Safety Notification

(Please read carefully before using the drives)

Please read the manual carefully for installation, operation, maintenance and inspection. Make sure knowing the related information about the instruments, safety issues and all other notifications before using the drive. Please keep this manual properly for reference. Please contact us when you can not solve any problem.

- Some modification in the manual may not be notified for product improvement and update.

- Our company is not responsible for the customer's modification to the product without our authorization and the warranty will end accordingly.

- Please pay attention to the following cautions to avoid personal injury or device damage.

- The following "DANGER" and "CAUTION" are listed based on their dangerous level.

> ⟡ DANGER Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
>
> ⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, will result in minor injury or property damage.

The following symbols represent "MUST NOT" or "MUST" operations which you have to observe.

🛈 Represents "MUST" operation which has to be executed.

🚫 Represents "MUST NOT" operation which is inhibited.

Operation Instruction of EPS Series Servo Drives

CAUTION

Install an energency stop circuit esternally so that you can stop the operatio and shut off the power immediately.

Failure to observe this instruction could result in injurse electrical shocks,fire bredkdowns and damages.

Do not Place water,combustibl-es or caustics near the drives.

Failure to observe this instru ction could result in fire.

Servo notor drives and servo motor should be grounded safely.

Failure to observe this in struction couid result in electrical shocks.

Don`t put your figure inside the drives.

Failure to observe this instruction could result in injurise and electrical shocks.

Wait at least ten minutes after shutting off the pow-er for drives movement, wire connection and inspection.

Failure to observe this instruction could result in electrical shocks.

For the trial run,connect the notot without the load.

Failure to observe this instruction could result in component damage.

Choose and use the correct ratde voltage.

Failure to observe this instruction could result in electrical shock,damage and fire.

Do not modify, disassemble or repair the drives by yourself.

Failure to observe this instruction could result in electrical in electrical shock or injury.

Make sure the circuit is connected correctly and properly.

Failure to observe this instruction could result in electrical shock or fire.

Content

Chapter 1 Functions and Configuration

1.1 EPS-TA Series Drives technical specs

Table 1.1   Drives Technical Specs

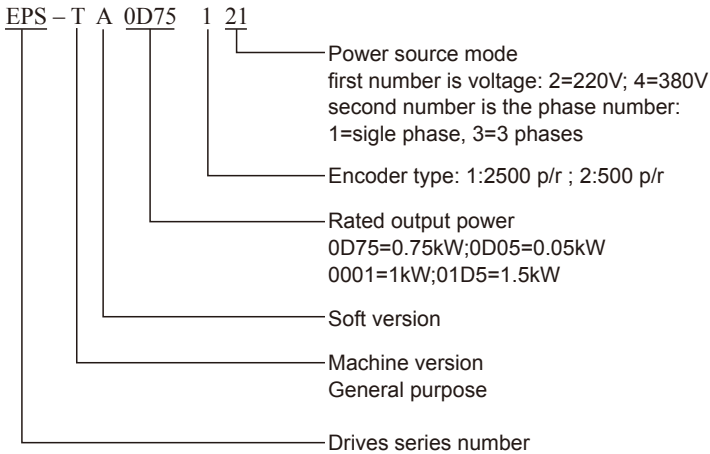| Control Circuit Power Supply		Single Phase AC220V -15~+10% 50/60Hz	Main Circuit Power Supply	3/single-phase AC220V -15~+10% 50/60Hz
Amb-ient	Temperature	Operation: 0~55℃ Storage: -20~80℃		
	Humidity	<90%(free from condensation)		
	Vibration	<0.5G(4.9m/S2), 10~60Hz(non-continuous operation)		
Control Method		IGBT PWM sinusoidal waveform control		
Control Mode		①Position control ②Speed control ③Torque control 4.Position/speed control 5.Position/Torque Control 6.Speed/Torque Control 7.Internal position control 8.Internal speed control 9.Internal torque control		
Control Input		① Servo control enable ② Fault clear ③ Initial position error clear ④ Command pulse disable ⑤ CCW drives disable ⑥ CW drives disable⑦ Control mode selection ⑧ zero speed clamp		
Control Output		① Servo ready ② Servo alarm ③ Mechanical brake release ④ Position/Speed arrival ⑤ Zero-speed detection ⑥ Torque limit ⑦ Phase-Z output		
Encoder(Speed Sensor) Feedback		2500p/r, 15 resolution incremental encoder, differential output 500 p/r, 15 resolution incremental encoder, differential output		
Communication method		①RS232 ②RS485		
Display and operation		①5-bit LED display ② 4 buttons		
Brake method		Internal/External braking resistor		
Cooling method		Air cooling (Heat conductive material, High speed cooling fan)		
Motor model		Compatible for various type of motors (by adjusting the system parameters)		
Power range		≤22KW		

1.2 EPS-TA Series Drives Functions

Table 1.2 Drives function overview

Control	Position Control	External input pulse	Pulse/direction，CW/CCW，A/B 2-phase
		Maximum command pulse frequency	500Kpps(differential input)
		Electrical gear	1/1800~1800(Recommend：1/50~50)
		Command pulse input disable	Command pulse input is disabled when the corresponding bit is effective and can be set through parameters.
		Internal position command	8 kinds of position setting
	Speed control	External speed reference	0~±10V DC
		Zero speed clamp	Speed is controlled to zero by this function.
		Speed control range	1~3000
		Internal speed reference	3 kinds of speed reference setting
	Torque control	External torque command	0~±10V DC
		Internal torque command	3 kinds of torque setting
		Torque control range	External torque command：0~300% Internal torque command：0~300%
Drive disable		When signal CCWL/CWL is active，motor keeps zero-speed and maintains the torque in CCW/CW direction.	
Monitoring function		Speed, position, command pulse accumulation, position error, motor torque, motor current, rotor position, command pulse frequency, operation status, input/output terminal signal	
Protection function		Over-voltage, low-voltage, over-current, over-speed, over-load, Z-pulse missing, encoder error, EEPROM error, position error exceed.	
Alarm function		Output alarm signal when abnormal operation happens. All 5 LEDs' decimal points keep blinking at the same time.	
Signal display		ON/OFF status of the I/O signal are displayed	
Gain tuning		Gain can be adjusted to improve the motor performance when motor is running or stop.	
Alarm record		4 alarm records including the present one are memorized.	

1.3 Name plate for EPS-TA series drives

EPS – T A 0D75 1 21

— Power source mode
first number is voltage: 2=220V; 4=380V
second number is the phase number:
1=sigle phase, 3=3 phases

— Encoder type: 1:2500 p/r ; 2:500 p/r

— Rated output power
0D75=0.75kW;0D05=0.05kW
0001=1kW;01D5=1.5kW

— Soft version

— Machine version
General purpose

— Drives series number

※1. Simplified version has no RS485, CAN communication and D/A output compared with full function version.

1.4 EPS-TA series drives dimensions

Fig. 1-1 EPS —TA0D40121~EPS-TA0D75121 servo drives dimensions(Unit：mm)
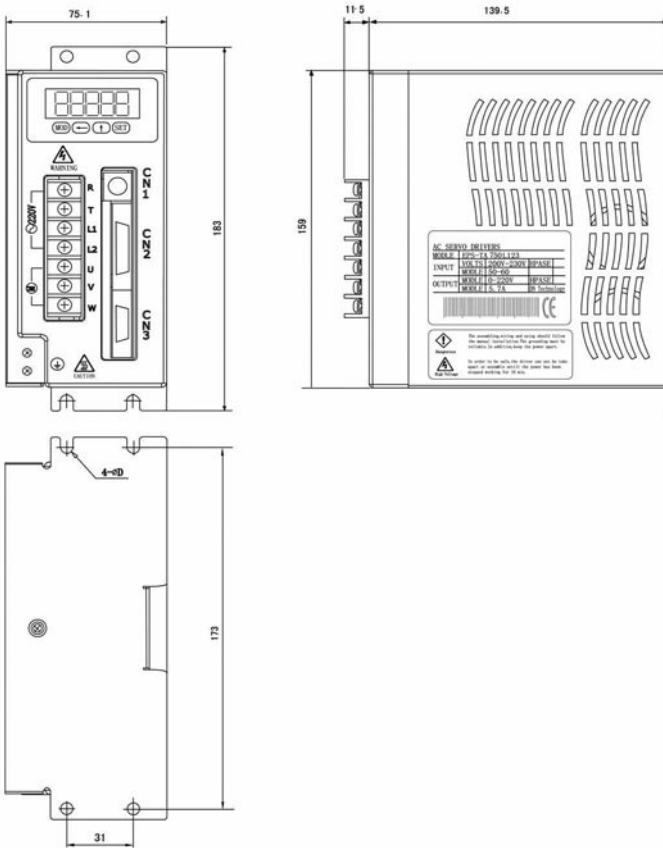
- EPS—TA0001123~EPS-TA02D3123 servo drives dimension is shown in Fig.1-2
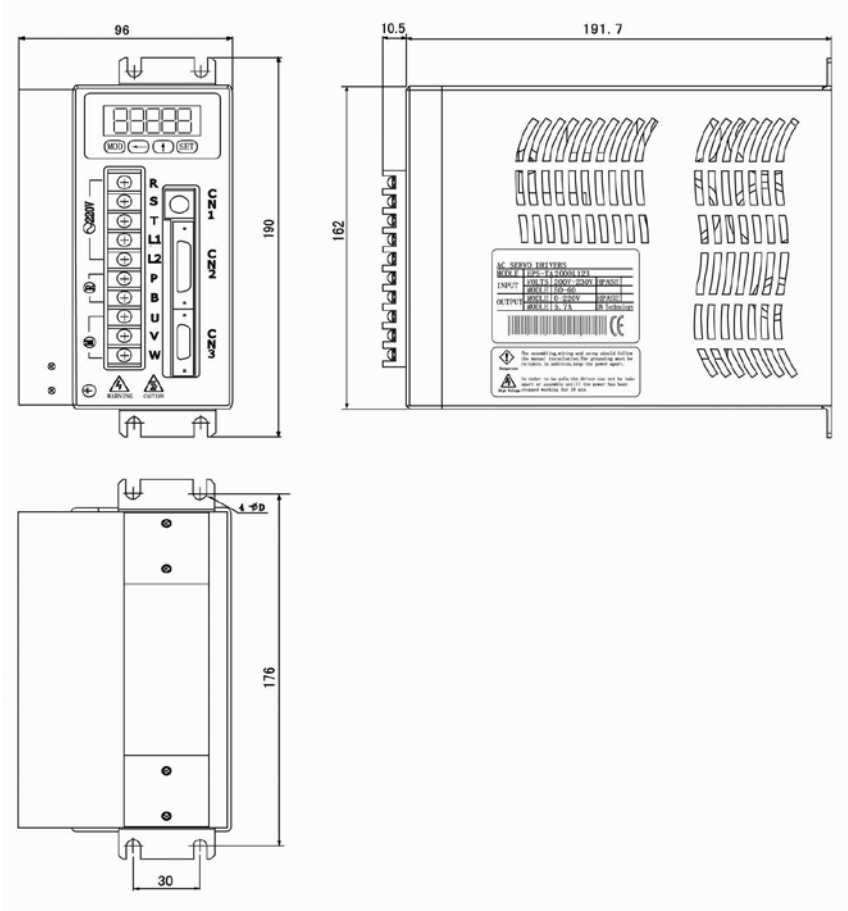
Operation Instruction of EPS Series Servo Drives

- EPS—TA02D7123~EPS—TA05D5123 servo drives dimension is shown in Fig.1-3
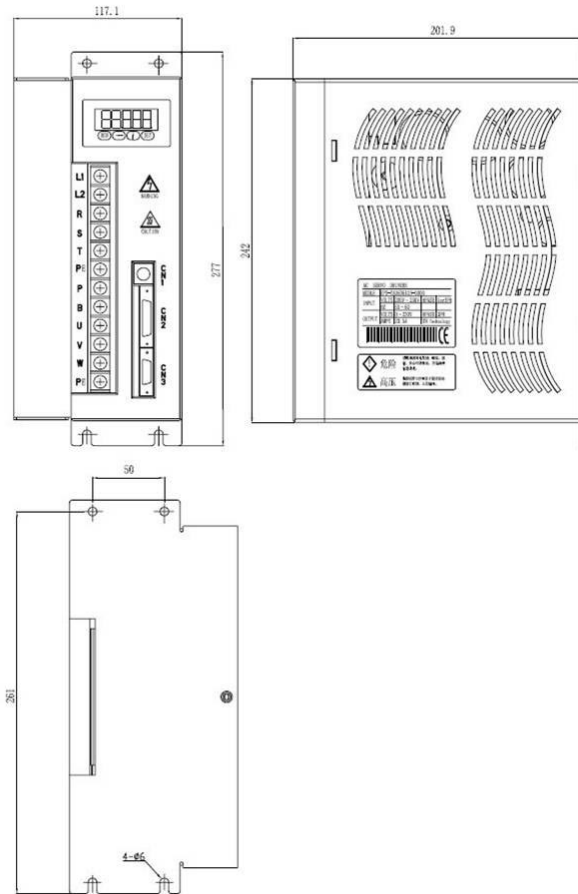
380V Series

- EPS—TA0001143~EPS—TA02D3143 servo drives dimension is shown in Fig.1-4
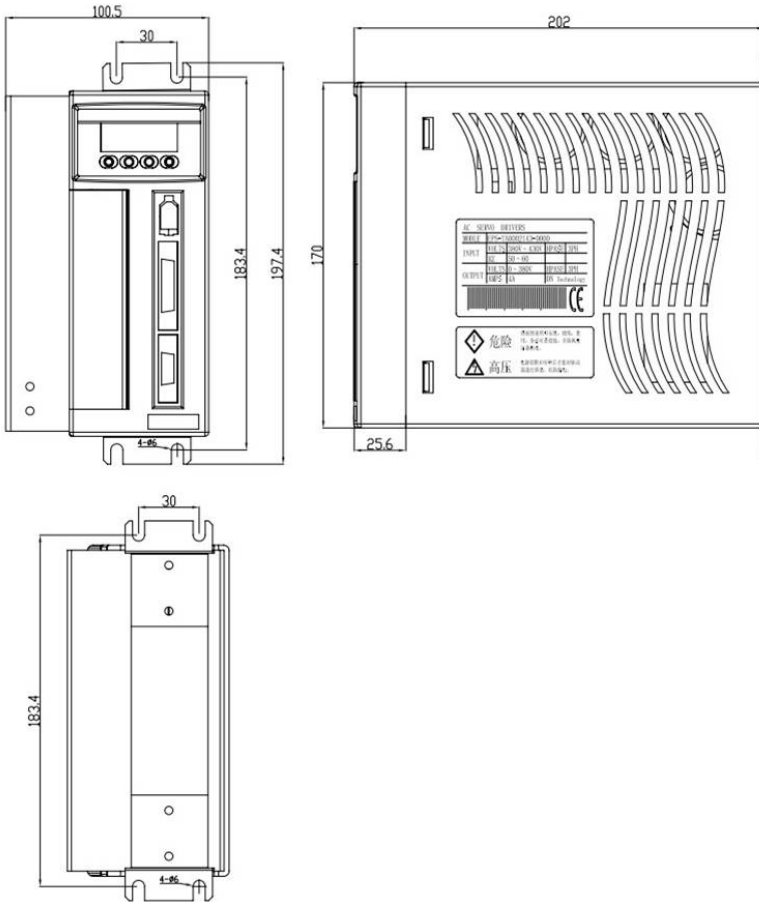
Operation Instruction of EPS Series Servo Drives

- EPS－TA02D7143~EPS－TA07D5143 servo drives dimension is shown in Fig.1-5
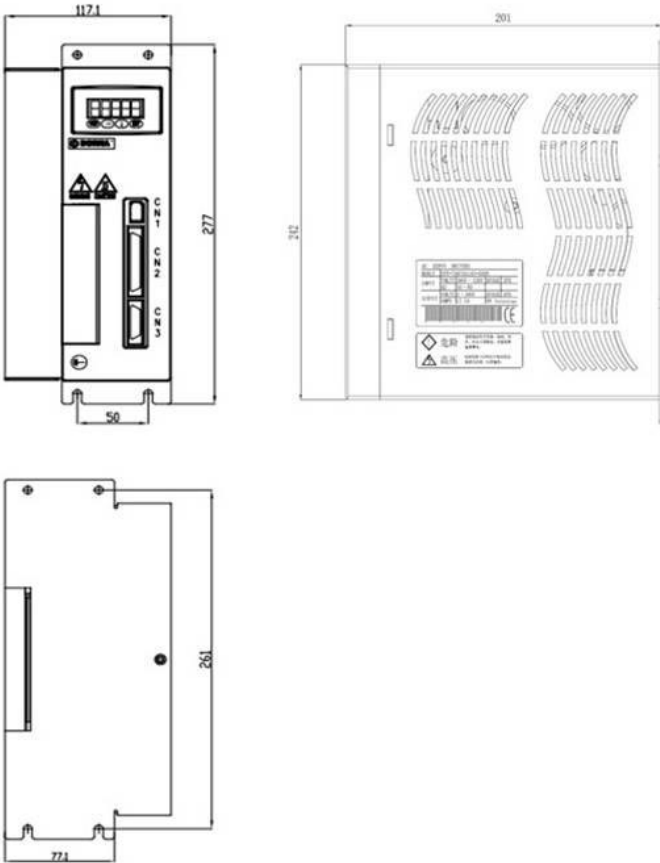
• EPS−TA08D5143~EPS−TA0022143 servo drives dimension is shown in Fig.1-6
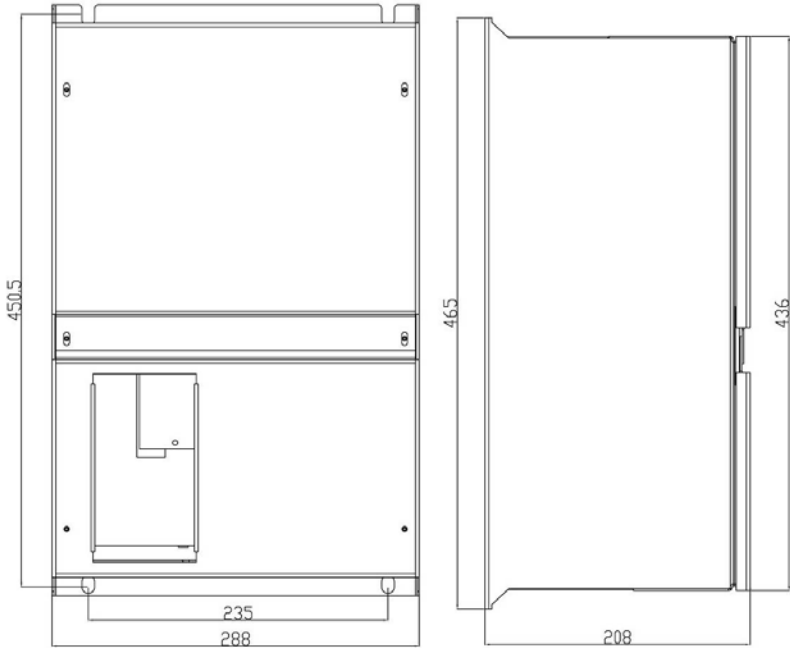
1.5 EPS series drives compatible motor

