle TB0=1/2TB1=1/4TB2=1/8TB3=1/16TB,so Rotation table stations

maxmum can define 32 bits. Theoretic rotor must be less than 1 cycle, otherwise it

invalid. E.g.

If TB_GRN/ TB_GRM=1，TB_NUM =2 ,2 stations are avaibale,viz.0°（only CTRIG），

180°（trigger TB0），other trigger points ADL.

If TB_GRN/ TB_GRM =1，TB_NUM =3 ,3 stations are avaibale, viz. 0°, 120°（trigger

TB0），240°（trigger TB1），other trigger points ADL。

If TB_GRN/ TB_GRM =1，TB_NUM =4,4 stations are avaibale,viz.0°，90°（trigger

TB0），180°（trigger TB1），270（trigger TB0+TB1）°, other trigger point ADL.

Above rotor angle is forward direction　（Anticlockwise facing motor axe）

4.）Note：

Graduation speed is defined by B25 SP1.

When H35 TB_MD=1, dislocation ends,torque limitation. limitation value is set by

B59 TRQ1.

H40 BLAS Graduation control backlash compensation. The pluse NO. set should be

less than 1 cyc pulse NO.

Chapter 6 Servo Parameters function struction

6-1. Monitor parameter（status group）

Series NO	E^2 address	RAM address	Parameter	Function	Unit	Default	Range
A00		0000H	VER	Firmware version	—	—	—
A01		0001H	ALM_FLG	Drive fault alarm code	—	—	—
A02		0002H	ALM_FLG1	Drive fault alarm code 1	—	—	—

Drive fault alarm code A01:	Alarm codes in address 0001H display in BCD code.
0001：CPU error	Bit 0~15 correspond to alarm 01~16
0002：RAM error	Corresponding bit =0à No this alarm
0004：EEP error	Corresponding bit =1à This alarm occurs
0008：CW/CCW prohibited fault	
0010：Encoder fault	0002H：
0020：Overcurrent	Bit 0~4 is corresponding with alarm 17~21
0040：Overload	Corresponding bit=0à NO this alarm
0080：Undervoltage	Corresponding bit =1à This alarm occurs.
0100：Overvoltage	
0200：Regeneration error	0001H, 0002H boths show "0"à No alarm
0400：IPM error	The first 5 alarm of A01 occurs,can not relieve via
0800: Overspeed	alarm reposition.,need to reset power.
1000：Emergency stop	Alarm reposition must be under servo enable
2000：Excessive deviation	
4000：Motor over hot	**Remarks：If alarm code of A01 and A02 is not**
8000：Drive over hot	**included abve,then there are more than 1 error codes.**
A02：	**e.g. A01=0003, there are 2 alarms: CPU error and**
0001：Input power phase loss	**RAM error.**
0002：Dynamic braking relay fault	
0004：CW limitation alarm	
0008：CCW limitation alarm	
0100：Communication abnormal	

A03		0003H	SPD_FB_H	Motor speed feedback	—	—	—

Keyboard desplays motor actual speed
Communication gets corresponding data conversion relation 4000hà 3000rpm （Data read by upper monitor

			communication firmware）			
A04	0004H	SPD_CMD	Speed command	—	—	—
	Keyboard desplays speed loop command input					
	Communication gets corresponding data conversion relation 4000h à 3000rpm					
A05	0005H	SPD_REF	Analog speed reference input	—	—	—
	Keyboard displays external analog speed command input 4000h à 3000rpm					
	Communication gets corresponding data conversion relation 4000h à 3000rpm					
A06	0006H	POS_FB_H	Motor feedback pulse	—	—	—
A07	0006H	POS_FB_L	NO.	—	—	—
	Addup pulse NO.feedback by motor，totally 32bit,display hight 16bits and low 16bits respectively					
A08	0007H	POS_CMD_H	Position command	—	—	—
A09	0007H	POS_CMD_L	pulse NO.	—	—	—
	Addup pulse NO. of input command，32bit, display hight 16bits and low 16bits respectively					
A10	0008H	POS_ERR_H	Position command and	—	—	—
A11	0008H	POS_ERR_L	feedback warp	—	—	—
	Warp between addup pulse NO. of input command and Addup pulse NO.feedback by motor					
	Totally 32bit, display hight 16bits and low 16bits respectively					
A12	0009H	TRQ_CMD	Torque command	—	—	—
	Keyboard display current loop torque command input，communication gets data 1000h à 100% rated current					
A13	000AH	TRQ_REF	Analog torque reference	—	—	—
	Keyboard display external analog torque command input，communication gets data 1000h à 100% keyboard display rated current					
A14	000BH	TRQ_FB	Actual torque	—	—	—
	Keyboard display motor actual torque，communication gets data 1000h à 100% rated current					
A15	000CH	DC_V	Main circuit voltage	—	—	—
	Keyboard display main loop WB voltage,communication gets data. DC actual voltage= DC_V*400/8192					
A16	000DH	IN_ST	Input status	—	—	—
	Input signal status:					
	0bit—DI1 1bit—DI2 2bit—DI3					
	3bit—DI4 4bit—DI5 5bit—DI6					
	6bit—DI7 7bit—DI8					
	Corresponding bit =0 à With input					
	Corresponding bit =1 à without input					
A17	000EH	OUT_ST	Output status	—	—	—

			Output signal status display			
			0BIT—DO1 1BIT—DO2 2BIT—DO3			
			3BIT—DO4 4BIT—DO5			
			Corresponding bit=0 à			
			Corresponding bit =1 à No output			
A18	000FH	MODE	Control mode	—	—	—
	Current control mode display：0：Torque 1：Speed 2：Position					
A19	0010H	SV_ON	Servo on mark	—	—	—
	Current Servo enable status， 0：Servo status is OFF 1：Servo status is ON					
A20	0011H	CPLD ver	CPLD version			
A21	0012H	IU_FB	IU Feedback current instant value			
A22	0013H	IV_FB	IV Feedback current instant value			

6-2. Fault parameter（fault group）

序号	E²address	RAM address	Parameter name	funtion	Unit	Default	Range
F00	00		ALM_0	Fault record 0	—	0	0~15
F01	01		ALM_1	Fault record 1	—	0	0~15
F02	02		ALM_2	Fault record 2	—	0	0~15
F03	03		ALM_3	Fault record 3	—	0	0~15
F04	04		ALM_4	Fault record 4	—	0	0~15
F05	05		ALM_5	Fault record 5	—	0	0~15
F06	06		ALM_6	Fault record 6	—	0	0~15
F07	07		ALM_7	Fault record 7	—	0	0~15
F08	08		ALM_8	Fault record 8	—	0	0~15
F09	09		ALM_9	Fault record 9	—	0	0~15
	Drive fault alarm fault						
	01：CPU fault 02：RAM fault 03：EEP fault 04：CW/CCW prohibited fault						
	05：Coder abnormal 06：Overcurrent 07：Overload 08：Undervoltage						
	09：Overvoltage 10：Regeneration error 11：IPM 12:Overspeed						
	13：Emergency stop 14：Excessive deviation 15：Moter overhot 16：Drive overhot						
	17: Input power phase loss 18: dynamic braking relay fault 19: CCW limitation alarm 20: CCW						

				limitation alarm　21：Communication abnormal				
F10	0A		ALM_ADR	Latest fault address	—	0	0~9
				EEPROM 的 ALM0-9updated fault address				
F11	0B		Reserved	Reserved	—	0FFFFH	—
F12	0C		Reserved	Reserved	—	0FFFFH	—
F13	0D		Reserved	Reserved	—	0FFFFH	—
F14	0E		Reserved	Reserved	—	0FFFFH	—
F15	0F		Reserved	Reserved	—	0FFFFH	—

6-3. Basic parameter（base Group）

Series NO.	E^2 address	RAM address	Parameter	Function	Unit	Default	Range
b00	10	0100H	PMOD	Pulse input style	—	0	0~4

0：CW/CCW Pulse （Rising edge）

1：Pulse and direction（Rising edge）

2：AB phase pulse

3：CW/CCW pulse（Trailing edge）

4：Pulse and direction（Trailing edge）

e.g:（Positive logic）

CW/CCW pulse（
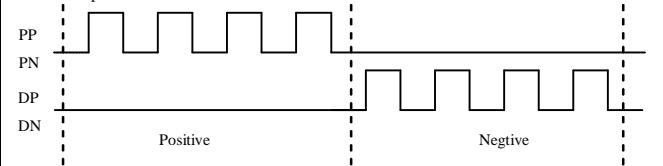
PP
PN
DP
DN
　　Positive rotation　　Negtive rotation

Pulse and sign
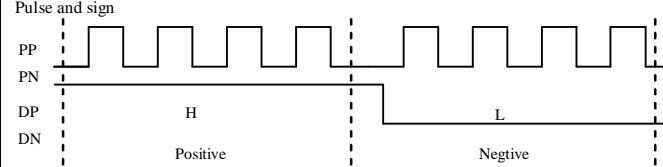
PP
PN
DP H　　　L
DN
　　Positive rotation　　Negtive rotation

AB Phase pulse

PP
PN
DP
DN
　　Positive　　　　Negtive rotation

b01	11	0101H	CTRL_MOD	Control mode	—	1	0~8

Series can be programmed to provide six single and five dual modes of operation. Their operation and description is listed in the following table and special graduation mode(available for rotation table control)

Value	Control mode	Mode instruction		
0	T-Anolog torque control mode	Torque control for the servo motor is achieved via by 3 commands stored within the servo controller）, or input anolog voltage via external terminals（-10V～+10V）.Commands selection is according to DI. Drive receives torque conmmands，to control the motor till target torque.		
1	S-Anolog speed control mode	Speed command is offered by internal servo controller.（3 commands stored within the servo controller）, or input alolog voltage via terminals (-10V～+10V. Select commands according to DI signal.Drive receives speed conmmands，to control the motor till target speed.		
2	P-Pulse position control mode	Position command is input by terminal，signal aspect is pulse.Drive receives position conmmands，to control the motor till target position.		
3	P/S	Selected by input signal MODE	OFF:P MODE	ON:S MODE
4	P/T	Selected by input signal MODE	OFF:P MODE	ON:T MODE
5	S/T	Selected by input signal MODE	OFF:S MODE	ON:T MODE
6	Pi Internal position control mode	Position control for the servo motor is achieved via by 8 commands stored within the servo controller，can use DI signal to select register NO. can also set the run order according to parameter setting. Drive receives positon conmmands，to control the motor till target positon.		
7	Si Internal speed contro mode	Speed control for the servo motor is only achieved via by 3 commands stored within the servo controlle，can't be achieved by external terminals.Commands selection is according to DI.Drive receives speed conmmands，to control the motor till target speed.		
8	Ti Internal torque control mode	Torque control for the servo motor is only achieved via by 3 commands stored within the servo controlle，can't be achieved by external terminals.Commands selection is according to DI. Drive receives torque		

				conmmands，to control the motor till target torque.			
	9		Pi/S	Selected by input signal MODE	OFF:Pi mode	ON:S mode	
	10		Pi/T	Selected by input signal MODE	OFF:Pi mode	ON:T mode	
	11		Toe index	Control mode for turning charactor，according to input terminal commands, to proceed with graduation orientation control.			

Attention：After changing control mode parameters， must power off then power on before running. Otherwise accident will occur!!

b02	12	0102H	GRN	Electronic gear ratio numberator	—	1	1~32767
b03	13	0103H	GRM	Electronic gear ratio denominator	—	1	1~32767

$1/50 ≦ (GRN / GRM) ≦ 200$

Set the denominator of position command pulse rotio

Under absolute mode（parameter H41 is 1、5、7）, Electronic gear ratio denominator must be 1

Remarks：1、Please set electronic gear ratio under SERVO OFF，if set it wrongly servo motor easy to cause violent motion

2、Drive 4th DF coder input pulse internally,viz. coder send each 2500 pulses to drive, after 4th DF,totally 10000 pulses.

