

ECON HS Series close loop stepper Hardware Manual

HS506& HS806&HS806AC

CE RoHS



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SHENZHEN ECON TECHNOLOGY CO.,LTD

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Safety Items



Read this manual carefully before trying to install the stepper drive into your system. The people who setup the stepper drive should have a better understanding on electronics and mechanics. Contact ECON technical guys when you have questions on this document.



Make sure the power supply voltage dose not exceed the drive's input range. Double check the connections and make sure the power lead polarity is correct.



Do not set high current for small stepper motor. It is possible that the motor will be damaged.



Disconnect the motor from the load if you are not sure the move direction. Adjust the axis in the center before trying to run the motor.



Never disconnect the motor lead when the power source is energized.

Introduction

HS Series close loop drive is based on the latest DSP technology and advanced control algorithm of combing brushless servo and stepper systems. It combines favored features of both open loop stepper and brushless servo drives, solve the fatal problem “loss of steps” of open loop step systems ,improve the stepper motor high speed performance, and motor & drive heating and noise are also significantly improved.

Compared with brushless servo systems, they have much higher starting and low-speed torque, high standstill stiffness, no hunting, no overshooting, almost zero settling time, and no tuning for almost for all applications.

Feature

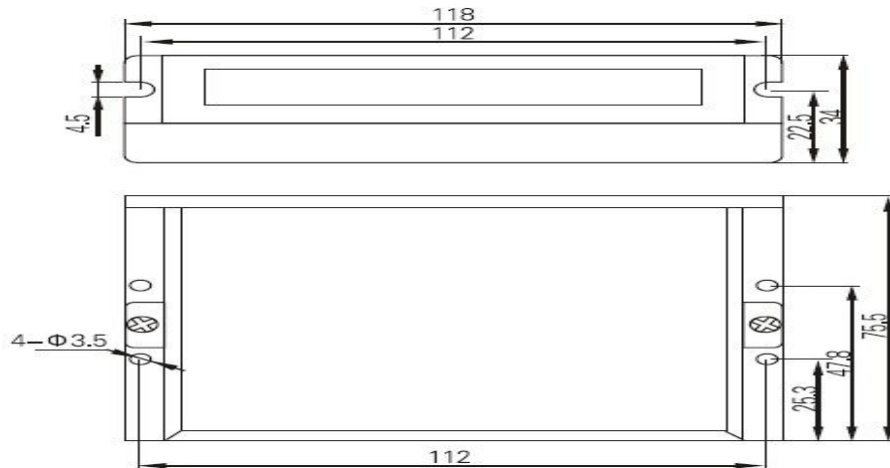
- all digital vector control
- full close loop control ,no lost step
- high speed ,the max speed up to 4500RPM
- fast start/stop,no ACC/DEC to 3000rpm
- good performance at smoothness ,low noise and vibration
- about 100% power output,low heat
- the response frequency is 300KHZ
- overcurrent , undervoltage, overvoltage,position error protection

