# AASD-15A

## Installation Manual

# Safety Caution

In order to ensure the safe use of this product, must observe the following safety signs, in order to avoid damaging to the people and the equipment.

| | |
|---|---|
|  警告 warning | Mearing Wrong operation will trigger dangerous, leading to mild or moderate personal injury, damage to equipment, and even fire. |
|  危险 dangerous | Mean wrong operation will trigger dangerous ,cause injury or death |
|  | Mean Prohibit operation |
|  | Mean must operate |

After the product arriving, when validation, installation, wiring, operation maintenance, inspection of the product, the following is one of the important matters must abide by:

# Installation attention

|  警告 Warning |
|---|
| It is forbidden to install will happen in the damp and corrosion environment, a flammable gas environment, and near combustible dust and metal powder more environment, or you may get an electric shock and fire. |

Matters needing attention during installation wiring

|  警告 Warning |
|---|
| ◢ The earthing terminal of the servo drive must be grounded, otherwise, will get an electric shock and fire could occur<br>◢ It is forbidden to put the output terminal of the servo drive, U, V, W, connected to a three-phase power supply, otherwise, could be injured and fire<br>◢ It is strictly prohibited to connect the 220v driver to 380 v, 220 v power supply, or you may get an electric shock and fire<br>◢ Be sure to tighten power terminal, motor output terminal, otherwise may cause a fire |

●The matters needing attention when running

危险 Dangerous

◢ In the operation, it is forbidden to touch any rotating parts, or you might get hurt

◢ In the operation, it is forbidden to touch electric motor and drive, otherwise you may burn

警告 Warning

◢ Before operating, must choose the right motor type, otherwise people wil be hurt and the equipment will be damaged.

◢ Before operating, you must set right parameters and applications that meet the needs of users, or may be hurt, damage to equipment

◢ Before operating, confirm whether the mechanical may at any time the emergency stop, otherwise, you might get hurt.

●Maintain the points for attention during the inspection

◢ It is forbidden to touch the inside of the servo drive, or you may get an electric shock

◢ When turn off the power,within the five minutes, do not touch terminals, the residual voltage may cause electric shock

◢ It is forbidden to tear open outfit servo motor, or you may get an electric shock

# CATALOGUE

## Product inspection

### 1.1

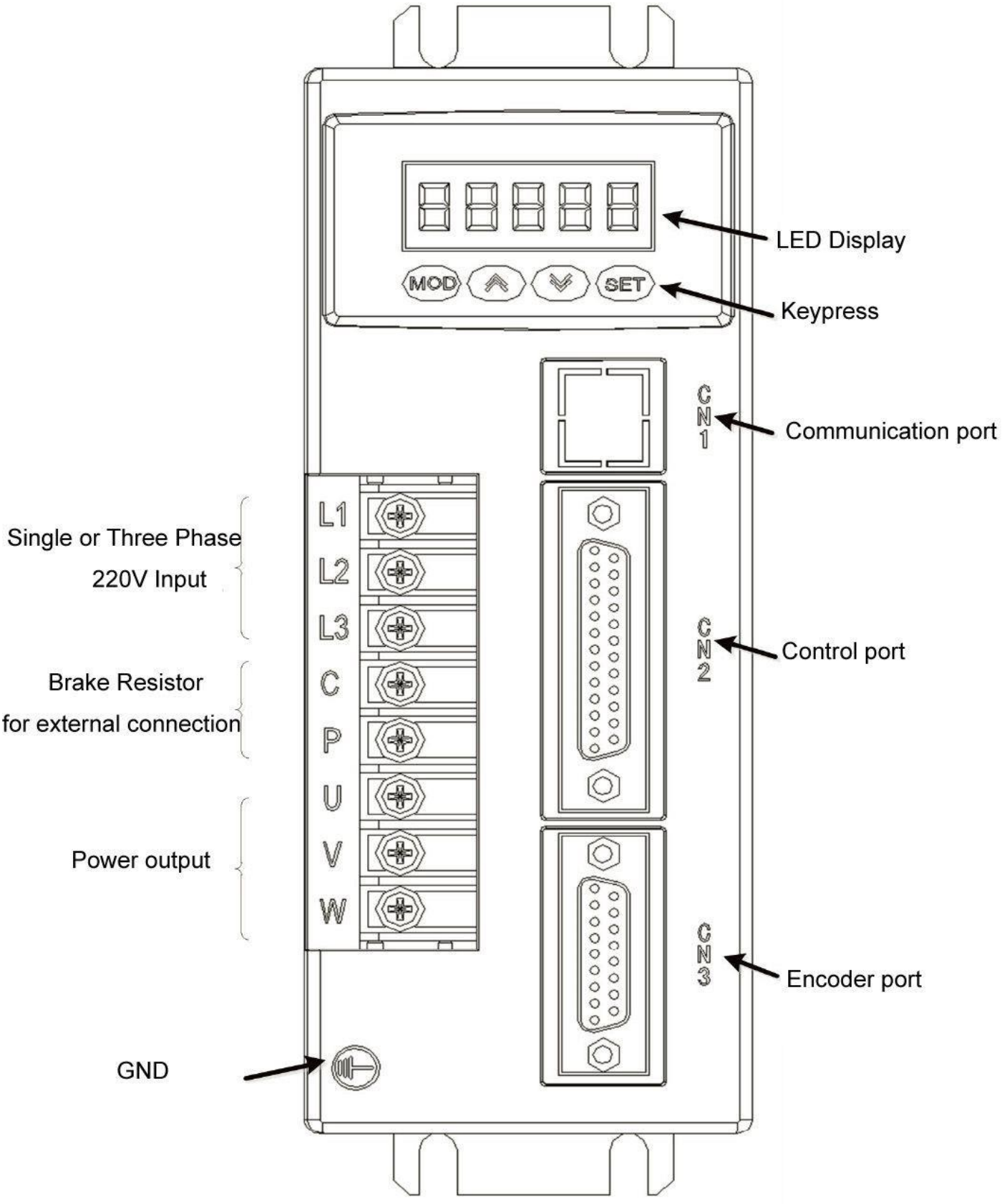
This product has made the complete function test before the leaving the factory, to prevent the product in the course of transportation for negligence resulted in the product (s) is not functioning properly. Once opened, please check the detailed the following matters:

- check the servo drive and servo motor type with the same whether order model
- Check the appearance of the servo drive and servo motor whether there is any damage and scratches phenomenon. If there is any damage during the shipment, please don’t wire power transmission.
- Check the servo drive and servo motor if there is any loose parts and other phenomenon. If there is a loose screw, screw not lock or fall off
- Check the servo motor rotor shaft can be smooth rotation. The motor with brake cannot be directly rotation

If there is any fault or unmoral phenomenon, please contact with dealers immediately

## 1.2 ID label


**1.3** The front panel



1.4 The function of AC servo motor driver.

| | | |
|---|---|---|
| The input power | | Single phase or three phase AC220V -15～+10% 50 / 60Hz |
| environment | temperature | Using: 0～55℃ Storage: -20℃～80℃ |
| | humidity | Below 90% RH No dewing |
| | vibration | Belown0.5G(4.9m/S$^2$),10-60 no continue running |
| Control mode | | IGBT PWM sine wave control |
| Control mode | | ① Torque mode (internal or external)<br>② speed mode (internal or external)<br>③ Position mode (internal or external)<br>④ Position/speed model<br>⑤ Position/torque model<br>⑥ Speed/torque model |
| Control input | | servo enables、alarm reset、Forward driving is prohibited、Reverse driving is prohibited 、External forward torque is limited 、external reverse torque is limited、Emergency stop、Zero speed clamp 、Internal speed command option 1、Internal speed command option 2、ternal speed command option 3、The internal torque command option 1、The internal torque command option 2、Control mode switch、Gain switch、Electronic gear molecular option 1、Electronic gear molecular option 2、nstructions for、Position deviation to clear、Pulse input is prohibited、Proportional control、The origin return to trigger、The origin return reference point、Internal location option 1、、Internal location option 2、Trigger internal position command、Suspend internal position command |
| Control the output | | Alarm detection、Servo ready、Emergency stop checked out、Positioning to complete、Speed to reach、Reach the predetermined torque、Zero speed detection、Servo motor current、Electromagnetic brake、The origin return to complete、Located close to、torque limit、speed limit、Tracking arrive torque command |
| The encoder feedback | | 2500p/r,15 line increment model, differential output |
| Communication mode | | RS-232 或 RS-485 RS-232 OR RS-485 |
| Display and operation | | ① five LED display ②Four buttons |
| Braking way | | Through the internal/external braking resistance braking energy |

| | |
|---|---|
| Cooling way | Air cooled (heat transfer film, the strong cold wind fan) |
| | |

**ervo motor installation**

| | |
|---|---|
| Power range | ≤7.5KW |

**Installation environment conditions**

## 1.5

### 1.4.1

- Working environment: 0 ~ and ℃; working environment: less than 80% (no condensation)
- Storage environment temperature: - ℃; Storage environment humidity: 80% of the (no condensation)
- Vibration: Below 0.5 G
- Well ventilated, less moisture and dust place
- No corrosive, flash gas, oil and gas, cutting fluid, iron powder and so on environment
- No moisture and direct sunlight place

### 1.4.2 Installation method

- Level installation: to avoid liquids such as water, oil from motor wire end into the motor internal, please will cable outlet in below
- Vrtical installation: if the motor shaft and the installation with reduction unit, must pay attention to and prevent reducer in mark through the motor shaft into the motor internal
- The motor shaft out quantity must be thoroughly, if insufficient out to motor sports generates vibration

- Installation and remove the motor, please do not use hammer knock motor, otherwise easy to cause damage to the motor shaft and encoder

**The motor direction of rotation**

ooking from the motor load on the motor shaft and counterclockwise (CCW) for the forward, clockwise (the CW) as the reverse

## 1.6

L

## 1.7 The KRS series drive and motor model adaptation

| Motor model | Pn001 | Rated speed (r/min) | 、Rated torque (N.M) | Rated power (W) | KRS 15A | KRS 20A | KRS 30A | KRS 50A | KRS 75A |
|---|---|---|---|---|---|---|---|---|---|
| 60st_m00630 | 0 | 3000 | 0.6 | 200 | √ | √ | √ | | |
| 60st_m01330 | 1 | 3000 | 1.3 | 400 | √ | √ | √ | | |
| 60st_m01930 | 2 | 3000 | 1.9 | 600 | √ | √ | √ | | |
| 80st_m01330 | 3 | 3000 | 1.3 | 400 | √ | √ | √ | | |
| 80st_m02430 | 4 | 3000 | 2.4 | 750 | √ | √ | √ | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 80st_m03520 | 5 | 2000 | 3.5 | 730 | √ | √ | √ | | |
| 80st_m04025 | 6 | 2500 | 4 | 1000 | √ | √ | √ | | |
| 90st_m02430 | 7 | 3000 | 2.4 | 750 | √ | √ | √ | | |
| 90st_m03520 | 8 | 2000 | 3.5 | 730 | √ | √ | √ | | |
| 90st_m04025 | 9 | 2500 | 4 | 1000 | √ | √ | √ | | |
| 110st_m02030 | 10 | 3000 | 2 | 600 | √ | √ | √ | | |
| 110st_m04020 | 11 | 2000 | 4 | 800 | √ | √ | √ | | |
| 110st_m04030 | 12 | 3000 | 4 | 1200 | | √ | √ | | |
| 110st_m05030 | 13 | 3000 | 5 | 1500 | | | √ | | |
| 110st_m06020 | 14 | 2000 | 6 | 1200 | √ | √ | √ | | |
| 110st_m06030 | 15 | 3000 | 6 | 1800 | | | √ | | |
| 130st_m04025 | 16 | 2500 | 4 | 1000 | √ | √ | √ | | |
| 130st_m06015 | 17 | 1500 | 6 | 1000 | √ | √ | √ | | |
| 130st_m05025 | 18 | 2500 | 5 | 1300 | | √ | √ | | |
| 130st_m06025 | 19 | 2500 | 6 | 1500 | | | √ | | |
| 130st_m07725 | 20 | 2500 | 7.7 | 2000 | | | √ | | |
| 130st_m10010 | 21 | 1000 | 10 | 1000 | √ | √ | √ | | |
| 130st_m10015 | 22 | 1500 | 10 | 1500 | | √ | √ | | |
| 130st_m10025 | 23 | 2500 | 10 | 2600 | | | √ | √ | √ |
| 130st_m15015 | 24 | 1500 | 15 | 2300 | | | √ | | |
| 130st_m15025 | 25 | 2500 | 15 | 3800 | | | | √ | √ |
| 150st_m15025 | 26 | 2500 | 15 | 3800 | | | | √ | √ |
| 150st_m15020 | 27 | 2000 | 15 | 3000 | | | | √ | √ |
| 150st_m18020 | 28 | 2000 | 18 | 3600 | | | | √ | √ |
| 150st_m23020 | 29 | 2000 | 23 | 4700 | | | | √ | √ |
| 150st_m27020 | 30 | 2000 | 27 | 5500 | | | | | √ |
| 180st_m17215 | 31 | 1500 | 17.2 | 2700 | | | | √ | √ |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 180st_m19015 | 32 | 1500 | 19 | 3000 | | | | √ | √ |
| 180st_m21520 | 33 | 2000 | 21.5 | 4500 | | | | √ | √ |
| 180st_m27010 | 34 | 1000 | 27 | 2900 | | | | √ | √ |
| 220st_m67010 | 35 | 1000 | 67 | 1000 | | | | | √ |

# Chapter 2 wiring

## The system composition and wiring

### 2.1 Servo driver wiring diagram

**2.1.1**

**Wiring instructions**

## 2.1.2

Wiring matters needing attention:

- The wire material should be in accordance with the wire specification.
- Cable length, instruction cable within 3 m, encoder cable within 20 m
- Check the L1, L2, L3 power wiring is correct or not, please do not connect to the 380 v power supply.
- U, V, W terminal phase sequence, must be corresponded to the terminal correspondence of the motor, otherwise, the motor may not transfer or coaster, the motor may not transfer or coaster. Can't use exchange three-phase terminal method to make motor reversal, this is totally different with asynchronous motor
- Must be reliable grounding, and single point grounding
- Into the output signal of the relay, the absorption of the direction of the diode to connected correctly, otherwise it will cause failure cannot output signal
- In order to prevent noise caused by the wrong action, please add in power transformer and noise filter device in the same wiring tube
- Please install the fuse type circuit breaker that drive failure can promptly cut off the external power supply

## 2.1.3 Wire specifications

| terminals | symbol | wire specifications |
|---|---|---|
| ower cord | U、V、W | 0.75～2.5mm² |
| Motor terminals | | 0.75～2.5mm² |
| Earthing terminal terminal | | 0.75～2.5mm² |
| control symbol terminal | CN2 | **≥0.12** mm²(AWG26), Including shielded wire |
| Encoder signal terminal | CN3 | **≥0.12** mm²(AWG26), Including shielded wire |

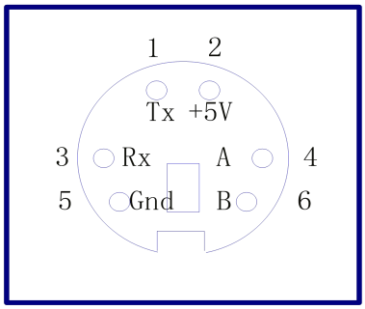
Encoder cable must use twisted-pair cable. If the encoder cable is too long (> twenty m), can lead to encoder power supply shortage, its power source and ground can use multiple wire connection or use thick wire

### 2.1.4 Terminal

| Name | Terminal symbol | Detailed description |
|---|---|---|
| Main circuit power | L1、L2、L3 | Connect the external ac power three-phase220VAC -15%～+10% 50/60Hz |
| Motor terminals | U | The output to motor U phase power |
| | V | The output to motor V phase power |
| | W | The output to motor W phase power |
| Earthing terminal | | Motor shell earthing terminal |
| | | Drive earthing terminal |

## 2.2 CN1 Communication interface

### 2.2.1 CN1 Port Numbers



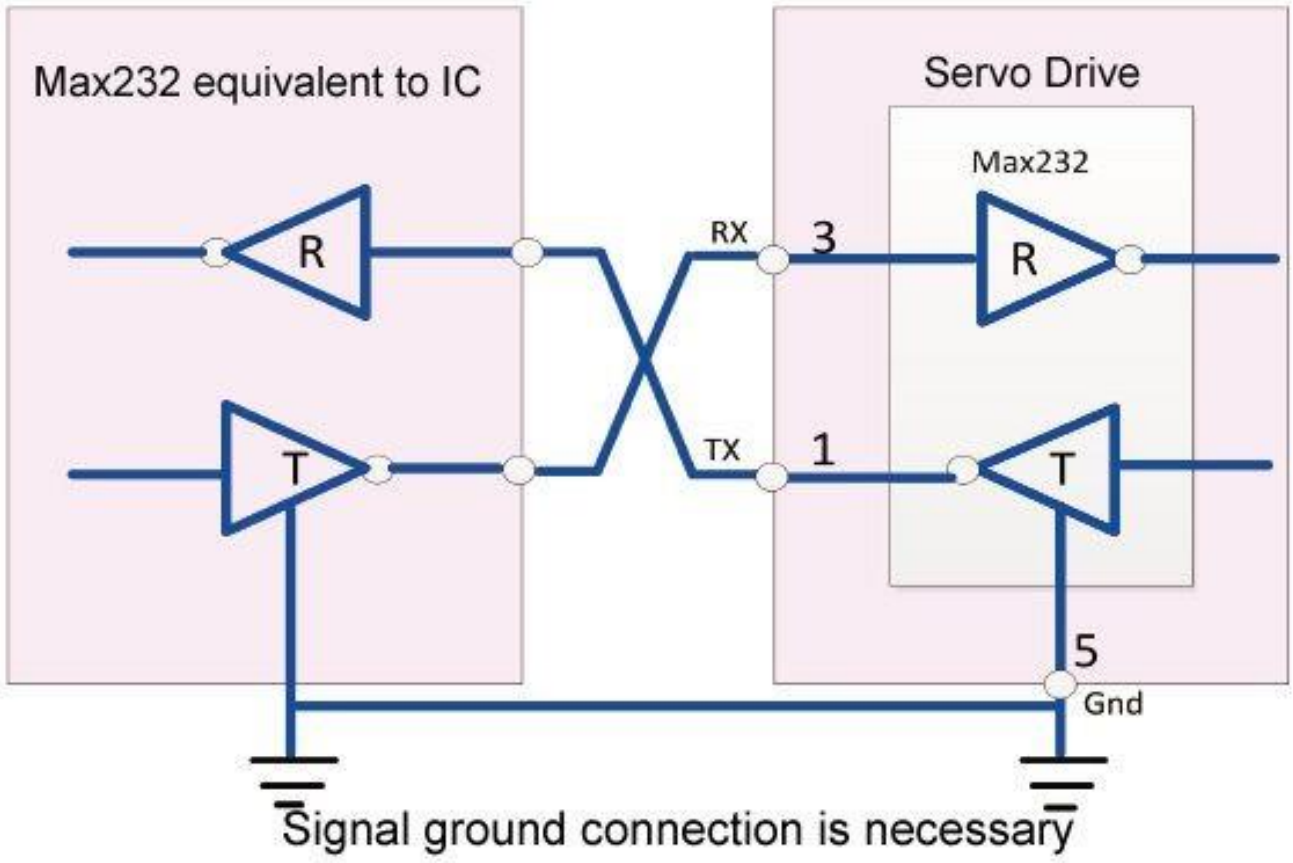

### 2.2.2 CN1 CN1 port

| pin | Number |
|---|---|
| +5V | 2 |
| GND | 5 |
| RS-232 发送引脚 Tx Send pin Tx | 1 |
| RS-232 接收引脚 Rx Receiving pin RX | 3 |
| RS-485 A | 4 |

| | |
|---|---|
| RS-485 B | 6 |

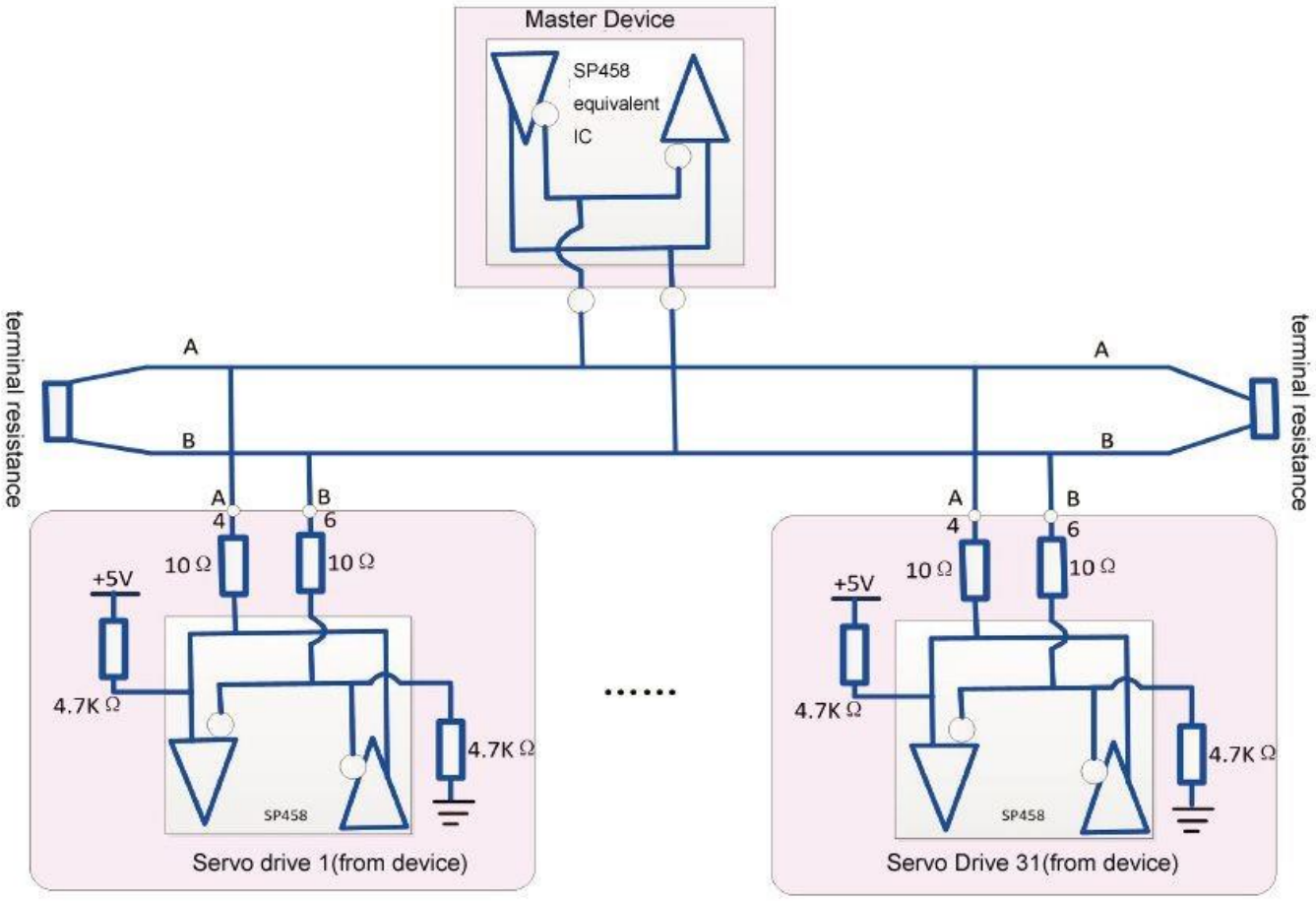
### 2.2.3 CN1 port type

### 1. RS-232 interface




### 2. RS-485 interface

●Adopt RS485 communication, at the same time the most connected and table servo drive, 485 network terminals separately by one euro 120 resistance terminal resistances. If want to connect more equipment, must use Repeaters to expand the connection Numbers




## 2.3 CN2 Control interface

CN2 control signal terminal to provide and the upper controller connection need signal, use DB25 socket, signs include:

●Four programmable input

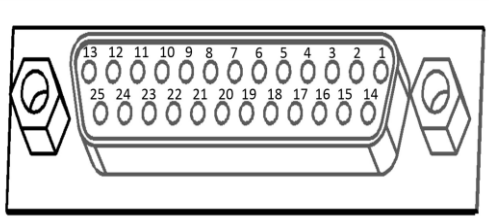
●Four programmable output

●Analog quantity order input

●Pulse command input

●Encoder signal input

### 2.3.1 CN2 port Numbers




### 2.3.2 CN2 port instructions

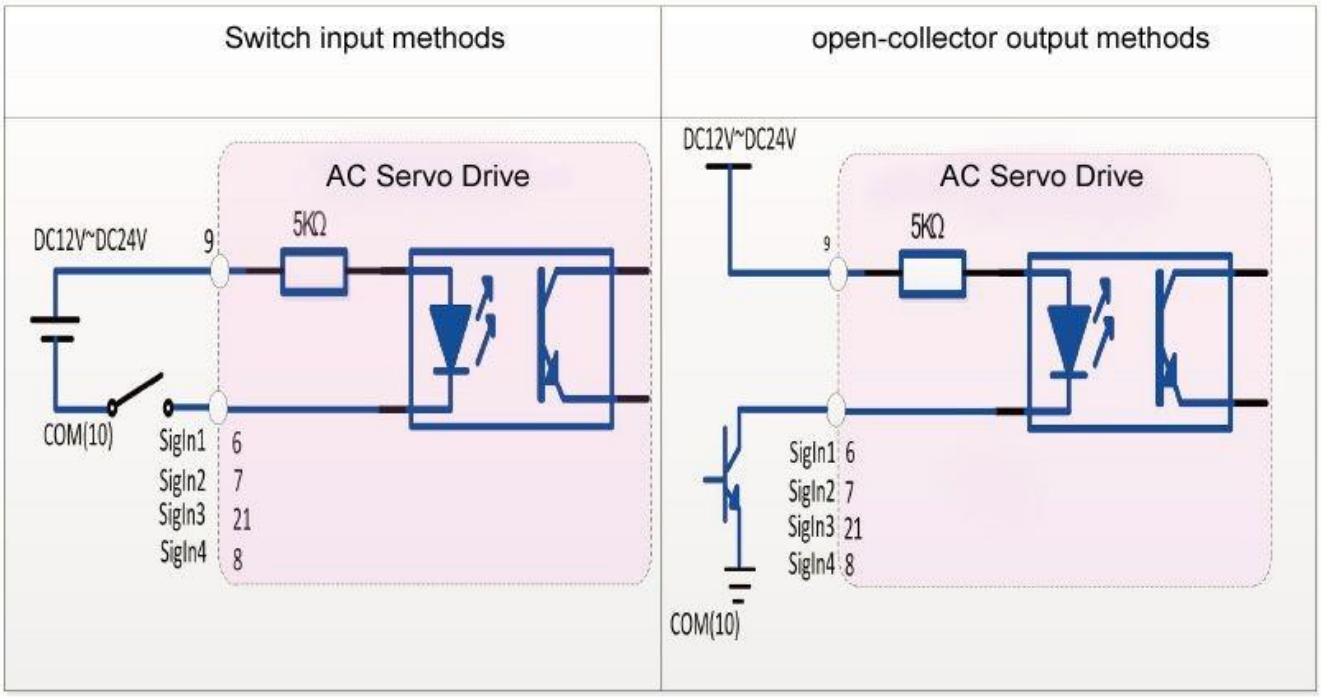
| pin | interface Number | Name | function |
|---|---|---|---|
| DC12~24V<br>COM | 9<br>10 | The control signal of power supply and ground | Input/output control signal input power and ground |
| SigIn1<br>SigIn2<br>SigIn3<br>SigIn4 | 6<br>7<br>21<br>8 | Input command signal | Input command signal. The factory all input signal port specified functions:<br>SigIn1: SRV-ON<br>SigIn2: alarm reset<br>SigIn3: Zero position deviation<br>SigIn4: Zero speed clamp |
| SigOUT1<br>SigOUT2<br>SigOUT3<br>SigOUT4 | 11<br>23<br>12<br>24 | output command signal | output command signal. The factory all port specified functions:<br>SigOUT1：Servo ready<br>SigOUT2：Alarm detection<br>SigOUT3：<br>SigOUT4：Positioningcomplete<br>Zero speed |

| | | | |
|---|---|---|---|
| PV<br>PP+<br>PPPD+<br>PD- | 2<br>3<br>14<br>4<br>5 | Instruction pulse input port | PV:open collector input power<br>Instruction pulse can be three different ways to input<br>1：Instruction direction and pulse input<br>2： Clockwise or counterclockwise pulse input<br>3： Phase difference 90 degrees of orthogonal input |
| PA+<br>PAPB+ | 20<br>19<br>18 | Encoder signal output | Encoder signal (ABZ) output port.<br>Through the parameter setting, AB |
| PBPZ+<br>PZ-<br>OZ<br>GND | 17<br>15<br>16<br>22<br>1 | | signal separable frequency output and logic take back output. |
| Vref<br>AGND | 25<br>13 | Analog input | Analog voltage input port. The speed or torque control, used for receiving the speed or torque command. Voltage input range-10V~+10V。 |

### 2.2.3 CN2 Port type

## 1. Digital input interface

Digital input interface circuit by switch, relay, open collector triode, photoelectric coupler of control. Relay required to choose low current relay, in order to avoid the phenomenon of poor contact. External voltage range DC12V ~ 24 V.

