# Guidelines for Quick Debugging of

EA180 Pulse Series Servo Drives

Preface

In order to improve the user experience of customers and distributors, our company has carried out many rounds of optimization on the debugging of servo system to facilitate the use and debugging of customers. In order to further enhance the user experience, our company has formulated the following rapid debugging guidelines to facilitate customers to use and debug faster.

1, please make sure that the connection between drive and motor, power supply and output is correct, and that there is no accident such as short circuit between the lines.
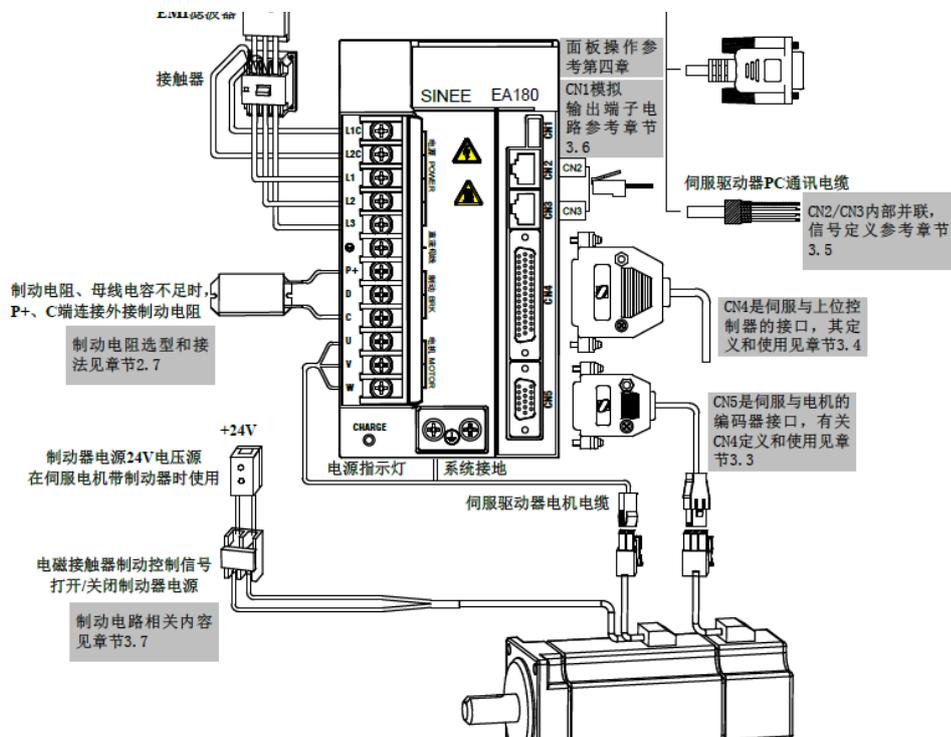
2, after confirming that there is no abnormal connection, the power-on operation will be carried out. If the connection is correct, it will not lead to failure report. If there is an accident, please contact our engineer to solve it.

3, if your drive, motor, cable and other servo systems are purchased from our company, then you can proceed directly to the fourth step. For key operation, please refer to Chapter 4 of our user manual for display and operation.
If your motor has been determined to be the type of motor supported by our servo system, the following operations can be carried out to match the motor with the drive.
Note: Our company only supports motors with Tamagawa encoder）

a.AF-10=1（Open the motor parameters group）；

b. Pd-01=XXX changed to 0, if the parameter is zero, no change is needed.

c.AF-00=reset(1) or power down and restart；

d.AF-10=1（Open the motor parameters group）；

e.　 Pd-02=XX.XX for example 7.50（input motor power）

　　 Pd-03=XX.XX for example 23.00（input motor rated current）

　　 Pd-04=XX.XX for example 48.00（input motor rated torque）

　　 Pd-05=XXX for example 380（input motor rated voltage）

　　 Pd-06=XXXX for example 1500（input motor rated RPM）

　　 Pd-07=XXXX for example 2000（input motor maximum RPM）

　　 Pd-08=X, for example, 7, input motor pole number, If the parameter is unknown, in most cases, the UVW line can be removed from the drive, then UV is connected, the UV joint is held by hand, the motor shaft is rotated by the other hand, and the number of shocks caused by rotation of the motor shaft is recorded. Dividing the number of shocks by 2, the motor pole number is obtained.）