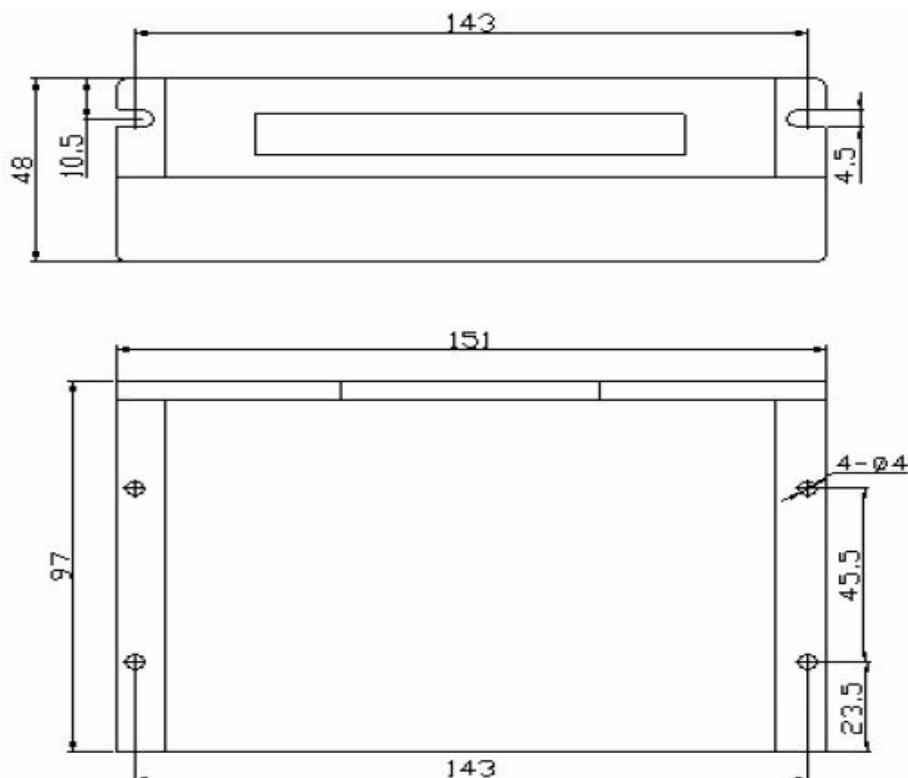
application

The main applications are cnc router,plasma/flame cutting,robot,lasor , advertising equipment, Packaging Equipment,etc.

Mounting (unit: mm)

HS506



HS806/HS806AC**Function description****DIP settings**

SW1: current loop setting, OFF: low value; ON: high value

SW2: position loop setting, OFF: low value; ON: high value

SW3: the max peak current setting: OFF: the max current 5.0A;
ON: the max current 6.5A

SW4: motor direction, OFF: CW; ON: CCW

SW5~SW8: Micro step setting,

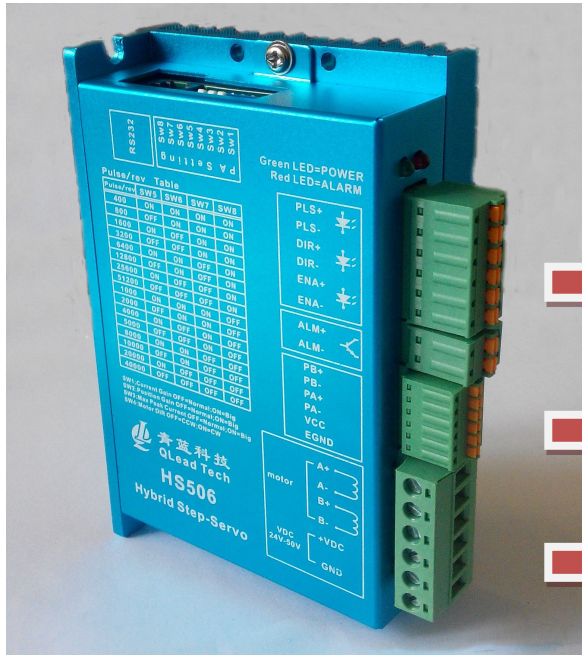
Pul/rev	SW5	SW6	SW7	SW8
400	ON	ON	ON	ON
800	OFF	ON	ON	ON
1600	ON	OFF	ON	ON
3200	OFF	OFF	ON	ON
6400	ON	ON	OFF	ON
12800	OFF	ON	OFF	ON
25600	ON	OFF	OFF	ON
51200	OFF	OFF	OFF	ON
1000	ON	ON	ON	OFF
2000	OFF	ON	ON	OFF
4000	ON	OFF	ON	OFF

