

HSD57 DIGITAL HYBRID SERVO DRIVER

USER MANUAL



Edited by ЧПУ Мастер

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Abstract:

HSD86H digital hybrid servo driver is a new type which developed by our company based on more than ten years' experience development in stepper and servo systems.

Hybrid servo driver, using the latest dedicated motor control DSP chip and typical three-loop closed-loop vector control technology (speed loop,

Position ring and current ring), which can completely overcome the problem of losing step of the open-loop stepper motor, and significantly improve the high speed performance of the motor.

It will reduce the heat and the vibration of the motor, which will help to improve the processing speed and accuracy and reduce the energy consumption of the machine.

When the motor is continuously overloaded, the driver will outputs an alarm signal with the same reliability as the ac servo system.

Main Features.

- ◆ With a new 32-bit motor control dedicated DSP chip;
- ◆ Adopt advanced vector closed-loop control technology;
- ◆ High-speed response and high precision;
- ◆ Protection against over-current, over-voltage and tracking error tolerance;
- ◆ Subdivision setting (within 800 ~ 51200, special subdivision parameters can be customized);
- ◆ Optocoupler isolated differential signal input;
- ◆ Impulse response frequency up to 200KHZ;
- ◆ Single and double pulse control function;
- ◆ Wide voltage range DC20V-60V DC power supply

Performance Specification

Electrical performance (ambient temperature $T_j = 25\text{ }^\circ\text{C}$)

Parameters	HSD57			
	Min	Typ	Max	Unit
Continuous output current	0	-	6.0	A
Input supply voltage	20	36	60	VDC
Logic input current	7	10	20	mA
Pulse frequency	0	-	200	kHz
Insulation resistance	500			mΩ
Provides encoder current			50	mA

Working temperature parameter

Cooling Method	Natural cooling (suggest to use the forced air cooling)	
USE ENVIRONMENT	Field	Try to avoid dust, oil mist and corrosive gas
	Temperature	0 °C ~ + 50 °C
	Humidity	< 80% RH, no condensation, no frost
	Vibration	5.9m / s ² Max
Storage Temperature	-20 °C ~ + 65 °C	
Weight	About 0.26Kg	

Caution: Due to the drastic changes in the temperature of the storage and transportation environment, condensation or frost is easy to occur.

Do not turn on the power until the temperature is consistent with the ambient temperature.

Driver interface and wiring instructions

1, The instruction of the connectors

A, Motor and Power supply input connectors

No.	Mark	Instruction	Remark
1	A+	A phase motor winding +	
2	A-	A phase motor winding -	
3	B+	B phase motor winding +	
4	B-	B phase motor winding -	
5	AC	Input power connector	20V-60VDC
6	AC	Input power connector	

B, Encoder signal input port

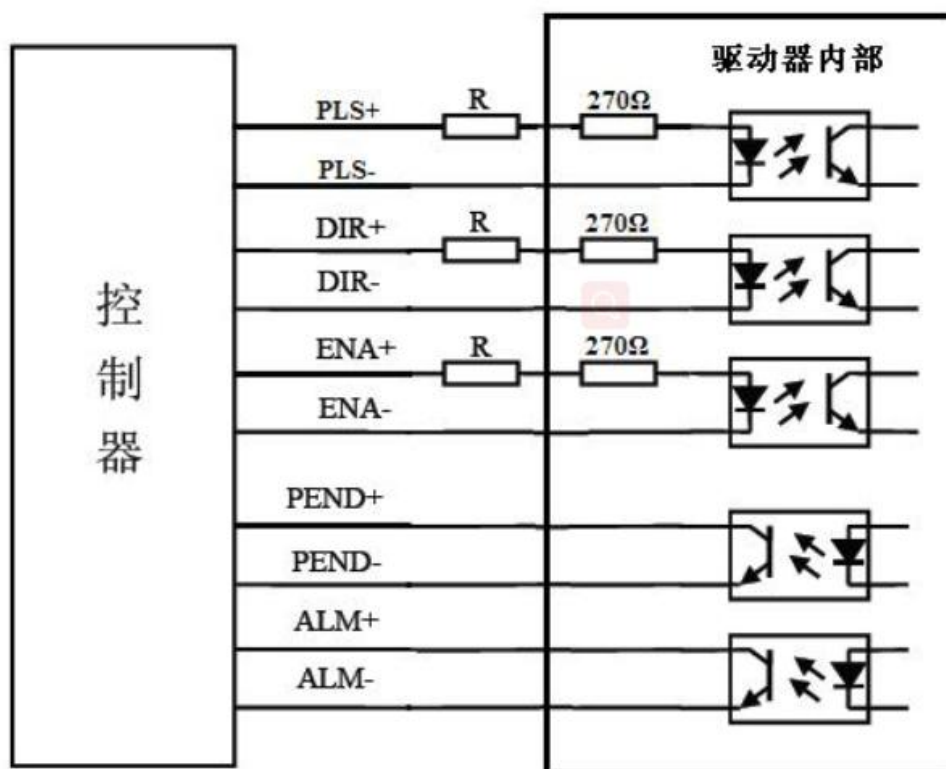
No.	Mark	Instruction	Remark
1	EB+	Motor encoder phase B positive input	
2	EB-	Motor encoder phase B negative input	
3	EA+	Motor encoder phase A positive input	
4	EA-	Motor encoder phase A negative input	
5	VCC	Encoder power supply positive	+5V≤50mA
6	EGND	Encoder power supply negative	0V

C, Control signal port

No.	Mark	Instruction	Remark
1	PLS+	Pulse signal input positive	
2	PLS-	Pulse signal input negative	
3	DIR+	Direction signal input positive	
4	DIR-	Direction signal input negative	
5	ENA+	Enable signal input positive	
6	ENA-	Enable signal input negative	
7	Pend+	In-position signal output positive	Load current ≤ 50mA
8	Pend-	In-position signal output negative	
9	ALM+	Alarm signal output positive	Load current ≤ 50mA
10	ALM-	Alarm signal output negative	

2, Control signal interface circuit diagram

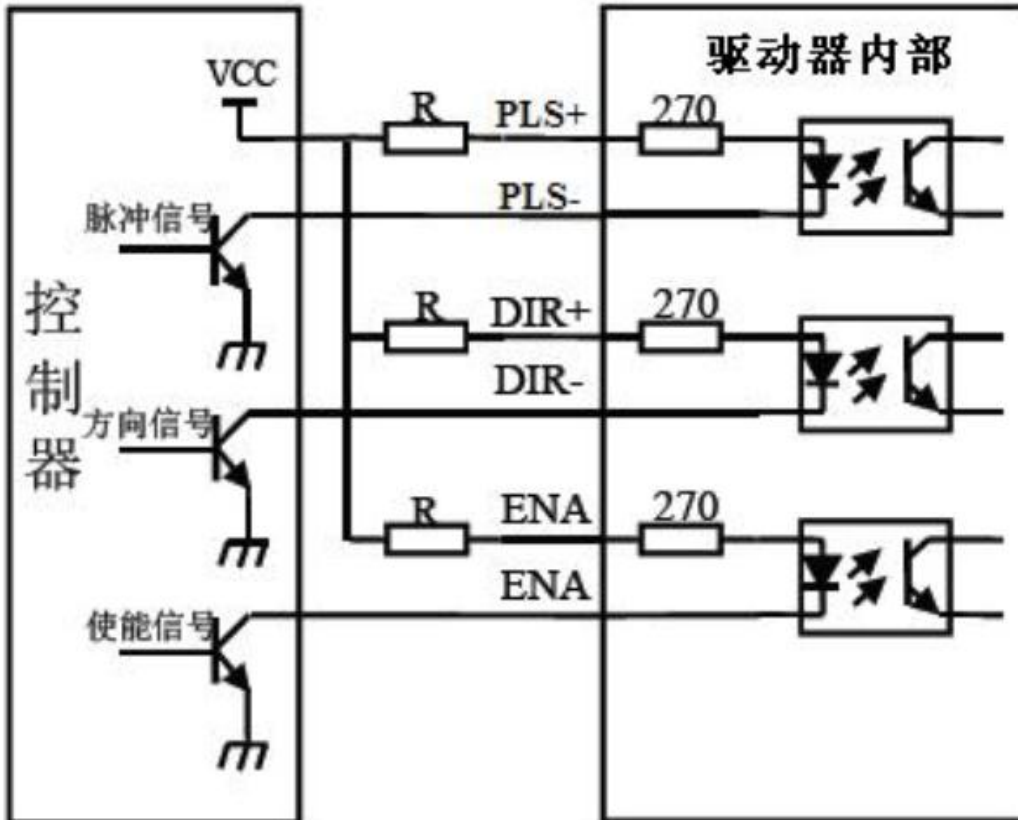
The control signal input and output interface circuit diagram is shown in Figure 1 below.



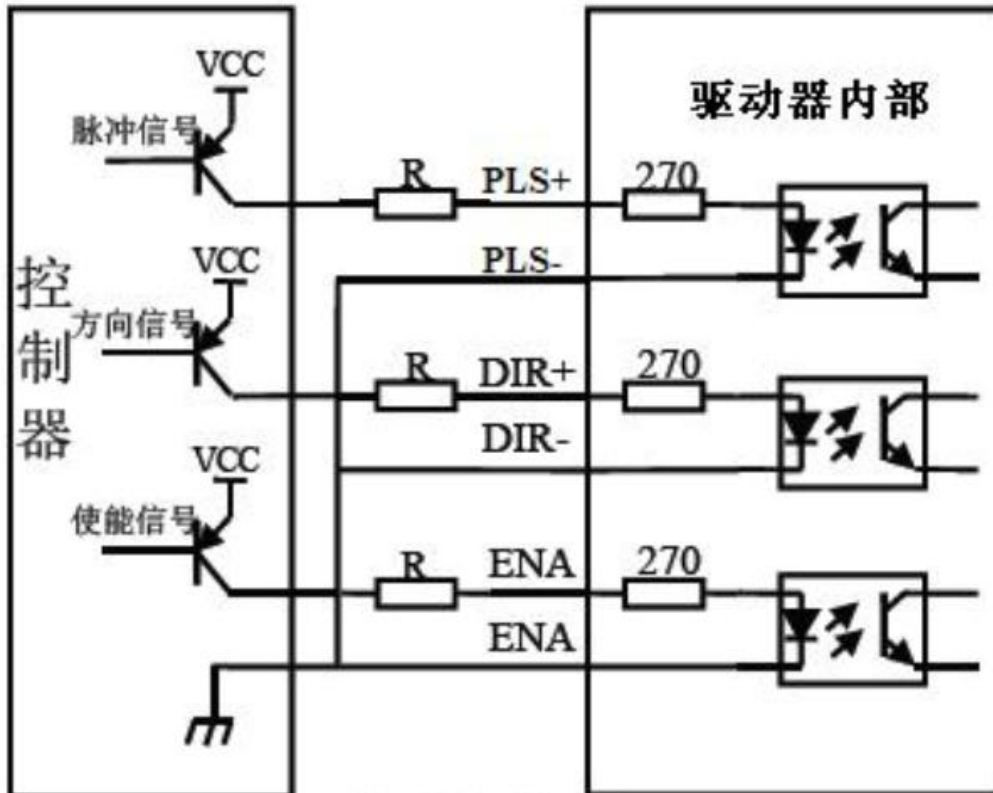
CONTROLLER

DRIVER

Figure 1 (a) Wiring diagram of differential mode control signal input interface



Common Anode Connection



Common cathode connection

Figure 1 (b) Wiring diagram of single-ended control signal input interface

Caution: If the control signal level is + 5V, the control signal input terminal does not need an external resistor R, that is, the control signal input and output interface The circuit diagram is shown in Figure 1. In the picture, R is short-circuited; if the control signal level is + 12V, the control signal input terminal needs to be connected with 1K power.

If the level of the control signal is + 24V, the 2K resistor must be connected to the input of the control signal.

3, Control signal timing diagram

In order to avoid some error actions and deviations, PLS, DIR and ENA should meet certain requirements, as shown in Figure 2 below.

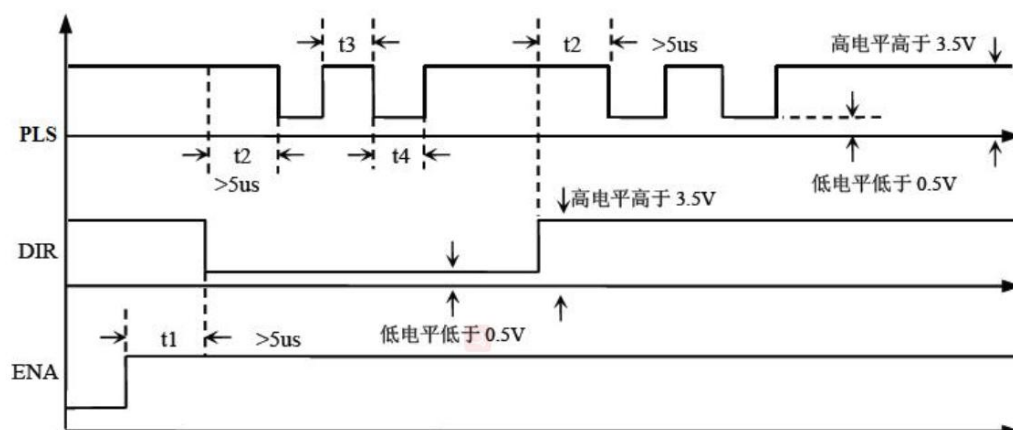





Figure 2

- (1) t_1 : ENA should be DIR at least $5 \mu s$ in advance and determined to be high. Generally, ENA + and ENA- are recommended to be left floating.
- (2) t_2 : DIR determines at least $5 \mu s$ in advance of the falling edge of PUL to determine its state is high or low.
- (3) t_3 : The pulse width is not less than $2.5\mu s$.
- (4) t_4 : Low-level width is not less than $2.5\mu s$.

Status indication function

The green LED is the power indicator. When the driver is powered on, the LED is always on; when the driver is powered off, the LED is off.

The red LED is the fault indicator. When a fault occurs, the indicator blinks in a cycle of 5 seconds. When the fault is cleared by the user, the red LED is off. The blinking frequency of the red LED is 2Hz, and the LED is on for 200ms and off for 300ms. The red LED flashes in 5 seconds represents different fault information, and the specific relationship is shown in the following table:

No,	Flash Numbers	Red LED flashing waveform	Instruction
1	1		Overcurrent protection
2	2		Overvoltage protection
3	7		Position tracking error alarm

When the drive fails, it will stop, and the user needs to power off and re-power on before the fault can be cleared.

DIP switch setting

The HSD86H driver uses a six-position DIP switch to set the subdivision accuracy, motor rotation direction, and single or double pulse function settings, as described below:

Segment settings

Step/Circle	SW1	SW2	SW3	SW4
Default	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	of

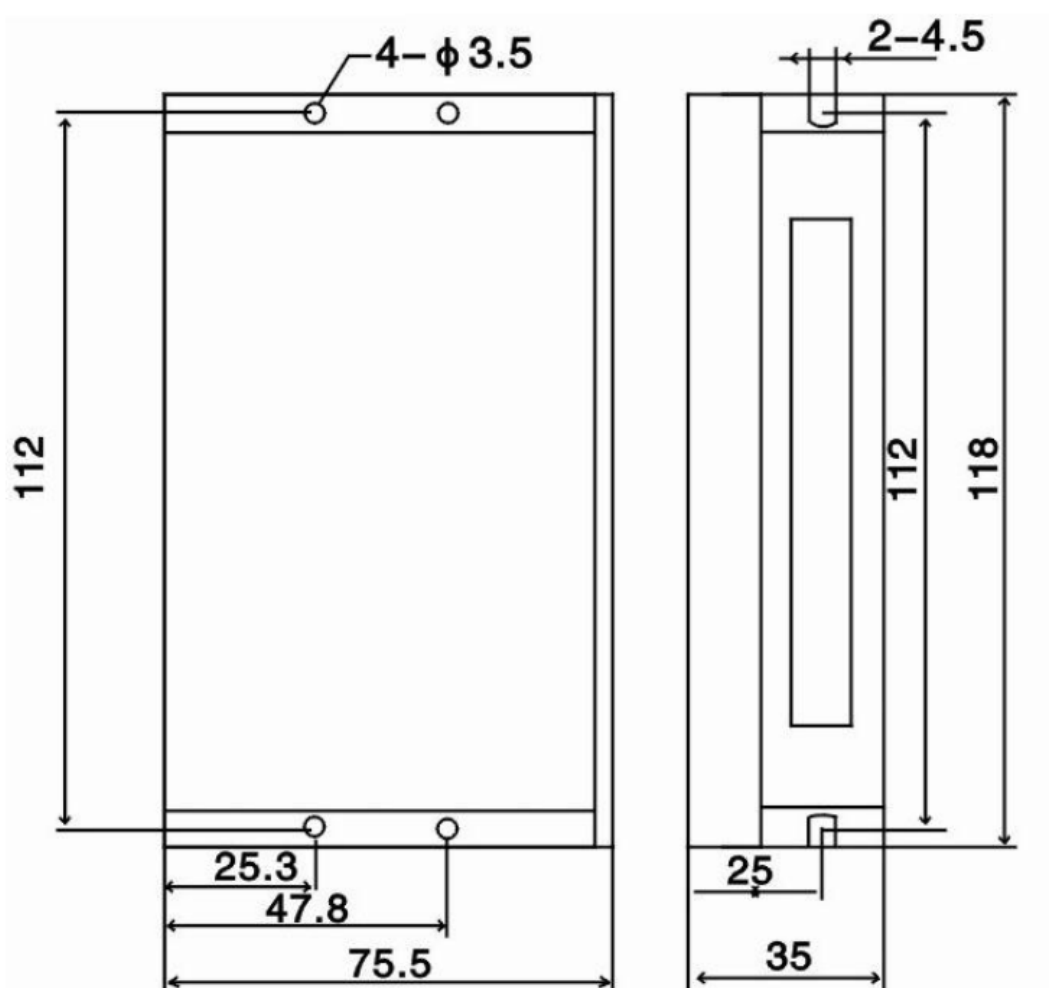
SW5: The direction of the motor rotation.

OFF means forward and On means Reserve

SW6: Single or Double pulse signal

OFF means Forward pulse + reverse pulse and ON means Pulse + direction level

Mechanical installation dimensions



Unit: mm

Figure 3

Caution: It should have a good cooling environment for installation, And while several drivers are used together, each driver's distance should at least 5cm away from each other. And to ensure the safety using, the ground protection terminal of the driver should connect with the ground correctly.

ЧПУ Мастер

Контактная информация

Напишите нам на почту info@cncmaster.org, через [форму обратной связи](#) или позвоните по телефонам приведённым ниже

Телефон: +7 966 030-63-20 Роман (WhatsApp, Viber, Telegram)

Телефон: +7 926 572-78-89 Александр (WhatsApp)