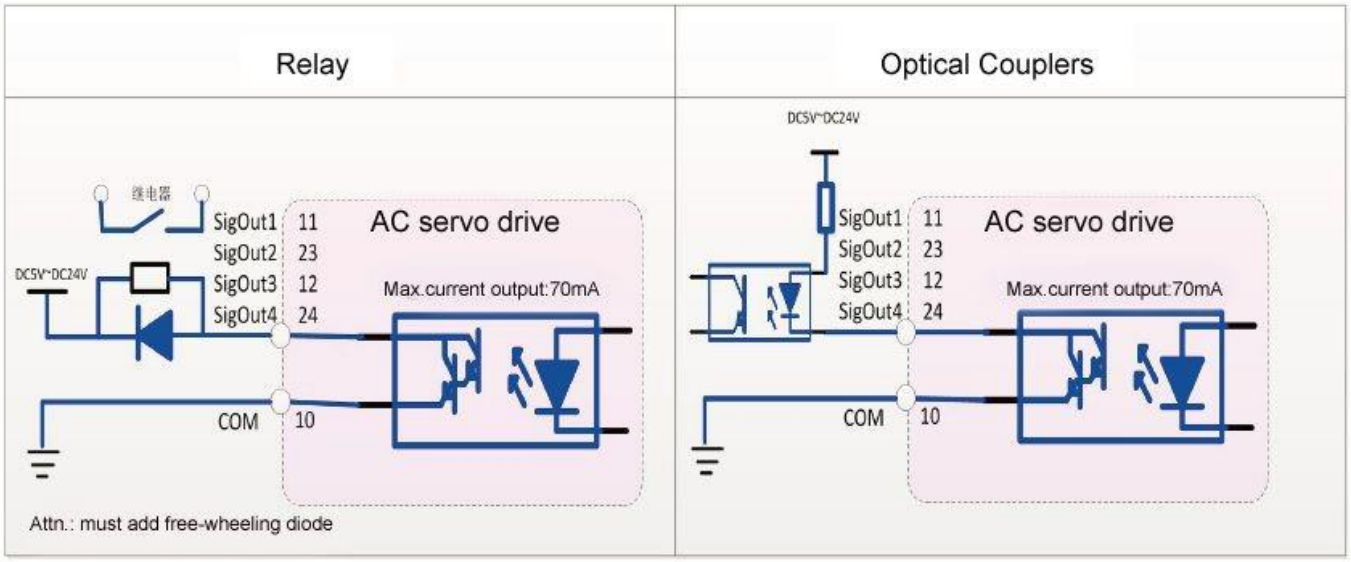



## 2. Digital output interface

Output circuit adopts darlington photoelectric coupler, but with relay, photoelectric coupler

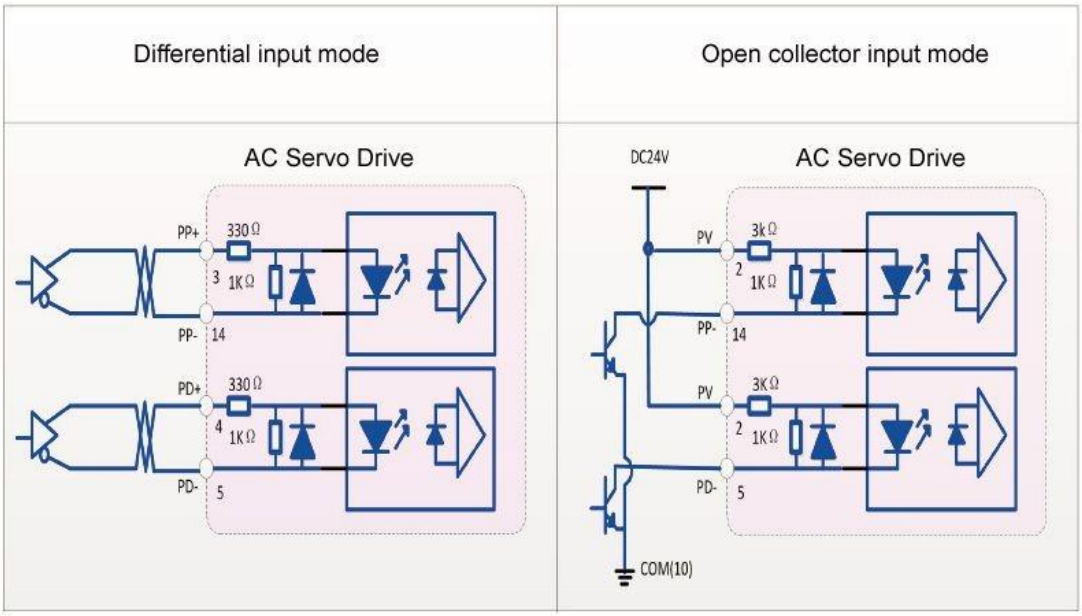
Note:

●External power supply by users, but must pay attention to, if the power polarity meet back, may cause damage to the servo driver.
●When the output open collector form, the maximum current is 70 mA, the external power peak voltage is 25 V. If more than limit requirements or output directly with power connection, may cause damage to the servo driver. ●If the load is relay and inductive load, the load must be both ends against parallel fly-wheel diode. If fly-wheel diode picks back, may cause damage to the servo driver.




## 3. Position pulse command interface

A differential drive and single end drive have two connections, recommend differential drive connection. Connection appropriate USES twisted-pair cable




●In the differential input mode, it is recommended AM26LS31 similar line drive; In order to make the transfer of pulse data has good anti-interference ability, it is suggested that the differential drive way; Maximum input pulse frequency 500 KHZ (KPPS).

●In the open collector input mode, the maximum input pulse frequency 200 KHZ (KPPS)

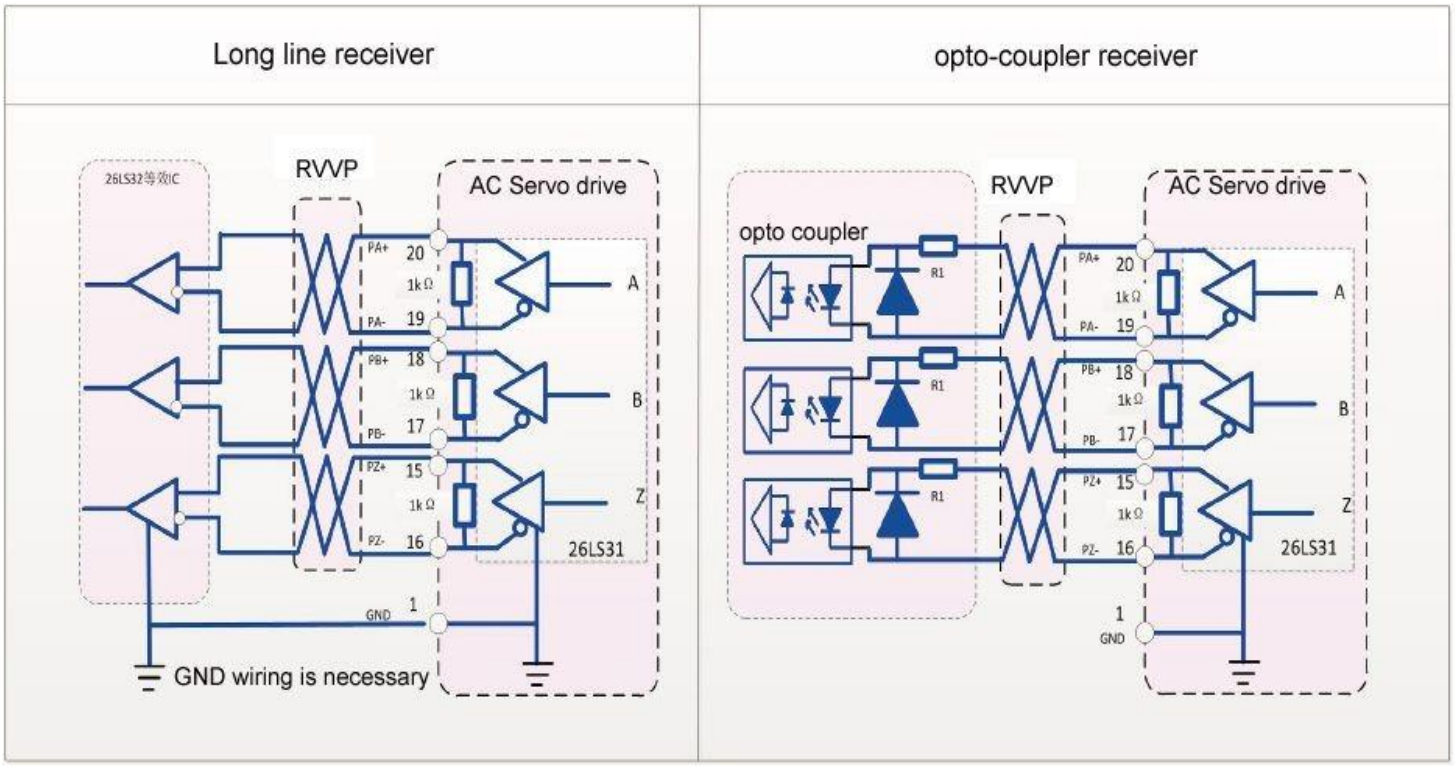
## 4. Encoder signal wire drive output

The encoder signal frequency division through line drive (26 ls31) output to the upper controller

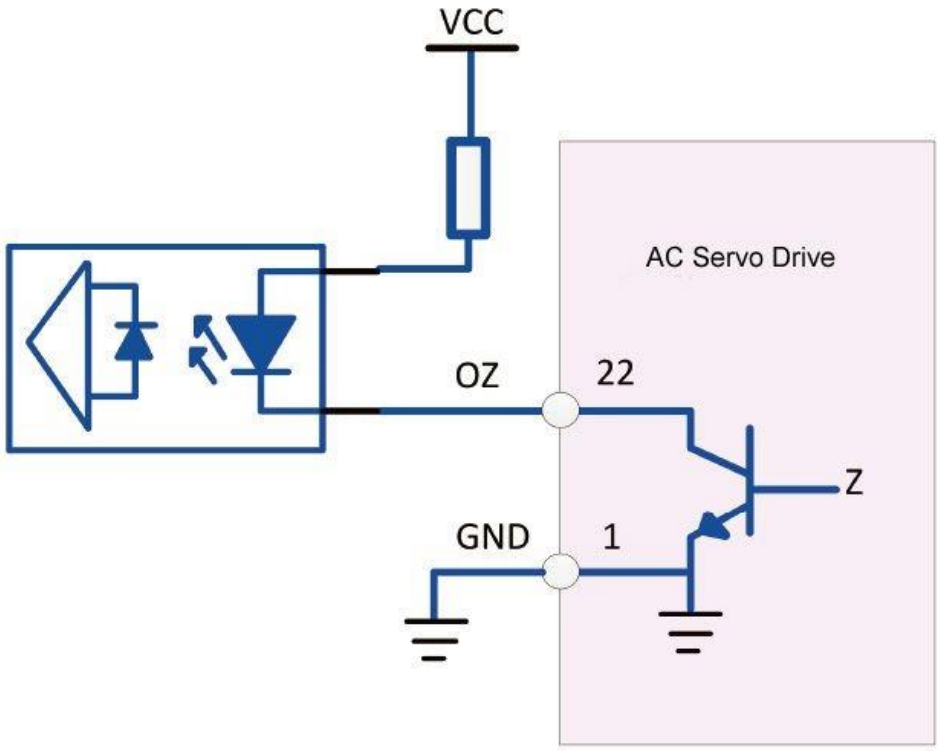
● In the long term receiver receive, the drive encoder signal (GND) must and upper controller signal ground connection.

● In the photoelectric coupler receiving, upper controller using high-speed photoelectric coupler (such as 6 n137), current limiting resistor R1 value about 220 Ω.

## 5. Encoder Z signal open collector output




Servo drives to open collector mode on the output signal of the encoder Z. Because Z letter feel the pulse width is narrower, PC please use high-speed photoelectric coupler receiving




- VCC peak voltage 30 V, output current maximum 50mA

## 2.4 **CN3** Encoder interface

Connect the servo motor encoder signal to CN3 of the servo driver.

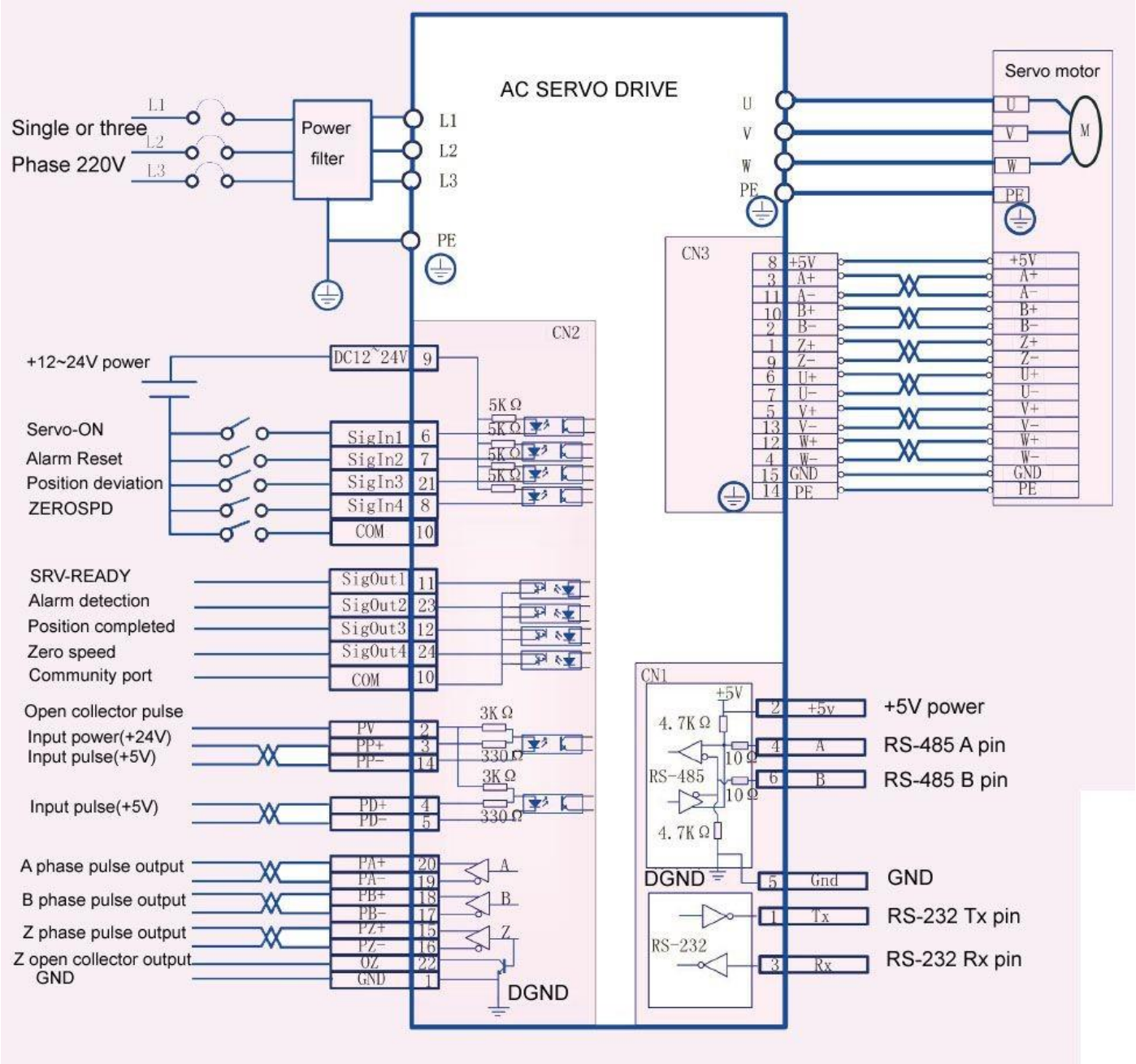
| pin | CN3 Number |
|---|---|
| +5v | 8 |
| GND | 15 |
| A+ | 3 |
| A- | 11 |
| B+ | 10 |

| | |
|---|---|
| B- | 2 |
| Z+ | 1 |

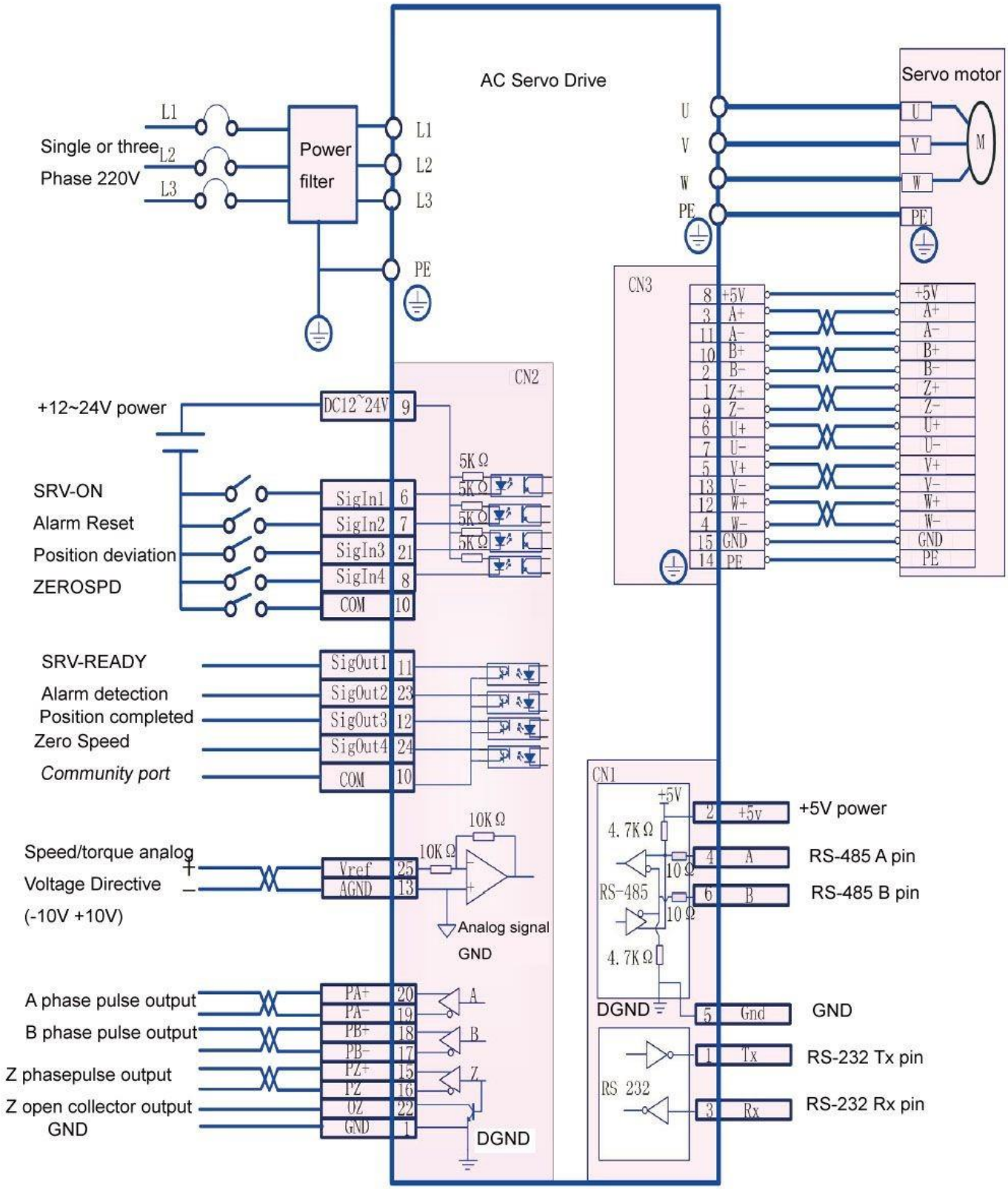
| | |
|---|---|
| Z- | 9 |
| U+ | 6 |
| U- | 7 |
| V+ | 5 |
| V- | 13 |
| W+ | 12 |
| W- | 4 |
| PE | 14 |

## 2.3 Standard connection 2.3.1

### Position control wiring diagram

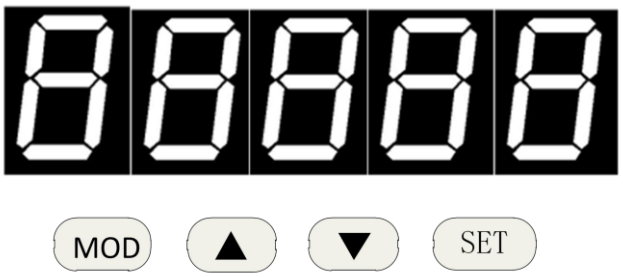


### 2.3.2 Speed, torque control wiring diagram



# Chapter 3 Panel operation

## 3.1 panel

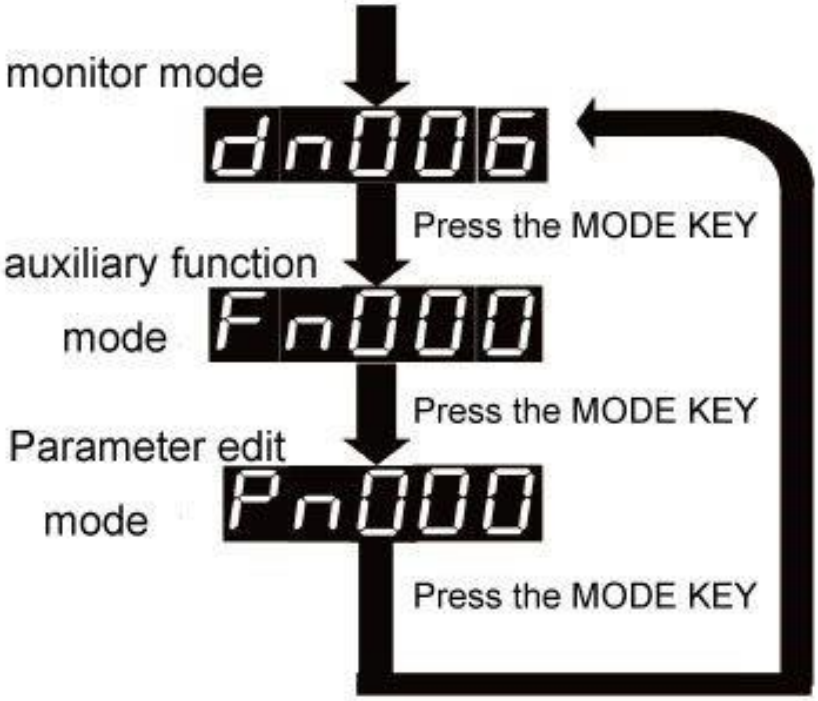



Panel instruction:

| Key | Key Name | Function |
|---|---|---|
| MODE | Mode option key | 1 mode switch<br>2 Return to the superior directory |
| ▲ | Digital increase key | increase Number,long press has the effect of repeat |
| ▼ | Digital reduce key | reduce Number,long press has the effect of repeat |
| SET | Confirmation Key | 1 Digital shift<br>2 Determine the set (long by 1 second)<br>3 End set parameters (long by 1 second) |

Note: if the five decimal points of the display are flashing, there are some alarm.Must clear the alarm,the drive can work normally.

## 3.2 mode switch




Note: when the screen shows Fnxxx, Dnxxx, Pnxxx, mode key at this time as the mode switching function, can be to switched to other

**Monitoring mode operation**

mode directly, otherwise the mode key is as the function of returnning to the upper directory.

## 3.3

Example: see dn015 monitoring parameters, sigOut1 port at this time as the low level, sigOut2, sigOut3, sigOut4 port are the high levels



**Auxiliary mode operation**

## 3.4


**Auxiliary function list**

Auxiliary mode function Number

### 3.4.1

| Number | Instruction |
|---|---|
| Fn000 | Alarm record inquires |
| Fn001 | Permanently written to the user parameters. If users set the parameters of Pn000 ~ Pn219, For the next after power on, the drive is loaded the modify parameters by the user, xecuting, need about 3 seconds, the block to write all the parameters into the EEPROM you must perform this operation, the parameter block write internal EEPROM chip. After e |
| Fn002 | JOG Trial operation |
| Fn003 | clear the current detection alarm |
| Fn004 | The parameters of the parameter in the table Pn000 ~ Pn219, according to the setting of Pn000, restore to factory default |

| | |
|---|---|
| Fn005 | Zero position deviation |
| Fn006 | SigOut all ports to cancel compulsory state<br>SigOut port output force, effectively under the forced state is limited to this operation<br>0： 1<br>：<br>2 SigOut all ports output high level ：<br>SigOut all ports output low level |
| Fn007 | Simulation of torque command voltage correction |
| Fn008 | Simulation speed reference voltage correction |
| Fn009 | Busbar voltage correction |
| Fn010 | Temperature calibration |
| Fn011 | Initialization alarm record |

**Alarm function query**

| | |
|---|---|
| Fn012 | encoder zero |

### 3.4.2 Fn000

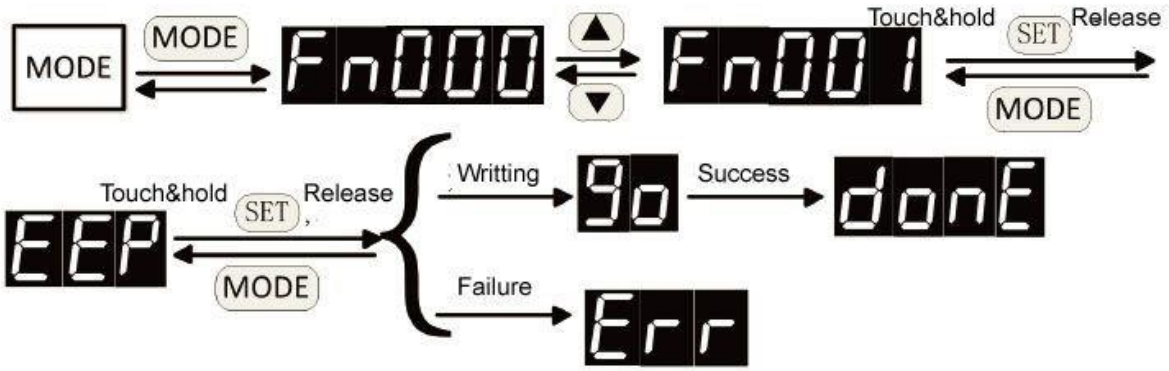
[

Touch

**Permanently written to the user parameters**

Instructions 1: if the last operation shows , may be internal drive is writing data operations performed, please wait a few seconds

### 3.4.3 Fn001

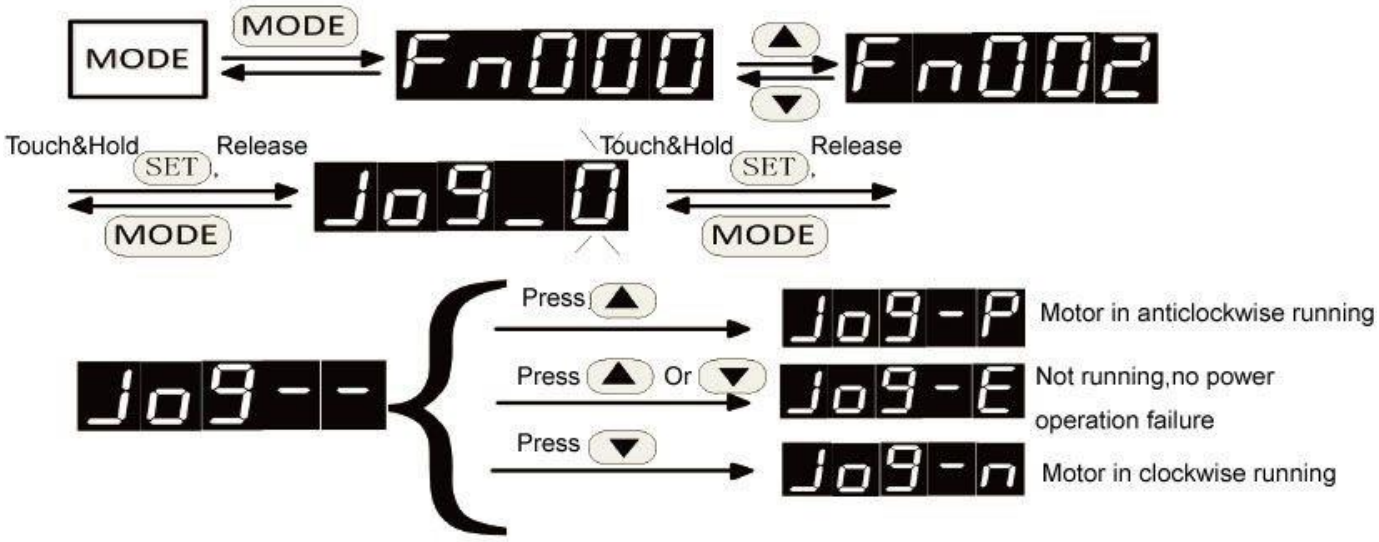



and try again

2: Power outages after write  completint, otherwise may cause memory chip content damage (AL - 01 alarm) after the reboot,

### 3.4.4 Fn002 Trial operation

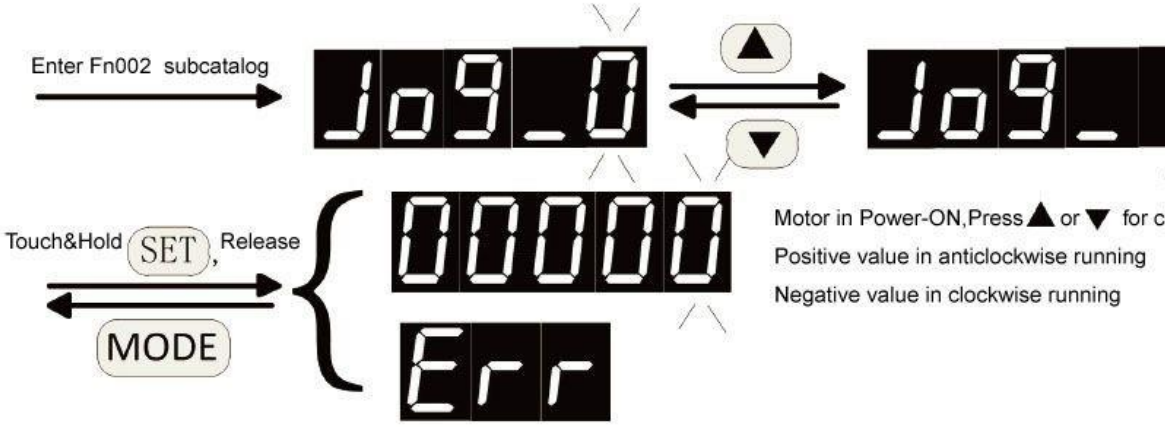
0： Inching mode



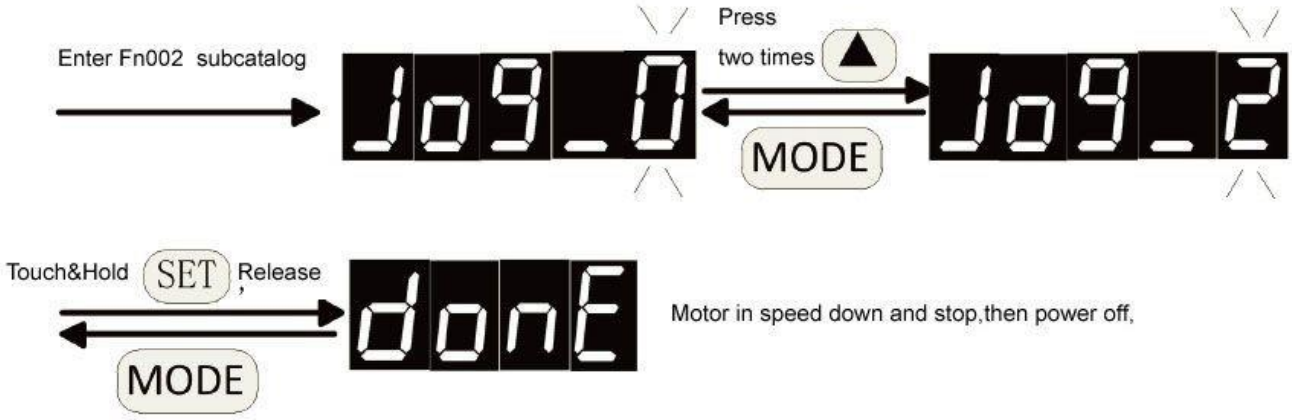

JOG The speed and deceleration time is set by the following parameters

| | | | | |
|---|---|---|---|---|
| Pn177 | JOG speed | 0~5000 | 200 | r/min |
| Pn178 | JOG speed time | 5~ 10000 | 100 | ms |
| Pn179 | JOG deceleration time | 5~ 10000 | 100 | ms |

1： Into speed control mode




2： Exit speed control mode




| Operation mode | Instruction |
|---|---|
| 0 | Inching mode. Press ▲ or ▼ button, the motor will be clockwise or counterclockwise rotation; release ▲or ▼ button, the motor will cease to spin, in a state of no electricity |
| 1 | Electricity into speed control mode, the motor. Drive at a speed loop model, running speed by ▲ or ▼ input. In the process of the buttons motor running, the other menu operations can be performed. If the motor stop rotating, please enter Jog_2 |

| | |
|---|---|
| | mode |
| 2 | Exit speed control mode, the motor is power off |

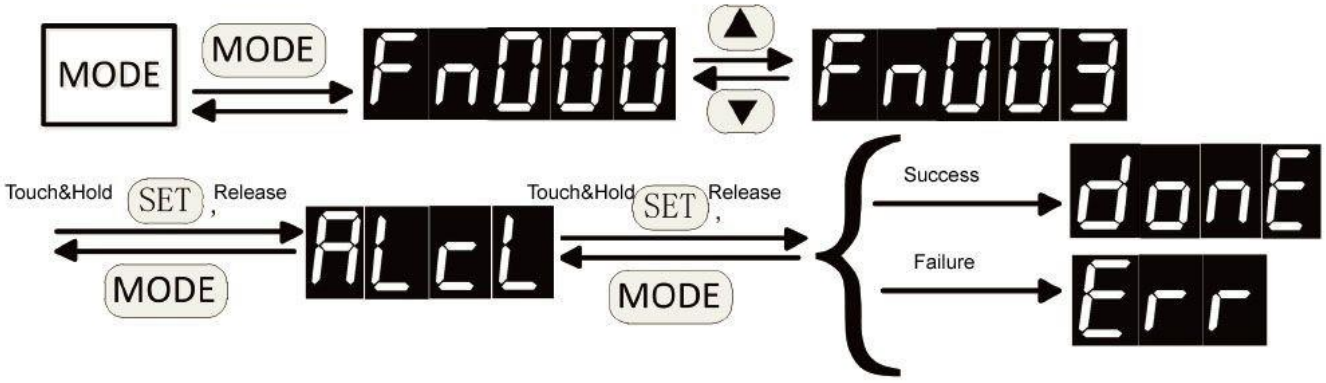
The motor is in the state of enabling or rotating. JOG trial run before operation, the motor must be in a non-working state. when

Note: if the display Jog-E or Err, the possible reasons are as follows:

1： commissioning,the control interface of the servo drive don't be connected to any control lines.