The following table listed the configuration for the EPS series servo motor drives and servo motor

220V Series

Motor Model	NO.09 Parameter	Power	Rated Speed (r/min)	Rated Torque (N.m)
60NZA-02DB1AKS	2	0.2	3000	0.64
60NZA-04DB1AKS	3	0.4	3000	1.27

Operation Instruction of EPS Series Servo Drives

Motor Model	NO.09 Parameter	Power	Rated Speed (r/min)	Rated Torque (N.m)
80NZA-05DB1AKS	5	0.4	3000	1.59
90NZA-05DB1AMS	5	0.5	3000	1.59
110NZA-04CB1AKS	10	0.5	2000	1.91
130NZA-06AB1AMS	10	0.6	1000	5.73
80NZA-08DB1AKS	5	0.8	3000	2.73
80NZA-08CB1AKS	5	0.8	2000	3.5
90NZA-08DB1AKS	5	0.8	3000	2.37
90NZA-08CB1AKS	5	0.8	2000	3.5
110NZA-09CB1AMS	11	0.8	2000	3.82
80NZA-10DB1AKS	11	1.0	3000	3.18
90NZA-10DB1AKS	5	1.0	3000	3.18
130NZA-10DB1AMS	11	1.0	3000	3.18
130NZA-10CB1AMS	13	1.0	2000	4.8
130NZA-10BB1AMS	19	1.0	1500	6.37
130NZA-10AB1AMS	13	1.0	1000	9.55
110NZA-12DB1AMS	11	1.2	3000	3.82
110NZA-12CB1AMS	13	1.2	2000	5.7
130NZA-12CB1AMS	17	1.2	2000	5.7
110NZA-15DB1AMS	14	1.5	3000	4.8
130NZA-15CB1AMS	17	1.5	2000	7.16
130NZA-15BB1AMS	19	1.5	1500	9.55
130NZA-15AB1AMS	21	1.5	1000	14.33
110NZA-18DB1AMS	14	1.8	3000	5.7
130NZA-20CBIAMS	20	2.0	2000	9.55
130NZA-20BB1AMS	21	2.0	1500	14.33
180NZA-20CB1AMS	18	2.0	2000	9.55

Motor Model	NO.09 Parameter	Power	Rated Speed (r/min)	Rated Torque (N.m)
180NZA-20BB1AMS	21	2.0	1500	14.33
180NZA-27BB1AMS	22	2.7	1500	17.2
130NZA-30DB1AMS	21	3.0	3000	9.55
130NZA-30CB1AMS	22	3.0	2000	14.33
180NZA-30CB1AMS	22	3.0	2000	14.33
180NZA-30BB1AMS	22	3.0	1500	19.1
180NZA-30AB1AMS	22	3.0	1000	28.6
180NZA-37AB1AMS	22	3.7	1000	35
130NZA-40DB1AMS	22	4.0	3000	12.7
180NZA-40CB1AMS	22	4.0	2000	19.1
180NZA-40BB1AMS	22	4.0	1500	25.5
130NZA-45DB1AMS	22	4.5	3000	14.33
180NZA-45CB1AMS	22	4.5	2000	21.5
180NZA-45BB1AMS	22	4.5	1500	28.6
180NZA-50CB1AMS	22	5	2000	23.8
180NZA-55BB1AMS	22	5.5	1500	35

380V Series

Motor Model	NO.09Parameter	Power	Rated Speed (r/min)	Rated Torque (N.m)
110NZB-0D80CB1AMS	10	0.8	2000	3.8
130NZB-0001DB1AMS	11	1.0	3000	3.18
130NZB-0001CB1AMS	10	1.0	2000	4.8
130NZB-0001BB1AMS	10	1.0	1500	6.37
130NZB-0001DB1AMS	10	1.0	1000	9.55
110NZB-01D2DB1AMS	11	1.2	3000	3.8

Operation Instruction of EPS Series Servo Drives

Motor Model	NO.09Parameter	Power	Rated Speed (r/min)	Rated Torque (N.m)
110NZB-01D2CB1AMS	10	1.2	2000	5.7
130NZB-01D2CB1AMS	10	1.2	2000	5.7
110NZB-01D5DB1AMS	11	1.5	3000	4.8
130NZB-01D5CB1AMS	10	1.5	2000	7.16
130NZB-01D5BB1AMS	10	1.5	1500	9.55
130NZB-01D5AB1AMS	10	1.5	1000	14.33
110NZB-01D8DB1AMS	11	1.8	3000	5.7
130NZB-0002CB1AMS	10	2.0	2000	9.55
130NZB-0002BB1AMS	19	2.0	1500	14.33
130NZB-0002CB1AMS	10	2.0	2000	9.55
130NZB-0002BB1AMS	19	2.0	1500	14.33
180NZB-02D7BB1AMS	21	2.7	1500	17.2
130NZB-0003DB1AMS	14	3.0	3000	9.55
130NZB-0003CB1AMS	18	3.0	2000	14.33
180NZB-0003CB1AMS	18	3.0	2000	14.33
180NZB-0003BB1AMS	21	3.0	1500	19.1
180NZB-0003AB1AMS	21	3.0	1000	28.6
180NZB-03D7AB1AMS	21	3.7	1000	35
130NZB-0004DB1AMS	22	4.0	3000	12.7
180NZB-0004CB1AMS	20	4.0	2000	19.1
180NZB-0004BB1AMS	21	4.0	1500	25.5
130NZB-04D5DB1AMS	22	4.5	3000	14.33
180NZB-04D5CB1AMS	22	4.5	2000	21.5
180NZB-04D5BB1AMS	22	4.5	1500	28.6
180NZB-0005CB1AMS	22	5	2000	23.8
180NZB-05D5BB1AMS	22	5.5	1500	35
180NZB-07D5BB1AMS	22	5.5	1500	47.7

1.6   Parts Description

Heat sink base:
For mounting the drives and
heat sink

Display part:
6 bit LED shows the drives
status

Control power input terminals:
L1,L2 connect to single phase
AC 220V, 50/60 Hz power
source.

Operation part:
4 buttons for monitoring
and setting parameters

Main power input
terminals:
R,S,T connected to AC
220V,
50/60Hz power source

External braking resistor:
Drives has its own
braking resistor inside. An
external braking resistor
can be
connected between P and
B if required.

Communication connector
(CN1)
Connect to PC or controller
via RS232 or CAN

Control connector (CN2)
Connect to program
controller

Drives output (Terminal
for motor connection):
Connect to the motor.
Never connect this to
the main power supply
which may damage the
drives.

Encoder connector(CN3)
Connect to servo motor
encoder

WARNING

CAUTION

L1 L2 R S T PE P B U V W PE

CN1 CN2 CN3

Fig.1-3 SC series drives illustration

Motor installation plane   Motor connector   Encoder connector

Motor shaft   Motor cover   Encoder
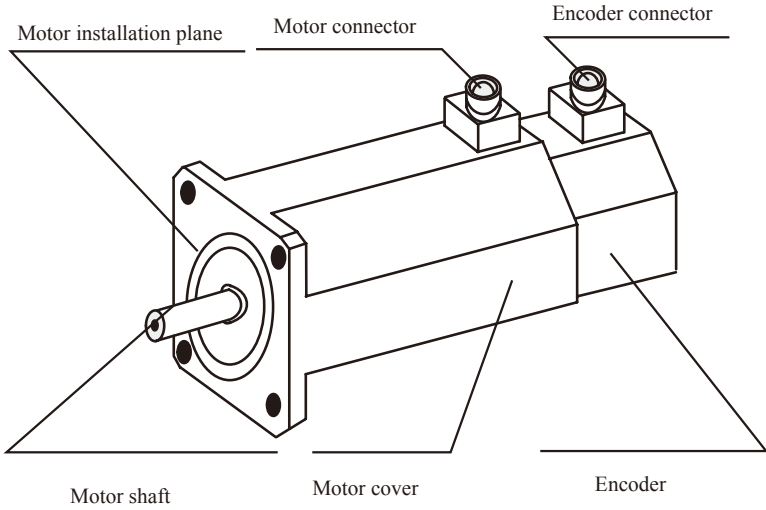
Fig.1-4 Servo motor outer view

Chapter 2   Installation

2.1 Environmental Conditions

Servo motor drives required operation and storage environmental conditions are shown as in Table 2.1.

Table 2.1 Drives environmental conditions

Environment		Conditions
Ambient temperature	Operation	0ºC~＋55ºC(free from freezing)
	Storage	−20ºC~＋65ºC(free from freezing)
Ambient humidity	Operation	≤90%RH(free from condensation)
	Storage	
Air condition		Indoor(No direct sun beams) No corrosive and combustible atmosphere, no oil liquid, dust-free
Altitude		Lower than 1000m
Vibration		Less than 0.5G(4.9M/S2)

2.2 Installation Place

1) Installation in cabinet

The drives lifetime is highly related to the ambient conditions. When designing the electrical cabinet, all the components and instruments should be considered together for better allocation to meet the drives environmental and thermal condition requirements.

2) Heat source around the drives

Operation at high temperature may reduce the drives lifetime and cause accident. Make sure the drives ambient temperature is lower than 55ºconsidering thermal convection and thermal radiation.

3) Vibrating instruments around the drives

Try to keep the drives away from the vibration source and keep the vibration below 0.5G(4.9M/S2).

4) Drives operation under severe conditions

The drives may breakdown when it is opposed to the severe environments such as corrosive gas, humidity, metal dust, water and processing liquids.

Some protection method must be used to guarantee the required working environment.

5) Disturbance instruments around the drives

EMI disturbance instruments around the drives may interfere with the power line and signal line, interrupting the drives normal operation. Noise filter and other anti-disturbance method can be used to keep normal operation. Adding filter may cause extra leakage current which can be avoided by adding isolation transformer to improve the power quality. Note that the control signal may easily be disturbed and proper wiring and shielding is needed.

2.3 Mounting orientation and space

1) Mounting orientation

The drives is supposed to be mounted vertically and kept proper height with the operation panel in front.

2) Mounting method

Use screws for mounting.

3) Mounting space

A certain space should be left between two drives or between one drives and another instrument when mounting two or more drives. The required space is: distance between two drivess should be larger than 25mm; distance between one drives and another instrument should be larger than 100mm. Please try to keep enough space to guarantee the drives lifetime and performance.

4) Cooling

If the drives is mounted inside the electrical cabinet, cooling fans installation is suggested to provide vertical air flow for cooling the heat sink.

5) Prevent other objects falling into the drives during mounting

Try to avoid drilling metal dust or cutting pieces falling into the drives when installing the control cabinet. Inspect whether oil, water or metal dust can go inside the drives though the gap or fans. If that happens, please use some protection method to ensure the required environment.

2.4 Motor installation

1) Don't submerge the motor cable to oil or water.
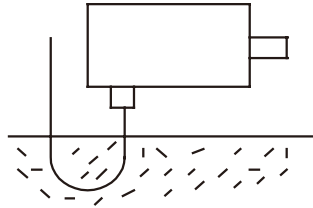
2) Do not apply direct impact to the shaft or encoder whileattaching/detaching a coupling to and from the motor shaft, otherwise, the encoder may be damaged. Please align the shaft to the best position.
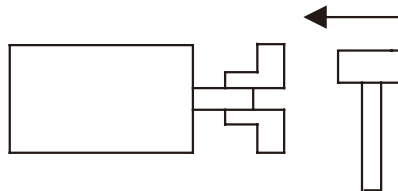
3) Do not let oil, water or metal dust into the motor connector. Certain protection method should be adopted. Otherwise, the drives may not work properly and the encoder or motor can be damaged permanently.

2.5 Servo motor drives installation figures

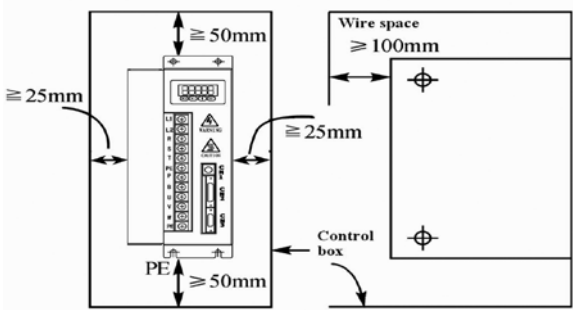<1> Installation for single drives:

Fig.2-1 Installation for single drives

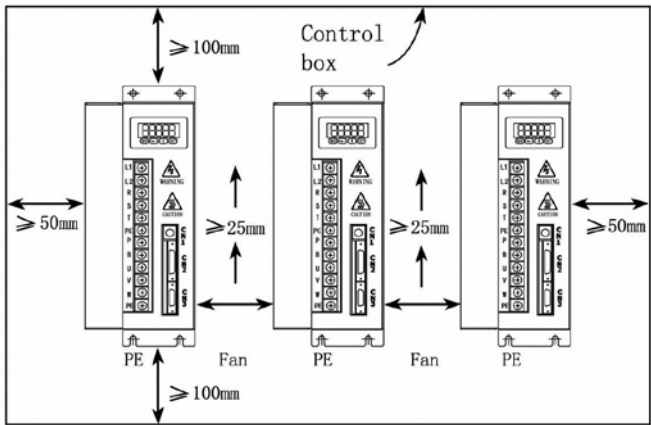<2> Installation for 2 or more drives

Fig.2-2 Multiple drives installation

2.6 Cable stress

1) Avoid a stress application to the cable outlet and connecting portion by bending or self-weight.

2) Especially in an application where the motor itself travels, the cable should have enough length and bending diameter to minimize the stress.

3) Keep the cable cover away from sharp cutting, mechanical contact and smashing.

Chapter 3 Wiring

〖 **CAUTION** 〗

- Please shut off the power before wiring or inspection. As there are lots of electrolytic capacitors inside the drives which will maintain certain high voltage even if the power is shut off. After shutting off the power, wait at least 10 minutes for the charging indicator LED turning off, then start to wire or inspect the drives or motor to avoid the electrical shock.

- Drives output terminal U,V,W must be connected to the corresponding motor terminal U,V,W correctly. Don't try to change the sequence of the 3-phase terminal to reverse the motor rotation direction and do not short the terminals. Phase sequence fault may cause motor start-up failure, abnormal operation or other unexpected conditions.

- Make sure the connection between the encoder (on the motor shaft) and drives is correct. In order to avoid disturbance, power line and encoder signal line should be wired separately. Shielding wire is suggested for the encoder signal line.

3.1 Drives configuration and connection to peripheral device

Non-fusible breaker (NFB):Protect the power line; break down the circuit during overcurrent

Noise Filter (NF) Prevent external noise from going into the power line and reduce the drives disturbance to peripheral device.

Magnetic Contactor (MC) Connect/disconnect the power form the motor. It should be used together with inrush current absorbing circuit.

Reactor (L) Reduce the harmonics in the power

lineRegenerative resistor (braking resistor

CN1
Communication cable

CN2
Communication cable

CN3
Encoder cable
Servo motor

Fig. 3-1 EPS-TA0003123-0000 Drives connection to peripheral device:

3.2 Standard connection

1. Wire requirement

(1) Power terminal TB

Wire size: R、S、T、U、V、W、PE terminal wire size≥1.5mm² (AWG14-16)，L1、L2 terminal wire size≥1.0mm² (AWG16-18). Large power drives needs bigger TB terminal wire size.

Grounding: Grounding wire (PE) size should be as large as possible. Drives grounding wire and servo motor grounding wire should be connected to ground at a single point and the grounding resistance should be less than 100Ω.

Terminal connection should be firm and reliable.

3-phase isolation transformer is suggested to use to improve power quality and anti-noise ability.

Please install non-fusible breaker (NFB) to shut off the power during drives fault.

Noise filter (NF), Magnetic contactor (MC) and Reactor (L) are suggested to add for filtering noise and improve EMI.

(2) Communication signal CN1, Control signal CN2, Encoder signal CN3

Wire size: Suggest using shielding wire (better to use twisted-pair shielding wire). Wire size≥0.12mm² (AWG24-26).

Wire length: Wire length should be as short as possible. Control signal wire CN2 can not exceed 5 meters. Encoder signal wire should be less than 15m. Encoder power wire and grounding wire should use at least 4 set of wires in parallel connection respectively.