5000	OFF	OFF	ON	OFF
8000	ON	ON	OFF	OFF
10000	OFF	ON	OFF	OFF
20000	ON	OFF	OFF	OFF
40000	OFF	OFF	OFF	OFF

Interface

Name	Description
POWER	When power on ,the light is on
ALARM	When the drive show alarm,the light is on
PLS+	Pulse signal,the range is +5V-+24V,if more than+5V,it need connect resistor
PLS-	Low level is 0-0.5V,high level is 4-5V,pulse width >2us。
DIR+	Direction signal,the range is +5V-+24V,if more than+5V,it need connect resistor
DIR-	Low level is 0-0.5V,high level is 4-5V,pulse width >2us
ENA+	the range is +5V-+24V,if more than+5V,it need connect resistor
ENA-	Low level is effective ,if it's effective ,the dirve stop working,the motor disable
PEND+	Motor reach the specified position ,outout a signal.PEND+ connect toVcc, PEND- connect to the controller input. The max current is 50MA。
PEND-	
ALM+	When the drive show alarm,the alarm output is on .ALM+ connect to Vcc, ALM- connect controller input。 The Max current is 50MA
ALM-	
PB+/PB-	Encoder B phase input
PA+/PA-	Encoder A phase input
VCC/GND	Encoder Power supply(5V)
VDC (AC1)	Power input
GND (AC2)	
A+,A-	Motor A phase, the phase sequence should be correct
B+,B-	Motor B phase, the phase sequence should be correct

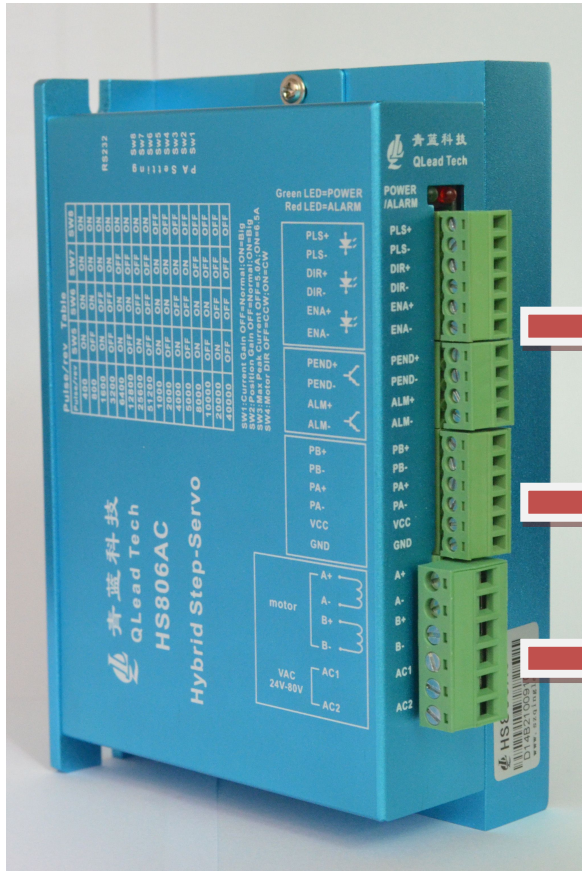
Drive Appearance and Connector Location-----HS506



- ➡ Control signals connectors including digital inputs and digital outputs (Screw Terminal Blocks)
- ➡ Encoder feedback signals connector
- ➡ Power & motor connector (Screw Terminal Block)

Drive appearance and connector location of the HS506

Drive Appearance and Connector Location -----HS808&HS806AC



- ➡ Control signals connectors including digital inputs and digital outputs (Screw Terminal Blocks)
- ➡ Encoder feedback signals connector
- ➡ Power & motor connector (Screw Terminal Block)

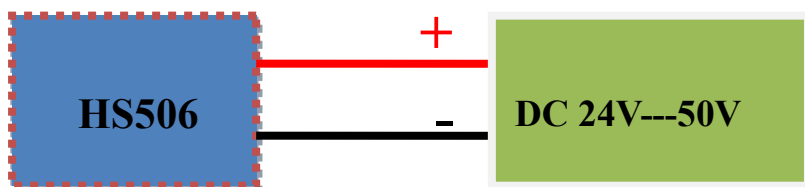
Drive appearance and connector location of the HS806&HS806AC