2 Servo driver alarm has occurred, and the alarm is not cleared. ：

### 3.4.5 Fn003 Alarm clearance operations



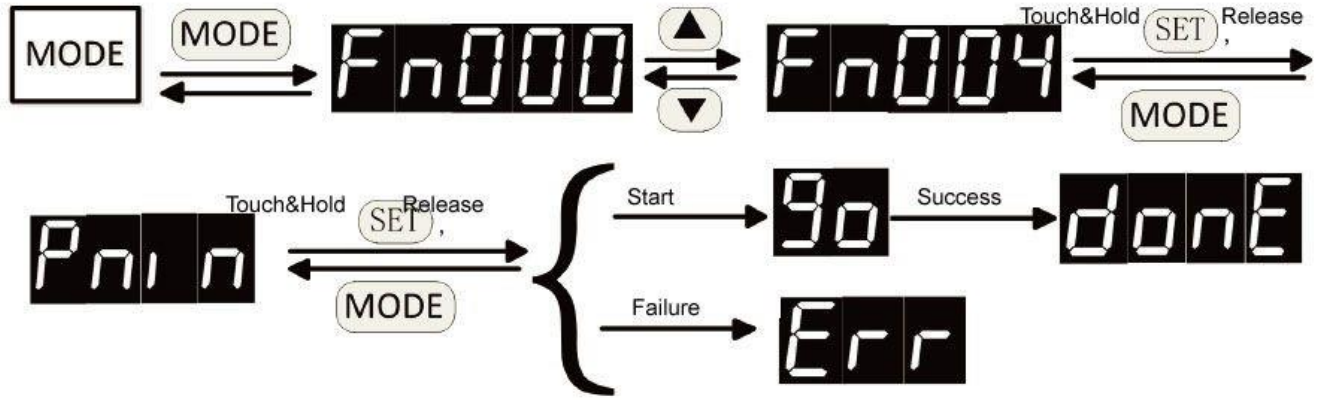

**Note:When the clearance is failure in finally,display Err ,the Checked out alarm can be cleared only after power on again**

| Through the clear operation to clear the alarm | | Electricity can remove alarm again | |
|---|---|---|---|
| AL--02 | Low voltage | AL--01 | Storage anomaly |
| AL--05 | Overload 1 | AL--03 | overvoltage |
| AL--07 | Motor speed is too high | AL--04 | Intelligent power module is abnormal |

| | | | |
|---|---|---|---|
| AL--08 | Heat sink is overheating | AL--06 | Overload 2 |
| AL--10 | Pulse frequency is too high | AL--09 | The encoder abnormal |
| AL--11 | Pulse position deviation value is too large | AL--13 | The CPU internal fault |
| AL--12 | Current sampling circuit may be damaged | AL--17 | The encoder signal frequency division output Settings abnormal |
| AL--14 | Emergency stop | AL--18 | impeoper motor code setting abnormal |
| AL--15 | driving ban Abnormal | | |

| | | | |
|---|---|---|---|
| **Initialization parameters** | | | |
| AL--16 | Brake average power overload | | |

### 3.4.6 Fn004




**Instructions 1: if the last operation display Err, the possible reason as following:**

1 Drives are executing write operations :

Parameters Pn000 doesn't open the parameters initialization

function

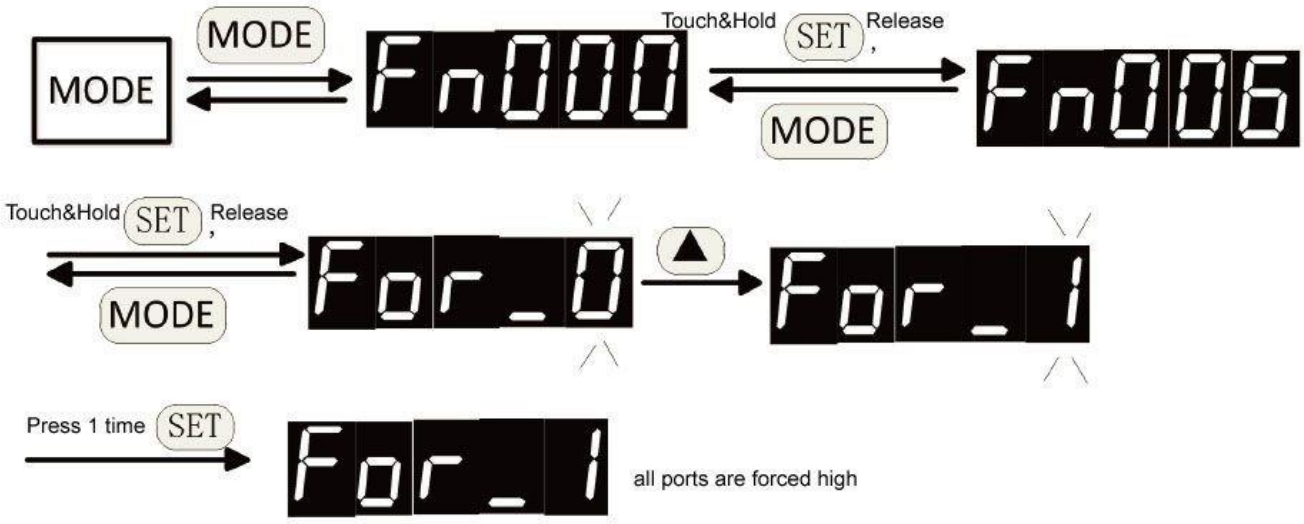
2: Instructions

2: must turn off the power after completing the wirting, otherwise ,after the reboot, may cause memory chip content damage

(AL - 01 alarm)

### 3.4.7 Fn005 Clear operation position deviation

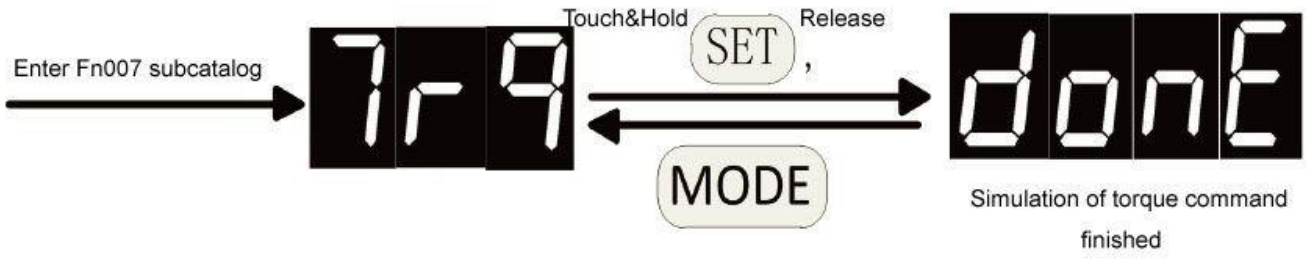

### 3.4.8 Fn006 The output port is mandatory




| Parameter selection | instructions |
|---|---|
| 0 | Cancel the forced state |
| 1 | all sigoutall ports are forced high |
| 2 | all sigoutall ports are forced low |

### 3.4.9 Fn007

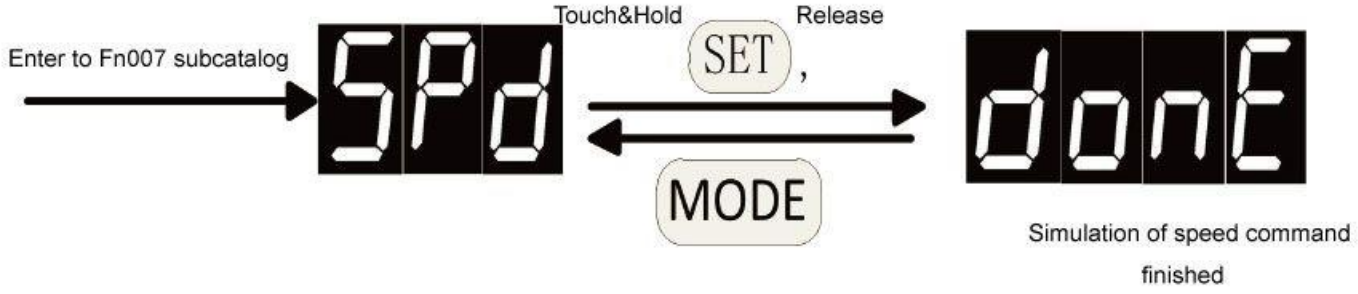
**Simulation of torque command voltage correction**




Note 1: before correcting operation, first direct short the CN2 analog voltage input port Vref (25 feet) and AGND circuit (13 feet)

**Simulation speed command voltage correction**

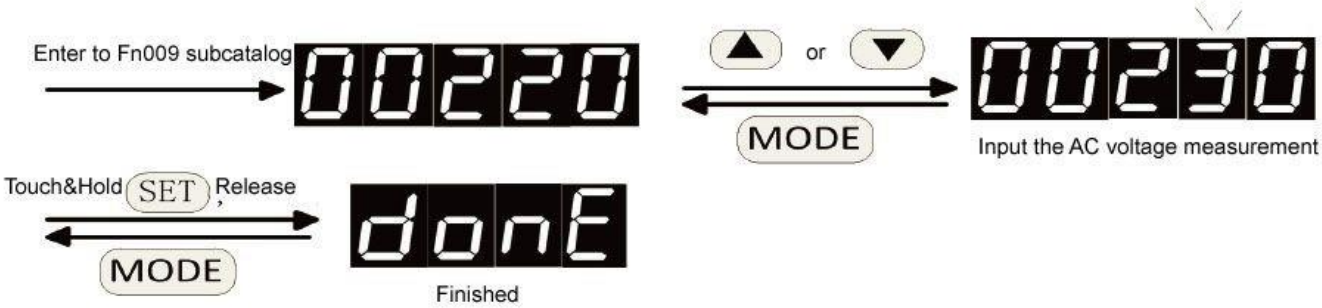
### 3.4.10 Fn008




Note 1: before correcting operation, first direct short the CN2 analog voltage input port Vref (25 feet) and AGND circuit (13 feet)

**Busbar voltage correction**

### 3.4.11 Fn009



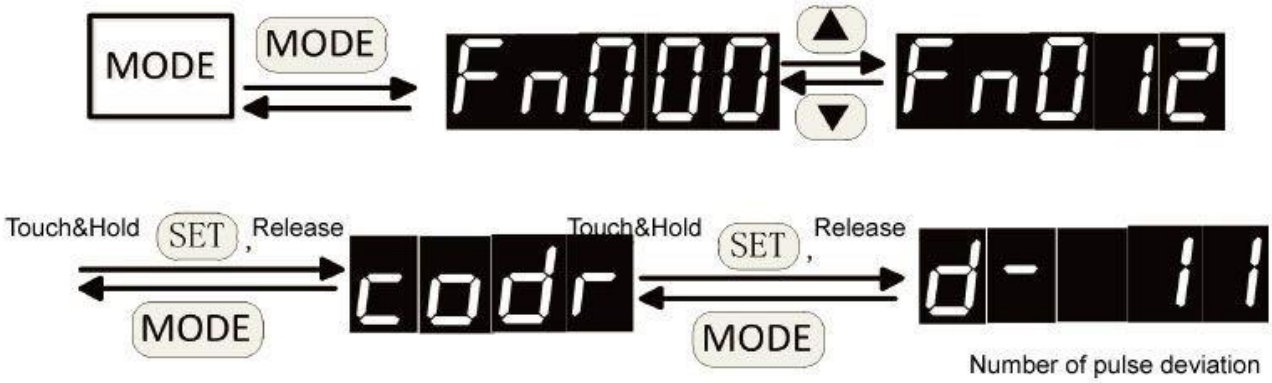
Note 1: when making correction, measurement drive input ac voltage, input to this operation.

### 3.4.12 Fn010 温度校正 The calibration temperature


Note 1: before the operation, the temperature sensor is replaced with 1.5 K high precision resistor.

### 3.4.13 Fn011 Alarm record initialization


### 3.4.14 Fn012 The encoder zero



Zero before operation, confirm the motor code Pn001 set value and the actual motor model is consistent, otherwise may lead to motor current is too large, damage the motor. Adjust zero, don't need can make internal or external can make the motor, the motor will turn a few laps, and then lock the zero. When the display Number of pulse deviation to 0, the motor has been aimed at zero

Note 1: if the motor heating, cooling for a period of time

## 3.5 User parameter mode operation

Parametric model

unction Number

**Choose parameter Number**

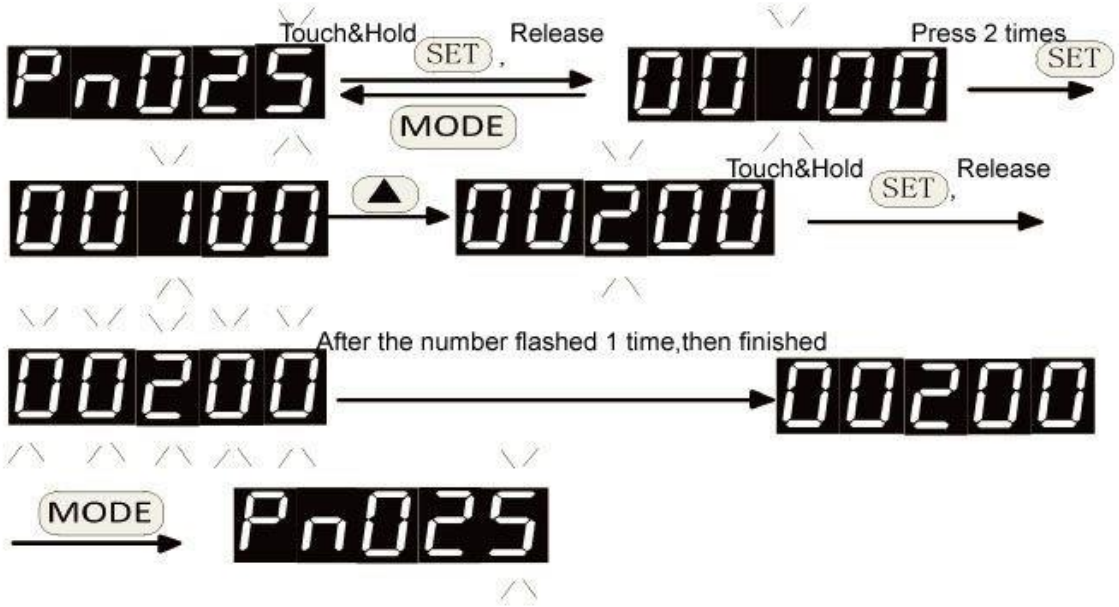
### 3.5.1

Example: select Pn011 parameters

Pres

### 3.5.2 Edit parameters

Example: change the current value of the Pn025 parameters from 100 to 200, the specific operation is as follows:




Note: Pn025 parameters are modified, if it does not have to save operation (Fn001 immortalised), after the next to electricity, Pn025 parameters still for 100.



# Chapter 4 function parameters

## 4.1 Parameter list

In the column of Numbers, if any symbols ▲, said after the parameter Settings, be it with electricity, can take effect; If symbol ◆, said after the parameter Settings, to enable motor, parameters take effect; If no special symbols, effective immediately

## 4.2

- The column of applicable mode, All said is suitable for the torque, speed and position control, T is suitable for the torque control, S suitable for speed control, said P is suitable for the position control.

- Must set parameters carefully. If setting undeserved, may cause the motor running is not stable

### 4.2.1 System parameters

| Number | Meanning | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn000 | Open parameters initialization function | 0~2 | 1 | | All |
| Pn001▲ | motor code | 3-12 | 3 | | All |
| Pn002▲ | control mode | 0~5 | 2 | | All |
| Pn003 | Servo enabled | 0~1 | 0 | | All |
| Pn004 | Servo broken that can stop | 0~2 | 0 | | All |
| Pn005 | Can make deceleration time | 5-10000 | 100 | ms | All |
| Pn006 | With/without positive driving is prohibited | 0-3 | 0 | | All |
| Pn007 | Is/ reverse the driver stop deceleration time is prohibited | 0-10000 | 60 | ms | All |
| Pn008 | Internal around are torque limit (CCW) | 0-300 | 300 | % | All |
| Pn009 | Around inside the torque limit (the CW) | -300~0 | -300 | % | All |
| Pn010 | External around are torque limit (CCW) | 0-300 | 300 | % | All |
| Pn011 | Around outside the torque limit (the CW) | -300~0 | -300 | % | All |
| Pn012 | Forward (CCW) torque overload alarm level 1 | 0-300 | 200 | % | All |
| Pn013 | Inversion (the CW) torque overload alarm level 1 | -300-0 | -200 | % | All |
| Pn014 | Torque overload alarm detection 1 time | 0-800 | 80 | 100ms | All |
| Pn015 | Overload 2 testing time | 0-150 | 40 | 100ms | All |
| Pn016▲ | DA The molecular DA of encoder divider output | 1~63 | 1 | | All |
| Pn017▲ | DB The denominator DB of encoder divider output | 1~63 | 1 | | All |

| | | | | | |
|---|---|---|---|---|---|
| Pn018▲ | Take the encoder output pulse AB phase logic | 0-1 | 0 | | All |
| Pn019▲ | Rated current Settings | 0-50 | 0 | A | All |
| Pn020▲ | Rated speed setting | 0~5000 | 0 | r/min | All |
| Pn021 | reach the predetermined speed | 0~5000 | 500 | r/min | All |

| | | | | | |
|---|---|---|---|---|---|
| Pn022 | Hysteresis comparison difference in speed | 0~5000 | 30 | r/min | All |
| Pn023 | Reach the predetermined speed detection direction | 0-2 | 0 | | All |
| Pn024 | Reach the predetermined torque | 0-300 | 100 | % | All |
| Pn025 | Reach the predetermined torque hysteresis comparison difference | 0-300 | 5 | % | All |
| Pn026 | Reach the predetermined torque direction | 0-2 | 0 | | All |
| Pn027 | Zero speed detection range setting | 0~1000 | 10 | r/min | All |
| Pn028 | Zero speed test back to the poor | 0~1000 | 5 | r/min | All |
| Pn029 | Motor electromagnetic brake testing point zero speed | 0~1000 | 5 | r/min | All |
| Pn030 | The motor stops electromagnetic brake delay time | 0~2000 | 0 | Ms | All |
| Pn031 | The motor electromagnetic brake waiting time during operation | 0~2000 | 500 | ms | All |
| Pn032 | The motor speed of electromagnetic brake action during operation | 0-3000 | 30 | r/min | All |
| Pn033 | The origin is triggered | 0~3 | 0 | | All |
| Pn034 | The origin return reference point model | 0~5 | 0 | | All |

| | | | | | |
|---|---|---|---|---|---|
| Pn035 | The origin back to the origin model | 0~2 | 0 | | All |
| Pn036 | The origin position offset high | -9999~9999 | 0 | Pulse | All |
| Pn037 | The origin position offset low | -9999~9999 | 0 | Pulse | All |
| Pn038 | The origin back to the first speed | 1~3000 | 200 | R/min | All |
| Pn039 | The origin back to the second speed | 1~3000 | 50 | R/min | All |
| Pn040 | The accelerating time of origin | 5~10000 | 50 | ms | All |
| Pn041 | The origin return to slow down time | 5~10000 | 50 | ms | All |
| Pn042 | The origin in the delay | 0~3000 | 60 | ms | All |
| Pn043 | Complete signal delay of origin | 5~3000 | 80 | ms | All |
| Pn044 | The origin of origin instruction execution mode | 0~1 | 0 | | All |
| Pn045 | Gain switch to choose | 0~5 | 5 | | All |
| Pn046 | Gain switch level | 0~30000 | 80 | | All |
| Pn047 | Gain switch back to the poor | 0~30000 | 6 | | All |
| Pn048 | Gain switch delay time | 0~20000 | 20 | 0.1ms | All |
| Pn049◆ | Gain switch time 1 | 0~15000 | 0 | 0.1ms | All |
| Pn050◆ | Gain switch time 2 | 0~15000 | 50 | 0.1ms | All |
| Pn051 | The motor running top speed limit | 0~5000 | 3000 | | All |
| Pn052▲ | SigIn1 port functional allocation | -27~27 | 1 | | All |
| Pn053▲ | SigIn 2 port functional allocation | -27~27 | 2 | | All |
| Pn054▲ | SigIn 3 port functional allocation | -27~27 | 19 | | All |
| Pn055▲ | SigIn 4 port functional allocation | -27~27 | 8 | | All |

| | | | | | |
|---|---|---|---|---|---|
| Pn056 | SigIn 1 port filtering time | 1~1000 | 2 | ms | All |
| Pn057 | SigIn 2 port filtering time | 1~1000 | 2 | ms | All |
| Pn058 | SigIn 3 port filtering time | 1~1000 | 2 | ms | All |
| Pn059 | SigIn 4 port filtering time | 1~1000 | 2 | ms | All |
| Pn060▲ | SigOut 1 port functional allocation | -14~14 | 2 | | All |
| Pn061▲ | SigOut 2 port functional allocation | -14~14 | 1 | | All |
| Pn062▲ | SigOut 3 port functional allocation | -14~14 | 4 | | All |
| Pn063▲ | SigOut 4 port functional allocation | -14~14 | 7 | | All |
| Pn064▲ | Communication mode | 0-2 | 0 | | All |
| Pn065 | Communications site | 1-254 | 1 | | All |
| Pn066▲ | Communication baud rate | 0-3 | 1 | | All |
| Pn067▲ | Communication mode setting | 0-8 | 8 | | All |
| Pn068 | Input function control mode select register 1 | 0~32767 | 0 | | All |
| Pn069 | Input function control mode select register 2 | 0~4095 | 0 | | All |
| Pn070 | Input function logic state set register 1 | 0~32767 | 32691 | | All |
| Pn071 | Input function logic state set register 2 | 0~4095 | 4095 | | All |
| Pn072 | Internal use | | | | |
| Pn073 | Internal use | | | | |
| Pn074 | Fan function temperature | 30~70 | 50 | ℃ | All |
| Pn075 | Fan operation mode | 0~2 | 0 | | All |
| Pn076 | Emergency stop reset (EMG) | 0-1 | 0 | | All |

| | | | | | |
|---|---|---|---|---|---|
| Pn077 | Positive and negative driving ban checked out | 0-2 | 0 | | All |
| Pn078 | Lack of voltage detection | 0~1 | 1 | | All |
| Pn079 | The system status display project selection | 0-23 | 0 | | All |
| Pn080▲ | The encoder to choose | 0~0 | 0 | | All |
| Pn081 | User preferences permanent write operation | 0-1 | 0 | | All |
| Pn082 | SigOut port force output | 0 | 0~255 | | All |
| Pn083 | Low pressure alarm detect amplitude | 50~280 | 200 | V | All |
| Pn084 | High pressure alarm detect amplitude | 290~380V | 365 | V | All |
| Pn085▲ | Motor pole logarithmic | 1~100 | 4 | 对 | All |
| Pn086 | Renewable circuit discharge cycle | 0~2000 | 70 | ms | All |

**Position control parameters**

| | | | | | |
|---|---|---|---|---|---|
| Pn087pn095 | Internal use | - | - | - | - |

**4.2.2**

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn096▲ | The command pulse input mode | 0-2 | 0 | | P |
| Pn097▲ | Instruction selection logic pulse input direction | 0-1 | 0 | | P |
| Pn098 | Pulse electronics gear than the molecules of 1 | 1~32767 | 1 | | P |
| Pn099 | Pulse electronics gear than the molecules of 2 | 1~32767 | 1 | | P |

| | | | | | |
|---|---|---|---|---|---|
| Pn100 | Pulse electronics gear than the molecules of 3 | 1~32767 | 1 | | P |
| Pn101 | Pulse electronics gear than the molecules of 4 | 1~32767 | 1 | | P |
| Pn102▲ | Pulse electronics gear than the denominator | 1~32767 | 1 | | P |
| Pn103 | Beyond the scope of setting position deviation | 1~ 500 | 500 | Thousand pulse | P |
| Pn104 | Complete range set position location | 0~ 32767 | 10 | pulse | P |
| Pn105 | Positioning to complete set | 0~ 32767 | 3 | pulse | P |
| Pn106 | Position location close to the range of Settings | 0~ 32767 | 300 | pulse | P |
| Pn107 | Position location close to the poor set back | 0~ 32767 | 30 | pulse | P |
| Pn108 | Position deviation clear way | 0-1 | 1 | | P |
| Pn109◆ | Position command deceleration mode | 0-2 | 1 | | P |
| Pn110◆ | Position command a filtering time constant | 5~1750 | 50 | ms | P |
| Pn111◆ | S-shaped filtering time constant Ta position instruction | 5~1200 | 50 | ms | P |
| Pn112◆ | position instruction Ts S-shaped filtering time constant Ts | 5~550 | 20 | ms | P |
| Pn113▲ | The position loop feedforward gain | 0-100 | 0 | % | P |

| | | | | | |
|---|---|---|---|---|---|
| Pn114▲ | Position loop feedforward filter time constant | 1-50 | 5 | ms | P |
| Pn115 | The position controller gain 1 | 5-2000 | 100 | % | P |
| Pn116 | The position controller gain 2 | 5-2000 | 100 | % | P |

| | | | | | |
|---|---|---|---|---|---|
| Pn117 | Position command source selection | 0~1 | 0 | | P |
| Pn118 | Internal position instruction suspend mode selection | 0~1 | 0 | | P |
| Pn119 | Internal position suspended deceleration time | 0~10000 | 50 | | P |
| Pn120 | Internal position 0 high pulse Number set up | -9999~9999 | 0 | ten thousand pulse | P |
| Pn121 | Internal position instruction 0 pulse Number low set | -9999~9999 | 0 | 个 a | P |
| Pn122 | Internal position instruction 1 pulse Number high set | -9999~9999 | 0 | ten thousand pulse | P |
| Pn123 | Internal position instruction 1pulse Number low set | -9999~9999 | 0 | a | P |
| Pn124 | Internal position instruction 2pulse Number high set | -9999~9999 | 0 | ten thousand pulse | P |
| Pn125 | Internal position instruction 2 pulse Number set low | -9999~9999 | 0 | a | P |

| | | | | | |
|---|---|---|---|---|---|
| Pn126 | Internal position instruction 3 pulse high setting | -9999~9999 | 0 | ten thousand pulse | P |
| Pn127 | Internal position instruction 3 pulse Number set low | -9999~9999 | 0 | a | P |
| Pn128 | Internal position command zero speed | 0~3000 | 100 | r/min | P |
| Pn129 | Internal position command 1 speed | 0~3000 | 100 | r/min | |
| Pn130 | Internal position command 2speed | 0~3000 | 100 | r/min | P |
| Pn131 | Internal position command 3 speed | 0~3000 | 100 | r/min | P |
| Pn132 | Torque/speed control switch to the position control | 0~1 | 0 | | P |
| Pn133 | Torque/speed control switch to the position control of the deceleration time | 5-10000 | 100 | ms | P |