Wiring: Keep away from power line to reduce noise.

Please add inrush current absorber circuit for inductive components (e.g. coil): Dc-coil needs anti-parallel diode and ac-coil needs parallel RC absorber circuit.

(3) Note

Power line and signal line should be firm and reliable, kept away form the drives heat sink and motor to avoid heat-caused insulation problem.

All circuits must be connected correctly before powering on.

2. Typical Wiring

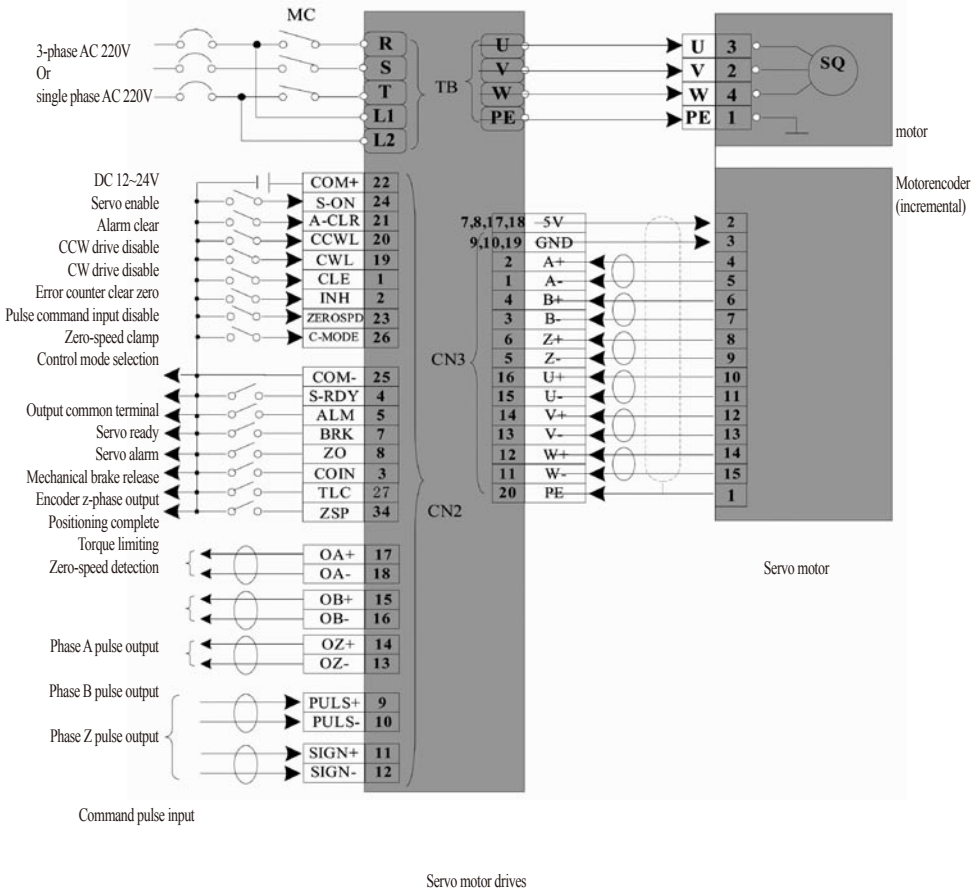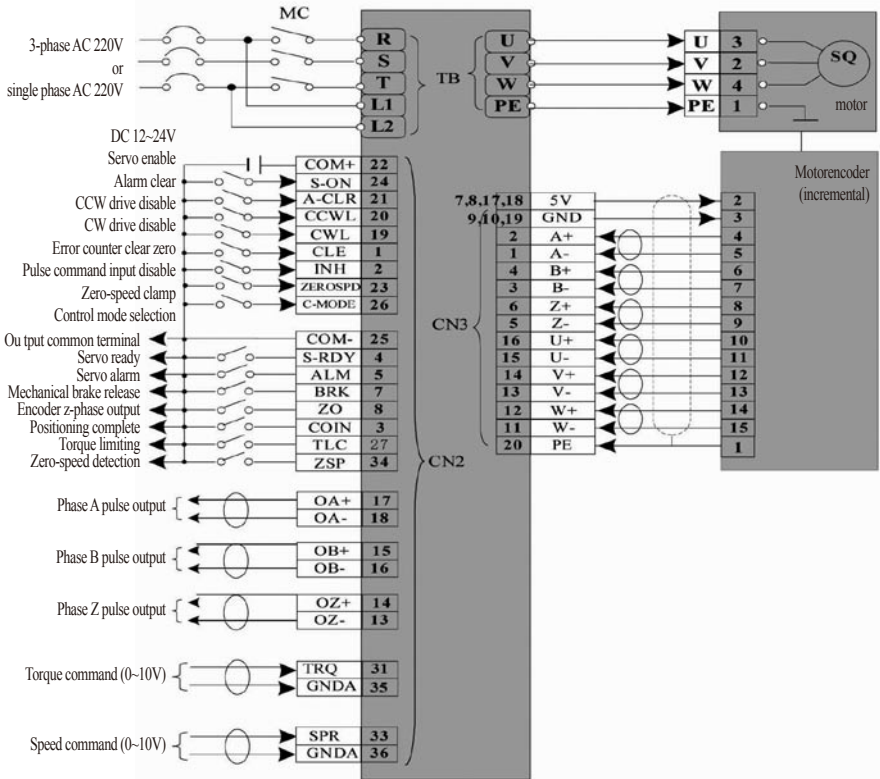1) Position control mode

NFB (non-fusible breaker)

Fig. 3-2 Position control mode wire connection with 130 motor

2) Speed/Torque control mode

NFB (non-fusible breaker)

Servo motor drives

Fig. 3-3 Speed/Torque control mode wire connection

3.3 Terminal functions

1. Power terminal TB

Table 3.1.1 EPS—0D40121~EPS—0D75121 drives power terminal

Symbol	Signal Name	Function
R	Main circuit power	Main circuit power input terminal AC 220V,50Hz/60Hz
T		
L1	Control Circuit Power	Control circuit power input terminal AC220V,50/60Hz
L2		
U	Connection to servo motor	These terminals should be connected to compatible servo motor and terminals U, V, W should match between drives and motor.(See Chap. 7.1).
V		
W		
PE	System ground	Grounding terminal; Grounding resistance<100Ω; Servo motor and power input should be grounded at single point.

Table 3.1.2 EPS—0001123~EPS—05D5123 drives power terminal TB

Symbol	Signal name	Function
R	Main circuit power (single phase or 3-phase)	Main circuit power input terminal AC220V，50／60Hz
S		
T		
L1	Control circuit power (single phase)	Control circuit power input terminal AC 220V，50Hz／60Hz
L2		
P	External braking resistor connection	When drives output power is large and the internal braking resistor is not enough for burning the excessive energy, an external braking resistor can be added between terminal P and B.
B		
U	Connect to servo motor	Drives output terminals must match the motor terminals U,V,W respectively(see Chap.7.1).
V		
W		
PE	System ground	Grounding terminal; grounding resistance<100Ω; servo motor output and power input should be grounded at a single point.

2. Communication terminal CN1

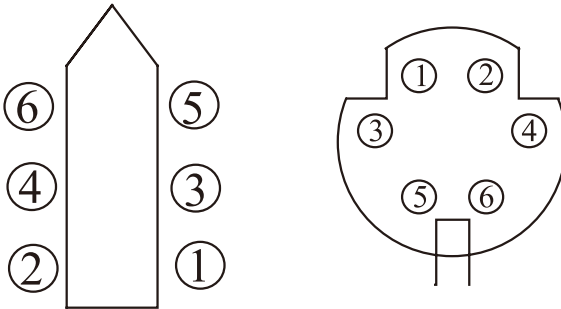CN1 is communication connector for parameter read and set through RS232 and RS485.

Table 3.2 Communication Terminal CN1

Input terminal	Signal name	symbol	function	I／O type
CN1-6	communication power supply	VCC	+5V	
CN1-5		GND	+5V GND	
CN1-4	RS232 communication	Rx	Signal receiving, connect to RS 232 transmission port of PC	
CN1-2		Tx	Signal transmission, connect to RS 232 receiving port of PC	
CN1-1	RS485 communication	RS+	Signal transmission differential signal +	Type 3
CN1-3		Rs-	Signal transmission differential signal -	

3. Control Terminal CN2

CN2 socket is male (needle) and plug is female. It is for communication with upper-level controller.
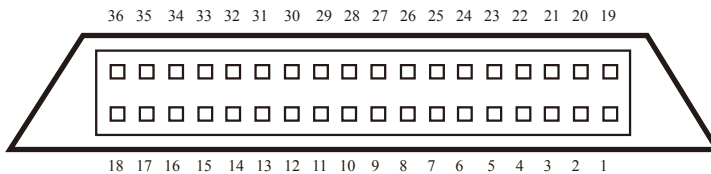
EPS drives control signal terminal
Table 3.3 Control terminal CN2 functions

Operation Instruction of EPS Series Servo Drives

Pin number	Signal name	symbol	function	I／O type
CN2-31	Analog torque reference input	T-Ref	Analog torque reference input terminal；Range：0~±10V DC.	——
CN2-33	Analog speed reference input	S-Ref	Analog speed reference input terminal; Range：0~±10V DC.	——
CN2-35,36	Analog speed reference input	S-Ref	Analog speed reference input terminal; Range：0~±10V DC.	——
CN2-17	Phase-A output	OA+	Provide encoder differential signal output from long distance drives(Phase A, B and Z) non-isolated. Parameter No. 26 can be used to change phase A and B output frequency divider coefficient. Parameter No.26 can be set to change the logic relationship between phase A and B.	type5
CN2-18	Phase-A output	OA-		type5
CN2-15	Phase B output	OB+		type5
CN2-16	Phase B output	OB-		type5
CN2-14	Phase Z output	OZ+		type5
CN2-13	Phase Z output	OZ-		type5
CN2-22	Control power supply(＋)	COM+	Positive end of the input power supply，which is for driving input optical-coupler. DC12~24V Current≥100mA.	——
CN2-1	Counter clear zero	CLE/ SPD1	1. In position control (PA4=0): 1.1 CWhen CLE signal (low effective) is ineffective, this will clear the error counter into zero. 1.2 IWhen INH signal (low effective) is ineffective, this will disable the pulse command input. No.29 (effective forbidden command pulse inpnt) for disabling the signal. 2. In speed mode:	type1
CN2-2	Inhibition of pulse command	INH/SPD2	(see speed mode table below)	type1

Speed mode table for CN2-1 / CN2-2:

SPD2 (CN2-2)	SPD1 (CN2-1)	SPEED mode option
1	1	External analog Speed command
1	0	Internal speed1(PA131)
0	1	Internal speed 2(PA132)
0	0	Internal speed 3 (PA133)

1:COM-disconnect 0: COM＋connect

Pin number	Signal name	symbol	function	I／O type
CN2-21	Alarm lear	A-CLR	Alarm clear terminal(low effective) A-CLR effective：clear system alarm. A-CLR effective：hold system alarm	type1
CN2-20	CCW limit	CCWL	When CCWL/CWL is on, motor stops at CCW/CW direction, it will keeps zero speed and maintain output torque. When receiving CW/CCW direction from upper level-controller control signal, it will starts rormally to run. ☆→Used for mechanical position limit switch；when the signal is low, motor stops by default setting. ☆ → Parameter No.64 is used for setting the logic level. ☆→NO.06【Drive effective input off】is used to shield this signal.	type1
CN2-19	CW limit	CWL		type1
CN2-24	Servo on	S-ON	On：enable drives(low effective) Off: effective drives; output turns off; drives stop running; motor idle. ☆ →When S-ON is effective, wait at least 50ms，then start to enter the command. ☆ →Don't use S-ON to start and stop the motor frequently.	type1
CN2-23	Zero- speed Clamping	ZEROS PD/T-sel2	Disconnect with COM-; speed command taken as zero. Parameter NO.08【zero speed input mod	type1
CN2-26	Control mode selection	C-MODE		type1
CN2-25	Control power supply（一）	COM-	Output terminal optical-coupler common point.	——
CN2-7	Braking release	BRK_OFF	When mechanical brake release, this output(transistor)conduct.	type2
CN2-4	Servo ready	S-RDY	S-RDY effective: Control power and main power condition is normal. No drives alarm, servo output ready S-RDY ineffective: drives alarm，servo output not ready(high)	type2

Pin number	Signal name	symbol	function	I／O type
CN2-5	Servo Alarm	ALM	ALM alarm: When drives detects fault, it outputs alarm signal (high). ALM no-alarm: When drives has no faults, no alarm signal output.(low).	type2
CN2-8	Phase-Zoutput	ZO	Servo motor encoder Phase-Z pulse output, open collector (OC) output.	type2
CN2-3	Positioning Complete	COIN	When positioning is complete, this output (transistor) conducts.	type2
CN2-27	Torque limiting	TLC	Output conducts when torque is limiting.	type2
CN2-28	Zero-speed detection	ZSP	When motor speed is below PA.51(zero speed)setting value, this output conducts.	type2
CN2-9	Pulse command	PULS	Command pulse input terminal. Command pulse can be input in three different forms. Use PA.28 to choose one of the following forms. 1、Quadruple (A&B)input. 2、CW/CCW pulse input. 3、Command pulse/direction input.	type3
CN2-10		PULS-		
CN2-11	Pulse command	SIGN+		
CN2-12		SIGN-		

3.4. Encoder signal terminal CN3

CN3 socket is female and plug is male (needle), which is used to connect the encoder. Twisted-pair shielding wire is suggested. When the length exceeds 10 meters, power and grounding cable is better to use multi-core wires and the wire size should be bigger than 0.15mm².
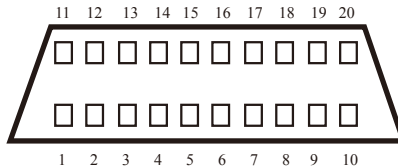

EPS drives encoder signal terminal

Table 3.4 Encoder signal terminal CN3

Terminal number	Signal name	Symbol	Function	I／O
CN3-7 CN3-8 CN3-17 CN3-18	Encoder power supply	5V GND	Servo motor encoder uses ＋5V power supply and the wire size should increase when the cable length exceeds 10m.	——
CN3-9 CN3-10 CN3-19		GND		——
CN3-20	Shielding ground	PE	Motor, drives and cabinet ground should connect together with the encoder ground.	——
CN3-2	Encoder A+ input	A+	Connect to servo motor encoder phase-A	Type4
CN3-1	Encoder A- input	A-		
CN3-4	Encoder B+ Input	B+	Connect to servo motor encoder phase-B	
CN3-3	Encoder B- Input	B-		
CN3-6	Encoder Z+ Input	Z+	Connect to servo motor encoder phase-Z	
CN3-5	Encoder Z- Input	Z-		
CN3-16	Encoder U+ Input	U+	Connect to servo motor encoder phase-U	
CN3-15	Encoder U- Input	U-		
CN3-14	Encoder V+ Input	V+	Connect to servo motor encoder phase-V	
CN3-13	Encoder V- Input	V-		
CN3-12	Encoder W+Input	W+	Connect to servo motor encoder phase-W	
CN3-11	Encoder W- Input	W-		

3.5 I/O interface

1. Switch signal input interface
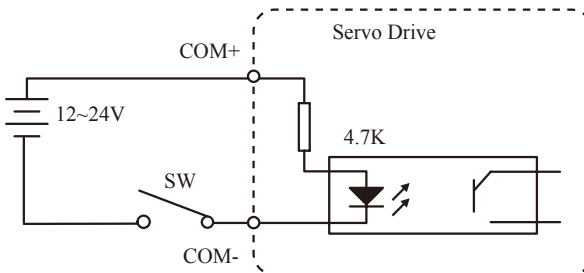

Fig.3-4 Type 1 switch signal input interface

(1) External power source is provided by user. Please note if the power polarity is misconnected, the drives may damage.

(2) Power supply requirement: DC 12~24V (Recommend: DC24V), current ≥ 100mA.

2. Switch signal output interface
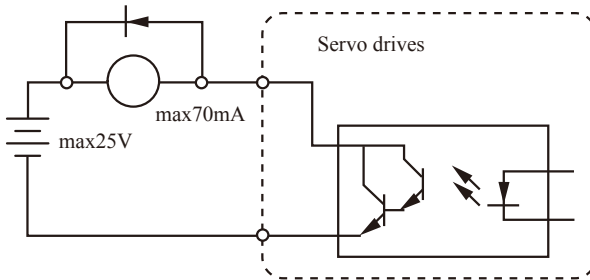
Fig.3-5 Type 2 switch signal output interface

(1) External power source is provided by user. Please note if the power polarity is misconnected, the drives may damage.

(2) Open-collector (OC) output, the maximum current is 70mA and maximum external power source voltage is 25V. If the rated value is exceeded or the output is directly connected to power source, the drives may damage.

(3) If the load is relay or other inductive load, an anti-parallel diode is needed for current free-wheeling. If the diode polarity is misconnected, the drives may damage.