Pulse reference $\xrightarrow{F1}$ GRN / GRM Positon $\xrightarrow{F2}$ F2=F1*GRN/GRM

If 10000 pulses enter drive from coderper ERVwhen electronic gear ratio=1，one command pulse is corresponding to one motor pulse. when electronic gear ratio=0.5，two command pulse is corresponding to one motor pulse

b04	14	0104H	POS_COIN_H	Position coincidence pulse	Pulse	0	0~0
b05	15	0104H	POS_COIN_L	Position coincidence pulse	Pulse	14H	0~C350H

Set Position coincidence pulse range

When pulse warp absolute value<b05，Position-fix signal output

b06	16	0105H	POS_LMP_H	CCW max warp pulse NO.（High 16 bit）	Pulse	7H	0~7H
b07	17	0105H	POS_LMP_L	CCW max warp pulse NO.（Low 16 bit）	Pulse	0A120H	0~0FFFFH 1~500000

When wap of command position and actual positon >b07, servo drive gives over-position warp alarm

b08	18	0106H	POS_LMN_H	CW max warp pulse NO.（High 16 bits）	Pulse	0FFF8H	8000~0FFFFH
b09	19	0106H	POS_LMN_L	CW max warp pulse NO.（Low 16 bits）	Pulse	5EE0H	0~0FFFFH (-500000~-1)

When command and actual position warp>b09,servo drive gives over-position warp alarm

b10	1A	0107H	KPP	Position loop proportional gain	1/s	10	1~500

Set according to concrete servo drive system and loads condition,set value is bigger, response faster;too big value arouse oscillating

b11	1B	0108H	KPF	Position loop feedforward proportional gain	1/s	0	1~500

Set according to concrete servo drive system and loads condition,set value is bigger, response faster;too big value arouse oscillating

b12	1C	0109H	KPPR	Position loop gain fluctuation ratio	%	100	10~500

			Adjust Position loop proportional gain fluctuation according to Position loop gain switch condition				
b13	1D	010AH	PFLT_TM	Position smooth filtering time constant	ms	0	0~10000
			Set position command filtering time constant				
b14	1E	010BH	PFFLT_TM	Position feedforward smooth filtering time constant	ms	10	0~10000
			Set Position feedforward smooth filtering time constant				
b15	1F	010CH	Reserved	Reserved		0	-
b16	20	010DH	Reserved	Reserved		0	-
b17	21	010EH	BIAS_SPD	Speed biasing function under positon control		0	-16384~16384 (0C000H~4000H)
			Position pulse warp > POS_COIN+POS_HIST，speed offset setting C000H～4000H(-3000rpm～3000rpm)				
b18	22	010FH	POS_HIST	Max speed warp under position mode	Pulse	10	0~30000
			Availble or invalid of speed offset Position pulse warp > POS_COIN+POS_HIST，speed offset AV; Position pulse warp < POS_COIN，speed offset ADL;				
b19		0110H	Reserved	Reserved		0	-
b20	23	0111H	PDIR	Positon command logic switch		1H	0,1H
b21		0112H	PINH	Position reference input prohibited		0	0,1H
			BIT0: Reserved BIT1: Position command logic switch (PDIR) 　　0:when position add CW 　　1:CCW BIT2: Position reference input prohibited(PINH)				
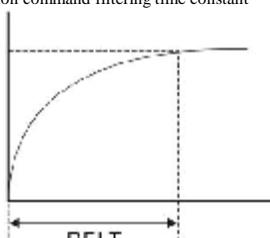
			0: command pulse input AV(default) 1: prohibited，command pulse input ADL				
b22	24	0113H	GCC	Gain switch condistion selection		2H	00~55H
			XY X: Position loop(bit4~7 correspoinding Position loop) Y: Speed loop(bit0~3 correspoinding speed loop) 0: Gain switch function OFF 1：Gain switch function ON 2: Under position control mode,when position error less than the value of parameter b24 3: Under position control mode,when position pulse frequency less than the value of parameter b24 4: when the motor speed less than the value of parameter　b52 5：when the motor speed warp less than the value of parameter b52				
b23	25	0114H	PGCT	Position loop gain switch time constant	ms	10	1~10000
			For position loop gain switch smooth				
b24	26	0115H	PGCV	Gain switch conditon	Pulse	000AH	1~FFFFH
			b24 finally determined by b22 selection				
b25	27	0200H	SP1	Internal speed 1		64H	C000H~4000H
b26	28	0201H	SP2	Internal speed 2		0F000H	C000H~4000H
b27	29	0202H	SP3	Internal speed 3		3E8H	C000H~4000H
			Set internal speed command value 4000H à 3000RPM Speed selection via external input terminals, Speed selection 1 and 2 ,to selction internal AV WHEN FLG_SP=1～3				
b28	2A	0203H	DFLT	Speed default low pass filtering time constant	0.1ms	0	0~50000
			Speed command default low pass filtering time constant AV WHEN ACCEL_MODE=0				
b29	2B	0204H	FLT	Speed smooth low pass filtering time constant	1ms	10	1~50000
			Speed command smooth low pass filtering time constant Valid WHEN ACCEL_MODE=1				

b30	2C	0205H	LNR	Beeline speedup time	1ms	30	1~50000
	0 to 3000rpm Beeline speedup time						
b31	2D	0206H	SLNR	S-curve speed up/down time constant	1ms	100	1~50000
	S speed up/down time constant AV WHEN ACCEL_MODE=3						
b32	2E	0207H	KVD	Speed loop differential time constant	0.1ms	0	1~1000
	Speed loop differential time constant，response faster;too big value arouse oscillating						
b33	2F	0208H	SV1	S yielding point speed 1		0555H	-16384~16384 (0C000H~4000H)
	S yielding point speed 1 4000H à 3000RPM AV WHEN ACCEL_MODE=3						
b34	30	0209H	SV2	S yielding point speed 2		3AABH	-16384~16384 (0C000H~4000H)
	S yielding point speed 2 4000H à 3000RPM AV WHEN ACCEL_MODE=3						
b35	31	020AH	ACEL_MOD	Acc/Dec mode		0	0~3
	Acceleration/deceleration mode 0:Default 1:speed smooth up/down 2:Beeline speed up/down 3:S-curve speed up/down Use default under positon mode Use beeline speed up/down when JOG mode						

60

b36	32	020BH	KVP	Velocity loop proportional gain	%	60	10~3000
	Set proportional speed loop proportional gain set value is bigger, response faster;too big value arouse oscillating Under the condition that system does not produce oscillating，set as big as possible Set according to concrete servo drive system and loads condition，						
b37	33	020CH	KVI	Velocity loop integral time constant	ms	33	1~1000
	set value is lower, response faster;too low value arouse oscillating Under the condition that system does not produce oscillating，set as low as possible Default ： when inertia is small: 33ms，when inertia is big:100ms						
b38	34	020DH	ZSPD	Zero-speed RTS	—	54	0~3000
	When motor speed < b38，output 0 speed signal 4000H à 3000RPM						
b39	35	020EH	G_SPD	External speed command conversion ratio (10V conversion)		3121	100~30000
	4000000H*(K/3000)/21504，K=100～30000<3000>[rpm/10V]，（4000000H=4000h＊2^12） Speed corresponding with Analog voltage input 10V, setting the ratio.						
b40	36	020FH	SP_OFST	External speed command offset	mV	0	-9999~9999 (0D8F1H~270FH)
	21504/10*K/1000 2. Set speed command offset voltage 3. Set value=Internal servo drive offset voltage 4. Speed command working voltage=speed command input voltage+offset voltage 5. [e.g] speed command input voltage =1V speed command offset voltage =0.5V speed command working voltage =1.5V Offset minimum input unit =1mv Offset input range is +/-10V						
b41	37	0210H	ASPD	Speed coincedence RTS		4000H	0~4000H
	When actual speed > b41，Speed coincidence signal output 4000H à 3000RPM						
b42	38	0211H	KVPR	velocity loop gain switching ratio	%	100	10~1000
	According to gain switch condition（24H），to adjust velocity loop proportional gain fluctuation						
b43	39	0212H	KVPF	velocity loop feed forward gain	%	0	10~1000

61

Set according to concrete servo drive system and loads condition,set value is bigger, response faster;too big value arouse oscillating

b44	3A	0213H	FLG_SP	Speed command selection mark		0	0~3

0：External analog/0 speed（When control mode=1，external analog;　　When control mode=4，0 speed）

1：Internal speed 1

2：Internal speed 2

3：Internal speed 3

Note：When speed selection is included within external terminals, external input priority. Viz:speed　selection is determined by external input terminal ON or OFF

B45	3B	0214H	FLGSTK	CW/CCW prohibited mark		0	0~3

0：invalid，1：CW prohibited,2：CCW prohibited, 3：CW and CCW prohibited(drive forbid)

Note：When drive prohibiting is included within external terminals, external input priority. Viz: drive prohibiting is determined by external input terminal ON or OFF,as below：

CCW terminal	CW terminal	selection
ON	ON	invalid
ON	OFF	CW prohibited
OFF	ON	CCW prohibited
OFF	OFF	CW and CCW prohibited

b46		0215H	P_CTL	P/PI switch		0	0,1
b47		0216H	ZCLAMP	Zero clamp		0	0,1
b48	3C	0217H	STK_OFF	CW/CCW prohibited invalid		0	0,1
b49		0218H	DIR_CTL	Positive/negative rotation switch		1	0,1
b50		0219H	reserved	Reserved		0	0,1

Bit0: P/PI switch (P_CTL)

　　Velocity loop proportional / Proportional Integral control switch

　　0: Velocity loop is PI control(default)

　　1: Velocity loop is P control

Bit1: Zero clamp(ZCLAMP)

　　0:Zero speed command output ADL

　　1:AV

　　When bit1=1,and speed command value < zero speed set value，

　　Force speed command is 0

Bit2: CW/CCW prohibited invalid (STK_OFF)

　　0:drive prohibiting DI AV　1:ADL

　　When bit2=1，the drive prohibiting input terminals ADL.

Bit3: Positive/negative rotation switch(DIR_CTL)

　　Speed command（Internal.external）

　　Facing the motor axis, rotation direction reference input symbol setting

　　B0=0:Speed A/D positive CW，　B0=1:CCW，

　　Bit4:Reserved

b51	3D	021AH	SGCT	Velocity gain switch time constant	ms	000AH	1~FFFFH

Used for velocity loop gain switch smooth transition

b52	3E	021BH	SGCV	Velocity gain switch condition		000AH	0~4000H

b52 is determined by 24H selection

4000Hà3000RPM

b53	3F	0300H	TRQ_SW	Torque command selection		0	0,1

External torque command input switch，0: AD;　　1:AV

Under torque control mode，it must be set to 1.Under speed control mode，when it is o，external input torque command ADL；When it set to 1,external input torque adds to actual torque command.

b54	40	0301H	TFLT	Torque command input Filter time constant	ms	10	0~10000

Torque command input smooth filter time constant

b55	41	0302H	G_TRQ	External torque command Scaling(10V conversion)	—	1170	30~3000

1800000H*(K/300)/21500，K=30～3000<300>[%/10V]　　1170 input 10V，output torque is triple rated torque.