**Speed control parameter**

| | | | | | |
|---|---|---|---|---|---|
| Pn134~ Pn145 | internal use | - | - | - | |

**4.2.3**

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|
| Pn146◆ | Speed instruction deceleration mode | 0~2 | 1 | | S |
| Pn147◆ | Speed instruction S curve and deceleration time constant Ts | 5~ 1500 | 80 | ms | S |

| | | | | | |
|---|---|---|---|---|---|
| Pn148◆ | Speed instruction S curve acceleration time constant of Ta | 5~ 10000 | 80 | ms | S |
| Pn149◆ | Speed instruction S curve deceleration time constant of Td | 5~ 10000 | 80 | ms | S |
| Pn150◆ | acceleration time constant | 5~30000 | 80 | ms | S |
| Pn151◆ | deceleration time constant | 5~30000 | 80 | ms | S |
| Pn152▲ | Speed detection filter time constant | 1~380 | 10 | 0.1ms | All |
| Pn153 | The speed regulator proportional gain 1 | 5~ 2000 | 100 | % | All |
| Pn154 | Speed regulator integral time constant of 1 | 5~ 2000 | 100 | % | All |
| Pn155 | The speed regulator proportional gain 2 | 5~ 2000 | 100 | % | All |
| Pn156 | Speed regulator integral time constant 2 | 5~ 2000 | 100 | % | All |
| Pn157▲ | Simulation speed instruction smoothing filtering time | 1~500 | 1 | 0.1ms | S |
| Pn158 | The directive gain simulation speed | 1~1500 | 300 | r/min/ V | S |
| Pn159 | Simulation speed instruction offset adjustment | -5000~5000 | mv | | S |
| Pn160 | Simulation speed instruction direction | 0-1 | 0 | | S |
| Pn161 | Simulation speed instruction to enforce zero range | 0~1000 | 0 | 10mv | S |
| Pn162 | Simulation speed instruction to enforce zero range limit | -1000~0 | 0 | 10mv | S |
| Pn163 | Zero speed clamp lock mode | 0-1 | | 0 | S |
| Pn164 | Zero speed clamp is triggered | 0~1 | | 0 | S |
| Pn165 | The clamp level zero speed | 0~200 | 6 | r/min | S |
| Pn166 | Zero speed clamp deceleration time | 5~10000 | 50 | ms | S |

| | | | | | |
|---|---|---|---|---|---|
| Pn167 | Internal position controller gain | 5~2000 | 100 | % | All |
| Pn168 | speed instruction source select | 0~1 | 0 | | S |
| Pn169 | Internal speed reference 1 | -5000-5000 | 0 | R/min | S |
| Pn170 | internal speed instruction 2 | -5000-5000 | 0 | R/min | S |
| Pn171 | Internal speed instruction 3 | -5000-5000 | 0 | R/min | S |
| Pn172 | Internal speed instruction 4 | -5000-5000 | 0 | R/min | S |
| Pn173 | Internal speed instruction 5 | -5000-5000 | 0 | R/min | S |
| Pn174 | Internal speed instruction 6 | -5000-5000 | 0 | R/min | S |
| Pn175 | Internal speed instruction 7 | -5000-5000 | 0 | R/min | S |
| Pn176 | Internal speed instruction 8 | -5000-5000 | 0 | R/min | S |
| Pn177 | JOG speed | 0~5000 | 200 | r/min | S |
| Pn178 | JOG speed up the time | 5~ 10000 | 100 | ms | S |
| Pn179 | JOG Deceleration time | 5~ 10000 | 100 | ms | S |

**Torque control parameters**

| | | | | | |
|---|---|---|---|---|---|
| Pn180~ Pn185 | Internal use | | | | |

**4.2.4**

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|
| Pn186 | Torque command deceleration mode | 0~1 | 0 | | T |
| Pn187▲ | torque instruction linear deceleration time constant | 1~30000 | 1 | ms | T |
| Pn188▲ | Analog torque instruction smooth filtering \ time | 1~500 | 1 | 0.1ms | T |
| Pn189 | \Analog torque instruction gain | 1-300 | 30 | %/V | T |

| | | | | | |
|---|---|---|---|---|---|
| Pn190 | Analog torque instruction offset \ adjustment | -1500~1500 | 0 | mv | T |
| Pn191 | \Simulation of torque command direction | 0-1 | 0 | | T |
| Pn192 | Q shaft torque regulator proportional gain is 1 | 5~ 2000 | 100 | % | All |
| Pn193 | Q shaft torque regulator integral time constant of 1 | 5~ 2000 | 100 | % | All |
| Pn194 | Proportional gain 2 Q shaft torque regulator | 5~ 2000 | 100 | % | All |
| Pn195 | Q shaft torque regulator integral time constant 2 | 5~ 2000 | 100 | % | All |
| Pn196 | Torque Q axis filter time constant of 1 | 1-500 | 1 | 0.1ms | All |
| Pn197 | Filtering time constant torque Q 2 | 1~500 | 1 | 0.1ms | All |
| Pn198 | Torque control speed limit | 0~4500 | 2500 | r/min | T |
| Pn199 | Source of limited torque control speed choice | 0~2 | 0 | | T |
| Pn200 | The internal torque 1 | -300~300 | 0 | % | T |
| Pn201 | The internal torque 2 | -300~300 | 0 | % | T |
| Pn202 | The internal torque 3 | -300~300 | 0 | % | T |
| Pn203 | The internal torque 4 | -300~300 | 0 | % | T |
| Pn204 | Torque command source | 0~1 | 0 | | T |
| Pn205 | D shaft torque regulator proportional gain | 5~2000 | 100 | % | All |

| | | | | | |
|---|---|---|---|---|---|
| Pn206 | D shaft torque regulator integral time constant | 5~2000 | 100 | % | All |
| Pn207 | Speed feedback adjustment coefficient | 1~3000 | 100 | | T |
| Pn208 | track torque instruction judgment error range 1 | 0~300 | 5 | % | T |
| Pn209 | tracking torque instruction judgment error range 2 | 0~300 | 2 | % | T |

**Extension parameters control**

| | | | | | |
|---|---|---|---|---|---|
| Pn210~ Pn219 | internal use | | | | |

**4.2.5**

## 4.3 Parameters

**System parameters**

**4.3.1**

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Open parameters initialization function

| | | | | | |
|---|---|---|---|---|---|
| Pn000 | Open parameters initialization function | 0~2 | 1 | | All |

◢ 0：

◢ 1： Allow to initialize to all parameters, but not initialized Pn001 code (motor), Pn159 (simulated speed instruction offset adjustment), Pn190 (analog torque instruction offset adjustment), and other parameter values

◢ 2：Allow to initialize all parameters

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Must set up the right motor type code, the motor can work normally. Drive model and motor model fit the table below

| | | | | | |
|---|---|---|---|---|---|
| Pn001▲ | Motor code | 3-12 | 3 | | All |

◢

| Motor model | Pn001 | Rated speed (r/min) | rated torque (N.M) | Rated power (W) | KRS 15A | KRS 20A | KRS 30A | KRS 50A | KRS 75A |
|---|---|---|---|---|---|---|---|---|---|
| 60st_m00630 | 0 | 3000 | 0.6 | 200 | √ | √ | √ | | |
| 60st_m01330 | 1 | 3000 | 1.3 | 400 | √ | √ | √ | | |
| 60st_m01930 | 2 | 3000 | 1.9 | 600 | √ | √ | √ | | |
| 80st_m01330 | 3 | 3000 | 1.3 | 400 | √ | √ | √ | | |
| 80st_m02430 | 4 | 3000 | 2.4 | 750 | √ | √ | √ | | |
| 80st_m03520 | 5 | 2000 | 3.5 | 730 | √ | √ | √ | | |
| 80st_m04025 | 6 | 2500 | 4 | 1000 | √ | √ | √ | | |
| 90st_m02430 | 7 | 3000 | 2.4 | 750 | √ | √ | √ | | |
| 90st_m03520 | 8 | 2000 | 3.5 | 730 | √ | √ | √ | | |
| 90st_m04025 | 9 | 2500 | 4 | 1000 | √ | √ | √ | | |
| 110st_m02030 | 10 | 3000 | 2 | 600 | √ | √ | √ | | |
| 110st_m04020 | 11 | 2000 | 4 | 800 | √ | √ | √ | | |
| 110st_m04030 | 12 | 3000 | 4 | 1200 | | √ | √ | | |
| 110st_m05030 | 13 | 3000 | 5 | 1500 | | | √ | | |
| 110st_m06020 | 14 | 2000 | 6 | 1200 | √ | √ | √ | | |
| 110st_m06030 | 15 | 3000 | 6 | 1800 | | | √ | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 130st_m04025 | 16 | 2500 | 4 | 1000 | √ | √ | √ | | |
| 130st_m06015 | 17 | 1500 | 6 | 1000 | √ | √ | √ | | |
| 130st_m05025 | 18 | 2500 | 5 | 1300 | | √ | √ | | |
| 130st_m06025 | 19 | 2500 | 6 | 1500 | | | √ | | |
| 130st_m07725 | 20 | 2500 | 7.7 | 2000 | | | √ | | |
| 130st_m10010 | 21 | 1000 | 10 | 1000 | √ | √ | √ | | |
| 130st_m10015 | 22 | 1500 | 10 | 1500 | | √ | √ | | |
| 130st_m10025 | 23 | 2500 | 10 | 2600 | | | √ | √ | √ |
| 130st_m15015 | 24 | 1500 | 15 | 2300 | | | √ | | |
| 130st_m15025 | 25 | 2500 | 15 | 3800 | | | | √ | √ |
| 150st_m15025 | 26 | 2500 | 15 | 3800 | | | | √ | √ |
| 150st_m15020 | 27 | 2000 | 15 | 3000 | | | | √ | √ |
| 150st_m18020 | 28 | 2000 | 18 | 3600 | | | | √ | √ |
| 150st_m23020 | 29 | 2000 | 23 | 4700 | | | | √ | √ |
| 150st_m27020 | 30 | 2000 | 27 | 5500 | | | | | √ |
| 180st_m17215 | 31 | 1500 | 17.2 | 2700 | | | | √ | √ |
| 180st_m19015 | 32 | 1500 | 19 | 3000 | | | √ | √ | √ |
| 180st_m21520 | 33 | 2000 | 21.5 | 4500 | | | | √ | √ |
| 180st_m27010 | 34 | 1000 | 27 | 2900 | | | | √ | √ |
| 220st_m67010 | 35 | 1000 | 67 | 1000 | | | | | √ |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

All kinds of control mode in the following table

| | | | | | |
|---|---|---|---|---|---|
| Pn002▲ | control mode | 0~5 | 2 | | All |

| Pn002 | control mode |
|---|---|
| 0 | torque mode |

| | |
|---|---|
| 1 | speed mode |
| 2 | location mode |
| 3 | location/speed mode |
| 4 | location/torque mode |

Set to 3,4,5, mode between the switch is determined by the input port SigIn Cmode signal state

| | |
|---|---|
| 5 | speed/torque mode |

◢

| | | |
|---|---|---|
| Pn002 | Cmode | control mode |
| 3 | OFF | location mode |
| | ON | speed mode |
| 4 | OFF | location mode |
| | ON | torque mode |
| 5 | OFF | speed mode |

Please refer to the appendix B for switching control mode

| | | |
|---|---|---|
| | ON | toeque mode |

◢

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

By the input port of the SigIn SON can drive

After power on can automatically make the drive

| | | | | | |
|---|---|---|---|---|---|
| Pn003 | Servo enabled mode | 0~1 | 0 | | All |

◢ 0：

◢ 1：

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn004 | Servo is broken can | 0~2 | 0 | | All |

When make the can signal from effective becomes invalid, can set the motor to stop running mode

| | | | | | |
|---|---|---|---|---|---|
| | stop the way | | | | |

| Pn004 | Electromagnetic brake | Slowing down | instructions |
|---|---|---|---|
| 0 | Do not use | Do not use | Inertial parking |
| 1 | Do not use | use | Determined by Pn005 decelerate parking, deceleration time |
| 2 | use | Do not use | Electromagnetic braking parking with electromagnetic brake (for motor) |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Can make the signal from the effective becomes invalid, the motor speed to zero time. If in the process of reduction, enabling signal

| | | | | | |
|---|---|---|---|---|---|
| Pn005 | Can make deceleration time | 5-10000 | 100 | ms | All |

effectively again, the motor will slow down to zero

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Set this parameter values, you can choose to use or not use driving ban function, the truth table below

| | | | | | |
|---|---|---|---|---|---|
| Pn006 | With/without positive driving is prohibited | 0-3 | 0 | | All |

| | | |
|---|---|---|
| Pn006 | Forward driving ban | Reverse driving ban |
| 0 | Do not use | Do not use |
| 1 | Do not use | use |
| 2 | use | Do not use |
| 3 | use | use |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

When overtravel happening, SigIn port CCWL or.cwl status is OFF; use Pn077 on whether can be set up alarm detection. Distance, the

| | | | | | |
|---|---|---|---|---|---|
| Pn007 | forward/reverse driving stop deceleration time is prohibited | 0-10000 | 60 | ms | All |

motor can be in accordance with the slow time to slow down, clear position instruction pulse (position control) at the same time, after stop for internal position lock. Internal position gain through Pn167 regulation

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn008 | Internal around are torque limit (CCW) | 0-300 | 300 | % | All |
| Pn009 | Around inside the torque limit (the CW) | -300~0 | -300 | % | All |
| Pn010 | External around are torque limit (CCW) | 0-300 | 300 | % | All |
| Pn011 | Around outside the torque limit (the CW) | -300~0 | -300 | % | All |

◢ Set the CCW/the CW direction of motor torque limit. Internal and external torque limit effectively at the same time, the actual torque
s
maller limi

◢ External torque limit by SigIn TCCWL, TCWL control of the port

◢ Some motor maximum output torque is twice the rated torque, the maximum torque of the motor output automatically restricted to within
t
wo times the rated torque

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn012 | Forward (CCW) torque overload alarm level 1 | 0-300 | 200 | % | All |
| Pn013 | Inversion (the CW) torque overload alarm level 1 | -300-0 | -200 | % | All |
| Pn014 | Torque overload 1 alarm detection time | 0-800 | 80 | 100ms | All |

Overload 1 alarm level refers to the overload overcurrent rated output current percentage, relative to the motor overload capacity range

| | | | | | |
|---|---|---|---|---|---|
| Pn015 | Overload 2 testing time | 0-150 | 40 | 100ms | All |

◢

between 0 and the maximum output current. Torque overload 1 the overload capacity of the Default value is 2 times, in the setting time,

In a set time, the motor to allow the rated torque output ratio, will perform overload 2 protection

lasts for more than 2 times the output torque, will perform overload 1 protection

◢

If the overload level sets is greater than the corresponding internal/external torque limit, overload conditions may not be met, the ◢

protection will not work

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn016▲ | The molecular DA of encoder divider output | 1~63 | 1 | | All |
| Pn017▲ | The denominator DB of encoder divider output | 1~63 | 1 | | All |

Encoder output, a electronic gear used for dividing the encoder pulse signal output. Frequency division value must be satisfied: DA/DB

> = 1. Encoder, for example, to line 2500, DA/DB crossover value = 25/8, then after frequency division line Number: 2500 / (DA/DB) = 2500 / (25/8) = 800 line

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

0: motor counterclockwise A, B in advance. Clockwise ahead of A B

1: motor counterclockwise B ahead; Clockwise ahead of B

| | | | | | |
|---|---|---|---|---|---|
| Pn018▲ | Take the encoder output pulse AB phase logic | 0-1 | 0 | | All |

◢

◢

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn019▲ | Rated current Settings | 0-15 | 0 | A | All |
| Pn020▲ | Rated speed setting | 0~5000 | Rated speed | r/min | All |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Parameter is set to 0, use the manufacturer to set a Default value; Otherwise, the user must be strictly in accordance with the motor

rated current RMS, rated speed and the corresponding internal positive and negative torque limit setting parameter values. If set incorrectly, the motor will not be able to run properly. According to the code of different types and motor drive, can achieve the largest actual current value is different. Please do not modify the average user.

| Number | Name | Value range | the Default value | unit | apply |
|---|---|---|---|---|---|
| Pn021 | reach to predetermined speed | 0~5000 | 500 | r/min | All |
| Pn022 | Hysteresis comparison difference in predetermined speed | 0~5000 | 30 | r/min | All |

When the motor is running at a faster rate than the decision value set, the output port SigOut Sreach will turn ON, or to OFF.

More instruments include hysteresis comparison. The setting of the difference is too small, the output signal cut-off frequency is higher;

| | | | | | |
|---|---|---|---|---|---|
| Pn023 | Reach to predetermined speed detection direction | 0-2 | 0 | | All |

The set value, the greater the cut-off frequency is small, but at the same time reduce the resolution of the comparator. Example: booking speed is set to 100, difference set to 10.

 
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◢ Can be set up speed detection direction, in the following table

| Pn023 | The comparator |
|---|---|
| 0 | Positive &negative were detected |
| 1 | Testing only forward speed; Inversion, the signal is OFF |
| 2 | Only detect reverse speed; Forward, the signal is OFF |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn024 | reach to the predetermined torque | 0-300 | 100 | % | All |

 
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| | | | | | |
|---|---|---|---|---|---|
| Pn025 | Reach a predetermined torque hysteresis comparison difference | 0-300 | 5 | % | All |
| Pn026 | Reach the predetermined torque direction | 0-2 | 0 | | All |

When the motor running torque than the decision value set, the output port SigOut Treach will turn ON, or to OFF

Can install torque detection direction, in the following table:

| Pn026 | The comparator |
|---|---|
| 0 | Positive &negative were detected |
| 1 | Testing is only around moment; Inversion, the signal is OFF |
| 2 | Only testing around the moment; Forward, the signal is OFF |

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|
| Pn027 | Zero speed detection range setting | 0~1000 | 10 | r/min | All |

When the speed of the motor speed is lower than the set value, the output port SigOut zerospeed into ON, otherwise to OFF

| | | | | | |
|---|---|---|---|---|---|
| Pn028 | Zero speed test back to the poor | 0~1000 | 5 | r/min | All |

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|

Only when using electromagnetic brake function, state whether the motor is zero speed

| | | | | | |
|---|---|---|---|---|---|
| Pn029 | Motor electromagnetic brake testing point zero speed | 0~1000 | 5 | r/min | All |

 
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| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|

Motor static, electromagnetic brake braking began to delay time of cut off the current to the motor

| | | | | | |
|---|---|---|---|---|---|
| Pn030 | Motor static electromagnetic brake delay time | 0~2000 | 0 | Ms | All |

When using the electromagnetic brake function, servo way can make Pn005 must be set to 2

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|

Motor operation, cut off the current to the waiting time between electromagnetic brake

| | | | | | |
|---|---|---|---|---|---|
| Pn031 | The motor electromagnetic brake waiting time during operation | 0~2000 | 500 | ms | All |

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|
| Pn032 | Electromagnetic brake movement speed while the machine running | 0-3000 | 30 | r/min | All |

 
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◢

Motor operation, when the speed of motor is lower than the set parameters, magnetic brakes brake

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|

Close the origin regression function

| | | | | | |
|---|---|---|---|---|---|
| Pn033 | DSZR trigger mode | 0~3 | 0 | | All |

◢ 0:

◢ 1 By the input port of the SigIn GOH level trigger :

◢ 2 : By the input port of the SigIn GOH rising along the trigger

Power on automatically

◢ See the appendix F origin point execution way

3

:

◢

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|

Forward looking for REF (rising along the trigger) as a reference point

Inversion for REF (rising along the trigger) as a reference point

Forward looking for CCWL falling edge (trigger) as a reference point

| | | | | | |
|---|---|---|---|---|---|
| Pn034 | The origin return reference point model | 0~5 | 0 | | All |

◢ 0：

◢ 1：

◢ 2：

 
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◢

◢ 3 Inversion to find.cwl falling edge (trigger) as a reference point :

◢ 4 Forward looking for Z pulse as a reference point :

◢ 5 Pulse inversion for Z as a reference point :

Note: CCWL or.cwl as a reference point, need to set the Pn006 parameters, open the function

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|

Backward looking for Z pulse as the origin

Forward looking for Z pulse as the origin

Directly with reference point rise along the origin

| | | | | | |
|---|---|---|---|---|---|
| Pn035 | The origin back to the origin model | 0~2 | 0 | | All |

◢ 1:

◢ 2:

◢ 3:

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|
| Pn036 | The origin position offset high | -9999~9999 | 0 | ten thousand pulse | All |

After finding the origin, plus the offset (10000 + Pn037 Pn036 *) as a real origin

| | | | | | |
|---|---|---|---|---|---|
| Pn037 | The origin position offset low | -9999~9999 | 0 | pulse | All |

◢

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|
| Pn038 | The origin back to the first speed | 1~3000 | 200 | R/min | All |
| Pn039 | The origin back to the second speed | 1~3000 | 50 | R/min | All |

Perform operation on the origin, looking for reference points at the first speed, arrived at the reference point, seeking the origin at the second rate. The second speed should be less than the first speed

 
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| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|
| Pn040 | The accelerating time of origin | 5~10000 | 50 | ms | All |

In the execution of origin point, motor from zero speed accelerated to the rated speed of the time, only for the origin returning operation

| | | | | | |
|---|---|---|---|---|---|
| Pn041 | The origin return to slow down time | 5~10000 | 50 | ms | All |

| Number | Name | Alue range | Default value | Unit | Apply |
|---|---|---|---|---|---|

On arriving at the origin, the delay for a period of time, let the motor is perfectly still. After the completion of the delay, output port SigOut

| | | | | | |
|---|---|---|---|---|---|
| Pn042 | The origin in the delay | 0~3000 | 60 | ms | All |

HOME output ON

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|

HOME last valid time

| | | | | | |
|---|---|---|---|---|---|
| Pn043 | Complete the signal delay of origin | 5~3000 | 80 | ms | All |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

After the completion of the origin, waiting for the HOME signal into OFF to receive and executes instructions

| | | | | | |
|---|---|---|---|---|---|
| Pn044 | The origin return instruction execution mode | 0~1 | 0 | | All |

0：

 
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◢

◢ 1 The origin return immediately after the completion of receiving and executes instructions：

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Fixed gain 1

| | | | | | |
|---|---|---|---|---|---|
| Pn045 | Gain switch to choose | 0~5 | 5 | | All |

◢ 0:

Fixed gain 2

◢ 1: Controlled by input port SigIn Cgain terminals, OFF as gain 1, ON 2 gain

◢ 2 Controlled by speed command, speed command exceeds Pn046, switch to gain 1：

◢ 3 Controlled by pulse bias, position deviation exceeds Pn046, switch to gain 1：

By the motor speed control, feedback speed exceeds Pn046, switch to gain 1

◢ 4： See the appendix A for gain switch

◢ 5：

◢

| Number | Name | Value range | Default value | Unit | Apply |
|---|---|---|---|---|---|
| Pn046 | Gain switch level | 0~30000 | 80 | | All |
| Pn047 | Gain switch back to the poor | 0~30000 | 6 | | All |

According to Pn045 parameter setting, switching condition and the unit is not the same

| Pn044 | Gain switching conditions | unit |
|---|---|---|
| 3 | Speed instruction | R/min |
| 4 | Pulse bias | a pulse |
| 5 | Motor speed | r/min |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Gain switching conditions meet the delay time to start switch. If detected in delayed phase switching conditions are not met, then cancel

| | | | | | |
|---|---|---|---|---|---|
| Pn048 | Gain switch delay time | 0~20000 | 20 | 0.1ms | All |

 
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◢

◢

the switch

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn049◆ | Gain switch time 1 | 0~15000 | 0 | 0.1ms | All |

Gain switch, current gain linear smoothing gradient combination in this time to the target gain combination, combination of the various

| | | | | | |
|---|---|---|---|---|---|
| Pn050◆ | Gain switch time 2 | 0~15000 | 50 | 0.1ms | All |

◢

parameters change at the same time

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Used to restrict the highest speed of the motor running. Value should be less than or equal to the rated speed, otherwise the motor can

| | | | | | |
|---|---|---|---|---|---|
| Pn051 | The motor running top speed limit | 0~5000 | 3000 | | All |

◢

run a maximum speed of the rated speed

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn052▲ | SigIn1 port functional allocation | -27~27 | 1 | | All |
| Pn053▲ | SigIn2port functional allocation | -27~27 | 2 | | All |
| Pn054▲ | SigIn3 port functional allocation | -27~27 | 19 | | All |

Specific functional allocation reference SigIn function, a table

- 1 ~ 27 function Number is 1-27 corresponding negative logic function, function is the same, the effective level instead

| | | | | | |
|---|---|---|---|---|---|
| Pn055▲ | SigIn4 port functional allocation | -27~27 | 8 | | All |

◢ 1：

◢ 2：

| Parameter values | SigIn input level | SigIn corresponding function |
|---|---|---|
| | low level | ON |

 
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| | | |
|---|---|---|
| positive values | high level | OFF |
| negative | low level | OFF |

If the same overlapped functions assigned to different port, the port Number of ports real effective, small Number of port doesn't

| | | |
|---|---|---|
| | high level | ON |

◢ 3：

work. Example: SigIn1 - > 6; SigIn - > 3-6; The functions assigned to SigIn 3, 6 and logic is negative, and SigIn 1 port status is ignored

 
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| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn056 | SigIn filtering time 1 port | 1~1000 | 2 | ms | All |
| Pn057 | SigIn filtering time 2 port | 1~1000 | 2 | ms | All |
| Pn058 | SigIn filtering time 3 port | 1~1000 | 2s | ms | All |

For digital filter input port SigIn

| | | | | | |
|---|---|---|---|---|---|
| Pn059 | SigIn filtering time 4 port | 1~1000 | 2 | ms | All |

◢

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn060▲ | SigOut1 port functional allocation | -14~14 | 2 | | All |
| Pn061▲ | SigOut2port functional allocation | -14~14 | 1 | | All |
| Pn062▲ | SigOut3 port functional allocation | -14~14 | 4 | | All |

Specific functional allocation reference to SigOut function, a table.

| | | | | | |
|---|---|---|---|---|---|
| Pn063▲ | SigOut4port functional allocation | -14~14 | 7 | | All |

◢

| Parameter values | Corresponding function | SigOut output |
|---|---|---|
| positive values | ON | low level |
| | OFF | high level |
| negative | OFF | low level |
| | ON | high level |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

No communication

| | | | | | |
|---|---|---|---|---|---|
| Pn064▲ | Communication mode | 0-2 | 0 | | All |

◢ 0：

◢ 1：RS-232

◢ 2: RS-485

See chapter 7 Modbus communication protocol communication function

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

When using the Modbus communication, drive in each group should be set in advance different sites; If repeat setting site, will lead to

| | | | | | |
|---|---|---|---|---|---|
| Pn065 | Communications site | 1-254 | 1 | | All |

paralysis of communication

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn066▲ | Communication baud rate | 0-3 | 1 | | All |

- 0 ： 4800
- 1 ： 9600
- 2 ： 19200
- 3 ： 38400

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Parameter values are defined as follows table, see chapter 7 of the Modbus communication function

| | | | | | |
|---|---|---|---|---|---|
| Pn067▲ | Communication mode setting | 0-8 | 8 | | All |

| set | instructions |
|---|---|
| 0 | 7 , N , 2 ( Modbus ,ASCII ) |
| 1 | 7 , E , 1 ( Modbus , ASCII ) |
| 2 | 7 , O , 1 ( Modbus , ASCII ) |
| 3 | 8 , N , 2 ( Modbus , ASCII ) |
| 4 | 8 , E , 1 ( Modbus , ASCII ) |
| 5 | 8 , O , 1 ( Modbus , ASCII ) |
| 6 | 8 , N , 2 ( Modbus , RTU ) |
| 7 | 8 , E , 1 ( Modbus , RTU ) |
| 8 | 8 , O , 1 ( Modbus , RTU ) |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn068 | 1 Choose to register 1 input function control way | 0~32767 | 0 | | All |

Determine the function or port input mode control by way of communication. If you don't communicate mode control, set the zero

| | | | | | |
|---|---|---|---|---|---|
| Pn069 | 2 Choose to register2 input function control way | 0~4095 | 0 | | All |

◢

Pn068 parameters

| bit | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| function | Zero Lock | EMG | TCW | TCCW | CWL | CCWL | Alarm rst | Son |
| Default value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT15 | BIT14 | BIT13 | BIT12 | BIT11 | BIT10 | BIT9 | BIT8 |
|---|---|---|---|---|---|---|---|
| keep | Cgain | Cmode | TR2 | TR1 | Sp3 | Sp2 | Sp1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Pn069 parameters

| bit | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| function | REF | GOH | PC | INH | Pclear | Cinv | Gn2 | Gn1 |
| The Default value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| BIT15 | BIT14 | BIT13 | BIT12 | BIT11 | BIT10 | BIT9 | BIT8 |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| keep | keep | keep | keep | pstop | ptriger | Pos2 | Pos1 |

When the communication control, determine the above function from the input port or on the CN3 from communication control to change.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Set to 0, the controlled by the input port on the CN3 change; Is set to 1, is controlled by the communication change. The default all controlled by the input port. For example: son sp3 sp2 sp1 function through communication control, other control, through the input port is set value is 00000111 _00000001 (binary) -- - > 0 x0701 (hexadecimal) -- - > 1793 (decimal), so set Pn065 parameter value is 1793.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn070 | Input function logic state set register 1 | 0~32767 | 32691 | | All |

On RS232 or RS485 communication, and set the Pn068, Pn069 corresponding controlled by communication, this parameter with the

| | | | | | |
|---|---|---|---|---|---|
| Pn071 | Input function logic state set register 2 | 0~4095 | 4095 | | All |

corresponding bit to set or reset, can control the state of the function of input signal. Logic 0 for valid state.