Power Supply for drives

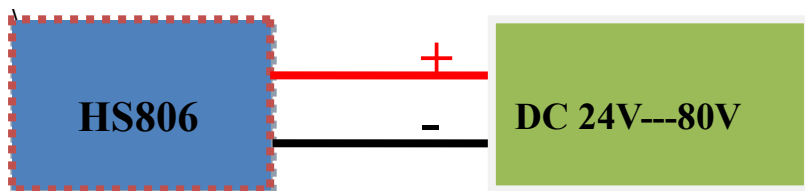
HS506 & HS806 Power supply

The power supply of HS506 & HS806 is DC. the printed “+Vdc” and “GND” symbol on the cover ,connect Connect the positive wire to “+Vdc” terminal and connect the negative wire to “GND” terminal. Note that the power should be switched off when you make any connections.

Note: Do not exceed the input voltage range of the easy servo drive.



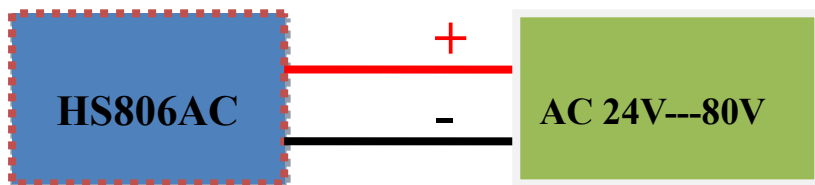
Note:the recommended power supply is 36VDC



Note:the recommended power supply is 68VDC

HS806AC power supply

The power supply of HS806AC is AC. There is no power input polarity for the AC power connection.



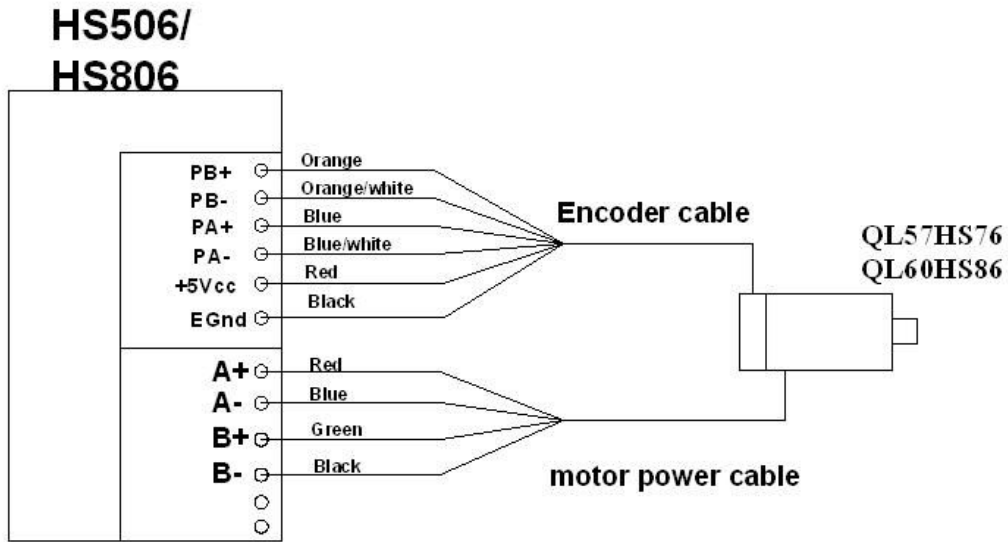
Note:the recommended power supply is 68VAC