　　 Pd-14=XXX.XX,for example 120.36（input motor rotor inertia）

　　 Pd-15=4（input encoder type, 4 stands for 17bit/23bit, 0 for 2500ppr）

　　 Pd-16=32768（input encoder ppr, 17 bit is 32768,23 bit is 2097152,2500ppr is 2500）

f. After all input is completed, the alarm AL.E0A reported in the input process needs no attention. The meaning of the alarm means that the setting parameters need to be restarted before they can take effect. Power down and restart.

g.AF-14=tunEb（autotuning mode b, corrected phase order autotuning, press ^ for twice ）**Press SET to confirm, then the motor enters autotuning state. Note: When entering the autotuning state, please ensure that the motor is in the empty shaft state. Please unload the load on the motor. There can be no load on the motor. Otherwise, we will not be responsible for any accidents.**

h. After autotuning is finished, it will report to AL.01F, which represents the completion of autotuning. After power down and restart, the motor and drive matching is completed.

4, Servo system test operation, press AF-02, confirm by SET, at this time it will display-SJoG,　press ∧, motor runs forward, press ∨, motor runs reverse, it means that the match is finished.

5, the system can be loaded at this time, adjust the corresponding parameters according to the setting, and then enter the running state.

6, Adjust parameters, taking simple position control as an example

For example, a company ordered a set of servo system for position control. The control mode is given by pulse + direction. It requires power on enabled. After the servo error is reported, the host computer needs to be informed. The connection ports are 24V, pulse Y0, direction Y1, alarm +, alarm-interface. The 24V power supply has been connected to the common point COM of Y0 and Y1.

Connection to CN4 interface is as follows

Client's interface	SINEE CN4 interface
24V	1/16（24V needs connecting to the two ports at the same time, jumping）
pulse Y0	34
direction Y1	32
alarm +	24
alarm -	10

PLC connection： 24V power supply negative should be connected to the common point of Y0 and Y1.

AF-03=S-ON（1）set to confirm, ensure enabled once power on, in an enabled state constantly.

P1-02=XXXXXX, for example 10000,(we can set how many pulses for a turn)

or

P1-02=XXXXX set the numerator of electronic Gear Ratio

P1-02=XXXXX set the denominator of electronic Gear Ratio

When setting the electronic gear ratio, the value of P1-02 should be set to 0, otherwise the value of P1-02 should be the highest priority.