Pn070 parameters

| bit | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| function | ZeroLock | EMG | TCW | TCCW | CWL | CCWL | Alarmrst | Son |
| Default value | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |

| BIT15 | BIT14 | BIT13 | BIT12 | BIT11 | BIT10 | BIT9 | BIT8 |
|---|---|---|---|---|---|---|---|
| keep | Cgain | Cmode | TR2 | TR1 | Sp3 | Sp2 | Sp1 |
| 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Pn071 parameters

| bit | BIT 7 | BIT6 | BIT5 | BIT 4 | BIT3 | BIT2 | BIT1 | BIT0 |
|---|---|---|---|---|---|---|---|---|
| Function signal | REF | GO H | PC | INH | Pclear | Cinv | Gn2 | Gn1 |
| Default value | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| BIT15 | BIT14 | BIT13 | BIT12 | BIT11 | BIT10 | BIT9 | BIT8 |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| keep | keep | keep | keep | pstop | ptriger | Pos2 | Pos1 |

In a communication control mode, by setting the register, CN3 external input signal control could be achieved. Drive in position

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |

control mode, for example, to ban pulse command, set Pn071 BIT4 set 0, input pulse becomes invalid. The communication control, set the parameter value, shall be invalid.

Note: after each access to electricity, drive will automatically load the Pn070, Pn071 register values, and perform the corresponding operation immediately. So, before enabling the motor to determine the function of input signal into the proper working condition

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn074 | Fan temperature | 30~70 | 50 | ℃ | All |

Fan operation mode,: 0: heat automatically

boot operation

don't run

| | | | | | |
|---|---|---|---|---|---|
| Pn075 | Fan operation mode | 0~2 | 0 | | All |

1:

2:

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn076 | Emergency stop reset (EMG) | 0-1 | 0 | | All |

Must be under the servo can make OFF, by manual or port SigIn: AlarmRst cleared.

Regardless of servo enabled ON or OFF, EMG again into ON, will be automatically removed

1

In can make ON the state, if the external command input, EMG alarm automatically remove, instructions are executed immediately

:

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

If use the function of CCWL or.cwl, when CCWL or.cwl for the OFF state, whether can be set up from AL - 15 police

Don't send out alarm

Motor is running, reducing stopped, send out alarm, motor is no longer current

Immediately issued a warning, motor power, free downtime

| | | | | | |
|---|---|---|---|---|---|
| Pn077 | ccwl/cwl driving ban checked out | 0-2 | 0 | | All |

0：

1：

2：

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn078 | Lack of voltage detection | 0~1 | 1 | | All |

◢ 0 not check out :

◢ 1 Check out :

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Drive, automatic Dn000 submenu into monitor mode menu. By default, according to the manufacturer to display the system status

| | | | | | |
|---|---|---|---|---|---|
| Pn079 | The system status display project selection | 0-23 | 0 | | All |

◢

(motor speed), the user can set the parameter value, so it shows Dn000 particular state of the system parameters, details see the list of

The default system (motor speed) 1 Speed instruction 2 The average torque 3 Position deviation value 4 The ac power voltage "monitoring mode"

.

0 5

Maximum instantaneous torque 6 Pulse input frequency 7 Temperature of the heat sink 8 The current motor speed 9 Effective input command pulse accumulative total value is low 10 Effective input command pulse accumulative total value is high 11 Position control, effective feedback pulse encoder accumulative total value is low

Position control, effective feedback pulse encoder cumulative value high 13 Regenerative braking load factor

12

Input port signal state 15 Signal output port state 1

Analog voltage instruction torque 17 Simulate the speed reference voltage 18 Output function status register 19 After power on

4

16

the servo, pulse encoder feedback accumulative total value is low 20 After power on the servo, pulse encoder feedback accumulative total value is high

Driver software version 22 23 rotor absolute position encoder UVW letter 2

1

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Incremental encoder 2500 line

| | | | | | |
|---|---|---|---|---|---|
| Pn080▲ | The encoder to choose | 0~1 | 0 | | All |

◢ 0:

◢ 1 Absolute encoder 130000 line :

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

The corresponding auxiliary mode Fn001 operation. The current Pn000 ~ Pn219 block all parameter value written to the EEPROM.

| | | | | | |
|---|---|---|---|---|---|
| Pn081 | User preferences permanent write operation | 0-1 | 0 | | All |

◢

When the parameter value from 0 to 1, the driver will perform a write operation. This operation is only valid at the time of communication (Pn064 > 0)

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Mandatory SigOut port output fixed level. By setting the parameters, the force output port level

| | | | | | |
|---|---|---|---|---|---|
| Pn082 | SigOut port output | 0 | 0~255 | | All |

◢

| | keep | SigOut4 | | SigOut3 | | SigOut2 | | SigOut1 | |
|---|---|---|---|---|---|---|---|---|---|
| bit | BIT15~BIT8 | BIT7 | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
| Default value | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Output port truth table below

| SigOut 2 | | | SigOut 1 | | |
|---|---|---|---|---|---|
| BIT3 | BIT2 | Output level | BIT1 | BIT0 | Output level |
| 0 | 0 | Optional state | 0 | 0 | Optional state |
| 0 | 1 | Forced to high level | 0 | 1 | Forced to high level |
| 1 | 0 | Forced to low level | 1 | 0 | Forced to low level |
| 1 | 1 | Optional state | 1 | 1 | Optional state |
| SigOut 4 | | | SigOut 3 | | |

| BIT7 | BIT6 | Output level | BIT 5 | BIT 4 | Output level |
|---|---|---|---|---|---|
| 0 | 0 | Optional state | 0 | 0 | Optional state |
| 0 | 1 | Forced to high level | 0 | 1 | Forced to high level |
| 1 | 0 | Forced to low level | 1 | 0 | Forced to low level |
| 1 | 1 | Optional state | 1 | 1 | Optional state |

Example: output port SigOut2 force output low level, other optional output port status, setting Pn082 parameter value is 8.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

When the bus voltage is less than the amplitude, the Pn078 decided whether to send out alarm.

| Pn083 | Low pressure alarm detect amplitude | 50~280 | 200 | V | All |
|---|---|---|---|---|---|

◢

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

When the bus voltage is higher than the amplitude, immediately issued a warning, in order to protect the internal electronic components.

| Pn084 | High pressure alarm detect amplitude | 290~380V | 365 | V | All |
|---|---|---|---|---|---|

◢

Input power supply voltage should be within the specifications of the acceptable, if slightly on the high side, can be appropriately increase amplitude detection. If the input voltage power supply has been far beyond specification, shall not increase the parameter value, otherwise it will damage the driver, please conform to the specifications of the power supply.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn085▲ | Motor pole logarithmic | 1~100 | 4 | 对 | All |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn086 | Renewable circuit discharge cycle | 0~2000 | 70 | ms | All |

When the servo motor running in generator mode, renewable electricity too much, must through the regeneration way ◢ discharge, otherwise the internal voltage is too high, damage to the drive. Set up, the longer the voltage release faster, but the greater the power needed for regenerative resistor, otherwise easy to burn regenerative resistor. See appendix E specific Settings.

**Position control parameters**

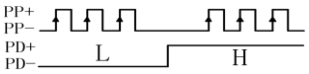
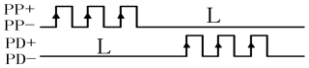
## 4.3.2

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn096▲ | The command pulse input mode | 0-2 | 0 | | P |

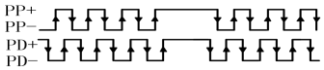
Command pulse input mode in the following table:

| | | | | | |
|---|---|---|---|---|---|
| Pn097▲ | Instruction selection logic pulse input direction | 0-1 | 0 | | P |

◢

| Pn096 | | Forward command | reverse command |
|---|---|---|---|
| 0 | Pulse + direction |  | |
| 1 | Forward/reverse pulse |  | |

Pn097 = 0: input command, the motor rotate counterclockwise (CCW)

| | | |
|---|---|---|
| 2 | The orthogonal pulse |  |

◢

Pn097 = 1: input command, motor rotate clockwise (included)

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn098 | Pulse electronics gear than the molecules of 1 | 1~32767 | 1 | | P |
| Pn099 | Pulse electronics gear than the molecules of 2 | 1~32767 | 1 | | P |

| | | | | | |
|---|---|---|---|---|---|
| Pn100 | Pulse electronics gear than the molecules of 3 | 1~32767 | 1 | | P |
| Pn101 | Pulse electronics gear than the molecules of 4 | 1~32767 | 1 | | P |

Electronic gear ratio must meet the following conditions, otherwise will not work:

| | | | | | |
|---|---|---|---|---|---|
| Pn102▲ | Pulse electronics gear than the denominator | 1~32767 | 1 | | P |

◢

Electronic gear than the molecules of N by the input port of the SigIn GN1, GN2 decision. The denominator is fixed. Molecules to choose Electronic gear or less than 1/127 of 127 or less

◢

in the following table:

| GN2 | GN1 | Electronic gear than N N |
|---|---|---|
| OFF | OFF | Molecular 1 |
| OFF | ON | Molecular 2 |
| ON | OFF | Molecular 3 |
| ON | ON | Molecular 4 |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn103 | Beyond the scope of setting position deviation | 1~ 500 | 50 | thousand pulse | P |

Deviation when the pulse counter pulse count more than the value set (i.e., the current position and target location are too large), drive

◢

out alarm signal.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn104 | Complete range set position location | 0~ 32767 | 10 | pulse | P |

While the rest of the deviation counter pulse Number is lower than the parameters setting, output port SigOut Preach signal is ON, or

| | | | | | |
|---|---|---|---|---|---|
| Pn105 | Positioning to complete set | 0~ 32767 | 3 | pulse | P |

◢

OFF.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn106 | Position location close to the range of Settings | 0~ 32767 | 300 | pulse | P |

While the rest of the deviation counter pulse Number is lower than the parameters setting, output port SigOut Pnear signal is ON, or

| | | | | | |
|---|---|---|---|---|---|
| Pn107 | Position location close to the poor set back | 0~ 32767 | 30 | pulse | P |

◢

OFF.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Position control, can use SigIn Pclear function, clear position deviation value of the counter. Position deviation clearance in -

| | | | | | |
|---|---|---|---|---|---|
| Pn108 | Position deviation clear way | 0-1 | 1 | | P |

◢

0: Pclear level ON period

1: Pclear rise along time (from OFF to ON)

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Do not use the filter

| | | | | | |
|---|---|---|---|---|---|
| Pn109◆ | Position command deceleration mode | 0-2 | 1 | | P |

◢ 0：

◢ 1 A smoothing filter :

◢ 2 S-shaped filtering :

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn110◆ | Position command s-shaped filtering time constant | 5~1750 | 50 | ms | P |
| Pn111◆ | S-shaped filtering time constant Ta position instruction | 5~1200 | 50 | ms | P |

Filter time constant is defined by the current location instructions frequency operation to the target frequency. Filtering, the longer the

| | | | | | |
|---|---|---|---|---|---|
| Pn112◆ | S-shaped filtering time constant Ts position instruction | 5~550 | 20 | ms | P |

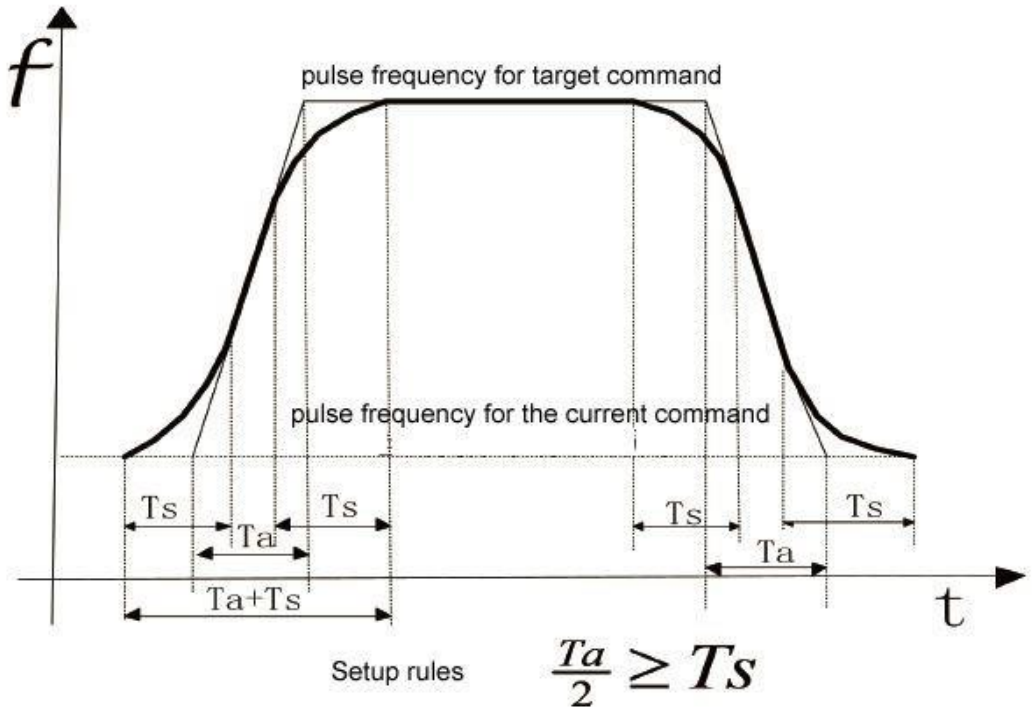
◢

better position instruction frequency smoothness, but command the greater the response delay. In instruction pulse frequency step change,

Filtering time T = Ta + Ts. Ta: straight line part of the time, the smaller the Ta, the faster the deceleration. Ts: arc part time, Ts, the
have the effect of smooth running motor. The filter has no effect on instruction pulse Number.

◢

greater the speed is smooth, the smaller the impact.




| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn113▲ | The position loop feedforward gain | 0-100 | 0 | % | P |

Position control, position feedforward directly on the speed instruction, can reduce the position tracking error, improve the response. If

| Pn114▲ | Position loop feedforward filter time constant | 1-50 | 5 | ms | P |
|---|---|---|---|---|---|

◢

the feedforward gain is too big, can lead to speed overshoot. To smooth the feedforward commands.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn115 | The position controller gain 1 | 5-2000 | 100 | % | P |

In mechanical systems do not produce under the premise of vibration or noise, increase the position loop gain value, to speed up the

| Pn116 | The position controller gain 2 | 5-2000 | 100 | % | P |
|---|---|---|---|---|---|

◢

reaction rate, shorten the positioning time.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn117 | Position command source selection | 0~1 | 0 | | P |

◢ 0 The external input pulse :

◢ 1 Internal location instructions (see appendix G) :

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

When pstop the trigger action, ptriger trigger again, according to the currently selected internal drive position command to run.

When pstop the trigger action, ptriger trigger again, drive to continue to complete the last remaining internal position command pulse

Falling edge position in internal control, pstop, motor by the current running speed will slow down to zero, the deceleration time can be

| | | | | | |
|---|---|---|---|---|---|
| Pn118 | Internal position instruction suspend mode selection | 0~1 | 0 | | P |

◢ 0：

◢ 1：

Number.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn119 | Internal position suspended deceleration time | 0~10000 | 50 | | P |

◢

set by this parameter (only for internal position control).

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Pn120 | Internal position 0 high pulse Number set up | -9999~9999 | 0 | ten thousand pulse | P |
| Pn121 | Internal position 0 low pulse Number set up | -9999~9999 | 0 | 个 | P |
| Pn122 | Internal position 1 high pulse Number set up | -9999~9999 | 0 | ten thousand pulse | P |
| Pn123 | Internal position 0 low pulse Number set up | -9999~9999 | 0 | 个 | P |
| Pn124 | Internal position 2high pulse Number set up | -9999~9999 | 0 | ten thousand pulse | P |
| Pn125 | Internal position 2 low pulse Number set up | -9999~9999 | 0 | 个 | P |
| Pn126 | Internal position 3 high pulse Number set up | -9999~9999 | 0 | ten thousand pulse | P |

Internal location instructions N (pulse) = internal position Number N pulse high value x 10000 + internal position instruction N pulse

| | | | | | |
|---|---|---|---|---|---|
| Pn127 | Internal position 3 low pulse Number set up | -9999~9999 | 0 | 个 | P |

◢

Number value low

◢ Pn120=12，Pn121=5000 Example: the encoder 2500 line, to go travel 12.5 turn, is set Pn120 = 12, Pn121 = 5000.。

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn128 | Internal position | 0~3000 | 100 | r/min | P |

| | | | | | |
|---|---|---|---|---|---|
| | command zero speed | | | | |
| Pn129 | Internal position command 1 speed | 0~3000 | 100 | r/min | |
| Pn130 | Internal position command 2 speed | 0~3000 | 100 | r/min | P |

When performing internal position instruction N, restrict the highest speed of motor can run.

| | | | | | |
|---|---|---|---|---|---|
| Pn131 | Internal position command 3 speed | 0~3000 | 100 | r/min | P |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Control mode from the speed/torque mode conversion to position control (Pn002 = 3 or 4), to avoid severe mechanical shock, should be

| | | | | | |
|---|---|---|---|---|---|
| Pn132 | Torque/speed control switch to the position control | 0~1 | 0 | | P |

in low speed switching. The conditions of the switch can be set up:

Pn132=0： （zerospeed）

Pn132=1： Slow down to zero

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn133 | Torque/speed control switch to the position control of the deceleration time | 5-10000 | 100 | ms | P |

Pn132 = 1, when cmode signals effectively, the order control mode by the torque/speed control switch to the position control, motor slow down to zero, then switch to the position control mode. Please refer to the appendix B for specific timing.

### 4.3.3 Speed control parameter

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| | Do not use the speed instruction deceleration function | | | | |
| | Using the speed instruction S curve deceleration function | | | | |
| | Use linear deceleration function | | | | |
| | In speed control mode and the external position loop, this parameter must be set to 0. | | | | |
| Pn146◆ | Speed instruction deceleration mode | 0~2 | 1 | | S |

Pn146=0:

Pn146=1:

Pn146=2:

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn147◆ | Speed instruction S curve and deceleration time constant Ts | 5~ 1500 | 80 | ms | S |
| Pn148◆ | Speed instruction S curve acceleration time constant | 5~ 10000 | 80 | ms | S |

| | | | | | |
|---|---|---|---|---|---|
| | of Ta | | | | |

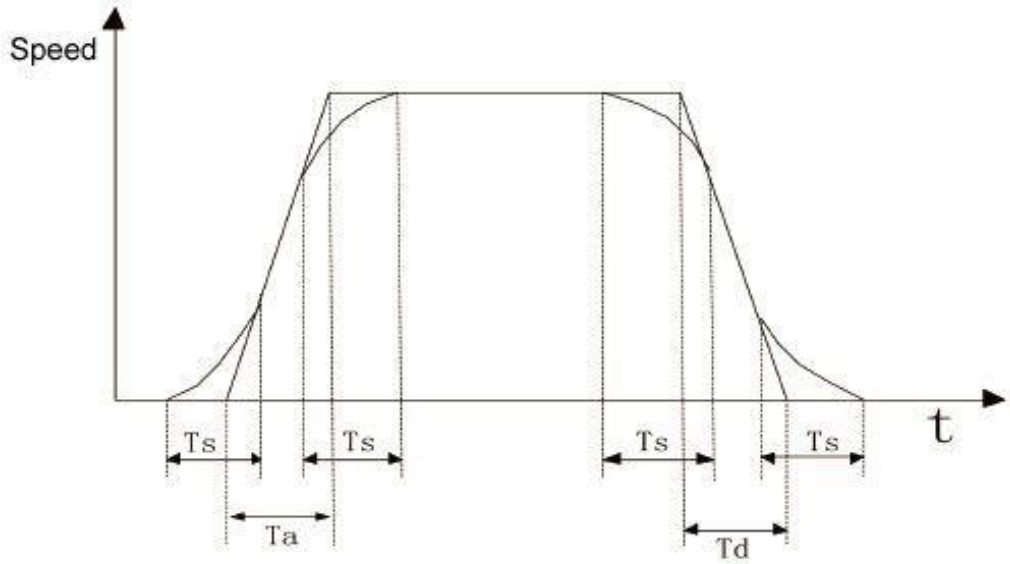
In speed control mode, you can set the speed instruction, deceleration time, in order to smoothly to start and stop the servo motor.

| | | | | | |
|---|---|---|---|---|---|
| Pn149◆ | Speed instruction S curve deceleration time constant of Td | 5~ 10000 | 80 | ms | S |

Ta: acceleration time: from 0 r/min to rated speed. For example, servo motor rated speed 3000 r/min, if the setting time is 3 s, accelerate from 0 r/min to 1000 r/min for 1 s.

Td: Deceleration time: by the rated speed reduced to 0 r/min

Ts: Arc part time

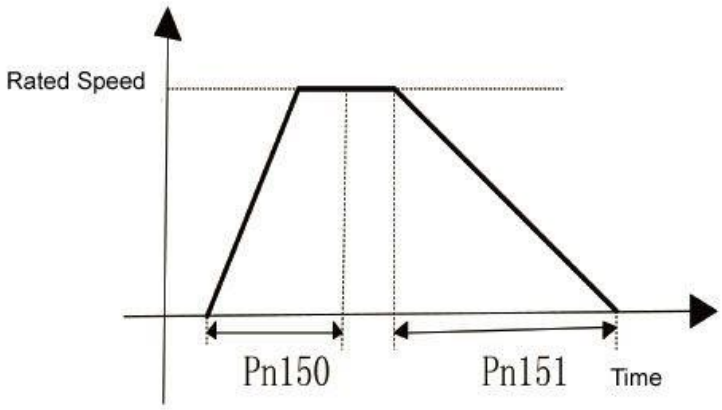



Setup rules : $\frac{Ta}{2} \geq Ts, \frac{Td}{2} \geq Ts$

| Number | Name | Value range | the Default value | unit | apply |
|---|---|---|---|---|---|
| Pn150◆ | Linear acceleration time constant | 5~30000 | 80 | ms | S |

Accelerating time constant is defined as the speed instruction from zero to rated speed.

| | | | | | |
|---|---|---|---|---|---|
| Pn151◆ | Linear deceleration time constant | 5~30000 | 80 | ms | S |




| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

The smooth the speed of the parameter value, the greater the detected, but lead to the slower speed response. Too easy to cause the

| | | | | | |
|---|---|---|---|---|---|
| Pn152▲ | Speed detection filter time constant | 1~380 | 10 | 0.1ms | All |

oscillation, too small may lead to noise.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn153 | The speed regulator proportional gain 1 | 5~ 2000 | 100 | % | All |
| Pn154 | Speed regulator integral time constant of 1 | 5~ 2000 | 100 | % | All |
| Pn155 | The speed regulator proportional gain 2 | 5~ 2000 | 100 | % | All |

Speed loop controller gain directly determine the response of the speed control loop bandwidth, the mechanical system without

| | | | | | |
|---|---|---|---|---|---|
| Pn156 | Speed regulator integral time constant 2 | 5~ 2000 | 100 | % | All |

vibration or noise, increase the speed loop gain value, accelerated the response.

Integral time constant is used to adjust the steady-state error compensation rate, decrease the parameter values, reduce the speed

control error, increase rigidity. Is too small easy to cause vibration and noise.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| | | | | | |

The set value, the greater the input analog response speed is slow, is beneficial to reduce the high frequency noise, setting is smaller,

| | | | | | |
|---|---|---|---|---|---|
| Pn157▲ | Simulation speed instruction smoothing filtering time | 1~500 | 1 | 0.1ms | S |

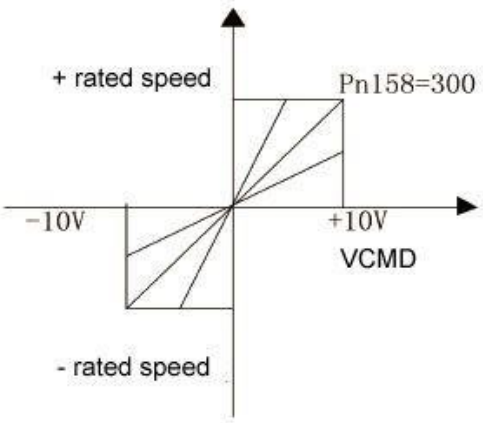
the faster response speed, but will get big interference noise.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| | | | | | |

Analog speed reference input and the ratio between the actual speed motor. The range of input voltage - 10 ~ 10 v. Formula: speed = *

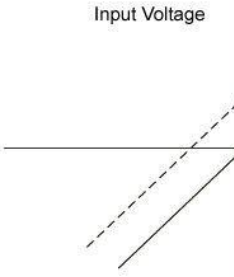
| | | | | | |
|---|---|---|---|---|---|
| Pn158 | The directive gain simulation speed | 1~1500 | 300 | r/min/V | S |

Pn158 input voltage. For example: when the input voltage of 10 v, if set to 300, the corresponding rate of 10 * 300 = 3000 r/min.




| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn159 | Simulation speed instruction offset adjustment | -5000~5000 | mv | | S |

May occur in the analog input offset phenomenon, can through this parameter.




Automatic offset adjusting, perform Fn008 operations.

Manually adjust the migration steps are as follows:

1 The external zero potential access to the analog input port

：

This parameter is zero, the monitor dn17 shows the value of the model.

2

：

3 If observed values are not zero, negative observation value to the input parameters, can be realized to adjust (note that the voltage

：

unit conversion relationship).

Example: dn17 = 1.12 V, Pn159 input - 1120 mv.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| | | | | | |

Positive voltage forward (CCW), negative voltage inversion (the cw)

| | | | | | |
|---|---|---|---|---|---|
| Pn160 | Simulation speed instruction direction | 0-1 | 0 | | S |

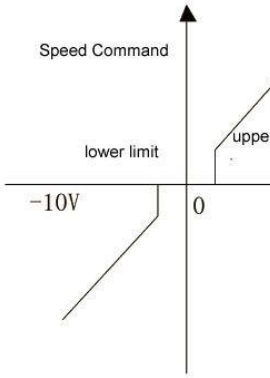
◢ 0：

◢ 1： Positive voltage forward (CCW), negative voltage inversion (the cw)

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn161 | Simulation speed instruction to enforce zero range | 0~1000 | 0 | 10mv | S |

Input speed instruction lies between floor and ceiling, forced to 0 V input instructions.

| | | | | | |
|---|---|---|---|---|---|
| Pn162 | Simulation speed instruction to enforce zero range | -1000~0 | 0 | 10mv | S |




When the input voltage is after adjusting for PN159 offset of the input voltage.

Through the upper and lower set, can make the input instructions into a single polarity, double polarity. Example: the upper limit of 0,

lower limit for - 1000, the equivalent input command range of 0 ~ 10 v, for normal polarity speed commands.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Lock, the clamping position loop control is the mode, involved in internal ring loop control, gain by Pn167 Settings.

| | | | | | |
|---|---|---|---|---|---|
| Pn163 | Zero speed clamp lock mode | 0-1 | | 0 | S |

0 :

1 Locked, clamping way is speed loop control, speed instruction forced to 0, location may change due to external force. :

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn164 | Zero speed clamp is triggered | 0~1 | | 0 | S |

0： SigIn port ZeroLocK to ON

1： Triggered when the speed instruction below Pn165 parameters

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn165 | The clamp level zero speed | 0~200 | 6 | r/min | S |

When Pn164 is set to 1, and the speed instruction below this parameter value, the lock on the motor shaft. Example: this parameter is

set to 10 r/min, if the analog speed instruction - 10 r/min ~ 10 r/min, within the scope of the deceleration clamp, in order to prevent the analog speed instruction near the zero drift, lead to the motor shaft instability.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

When zero speed clamp when triggered, immediately according to deceleration time to slow down to zero, and then to lock.

| | | | | | |
|---|---|---|---|---|---|
| Pn166 | Zero speed clamp deceleration time | 5~10000 | 50 | ms | S |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn167 | Internal position controller gain | 5~2000 | 100 | % | All |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

In speed control mode, the optional speed reference source:

| | | | | | |
|---|---|---|---|---|---|
| Pn168 | Speed reference source | 0~1 | 0 | | S |

Pn168=0： External simulation speed instruction within + 2 ~ 8

Pn168=1： Speed within 1 ~ 8

1 ~8

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn169 | Internal speed reference 1 | -5000-5000 | 0 | R/min | S |
| Pn170 | Internal speed reference 2 | -5000-5000 | 0 | R/min | S |
| Pn171 | Internal speed reference 3 | -5000-5000 | 0 | R/min | S |
| Pn172 | Internal speed reference 4 | -5000-5000 | 0 | R/min | S |
| Pn173 | Internal speed reference 5 | -5000-5000 | 0 | R/min | S |
| Pn174 | Internal speed reference 6 | -5000-5000 | 0 | R/min | S |
| Pn175 | Internal speed reference 7 | -5000-5000 | 0 | R/min | S |
| Pn176 | Internal speed reference 8 | -5000-5000 | 0 | R/min | S |

When a drive control mode in speed control mode, the speed reference source by the input port of the SigIn SP1, SP2, SP3 decision:

| SP3 | SP2 | SP1 | Speed instruction |
|---|---|---|---|
| 0 | 0 | 0 | Internal speed 1 / external analog instruction (decided by Pn168) |
| 0 | 0 | 1 | Internal speed 2 |
| 0 | 1 | 0 | Internal speed 3 |
| 0 | 1 | 1 | Internal speed 4 |
| 1 | 0 | 0 | Internal speed 5 |
| 1 | 0 | 1 | Internal speed 6 |
| 1 | 1 | 0 | Internal speed 7 |
| 1 | 1 | 1 | Internal speed 8 |

Note 1:0 is OFF, 1 is ON.