For power supply

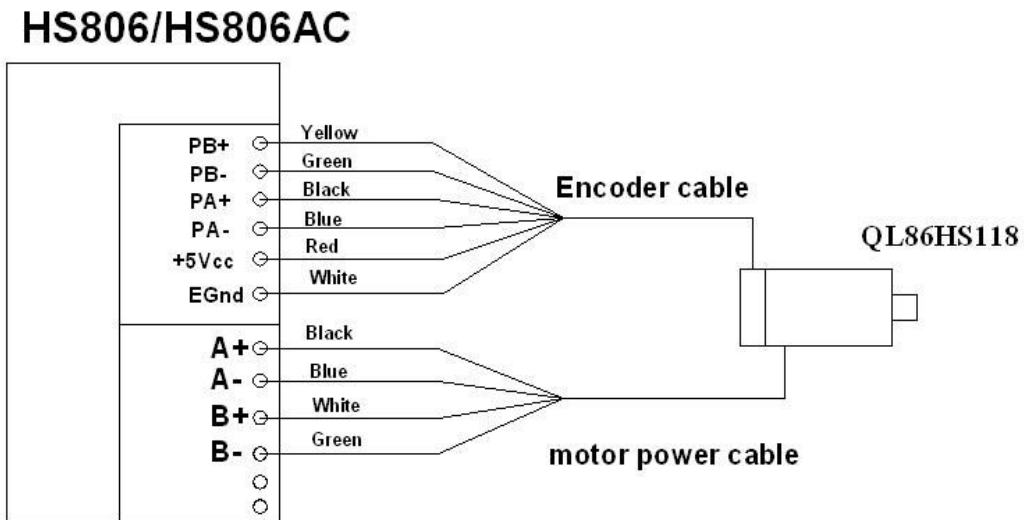
Higher supply voltage can increase motor torque at higher speeds, thus helpful for avoiding losing steps. However, higher voltage may cause bigger motor vibration at lower speed, and it may also cause over-voltage protection or even drive damage. Therefore, it is suggested to choose only sufficiently high supply voltage for intended applications, and it is suggested to use power supplies with theoretical output voltage of drive's minimum + 10% to drive's maximum - 10%, leaving room for power fluctuation and back-EMF.

Wiring for encoder and motor

HS506/HS806 drive with QL57HS76/QL60HS86 motor



HS806 drive with QL86HS118 motor



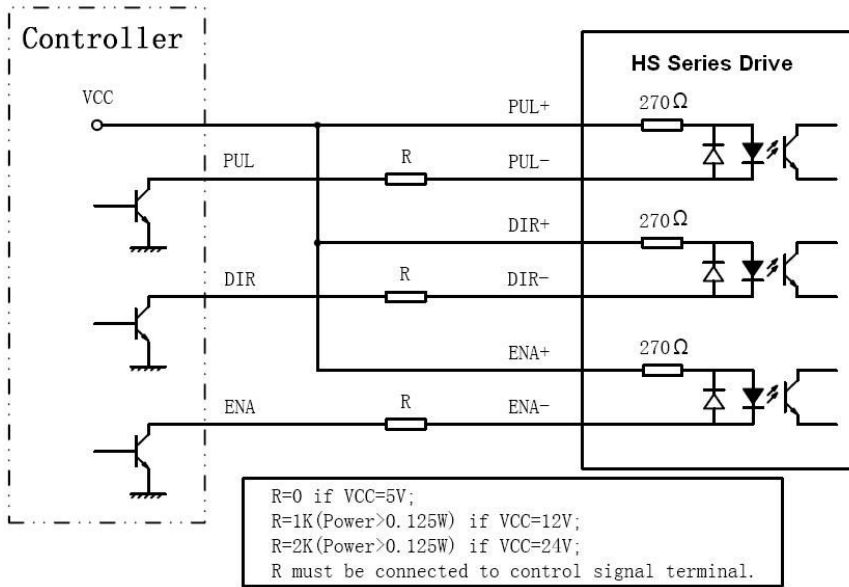
Note: As the easy servo drive works in close-loop mode, it needs to know the actual motor position. The encoder mounted on the motor offers such information. Please note that the easy servo drive can not work without encoder feedback.

The motor power cable should connect correctly, or else, the motor can not work.