Set conversion constant of torque command input voltage and output torque (Ratio to rated torque)。

At command voltage 10V,corresponding(output torque/rated torque) percentage to set this value

[e.g.]At command voltage 10V,output torque=rated torque,input set value as 100。

[Note]Output torque must be less than 300% rated torque.

b56	42	0303H	TRQ_OFST	External torque command offset		0	-3000H~3000H (0D000~3000H)

				11000H 100% rating torque.			
				Set torque command offset voltage. Set value=Servo drive internal torque offset voltage			
				Output torque working voltage=torque command input voltage + offset voltage			
				[e.g] Torque command output voltage=1V			
				Torque command offset voltage =0.5V			
				Output torque working voltage =1.5V			
b57	43	0304H	TRQ_GSP	Volecity gain under torque mode	%	100	10~1000
				RAM 的 T_GSP=SPD_STD×T_GSP /100/2⁴			
				Speed limitation control proportional gain under torque mode			
b58	44	0305H	TRQ_SPLM	Internal speed limit value		2AAAH	0~4000H
				Internal speed limit value setting under torque mode.			
				AV only under torque control mode			
				4000H 3000RPM			
b59	45	0306H	TRQ1	Internal torque command 1		0	-3000H~3000H (0D000~3000H)
b60	46	0307H	TRQ2	Internal torque command 2		0	-3000H~3000H
b61	47	0308H	TRQ3	Internal torque command 3		0	-3000H~3000H

Set internal torque command value

Torque selection via external input terminals:1、Torque selection 2，to select internal torque 1、internal torque 2、internal torque

Control mode	Torque selection 2	Torque selection 1	Torque command
0（T）	OFF	OFF	External analog
	OFF	ON	Internal torque 1
	ON	OFF	Internal torque 2
	ON	ON	Internal torque 3
3（Ti）	OFF	OFF	0
	OFF	ON	Internal torque 1
	ON	OFF	Internal torque 2
	ON	ON	Internal torque 3

3.1000H 100% rated voltage

b62	4A	0309H	FLG_T	Torque command selection		0	0, 1, 2, 3

				0：External analog/0 torque（when control mode=0，external analog; when control mode=3，0 torque）			
				1：Internal torque command 1			
				2：Internal torque command 令 2			
				3：Internal torque command 3			
				Note：When torque selection is included within external terminals, external input priority. Viz:torqueselection is determined by external input terminal ON or OFF			
b63		030AH	TSPLM_F	Speed limit selection		0	0,1
b64	4B	030BH	T_DIR	Torque direction selection		0	0,1
				BIT0: Speed limit selection (TSPLM_F)			
				0：Internal speed limit AV			
				Speed limit value is 44H(TRQ_SPLM) set value			
				1：External speed limit AV			
				Speed limit value is external speed command analog input			
				BIT1: Torque direction switch (T_DIR)			
				0: Torque A/D positive CW			
				1: Torque A/D positive CCW			
				Only valid to external analog torque command			
				BIT2: Reserved			
b65	4C	FFFFH	Reserved	Reserved	—	0FFFFH	
b66	4D	FFFFH	Reserved	Reserved	—	0FFFFH	

6-4. High parameter（high group）

Series NO	E² address	RAM address	Parameter name	Function	Unit	Default	Range
H00	4E	0400H	CARRY_F	Control period		10	4，7，10，15
	Control period set：						
	4：4KHZ 7：7KHZ 10：10KHZ 15：15KHZ						
H01	4F	0401H	TLM_PCCW	CCW internal torque limit		3000H	0~3000H
	Set servo motor CCW internal torque limit value.						
	Parameter value is percentage of rated torque.						
	[e.g] limit is twice rated torque,settings=2000H						
	[Note] When the external and internal torque limit both AV, the lower value is awailable.						

	Max torque setting　1000H=rated torque						
H02	50	0402H	TLM_NCW	CW internal torque limit		0D000H	0D000~0H (-3000H~0)

Set servo motor CW internal torque limit value.

Parameter value is percentage of rated torque.

　[e.g] limit is twice rated torque,settings＝-2000（E000H）

[Note] When the external and internal torque limit both AV, the higher value is awailable.

Max torque setting　　1000H=rated torque

H03	51	0403H	BRK_TM	Brake order time		0	0F830~07D0H (-2000~+2000)

RAM value: BRK_TM=CARRY_F*BRK_TM

Set the timen between brake signal and servo on or servo off.

BRK_TM>0 时

BRK_TM<0 时

Timing fit between Brake and Drive

RAM computing: BRK_TM=CTRL_F*BRK_TM_EP

2000.0～2000.0msec

H04	53	0404H	EST_LVL	Electronic load protection	%	120	0~300

Overload protection

Setting value is percentage of rated current. When current> this value and last for some time, overload alarm will occur. Current higher, last time shorter. Twice current,10 second; triple current 5 second.

H05	54	0405H	MON_MODE	Analog inspection output	－	1H	0~4H

Analog output selection setting.

XY:X:MON1,Y:MON2 output

0: Motor speed（±10V/full-range speed）；

1：Motor torque（±10V/ full-range speed）；

2：Speed command（±10V/ full-range speed）；

3：Torque command（±10V/ full-range torque）

4: Generatrix voltage（DC_V）

Note：full-range speed set by 6FH

　full-range torque set by 70H

　full-range voltage set by 71H

H06	55	0406H	RG_LVL	Regenerative resistor protection value	－	200	0~10000

Set the value of Regenerative resistor protection.

Set value＝（resistor value×resistor power×100/1332）

　　　Resistor value：ohm　resister power：watt

Using internal regenerative resistor,H06 default is 100

Using external regenerative resistor,setting value through caculation

H07	56	0407H	JOG_SP	JOG speed		0	0C000~4000H (-16384~16384)

Speed setting value when JOG run

This value AV only when JOG run（1BH=1）

H08	57	0408H	TRQ_FIL	Torque filtering time constant	0.1ms	0~1000	0~0
H09		0409H	Reserved				

Current loop torque filtering time constant, setting to 0, low pass filter function OFF.

H10	58	040AH	SPFB_FIL	Speed inspection filtering time constant	0.1ms	10	0~1000
H11		040BH	Reserved		－		

Speed feedback low pass filtering time constant. set to 0, low pass filter function OFF.

H12	59	040CH	ID	Drive ID ADD No	－	0	0~0FH

The ID ADD No. when several servo drive communicate in RS485

H13	5A	040DH	DLY_VAL	RS485 answering delay time		11	0~255

　RS485 set by Transmit and Receiving switch delay time

H14	5B	040EH	DI2-DI1	Input terminal DI2,DI1 definition		0601H	0~FFFFH
H15	5C	040FH	DI4-DI3	Input terminal DI4,DI3 definition		0B0AH	0~FFFFH
H16	5D	0410H	DI6-DI5	Input terminal DI6,DI5 definition		0D0CH	0~FFFFH
H17	87	0411H	DI8-DI7	Input terminal DI8,DI7 definition		0208H	0~FFFFH

Input function definition chart

Symbol	Value	Function instruction
P/PI	0H	ON:Velocity loop is proportional component,OFF: velocity loop is proportional integral component
SVON	1H	ON: servo ennable
ALMRST	2H	Alarm reset
MODE	3H	Mode selection under dual mode，OPEN:MODE1;SHORT:MODE2
DIR_REV	4H	Motor reverse.
GAIN_CHG	5H	Gain switch
TRQLM	6H	Speed limit command selection under speed&position control mode. OPEN—Internal register（4FH,50H）, SHORT—External torque analog command
SPDLM	7H	Speed limit command selection , OPEN—Internal register（44H）, SHORT—external speed analog command
EMG	8H	ON, motor urgent brake
SV_LOCK	9H	Motor lock，available for Pt,Pr，S，Sz
CWSTE	AH	CW prohibited fault
CCWSTE	BH	CCW prohibited fault
SP0	CH	Internal speed command selection
SP1	DH	
DISPN	EH	ON,external pulse input ADL under positon mode.
ORG_ST	FH	ON, activate origin searching function
ORG_SW	10H	when origin searching, switch ORG_SW on, take this point as origin.
TC0	11H	Internal torque command selection
TC1	12H	
JOGU	13H	JOGU on,motor inching, inching parameter is JOG_SP(56H)
JOGD	14H	JOGD on, motor inverse inching.

68

	HOLD	15H	Under internal position register mode.HOLD ON, motor stop
	POSU	16H	Under internal position register mode,POSU ON, run to next internal postion register position command.
	POSD	17H	Under internal position register mode. POSD ON, run to next internal postion register position command.
	POSR	18H	Under internal position register mode POSR ON, back to next internal postion register position command.
	ATRIG	19H	Under internal position register mode.After setting internal position control command (POS0~2)，ATRIG ON,trigger motor move according to internal positon register command.
	POS_AUTO	1AH	Under internal position register mode trigger motor move according to internal positon register command. Moving spacing time refers to POST0~POST7, moving speed refers to POSV0~POSV7
	PS0	1BH	Internal register position command selection
	PS1	1CH	
	PS2	1DH	
	ZCLAMP	1EH	ACLAMP ON When speed <0 speed set value(),motor stop
	TB0	1FH	Devision selection input：TB0—bit0; TB1—bit1; TB2—bit2; TB3—bit3; TB4—bit4;
	TB1	20H	
	TB2	21H	
	TB3	22H	
	TB4	23H	
	CTRIG	24H	Internal trigger, used for devision

H18	5E	0412H	DO2-DO1	Output terminal DO2,DO1 definition		0100H	0~FFFFH
H19	5F	0413H	DO4-DO3	Output terminal DO4,DO3 definition		0502H	0~FFFFH
H20	60	0414H	DO5	Output terminal DO5 definition		0003H	0~FFFFH

Output function chart definition

symbol	Set value	Function instruction
RDY	0H	Control power and main power ready, if no fault, RDY switch on
SON	1H	Servo enable, if no fault, SON switch on
ZS	2H	Motor speed<zero speed, ZS switch on
ARRV	3H	Motor speed> setting target speed, ARRV switch on

69

	TLM	4H	Torque is confined, TLM switch on			
	ALM	5H	Alarm accur, ALM switch on			
	BRK	6H	Electromagnet brake on			
	HOME	7H	Origion regress			
	POSIN	8H	Under position control mode,when error pulse NO.< setting position range,POSIN switch on			
		9H	Reserved			
		AH	Reserved			
		BH	Reserved			
		CH	Reserved			
		DH	Reserved			
		EH	Reserved			
		FH	NC			
H21		0415H	ORG_EN	Origin activation mode selection	0	Bit0~3
H22	61	0416H	ORG_DIR	Origin regression direction	0	Bit4~7
H23		0417H	ORG_ZM	Origin regression phase Z pulse counting method	0	Bit8~11

Bit0~3: Activation mode selection ORG_EN

    0:External I/O   1:Internal mode

Bit4~7: Origin regression direction ORG_DIR

    0:CW   1:CCW

Bit8~11: Origin regression phase Z pulse counting method ORG_ZM

0：After slowdown switch on，servo motor decelerates to zero，then reverse to leave slowdown switch, phase Z pulse cuonting start.

1：After slowdown switch on，servo motor decelerates to zero，till leaving slowdown switch, phase Z pulse cuonting start.

H24	62	0418H	ORG_SPH	Origin regression high speed		1555H	0~4000H (0~16384)

Origin regression high speed setting

4000Hà 3000rpm

H25	63	0419H	ORG_SPL	Origin regression low speed		222H	0~4000H

Origin regression low speed setting

H26	64	041AH	ORG_ZP	Z Phase pulse NO.		2	0~128

Z Phase pulse NO.

After slowdown switch off,phase Z pulse NO. up to the value, offset start,the offset value defined by 65H,66H.

H27	65	041BH	ORG_OFST_H	Origin offset high bits		0	7FFF~8000H (32767~-32768)
H28	66		ORG_OFST_L	Origin offset low bits		0	7FFF~8000H

ORG_OFST= ORG_OFST_H*2^16+ ORG_OFST_L，setting offset value，total 32 bits，formed by high 16 bits and low 16 bits.