Note 2: if the SigIn port is not specified SP3, SP2, SP1 function, is OFF by default

| Number | Name | Value range | the Default value | unit | apply |
|---|---|---|---|---|---|
| Pn177 | JOG speed | 0~5000 | 200 | r/min | S |
| Pn178◆ | JOG speed up the time | 5~ 10000 | 100 | ms | S |

When commissioning at, can set the speed of the motor running and the deceleration time

| | | | | | |
|---|---|---|---|---|---|
| Pn179◆ | JOG Deceleration time | 5~ 10000 | 100 | ms | S |

**Torque control parameters**

**4.3.4**

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Do not use the deceleration torque instruction

| | | | | | |
|---|---|---|---|---|---|
| Pn186 | Torque command deceleration mode | 0~1 | 0 | | T |

◢ 0:

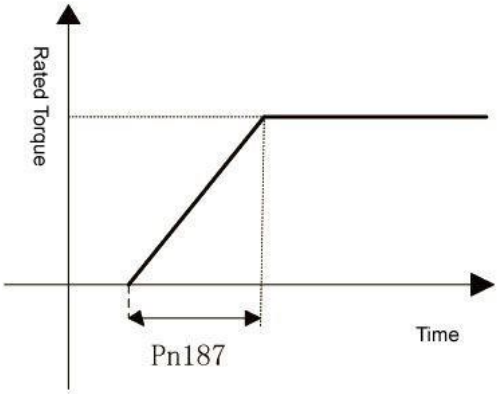
◢ 1 Using linear deceleration torque instruction :

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Time constant is defined as a torque command from zero has soared to the rated torque.

| | | | | | |
|---|---|---|---|---|---|
| Pn187▲ | Linear deceleration time constant torque instruction | 1~30000 | 1 | ms | T |

◢




| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

The set value, the greater the input analog response speed is slow, is helpful to reduce the high frequency noise; Setup is smaller, the

| | | | | | |
|---|---|---|---|---|---|
| Pn188▲ | Analog torque instruction smooth filtering time | 1~500 | 1 | 0.1ms | T |

◢

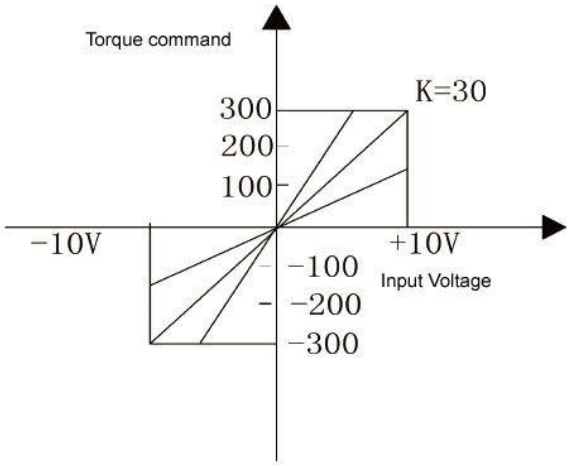
faster the speed of response, but will get big interference noise.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn189 | Analog gain torque instruction | 1-300 | 30 | %/V | T |

Analog torque command input and the ratio between the actual output torque. The range of input voltage - 10 ~ 10 v. The default input

◢

voltage of 10 v, motor at 3 times the rated torque, Namely = KX = 30 x, Y K = 30.




| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Adjust the way reference "simulation speed deviation adjustment directive"

| | | | | | |
|---|---|---|---|---|---|
| Pn190 | Analog torque instruction offset djustment | -1500~1500 | 0 | mv | T |

◢

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| | | | | | |

Positive voltage forward (CCW), negative voltage inversion (the cw)

| | | | | | |
|---|---|---|---|---|---|
| Pn191 | Simulation of torque command direction | 0-1 | 0 | | T |

◢ 0：

◢ 1 Turn negative voltage is (CCW), positive voltage inversion (the cw) :

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn192 | Q shaft torque regulator proportional gain is 1 | 5~ 2000 | 100 | % | All |
| Pn193 | Q shaft torque regulator integral time constant of 1 | 5~ 2000 | 100 | % | All |
| Pn194 | is 1 Q shaft torque regulator proportional gain 2 | 5~ 2000 | 100 | % | All |

Increase the proportional gain, can make the Q axis current response speed.

Reduce the integral time constant, can reduce the Q axis current control error

| | | | | | |
|---|---|---|---|---|---|
| Pn195 | Q shaft torque regulator integral time constant of 2 | 5~ 2000 | 100 | % | All |

◢

◢

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn196 | Torque Q axis filter time constant of 1 | 1-500 | 1 | 0.1ms | All |

Inhibits mechanical vibration, the larger the set values, the better the results, will cause slow response and may cause oscillation; Set the

| | | | | | |
|---|---|---|---|---|---|
| Pn197 | Torque Q axis filter time constant of 2 | 1~500 | 1 | 0.1ms | All |

◢

value is smaller, the faster the response, but the mechanical conditions.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

When the torque control, motor speed limit in this parameter range. There was a phenomenon of speeding can prevent the light load.

| | | | | | |
|---|---|---|---|---|---|
| Pn198 | Torque control speed limit | 0~4500 | 2500 | r/min | T |

◢

Speeding, speed control to reduce the actual torque intervention, but the actual speed will be slightly error.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

Restricted by Pn198 parameters

Restricted by internal speed instruction 1 ~ 8

| | | | | | |
|---|---|---|---|---|---|
| Pn199 | Source of limited torque control speed choice | 0~2 | 0 | | T |

◢ Pn199=0：

Pn199=1：

Pn199=2: If Pn204 = 1, i.e., all instructions from the internal torque, torque, speed can be restricted by analog voltage speed command

All the above speed limit both positive and negative, multiple speed limit, restricted to the minimum speed.

If this parameter is set to 1, restricted by internal speed instruction, by sp1, sp2, sp3 limited decision speed value:

| SP3 | SP2 | SP1 | Speed instruction |
|---|---|---|---|
| 0 | 0 | 0 | Internal speed 1 |
| 0 | 0 | 1 | Internal speed 2 |
| 0 | 1 | 0 | Internal speed 3 |
| 0 | 1 | 1 | Internal speed 4 |
| 1 | 0 | 0 | Internal speed 5 |
| 1 | 0 | 1 | Internal speed 6 |
| 1 | 1 | 0 | Internal speed 7 |
| 1 | 1 | 1 | Internal speed 8 |

0 means OFF, 1 is ON.

Even if the setting values than the system allows the highest speed, the actual speed can limit under the highest speed.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn200 | The internal torque 1 | -300~300 | 0 | % | T |
| Pn201 | The internal torque 2 | -300~300 | 0 | % | T |
| Pn202 | The internal torque 3 | -300~300 | 0 | % | T |
| Pn203 | The internal torque 4 | -300~300 | 0 | % | T |

Select the internal torque control mode, use input port of the SigIn TR1 TR2 can choose 4 kinds of torque command:

| TR2 | TR1 | Torque command |
|---|---|---|

| | | |
|---|---|---|
| 0 | 0 | The external torque 1 or internal analog torque instruction (decided by Pn204) |
| 0 | 1 | The external torque 2 |
| 1 | 0 | The external torque 3 |

0 means OFF, 1 is ON.

| | | |
|---|---|---|
| 1 | 1 | The external torque 4 |

NOTE:

Note 2: if the SigIn port doesn't specify TR2, TR1 functions, is OFF by default.

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn204 | Torque command source | 0~1 | 0 | | T |

0: external analog torque command

1:1internal torque

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn205 | D shaft torque regulator proportional gain | 5~2000 | 100 | % | All |
| Pn206 | D shaft torque regulator integral time | 5~2000 | 100 | % | All |

Space vector modulation, D shaft torque regulator proportional gain and integral time constant.

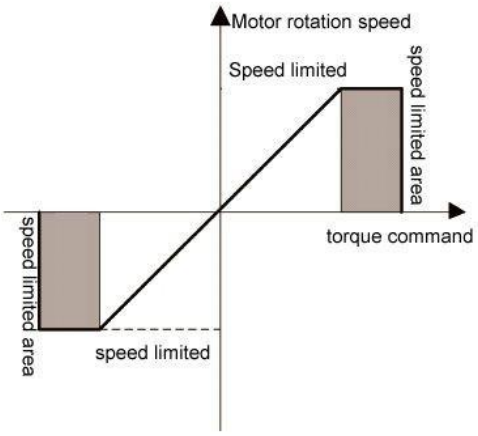
| | | | | | |
|---|---|---|---|---|---|
| | constant | | | | |

| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|

When the torque control, the motor speed in a limited speed range, interventional speed feedback, to reduce the actual torque, so that

| | | | | | |
|---|---|---|---|---|---|
| Pn207 | Speed feedback adjustment coefficient | 1~3000 | 100 | | T |

the speed to limit within the scope of regression. Parameter Settings is smaller, the greater the amount of feedback, the faster the adjustment, the smaller amount of speeding, but is too small will fuel motor shaking; Parameter is set too large, adjust the slower, may have been speed, less than the speed limit. Actual speed will be slightly higher than the limit speed value.




| Number | Name | Value range | Default value | unit | apply |
|---|---|---|---|---|---|
| Pn208 | track torque instruction judgment error range1 | 0~300 | 5 | % | T |

To make SigOut effective TCMDreach signal output port, must meet the following conditions:

| | | | | | |
|---|---|---|---|---|---|
| Pn209 | track torque instruction judgment error range2 | 0~300 | 2 | % | T |

Condition 1: PC set torque instruction must be within the error range of 1. Example: input torque command 80%, Pn208 set to 5%, internal drive of input torque instruction in deceleration operation, when calculating the output torque of the instructions within the scope of 75% ~ 85%, condition 1 is satisfied.

Condition 2: detect the actual motor torque and the difference between the input torque of the instructions in the judgment error range within 2.

### 4.3.5 Extension control parameters

**Port functions,** **4**
**.**

**SigIn port function explanation**

**4**

### 4.4.1

| Number | symbol | function | Functional specifications |
|---|---|---|---|
| 0 | NULL | No function specified | Drive the input status does not produce any action. |
| 1 | Son | servo enable | OFF： The driver is not enabled, the motor without power<br>ON： Drive enabled, the motor power<br>Note: Pn003 parameters or Son state decision. |
| 2 | AlarmRst | The alarm reset | Alarm, and when the alarm can be clear, the input signal (OFF to ON), the delay to clear the alarm. |
| 3 | CCWL | Forward driving ban | OFF: Motor forward is prohibited<br>ON： Allow the motor forward<br>Note 1: if you want to use forward driving ban, first set Pn006 parameters, enabled, and designated to a specific to the input port. By default, do not use this feature.<br>Note 2: the normal operation of the motor, CCWL must in a normally closed contact state (ON)<br>Note 3: the origin, this function is invalid. |
| 4 | CWL | Reverse driving ban | OFF: Prohibit motor reversal<br>ON： Allow the motor reversal |

| | | | |
|---|---|---|---|
| 5 | TCCW | External forward torque limit | OFF: CCW direction /torque without limited parameters Pn010<br>ON: CCW direction/torque limited by Pn010 parameters<br>Note: whether TCCW efficient or effective, CCW direction torque is also restricted by Pn008 parameters. |
| 6 | TCW | Around outside the torque limit | OFF: The CW direction torque Pn011 parameters without limit<br>ON: The CW direction torque Pn011 parameter restrictions<br>Note: whether TCW efficient or effective, the CW direction torque is also restricted by Pn009 parameters. |
| 7 | EMG | Emergency stop | OFF: Ban drive motor drive, to cut off the motor current<br>ON: Allow normal drive motor drive |
| 8 | Zero Lock | Zero speed clamp | Don't lock the motor shaft<br>Speed control:<br>OFF:<br>ON : Lock the motor shaft |
| 9 | SP1 | Internal speed command option 1 | When a drive control mode in speed control mode, the speed reference source by SigIn SP1, SP2, SP3 decision: |
| 10 | SP2 | Internal speed command option 2 | |
| 11 | SP3 | nternal speed 3 command option 1 | |

| SP3 | SP2 | SP1 | Speed instruction |
|---|---|---|---|
| 0 | 0 | 0 | Internal speed 1/ External analog External analog |
| 0 | 0 | 1 | internal speed 2 |
| 0 | 1 | 0 | internal speed 3 |

<table>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>0</td><td>1</td><td>1</td><td>internal speed 4</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>internal speed 5</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>internal speed 6</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>internal speed 7</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>internal speed 8</td></tr>
</table>
Note:0 means OFF,1means ON.<br>
Note 2: if the SigIn port is not specified SP3, SP2, SP1 unction,<br>
is OFF by default.
</td></tr>
<tr><td>12</td><td>TR1</td><td>The internal torque 1 command option 1</td><td rowspan="2">Select the internal torque control mode, the use of TR1, TR2 combination, can choose 4 kinds of torque command.
<table>
<tr><td>TR2</td><td>TR1</td><td>Torque command</td></tr>
<tr><td>0</td><td>0</td><td>The external torque 1 / internal analog torque command</td></tr>
<tr><td>0</td><td>1</td><td>The internal torque 2</td></tr>
<tr><td>1</td><td>0</td><td>The internal torque 3</td></tr>
<tr><td>1</td><td>1</td><td>The internal torque 4</td></tr>
</table>
Note:0 means OFF,1means ON.<br>
Note 2: if the SigIn port doesn't specify TR2, TR1 functions, is OFF by default.</td></tr>
<tr><td>13</td><td>TR2</td><td>The internal torque command</td></tr>
<tr><td>14</td><td>Cmode</td><td>Control mode switch</td><td>Parameter Pn002 for 3, 4, 5, control mode can be switched.</td></tr>
<tr><td>15</td><td>Cgain</td><td>Gain switch</td><td>When the parameter Pn045 is 2, through Cgain switch gain combination:<br>OFF The first gain：<br>ON： The second gain</td></tr>
<tr><td>16</td><td>Gn1</td><td>Electronic gear molecular option 1</td><td rowspan="2">By Gn1, Gn2 combination, electronic gear molecules 1 ~ 4
<table>
<tr><td>Gn2</td><td>Gn1</td><td>Electronic gear ratio than N</td></tr>
<tr><td>OFF</td><td>OFF</td><td>the 1</td></tr>
</table></td></tr>
<tr><td>17</td><td>Gn2</td><td>Electronic</td></tr>
</table>

| | | | |
|---|---|---|---|
| | | gear molecular option 2 | <table><tr><td></td><td></td><td>molecular</td></tr><tr><td>OFF</td><td>ON</td><td>the 2 molecular</td></tr><tr><td>ON</td><td>OFF</td><td>the 3 molecular</td></tr><tr><td>ON</td><td>ON</td><td>the 4 molecular</td></tr></table> |
| 18 | CINV | Instructions in reverse | The speed or torque control mode, take the speed or torque of the instruction.<br>OFF: The normal order<br>ON: Instructions in reverse |
| 19 | Pclear | Position deviation to clear | Clear position deviation value of the counter, clear way by Pn108 parameters:<br><table><tr><td>Pn108</td><td>way</td></tr><tr><td>0</td><td>During the Pclear level ON</td></tr><tr><td>1</td><td>Pclear rise along time (from OFF to ON)</td></tr></table> |
| 20 | INH | Pulse input is prohibited | OFF: Pulse allows input instructions<br>ON : Input instruction pulse have been banned, ignored |
| 21 | PC | Proportional control | Speed loop PI control<br>OFF: Speed loop P control<br>ON : |
| 22 | GOH | The origin return to trigger | See the appendix F |
| 23 | REF | The origin return reference point | |
| 24 | Pos1 | pos1 Pos1 internal location choice | See the appendix G |
| 25 | Pos2 | pos2 Pos2 internal location choice | |

| | | |
|---|---|---|
| 26 | ptriger | Trigger internal position command |

**SigOut port function explanation**

| | | |
|---|---|---|
| 27 | pstop | Suspend internal position command |

**4.4.2**

| Number | symbol | function | Functional specifications |
|---|---|---|---|
| 0 | null | No function specified | |
| 1 | Alarm | Alarm detection | OFF: alarm<br>ON: no alarm |
| 2 | Ready | servo is ready | OFF: There are alarm or malfunction<br>ON: No alarm and fault |
| 3 | Emg | Emergency stop checked out | OFF：Not in a state of emergency stop<br>ON : In a state of emergency stop |
| 4 | Preach | Positioning to complete | Pn104 position deviation is greater than the Position control mode<br>OFF:<br>The value of position deviation less than or parameter set value<br>ON: |
| | | | equal to Pn104 parameters setting |

| | | | |
|---|---|---|---|
| 5 | Sreach | Speed to reach | OFF: Speed is less than Pn021 set value<br>ON: Speed is greater than or equal to Pn021 set value |
| 6 | Treach | reach the predetermined torque | OFF: Torque is less than Pn024 set value<br>ON: The value of torque is greater than or equal to Pn024 set |
| 7 | Zero Speed | zero speed | OFF: Faster than Pn027 set value<br>ON: Speed is less than or equal to Pn027 set value |
| 8 | Run | Servo motor current | The motor has no electricity OFF:<br>motor current<br>ON: |
| 9 | BRK | Electromagnetic brake | OFF: Electromagnetic brake<br>ON：电磁制动器释放 Electromagnetic brake release |
| 10 | HOME | The origin return to complete | See the appendix F |
| 11 | Pnear | Located close to | Pn106 position deviation is greater than the in a position control<br>OFF:<br>The value of position deviation less than or parameter set value<br>ON:<br>equal to Pn106 parameters setting |
| 12 | TRQL | The torque limit | OFF: The motor torque is not limited<br>ON: The motor torque is limited<br>When the torque command reaches Pn008 Pn009, Pn010, the parameter value, the smallest Pn011 TRQL to ON. |
| 13 | SPL | The speed limit | Motor speed wasn't up to the limiting value When the torque control OFF: |

| | | | |
|---|---|---|---|
| | | | ON: Motor speed has reached the limit<br>Look Pn198 Pn199 instructions |
| 14 | TCMDreach | Look Pn198 Pn199 instructions | In torque control:<br>OFF: Motor torque did not reach the upper machine set torque instruction value<br>ON: The setting of motor torque reaches the upper machine set torque instruction value<br>See Pn208, Pn209 instructions. |

# Chapter 5 monitoring parameters and operation

## 5.1 Monitor panel operation

As shown in the third chapter "monitoring mode operation"

## 5.2 Monitor the parameter list

| Number | instruction |
|---|---|
| dn-00 | Monitor display options (the default for motor speed), and by setting the Pn079 parameter, make the dn - 00 show different monitoring status. |
| dn-01 | (r/min) Speed instruction (r/min) |
| dn-02 | The average torque (%) |
| dn-03 | Position deviation value (9999 ~ 9999) (unit: a) |
| dn-04 | The ac power voltage (V) |
| dn-05 | The maximum instantaneous torque (%) |
| dn-06 | Input pulse frequency (in KHZ) |
| dn-07 | Heat sink temperature (℃) |
| dn-08 | |

| | |
|---|---|
| | The current motor speed (r/min) |
| dn-09 | Effective input command pulse accumulative total value low (9999 ~ 9999) (unit: a) |
| dn-10 | Effective input command pulse accumulative total value high (5000 ~ 5000) (unit: m) (pulse accumulative total value high more than + 5000, the high position 0, low today, to count) |
| dn-11 | Effective feedback position control, the encoder pulse accumulative total value is low (9999 ~ 9999) (unit: a) |
| dn-12 | Effective feedback position control, the encoder pulse accumulative total value high (5000 ~ 5000) (unit: m) (feedback pulse accumulative total value more than + 5000 high, high position 0, low today, to count) |
| dn-13 | Regenerative braking load factor |
| dn-14 | Signal input port state, from left to right in turn is SigIn1 ~ SigIn4 (1: high level; 0: low level) |
| dn-15 | Output port status signal, from left to right in turn is SigOut1 ~ SigOut4 (1: high level; 0: low level) |
| dn-16 | Analog torque command voltage (V) |
| dn-17 | Simulation speed reference voltage (V) |
| dn-18 | Output function status register |
| dn-19 | After power on the servo, motor feedback pulse accumulative total value low (9999 ~ 9999) (unit: a) |
| dn-20 | Electric servo, motor feedback pulse accumulative total value high (5000 ~ 5000) (unit: m) (feedback pulse accumulative total value more than + 5000 high, high position 0, low today, to count) |
| dn-21 | The drive software version |
| dn-22 | Encoder UVW signals from left to right in order for the sale of state level (1: high level; 0: low level) |
| dn-23 | Rotor absolute position |

Note: Dn - 18 output function status register SigOut port state of logic, Namely each Bit position shown in the table below:

| Bit | Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|---|

| function | Run | Zero Speed | Treach | Sreach | Preach | Emg | Ready | Alarm |
|---|---|---|---|---|---|---|---|---|
| Bit | Bit15 | Bit14 | Bit13 | Bit12 | Bit11 | Bit10 | Bit9 | Bit8 |
| function | - | - | - | SPL | TRQL | Pnear | HOME | BRK |

Function for Bit is 0, said ON state, 1 is the OFF state.

## Chapter 6 alarm and processing

## 6.1 Alarm clearance operations

As shown in the third chapter of the auxiliary model operation "police clearance operation"

**Alarm content and countermeasure**

## 6.2

| Alarm display | Clear way | Abnormal alarm instructions | Elimination method |
|---|---|---|---|
| AL-01 | power on | The memory chip memory contents are destroyed or damaged | To initialize the parameters, and observation. 1: Internal chip is damaged, replace the 2: servo amplifier. |

| | | | |
|---|---|---|---|
| AL-02 | reset | In the case of lack of low-pressure warning, dc bus voltage below Pn083 alarm (200 v). | 1： The external power supply voltage is measured with a voltmeter is in accordance with the specifications. If conform to the specifications, can use Fn009 auxiliary<br>Through the display panel, into monitor mode, busbar voltage correction.<br>2：<br>mode, observations show that whether the voltage is consistent with an external voltage, if the difference is too big, the internal components damaged, replace the<br>Motor start too fast, large load, which servo amplifier.<br>3：<br>leads to the internal bus voltage is lower. If it is single phase power supply access, please use three-phase power supply connection. |

| | | | |
|---|---|---|---|
| AL-03 | power on | Internal dc bus voltage is higher than Pn084 (365 v). | 1： The external power supply voltage is measured with a voltmeter is in accordance with the specifications. If conform to the specifications, can use Fn009 auxiliary<br>Through the display panel, into monitor mode, busbar voltage correction.<br>2：<br>mode, observations show that whether the voltage is consistent with an external voltage, if the difference is too big, the internal components damaged, replace the<br>In a reasonable range, appropriate servo amplifier.<br>3：<br>reduction small load inertia or prolonged deceleration, or need additional braking resistor. |
| AL-04 | power on | Intelligent power module directly produce the report to the alarm | 1 Check the motor line U, V, W： and<br>Turn the power off half an hour, encoder line is normal.<br>2：<br>electricity again, if the alarm is still there, may be internal power module is damaged,<br>Speed loop and current loop pid please replace the servo amplifier.<br>3:<br>parameter Settings. |

| | | | |
|---|---|---|---|
| AL-05 | reset | overload 1 | Pn014 parameters set period of time for greater than Pn012 overload capacity parameters or Pn013 set by multiples of the curr ent. 1 ： Check the motor line U, V, W and Motor high frequency, acceleration and encoder line is normal. 2: deceleration delay when the director of the deceleration time, reduce the load inertia, or in more powerful capacity of servo motor. |
| AL-06 | power on | overload 2 | Pn015 parameter set period of time, 3 times greater than the rated load. Eliminate overload method reference 1. 注：有些电机只能承受额定负载的 2.5 或 2 倍，则不按 3 倍作为计算 。 Note: some motor can only bear the 2.5 or 2 times of the rated load, are not as calculated as 3 times. |
| AL-07 | reset | Motor speed is too high | 1 ： Check the motor line U, V, W and Reduce the pulse frequency of input encoder line is normal. 2： instructions, or adjust the electronic gear rati o. 3 ： Improper speed loop pid parameter adjustment, readjust. |
| AL-08 | reset | 70 ℃ Servo amplifier heat sink overheating, actual | 1 ： Repeat overload will cause the drive overheating, please change the motor operation mode. For prolonging the life of the |

| | | | |
|---|---|---|---|
| | | temperature has more than 70 ℃ | server, and should be used under the environment temperature of 55 ℃, the recommended temperature does not exceed |
| | | | Brake average power overload. 40 ℃. 2： |
| AL-09 | power | The encoder abnormal | 1： Check whether the motor encoder wiring is connected to the drive. 2： Check whether the motor encoder interface virtual welding, short circuit, or fall off, 3: the encoder power cord is normal (encoder connection. Check the encoder voltage (5 v + / - 5%). coder line is long, need to pay special attention to) |
| AL-10 | reset | 600kpps Actually receives the pulse frequency is too high, more than 600 KPPS | 1： Electronic gear ratio (A/B) Settings. To Reduce the pulse frequency of the input adjust the ratio of A/B. 2: command |
| AL-11 | reset | Postion Pulse deviation value over the default | 1： Check the motor line U, V, W and Position command smoothing time encoder line is normal. 2: constant set is too large. |

| | | | |
|---|---|---|---|
| | | | Increase the position loop gain, to speed<br>3:<br>up the response speed of the machine.<br><br>4：Using the monitor model, check to see if the<br>motor output torque limits. |
| AL-12 | reset | Current sampling circuit<br>may be damaged | 1：The instantaneous electric current too<br>Check the motor line (U, V, W) whether<br>big, is beyond the range of detection.<br>2:<br>Sampling circuit is damaged, replace the<br>loose fall off.<br>3:<br>servo amplifier. |
| AL-13 | power on | The CPU internal fault | The external interference is too large,1：<br>The CPU chip is damaged, replace the<br>reduce the interference.<br>2：<br>servo amplifier. |
| AL-14 | Emergency stop | Emergency stop signal is effective | See if port, setting of emergency stop<br>function, signal contact is in a normally<br>closed state (ON) |
| AL-15 | Abnormal driving ban | Ccwl or.cwl to OFF state | Check CCWL,.cwl wiring, the signal1：<br>contact is in a normally closed state (ON). |

| | | | |
|---|---|---|---|
| | | | 2：If do not use the driving ban function, can set<br>pn006 parameters, to block it. |
| AL-16 | Brake average | The input voltage is | 1：Using the monitoring mode to see if the |

| | | | |
|---|---|---|---|
| | power overload | too high or braking load rate above 85% | Reduce the start-stop frequency<br>input voltage is beyond the normal range<br>2：External more powerful regenerative<br>3：braking resistor (remove internal brake<br>Increase the deceleration time<br>resistance, not parallel)<br>4：Renewable power resistance value and<br>5：<br>Change a more powerful motor and drive<br>the resistance value is set correctly<br>6： |
| AL-17 | Abnormal encoder signal<br>frequency output Settings | Set the encoder output of frequency division than not. | Resetting Pn016, Pn017 parameter values, must satisfy the DA/DB > = 1. |
| AL-18 | Improper motor code sets | The current drive model does not support setting of motor model | Reference drive and motor type adapter table, resetting Pn001. |

# Chapter 7 Modbus communication function

## 7.1 Modbus communication profile

This drive is RS - 232 and RS - 485 communication interface, the user can choose a kind of communication interface and the driver. Communication method adopts the Modbus transfer agreement, can use the following two communication modes: ASCII (American Standard Code for information interchange) mode and the RTU (Remote Terminal Unit) model. Before communication, you must first set up good communication related parameters (Pn064 ~ Pn071).

### 7.1.2 Coding meaning

ASCII mode:

Each 8-bit data consists of two ASCII characters. For example, a 78 - byte data 1 h (hexadecimal notation), expressed in ASCII, contains the '7' ASCII (37 h) and "8" ASCII (38 h).

The Numbers 0 to 9 and letters A through F ASCII, the following table:

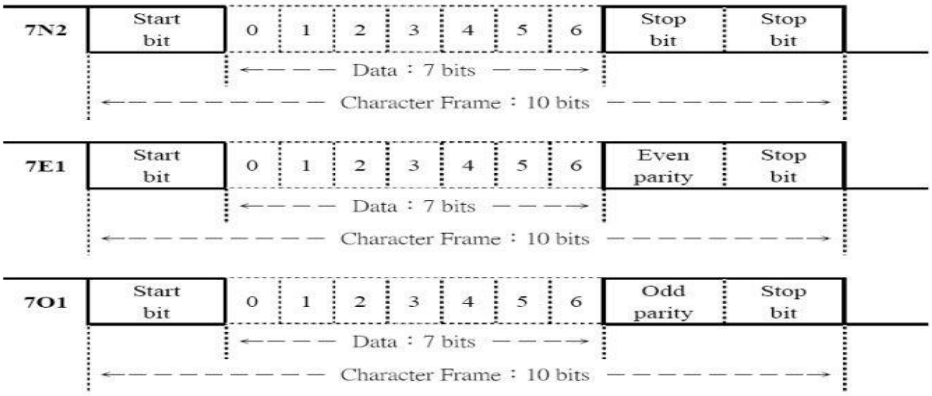
| Character symbols | '0' | '1' | '2' | '3' | '4' | '5' | '6' | '7' |
|---|---|---|---|---|---|---|---|---|
| Corresponding to the ASCII | 30H | 31H | 32H | 33H | 34H | 35H | 36H | 37H |
| Character symbols | '8' | '9' | 'A' | 'B' | 'C' | 'D' | 'E' | 'F' |
| Corresponding to the ASCII | 38H | 39H | 41H | 42H | 43H | 44H | 45H | 46H |

RTU mode:

Each 4 - bit 8-bit data by two hexadecimal data, Namely the general Number of hexadecimal. For example, decimal in 1 120 - byte RTU data representation for 78 H.

### 7.1.3 The data structure

10 bit character mode (for 7 bit data)




11 bit character mode (for 8 bit data)

## 7.2 Communication protocol structure

ASCII mode

| Name | meaning | instruction |
|---|---|---|
| Start | Communication began | The starting character ':' (ASCII: 3 ah) |
| Address | The communication address | '0'=30H Address, that is, drive site Number. For example: a drive site # 32, hexadecimal for 20 h, Address = '2', '0' or '2' = 32 h, '0' = 30 h |

| | | |
|---|---|---|
| CMD | order | 1 byte contains two ASCII.<br>Commonly used commands: 3 h (read registers), 6 h ((reading a single register), 8 h (diagnostic function), 10 h (write multiple register) |
| DATA(n-1)<br>.....<br>DATA(0) | The data content | N = 2 N word bytes = 4 N ASCII (N < = 8) |
| LRC | Check code | 1 byte contains two ASCII |
| End 1 | The end of the code 1 | 0 dh, i.e., CR |
| End 0 | The end of the code 0 | 0 ah, that is, LF |

RTU mode

| Name | meaning | instruction |
|---|---|---|
| Start | Communication began | The rest time to at least 3.5 bytes transmission time |
| Address | The communication address | Address =20H Address, that is, drive site Number. For example: a drive site # 32, hexadecimal for 20 h, Address = 20 h |
| CMD | command | 1 byte. Commonly used commands: 3 h (read registers), 6 h ((reading a single register), 8 h (diagnostic function), 10 h (write multiple register) |
| DATA(n-1) | | |

| | | |
|---|---|---|
| ..... | data content | Word N = 2 N bytes (N < = 9) |
| DATA(0) | | |
| CRC | Check code | 1 byte |

**Commonly used command code**

| | | |
|---|---|---|
| End 1 | The end | The rest time to at least 3.5 bytes transmission time |

**Reading a multiple register**

## 7.3

Reading a multiple register

### 7.3.1

03H：

Instructions: read the N word, N values for 1 ~ 8 scope

Example: from the site of 01 h drive read starting address 0013 h 2 words.