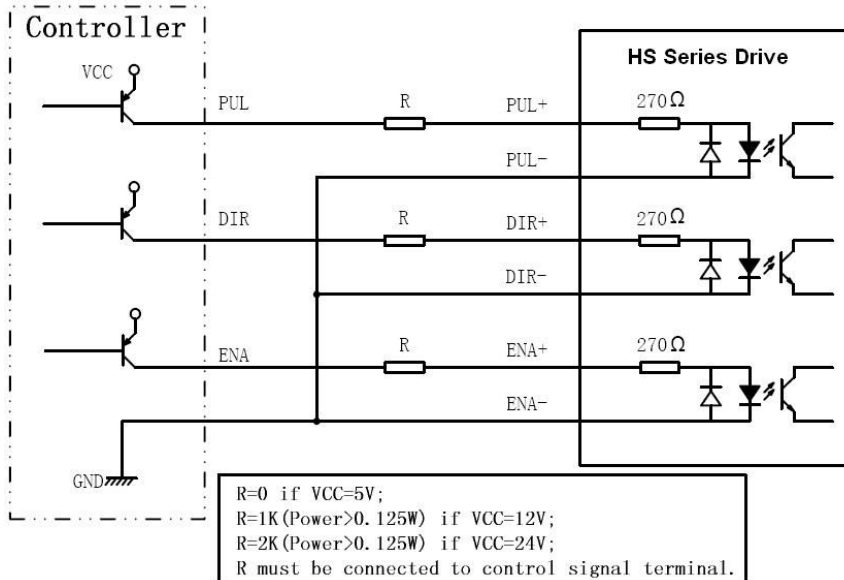
Wiring for control signal

The HS series drives can accept differential, PNP(sourcing) and NPN(sinking) pulse, direction and enable control signals. For the enable signal, apply 0V between ENA+ and ENA- or leave them unconnected to enable the drive. Recommend to leave the enable signal unconnected if you don't need to disable the drive.