H29	67	041CH	NOTCH_Q	Notch attenuation quotient		0	
H30	68	041DH	NOTCH_FREQ	Notch frequency	Hz	0	

Mechanical resonance frequency setting，close the function if the value is 0

H31	6E	041EH	ORG_TIME	Origin regression Acc/Dec time constant	ms	10	2~10000

AV when origin regression

H32	6F	041FH	G_MON_SPD	MON output speed Scaling		512	

Setting when 10V corresponding with 6000rpm:

$256/(4000H \times 2) \times 2^{16} = 512$

4000H—3000rpm

H33	70	0420H	G_MON_TRQ	MON output torque Scaling		1170	

Setting when 10V corresponding with 3.5 times rated torque：$256/(1000H \times 3.5) \times 2^{16} = 1170512$

H34	71	0421H	G_MON_V	MON output DC current Scaling		171	

Setting when 10V corresponding with 600V：$(256 \times 400)/600 = 171$

H35	52	0422H	TB_MD	Rotation table control mode		0	

Bit0:Torque reducing when rotation table stop

0：Invalable   1：Available

H36	AA	0423H	TB_NUM	Rotation Table positions number		0	2~16

Setting rotation table positions number，the max value is 16

	After setting, the drive should be restarted.						
H37	AB	0424H	TB_GRN	Rotation Table gear ratio numerator		0	1~5000
	B_GRN/TB_GRM: 1/50～50						
H38	AC	0425H	TB_GRM	Rotation Table gear ratio denominator		0	1~5000
	B_GRN/TB_GRM: 1/50～50						
H39	AD	0426H	TB_TM	Rotation table speed up/down time	10ms	0	0~10000
	speed up/down time from 0—3000rpm						
H40	AE	0427H	BLAS	Devision control cleaance compansition	Pulse	0	8000~7FFFH (-32768~32767)
	Unit is pulse NO. Positive：Positive direction compansation Negtive：Negtive direction compansation						
H41	AF	0428H	POSS_MD	Position reference control mode		0	0~8
	Internal position command control mode 0：INC increase position command 1：ABS absolute position command 2： Positive rotation devision 3： Negtive rotation devision 4：Toe index through the nearest path of rotation table 5: Absolute continious trigger arresting 6: Relative continious trigger arresting 7: Relative auto cycle arresting 8: Relative auto cycle arresting 1/5/7，Requires electronic gear ratio must be 1						
H42	B0	0429H	POS0_H	Position internal register 0	Pulse	0	7FFF~8000H (32767~-32768)
H43	B1		POS0_L	Position internal register 0	Pulse	0	7FFF~8000H
	IN RAM POS0= POS0H*2^16+ POS0L Interial positon 0 position pulse NO. setting						
H44	B2	042AH	POS1_H	Position internal register 1	Pulse	0	7FFF~8000H

H45	B3		POS1_L	Position internal register 1	Pulse	0	7FFF~8000H
	In RAM POS1= POS1H*2^16+ POS1L Interial positon 1 position pulse NO. setting						
H46	B4	042BH	POS2_H	Position internal register 2	Pulse	0	7FFF~8000H
H47	B5		POS2_L	Position internal register 2	Pulse	0	7FFF~8000H
	In RAM POS2= POS2H*2^16+ POS2L nterial positon 2 position pulse NO. setting						
H48	B6	042CH	POS3_H	Position internal register 3	Pulse	0	7FFF~8000H
H49	B7		POS3_L	Position internal register 3	Pulse	0	7FFF~8000H
	In RAM POS3= POS3H*2^16+ POS3L nterial positon 3 position pulse NO. setting						
H50	B8	042DH	POS4_H	Position internal register 4	Pulse	0	7FFF~8000H
H51	B9		POS4_L	Position internal register 4	Pulse	0	7FFF~8000H
	In RAM POS4= POS4H*2^16+ POS4L nterial positon 4 position pulse NO. setting						
H52	BA	042EH	POS5_H	Position internal register 5	Pulse	0	7FFF~8000H
H53	BB		POS5_L	Position internal register 5	Pulse	0	7FFF~8000H
	RAM 中 POS5= POS5H*2^16+ POS5L nterial positon 5 position pulse NO. setting						
H54	BC	042FH	POS6_H	Position internal register 6	Pulse	0	7FFF~8000H
H55	BD		POS6_L	Position internal register 6	Pulse	0	7FFF~8000H
	IN RAM POS6= POS6H*2^16+ POS6L nterial positon 6 position pulse NO. setting						

H56	BE	0430H	POS7_H	Position internal register 7	Pulse	0	7FFF~8000H
H57	BF		POS7_L	Position internal register7	Pulse	0	7FFF~8000H
		IN RAM POS7= POS7H*2^16+ POS7L nterial positon 7 position pulse NO. setting					
H58	C0	0431H	POSV0	Position internal register 0 moving speed	RPM	0	0~4000H (0~16384)
		Internal positon 0 moving speed setting					
H59	C1	0432H	POSV1	Position internal register 1 moving speed	RPM	0	0~4000H
		Internal positon 1 moving speed setting					
H60	C2	0433H	POSV2	Position internal register 2 moving speed	RPM	0	0~4000H
		Internal positon 2 moving speed setting					
H61	C3	0434H	POSV3	Position internal register 3 moving speed	RPM	0	0~4000H
		Internal positon 3 moving speed setting					
H62	C4	0435H	POSV4	Position internal register 4 moving speed	RPM	0	0~4000H
		Internal positon 4 moving speed setting					
H63	C5	0436H	POSV5	Position internal register 5 moving speed	RPM	0	0~4000H
		Internal positon 5 moving speed setting					
H64	C6	0437H	POSV6	Position internal register 6 moving speed	RPM	0	0~4000H
		Internal positon 6 moving speed setting					
H65	C7	0438H	POSV7	Position internal register 7 moving speed	RPM	0	0~4000H
		Internal positon 7 moving speed setting					
H66	C8	0439H	POST0	Position internal register 0 stop latency time	0.1s	0	0~7530H (0～30000)
		Internal 0 latency time setting under auto cyclic fixed channel assignment mode					
H67	C9	043AH	POST1	Position internal register 1 stop latency time	0.1s	0	0~7530H
		Internal 1 latency time setting under auto cyclic fixed channel assignment mode					

H68	CA	043BH	POST2	Position internal register 2 stop latency time	0.1s	0	0~7530H
		Internal 2 latency time setting under auto cyclic fixed channel assignment mode					
H69	CB	043CH	POST3	Position internal register 3 stop latency time	0.1s	0	0~7530H
		Internal 3 latency time setting under auto cyclic fixed channel assignment mode					
H70	CC	043DH	POST4	Position internal register 4 stop latency time	0.1s	0	0~7530H
		Internal 4 latency time setting under auto cyclic fixed channel assignment mode					
H71	CD	043EH	POST5	Position internal register 5 stop latency time	0.1s	0	0~7350H
		Internal 5 latency time setting under auto cyclic fixed channel assignment mode					
H72	CE	043FH	POST6	Position internal register 6 stop latency time	0.1s	0	0~7530H
		Internal 6latency time setting under auto cyclic fixed channel assignment mode					
H73	CF	0440H	POST7	Position internal register 7 stop latency time	0.1s	0	0~7530H
		Internal 7 latency time setting under auto cyclic fixed channel assignment mode					
H74		0441H	JOG_FLG	JOG mark		0	0,1
		JOG run, H74=1					
H75		0442H	RM_SVON	Remote servo enable mark		0	0,1
		On condition of SVON_CH（D6H）=1, IF H75=1，Servo enable					
H76		0443H	RM_ALM_RST	Romote servo alarm clearance mark		0	0,1
		On condition of servo NO enable, if H76=1, reposition will clear alarm.（alarms besides CPU fault/RAM fault /EEP fault /CW/CCW prohibited fault/coder fault）					

6-5. System parameter（sys group）

Series NO.	E² address	RAM address	Parameter name	Function	Unit	Default	Range
y00		0444H	Reserved	Reserved		0	
y01		0445H	CAN_MOD	CAN BUS mode selection		0	0,1
y02		0446H	BK_EN	Brake enable		1	0,1
y03		0447H	DY_EN	Dynamic brake enable		1	0,1
y04	80	0448H	SPDS_OFF_FLG	Seed demand A/D High-precision resolution		0	0,1
y05		0449H	reserved	Reserved		0	0,1
y06		044AH	STK_STP	Action setting when CW/CCW prohibited		0	0,1
y07		044BH	EX_TCLM_FLG	Torque limit selection under Seed and Position mode		1	0,1

Bit0: Reserved

Bit1:CAN_MOD

  0:CAN deffective   1: CAN effective

  Use CAN BUS,Bit1=1,or else,0

Bit2: Internal contracting brake （BK_EN）

  0: Deffective   1: Effective

Bit3: Dynamic brake（DY_EN）

  0:ADL   1: AV

  Set it to 1，when motor free-stop from high speed,achieve prompt stop.

Bit4: Speed command A/D High definition resolution (SPDS_OFF_FLG)

  0: High definition resolution AV

  1: High definition resolution ADL

  Set to 0，Can improve external analog speed command resolution

Bit5: Reserved

BIT6: Action setting when CW/CCW prohibited(STK_STP)

  0: 0 speed stop(default)

  1: free stop

  After changing the parameter, must power off

BIT7: Torque limit selection (EX_TCLM_FLG)

  Torque limit selection under position,speed mode

  0：Internal torque limit (TLM_P.TLM_N AV)

  1: External torque limit(Torque command AV）

y08		044CH	PHE_EN	Phase loss inspection		0	0,1
y09		044DH	LV_EN	Under voltage inspection		0	0,1
y10	81	044EH	ENC_EN	Coder inspection		0	0,1
y11		044FH	AHOT_EN	Drive overhot inspection		0	0,1
y12		0450H	MHOT_EN	Motor overhot inspection		0	0,1

BIT4: Phase loss inspection（PHE_EN）

  0：ADL   1：AV

BIT5 :Low voltage inspection（LV_EN）

  0：ADL   1：AV

BIT6 :Coder inspection（ENC_EN）

  0：ADL   1：AV

BIT7 :Drive overhot inspection（AHOT_EN）

  0：ADL   1：AV BIT8 :Motor overhot inspection（MHOT_EN）

  0：ADL   1：AV

y13	97	0451H	G_CUR	Current scaling coefficient		906	128~1FFFH

Y13=256*Module current crest value /Motor rated current/1.414）

y14	9F	0452H	ENC_PPR	Motor pulse NO. per rotation		2500	0~10000

Motor coder resolution/prm

y15	E6	0453H	MOTOR_POLE	Motor poles	Pole	8	6,8,14

Set motor poles

y16	7F	0454H	ENC_TYPE	Encoder type		3	0~3

0:DART LINE INC，2:ABS，3:Standard INC

y17	D6	0455H	SVON_CH	Internal servo enable setting		0	0,1

0： DI trigger servo enable

1：Servo enable can be set internally

y18	8E	0456H	E_ANG_OFST	Electric angle offset		-123	-200~200H

E_ANG_OFST =(Offset angle between phase Z and phase U /360)*2048;

							0~7FFFH

y19	8F	0457H	MAX_SPD	A/D speed input LIMIT	Speed	2BBCH	
	4000H=3000rpm						
	SPD_REF limit value						
y20	-	0458H	J OG_FLG_IN	Inching direction mark	-		0,1,2
	0:Stop	1:CCW	2:CW				
y21		0505H	SPD_ADTEST	speed command analog input read			-
	Used for speed command analog linear adjustment						
y22		0506H	TRQ_ADTEST	Torque command analog input read			-
	Used for torque command analog linear adjustment						
y23	F5	0507H	SPD_B_OFST	Analog CH A2 OFFSET updating		F800	
	Used for speed command analog linear adjustment						
y24	F6	0508H	SPD_S_OFST	Analog CH B2 OFFSET updating		FA00	
	Used for speed command analog linear adjustment						
y25	EF	0509H	G_SPD_B	Analog CH A2 OFFSET updating		0B06	
	Used for speed command analog linear adjustment						
y26	F0	050AH	G_SPD_S	Analog CH B2 OFFSET updating		02C2	
	Used for speed command analog linear adjustment						
y27	F1	050BH	G_T	Analog CH A3 OFFSET updating		0B06	
	Used for torque command analog linear adjustment						
y28	F7	050CH	T_OFST	Analog CH A3 OFFSET updating		F800	
	Used for torque command analog linear adjustment						
y29	FB	050DH	MON1_OFST	Analog output CH \OFFSET updating		0100	