Response - > PC

Response - > PC

***1. ASCII mode***

PC - > drive

(OK)(Error)

| | | |
|---|---|---|
| start | | ':' |
| Address | | '0' |
| | | '1' |
| cmd | | '0' |
| | | '3' |
| Data source addres | high bit | ' 0 ' |
| | | ' 0' |
| | low bit | '1' |
| | | ' 3 ' |
| Read the Number register | | ' 0 ' |
| | | ' 0 ' |
| | | ' 0 ' |
| | | ' 2' |
| LRC | | 'E' |
| | | '7' |
| END1(CR) | | 0DH |
| END0(LF) | | 0AH |

| | | |
|---|---|---|
| start | | ':' |
| Address | | '0' |
| | | '1' |
| cmd | | '0' |
| | | '3' |
| Data bytes | | '0' |
| | | '4' |
| Address 0013 h content | high bit | ' 0 ' |
| | | ' 0 ' |
| | low bit | ' 3 ' |
| | | '2' |
| Address 0014 h content | high bit | '0 ' |
| | | '0' |
| | low bit | '0' |
| | | ' A ' |
| LRC | | 'B' |
| | | 'C' |
| END1(CR) | | 0DH |
| END0(LF) | | 0AH |

| | |
|---|---|
| start | ':' |
| Address | '0' |
| | '1' |
| cmd | '8' |
| | '3' |
| Abnormal code | '0' |
| | '2' |
| LRC | '7' |
| | 'A' |
| END1(CR) | 0DH |
| END0(LF) | 0AH |

Response - > PC

***2. RTU mode***

PC - > drive

Response - > PC (OK)(Error)

| | | |
|---|---|---|
| Address | | 01H |
| CMD | | 03H |
| Data source address | high bit | 00H |
| | low bit | 13H |
| Read the register Number | | 00H |
| | | 02H |

| | | |
|---|---|---|
| Address | | 01H |
| CMD | | 03H |
| Data bytes | | 04H |
| The content of the 0013 h address | high bit | 00H |
| | low bit | 32H |
| The | high | 00H |

| | |
|---|---|
| Address | 01H |
| CMD | 83H |
| Abnormal code | 02H |
| CRC low bit | C0H |
| high bit | F1H |

**Write a single register**

| | |
|---|---|
| | |
| CRC low bit | 35H |
| CRC high bit | CEH |

| | | |
|---|---|---|
| | bit | |
| content of the 0014 h address | low bit | 0AH |
| CRC low bit | | DBH |
| CRC high bit | | FBH |

Write a single register

**7.3.2**

06H：

Description: write a word to the register.

For example: drive station Number of 01, write data initial address is 0013 h, write data, 100 (64 h).

Response - > PC

## *1. ASCII MODE*

PC - > drive

(OK)(Error)

Response - > PC

| | | |
|---|---|---|
| start | | ':' |
| Address | | '0' |
| | | '1' |
| cmd | | '0' |
| | | '6' |
| Data source address | high bit | ' 0 ' |
| | | ' 0' |
| | low bit | ' 1 ' |
| | | ' 3 ' |
| The data content (word format) | | ' 0 ' |
| | | ' 0 ' |
| | | ' 6' |
| | | ' 4' |
| LRC | | '8' |
| | | '2' |
| END1(CR) | | 0DH |
| END0(LF) | | 0AH |

| | | |
|---|---|---|
| start | | ':' |
| Address | | '0' |
| | | '1' |
| cmd | | '0' |
| | | '6' |
| Data source address | high bit | ' 0 ' |
| | | ' 0' |
| | low bit | ' 1 ' |
| | | ' 3' |
| The data content (word format) | | ' 0 ' |
| | | '0' |
| | | ' 6 ' |
| | | ' 4 ' |
| LRC | | '8' |
| | | '2' |
| END1(CR) | | 0DH |
| END0(LF) | | 0AH |

| | |
|---|---|
| start | ':' |
| Address | '0' |
| | '1' |
| cmd | '8' |
| | '6' |
| Abnormal code | '0' |
| | '3' |
| LRC | '7' |
| | '6' |
| END1(CR) | 0DH |
| END0(LF) | 0AH |

**2. RTU MODE**

PC - > driv

Response - > PC

e(OK)

(Error)

| | | |
|---|---|---|
| ddress | | 01H |
| CMD | | 06H |
| Data source address | high bit | 00H |
| | low bit | 13H |
| The data content (word format) | | 00H |
| | | 64H |
| CRC low bit | | 79H |
| CRC high bit | | E4H |

| | | |
|---|---|---|
| Address | | 01H |
| CMD | | 06H |
| Data source address | high bit | 00H |
| | low bit | 13H |
| The data content (word format) | | F4H 00H |
| | | 48H 64H |
| CRC low bit | | 79H |
| CRC high bit | | E4H |

| | |
|---|---|
| Address | 01H |
| CMD | 86H |
| Abnormal code | 03H |
| CRC low bit | 02H |
| CRC high bit | 61H |

**7.3.3 diagnosis**

08H: Diagnostic function

Note: use 0000 h subfunction code, check the signal transmission between the Master and Slaver. The data content can be any

Number.

For example: the site of 01 h drive using diagnostic function

***1. ASCII Mode***

| PC - > drive | | |
|---|---|---|
| start | | ':' |
| Address | | '0' |
| | | '1' |
| cmd | | '0' |
| | | '8' |
| Subroutine code | high bit | ' 0 ' |

| Response - > PC | | |
|---|---|---|
| start | | ':' |
| Address | | '0' |
| | | '1' |
| cmd | | '0' |
| | | '8' |
| Subroutine code | high bit | ' 0 ' |

| Response - > PC | (OK)(Error) |
|---|---|
| start | ':' |
| Address | '0' |
| | '1' |
| cmd | '8' |
| | '8' |
| Abnormal code | '0' |

| | | |
|---|---|---|
| | | ‘ 0’ |

| | | |
|---|---|---|
| | | ‘ 0 ’ |

| | |
|---|---|
| | ‘3’ |

| | | |
|---|---|---|
| | low bit | ‘ 0 ’ |
| | | ‘ 0 ’ |
| The data content (word format) | | ‘ 8 ’ |
| | | ‘ 6 ’ |
| | | ‘3’ |
| | | ‘ 1’ |
| LRC | | ‘4’ |
| | | ‘0’ |
| END1(CR) | | 0DH |
| END0(LF) | | 0AH |

| | | |
|---|---|---|
| | low bit | ‘ 0 ’ |
| | | ‘ 0 ’ |
| The data content (word format) | high bit | ‘ 8 ’ |
| | | ‘ 6 ’ |
| | low bit | ‘3’ |
| | | ‘ 1’ |
| LRC | | ‘4’ |
| | | ‘0’ |
| END1(CR) | | 0DH |
| END0(LF) | | 0AH |

| | |
|---|---|
| LRC | ‘7’ |
| | ‘4’ |
| END1(CR) | 0DH |
| END0(LF) | 0AH |

***2. RTU mode***

Response - > PC

PC - > drive

(OK)

| | | |
|---|---|---|
| Address | | 01H |
| CMD | | 08H |
| Subroutine code | high bit | 00H |
| | low bit | 00H |
| The data content (word format) | high bit | 86H |
| | low bit | 31H |

Response - > PC

(Error)

| | | |
|---|---|---|
| Address | | 01H |
| CMD | | 08H |
| Subroutine code | high bit | 00H |
| | low bit | 00H |
| The data content (word format) | high bit | 86H |
| | low bit | 31H |

| | |
|---|---|
| Address | 01H |
| CMD | 88H |
| Abnormal code | 03H |
| CRC low bit | 06H |
| CRC high bit | 01H |

**Write multiple register**

| | |
|---|---|
| CRC low bit | 43H |
| CRC high bit | BFH |

| | |
|---|---|
| CRC low bit | 43H |
| CRC high bit | BFH |

**7.3.4**

10H: Write multiple register

Note: write the N word to register in a row, the N maximum 8 h (08).

For example: 100 (0064 h), 300 (012 ch) writes JuHao for 01 servo drives the starting address of 0013 h two consecutive registers.

***1. ASCII MODE***

PC - > drive (OK)(Error) Response - > PC Response - > PC

| | | |
|---|---|---|
| start | | ':' |
| Address | | '0' |
| | | '1' |
| cmd | | '1' |
| | | '0' |
| Data source address | high bit | ' 0 ' |
| | | ' 0' |
| | low bit | ' 1 ' |
| | | ' 3 ' |
| Write the register Number | | ' 0 ' |
| | | ' 0 ' |
| | | ' 0 ' |
| | | ' 2 ' |
| Data bytes | | ' 0 ' |
| | | ' 4' |
| Write data to the 0013 h | high bit | ' 0 ' |
| | | ' 0 ' |
| | low | ' 6' |

| | | |
|---|---|---|
| start | | ':' |
| Address | | '0' |
| | | '1' |
| cmd | | '1' |
| | | '0' |
| Data source address | high bit | ' 0 ' |
| | | ' 0 ' |
| | low bit | ' 1 ' |
| | | ' 3 ' |
| Write the register Number | high bit | ' 0 ' |
| | | '0' |
| | low bit | '0' |
| | | ' 2 ' |
| LRC | | '4' |
| | | '1' |
| END1(CR) | | 0DH |
| END0(LF) | | 0AH |

| | |
|---|---|
| start | ':' |
| Address | '0' |
| | '1' |
| cmd | '9' |
| | '0' |
| Abnormal code | '0' |
| | '3' |
| LRC | '6' |
| | 'C' |
| END1(CR) | 0DH |
| END0(LF) | 0AH |

| | | |
|---|---|---|
| | bit | ‘ 4 ’ |
| Write data to the 0014 h | high bit | ‘ 0 ’ |
| | | ‘ 1 ’ |
| | low bit | ‘ 2’ |
| | | ‘ C’ |
| LRC | | ‘4’ |
| | | ‘5’ |
| END1(CR) | | 0DH |
| END0(LF) | | 0AH |

| | |
|---|---|
| | |

***2. RTU Mode***

| PC - > drive | Response - > PC | Response - > PC |
|---|---|---|
| | | (OK)(Error) |

| | | |
|---|---|---|
| Address | | 01H |
| CMD | | 10H |
| Data source address | high bit | 00H |
| | low bit | 13H |
| Write the register Number | high bit | 00H |
| | 低位 low bit | 02H |
| Data bytes | | 04H |
| Write data to the 0013 h | high bit | 00H |
| | low bit | 64H |
| Write data to the 0014 h | high bit | 01H |
| | low bit | 2CH |
| CRC low bit | | F3H |

| | | |
|---|---|---|
| Address | | 01H |
| CMD | | 10H |
| Data source address | high bit | 00H |
| | low bit | 13H |
| Write the register Number | high bit | 00H |
| | low bit | 02H |
| CRC low bit | | B0H |
| CRC high bit | | 0DH |

| | |
|---|---|
| Address | 01H |
| CMD | 90H |
| Abnormal code | 03H |
| CRC low bit | 0CH |
| CRC high bit | 01H |

A signed integer.

Note 2: write a single register, PC must be about 5.5 ms, waiting for the driver to complete the internal data storage of burning; By the same token, the register write N (N < = 8), the upper machine needs 5.5 ms * N waiting time, to send the write command.

Note 3: read the Dn - 13 parameters, the actual voltage value = value read / 100.

**Check code to calculate**

***LRC England***

***check*** **7**

**.3.5 *1.***

ASCII mode using LRC England (Longitudinal Redundancy Check) Check code. LRC England calibration is to calculate the Address,

CMD, initial data Address and the sum total of the data content will be combined results in 256, modulo (if the sum of the results for

150 h, then only take 50 h), to calculate its complement, the final results for LRC England check code.

Example: 01 H servo drive from site 0013 address read 2 word (word)

| | | |
|---|---|---|
| start | | ':' |
| Address | | '0' |
| | | '1' |
| cmd | | '0' |
| | | '3' |
| Data source address | high bit | ' 0 ' |
| | | ' 0' |
| | low bit | '1' |
| | | ' 3 ' |
| Read the register Number | | ' 0 ' |
| | | ' 0 ' |
| | | ' 0 ' |
| | | ' 2' |
| LRC | | 'E' |
| | | '7' |
| END1(CR) | | 0DH |
| END0(LF) | | 0AH |

From the Address data add to the last data:

01 H + 3 H + 00 00 H + 13 H + H + 02 H = 19 H, for 19 H complement E7H, so LRC England as the 'E', '7'

***CRC check*** ***2 .***

RTU mode adopts CRC (Cyclical Redundancy Check) Check code. Cyclic redundancy check (CRC) domain into two bytes, containing a binary 16-bit value. Attached to the message behind the CRC value calculated by the transmitting device. When receiving device on the receiving message to recalculate the CRC value, and the calculated results compared to actually receives the CRC value. If the two values are not equal, is wrong.

CRC calculation, to a 16-bit registers with full 1. Then put the message in the continuous section 8 of the seats on the subsequent calculations. Only the characters of the eight data bits participate in the operation of generating CRC, start bit, stop bits and parity bit CRC calculation will not be involved.

To generate CRC process as follows:

1. The a 16-bit registers into hexadecimal FFFF. (1) all will be referred to as the CRC register.

2. The first 8 bytes of a message with a 16-bit CRC register low byte exclusive or, result in CRC register.

3. The CRC register moves to the right one to the LSB (direction), the MSB filling zero. Extraction and detection of LSB.

4. (if the LSB of 0) : repeat step 3 (another shift). .

Repeat steps 3 and 4 until complete displacement of 8 times. As after this action, will complete the full operation of eight bytes. (if the LSB to 1) : the CRC register exclusive or polynomial value 0 xa001 (1010, 0000, 0000, 0001).

5. For the next byte of message repeat steps 2 to 5, this operation until all message being processed.

6. CRC register the final content for CRC value.

7. When the CRC value is placed on a message, high and low byte must exchange. Byte is sent first, and then the high byte .

8. For example: from the site of 01 H drive reads two words (word), reading the starting address of 0200 H address. The last of the data from the Address to calculate the CRC register at the end of the content is 0704 H, is the instruction format as shown below, note that the front of the 04 H in H.

| | | |
|---|---|---|
| Address | | 01H |
| CMD | | 03H |
| Data source address | high bit | 02H |
| | low high | 00H |
| | | 00H |

| | |
|---|---|
| Data length (in terms of word) | 02H |
| CRC low bit | 04H |
| CRC high bit | 07H |

CRC generation paradigm:

he following CRC value by C language. This function requires two parameters:

Unsigned char * data; / / data source address, used to calculate the CRC value

Unsigned char length; / / data length

This function returns the unsigned integer type of CRC value.

```
unsigned int crc_chk(unsigned char * data,unsigned char length)
{
   int i,j;
   unsigned int crc_reg=oxFFFF;
    While(length- -)
    {
     Crc_ reg ^=*data++;
     for(j=0;j<8;j++)
     {
         If(crc_reg & 0x01)
         {
            crc_reg=( crc_reg >>1)^0xA001;
         }else
         {
          crc_reg＝crc_reg >>1;
         }
     }
   }
   return crc_reg;
}
```

### 7.3.6 Abnormal code

In the process of communication, may create a communication error, common error event in the following table:

| Communication error event | Servo driver approach |
|---|---|
| Read/write parameters, data address is not correct; | The request for processing, and abnormal return an error code |

| | |
|---|---|
| Write parameters, data Number more than the maximum or not within the scope of this parameter; | The request for processing, and abnormal return an error code |
| Data transmission errors or check code (LRC England, CRC, parity check) error | Data is discarded, not returns the response, PC should be request as state handling overtime |

Drive send error exception code, will command function code plus 80 h after send the ModBus master station system together.

Abnormal code in the following table:

| | |
|---|---|
| 01 H | The function of the servo driver does not recognize the request code |
| 02 H | Data address illegal request |
| 03 H | Request the data given in the servo driver does not allow (read and write data Number more than drive to allow maximum or write data value is beyond the scope of parameter values) |
| 04 H | Servo drives are beginning to execute the request, but can't complete the request. |

**7.4 The servo parameters, the state information communication address**

| Data address | | meaning | instructions | operation |
|---|---|---|---|---|
| hexadecimal | The decimal system | | | |
| 0000H~00EFH | 0 ~ 239 | Parameter setting area | Corresponding Pn000 ~ Pn239 | Can read but write |
| 0164H~016DH | 356 ~ 365 | Alarm recording area | In Fn000 can view, corresponding Sn - 0 to Sn - 9 | read-only |
| 0170H~0185H | 368 ~ 389 | Data monitoring area | Corresponding Dn000~Dn021 | read-only |

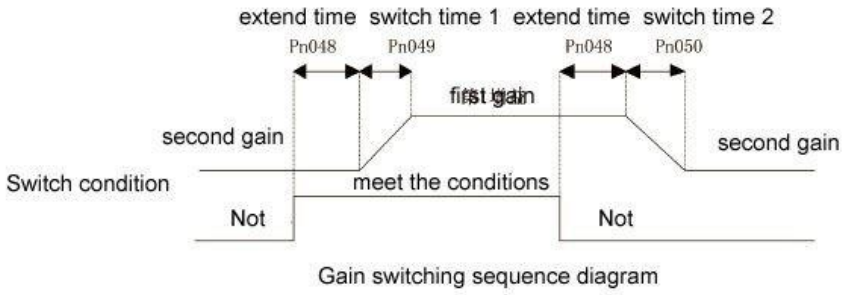
**The appendix**

**Appendix A gain switch**

| | |
|---|---|
| The first gain | The second gain |

| parameter | Name | parameter | Name |
|---|---|---|---|
| Pn153 | The speed regulator proportional gain 1 | Pn155 | The speed regulator proportional gain 2 |
| Pn154 | Speed regulator integral time constant of 1 | Pn156 | Speed regulator integral time constant of 2 |
| Pn192 | Q shaft torque regulator proportional gain is 1 | Pn194 | Q shaft torque regulator proportional gain is 2 |
| Pn193 | Q shaft torque regulator integral time constant of 1 | Pn195 | Q shaft torque regulator integral time constant of 2 |
| Pn196 | Torque Q axis filter time constant of 1 | Pn197 | Torque Q axis filter time constant of 2 |
| Pn115 | The position controller gain 1 | Pn116 | The position controller gain 2 |

Note: gain switch, must be in the right control mode, the setting parameters Pn046 conditions are right, to meet gain switching conditions, to switch.




Gain switching sequence diagram

**Appendix B control mode switch**

**Position/speed control mode switch**

Using the control switch (cmode), can be controlled by input port SigIn contact for position control and speed control mode switch.

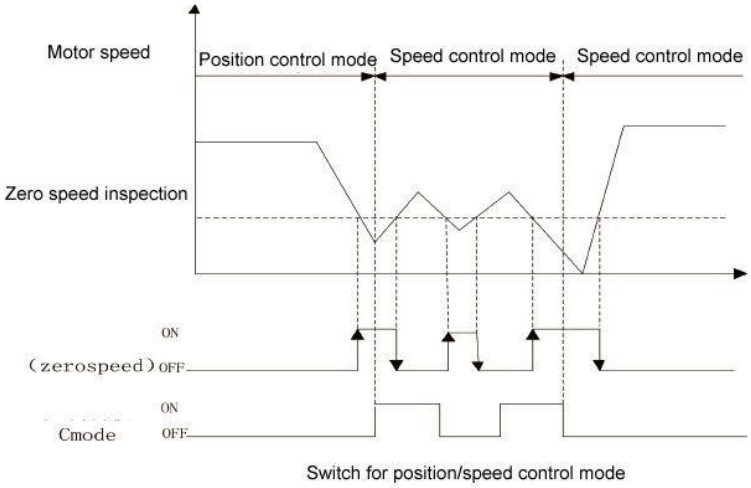
Cmode relationship with control mode is shown below.

| Cmode | Control mode |
|---|---|
| OFF | Position control mode |
| ON | Speed control mode |

Can be in the state of zero speed control mode switch. But to be on the safe side, please switch with the servo motor stopped. From the position control mode switch to the speed control mode, the trapped pulse will be cleared. Before the machine can make, please make sure to enter the control mode (state) of cmode pin. Motor can make, there are two main ways to switch, sequence diagram as shown below:

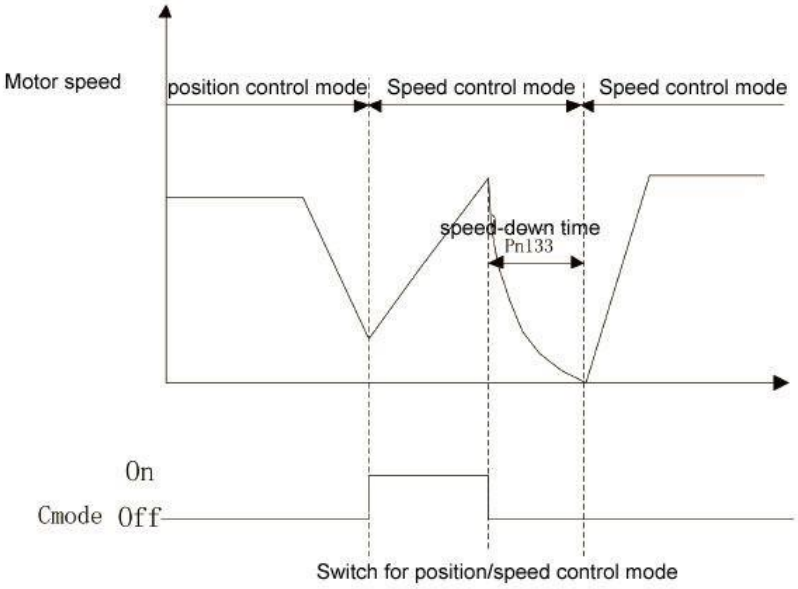
◢Pn132=0:

Only the zero speed condition, switching signal changes, the mode switch is valid; If not zero speed state, the switching signal is changed, then enter into the state of zero speed signal, the mode switch does not occur.




Switch for position/speed control mode

◢Pn132=1:




## B.2 Position/torque control mode switch

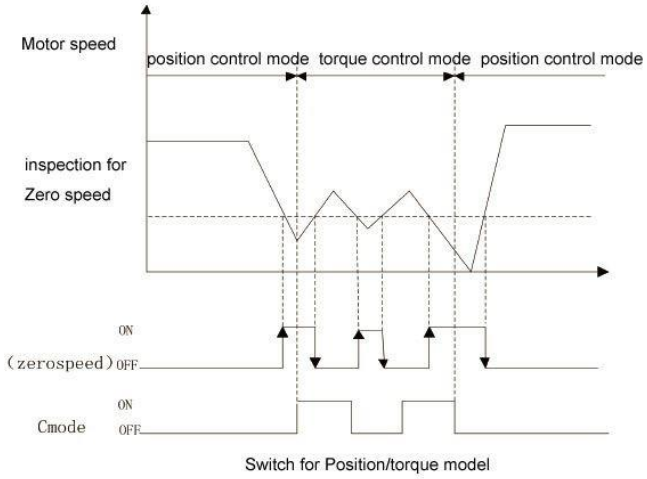
Using the control switch (cmode), can be controlled by input port SigIn contact position control mode and the torque control mode switching. Cmode relationship with control mode is shown below.

| Cmode | Control mode |
|---|---|
| OFF | Position control mode |
| ON | Torque control mode |

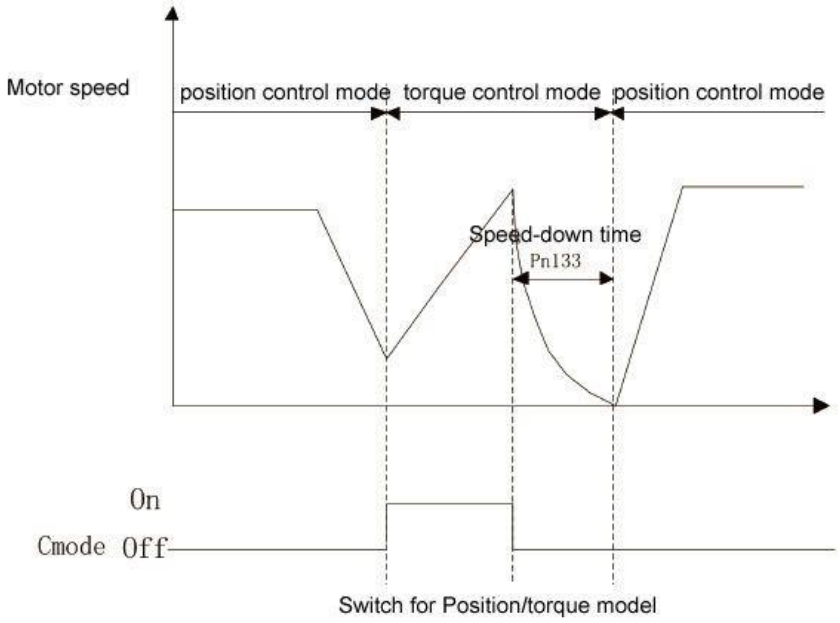
Can be in the state of zero speed control mode switch. But to be on the safe side, please switch with the servo motor stopped. From the position control mode switch to the torque control mode, the trapped pulse will be cleared. Motor can make, there are two main ways to switch, sequence diagram as shown below:

◢Pn132=0:

Only the zero speed condition, switching signal changes, the mode switch is valid; If not zero speed state, the switching signal is changed, then enter into the state of zero speed signal, the mode switch does not occur.




◢Pn132=1:




## B.3 Speed/torque control mode switch

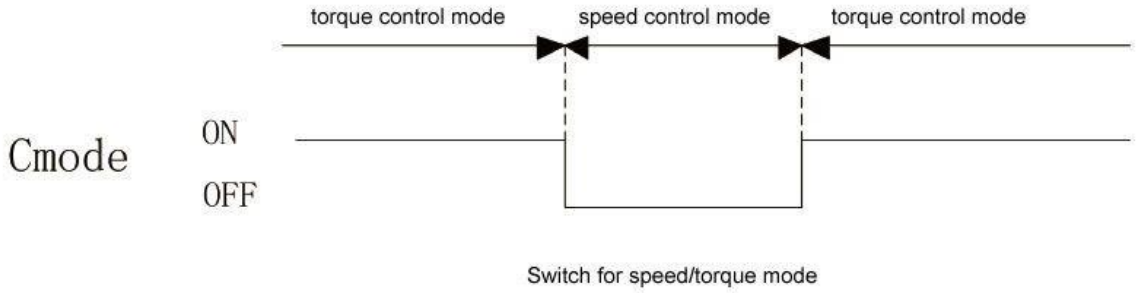
Using the control switch (cmode), can be controlled by input port SigIn contact for speed control mode and the torque control mode switching.

Cmode relationship with control mode is shown below.

| Cmode | Control mode |
|---|---|
| OFF | Position control mode |

| | |
|---|---|
| ON | Torque control mode |

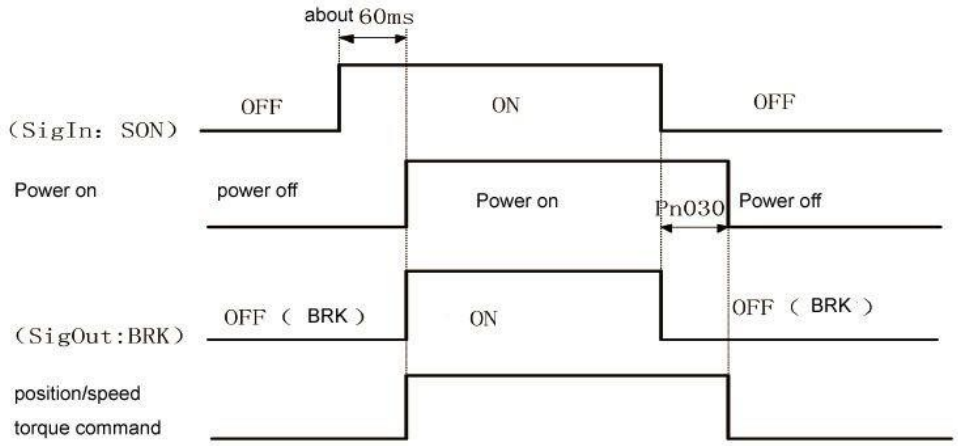
Whenever can control mode switch, switching sequence diagram as shown below:




Switch for speed/torque mode

**Appendix C servo driver work sequence**

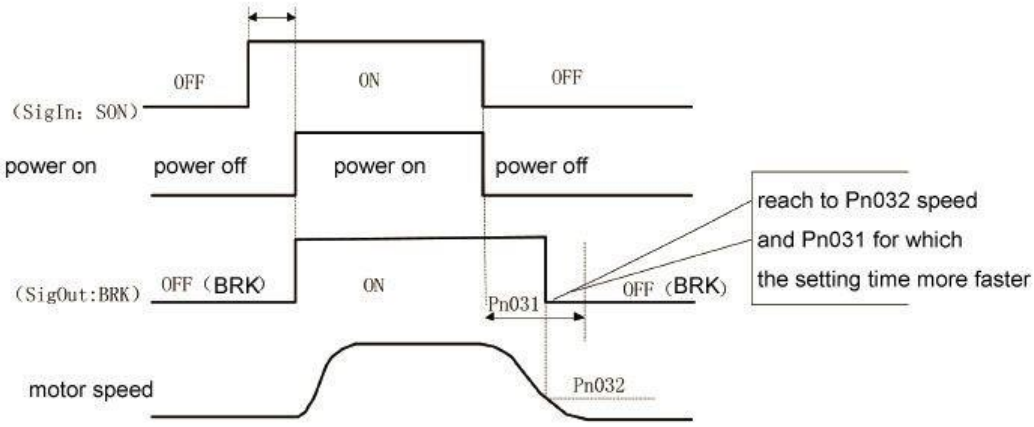
**Motor resting ON/OFF action sequence**




Note 1: when using electromagnetic brake function, servo broken way can make Pn004 must be set to 2.

Note 2: when Pn029 motor speed is lower than the argument, the electromagnetic brake action sequence.