Pulse connection

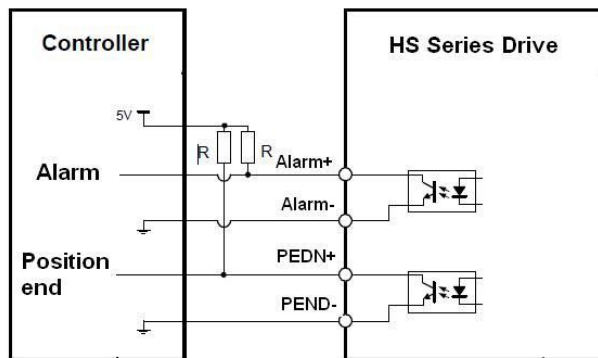


NPN connection type



PNP connection type

Alarm, position end Output Connections



Notes

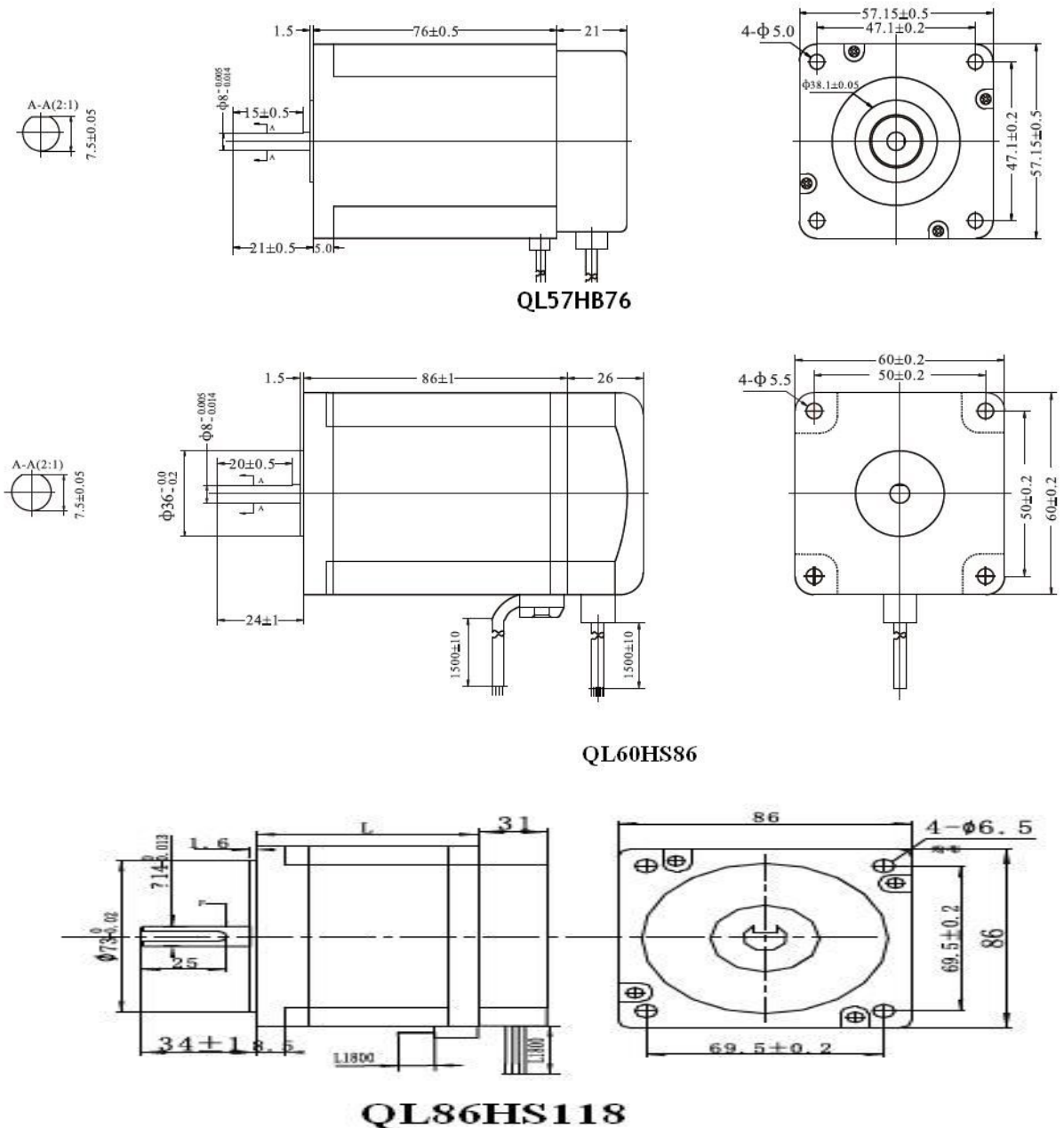
- In order to improve anti-interference performance of the system, it is recommended to use twisted pair shield cable.
- To prevent noise incurred in PUL/DIR signal, pulse/direction signal wires and motor wires should not be tied up together. It is better to separate them by at least 10 cm, otherwise the disturbing signals generated by motor will easily disturb pulse direction signals, causing motor position error, system instability or other failures.
- If a power supply serves several drives, separately connecting the drives is recommended instead of daisy-chaining.
- It is prohibited to pull and plug power connector while the drive is powered ON, because there is high current flowing through motor coils (even when motor is at standstill). Pulling or plugging power connector with power on will cause extremely high back-EMF voltage surge, which may damage the drive.

ECON MOTOR

Technique Feature

Step Accuracy	5%
Encoder	1000PPR
Step Angle	1.8°
Insulation resistance	500VDC 100MΩ Min
Insulating strength	500VAC 50Hz 1mA 1 Min
Environment temperature	-20~+40°C
Temperature rise	80°C Max
insulation grade	B

Mounting (unit: mm)