If your driver is loaded heavily, we suggest you install external brake resistance.
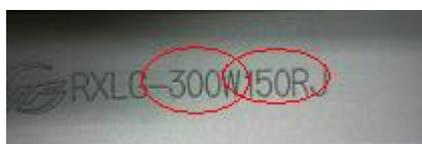
For example：
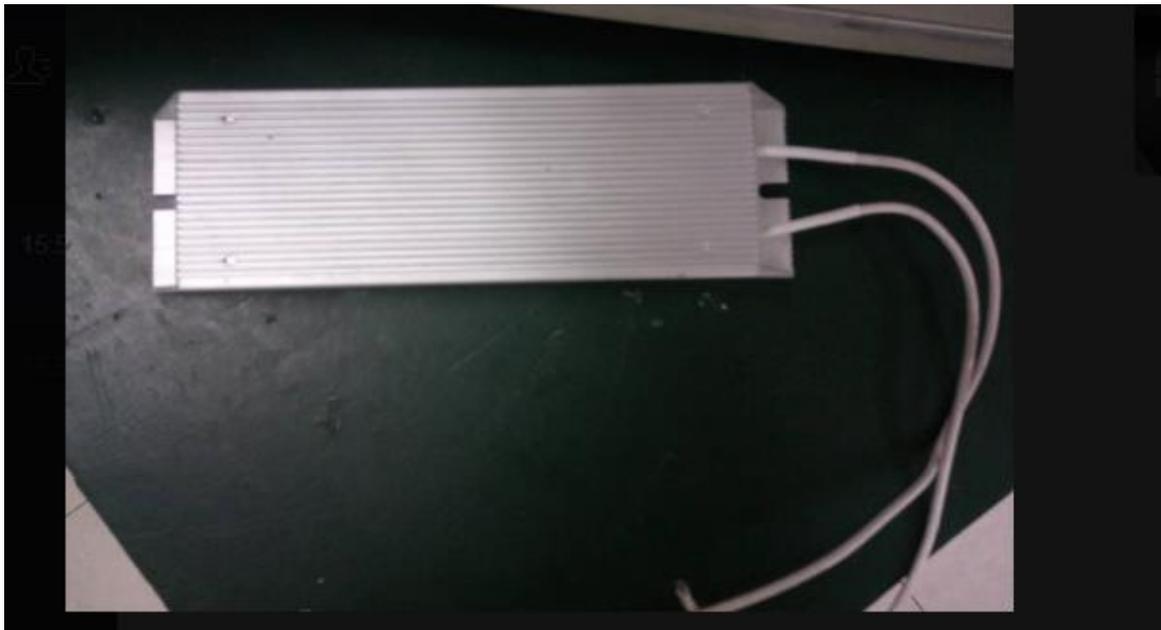
You need to remove the iron sheet or cable connecting P + and D on the drive and connect the two ends of the brake resistance to P + and C respectively.

The corresponding parameters can be set by referring to the table below.

for example:

P8-10 can be set to 150 (brake resistance value)

P8-11 is set to 300 (brake resistance power)

The value of P8-12 is set to 100 (Brake Resistance Duty Rate)

7. Gain parameter optimization (simple debugging) can solve most field problems
Generally speaking, our company has optimized the gain debugging process specially, and only need to adjust two parameters to achieve good results.
Debugging parameter 1:
P4-01，The stiffness coefficient of the system indicates the response speed of the system. Generally speaking, it is the difference between strong output and gentle output. If the system requires fast response, the parameter can be adjusted appropriately. However, when the system oscillates and the motor makes abnormal noise, the value should be adjusted quickly.
P4-10，The load inertia ratio of the motor indicates the load inertia of the motor shaft. It can be adjusted according to the actual situation. If the actual inertia is large, the value will be set large, and the value of P4-01 will be reduced at the same time.
Examples of parameters for common applications:

High power, heavy load, pure mechanical transmission
P4-01=8,P4-10=15
High power, heavy load, belt transmission
P4-01=6,P4-10=12
High power, small load, pure mechanical transmission
P4-01=11,P4-10=2.5
High Power, Small Load, Belt transmission
P4-01=10,P4-10=2.5
Small power, large load, pure mechanical transmission
P4-01=12,P4-10=4
Small power, large load, belt transmission
P4-01=10,P4-10=3.5
Small power, small load, pure mechanical transmission
P4-01=13,P4-10=1.01，P4-13=1.0
Small Power, Small Load, Belt transmission
P4-01=13,P4-10=1.01，

In high power/medium power applications, the load is generally heavy, so in general, the rigidity is set to range 6-8, and then slowly adjust the P4-10 value to the appropriate range, so that the system works well, but once the motor abnormal noise occurs, please immediately reduce the value of P4-10. When the load is lighter, the default parameters can be used.

In the case of low power application, the load will not be very heavy, but the accuracy requirement is generally high, so in general, the rigidity of P4-01 can be stronger, and the value of P4-10 will not be very large. The rigidity of P4-01 is set in the range of

11-15, and then the value of P4-10 is adjusted slowly to the appropriate range to make the system run well, but once the abnormal noise of the motor occurs, please immediately reduce the P4-10. The value of -10. The default parameters can basically adapt to this situation.

In the case of pure mechanical transmission, generally speaking, the rigidity can be slightly stronger. In the case of belt transmission, the rigidity needs to be slightly weaker to prevent accidents such as skidding.