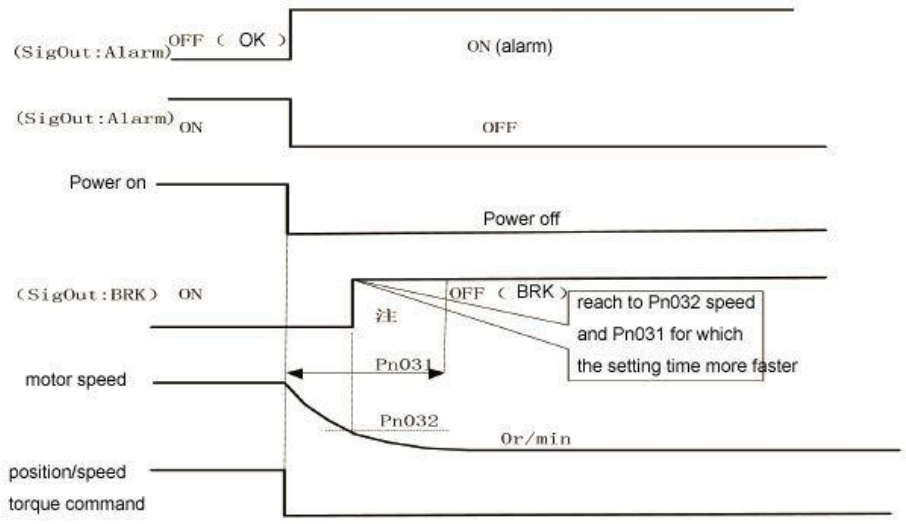
## C.2 In the operation of the motor ON/OFF action sequence




Note 1: when using electromagnetic brake function, servo broken way can make Pn004 must be set to 2

Note 2: when the motor speed is not lower than Pn029 setting parameters, the electromagnetic brake action sequence.

### C.3 When the servo ON alarm sequence




Note 1: when using electromagnetic brake function, servo broken way can make Pn005 must be set to 2

**Appendix D electromagnetic brake**

Electromagnetic brake (to keep the brakes, brake losing electricity, are connected to the motor is used to lock the vertical or inclined workbench, prevent the servo power after losing the workbench. Implement this function, you must choose and buy motor with brake. The brake can be used to keep the workbench, must not be used to slow down and stop the machine movement.

n004 parameter must be set using the electromagnetic brake, to 2, and specify the SigOut port function. Pn029 drive according to the speed of the motor running, according to the parameters setting, choose corresponding braking time sequence, perform the function of electromagnetic brake. Please refer to the appendix C for specific timing.

**Appendix E regenerative braking resistor**

When servo motor running in generator mode, electricity will flow by motor drives, called renewable electricity. The following usage, can make the servo motor running in generator (renewable) mode:

Servo motor, the deceleration is running by slowing down to stop. (1)

When applied to the vertical load. (2)

Driven by load operation of the servo motor. (3)

)

The renewable electricity will be absorbed by the drive of the primary loop filter capacitor, but too much renewable electricity, filter capacitance cannot afford, regenerative resistor must be used to burn off excess renewable electricity. When there is a renewable energy is too large, the internal brake resistance cannot be fully absorbed, resulting in AL - 03 (overvoltage), AL - 08 (temperature) or AL - 16 (such as brake average power overload) call the police. According to the practical application, increase deceleration time, if still alarm, requires external braking resistance, enhance the braking effect. External braking resistance tolerance range of 40 ~ 200 ohms, 1000-50 w, the smaller the value, the braking current, the greater the power, the greater the braking resistance is required for braking energy is larger, but the value is too small may cause damage to the drive, resistance test method is from big to small, until the alarm is no longer present drives, running at the same time, the brake resistance temperature is not too high. When external braking resistor, down the internal regenerative braking resistor. Because regenerative resistor in the consumption of renewable power, can produce high temperature above 100 ° C, please be careful, the connection of regenerative resistor wire please use of heat-resistant non-flammable cables, and confirm the regenerative resistor without touching anything.

Note: if the alarm when using regenerative resistor, please cut off power supply, cooling and a half hours. Due to the regenerative transistor failure, abnormal regeneration resistance heating, may cause a fire. Please be sure to choose according to applications, matching the braking resistor.

**Appendix F origin point**

**F. 1 origin point operation steps**

Looking for a reference point

After start origin regression function, looking for reference point at the origin and return to the first rate, can use SigIn input terminals REF, CCWL or.cwl as a reference point, can also be Z pulse as a reference point, can choose forward or reverse direction finding.

nd the origin

2：Fi

When find reference point, and then to find the origin at the second speed, can choose continue to forward or backward turn-back find Z pulse, may also directly to the reference point for the origin.

Pn041. Find the origin and offset pulse as actual origin, the offset is: Origin point execution process, to avoid rapid changes of mechanical impact speed, can be set parameters for deceleration Pn040,

Pn036*10000+Pn037。

The origin return reference point mode (Pn034) and the origin (Pn035) has the following combination:

| Pn034 / Pn035 | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 0 | ✓(A) | ✓(B) | ✓(A) | ✓(B) | X | X |
| 1 | ✓(C) | ✓(D) | X | X | X | X |
| 2 | ✓(E) | ✓(F) | X | X | ✓(G) | ✓(H) |

✓ mean will work in correct for this combine X mean will not work for this combine

## F.2 The origin return to trigger sequence

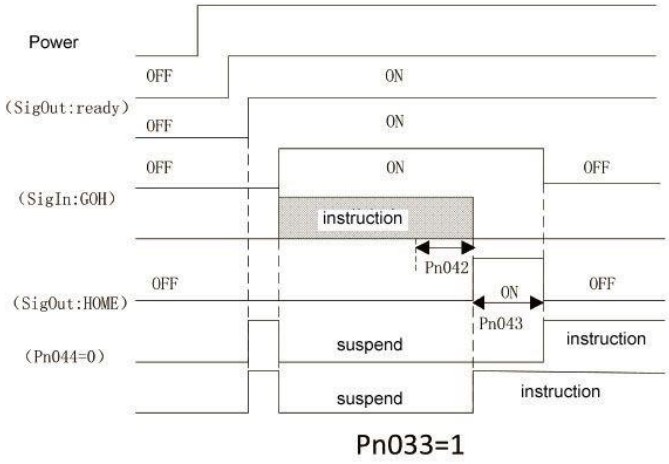
| | | |
|---|---|---|
| Pn033 | The origin is triggered | Close the origin regression function 0<br>:<br>1：Triggered by the GOH SigIn input level<br>2：GOH edge triggered by SigIn input<br>3：Electricity automatically perform again |

***Level trigger (Pn033 = 1)***

Servo enabled, the input terminals GOH triggered the origin return to execute, GOH edge began to return to operation, the suspension of normal instruction execution, the end of the edge back to operation. GOH has kept ON, after the return to perform, position deviation reset (position control), the output terminal HOME ON. Until GOH is OFF, is HOME to OFF.

When Pn044 = 0, origin wait for after the completion of the HOME after the signal into a OFF again executes instructions, waiting for the motor during stay at the origin, not accept instructions; When Pn044 = 1, the origin return immediately after the completion of the instructions.

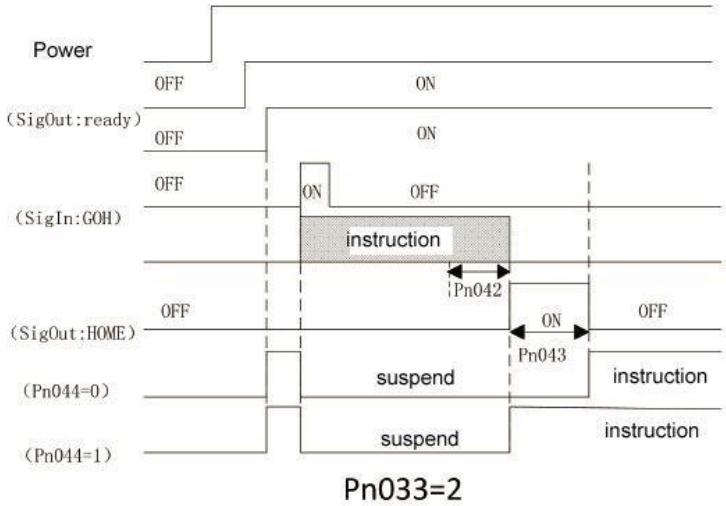
At the origin in the execution of regression, if cancel the servo can make SON, produce any alarm, GOH into OFF ahead of schedule, the origin of regression function suspension and output terminals HOME not action. In addition, if effective, no alarm, can make the son return in execution and there is no complete, even if the edge triggered (Pn033 = 2) repeat signals effectively, the drive will be completed the current return after operation, to detect edge trigger signal.




Pn033=1

***Edge triggered (Pn033 = 2)***

Servo enabled, the input terminals GOH rise triggered the origin return to perform, and suspension of normal instruction execution

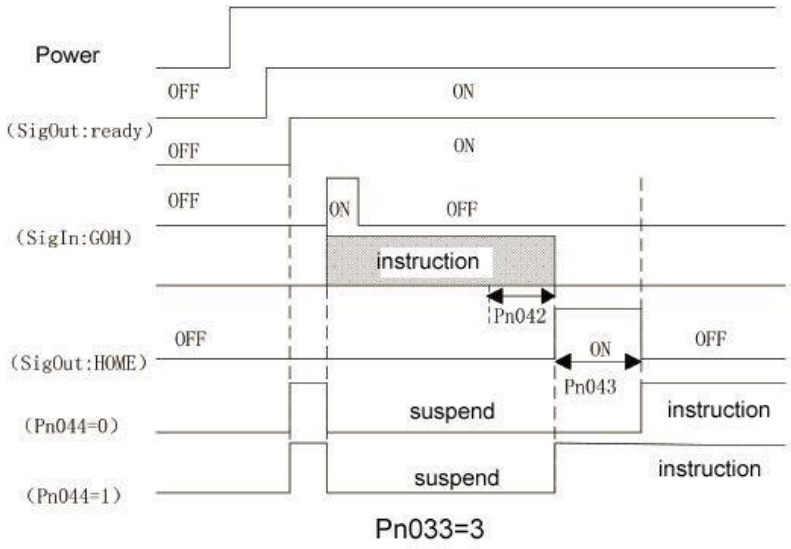



Pn033=2

***Electricity automatically perform (Pn033 = 3)***

This function only in electric servo make effective for the first time after the execution time, later don't need to repeat the origin regression.

Every time it with electricity, drive automatically perform an origin point operations. Use this feature can save one input terminal GOH.




## F.3 The origin model time-series regression combination

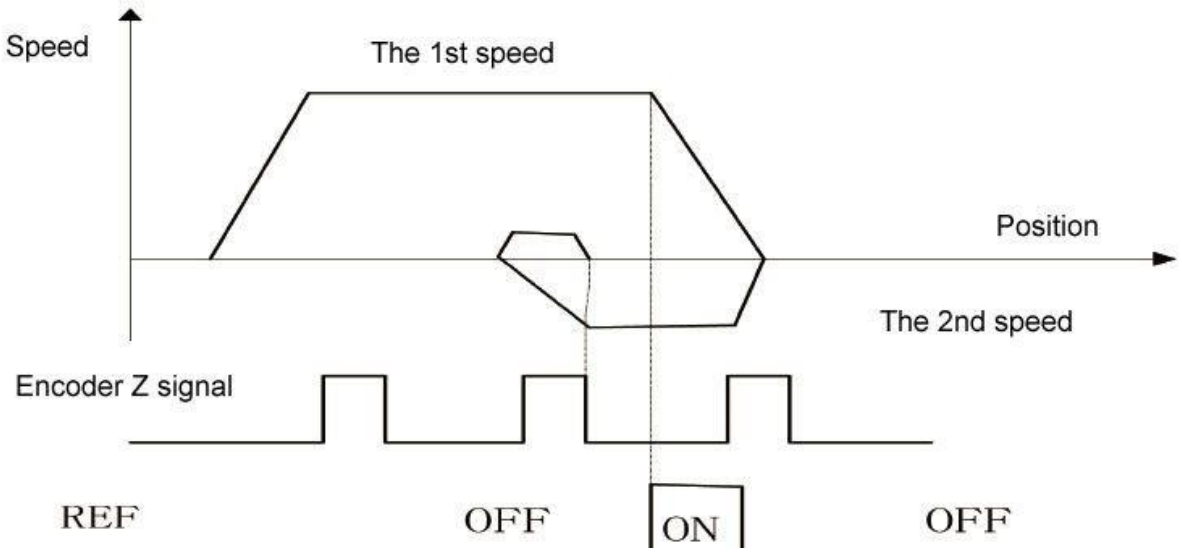
| | | | | |
|---|---|---|---|---|
| Pn034 | The origin return reference point model | 0: Forward looking for REF (rising along the trigger) as a reference point<br>1: Inversion for REF (rising along the trigger) as a reference point<br>2: Forward looking for CCWL falling edge (trigger) as a reference point<br>3: Inversion to find.cwl falling edge (trigger) for reference<br>4: Forward looking for Z pulse as a reference point<br>5: Pulse inversion for Z as a reference point | 0~5 | 0 |
| Pn035 | The origin back to the origin model | 0 Backward looking for Z pulse as the origin：<br>1 Forward looking for Z pulse as the origin<br>： 2 Directly with reference point rise along the origin<br>： | 0~2 | 0 |

Note 1: by combining Pn034 and Pn035 parameters, there are eight kinds of available ways of origin.

Note 2: when operating at the origin regression will close/reverse driving ban function, until the exit to return to operation.

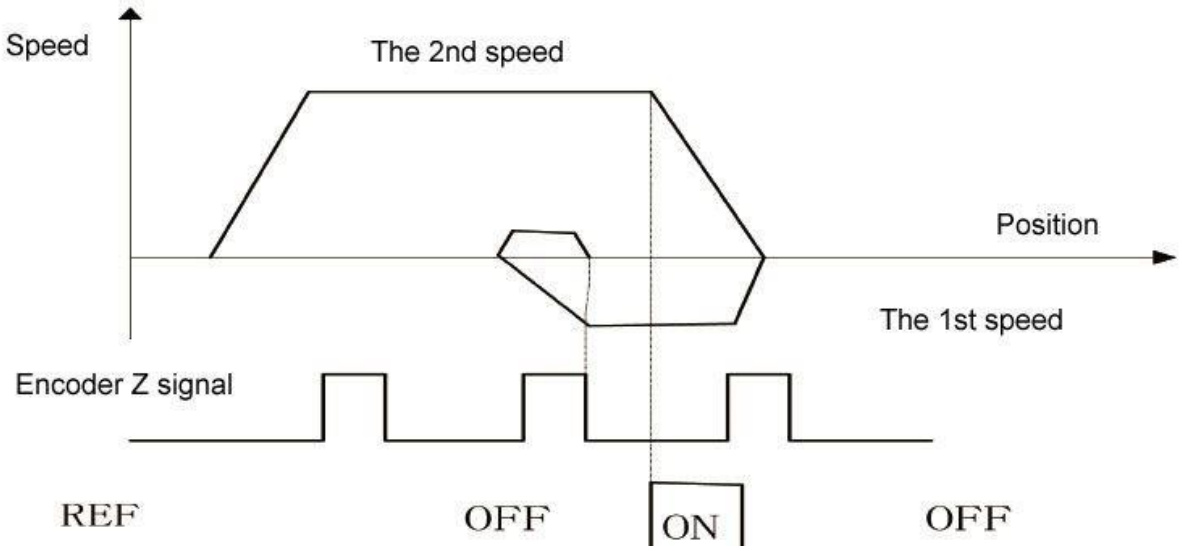
***(A)Pn034=0 or 2,Pn035=0***

| parameter | set | instruction |
|---|---|---|
| Pn034 | 0 or 2 | Origin starts, to return to the first speed forward looking for REF (rising along the trigger) or CCWL falling edge (trigger) as a reference point |
| Pn035 | 0 | Arriving at reference points, the backward looking for Z pulse to return to the second speed as the origin |



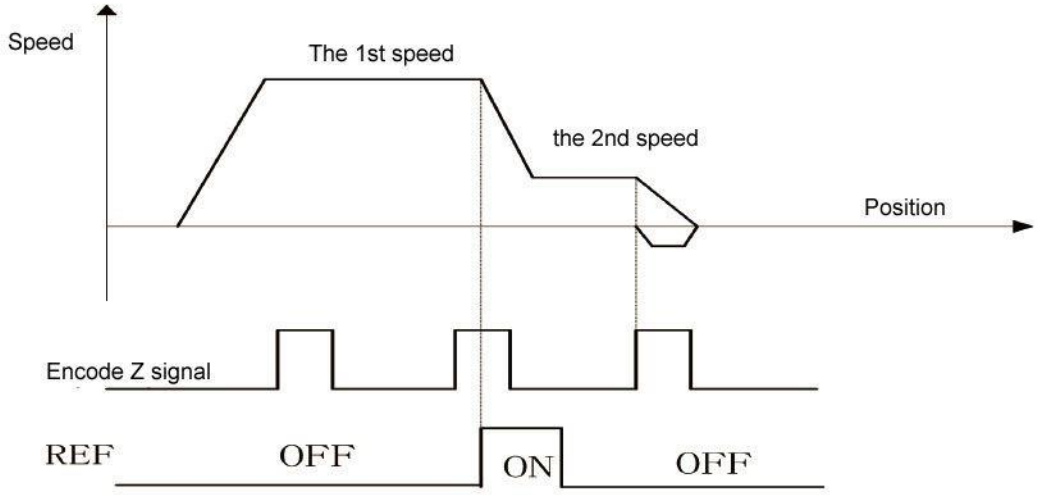

***(B)Pn034=1or 3,Pn035=0***

| parameter | set | instruction |
|---|---|---|
| Pn034 | 1or 3 | Origin starts, to return to the first speed inversion for REF (rising along the trigger) or.cwl falling edge (trigger) as a reference point |
| Pn035 | 0 | Arriving at reference points, the backward looking for Z pulse to return to the second speed as the origin |




***(C)Pn034=0,Pn035=1***

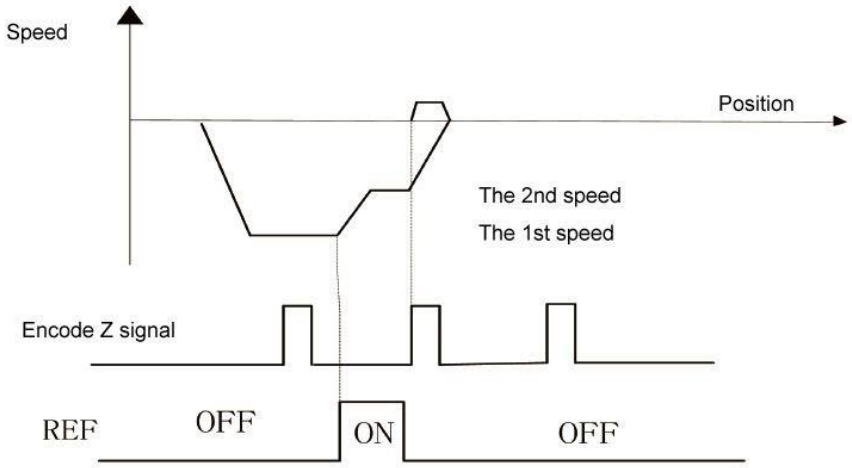
| parameter | set | instruction |
|---|---|---|
| Pn034 | 0 | Origin starts, to return to the first speed forward looking for REF (rising along the trigger) as a reference point |
| Pn035 | 1 | Arrived at the reference point, to return to the second speed forward looking for Z pulse as the origin |




***(D)Pn034=1,Pn035=1***

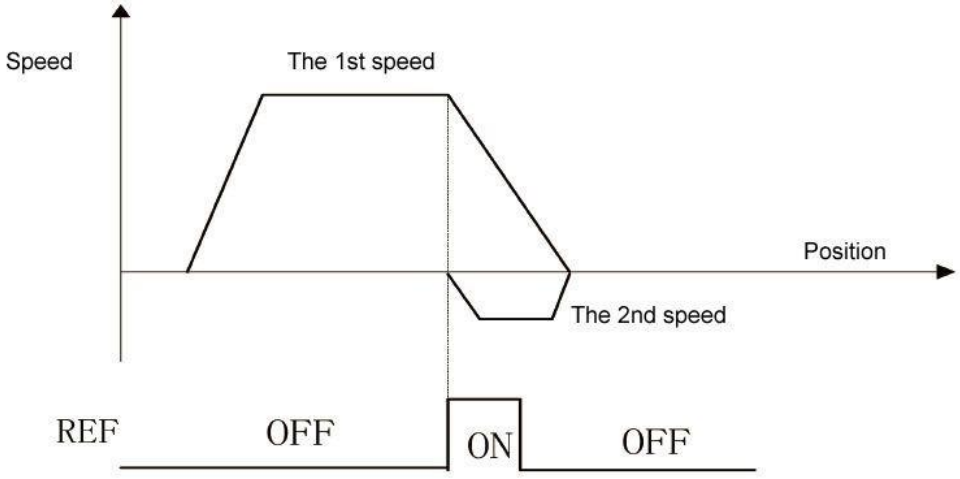
| parameter | set | instruction |
|---|---|---|
| Pn034 | 1 | Origin starts, to return to the first speed inversion to find the REF (rising along the trigger) as a reference point |

| | | |
|---|---|---|
| Pn035 | 1 | Arrived at the reference point, to return to the second speed forward looking for Z pulse as the origin |




***(E)Pn034=0,Pn035=2***

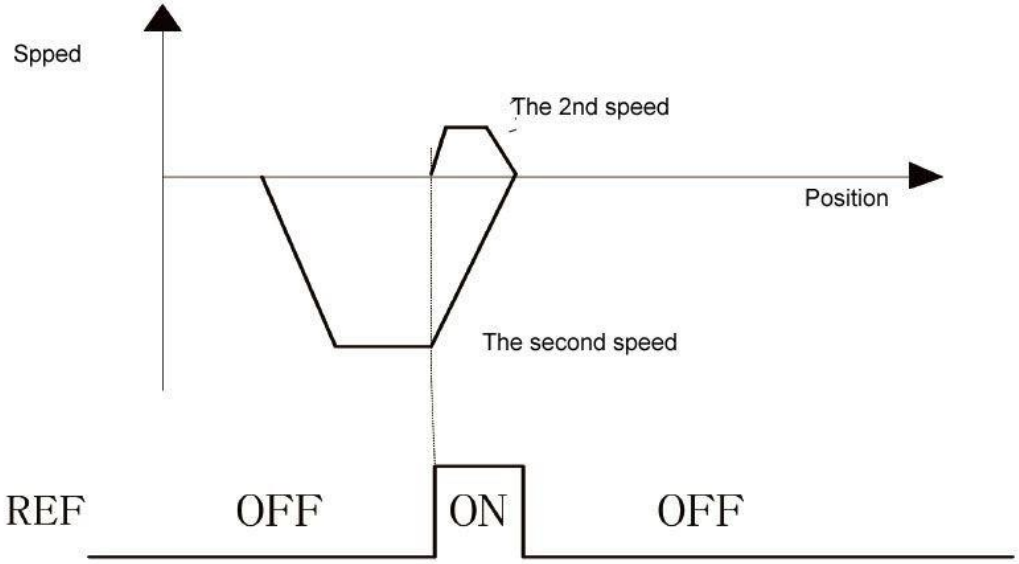
| parameter | set | instruction |
|---|---|---|
| Pn034 | 0 | Origin starts, to return to the first speed forward looking for REF (rising along the trigger) as a reference point |
| Pn035 | 2 | Arriving at reference points, the direct reference point as the origin |




***(F)Pn034=1,Pn035=2***

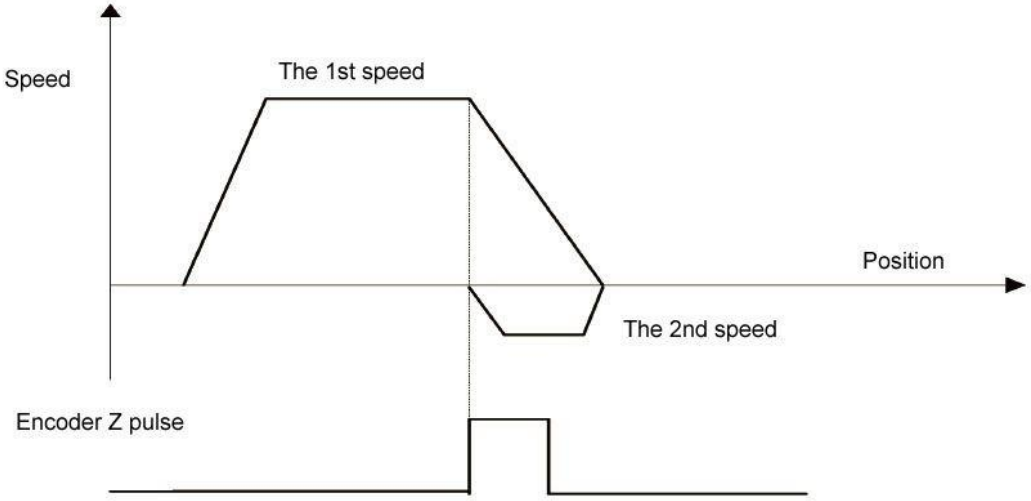
| parameter | set | instruction |
|---|---|---|
| Pn034 | 1 | Origin starts, to return to the first speed inversion for REF (rising along |

| | | |
|---|---|---|
| | | the trigger) as a reference point |
| Pn035 | 2 | Arriving at reference points, the direct reference point as the origin |



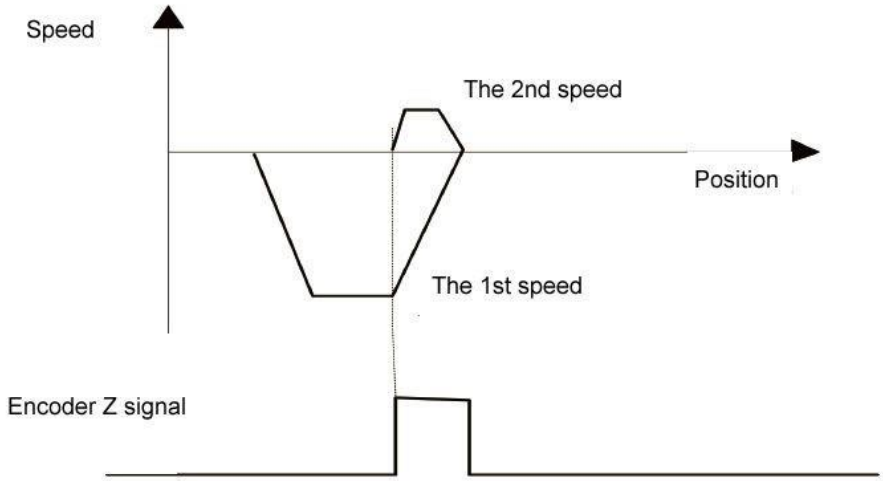

**(G)Pn034=4,Pn035=2**

| parameter | set | instruction |
|---|---|---|
| Pn034 | 4 | Origin starts, to return to the first speed forward looking for Z pulse as a reference point |
| Pn035 | 2 | Arriving at reference points, the direct reference point as the origin |



**(H)Pn034=5,Pn035=2**

| parameter | set | instruction |
|---|---|---|
| Pn034 | 5 | Origin starts, to return to the first speed pulse inversion for Z as a reference point |
| Pn035 | 2 | Arriving at reference points, the direct reference point as the origin |



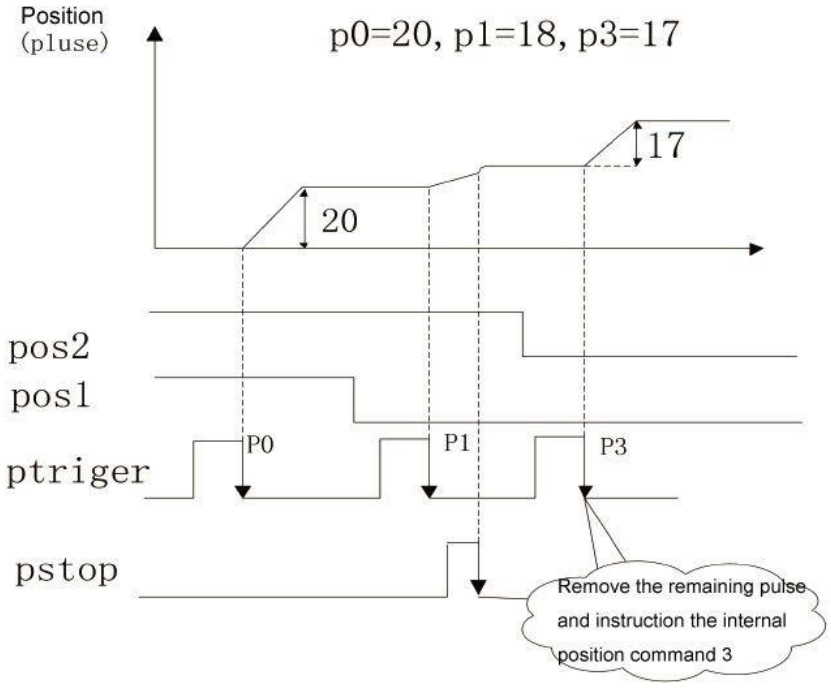

**The appendix G internal position control**

Internal position control, need to set Pn002 = 2, Pn117 = 1, and in Pn118 ~ Pn131 set up corresponding operation parameters. SigIn port pos1, pos2 choose internal position command N:

| Pos2 | Pos1 | internal location instructions N |
|---|---|---|
| 1 | 1 | internal location instructions 0 |
| 1 | 0 | internal location instructions 1 |
| 0 | 1 | internal location instructions 2 |
| 0 | 0 | internal location instructions 3 |

When using internal position control, make sure the input port pos1, pos2 state, Namely choose corresponding internal position command, and then trigger ptriger input signal, each ptriger (OFF - > ON) falling edge, the driver will read instruction N internal position, accumulate to the rest of the order the Number of pulses, continue to perform the corresponding operation.

If set Pn118 = 0, want to suspend the motor running, in the process of position when the trigger input port pstop signal, motor speed to stop, and then drive automatically remove residual position instruction, when the input port ptriger fire again, the drive will be based on the current pos1, pos2 state, execute the position of the corresponding instructions, please refer to the following sequence diagram:




If set Pn118 = 1, want to pause in the process of the position the motor running, when the trigger input port pstop signal, motor speed to stop, when the input port ptriger fire again, the location of the electricity opportunities continue to walk the remaining instructions, the input port pstop trigger issued before the target location, please refer to the following sequence diagram: