# Changzhou ACT Motor Co., Ltd

## HBS — Hybrid Step Servo Motor Driver
### HBS57
MicroSteps Setting:200~51200        DC : 24~60V

### Products Image



### Overview

Without losing step, High accuracy in positioning.

Accelerate and decelerate control inside, Great improvement in smoothness of starting or stopping the motor.

Small vibration, Smooth and reliable moving at low speed.

The optocoupler isolates the differential signal input.

Over current, over voltage and over position error protection.

The impulse response frequency can reach up to 200KHz.

Subdivision Settings (within 200~ 51200).

### Encoder signal

| Symbol | Name | Wiring color |
|---|---|---|
| PB+ | Encoder phase B + | Green |
| PB- | Encoder phase B - | Yellow |
| PA+ | Encoder phase A + | Blue |
| PA- | Encoder phase A - | BLACK |
| +5V | Encoder power | Red ( +5V ) |
| GND | Encoder power ground | White ( 0V ) |

### Motor and power

| Symbol | Name | Remark |
|---|---|---|
| A+ | Phase A+ | Black |
| A- | Phase A- | Red |
| B+ | Phase B+ | Yellow |
| B- | Phase B- | Blue |
| +V | Input Power + | +24V~60V |
| GND | Input Power- | 0V |

### Features

| Input voltage | 24~60VDC |
|---|---|
| Output current | 4.5A |
| Pulse frequency | 0~200KHz |
| MicroSteps | 16 MicroSteps |
| Signal current | 7~20mA |
| Using environment | 0 ~ 70 ℃, avoid dust and corrosive gas |
| Storage environment | -20~+80℃ , avoid direct sunlight |
| Heavy volume | 280g ( Does not contain the packaging ) |

### Control Signal

| Symbol | Name | Remark |
|---|---|---|
| PUL+ | Pulse signal + | / |
| PUL- | Pulse signal - | / |
| DIR+ | Direction signal+ | / |
| DIR- | Direction signal- | / |
| ENA+ | Enable signal + | Only connected when used |
| ENA- | Enable signal - | Only connected when used |

### ALM Signal

| Symbol | Name | Remark |
|---|---|---|
| ALM+ | Positive alarm signal | Only connected when used |
| ALM- | Negative alarm signal | Only connected when used |

Generally speaking, the power supply voltage is a little higher, and the motor's high-speed performance will be relatively low when the power supply voltage is good. It is suggested that the normal operating speed range is 36V above power supply for high-speed operation.

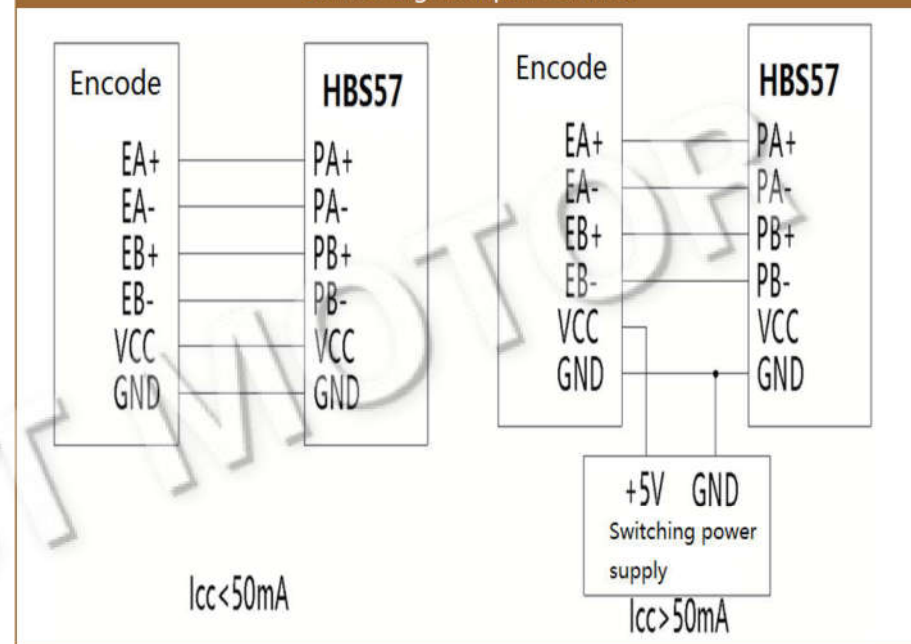| Dial Code Switch Setting |
| --- |
| SW1 is used for setting the activate edge of the input signal, "off" means the activate edge is the rising edge, while "on" is the falling edge. |
| SW2 is used for setting the running direction, "off" means CCW,while "on" means CW. |