3.Pulse signal input interface
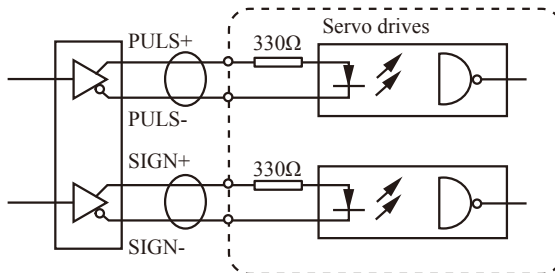
Fig.3-6 Type 3 pulse signal input interface in differential drive mode

1) Single-phase differential drive mode, it is recommended AM26LS31 and other similar RS422 line drive;To make good anti-jamming capability for the transmission of the pulse data, we recommend using a differential drive

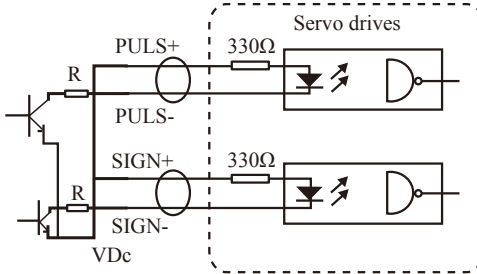2) In order to improve the pulse data anti-noise ability, the differential drive mode is suggested.

Fig.3-6 Type 3 pulse signal input interface in drive mode(The first connection)

2) Series current limiting resistor R, the following specifications：

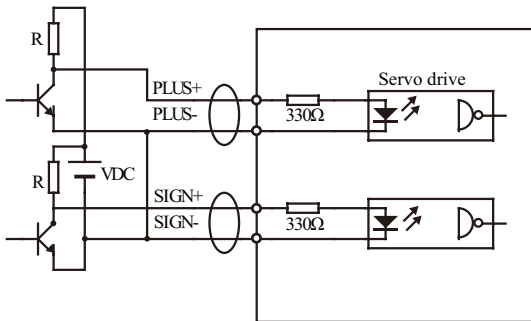| Input Power(VDc)	R resistance	R resistance power
12V	1K	≥1/2W
24V	2K	≥1/2W
5V	No connecting Resistor	

Fig.3-7 Type 3 pulse signal input interface in differential drive mode(The second connection)

Series current limiting resistor R, the following specifications:

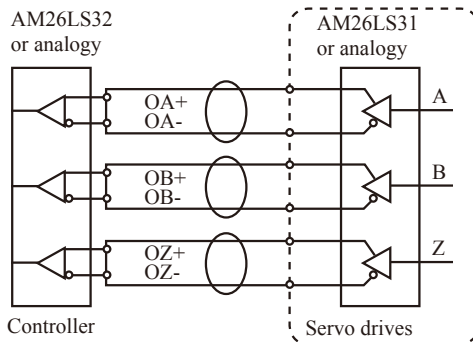| Input Power(VDc)	R resistance	R resistance power
12V	1K	≥1/2W
24V	2K	≥1/2W

4.Drives optical encoder input interface
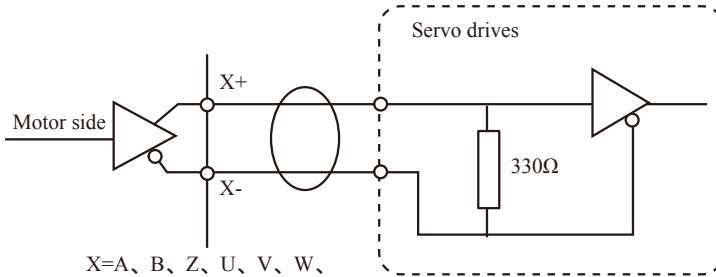
Fig. 3-8 Type 4 servo drives optical encoder input interface

Receiving encoder output A、B、Z、U、V、W signal.

5. Long-wire drives(differential output) interface

Fig. 3-9 Type 5 long-wire drives output interface

(1) Long-wire drives output signal is non-isolated

(2) For long-wire signal receiver, in this case, a 330Ω resistor is connected at the input.

『**NOTE**』

- Drives and motor must be grounded reliably. Drives power feeds the motor through power transistors. Improper wiring or grounding may introduce noise to the system. For this, firmly grounding is required.

- To avoid electrical shock, drives protection ground (PE) terminal must be connected to cabinet protection ground (PE).

- Symbol ⎓ in this manual represents twisted-pair wires.

3.6 Power supply circuit

The following graph depicts the drives wire connection with 3-phase and single phase power supply.
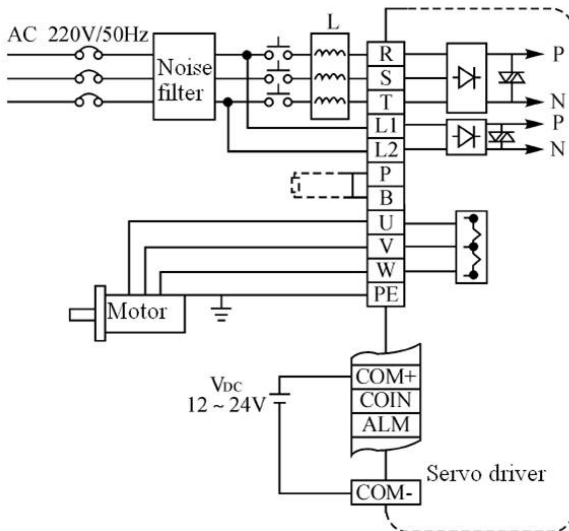
(1) 3-phase AC 220V power input

Fig. 3-10-phase 220V drives wire connection
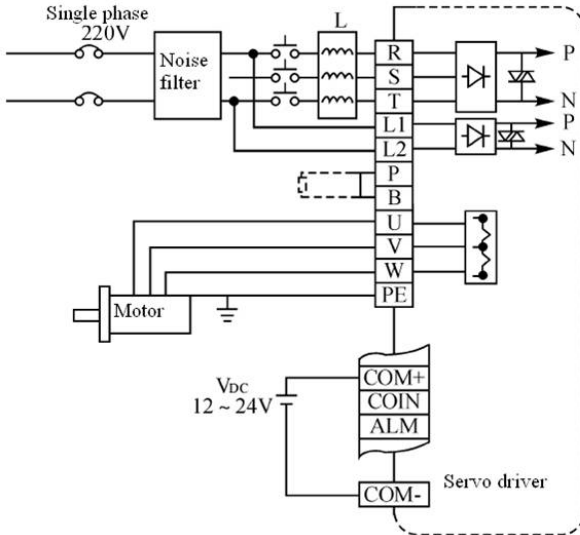
(2)Single phase AC 220V power input

Fig. 3-10 single phase 220V servo drives wire connection

Chap. 4 Parameters

【**CAUTION**】

- Inappropriate parameter setting may cause the system unstable. Pleases becareful with it.

- Parameters with "※"can be modified and displayed, but is not effective inthe control until written into EEPROM and then re-power on. Otherparameters value can be changed and become effective in the controlimmediately after change.

- Parameters with "★" are read-only parameters, writing is invalid.

- Parameters with "▲" are under development for future function extension.

4.1 Parameter overview

Table 4.1 User parameters (Password: 58)

	No.	Parameter name	Set range	Default range
Function Selection	00	Drives password	0~9999	58
	01★	Drives version display	——	——
	02★	Software version	——	——
	03※	LED initial display status	0~30	0
	04※	Control mode selection	0~8	0
	05	Torque limit input disable	0~1	0
	06	Drives disable input ineffective	0~1	1
	07	Zero-speed input signal function selection	0~1	1
	08	Zero-speed input selection	0~1	0
	09※	Drives version selection	0~50	15
	10▲	Analog output channel selection	0~8	0

	No.	Parameter name	Set range	Default range
	11	Position loop gain	500~8000	2200
	12	Position feed-forward gain	0~100	0
	13	Position feed-forward filtering time constant	0~1024	2
	14	Speed loop gain	500~8000	3000
	15	Speed loop integral time constant	500~6000	2000
Gain and filter param-eters	16	Speed sampling filtering time constant	0~4096	25
	17	reserved	——	——
	18▲	Speed loop differential gain	0~100	0
	19	reserved	——	——
	20	S function enable	0~1	1
	21	S function constant	1~16	1
	23~24	reserved	——	——
	25※	Motor encoder feedback frequency-division ratio	1~255	1
	26※	Output pulse logic reverse	0~1	0
	27※	Input pulse logic reverse	0~1	0
	28	Command pulse input mode selection	0~2	0
Position control param-eters	29	Command pulse disable input ineffective	0~1	1
	30	reserved	——	——
	31	Electrical gear numerator	1~9999	1
	32	Electrical gear denominator	1~9999	1
	33~36	reserved	——	——
	37	Internal position register loop times selection	1~16	16
	38	reserved	——	——
	39	Acceleration time constant	10~3000	200
Speed, torque control param-eter	40	Deceleration time constant	10~3000	200
	41~42	reserved	——	——
	43	Speed reference input gain	10~1000	200
	44	Speed reference input logic reverse	0~1	0

	No.	Parameter name	Set range	Default range
Speed, torque control parameter	45	Speed reference zero-drift compensation	-2048~2048	0
	46	Torque reference input gain	1~100	10
	47	Torque reference input logic reverse	0~1	0
	48	Torque limit setting	0~300	200
	49	reserve	——	——
Logic program related parameters	50	Positioning complete range	1~9999	50
	51	Zero speed	0~2000	50
	52	Speed arrival	0~3000	2000
	53	Position error exceed setting	1~9999	500
	54	Position error abnormal setting	0~1	0
	55~57	reserved	——	——
	58	Mechanical brake action delay time	1~1000	10
	59	reserved	——	——
	60	Mechanical brake action time with motor running	0~1000	10
	61	Motor speed when mechanical brake acts	0~200	50
	62~63	reserved	——	——
	64	Input signal logic selection	0~255	0
	65	reserved	——	——
	66	Input terminal logic selection	0~255	2
	67~68	reserved	——	——
Communication Related parameters	69※	Communication method selection	0~2	0
	70▲	Software input connection point, communication control	0~1024	0
	71	reserved	——	——
	72※	232、485 communication drives number setting	0~255	0
	73※	232、485 communication speed–rate setting	0~6	0
	74※	232、485 communication protocol selection	0~8	6
	75~82	reserved	——	——
	83	Internal position command 1 speed setting	–9999~9999	1
	84	Internal position command 1 pulse number setting	–9999~9999	1
	85	Internal position command 2 speed setting	–9999~9999	1

	No.	Parameter name	Set range	Default range
Internal position control parameters	86	Internal position command 2 pulse number setting	–9999~9999	1
	87	Internal position command 3 speed setting	–9999~9999	1
	88	Internal position command 3 pulse number setting	–9999~9999	1
	89	Internal position command 4 speed setting	–9999~9999	1
	90	Internal position command 4 pulse number setting	–9999~9999	1
	91	Internal position command 5 speed setting	–9999~9999	1
	92	Internal position command 5 pulse number setting	–9999~9999	1
	93	Internal position command 6 speed setting	–9999~9999	1
	94	Internal position command 6 pulse number setting	–9999~9999	1
	95	Internal position command 7 speed setting	–9999~9999	1
	96	Internal position command 7 pulse number setting	–9999~9999	1
	97	Internal position command 8 speed setting	–9999~9999	1
	98	Internal position command 8 pulse number setting	–9999~9999	1
	99	Internal position command 9 speed setting	–9999~9999	1
	100	Internal position command 9 pulse number setting	–9999~9999	1
Internal position control parameters	101	Internal position command 9 speed setting	–9999~9999	1
	102	Internal position command 9 pulse number setting	–9999~9999	1
	103	Internal position command 10 speed setting	–9999~9999	1
	104	Internal position command 10 pulse number setting	–9999~9999	1
	105	Internal position command 11 speed setting	–9999~9999	1
	106	Internal position command 11 pulse number setting	–9999~9999	1
	107	Internal position command 12 speed setting	–9999~9999	1
	108	Internal position command 12 pulse number setting	–9999~9999	1

	No.	Parameter name	Set range	Default range
Internal position control parameters	109	Internal position command 13 speed setting	−9999~9999	1
	110	Internal position command 13 pulse number setting	−9999~9999	1
	111	Internal positioncommand 14 speed setting	−9999~9999	1
	112	Internal position command 14 pulse number setting	−9999~9999	1
	113	Internal position command 15 speed setting	−9999~9999	1
	114	Internal position command 15 pulse number setting	−9999~9999	1
	115	Internal position command 1 moving speed	0~3000	100
	116	Internal position command 2 moving speed	0~3000	100
	117	Internal position command 3 moving speed	0~3000	100
	118	Internal position command 4 moving speed	0~3000	100
	119	Internal position command 5 moving speed	0~3000	100
	120	Internal position command 6 moving speed	0~3000	100
	121	Internal position command 7 moving speed	0~3000	100
	122	Internal position command 8 moving speed	0~3000	100
	123	Internal position command 9 moving speed	0~3000	100
	124	Internal position command 10 moving speed	0~3000	100
	125	Internal position command 11 moving speed	0~3000	100
	126	Internal position command 12 moving speed	0~3000	100
	127	Internal position command 13 moving speed	0~3000	100
	128	Internal position command 14 moving speed	0~3000	100
	129	Internal position command 15 moving speed	0~3000	100
	130	Internal position command 16 moving speed	0~3000	100
	131	Internal speed command1	-3000~3000	500
	132	Internal speed command2	-3000~3000	500
	133	Internal speed command3	-3000~3000	500
	134	Internal speed command 4	-3000~3000	500
Internaltorque control Parameters	135	Internal torque command1	-300~300	50
	136	Internal torque command2	-300~300	50
	137	Internal torquecommand3	-300~300	50
	138	Internal torque command4	-300~300	50

	No.	Parameter name	Set range	Default range
	139	Delay register 1	0~9999	100
	140	Delay register 2	0~9999	100
	141	Delay register 3	0~9999	100
	142	Delay register 4	0~9999	100
	143	Delay register 5	0~9999	100
	144	Delay register 6	0~9999	100
	145	Delay register 7	0~9999	100
	146	Delay register 8	0~9999	100
Internal. position control. delay param- eters	147	Delay register 9	0~9999	100
	148	Delay register 10	0~9999	100
	149	Delay register 11	0~9999	100
	150	Delay register 12	0~9999	100
	151	Delay register 13	0~9999	100
	152	Delay register 14	0~9999	100
	153	Delay register 15	0~9999	100
	154	Delay register 16	0~9999	100
	155—	reserved	——	——

4.2 Parameter function

Table 4.2 Parameter function (Password: 58)

Number	Parameter name	Function	Default range(defa- ult value)
00	Password	Prevent parameters from being changed by mistake. Before changing other parameters, this parameter must be set to 58 first. After setting other parameters, change this parameter to be other values except 58 to avoidother parameters changed by mistake.	0~9999 (58)
01★	Drives version display	1.This parameter is for checking only and can not be modified. 2.By changing parameter NO.09(Drives version selection)drives version will change accordingly. 3.Please use the compatible drives and motor.	-- --

Number	Parameter name	Function	Default range(default value)
02★	Software version	This parameter is for checking software version only, can not be modified.	-- --
03※	Initial display status	Selection for the initial LED display content after powering on. 0: Display motor speed; 1: Display motor feedback pulse lower 4 bits; 2: Display motor feedback pulse higher 4 bits; 3: Display position receiving command lower 4 bits; 4: Display position receiving command higher 4 bits; 5: Display position error; 6: Display encoder resolution; 7: Display speed reference input value; 9: Display torque reference input value percentage[%]; 13: Display motor average current; 15: Display pulse input frequency; 16: Display main circuit voltage; 17: Display rotor position in a circle; 18: Display input terminal status; 19: Display output terminal status; 20: Display encoder status; 21: Display control mode; 22: Display operation status; 23: Display Id; 24: Display Iq; 25: Display alarm record 1; 26: Display alarm record 2; 27: Display alarm record 3; 28: Display alarm record 4; 08,10,12,14,29,35 are reserved.	0~35 【 0 】

Number	Parameter name	Function			Default range(default value)
04※	Control mode selection	Select drives control mode			0~8 【 0 】

Setting Value	Mode I	Mode II
0	Position control mode	——
1	Speed control mode	——
2	Torque control mode	——
3	Position mode	Speed mode
4	Position mode	Torque mode
5	Speed mode	Torque mode
6	Internal position control mode	——
7	Internal speed control mode	——
8	Internal torque control mode	——