6-6. User parameters（User group）

Series NO	Parameter name	Function		Default	Upper limit	Lower limit
U00	board->key	0	Ignore	0	1	0
		1	Controller EEPROM Data Store to keyboard EEPROM			
U0	key->board	0	Ignore	0	1	0

1		1	Keyboard EEPROM Data store to controller EEPROM			
U02	Reset->factory	0	Ignore	0	1	0
		1	Reset			
U03	Authority set（Parameter group mask）	0bit	1：Mask Status group	0	03FH	0
		1bit	1：Mask Fault group			
		2bit	1：Mask Basic group			
		3bit	1：Mask High group			
		4bit	1：Mask Sys group			
		5bit	1：Mask Monitor group			
U04	PASSWORD (User's password)	Set correct password，parameter remind is available		0FFFFH	0FFFFH	0

6-7. EEPROM Parameter（super group）

Series NO.	E²address	RAM address	Parameter name	Function	Range
5-00		0500H	EEP_COM	EEPROM operation commands	0~2
	0：Operation possible status				
	1：Write operation				
	2：Read operation				
5-01		0501H	EEP_WR_AD	Write operation EEPROM address	
	Used for EEPROM write.				
5-02		0502H	EEP_WR_DAT	Write Date	
	Used for EEPROM write				
5-03		0503H	EEP_RD_ADR	Read operation EEPROM address	
	Used for EEPROM read				
5-04		0504H	EEP_RD_DAT	Read data	
	Used for EEPROM read				

Chapter 7 Communication Function

7-1 Introduction of communication hardware RS-485、RS-232、RS-422.

This servo drive has three modes of communication :RS-485、RS-232、RS-422，

All aspects of control, operation and monitoring as well as programming of the controller can be achieved via communication. However, only one communication mode can be used at a time. The method of cable connection is as following:

7-1-1 RS-232

Configuration
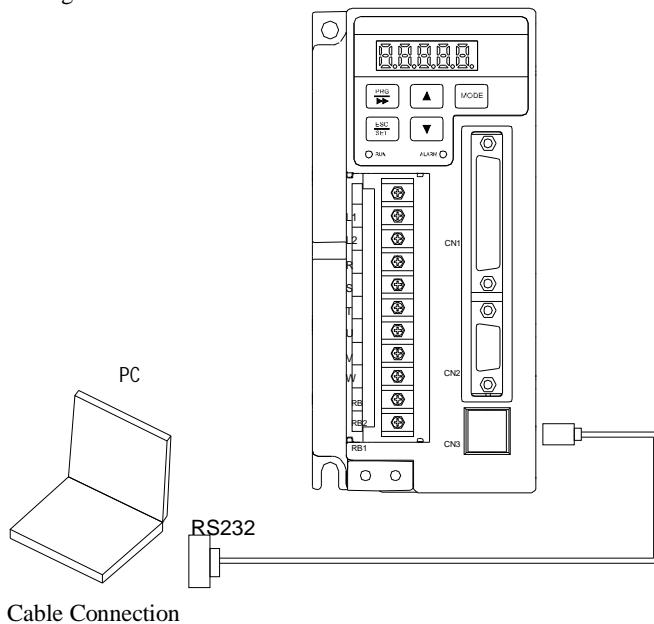
Cable Connection

7-1-2 RS-422/RS485

Configuration
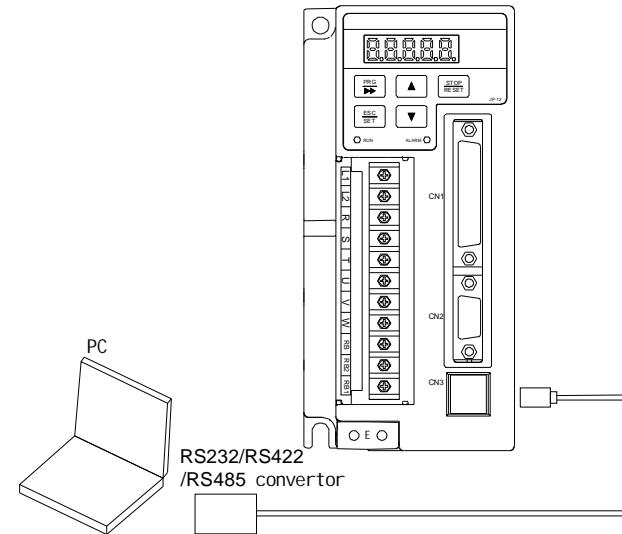
Cable Connection

7-2 Communication protocol

1.Intention:

By using of   this communication protocol software, epigynous computer can monitor servor status, change, load and save servor interior parameters.

2. Working condition:

Hardware: Epigynous computer,digital servor and connecting cable (RS232).

Operating system: Superior than WINDOWS95.

3. Communication format:

（1）   Communication condition:

①Speed：9600bps

②Parity inspection：NO

③Data lenght：8bit

④Stop bit：1bit

All datas will divided into "4bit"fragment, and each one will transform   to character（ASCII CODE）and   transmit.

All appointed addresses in transmission are "RAM" address.

（2）   Requestment sent to driver.

①The read of integer variables(7byte)

"R"+Pages of variables(H)+ page layout of variables(L)+ deviation of

varia

Deviation of variables(H)+ deviation of variables(L)+

inspect(H)+inspect(L)

②Input of integer variables(11byte)

"W"+page of variables(H)+ page of variables(L)+ deviation of

variables(H)+ deviation of variables(L)+data(HH)+data(HL)+data(LH)+

data(LL)+inspect(H)+inspect(L)

③Input of long integer variables(7byte)

"X"+page of variables(H)+ page of variables(L)+ deviation of

variables(H)+ deviation of variables(L)+inspect(H)+inspect(L)

④Input of long integer variables(13byte)

"Y"+page of variables(H)+ page of variables(L)+ deviation of

variables(H)+ deviation of

variables(L)+data(HHH)+data(HHL)+data(LHH)+ data(LHL) +data(LLH)

+data(LLL)+inspect(H)+inspect(L)

（3）   Return of drive

①Return of integer variables read request.

"%" +data(HH)+data(HL)+data(LH)+

data(LL)+inspect(H)+inspect(L)

①Return of long integer variables read request(9byte).

¡°%¡± +data(HH)+data(HL)+data(LH)+ data(LL)+inspect(H)+inspect(L)

③Return of input request(1byte)

"%"————ACK

"!"————NACK

(4)   Inspect data

All characters'（ASCII CODE）sum and low 8bit.

Example：page of variables=01H, deviation of variables=00H,format of reading this variables is as following：

R010013

Among the aftermost bit binary digit 13=（52H+30H+31H+30H+30H）low 8bit

7-3 Communication operation

1、Communication software of operating A&D servo drive
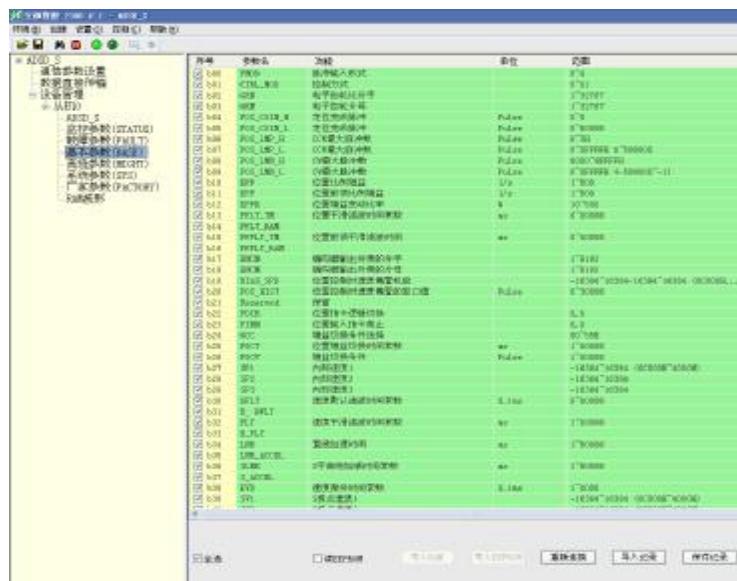
2、Setup communication parameter，to setup baud rate and communication port according to different computer.

3、Click ADSD-S in the main menu of the communication software after the commnication display is well, and conduct read-out and write-in of RAM and EEPROM directly.The specific address of RAM and EEPROM should be refered to detailed specification.
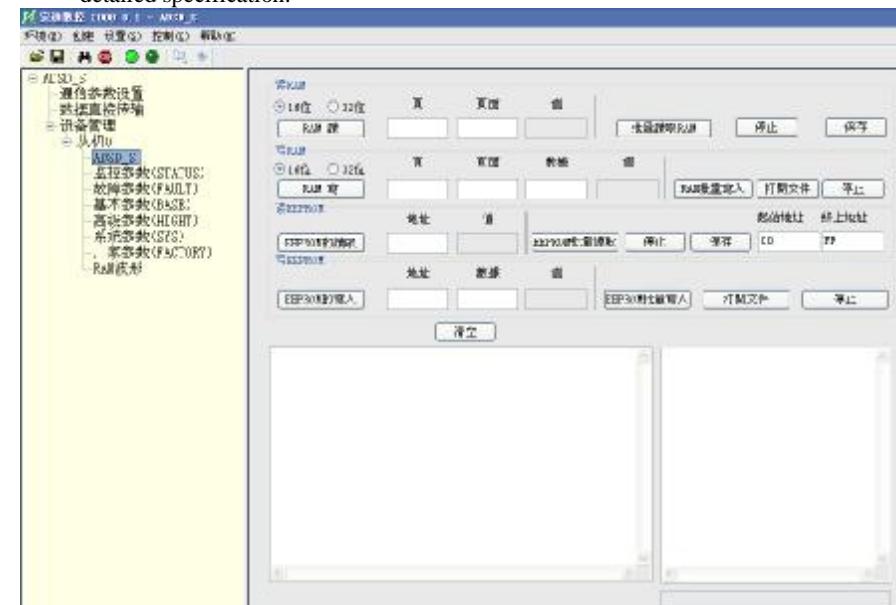
4、The related parameters also can be read and put in direct through parameter page, but the parameters of EEPROM just will be valid after power off.
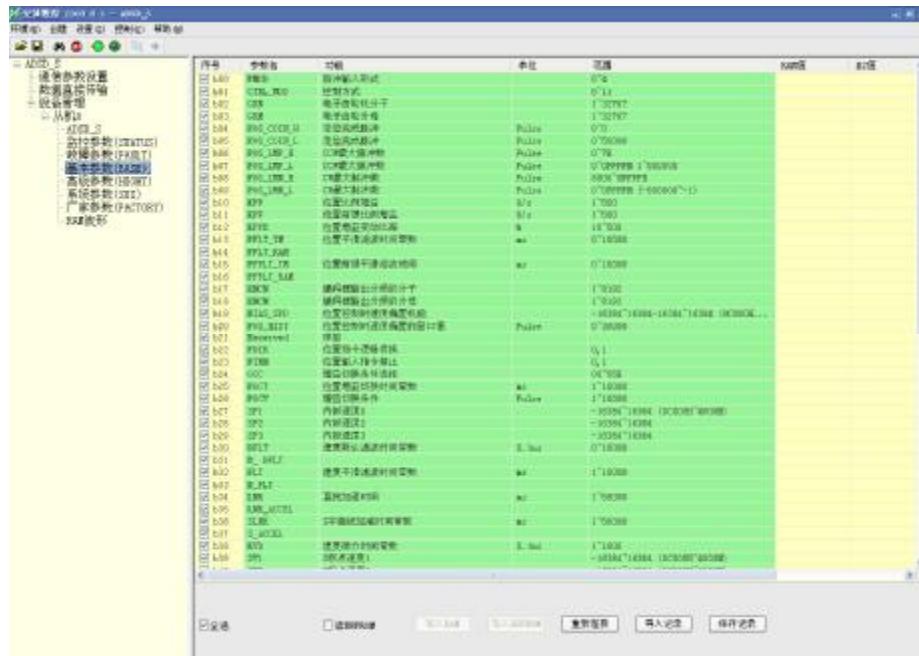
5、Servor can be leaded in recorded parameter by "lead-in record" .All parameters also can be kept in servo-drive by" keeping record".

Chapter 8 Maintenance and Inspection

8-1 Basic Inspection

Item	Content of inspection
General Inspection	Periodically inspect the screws of the servo drive, motor shaft, terminal block andthe connection to mechanical system. Tighten screws as necessary as they mayloosen due to vibration and varying temperatures.
	Ensure that oil, water, metallic particles or any foreign objects do not fall insidethe servo drive, motor, control panel or ventilation slots and holes. As these willcause damage.
	Ensure the correct installation and the control panel. It should be free fromairborne dust, harmful gases or liquids.
	Ensure that all wiring instructions and recommendations are followed; otherwisedamage to the drive and or motor may result.
Inpsection before operation （ Control power is not applied）	To avoid an electric shock, be sure to connect the ground terminal of servo driveto the ground terminal of control panel.
	Before making any connection, wait 10 minutes for capacitors to discharge afterthe power is disconnected, alternatively, use an appropriate discharge device todischarge.
	Ensure that all wiring terminals are correctly insulated.
	Ensure that all wiring is correct or damage and or malfunction may result.
	Visually check to ensure that there are not any unused screws, metal strips, orany conductive or inflammable materials inside the drive.
	Make sure control switch is OFF.
	Servo controller and exterior brake resistant cann't be install on combustible object.
	To avoid electromagnetic braker invalid,please check the circuit of immediately stop and cutting off power.
	When electronic equipments are being interfered arround servo-controller, Please use other equipment to abate this interference.
Inspection before working	Ensure that detector cable is not over tension.When servo motor is working, Please take caution to avoid attrition between cable and machine member.
	If the servo motor has phenomenon of vibration and big noise,please contact to

(Control	manufacturer.
power is	Comfirming all parameters are proper set, difference of mechanical features will lead to unpredictable motion.Do not excessive adjust parameters.
applied）	Reseting parameter should be done under controller status of（SERVO OFF）.Otherwise which will be reason of fault.
	If there is an abnormal voice or not voice of touching when relay acts, please contact manufacturer directly.
	Whether there is abnormal phenomenon of power indicator-light and LED.

8-2 Maintenance

◇   Use and store the product in a proper and normal environment.
◇   Periodically clean the surface and panel of servo drive and motor.
◇   Do not disassemble or damage any mechanical part when performing maintenance.
◇   Clean off any dust and dirt with a vacuum cleaner. Place special emphasis on cleaning the ventilationports and PCBs. Always keep these areas clean, as accumulation of dust and dirt can cause unforeseenfailures

8-3 Lifespan of Replacement Components

Smooth capacitor

◇   The characteristics of smooth capacitor would be deteriorated by ripple current affection. The life ofsmooth capacitor varies according to ambient temperature and operating conditions.The common guaranteed life of smooth capacitor is ten years when it is properly used in normal air-conditioned environment.

Relay

◇   The contacts will wear and result in malfunction due to switching currentThe life of relay variesaccording to power supply capacity. Therefore, the common guaranteed life of relay is cumulative100,000 times of power on and power off.

Cooling fan

◇   The cooling fan life is limited and should be changed periodically. The cooling fan will reach the end ofits life in 2~3 years when it is in continuous operation. However, it also must be replaced if the coolingfan is vibrating or there are unusual noises.

Chapter 9 Troubleshooting

9-1 Fault Messages Table

Parameter No.	Fault Code	Fault Name	Fault Description
A01	0001	CPU error	CPU is in error
	0002	RAM error	RAM write-in and read-out is in error
	0004	EEP error	EEPROM write-in and read-out is in error
	0008	CW/CCW prohibited fault	The forward and reverse drive forbidden switches are in error.
	0010	Encoder error	Pulse signal is in error.
	0020	Overcurrent	Main circuit current is higher than 1.5 multiple of motor's instantaneous maximum current value.
	0040	Overload	Servo motor and drive is overload.
	0080	Undervoltage	Main circuit voltage is below its minimum specified value.
	0100	Overvoltage	Main circuit voltage has exceeded its maximum allowable value.
	0200	Regeneration error	Regeneration control operation is in error.
	0400	IPM error	IPM hardware is in error.
	0800	Overspeed	Motor's control speed exceeds the limit of normal speed.
	1000	Emergency stop	Emergency stop switch is activated.
	2000	Excessive deviation	Position control deviation value exceeds the limit of its allowable setting value.
	4000	Motor overhot	The drive detected the motor temperature exceeded its allowable value.
	8000	Drive overhot	IGBT temperature is overheated.
A02	0001	Input power phase loss	The main circuit lacks of phase.

	0002	Dynamic braking relay error	Dynamic breaking relay is in error.
	0004	CW limitation alarm	Forward limit switch is activated.
	0008	CW limitation alarm	Reverse limit switch is activated.
	0010	Communication abnormal	Communication is in error.

9-2 Potential Cause and Corrective Actions

Fault Name	Potential Cause	Corrective Actions
CPU error	The CPU of the driver is in error.	Please contact your distributor or manufacturer for service.
RAM/EEPROM error	The drive is error during parameter read-out and write-in.	Reset the parameter in the guidance of technicians, if the error is still unclear, please contact your distributor or manufacturer for service.
CW/CCW prohibited fault	1. The parameter setting of the forward and reverse drvie forbidden error	1.Correctly set the parameter.
	2. When the forward and reverse forbidden switch is set, the swith is in error.	2.Check the the location of drive and switch and if the wiring of the switch is correct, if there's broken wire for the normally closed switch.
Encoder error	1、The wiring of encoder is in error.	1、Ensure all wiring is corret.
	2、Encoder connector is loose.	2、Restall the connector.
	3、The wiring of encoder is defective.	3、Conduct the wiring again.
	4、Encoder is damage.	4、Change the motor.
Overcurrent	Short-circuit at drive output.	Check the wiring connections between drive and motor and check if the drive is short-circuited, if so, repair it.
	Motor wiring error	Follow the standard wiring steps to reconnect wiring.
	Main circuit drive power tube IGBT error	Please contact your distributor or manufacturer for service.
	Parameter setting error	Adjust the parameter setting again.
Overload	The drive has exceeded its rated load.	Reduce load or change the drive with higher

		capacity
	Control system parameter setting is incorrect	Adjust gain value, increase Accel/Decel time or decrease inner torque limit.
	The wiring of drive and encoder is in error	Adjust the wiring of U\V\W or encoder.
	The motor encoder is damaged.	Please contact your distributor or manufacturer for service.
Undervoltage	Main circuit voltage is below its minimum specified value.	Check whether the wiring of main circuit is correct and if the input voltage is low, if so, rejust.
	Power input error (incorrect power system)	Use correct power supply.
Overvoltage	The main circuit voltage has exceeded its maximum allowable value.	Use correct power supply.
	Drive hardware error	Please contact your distributor or manufacturer for service.
Regeneration error	Regenerative resistor is not connected or low.	For inner regenerative resistor, check if short circuit occurs between RB and RB2 terminator. For external regenerative resistor, check if there's resistor between RB and RB1, and if the resistance is correct.
	Regenerative switch transistor fault	Please contact your distributor or manufacturer for service.
	The control parameter setting of the drive is incorrect.	Change the parameter.
IPM error	Motor wiring error	Check if the phase-sequence of U\V\W is correct.
	Hardware damange	Please contact your distributor or manufacturer for service.
	Y13 (current coefficient) of system parameter setting error	Change the parameter.
	The maximum torque current exceeds IGBT capacity.	Change the inner torque current limit parameter.
Overspeed	Speed input command exceeds the limit of the drive	Change the speed command.

	The permissible value of the drive is too small.	Change the parameter.
	Electronic gear ratio setting is too high.	Correctly set the electronic gear ratio and change the parameter.
Emergency stop	Check if the emergency stop switch is on.	Release the emergency stop button when there's no error.
	The wiring of the emergency stop is in error.	Change the wiring, reconnect the wire if there's broken wire.
	Parameter setting is in error, and the emergency stop input port setting is incorrect.	Change the parameter.
Excessive deviation	The forward and reverse maximum deviation no. setting of the basic parameter is too small.	Change the parameter.
	The system gain value is too small.	Correctly adjust gain value.
	Encoder cable connection error	Reconnect encoder cable.
	External load is too high.	Check the external load condition or reassess the motor capacity.
	Control parameter setting of the controller is incorrect, and the motor can't work normally.	Change the parameters.
	The motor capacity is too small and can't work in overload condition for longtime.	Change a appropriate motor.
Drive overhot	Ventilation of the drive is poor, and the temperature is too high.	Improve the ventilation.
	Hardware error	Please contact your distributor or manufacturer for service.
Input power phase loss	Input power supply of main circuit lacks of phase.	Check if the wiring is correct or loose, and if the power supply lack of phase, if not, the drive hardware may be in error, contact your distributor or manufacturer for service.
Dynamic braking relay error	Dynamic breaking relay is in error.	Please contact your distributor or manufacturer for service.
CW limitation	The motor mechanism reaches the	Remove the mechanism and reset,and get rid of

alarm	forward limit switch postion.	alarm.
	The wiring of the forward limit switch is incorrect or loose.	Reconnect again.
	The parameter setting of the limit switch is in error.	Change the parameter.
CCW limitation alarm	The motor mechanism reaches the forward limit switch postion.	Remove the mechanism and reset,and get rid of alarm.
	The wiring of the forward limit switch is incorrect or loose.	Reconnect again.
	The parameter setting of the limit switch is in error.	Change the parameter.
Communication error	Communication wire error	Confirm the wiring is in good condition and correct.
	Communication parameter setting error	Confirm the communication parameter setting is correct.

Chapter 10 Specifications
10-1 Specifications of Servo Drive

Items		Specifications		
Power supply	Voltage/frequency range	Single-phase 220V，50/60HZ Three-phase 220V，50/60HZ Single-phase 380V，50/60HZ Three-phase 440V，50/60HZ		
	Permissible fluctuation	Voltage：±15% Frequency：±5%		
control mode	Control System	Based on 32 byte great performance controller of vector		
	Output frequency	0.00～450.00Hz，The highest frequency can be set among 10.00～450.00Hz at random.		
	The highest speed of vector control 300Hz as example	Output frequency	2 poles	18000 r/min
			4 poles	9000 r/min
			6 poles	6000 r/min
	Methods of control	Mode of position-control，Mode of speed-control，Mode of torque-control Position/speed compounded mode，position/torque compounded mode，torque/speed compounded mode Mode of set by user.		
	Torque control	Precision of torque	±5% rated torque	
		Amplitude limiting of torque	0～300％ set rated torque at random	
		Limit of torque	Methods of parameter set or analog input	
	range of speed-control	1：5000 above		
	Postion-control	Highest precision	±1pulse	
		The highest frequency of input pulse	500KPPS	
		Range of position-control	0～2^{31}given pulse	

			Input mode	Double phases A/B orthogonal pulse，pulse＋direction，double pulses of forward and reverse
Operation			Electronic gear wheel	1/50～50
		Control of acceleration and deceleration	beenline，smoothing filtering，acceleration and deceleration of S curve.	
		Resolution of speed set	0.1RPM	
		Overload capacity	300% rated current-5 seconds。	
	Output signal	Methods of operation	keyboard/terminals/methods of communication	
		Setup of speed	Methods of speed-setup:keyboard，simulation，communication	
		Input of programmable digital quantity.	Multifunctional input,such as servo start,abnormal reset.Support source/drain electrode, Total 8 ports.	
		Input of programmable digital quantity.	Output of servo start-preparation,start,etc. Total:8 ports.	
			Output of A,B,Z lines drive.	
		Input of programmable analog quantity	Double input ports of analog signal, and be equally to input of speed,torque,position.	
		Output of programmable analog quantity	Double output ports of analog signal with voltage or current mode.	
		Input of digital quantity.	Control-logic of high-speed multifunctional digital quantity-input.	
	Input signal	Working status	Servo motor shows status that is stop,speed up or down,uniform-spped,program running.	
		Output of fault	Touch spot output–AC 250V 5A，DC 30V 5A	
		Output of analog signal	Output of frequency/current/voltmeter	
		output of digital quantity.	There are 6 channels for signal output, and each channel has 32 kinds of signal for choosing.	
		DC current braking	External braking resistor can provide enough torque on the condition of not over current.	
Protection		Protection of controller	Over voltage，less voltage,over cuurent,over load,over heat,over speed,less phase,outside fault,fault of communication,abnormal PID feedback signal,PG fault.	

	Protection of parameters		Through set administer's password or decode to protect parameters.
Display	LCD Chinese-english display + LED keyboard	Operation message	There are total 16 objections of operation: set frequency,actual frequency,motor actual current,actual current percentage,DC Bus voltage,motor actual speed,total ruuning time,IGBT temperature,torque heft set value,torque heft actual value.
		fault message	The memory capacity is 10 fault messages, which can be checked when fault occur.
communicatio	RS485		Isolated RS485 communication mode can be chose to realize connection with upper computer.
	CAN BUS		Optional Bus mode
Environment	Environment temperature		-10℃ - 40℃
	Memory temperature		-20℃ - 65℃
	Environment humidity		At most 90% RH .
	Height·vibration		Below 1，000m，and 5.9m/S²(=0.6g)
	Place of application		No sunlight,corrosive and explosive gas and moisture
Cooling mode			Fan cooling and natural circulation cooling.

10-2 Specification of ADSM Servo Motor

Stardard specification of 110 series motor

Motor model	110-020M30	110-020M30	110-050M30	110-060M20	110-060M30
Power（KW）	0.6	1.2	1.5	1.2	1．6
Rated torque（N.m）	2	4	5	6	6
Rated RPM (Rpm)	3000	3000	3000	2000	3000
Rated current (A)	4.0	6.0	7.0	6.0	8.5
Rotor inertia Kgm²）	0.33×10^{-3}	0.828×10^{-3}	0.915×10^{-3}	1.0×10^{-3}	1.111×10^{-3}
mechanical time constant （ms)	3.64	3.46	4.8	1.82	1.864
Encoder line	2500（A、B、Z、U、V、W）				

number（C/T）					
Motor insulation class	B				
Operational environment	Environment temperature：0～55℃ Humidity：at most 90%（non condensing）				
Protection class	IP65				
Motor weight（Kg）	4.2	6	5.8	6.4	6.4

Stardard specification of 130 series motor

Motor model	130-040M25	130-050M20	130-050M25	130-060M25	130-077M20	130-077M25
Power（KW）	1.0	1.0	1.3	1.5	1.6	2.0
Rated torque（N.m）	4	5	5	6	7.7	7.7
Rated RPM (Rpm)	2500	2000	2500	2500	2000	2500
Rated current(A)	5.0	5.5	6.0	7.0	6.5	8.5
Rotor inertia Kgm²）	1.101×10^{-3}	1.333×10^{-3}	1.333×10^{-3}	1.544×10^{-3}	2.017×10^{-3}	2.017×10^{-3}
mechanical time constant(Ms)	5.042	4.186	3.677	3.122	2.34	2.624
Encoder line number（C/T）	2500（A、B、Z、U、V、W）					
Motor insulation class	B					
Operational environment	Environmental temperature：0～55℃ Humidity：at most 90%（non condensing）					
Protection class	IP65					
Motor weight (Kg)	6.1	6.9	7.0	7.6	8.8	8.8

Motor model	130-077M30	130-100M15	130-100M25	130-150M15	130-150M25
Power（KW）	2.4	1.5	2.6	2.3	3.8
Rated torque（N.m）	7.7	10	10	15	15

Rated RPM (Rpm)	3000	1500	2500	1500	2500
Rated current(A)	10.5	6.5	11.5	9.5	16.5
Rotor inertia Kgm^2)	$2.017×10^{-3}$	$2.595×10^{-33}$	$2.595×10^{-3}$	$3.24×10^{-3}$	$6.15×10^{-3}$
mechanical time constant(Ms)	2.353	2.162	1.903	1.88	2.59
Encoder line number（C/T）	2500（A、B、Z、U、V、W）				
Motor insulation class	B				
Operational environment	Environmental temperature：0～55℃　Humidity：at most 90%（non condensing）				
Protection class	IP65				
Motor weight (Kg)	8.8	10.6	10.6	14.3	15.35

Stardard specification of 150 series motor

Motor model	150-150M25	150-180M20	150-230M20	150-270M20
Power（KW）	3.8	3.6	4.7	5.5
Rated torque（N.m）	15	18	23	27
Rated RPM (Rpm)	2500	2000	2000	2000
Rated current(A)	16.5	16.5	20.5	26
Rotor inertia	$5.2×10^{-3}$	$6.3×10^{-3}$	$8.0×10^{-3}$	$11.19×10^{-3}$

Kgm^2)				
mechanical time constant(Ms)	2.43	2.27	2.04	1.932

Chapter 11 Application examples

It can be widely used in manufacturing equipment of machine tool, printing, textile, plastic, paper, wind energy area that the synchro servo drive produced by Dalian A&D digital operation. The following is the specification of its main function.

11-1 Internal position register control（including origin regression function）

The internal position register function of ADSD-S drive can let it be used as isolated controller, and no need control of NC system and PLC. There are 8 group position registers in drive. When the conrol motion is not complex and alternation is not frequent, the internal position register control mode can be used to set corresponding order of position and speed, as well as delayed time of two positions.

When using internal position register control function,because the motor encoder is incremental model, so in order to promise consistency and precision of processing,every time homing operation is needed when the drive restarts.Specific operation is as following：

1、 Confirm the definition of I/O interface.

    DI1:Servo-on（SVON）

    DI2:Internal position register triger（ATRIG）

    DI3：Selection of internal position register order （PS0）

    DI3：Selection of internal position register order （PS1）

    DI5：The prohibitive extreme limit of reverse（CWSTE）

    DI5：The prohibitive extreme limit of forward（CWSTE）

    DI7: Starting signal of activating homing function（ORG_ST）

    DI8：Slowdown switch of homing function（ORG_SW）

    DO1：Output signal of servo on（SON）

    DO2: Finish signal of homing function（HOME）

    DO5: Alarm output signal（ALM）

2、 parameters setting

□ B01=6（Internal position register control model Pi setting）

□ H14=1901（DI2:ATRIG，DI1:SVON）

□ H15=1C1B（DI4:PS1,DI3:PS0）

□ H16=0B0A（DI6:CCWSTE,DI5:CWSTE）

□ H17=100F（DI8:ORG_SW,DI7:ORG_ST）

□ H18= 0701(DO2:HOME ,DO1:SON)

□ H19=0000

□ H20=0005（DO5:ALM）

□ H21=0（The mode of homing is I/O activating mode）

□ H22=0（The homing direction is forward）

□ H23=0（The confirming method of Z-phase pulse is to press slowdown switch -ORG_SW and when the motor reverse runs and pulled off switch,the Z-phase will count）

□ H24=1555H（The high-speed of homing is 1000rpm）

□ H25=444H（The low-speed of homing is 200rpm）

□ H26=1（the No. of Z-phase pulse in homing is 1, namely after pulling off speed reduing switch ,the system find NO.1 Z-phase pulse and regards it as homing point ）

□ H27/H28=0（There is no homing deviation after finding homing point ）

□ H41=1（absolute positioning order）

□ H42～H49 Set internal register position order

□ H58~H61 Set corresponding speed of internal position order

□ Other motor parameters such as gain of position,speed will be set according to mechanical running condition.

3、Timing diagram of origin regression action

（Pulse No.defined by H23）
（The diagram display the condition of H23=0)
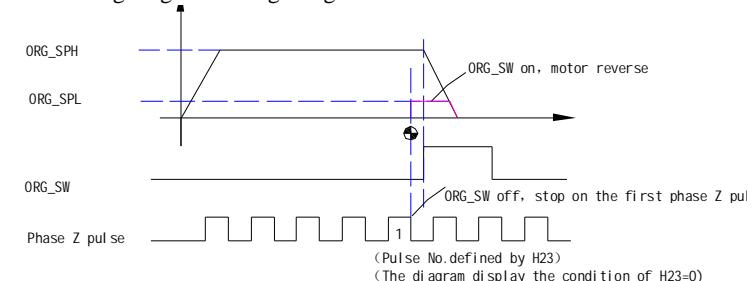
4、Operation

Under the correct wiring and parameters setting

    1）First let SVON=1（DI1），

    2)Doing origin regression operation and then choose origin regression mode ORG_ST=1(DI7).The motor will start forward running with high speed from origin according to parameter setting. When motor meets ORG_SW(speed reducing switch),it will decelerate and reverse running with low speed from origin until the speed reducing switch falling off, the system will check Z-phase pulse,lastly the motor will stop when checked Z-phase pulse.

    3）According to processing demand to choose respectively corresponding 0～internal position register under PS1 and PS0 status,3，Put down order

triger（ATRIG-DI2）,motor will running according to position and speed

order.

Remark：The origin homing operation just needs to be done one time

when everytime power on.

11-2 Rotation table control

ADSD-S drive has inside toe index function, which can replace tool control function.As the more and more precise demand of digital control machine tool, the servo tool has gradually replaced electrical and hydraulic tool.ADSD servo drive can be convenient matched with machine tool and without extral servo tool controller.In addition, the function can be widely used in Rotation table control and other Rotation equipments.

The following is the specification of servo tool turret control.

We assume that turret has 8 positions, there are shortest path for turret swithching and the deceleatration rate is 2:1(The motor runs 2 circles 720 degress, the turret will run 1 circle 360 degree)

1、 Confirm the definition of I/O interface.