**MicroSteps Setting**

| RPM | Default | 800 | 1600 | 3200 | 6400 | 12800 | 25600 | 51200 | 1000 | 2000 | 4000 | 5000 | 8000 | 10000 | 20000 | 40000 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SW3 | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF |
| SW4 | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF |
| SW5 | ON | ON | ON | ON | OFF | OFF | OFF | OFF | ON | ON | ON | ON | OFF | OFF | OFF | OFF |
| SW6 | ON | ON | ON | ON | ON | ON | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |

**Control Signal Connection**



Difference mode connection     Common-anode     common-cathode
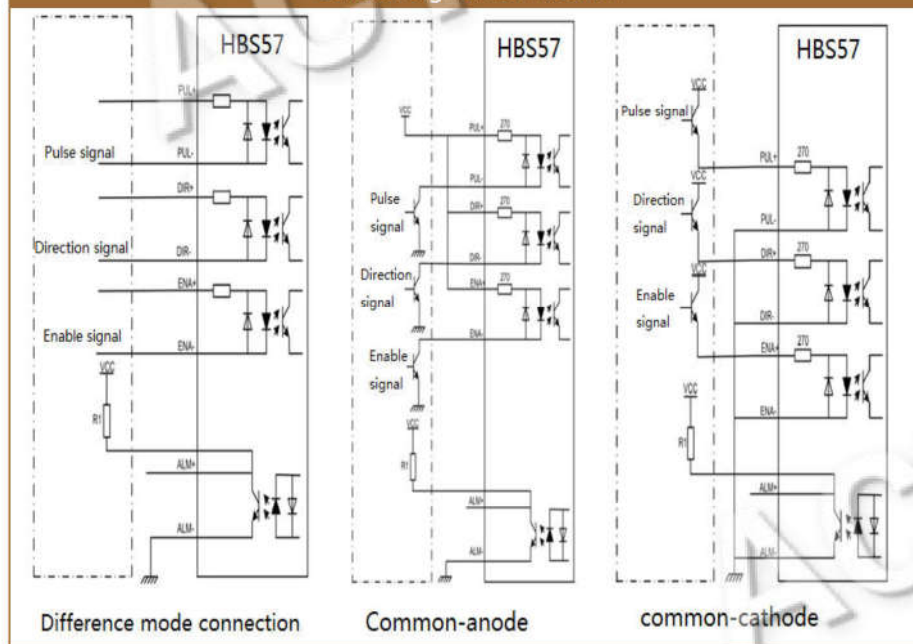
**Control Signal Input Terminal**



Icc<50mA

Icc>50mA

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## RS232 Interface Pin Definition

| Terminals no. | Symbol | Designation | Instructions |
|---|---|---|---|
| 1 | NC | / | / |
| 2 | +5V | Positive-supply | For external use only |
| 3 | TxD | RS232 sender | / |
| 4 | GND | Power ground | 0V |
| 5 | RxD | RS232 receiver | / |
| 6 | NC | / | / |
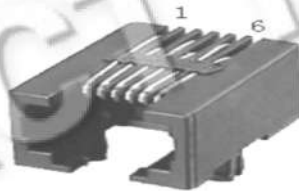
## Normal Connection Diagram
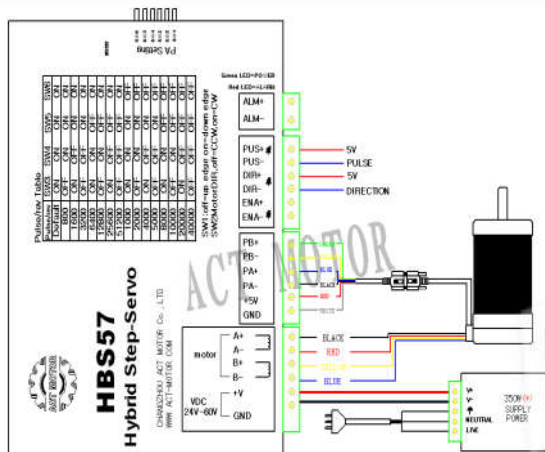