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Number	Parameter name	Function	Default range(default value)
		CN2-26(C-MODE)is used to switch between Mode I and Mode II;	
05	Torque limit input disable	To disable analog torque limit signal input(counter-clockwise or clockwise). 1：input ineffective；Response to torque input signal normally；0：input effective. Mask off the torque input signal.	0~1 【 1 】
06	Drives disable input ineffective	<table><tr><td>Value</td><td>Input</td><td>Control input</td><td colspan="2">Connect to COM-</td><td>Operation</td></tr><tr><td rowspan="4">0</td><td rowspan="4">effective</td><td rowspan="2">CCWL (CN2-20)</td><td colspan="2">Connected(L)</td><td>Normal CW limit switch noaction</td></tr><tr><td colspan="2">Open(H)</td><td>CCW direction Peration sprohibited, CW direction is allowed</td></tr><tr><td rowspan="2">CWL (CN2-19)</td><td colspan="2">Connected(L)</td><td>Normal,CW limit switch no action</td></tr><tr><td colspan="2">Open(H)</td><td>CW direction operation is prohibited,CCW direction is allowed.</td></tr><tr><td>1</td><td>ineffective</td><td colspan="4">CCWL and CWL input are both ineffective, clockwise andcounter- clockwise operation are both allowed.</td></tr></table> If this parameter is set to zero, and CWL/CCWL are both open circuit(not connect to COM-),drives will have alarm 23 【drives disable abnormal】.	0~1 【 1 】
07	Zero-speed input function selection / Zero-speed signal effectiveness	In speed control mode, ZEROSPD signal(Pin CN2-23) function selection. <table><tr><td>value</td><td>ZEROSPD signal function</td></tr><tr><td>0</td><td>When ZEROSPD signal is effective,motor speed is clamped to be zero.</td></tr><tr><td>1</td><td>When ZEROSPD signal is effective,motor speed reference is zero.</td></tr></table>	0~1 【 1 】
08		Enable and disable zero-speed clamp ZEROSPD signal (Pin CN2-23) Switch between enable and disable,this parameter is valid for speed control mode.	
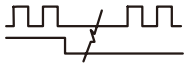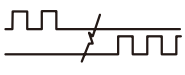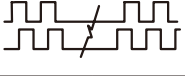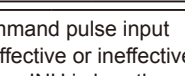
Number	Parameter name	Function	Default range(defa-ult value)
08		Value · ZEROSPD signal effective and ineffective selection / 0 · ZEROSPD input disable / 1 · ZEROSPD input enable	0~1 【 1 】
09※	Drives version selection	According to "1.5 SC series drives compatible motor" set proper drives version number to this parameter. Make sure to choose the compatible drives for the motor, otherwise, unexpected condition may happen.	0~50 【 15 】
10▲	Analog output channel selection	Analog output monitoring： 0:Motor speed(0~5V，5V for the maximum speed) 1:Motor torque(0~5V，5V for the maximum torque) 2:Motor current(0~5V，5V for the maximum current) 3:input pulse frequency(0~5V corresponding to 0~500K) 4:Speed command (0~5V corresponding to -10V~+10V) 5:Torque command (0~5V corresponding to -10V~+10V) 6:Main circuit voltage(0~5V corresponding to 0~500V)	0~8 【 0 】
11	Position loop gain	Set the position loop controller proportional gain to define the position control response curve. Larger setting value means higher gain, higher stiffness, less delay, faster positioning for the same frequency pulse command. Too large value for this parameter may cause system unstable, oscillation or overshoot.	500~8000 【2200】
12	Speed feed-forward	This parameter can be set to change the speed feed-forward term in the position control(%). Larger setting value means faster and better position loop response and position tracking. Too large value for this parameter may cause system unstable,oscillation or overshoot.	0~100 【 0 】
13	Feed-forwar-d time constant	This parameter can be used to set the time constant of the filter for the speed feed-forward term. This function help to reduce the speed overshoot or detuning.	0~1024 【 2 】
14		Setting the speed loop controller proportional gain. Larger setting value means higher loop gain, higher ffness.	
14	Speed loop gain	Usually, the bigger the load inertia is, the larger value hould be set. The gain is suggested to be set higher, as long as there is no system oscillation.	500~8000 【3000】

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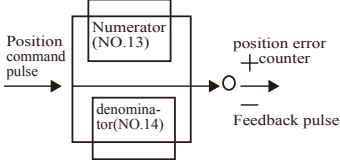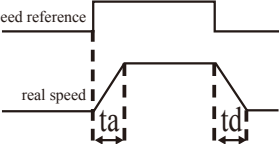
Number	Parameter name	Function	Default range(default value)
15	Speed loop integral time constant	The smaller the setting value is, the faster the integration is,And he higher the stiffness is. Usually，the bigger the load inertia is，the bigger the setting Value sould be. The value is suggested to be set smaller, as long as there is no system oscillation.	500~6000 【2000】
16	Speed etect on ilter	When the motor speed error is large, properly increasing the value of this parameter can get better performance. If the load inertia is large, the value can be increased. Too large value will slow down the response and may Cause scillation.	0~8100 【0】
17	Speed Commnd filter	The bigger the setting value is, and the smoother the speed command is. Too large value will slow down the response.	0~8100 【0】
18▲	Speed loop differential gain	Speed loop differential gain parameter.	0~100 【0】
25※	Encoderoutpu Frequncy divisin ratio	This parameter is used to set the encoder output pulse frequency division ratio. For example, if the encoder is 2500-line resolution, and this parameter is set to be 5, the A/B signal output is 500 lines.	1~255 【1】
26※	Pulse Output Logic reverse	When the motor is rotating clockwise, phase-B pulse is leading phase-A pulse. (When the motor is rotating counter-clockwise, phase-B pulse is lagging phase-A pulse). This parameter can be used to reverse the logic of phase-B pulse, thus changing the phase relationship between A and B 		CCW rotation	CW rotation	 		Phase A	⊓⊔⊓⊔	⊔⊓⊔⊓	 	0	Phase B not reverse	⊓⊔⊓⊔	⊔⊓⊔⊓	 	1	Phase B reverse	⊔⊓⊔⊓	⊓⊔⊓⊔		0~1 【0】

Number	Parameter name	Function	Default range(defa- ult value)
27※	Pulse Inputgic reverse	When you want to change the motor rotation direction, but do not want to change the polarity of the command signal from the controller, this parameter can be used. 	Value	Motor rotation direction	 |---|---| | 0 | (+) command, counter-clockwise rotation | | 1 | (+) command, clockwise rotation |	0 ~ 1 【 0 】
28	Command pulse Input Type selection	This parameter is used to set the command pulse type given by the controller to the drives. There are three kinds of command pulse type showing as follows: | value	Command pulse type	Signal name	CCW command	CW command | |---|---|---|---|---| | 0 | Pulse/ direction mode | PLUS SIGN | | | | 1 | CW/CCW pulse command mode | PLUS SIGN | | | | 2 | A/B pulse command mode | PLUS SIGN | | |	0~2 【 0 】
29	Command Pulse input disable Ineffecive	This parameter determines the command pulse input disable signal (INH, Pin CN2-2)is effective or ineffective. When this parameter is set to 1, even INH is low, the command pulse input is not disabled. 	Value	INH input	 |---|---| | 0 | effective | | 1 | ineffective |	0~1 【 1 】
31	Input Comm Nd Pulse Frequ Ncy ultip lcation Nume ator	Command pulse frequency multiplication functio (electrical gear) Purpose: ①→is parameter can be used to set the corresponding motor speed or position for the unit input command pulse. ②→en the controller output frequency is not high enough to get the required speed reference, this parameter can be set to multiple the frequency to achieve higher command frequency.Division/ multiplication function diagram	1~9999 【 1 】

Number	Parameter name	Function	Default range(default value)
31			
32	Input command pulse frequency multiplication denominator	Electrical gear ratio setting range:1/1800≦G≦1800 Electrical gear ratio recommended range:1/100≦G≦100	1~9999 【 1 】
34▲	Positin command filtering coefficient	When position command frequency is divided or multiplied too many times, (more than 10 times or less than 1/10),this parameter is used to reduce the motor speed jump because of the frequency division or multiplication. Value / Time constant: 0 / No filtering function; 1 / ↓; ~ / Large time constant; 2048 / ↓	0~2048 【 0 】
37	Internal position register loop counter selection	The selection range for the internal position register loop counter is 1~16.	1~16 【 16 】
39	Acceler-ation time constant (ms)	In speed control mode, the time duration for motor accelerating/decelerating from zero speed to the rated speed (ms).	10~3000 【 200 】
40	Decele-ration time constant (ms)	The larger the parameter is, the longer the time duration for accelerating/decelerating is; the smaller the parameter is, the shorter the time duration for accelerating/decelerating is.	10~3000 【 200 】
43	SpeedCommnd Input gain	This parameter can be used to set the ratio between motor speed and analog speed reference voltage.(Speed reference signal terminal is at pin CN2-33,signal ground	10~500 【 200 】

Number	Parameter name	Function	Default range(default value)
		is at CN2-35) Speed control command =input voltage×parameter setting value; No.43 default value is 200. For example, if analog input is 10V,then, the speed command is 2000rpm;If analog input is 5V speed command is 1000rpm.	
44	Speed Command Input Logic inverse	When you want to change the motor rotation direction, but not change the analog speed reference polarity, this parameter can be used. Value / Rotation direction 0 / (+) command, counter-clockwise rotation(viewed from the shaft) 1 / (+) command, clockwise rotation(viewed from the shaft)	0~1 【0】
45	Speed Commnd Zero Dift Comp nsation	This parameter can be used to adjust the external analog speed reference zero-drift; Changing every unit of this parameter can adjust 5mV of the drift.	−2048~ 2048 【0】
46	Torque command input gain	This parameter can be used to set the ratio between mototor que and analog torque reference voltage.(Torque reference signal terminal is at pin CN2-31. Signal ground is at CN-36) Torque control command=input voltage×parameter setting value; No.46 default value is 10. If input is 10V,torque control command is 100%；If input is 5V，torque control command is 50%.	1~100 【10】
47	Torque command input reverse	This parameter can be set to change the torque reference Input polarity. Value / Motor torque direction 0 / (+) command, counter-clockwise torque 1 / (+) command, clockwise torque.	1~1 【0】
48	Torque limit setting	This parameter is used to limit the maximum motor toque. Default value 200 means motor torque is limited within 200% of the rated torque.	1~300 【200】
50	Positio- ning complete range	This parameter can be used to set the positioning complete signal(COIN,CN2-3) output time sequence, when motor arrives at the reference position given by the command pulse. When the rest of the position error counter number is	1~9999 【50】

Number	Parameter name	Function	Default range(defa-ult value)
		within the value set by this parameter, the position complete signal will output.	
51	Zero speed	This parameter is used to set the zero speed dete (ZSP,CN2-34 output time sequence. When motor speed is below the setting value, signal ZSP will be sent out.	0~2000 【50】
52	Speed arrival	In speed and torque control mode, this parameter is used to set the speed arrival signal(COIN,CN2-3)output time sequence. When motor speed exceed the setting value, speed arrival signal will be sent out.	0~3000 【2000】
53	Position error overlarge setting	This parameter can be used to set the threshold value for the position error overlarge. Parameter value=[Threshold value for position error overlarge (Pulse number)]/256 If the position loop gain is small and the setting value of this parameter is also too small, position error overlarge protection(Alarm NO.9)will be activated even there is no position error.	0~9999 【500】
54	Position error overlarge protection ineffective	This parameter is used to disable the position error overlarge protection.<table><tr><td>Value</td><td>Position error overlarge protection</td></tr><tr><td>0</td><td>effective</td></tr><tr><td>1</td><td>Ineffective. Even if the pulse number exceeds the setting value of parameter No.53.the motor will keep running</td></tr></table>	0~1 【0】
58	Mechanical brake Action time for motor stop	This parameter is used to define the process from mechanical brake break-off signal to motor current cutting off(servo idle) for motor stop. After servo-ON signal is turning off, it takes about 6ms for software calculation, then BRK signal is sent out. As the mechanical brake has delay time, after time duration Ta,then, the brake will actually act. During this period, to Avoid motor minor shift or the working panel falling off, the motor must be kept powered by electricity to maintain the torque. Only after he mechanical brake actually acts, tthe electricity can be trned off. Value for this parameter should be larger than Ta(Mechanical brake delay time),to avoid motor minor shift or component falling off.	0~1000 【10】

Number	Parameter name	Function	Default range(defa-ult value)
58		No.58=(Setting value)×2ms. ineffective effective Servo-ON brake hold about 6ms Brake release brake hold Ta BRK Brake release Actual brake idle(No electricity) No.58 Motor maintain electricity current	0~1000 【10】
60	Mecha-nical brake action time during motor running	To define the process from mechanical brake break off signal to motor current cutting off (servo idle)during motor running. The value of Tb is either the value of parameter NO.60 or the value of the motor speed in parameter NO.61,chosen the smaller one from the above two values. No.60=(Setting value)×2ms.	0~1000 【50】
61	Motor Speed For Mech Nical Brake action		0~200 【50】
64	Input signal logic selection	<table><tr><td>BI T7</td><td>BI T6</td><td>BI T5</td><td>BI T4</td><td>BI T3</td><td>BI T2</td><td>BI T1</td><td>BI T0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>0:input low effective 1:input high effective	0~255 【0】
66	Output signal logic selection	<table><tr><td>BIT7</td><td>BI T6</td><td>BI T5</td><td>BI T4</td><td>BIT3</td><td>BI T2</td><td>BI T1</td><td>BIT0</td></tr><tr><td></td><td></td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td></tr></table>0: output low level 1:Output high level	0~255 【0】
69※	Comm-unication method selection	<table><tr><td colspan="3">Communication method selection</td></tr><tr><td>Parameter value</td><td>0</td><td>1</td><td>2</td></tr><tr><td>Communication method</td><td>Non-communication</td><td>RS232</td><td>RS485</td></tr></table>	0~2 【0】
72※	232、485 commun-ication drives setting	Select for the communication drives number, must agree with The upper-level controller setting.	0~255 【0】

Number	Parameter name	Function	Default range(default value)
73※	232、485 communication baud rate setting	<table><tr><td>value</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Baud rate</td><td>2400</td><td>4800</td><td>9600</td><td>19200</td></tr></table>	0~6 【0】
74※	232 485 Communicat¬ in protocol setting	<table><tr><td>0</td><td>7bit,even parity check(e),1 stop bit</td></tr><tr><td>1</td><td>7bit,odd parity check(o),1 stop bit</td></tr><tr><td>2</td><td>7bit,no parity check(n),2 stop bit</td></tr></table> The setting of this parameter must agree with the settings of upper-level controller.	0~8 【6】
78	Torque command filter	The bigger the setting value is, and the smoother the torque command is. Too large value will slow down the response.	0~8100 【0】
83	Internal position command1 speed setting	Internal position command(pulse number)= Internal position command setting value×pulse number per rotate+Internal position command pulse number setting value.	-9999~9999 【1】
84	Internal position command 1pulse number setting		-9999~9999 【1】
85	Internal position command 2 speed setting		
86	Internal position command 2 pulse number setting		
87	Internal position command 3 speed setting		
88	Internal position command 3 pulse number setting		
89	Internal position command 4 speed setting		-9999~9999 【1】
90	Internal position command 4 pulse number setting		-9999~9999 【1】
91	Internal position command 5 speed setting		
92	Internal position command 5 pulse number setting		
93	Internal position command 6 speed setting		
94	Internal position command 6 pulse number setting		
95	Internal position command 7 speed setting		
96	Internal position command 7 pulse number setting		

Number	Parameter name	Function	Default range(default value)
97		Internal position command 8 speed setting	
98		Internal position command 8 pulse number setting	
99		Internal position command 9 speed setting	
100		Internal position command 9 pulse number setting	
101		Internal position command 10 speed setting	
102		Internal position command 10 pulse number setting	
103		Internal position command 11 speed setting	
104		Internal position command 11 pulse number setting	
105		Internal position command 12 speed setting	-9999~9999 【 1 】
106		Internal position command 12 pulse number setting	-9999~9999 【 1 】
107		Internal position command 13 speed setting	
108		Internal position command 13 pulse number setting	
109		Internal position command 14 speed setting	
110		Internal position command 14 pulse number setting	
111		Internal position command 15 speed setting	
112		Internal position command 15 pulse number setting	
113		Internal position command 16 speed setting	
114		Internal position command 16 pulse number setting	
115		Internal position command 1 moving speed	
116		Internal position command 2 moving speed	
117		Internal position command 3 moving speed	
118		Internal position command 4 moving speed	
119		Internal position command 5 moving speed	
120		Internal position command 6 moving speed	
121		Internal position command 7 moving speed	0~3000 【 100 】
122		Internal position command 8 moving speed	
123		Internal position command 9 moving speed	
124		Internal position command 10 moving speed	
125		Internal position command 11 moving speed	
126		Internal position command 12 moving speed	
127		Internal position command 13 moving speed	

Number	Parameter name	Function	Default range(default value)
128	Internal position command 14 moving speed		
129	Internal position command 15 moving speed		
130	Internal position command 16 moving speed	Speed command proportion setting value as No.43 −3000~3000 【500】
131	Internal speed command 1	
132	Internal speed command 2	
133	Internal speed command 3	
134	Internal speed command 4	
135	Internal torque command 1	Torque command proportion setting value as No.46 -300~300 【50】
136	Internal torque command 2	
137	Internal torque command 3	
138	Internal torque command 4	
139	Delay register 1	Delay time form internal position command n to Internal position command n+1, delay time = setting value * 10ms 0~9999 【100】
140	Delay register 2	
141	Delay register 3	
142	Delay register 4	
143	Delay register 5	
144	Delay register 6	
145	Delay register 7	
146	Delay register 8	
147	Delay register 9	
148	Delay register 10	
149	Delay register 11	
150	Delay register 12	
151	Delay register 13	
152	Delay register 14	
153	Delay register 15	
154	Delay register 16	

Chapter 5 Monitoring and Operation

5.1 Panel operation

The panel is composed of 5 LEDs and 4 buttons,"MOD""←""↑" and "SET". It is used for displaying the system status and setting parameters.

The operation is based on different levels, which are described level by level as follows:

Level 1: It is used to select one of the 4 operating modes with the button "MOD". Press "SET" to go into the second level. After typing the parameter number, press "SET" going into the third level and the parameter value can be changed. Button "MOD" can be used to return to the upper level when you are at level 2 or level 3. When setting the parameters, press "MOD", the parameter value will not be changed. In short:
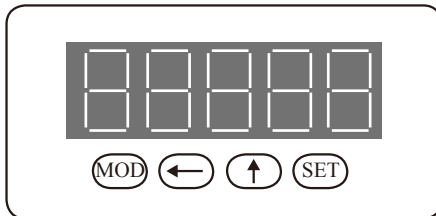
"MOD": Mode selection/ cancellation

"←" : Shifting bit position

"↑" : Value increase

"SET" : Confirm

During operation, the bit where the decimal point is blinking indicates this bit can be modified.

If all 5 LEDs' decimal points are blinking, there is alarm and the alarm number will be displayed.

If press the same button continuously, the following condition may happen:

Button	The condition may happen
MOD	Switching between different control modes or keeping going back to the upper level
←	Keep shifting the bit position to the left
↑	Increase the bit value without carry. When reaching 9, start from 0 again.
SET	If the operation is for EEPROM,it will keep writing EEPROM.