DI1: DI1:Servo-on（SVON）

DI2: Choose turret position TB0

DI3:Choose turret position TB1

DI4:Choose turret position TB2

DI5：Triger turret position CTRIG

DI6：empty

DI7: Starting signal of activating origin homing function（ORG_ST）

DI8：Deceleration signal of origin homing（ORG_SW）（origin is as NO 1 position

of turret）

DO1：Output signal of ENAB（SON）

DO2: Finish signal of origin homing function（HOME）

DO3：Position coincidence signal（POSIN）

DO5: Alarm output signal（ALM）

2、 Parameters setting

☐ B01=11（Toe index function）

☐ B25=1555(graduated speed 1000rpm）

☐ H14=1F01（DI2:TB0，DI1:SVON）

☐ H15=2120（DI4:TB2，DI3:TB1）

☐ H16=0024（DI6:empty,DI5:CTRIG）

☐ H17=100F（DI8:ORG_SW,DI7:ORG_ST）

☐ H18= 0701(DO2:HOME ,DO1:SON)

☐ H19=0008（DO3:POSIN）

☐ H20=0005（DO5:ALM）

☐ H21=0（The mode of origin homing is I/O activating mode）

☐ H22=0（The origin homing direction is forward）

☐ H23=0（The confirming method of Z-phase pulse is to press speed reducing

switch-ORG_SW. When the motor reverse runs and   pulled off switch,the Z-phase

will count）

☐ H24=1555H（The high-speed of homing is 1000rpm）

☐ H25=444H（The low-speed of homing is 200rpm）

☐ H26=1（the No of Z-phase pulse in homing is 1, namely after pulling off speed reduing

switch ,the system find NO.1 Z-phase pulse and regards it as homing point ）

☐ H27/H28=0（There is no origin deviation after finding origin homing point ）

☐ H41=4（Turret shortest path graduation）

☐ H35=0（The torque will not reduce when turret stop,the practical application of this

parameter is set according to mechanical structure）

☐ H36=8（The turret has 8 positions）

☐ H37=1 H38=2(Deceleration rate of Rotation table）

☐ Other motor parameters such as loop of position,speed and graduated control gap

compesation parameters will be set according to mechanical running condition.

3、 Operation:

1） When the serve is equipped, first use SVON=1（DI1）

2） Doing origin homing operation and comfirming No1 positon of turret.

3） Put in turret optional signal(TB0～TB2) according to demand,then trigger

CTRIG（DI5).The Rotation table will reversely run turret and reach target

position in princle of shortest path from currently position to target position.

4） Sequence chart
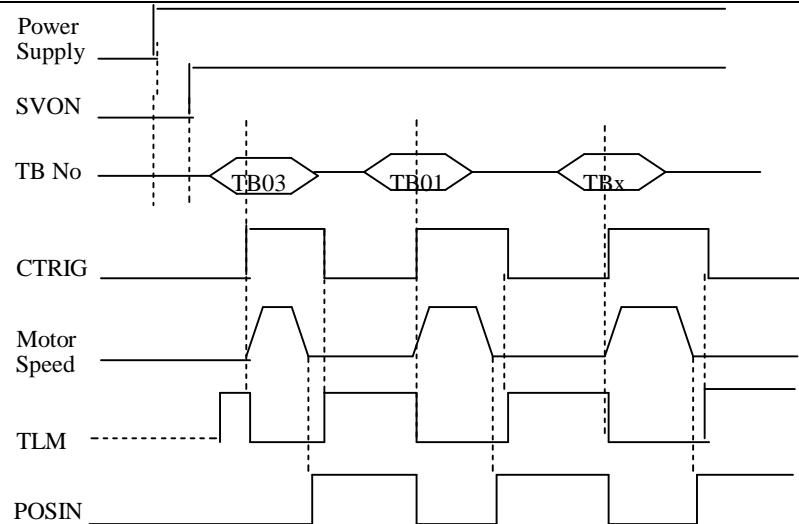
11-3 ADSD-S drive and numerical control system accessories

11-3-1 The accessories schematic chart with HNC-21T（century star）/Dalian CNC

1、Using HNC-21T and matching with ADSM series motor wiring.
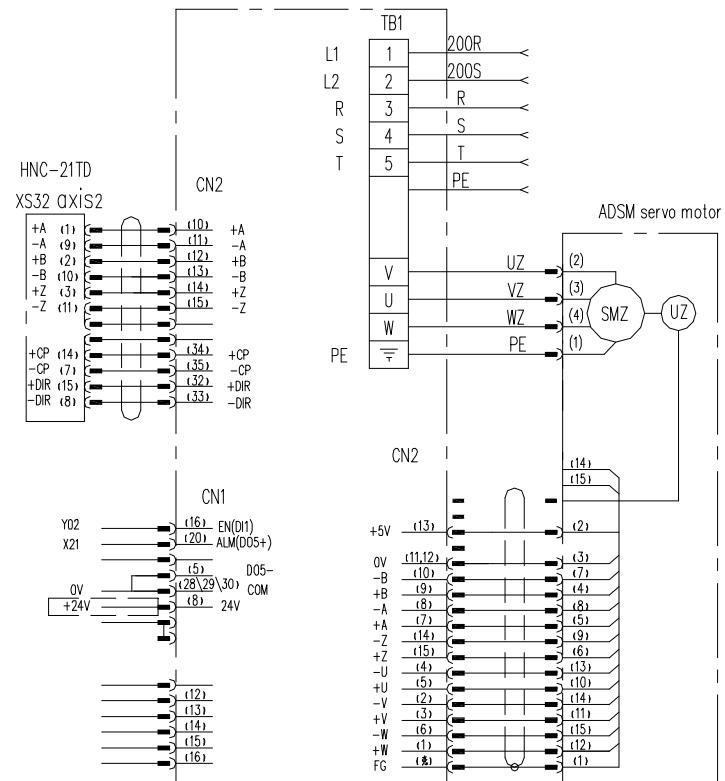
**Remark:Using Dalian CNC 31T/M.The wiring of numerical control system is same as above.**

servo motor
GK6062-6AC31-FB
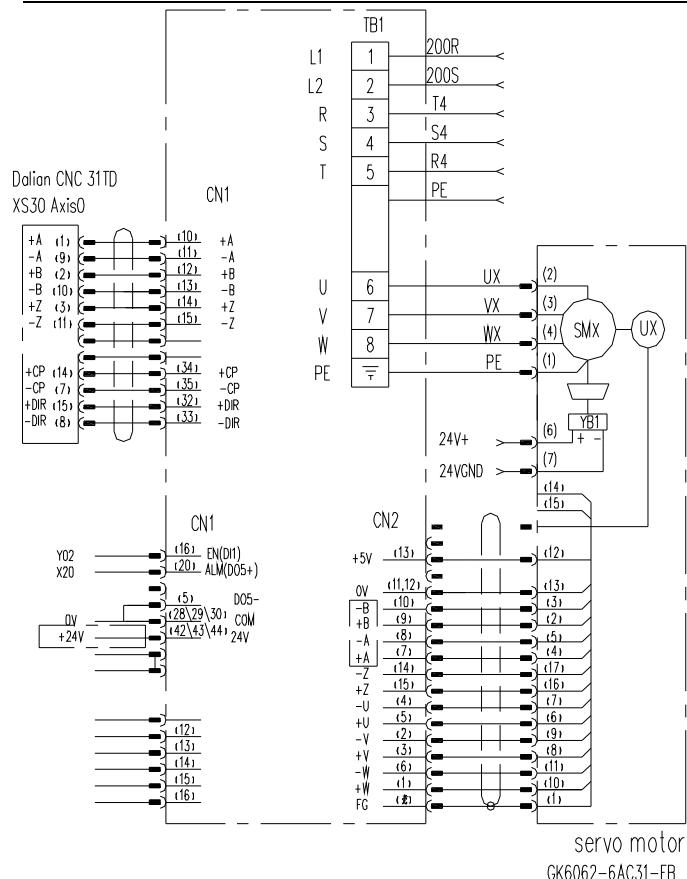
2、Using Dalian CNC 31T system and matching with Wuhan Golden motor wiring.

Remark:The wiring of using HCNC system 21T/M is same as above.

11-3-2.The schematic chart of matching with Guangzhou NC GSK218M.

1、ADSD-S drive connects to GSK-218M
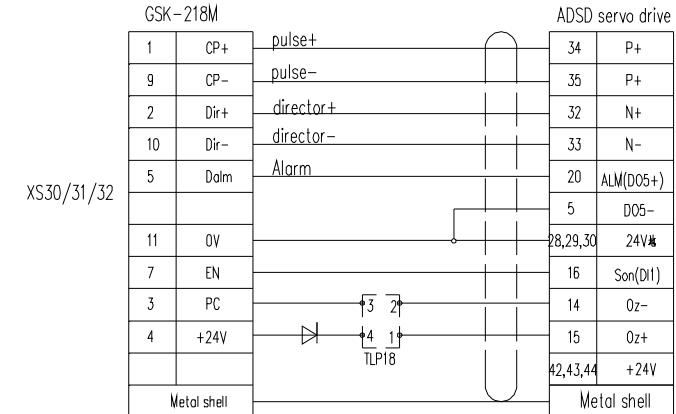
2、The wiring of ADSD-S drive matching with TSFA of Dalian motor factory
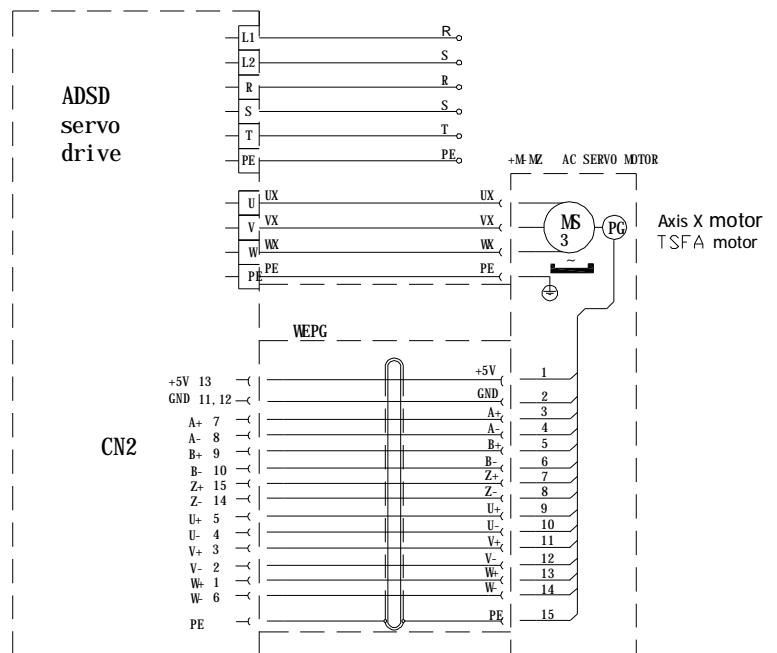
Addendum

Drive matched cable

（1）power cable:

Order model：ADSD-S-CP-***　　　（*** indicates cable length）

Aviation plug model of lateral configuration ADSM-S series motor：YD28K4TS-A

### （2）encoder feedback cable：

Order model：ADSD-S-CE-***　　　（*** indicate cable length）

Aviation plug model of lateral configuration ADSM-S series motor：YD28K15TS-A
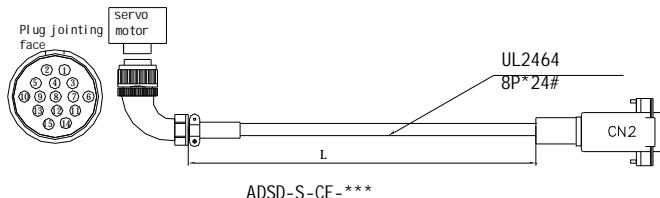
（2）Communication cable(optional)

Order model：ADSD-CRS-***　　　（*** indicates cable length）
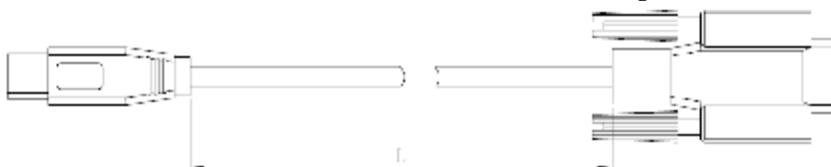
Pinboard of interface（optional）

Our company's interface pinboard is designed for customer's convenience and it has CN1

and CN2 interface of synchro servo motor for all signals.

Order model：ADSD-B