| Description | Light |
|---|---|
| Driver overcurrent | ● |
| Driver internal voltage reference error | ●● |
| Error uploading drive parameters | ●●● |
| Driver supply voltage exceeds maximum | ●●●● |
| Driver position deviation exceeds maximum | ●●●●● |
| Motor phase missing alarm | ●●●●●● |

Note: one red light means one flashing.

## Frequently Questions And Troubleshooting
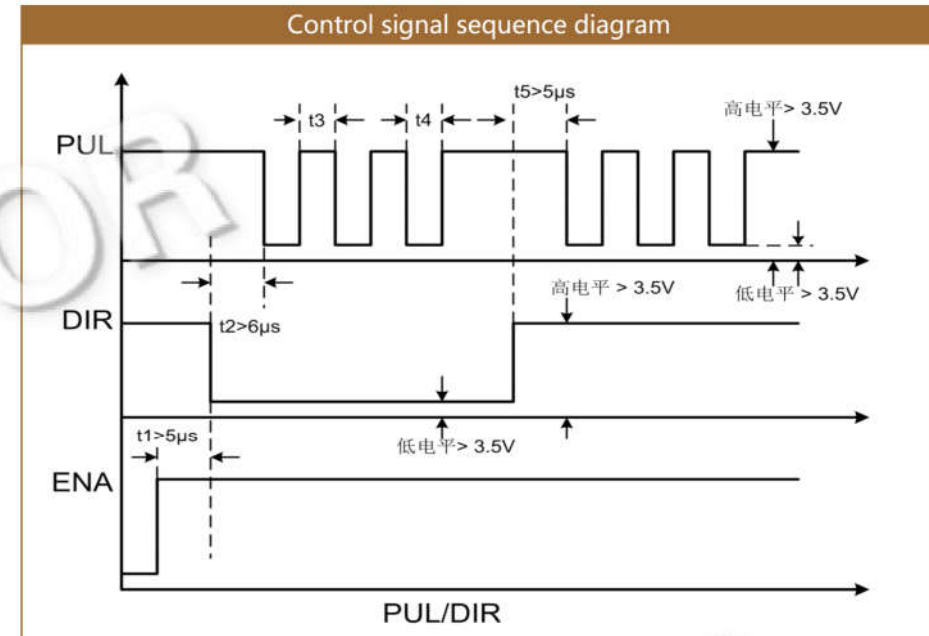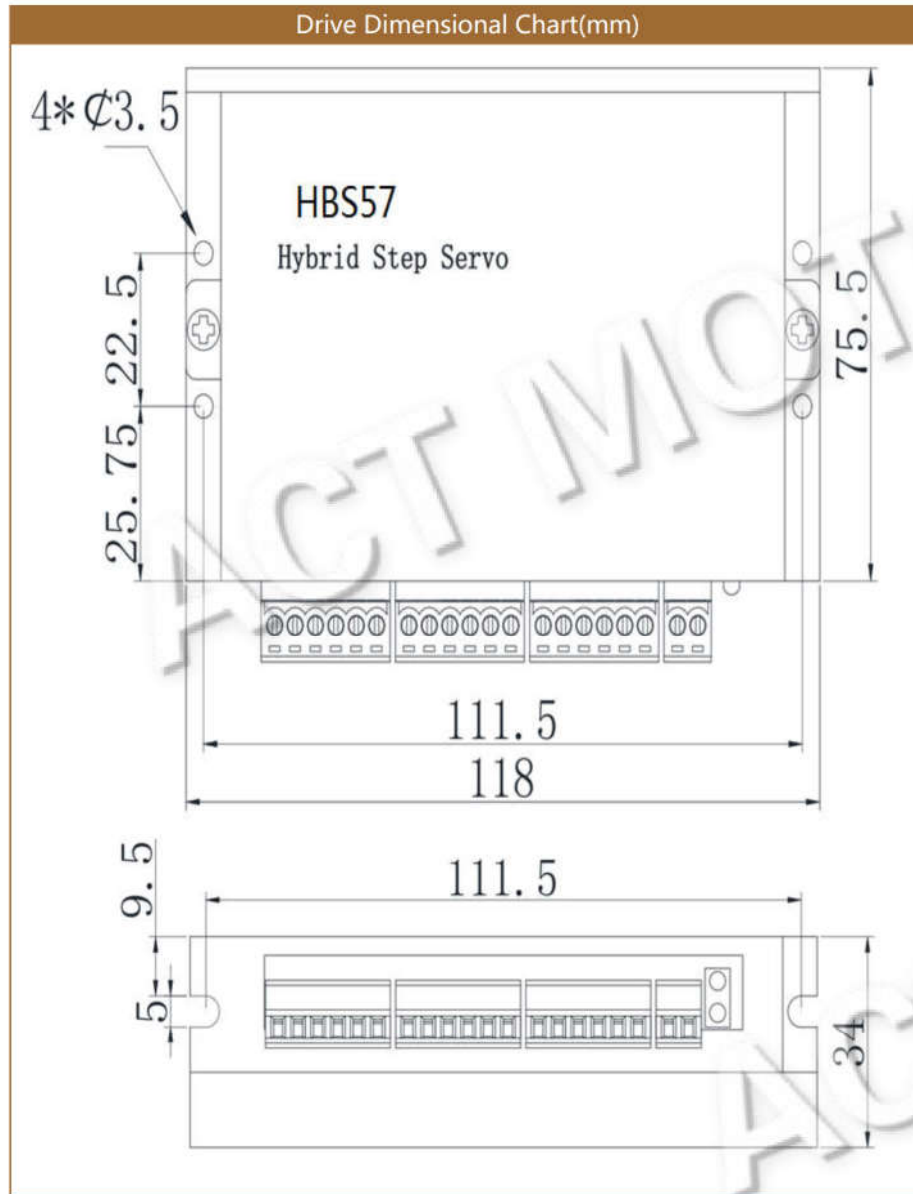
**1,Power light is off, while the power is on**