The operation selection diagram is shown as follows:
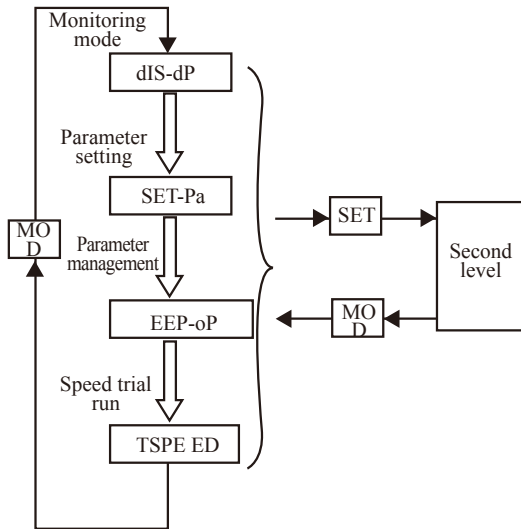
Fig. 5-1 Operation mode selection diagram (The first level)

5.2 Monitoring Mode (DISP)

1. Selecting monitoring mode "dISP" from the first level, press "SET" to enter the monitoring mode and LEDs display "dP0".

2. In monitoring mode, there are 27 monitoring variables. Press "↑" to increase

the value, press "←" to change the position. After choosing the needed display number, press "SET" to enter the specific display.

3. If you want to display other variables, press "SET" or "MOD"(Inmonitoring mode, these two buttons have the same function for return) to exit the present display and return to level 2.

4. If you want to go to other operation modes, press "MOD", and it will go back to the upper level. When arriving at the first level, pressing "MOD" can switch between different modes.

5. If there is alarm, the decimal point right to the 5 LEDs will blink. It will not affect the button operation. When the alarm is clear, the display will return to normal.

In monitoring mode, the operation code and corresponding display content is shown in Fig. 5.1.

Table 5.1 Status Display

Operation code	Display content		Display example	Brief explanation
dP 0	Motor speed r/min)		-1000	Motor reverse rotation speed 1000r/min
dP 1	Motor feedback pulse lower 4 bits		1000	At current position, motor has accumulated 151000 (hexadecimal) pulses in the reverse direction.
dP 2	Motor feedback pulse higher 4 bits		15	Position command has accumulated 251000 (hexadecimal)pulses in the forward direction.
dP 3	Position command lower four(Pulse)	→SET→ ←MOD← ←SET←	1000	Position errorhasaccumulated 101 pulses in the positive direction.
dP 4	Position command higher 4 bi(Pulse)		25	
dP 5	Position error(Pulse)		101	Position errorhasaccumulated 101 pulses in the positive direction.
dP 6	Motor encoder lines		2500	Motor encoder has 2500-line resolution.
dP 7	Speed reference input		50	Speed reference is 50(r/min)

Operation Instruction of EPS Series Servo Drives

Operation code	Display content		Display example	Brief explanation
dP 9	Torque reference input(%)		100	Torque reference input is 100%
dP 13	Motor averagecurrent (A)		4.2	Motor average phase current is 4.2A
dP 15	Command pulse frequency(kHz)		100	Position command pulse frequency is 100 kHz.
dP 16	Main circuit voltage(V)		330	Main circuit voltage is 330V.
dP 18	Input terminal status		|||||||	Input terminal signal, light indicates there is input at this bit.
dP 19	Output terminal signal		||||||	Output terminal signal, light indicates there is output at this bit.
dP 20	Encoder status	→SET→	|||	Encoder status, light indicates there is input at this bit.
dP 21	Control mode	←MOD←	C1	Control mode is 1(speed control mode)
dP 22	Operation status	←SET←	Cn-on	Operation status:running
dP 23	Id		0	Current at field direction
dP 24	Iq		8192	Current at vertical to field direction, rated torque operation.
dP 25	Alarm record 1		Err01	Alarm record 1 is No.1 alarm.
dP 26	Alarm record 2		Err01	Alarm record 2 is No.1 alarm.
dP 27	Alarm record 3		Err01	Alarm record 3 is No.1 alarm.
dP 28	Alarm record 4		Err01	Alarm record 4 is No.1 alarm.
dp35	Displays the motor encoder signal Z		10	电机积累10个Z脉冲信号

Note:

1. Input pulse is the one after the electrical gear.

2. Position command pulse frequency is the actual input pulse frequency before the electrical gear. The minimum unit is 0.1 kHz. Forward rotation is displayed by positive number, and reverse rotation is displayed by negative number.

3. Rotor absolute position represents the rotor position in a circle with respect to

the stator. One round is a circle and the value range is 0~9999.

4.Operation status display:

"Cn oFF" : indicates the servo system is not running (Drives is not started, or there is alarm) .

"Cn on": indicates the servo system is running.

5. Terminal input status is shown in Fig. 5-2 and output status is shown in Fig.5-3. Dotted lines at the upper part of the LEDs are the bits for monitoring the terminal status.
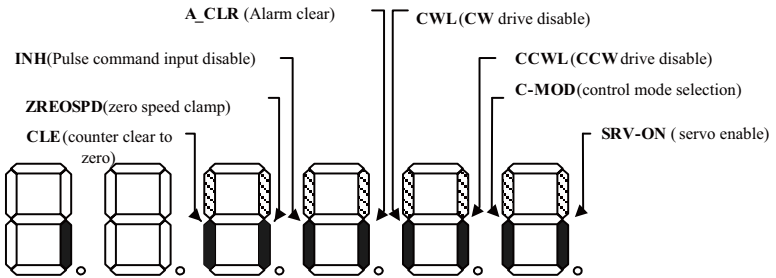
Fig. 5-2 Input terminal display (If the dotted line is on, it means the Correspondinginput terminal is ON. If the dotted line is off, it means the corresponding input terminal is OFF.)
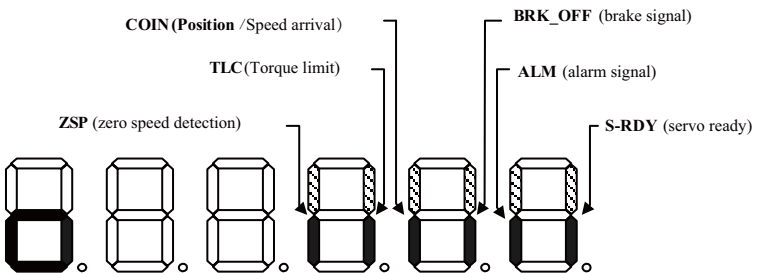
Fig. 5-3 Output terminal display (If the dotted line is on, it means the corresponding output terminal is ON. If the dotted line is off, it means thecorresponding output terminal is OFF.)

5.3 Parameter setup (SET-P)

【**NOTE**】

- Before changing other parameters, parameter PA0 (PA0【Password】) must be set to be 58 first.

- Parameter setting will become effective immediately after change.(Except for the parameters needed system re-power on). Wrong parameter setting may cause the abnormal function of the drives and cause accident.

- If the changed parameter is not written into EEPROM, it will not be saved after the system power-off.

- If the system lost power during the EEPROM written, please set the parameters again.

At the first level, select "SET-P", press "SET" button to enter the parameter setting mode. Use "↑"、"←" button to choose the parameter number, then press "SET" to enter the parameter.

Use "↑"、"←" button to set up the parameter value. The decimal point of the right most LED will be blinking. Press "SET" to confirm the parameter change and it will come back to the upper level automatically.

If you are not satisfied with the parameter value, do not press "SET", but press "MOD" to cancel this operation and return to the upper level. The parameter will remain the same value as before change.

After every change to the parameter value, please re-enter the parameter, double check and make sure the parameter value has been changed.

Note: In the parameter table, the parameter with "※" in front needs to be written into EEPROM after change and re-power on the system to let it effective.

5.4 Parameter management (EEPOP)

Parameter management deals with the operation between DSP RAM and EEPROM. At the first level, select "EEPOP", press "SET" button, then go into the

parameter management mode.

Parameter management has 2 modes, use "↑" to select the mode number, then press "SET" to enter the corresponding parameter management.

Table 5.2 gives a brief explanation to the parameter management.

Table 5.2 Parameter management

Operation code	operation	Brief explanation	Corresponding relationship
EE- 0	Parameter writing	• The parameter values in the RAM arewritten into EEPROM. • If the user changes the parameter value, only the value stored in DSP's RAM will change temporarily and will return to the original value after next power on. If want to change the parameter value permanently, you need to use this written command and the parameter will remain the changed value after next power on.	RAM ↓ EEPROM parameter region
EE – 1	Parameter read	Read all the parameters' default value to the RAM and write them into EEPROM parameter region. During next power on, the default parameter values will be used. Please note, different drives version has different parameter values. Make sure the drives version is correct before using the default value.	Parameter default value ↓ RAM ↓ EEPROM parameter region

The flowchart of parameter management is shown in Fig. 5-4.

操作参数保存模式

1. Press " MOD" button to display "EEPOP"

2. Press "SET" to enter the parameter management and select the operation code. The default operation is parameter writing ("EE—0").

3. Press "SET" button again and LED displays "EEP -". Keep pressing button "SET".(About 4 seconds)

4. When LED displays "Finish",indicating the operation is completed,release the button.

EEP-OP

⇩

EE-O

⇩

EEP-

⇩

EEP-

⇩

- - - - - -

⇩

StArt

Fnish   Fail
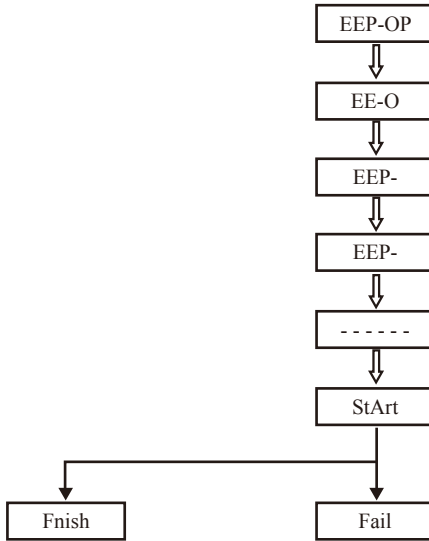
Fig. 5-4 Parameter management operation flowchart

SEc-P ⬅ mod 0

SET   MOD

PA 0   EEPOP

SET   SET

58改123按SET   EE-0

MOD   SET

EEPOP   EEP-

SET

EE-1   EEP--

- - - - - -

StArt

Fnish   Fail
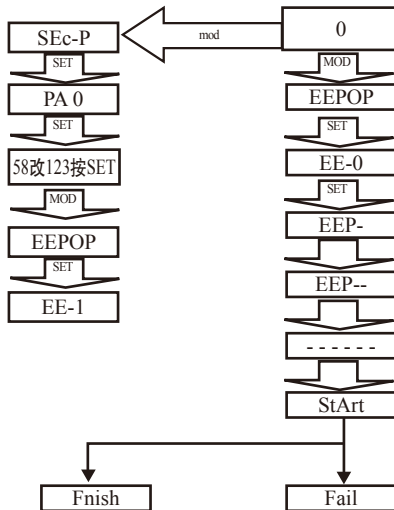
- If you still keep pressing "SET" after the parameters written finished,the operation will start from step 3 again

- If you release the button before "Finish" is displayed,the operation will be cancelled automatically.

5.5 Speed trial run

- Make sure terminal TB and encoder terminal (CN3) is connected correctly and control terminal (CN2) is disconnected.

- Make sure selecting the correct 【Drives version selection】parameter and other parameters. Load is removed from the motor shaft.

- After entering the trial run mode, you can press "MOD" to exit the trial run mode.

  (6)Before exiting the trial run, please reduce the motor speed, otherwise, the motor will stop dramatically fast and may cause unexpected problems.

- If the servo enable signal (S-ON) is effective, it is impossible to enter trial run mode.

- If speed trial run is OK, meaning the motor and drives status is fine, the connection is good.

    (1) At level 1, choose "t-SPd".

    (2) Press "SET" to enter the speed trial run mode and LEDs display "S-rdy".

    (3) Press "SET" to start speed trial run. The speed unit is r/min and the value can be set by button.

    (4) Press "←" to increase the speed for reverse rotation and press "↑" to increase the speed for forward rotation. If you release the button, the motor will run at the setting speed.

First step ──────▶

Second step ──────▶

Third step ──────▶
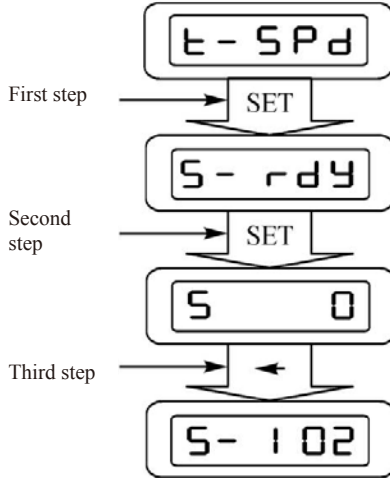
Fig. 5-5 Speed trial run operation diagram

Chapter 6 Alarm and handling

6.I Drives alarm

EPS series drives has many protection functions. When one of the protections is triggered, the drives will turn off the output with a certain sequence and generate the alarm at the same time.

When alarm occurs, LED panel will display an alarm number. The 5 LEDs' decimal points will blink and the servo-on signal is turned off.

When alarm occurs, please shut off the power immediately and clear the fault according to the alarm number. If the problem is identified to be inside the drives, please contact our company for solution.

Table 6.1 Alarm overview

Alarm number	Alarm name	Brief reason
——	normal	
1	overload	Motor stator current is overlarge for a long time.
2	under voltage	Main circuit is under voltage.
3	Over voltage	Main circuit is over voltage.
4	Main circuit power losingphase	Main circuit only has signal phase power input.
8	Motor over-speed	Motor speed is over the rated value for a long time.
9	Position error over-large	Position error counter value exceed the threshold
12	Serial communication error	Serial communication error
14	CAN communication error	CAN communication error
16	EEPROM parameter error	EEPROM stored data is destroyed.
20	IPM alarm	IPM protection pin is always high.
21	Phase V current abnormal	The measured phase V current is too large
22	Phase W current abnormal	The measured phase W current is too large
25	Encoder AB pulses	Encoder AB pulses are lost

Alarm number	Alarm name	Brief reason
26	Encoder Z pulse missing	Encoder Z pulse is lost
27	Encoder UVW signal iswrong	Encoder U、V、W signal is wrong
30	Speed tracking abnormal	The error between motor speed and speed reference is too large.

6.2 Alarm handling

The followings list several non-alarm failures and give some handling method to identify the problem.

■ **Motor can not run.**

1. Parameter: Control mode(PA4) selection is not proper.

2. Wire connection: Not receiving CN2 servo-on signal; CN2 counter clear

zero is always effective(short circuit). CN2 command pulse input disable is effective------Monitoring input signal (dp 13) status via LED panel display, to identify the problem.

3. Shaft is locked permanently: Shut off the power, disconnect the motor, turn the motor shaft by hand to make sure the motor can rotate freely. If the motor has lose-power brake, then, add a 24V DC power to the brake and try to turn the motor shaft by hand.

■ **Rotation is not smooth.**

Wire connection:

a) Servo- ON signal keeps appearing intermittently.

b) CN2 CW/CCW signal keeps appearing intermittently.

c) Counter clear signal is effective

d) CN2 command pulse input disable signal is effective.

You can use LED panel to monitor input signal status (dp 13) to identify the problem.

■ **Motor has noise or vibration.**

1. Parameter:The gain is too high: speed gain or position gain(PA14) is too high; Speed detection filter is not set properly.

2. Installation: Machine and motor have resonance vibrations.

For every alarm, Table 6.3 gives some general handling methods.

Table 6.3 Alarm handling method

Num-ber	Alarm name	Operation status	Alarm reason	Handling methods
1	Over load protection	During System acceleration or deceleration During system running	Drives has sampled overlarge current several times.	①Increase the acceleration or deceleration time; ②Make sure the drives version is compatible with the motor model. ③Replace the drives and motor with a larger power rating one.
2	Main circuit under-voltage	During Drives power-on During system running	Main circuit power converter dc-link voltage is below the setting value.	①Increase the main power transformer rating, increase the main power voltage; ②Check the main power and control power connection time sequence.
3	Main circuit over-voltage	During Drives power-on During system running or stopping	Main power supply input voltage is higher than the rated acceptable voltage, which causes the dc-link voltage is higher than the rated value.	①Measure the terminal voltage between(R、 S and T)to see whether it is within the range. ②Check whether the braking resistor is broken.
4	Main circuit power losing phase	During drives power-on •During system running	R、 T has no input power, or L1 or L2 the input electric power is not enough.	Make sure the main power terminal is connected to 3-phase AC 220V power source or R、 T terminal is connected to single phase AC220 power source.

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Num-ber	Alarm name	Operation status	Alarm reason	Handling methods
8	Motor over-speed protection	During system running	Motor speed exceeds the rated speed for a long time.	①Reduce the speed reference; ②Make sure the motor model is selected correctly. ③Decrease parameter NO.43 【Speed command input gain】value; ④Make sure input pulse frequency×electrical gear≦500KHz.
9	Position error protection	During system running	The number of position error pulses is larger than parameter NO.53 【Position error over-large setting】value.	①Increase parameter NO.11 【Position loop gain】value; ②Reduce the load and speed; ③Increase parameter NO.53 【Position error over-large setting】value.
12	Serial commu-nication error	During Communicaton	The drives received data is found out to be different from the one upper –level controller has sent after CRT check.	①Check the communication line; ②Check the baud rate and serial port parameters setting; ③Communication chip failure inside the drives
16	EEPROM parameter error	During drives power-on During Parameter Management operation	The data stored in EEPROM are destroyed.	Re-set the parameters or re-write the default parameter values. If this alarm happens frequently, the drives may have problem.
20	IPM alarm	During Drive power-on	Drives power module is damaged.	① Check whether motor power line and encoder line are connected properly; ② Check whether the drives motor model selection parameter is correct. ③ Check whether the drives IPM module is ok; After checking, re-power on the system, if the alarm No.20 still exists, please contact our company.

Num-ber	Alarm name	Operation status	Alarm reason	Handling methods
21	Phase V current abnormal	During drives power-on	The reason could be unstable power supply, current sensor damage or AD sampling circuit damage which causes the sampling error.	Drives power supply damage or other damage inside the drives.
22	Phase W current abnormal	During system running		
25	Encoder AB pulse missing	During system running	There is no Phase-A,B signal between drives and encoder, or the encoder has sent the wrong data.	① Check the encoder ② connection wire. ③ Do not put the encoder wire and motor cable together, connect the shielding wire to the motor cover. ④ Increase the acceleration and deceleration time
26	Encoder Z pulse missing	During system running	Z pulse signal generated once every circle is not detected.	① Check the cable connection, don't put the encoder signal wire together with the motor cable. ② Increase acceleration and deceleration time. ③ Replace the servo motor.
27	Encoder U、V、W signal error	During drives power-on During system running	The detected encoder U、V、W signal is ineffective. They are 0 or 1 at the same time.	① Check the encoder wire ② Replace the servo motor ③ Replace the drives
30	Speed tracking abnormal	During drives power-on During system running	Motor speed can not track the speed reference for a long time.	① Check whether the load mechanical part is locked; ② Check whether the motor power line and encoder line is connected properly; ③ Check whether the drives IPM module is okAfterchecking, re-power on the system, if the same No. 30 alarm happens, please contact the company.

『**Note**』

- Explanation:"During diver power-on"means the servo system is under disabled condition(S-ON ineffective);

- "During system running"means the servo system is under enabled condition(S-ON effective).

Chapter 7　Servo motor

〖**NOTE**〗

- Servo drives must be compatible with the motor.

- Motor winding U、V、W phase sequence should agree with the drives terminal.

- Servo motor has precise feedback devices inside. Knocking or strong vibration is prohibited during transportation and installation.

- If the user wants to choose the servo motor from other companies, please notified us in the order and we will try our best to meet your requirement.

7.1 Motor model name is composed of frame number, product number and performance specs number:

Model code example: 90　NZ　A　—　08　D　B　1　A　K　S

Code	Frame Size
60	60mm
80	80mm
90	90mm
110	110mm
130	130mm
142	143mm
180	180mm

Product Name

Voltage	A:220V B:380V

Code	Rated Power	Code	Rated Power
02	0.2kW	35	3.5kW
04	0.4kW	40	4.0kW
08	0.75kW	44	4.4kW
09	0.8kW	45	4.5kW
10	1.0kW	50	5.0kW
12	1.2kW	55	5.5kW
15	1.5kW		
18	1.8kW		
20	2.0kW		
23	2.3kW		
25	2.5kW		
30	3.0kW		

Code	Speed
A	1000r/min
B	1500r/min
C	2000r/min
D	3000r/min
E	4000r/min
F	2500r/min

Encoder Type	
A	500P/R
B	2500P/R
C	4096P/R
D	8192P/R
E	2500P/R

Product Name
1 Standard

Brake Unit	
A	NO
B	YES

Code	Keypad	Oil seal
K	O	X
Y	X	O
M	O	O
N	X	X

Standard Axis:S

Special Axis:

1=11mm　9=19mm　8=28mm

7=14mm　2=22mm　5=35mm

6=16mm　4=24mm　3=42mm

Operation Instruction of EPS Series Servo Drives

1.Parameters list of 60/80/90 serial servo motors.

Model	Rated speedNn (rpm)	Rated Torque TN (N.m)	Rated current IN (A)	Rated Power PN (W)	Immediate max torque Tmax (N.m)	Immediate max current Imax (A)	Rotor inertia (kg/m2)	Torque constant (N.m/A)
60NZA-02DB1AKS	3000	0.64	2	200	1.92	3.6	0.21*10-4	0.455
60NZA-04DB1AKS	3000	1.27	2.8	400	3.81	6.7	0.27*10-4	0.455
80NZA-05DB1AKS	3000	1.59	3	500	4.8	6.9	1.08*10-4	0.66
80NZA-08DB1AKS-05	3000	2.37	4	750	7.2	12	1.4*10-4	0.8
80NZA-08DB1AKS	3000	2.37	4	750	7.2	12	1.4*10-4	0.8
80NZA-10DB1AKS	3000	3.18	4.5	1000	9.6	13.6	1.63*10-4	0.74
90NZA-05DB1AKS	3000	1.59	2.3	500	4.8	6.9	2.5*10-4	0.66
90NZA-08DB1AKS-02	3000	2.37	4	750	7.2	11.4	3.0*10-4	0.7
90NZA-08DB1AKS	3000	2.37	4	750	7.2	11.4	3.0*10-4	0.7
90NZA-08CB1AKS	2000	3.5	4.5	750	10.5	13.5	3.5*10-4	0.92
90NZA-10DB1AKS	3000	3.18	4.5	1000	9.6	13.6	1.63*10-4	0.74
Encoder lines(PPR)	2500							
Motor insulation level	Class F(155℃)							
Prevention level	IP65							
Using environmental	Environmental temperature: -20℃ ~+50℃ Environmental moisture:relative moisture <90%(non-dew)							

Motor winding socket	Winding lines	U		V		W		PE	
	Socket number	1		2		3		4	

	Winding lines	5V	0V	A+	A-	B+	B-	Z+	Z-
Encoder socket	Socket number	2	3	4	14	9	13	7	5
	Winding lines	U+	U-	V+	V-	W+	W-	PE	
	Socket number	6	8	11	15	10	12	1	

2. Parameters list of 110/130 serial servo motors

Model	Rated speed Nn (rpm)	Rated Torque TN (N.m)	Rated current IN (A)	Rated Power PN (W)	Imme-diate max torque Tmax (N.m)	Imm-ediate max current Imax (A)	Rotor inertia (kg/m2)	Torque cons-tant (N.m/A)
110NZA-04CB1AMS	2000	1.91	2.3	400	5.75	7	0.31*10-3	0.8
110NZA-09CB1AMS	2000	3.8	3.5	800	11.4	11	0.54*10-3	1.18
110NZA-12DB1AMS	3000	3.82	5.6	1200	11.5	16.8	0.54*10-3	0.8
110NZA-12CB1AMS	2000	5.7	5.6	1200	15.4	15.7	0.76*10-3	1.33
110NZA-15DB1AMS	3000	4.77	6.5	1500	14.3	20	0.63*10-3	0.83
110NZA-18DB1AMS	3000	5.7	7	1800	17.1	22	0.76*10-3	1.0
130NZA-06AB1AMS	1000	5.73	2.8	600	18.1	8.6	1.98*10-3	1.0
130NZA-10DB1AMS	3000	3.18	4.5	1000	9.6	13.6	1.42*10-3	1.0
130NZA-10CB1AMS	2000	4.77	4.5	1000	14.3	13.7	1.42*10-3	1.0
130NZA-10BB1AMS	1500	6.37	4.5	1000	19.1	13.6	1.98*10-3	1.2
130NZA-10AB1AMS	1000	9.55	4.5	1000	27.2	13.8	2.84*10-3	2.27
130NZA-12CB1AMS	2000	5.73	5.6	1200	17.2	17	1.98*10-3	1.03
130NZA-15DB1AMS	3000	4.77	6.5	1500	14.3	19.8	2.26*10-3	1.0
130NZA-15CB1AMS	2000	7.16	6.5	1500	21.5	19.8	2.26*10-3	1.2
130NZA-15BB1AMS	1500	9.55	6.5	1500	28.7	19.8	1.94*10-3	1.67
130NZA-15AB1AMS	1000	14.33	6.5	1500	42.99	19.5	2.77*10-3	1.5
130NZA-20CB1AMS	2000	9.55	7.5	2000	28.7	22.8	1.94*10-3	1.28
130NZA-20BB1AMS	1500	12.7	7.5	2000	38	22.8	1.94*10-3	1.67
130NZA-30DB1AMS	3000	9.55	11.5	3000	28.7	34.5	1.85*10-3	1.0
130NZA-30CB1AMS	2000	14.33	11.5	3000	34.3	28.8	2.52*10-3	0.88
130NZA-40DB1AMS	3000	12.7	15	4000	38.11	45.8	1.94*10-3	1.0
130NZA-45DB1AMS	3000	14.33	17	4500	34.3	42	2.77*10-3	0.88
130NZB-0001DB1AMS	3000	3.18	2.3	1000	9.6	6.9	0.85*10-3	1.67
130NZB-0001CB1AMS	2000	4.77	2.3	1000	14.3	9.9	0.85*10-3	2.5
130NZB-0001BB1AMS	1500	6.37	2.3	1000	19.1	9.9	0.85*10-3	3.3
130NZB-0001AB1AMS	1000	9.55	2.3	1000	27.2	6.9	1.94*10-3	5

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Model	Rated speed Nn (rpm)	Rated Torque TN (N.m)	Rated current IN (A)	Rated Power PN (W)	Immediate max torque Tmax (N.m)	Immediate max current Imax (A)	Rotor inertia (kg/m2)	Torque constant (N.m/A)
130NZB-01D2BB1AMS	2000	5.73	2.7	1200	17.2	8.1	1.94*10-3	2.4
130NZB-01D5DB1AMS	3000	4.77	3.4	1500	14.3	10.2	1.94*10-3	1.6
130NZB-01D5CB1AMS	2000	7.16	3.4	1500	21.5	10.2	1.94*10-3	2.4
130NZB-01D5AB1AMS	1000	14.33	3.4	1.5	42.99	10.2	2.77*10-3	5
130NZB-0002CB1AMS	2000	9.55	4	2	28.7	12	1.94*10-3	2.87
130NZB-0002BB1AMS	1500	12.7	4	2	38	12	2.77*10-3	3.8
130NZB-0003DB1AMS	3000	9.55	6.8	3	28.7	28.65	1.94*10-3	2.24
130NZB-0003CB1AMS	2000	14.33	6.8	3	34.3	20.4	2.77*10-3	2.4
130NZB-0004DB1AMS	3000	12.7	9.2	4	38.11	27.6	2.77*10-3	1.57
130NZB-04D5DB1AMS	3000	14.3	10.3	4.5	34.3	30.9	2.77*10-3	1.53

Encoder lines(PPR)	2500							
Motor insulation level	Class F(155℃)							
Prevention level	IP65							
Using environmental	Environmental temperature: -20℃ ~ +50℃ Environmental moisture:relative moisture <90%(non-dew)							

Motor winding socket	Winding lines	U		V		W		PE	
	Socket number	3		2		4		1	

Encoder socket	Winding lines	5V	0V	A+	A-	B+	B-	Z+	Z-
	Socket number	2	3	4	7	5	8	6	9
	Winding lines	U+	U-	V+	V-	W+	W-	PE	
	Socket number	10	13	11	14	12	15	1	

3. Parameters list of 142 serial servo motor.

Model	Rated speed Nn (rpm)	Rated Torque TN (N.m)	Rated current IN (A)	Rated Power PN (W)	Immediate max torque Tmax (N.m)	Immediate max current Imax (A)	Rotor inertia (kg/ m²)	Torque constant (N.m/A)
142NZA-20BB1AMS	1500	12.7	7.5	2	38.1	22.5	1.98*10-3	1.8
142NZA-15AB1AMS	1000	14.3	6.5	1.5	42.9	19.5	2.56*10-3	2.31
142NZA-30CB1AMS	2000	14.3	11.5	3	42.9	34.5	2.84*10-3	1.3
142NZA-30BB1AMS	1500	19.1	11.5	3	57.3	34.5	2.77*10-3	1.82
142NZA-40BB1AMS	1500	25.5	15	4	76.5	45	3.4*10-3	1.78
142NZA-20AB1AMS	1000	19.1	7.5	2	57.3	22.5	2.84*10-3	2.9
142NZA-25AB1AMS	1000	23.8	11	2.5	71.4	33	3.98*10-3	2.5
142NZA-30AB1AMS	1000	28.6	11.5	3	88.8	34.5	4.54*10-3	2.7
142NZB-0002BB1AMS	1500	12.7	4.5	2	38.1	22.5	1.98*10-3	3.3
142NZB-01D5AB1AMS	1000	14.3	3.4	1.5	42.9	19.5	2.56*10-3	5
142NZB-0003CB1AMS	2000	14.3	6.8	3	42.9	34.5	2.84*10-3	2.38
142NZB-0003BB1AMS	1500	19.1	6.8	3	57.3	34.5	2.84*10-3	3.18
142NZB-0004BB1AMS	1500	25.5	9.1	4	76.5	45	3.4*10-3	3.2
142NZB-0002AB1AMS	1000	19.1	4.5	2	57.3	22.5	2.84*10-3	5.0
142NZB-02D5AB1AMS	1000	23.8	5.7	2.5	71.4	33	3.98*10-3	4.8
142NZB-0003AB1AMS	1000	28.6	6.8	3	88.8	34.5	4.54*10-3	4.7
Encoder lines(PPR)	2500							
Motor insulation level	Class F(155℃)							
Prevention level	IP65							
Using environmental	Environmental temperature: -20℃ ~ +50℃ Environmental moisture:relative moisture <90%(non-dew)							
Motor winding socket	Winding lines	U	V	W	PE
	Socket number	3	2	4	1

Model	Rated speed Nn (rpm)	Rated Torque TN (N.m)	Rated current IN (A)	Rated Power PN (W)	Imm-ediate max torque Tmax (N.m)	Imm-ediate max current Imax (A)	Rotor inertia (kg/m²)		Torque constant (N.m/A)
Encoder socket	Winding lines	5V	0V	A+	A-	5V	0V	A+	A-
	Socket number	2	3	4	7	2	3	4	7
	Winding lines	U+	U-	V+	V-	U+	U-	V+	V-
	Socket number	10	13	11	14	10	13	11	14

4. Parameters list of 180 serial servo motors

Model	Rated speed Nn (rpm)	Rated Torque TN (N.m)	Rated current IN (A)	Rated Power PN (W)	Imme-diate max torque Tmax (N.m)	Imme-diate max current Imax (A)	Rotor inertia (kg/m²)	Torque constant (N.m/A)
180NZA-20BB1AMS	1500	12.7	7.5	2	38.1	22.5	42.5*10-4	1.9
180NZA-20CB1AMS	2000	9.55	7.5	2	28.65	22.5	35.4*10-4	1.4
180NZA-27BB1AMS	1500	17.2	10.6	2.7	43	21.2	49.5*10-4	1.8
180NZA-30CB1AMS	2000	14.33	12	3	42.99	36	42.5*10-4	1.3
180NZA-30BB1AMS	1500	19.1	12	3	47	24	49.5*10-4	1.8
180NZA-30AB1AMS	1000	28.6	12	3	67	24	63.7*10-4	2.7
180NZA-37AB1AMS	1000	35	16	3.7	88	32	92*10-4	2.4
180NZA-40CB1AMS	2000	19.1	17	4	57.3	51	42.5*10-4	1.3
180NZA-40BB1AMS	1500	25.5	17	4	76.5	51	63.7*10-4	1.67
180NZA-45CB1AMS	2000	21.5	18.4	4.5	53	34	63.7*10-4	1.3
180NZA-45BB1AMS	1500	28.6	18.4	4.5	85.8	55.2	77.9*10-4	1.71
180NZA-55BB1AMS	1500	35	23.5	5.5	105	70.5	92*10-4	1.6
180NZB-0002BB1AMS	1500	12.7	7.5	2	38.1	22.5	42.5*10-4	1.9

Model	Rated speed Nn (rpm)	Rated Torque TN (N.m)	Rated current IN (A)	Rated Power PN (W)	Immediate max torque Tmax (N.m)	Immediate max current Imax (A)	Rotor inertia (kg/m^2)	Torque constant (N.m/A)
180NZB-0002CB1AMS	2000	9.55	7.5	2	28.65	22.5	35.4*10-4	1.4
180NZB-02D7BB1AMS	1500	17.2	10.6	2.7	43	21.2	49.5*10-4	1.8
180NZB-0003CB1AMS	2000	14.33	12	3	42.99	36	42.5*10-4	1.3
180NZB-0003BB1AMS	1500	19.1	12	3	47	24	49.5*10-4	1.8
180NZB-0003AB1AMS	1000	28.6	12	3	67	24	63.7*10-4	2.7
180NZB-03D7AB1AMS	1000	35	16	3.7	88	32	92*10-4	2.4
180NZB-0004CB1AMS	2000	19.1	17	4	57.3	51	42.5*10-4	1.3
180NZB-0004BB1AMS	1500	25.5	17	4	76.5	51	63.7*10-4	1.67
180NZB-04D5CB1AMS	2000	21.5	18.4	4.5	53	34	63.7*10-4	1.3
180NZB-04D5BB1AMS	1500	28.6	18.4	4.5	85.8	55.2	77.9*10-4	1.71
180NZB-05D5BB1AMS	1500	35	23.5	5.5	105	70.5	92*10-4	1.6
180NZB-07D5BB1AMS	1500	47.7	17.5	7.5	143.1	52.5	104*10-4	2.9

Encoder lines(PPR)	2500							
Motor insulation level	Class F(155℃)							
Prevention level	IP65							
Using environmental	Environmental temperature: -20℃ ~ +50℃ Environmental moisture:relative moisture <90%(non-dew)							

Motor winding socket	Winding lines	U		V		W		PE
	Socket number	3		2		4		1

Encoder socket	Winding lines	5V	0V	A+	A-	B+	B-	Z+	Z-
	Socket number	2	3	4	7	5	8	6	9
	Winding lines	U+	U-	V+	V-	W+	W-	PE	
	Socket number	10	13	11	14	12	15	1	

5.Parameters list of 220/250/280 serial servo motors.