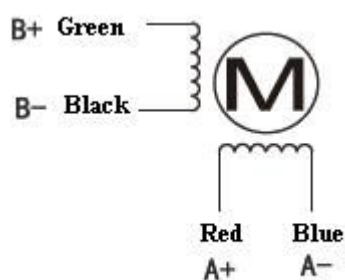


Technical Data

Model	Holding torque(N M)	Phase current(A)	Resistance (Ω)	inductance (MH)	Rotary inertia(g.c m2)	length (MM)	weight (Kg)	Matched drive
QL42HS 47	0.5	2.0	1.0	1.9	77	47	0.53	HS506
QL57HS 56	1.2	3.0	0.7	2.4	280	56	0.8	HS506
QL57HS 56-33	1.2	3.0	0.7	2.4	280	56	0.8	HS506
QL57HS 76	2.0	4.0	0.6	2.4	480	76	1.1	HS506
QL57HS 76-30	2.0	4.0	0.6	2.4	480	76	1.1	HS506
QL57HS 76-33	2.0	4.0	0.6	2.4	480	76	1.1	HS506
QL60HS 65	2.2	4.0	0.6	1.9	490	65	1.0	HS506
QL60HS 86	3.0	5.0	0.4	2.0	690	86	1.3	HS806
QL86HS 80	4.5	4.5	0.6	6.0	1800	80	2.1	HS806/HS806AC
QL86HS 118-40	8.5	6.0	0.5	6.5	3600	118	3.8	HS806/HS806AC

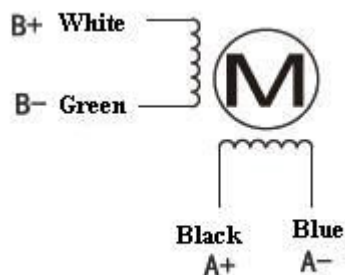
Motor wire definition

QL57HS76/QL60HS86



1	Orange	EB+
2	Orange/white	EB-
3	Blue	EA+
4	Blue/white	EA-
5	Red	+5VCC
6	Black	EGND

QL86HS118



1	Yellow	EB+
2	Green	EB-
3	Black	EA+
4	Blue	EA-
5	Red	+5VCC
6	White	EGND

Frequently Asked Questions

In the event that your drive doesn't operate properly, the first step is to identify whether the problem is electrical or mechanical in nature. The next step is to isolate the system component that is causing the problem. As part of this process you may have to disconnect the individual components that make up your system and verify that they operate independently. It is important to document each step in the troubleshooting process. You may need this documentation to refer back to at a later date, and these details will greatly assist our Technical Support staff in determining the problem should you need assistance.

Many of the problems that affect motion control systems can be traced to electrical noise, controller software errors, or mistake in wiring.

Problem Symptoms and Possible Causes

Symptoms	Possible Problems
Motor is not rotating	No power
	Microstep resolution setting is wrong
	Fault condition exists
	The drive is disabled
	The wiring is wrong
The drive In alarm	Power supply is over voltage
	Something wrong with motor coil
Wrong motor motion	Control signal is too weak
	Control signal is interfered
	Something wrong with motor coil
	Power supply voltage too low
Motor or drive is too heating	Inadequate heat sinking / cooling
	Load is too heavy

Warranty

SHENZHEN ECON TECHNOLOGY CO.,LTD warrants its products against defects

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in materials and workmanship for a period of 12 months from shipment out of factory. During the warranty period, ECON will either, at its option, repair or replace products which proved to be defective.

Exclusions

The above warranty does not extend to any product damaged by reasons of improper or inadequate handlings by customer, improper or inadequate customer wirings, unauthorized modification or misuse, or operation beyond the electrical specifications of the product and/or operation beyond environmental specifications for the product.

Obtaining Warranty Service

To obtain warranty service, a returned material authorization number (RMA) must be obtained from customer service at e-mail: before returning product for service. Customer shall prepay shipping charges for products returned to ECON for warranty service, and ECON shall pay for return of products to customer.

Warranty Limitations

ECON makes no other warranty, either expressed or implied, with respect to the product. ECON specifically disclaims the implied warranties of merchantability and fitness for a particular purpose. Some jurisdictions do not allow limitations on how long and implied warranty lasts, so the above limitation or exclusion may not apply to you. However, any implied warranty of merchantability or fitness is limited to the 12-month duration of this written warranty.

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