● Input power failure, please check the power line, to see if the voltage is too low or not.

**2,Red light alarms when offering power**

● Please check if the motor feedback signal line and motor power cable are connected or not.

● Please check if driver's input voltage is too high or too low.

**3,The red light alarms after running a small angle**

● Please check if motor's phase wires are connected correctly or not. If not, please double check motor's wires & driver's corresponding phase sequence are correctly connected.

● In the driver configuration parameters, if the number of wires for motor encoder is the same as the actual parameters for connected motor or not? If not, please reset.

● Please check if pulse's input speed is higher than motor's rated speed or not? If so, it will cause position's out of tolerance.

**4,The driver doesn't run after offering input pulse**

● Please check if wiring of pulse input terminals for the driver is reliable or not?

● Please check if input mode of the step servo drive system configuration is the same as pulse's input method or not.

● Please check if the motor's Enable signal is on or off.

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## Drive Dimensional Chart(mm)



4*⌀3.5

HBS57
Hybrid Step Servo

22.5
25.75
75.5

111.5
118

9.5
5
111.5
34

## Control signal sequence diagram



PUL

t3 t4 t5>5μs

高电平 > 3.5V

DIR

t2>6μs

高电平 > 3.5V

低电平 > 3.5V

ENA

t1>5μs

低电平 > 3.5V

PUL/DIR

Remark :

a. t1: ENA must be ahead of DIR by at least 5μ s. Usually, ENA+ and ENA- are NC (not connected);

b. t2: DIR must be ahead of PUL active edge by 6μ s to ensure correct direction;

c. t3: Pulse width not less than 2.5μ s;

d. t4: Low level width not less than 2.5μ s.