Model	Rated speed Nn (rpm)	Rated Torque TN (N.m)	Rated current IN (A)	Rated Power PN (KW)	Immediate max torque Tmax (N.m)	Immediate max current Imax (A)	Rotor inertia (kg/m^2)	Torque constant (N.m/A)
220NZB-03D5CB1AMS	2000	16.7	8	3.5	50.1	24	80.35*10-4	1.9
220NZB-04D4AB1AMS	1000	42	10	4.4	126	30	172.91*10-4	1.4
220NZB-05D5CB1AMS	2000	26.3	12.5	5.5	78.8	37.5	132.41*10-4	1.8
220NZB-0006AB1AMS	1000	57.3	15	6	171.9	45	291.36*10-4	1.3
220NZB-07D5CB1AMS	2000	35.8	18	7.5	89.5	56	172.91*10-4	1.8
220NZB-07D5BB1AMS	1500	47.8	18	7.5	119.4	56	186.2*10-4	2.7
220NZB-08D5BB1AMS	1500	54.1	19	8.5	135.3	57	291.36*10-4	2.4
220NZB-0011CB1AMS	2000	52.5	26	11	131.3	70	291.36*10-4	1.3
220NZB-0011BB1AMS	1500	70	26	11	175	70	271.6*10-4	1.67
220NZB-0015BB1AMS	1500	95.5	34	15	191	84	338.8*10-4	1.3
250NZB-0022BB1AMS	1500	140.04	50	22	280.08	120	628.51*10-4	1.71
250NZB-0030BB1AMS	1500	190.96	68	30	381.93	150	800.8*10-4	1.2
280NZB-0037BB1AMS	1500	235.52	84	37	471.04	184	1314.31*10-4	1.6

Encoder lines(PPR)	2500							
Motor insulation level	Class F(155℃)							
Prevention level	IP65							
Using environmental	Environmental temperature: -20℃ ~ +50℃ Environmental moisture:relative moisture <90%(不结霜条件)							

Motor winding socket	Winding lines	U		V		W		PE
	Socket number	3		2		4		1

Encoder socket	Winding lines	5V	0V	A+	A-	B+	B-	Z+	Z-
	Socket number	2	3	4	7	5	8	6	9
	Winding lines	U+	U-	V+	V-	W+	W-	PE	
	Socket number	10	13	11	14	12	15	1	

7.2 Motor installation dimension

1. 60/80/90 serial Servo motor installation dimension: Unit (mm)
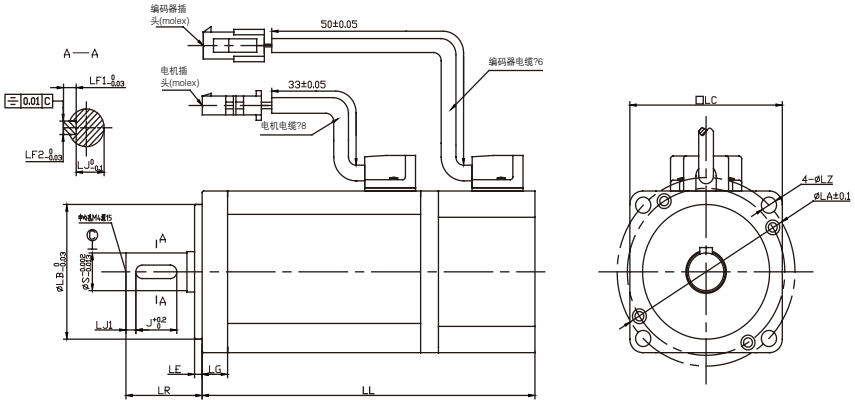
Model	LL	LR	LE	LG	Shaft end dimensions						Flange Dimensions			
					S	LJ1	LJ	J	LF1	LF2	LA	LB	LC	LZ
60NZA-02DB1AKS	121	30	3	10	14	0	11	20	5	5	70	50	60	6
60NZA-04DB1AKS	131	30	3	10	14	0	11	20	5	5	70	50	60	6
80NZA-05DB1AKS	145	35	3	18.5	19	3	15.5	25	6	6	90	70	80	6.5
80NZA-08DB1AKS-05	145	35	3	18.5	19	3	15.5	25	6	6	90	70	80	6.5
80NZA-08DB1AKS	160	35	3	18.5	19	3	15.5	25	6	6	90	70	80	6.5
80NZA-18CB1AKS	170	35	3	18.5	19	3	15.5	25	6	6	90	70	80	6.5
80NZA-10DB1AKS	170	35	3	18.5	19	3	15.5	25	6	6	90	70	80	6.5
90NZA-05DB1AKS	142	35	3	12	16	3	13	20	5	5	100	80	90	6
90NZA-08DB1AKS-02	142	35	3	12	16	3	13	20	5	5	100	80	90	6
90NZA-08DB1AKS	152	35	3	12	16	3	13	20	5	5	100	80	90	6
90NZA-08CB1AKS	162	35	3	12	16	3	13	20	5	5	100	80	90	6
90NZA-10DB1AKS	162	35	3	12	16	3	13	20	5	5	100	80	90	6

2. 110/130 serial Servo motor installation dimension: Unit (mm)
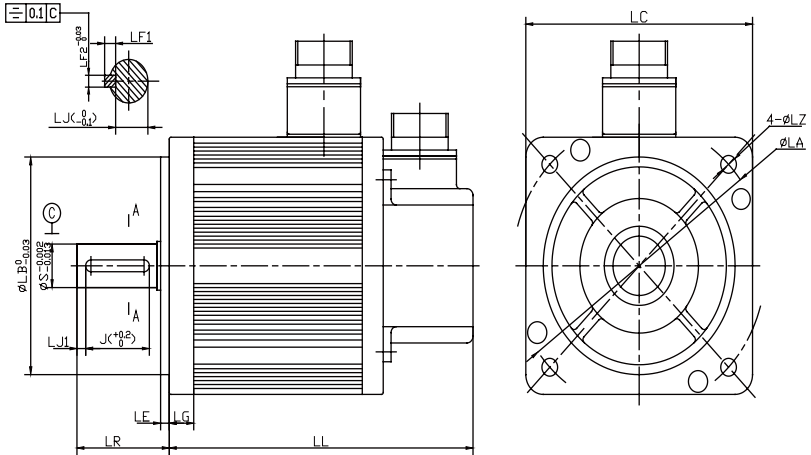
Model	LL	LR	LE	LG	Shaft end dimensions						Flange Dimensions			
					S	LJ1	LJ	J	LF1	LF2	LA	LB	LC	LZ
110NZA-04CB1AMS	164	40	5	14	19	3	15.5	25	6	6	130	95	110	9
110NZA-09CB1AMS	184	40	5	14	19	3	15.5	25	6	6	130	95	110	9
110NZA-12DB1AMS	184	55	5	14	19	3	15.5	25	6	6	130	95	110	9
110NZA-12CB1AMS	204	55	5	14	19	3	15.5	25	6	6	130	95	110	9
110NZA-15DB1AMS	204	40	5	14	19	3	15.5	25	6	6	130	95	110	9
110NZA-18DB1AMS	204	40	5	14	19	3	15.5	25	6	6	130	95	110	9
130NZA-06AB1AMS	189	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-10DB1AMS	168	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-10CB1AMS	168	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-10BB1AMS	189	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-10AB1AMS	223	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-12CB1AMS	189	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9

Model	LL	LR	LE	LG	Shaft end dimensions						Flange Dimensions			
					S	LJ1	LJ	J	LF1	LF2	LA	LB	LC	LZ
130NZA-15DB1AMS	168	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-15CB1AMS	203	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-15BB1AMS	223	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-15AB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-20CB1AMS	223	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-20BB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-30DB1AMS	223	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-30CB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-40DB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZA-45DB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-0001DB1AMS	168	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-0001CB1AMS	168	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-0001BB1AMS	189	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-0001AB1AMS	223	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-01D2CB1AMS	189	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-01D5DB1AMS	168	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-01D5CB1AMS	203	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-01D5BB1AMS	223	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-01D5AB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-0002CB1AMS	223	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-0002BB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-0003DB1AMS	223	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-0003CB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-0004DB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9
130NZB-04D5DB1AMS	273	57	5	14	22	5	18.5	36.5	6	6	145	110	130	9

3. 142 serial Servo motor installation dimension: Unit (mm)
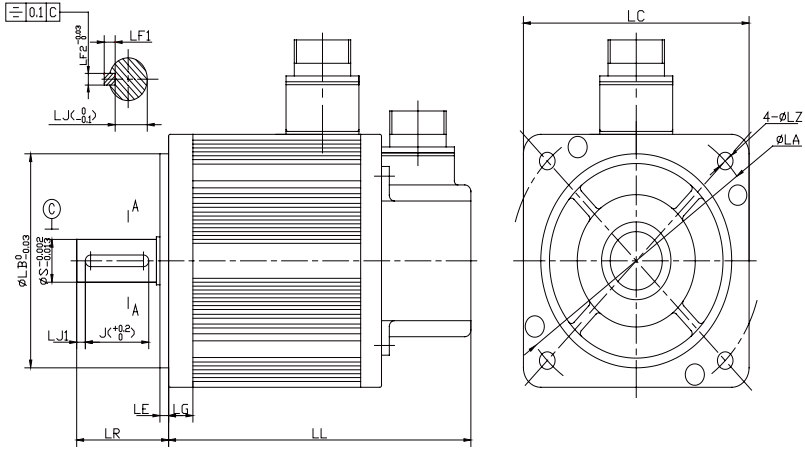
Model	LL	LR	LE	LG	Shaft end dimensions						Flange Dimensions			
					S	LJ1	LJ	J	LF1	LF2	LA	LB	LC	LZ
142NZA-20BB1AMS	221	50	3.5	15	24	3	20	40	7	8	165	130	143	11
142NZA-15AB1AMS	231	50	3.5	15	24	3	20	40	7	8	165	130	143	11
142NZA-30CB1AMS	231	50	3.5	15	24	3	20	40	7	8	165	130	143	11
142NZA-30BB1AMS	241	50	3.5	15	24	3	20	40	7	8	165	130	143	11
142NZA-40BB1AMS	281	50	3.5	15	24	3	20	40	7	8	165	130	143	11
142NZA-10AB1AMS	241	50	3.5	15	24	3	20	40	7	8	165	130	143	11
142NZA-25AB1AMS	261	50	3.5	15	24	3	20	40	7	8	165	130	143	11
142NZA-30AB1AMS	311	50	3.5	15	24	3	20	40	7	8	165	130	143	11
140NZB-0002BB1AMS	221	50	3.5	15	24	3	20	40	7	8	165	130	143	11
140NZB-01D5AB1AMS	231	50	3.5	15	24	3	20	40	7	8	165	130	143	11
140NZB-0003CB1AMS	231	50	3.5	15	24	3	20	40	7	8	165	130	143	11
140NZB-0003BB1AMS	241	50	3.5	15	24	3	20	40	7	8	165	130	143	11
140NZB-0004BB1AMS	281	50	3.5	15	24	3	20	40	7	8	165	130	143	11

Model	LL	LR	LE	LG	Shaft end dimensions						Flange Dimensions			
					S	LJ1	LJ	J	LF1	LF2	LA	LB	LC	LZ
140NZB-0002AB1AMS	241	50	3.5	15	24	3	20	40	7	8	165	130	143	11
140NZB-02D5AB1AMS	261	50	3.5	15	24	3	20	40	7	8	165	130	143	11
140NZB-0003AB1AMS	311	50	3.5	15	24	3	20	40	7	8	165	130	143	11

4. 180 serial Servo motor installation dimension: Unit (mm)
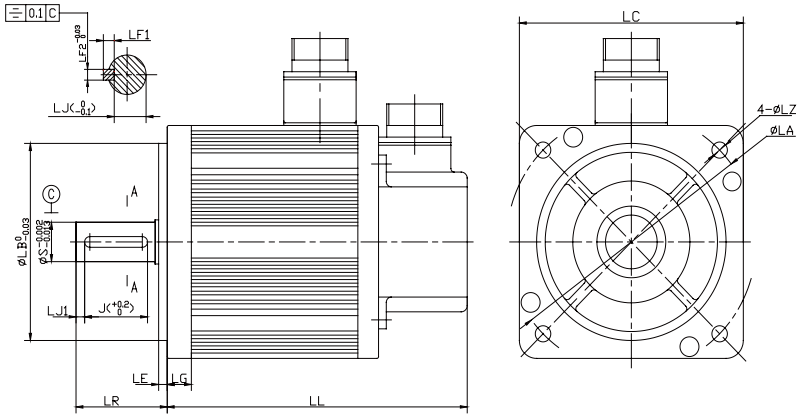
Model	LL	LR	LE	LG	Shaft end dimensions						Flange Dimensions			
					S	LJ1	LJ	J	LF1	LF2	LA	LB	LC	LZ
180NZA-20BB1AMS	202	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-20CB1AMS	192	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-27BB1AMS	212	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-30BB1AMS	202	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-30BB1AMS	212	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-30AB1AMS	232	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-37AB1AMS	272	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-40CB1AMS	212	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-40BB1AMS	232	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-45CB1AMS	212	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13

Model	LL	LR	LE	LG	Shaft end dimensions						Flange Dimensions			
					S	LJ1	LJ	J	LF1	LF2	LA	LB	LC	LZ
180NZA-45BB1AMS	252	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-50BB1AMS	232	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZA-55BB1AMS	272	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-0002BB1AMS	202	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-0002CB1AMS	192	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-02D7BB1AMS	212	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-0003BB1AMS	212	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-03D7AB1AMS	272	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-04D5CB1AMS	212	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-04D5BB1AMS	252	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-0005CB1AMS	232	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-05D5BB1AMS	272	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13
180NZB-07D5BB1AMS	332	65	3.2	18	35	3	30	51	8	10	200	114.3	180	13

5. 220/250/280 serial Servo motor installation dimension: Unit (mm)

Model	LL	LR	LE	LG	Shaft end dimensions						Flange Dimensions			
					S	LJ1	LJ	J	LF1	LF2	LA	LB	LC	LZ
220NZB-03D5CB1AMS	192	116	4	20	42	6	37	90	8	12	235	200	220	13.5
220NZB-04D4AB1AMS	256	116	4	20	42	6	37	90	8	12	235	200	220	13.5
220NZB-05D5CB1AMS	228	116	4	20	42	6	37	90	8	12	235	200	220	13.5
220NZB-0006AB1AMS	356	116	4	20	42	6	37	90	8	12	235	200	220	13.5
220NZB-07D5CB1AMS	256	116	4	20	42	6	37	90	8	12	235	200	220	13.5
220NZB-07D5BB1AMS	356	116	4	20	42	6	37	90	8	12	235	200	220	13.5
220NZB-08D5BB1AMS	356	116	4	20	42	6	37	90	8	12	235	200	220	13.5
220NZB-0011CB1AMS	356	116	4	20	42	6	37	90	8	12	235	200	220	13.5
220NZB-0011BB1AMS	356	116	4	20	42	6	37	90	8	12	235	200	220	13.5
220NZB-0015BB1AMS	459	116	4	20	55	6	49	90	10	16	235	200	220	13.5
250NZB-0022BB1AMS	615	116	5	22	60	6	53	90	11	18	304	230	254	13.5
250NZB-0030BB1AMS	683	116	5	22	60	6	53	90	11	18	304	230	254	13.5
280NZB-0037BB1AMS	671	116	5	22	70	6	62.5	90	11	20	350	250	285	17.5

Appendix

1. Motor power calculation

Based on motor rated speed and rated torque, the servo motor power can be calculated by the following equation:

$$W = \frac{2\pi}{60}\ NM$$

W:Motor power,unit: W;

M:Motor torque,unit : Nm;

N:Motor speed, unit: rpm;

For example:130DNA-15BB1AMS motor,its power is 1500W and speed is 1500rpm;

Based on the above equation, the power is: M=1500*60/(2*3.14*1500)=9.55N.M

2. electrical gear ratio

The meaning of electrical gear ratio and its adjustment method:

In position control mode, the load actual speed is:

Command pulse speed×G×mechanical reduction gear ratio

In the diver with mechanical gears, the electrical gear ratio G is calculated by the following equation:

$$G = \frac{P_{pulse} \times M \times i}{L}$$

P_{Pulse}:The number of pulses for every motor cycle; it represents the number of pulses feed back by feedback device for the motor rotating one round. For a

2500 pulse incremental encoder, the number of pulses feed back to the drives is 2500×4=10000 a round;

M:Pulse calculation equivalent (mm). It refers to the upper-level controller resolution;

L:Lead screw pitch (mm);

i:Mechanical gear ratio

i=   driven gear teeth number (machine side)

      driving gear teeth number(motor side)

For example:If the upper-level controller pulse equivalent is 0.001mm;Mechanical reduction gear ratio is i=driven gear/ driving gear=36/24;Lead screw pitch is 6mm;Motor encoder is 2500P/r,the number of encoder feedback pulses per round is 2500×4=10000.

Based on the above equation:

$$G = \frac{100\ 00 \times 0.001 \times \frac{36}{24}}{6} = \frac{5}{2}$$

『**Note**』

- When the electrical gear ratio is not 1, there may be remainder after division operation. In this case, there will be position error; the maximum error will be motor minimum movement. (Minimum resolution 1/10000 per round)

- For direct connection (without mechanical gear), the calculation will be the same as above except that the mechanical gear ratio is i=1.

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