

HS

Hybrid servo driver

HBS758

Subdivision 200 ~ 65535

AC : 20~75V

### Overview

HBS758 adopts the latest dedicated motor control DSP chip and application of vector type closed-loop control technology, thus completely overcoming the problem of open-loop stepper motor losing steps, while also significantly improving the high-speed performance of the motor, reducing the degree of heat generation and reducing the vibration of the motor, And improve the processing speed and accuracy of the machine and reduce the energy consumption of the machine. In addition, when the motor is continuously overloaded, the driver will output an alarm signal, which has the same reliability as the AC servo system. The installation size of HBS758 adapted motor is fully compatible with the traditional 86 series stepper motor, and the traditional stepper drive scheme is very easy to upgrade.

### Features

- 1、 Adopt a new 32-bit motor control dedicated DSP chip;
- 2、 Adopt advanced vector-type variable current closed-loop control technology;
- 3、 Can be derived to contain the motor brake control function;
- 4、 Can be derived to contain encoder output function;
- 5、 Can drive 57 series, 60 series, 86 series hybrid servo motors;
- 6、 Signal optocoupler isolation differential input;
- 7、 Impulse response frequency 200KHz and 500KHz are optional;
- 8、 Subdivision setting (within 200~51200);
- 9、 With protections such as overcurrent, overvoltage and tracking error out of tolerance;
- 10、 Six-digit digital tube display, easy to set parameters and monitor the running status of the motor, etc.

### Electricity indicator

Parameter	758		
	Minimum	Typical value	Max
Input voltage	20VAC	60VAC	75VAC
Continuous output current	0.5A		8.0A
Signal interface level	5VDC		24VDC
Logic input current	7mA	10mA	20mA
Pulse frequency	0		200KHZ
Insulation resistance	100MΩ		

### Use environment and parameters

cooling method	Natural cooling or additional radiator	
Use environment	Use occasion	Try to avoid dust, oil mist and corrosive gas
	Temperature	0°C - 50°C
	Humidity	40 - 90%RH
	Shock	5.9 m/s <sup>2</sup> Max
Storage temperature	-20°C - +80°C	
Weight	About 1.5KG	

### Power terminal interface 1

Terminal number	Symbol	Name	Explain
1	AC	AC power input	Power supply 20-75Vac
2	AC		

### Power terminal interface 2

Terminal number	Symbol	Name	Explain
1	A+	Hybrid servo motor terminal (Note that the color of the wiring cannot be mistaken)	
2	A-		
3	B+		
4	B-		

### Control signal port (44-pin DB header)

Terminal number	Symbol	Name	Explain
3	PUL +	Pulse positive input	
4	PUL -	Pulse negative input	
5	DIR +	Positive direction input	
6	DIR -	Direction negative input	
7	ALM +	Alarm positive output	
8	ALM -	Alarm negative output	
9	Pend +	In-position signal positive	
10	Pend -	In-position signal negative	
11	ENA +	Enable positive input	
12	ENA -	Enable negative input	

### RS232Communication port

RS232

It can be connected to a PC or STU debugger through a dedicated USB serial cable, and plugging or unplugging is prohibited. It is recommended to use twisted pair or shielded wire, the wire length is less than 2 meters.

Note: The cable connecting HBS758 to PC, text display or STU servo debugger must be a dedicated cable, please confirm before use to avoid damage.

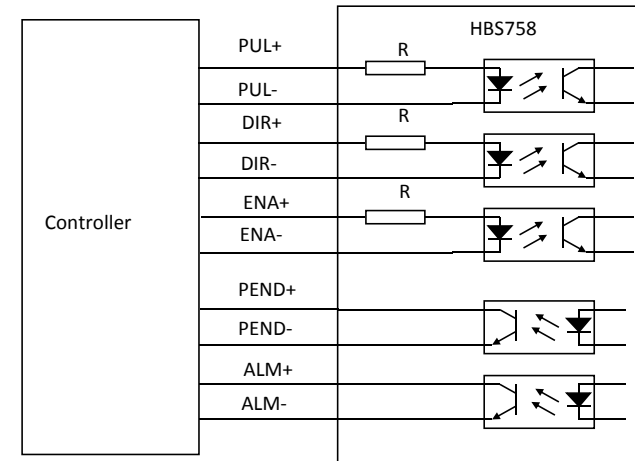
### Status indication

HBS758 has an LED to indicate the power supply and six-digit digital tube display status. Please refer to the instructions for the operation of the digital tube panel. The display parameters are defined in the following table:

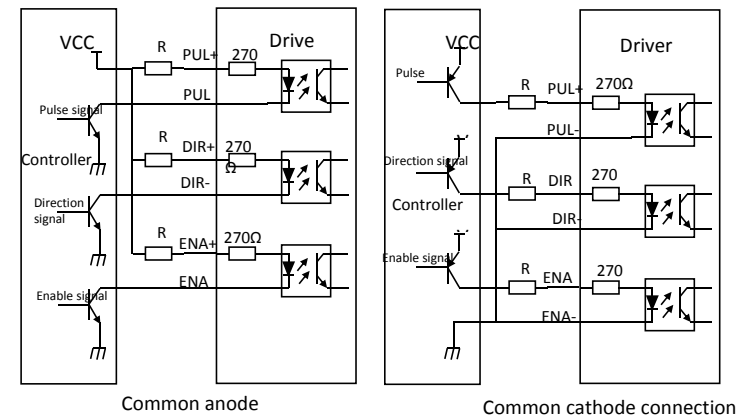
LED display	Meaning	Remarks
	Data low	
	Data high	
	Position error	The difference between the given pulse and the feedback pulse
	Motor speed: r/min	
	Given speed: r/min	
	Feedback pulse: p	
	Given pulse: p	
	Current setting: mA	
	Drive fault code	0001—Overcurrent protection 0002—Overvoltage protection 0008—Brake failure 0020—Tolerance protection
	Rectified bus voltage	Voltage=display data/10
	Drive version number	

### Control signal interface circuit diagram

#### Differential control signal interface wiring diagram

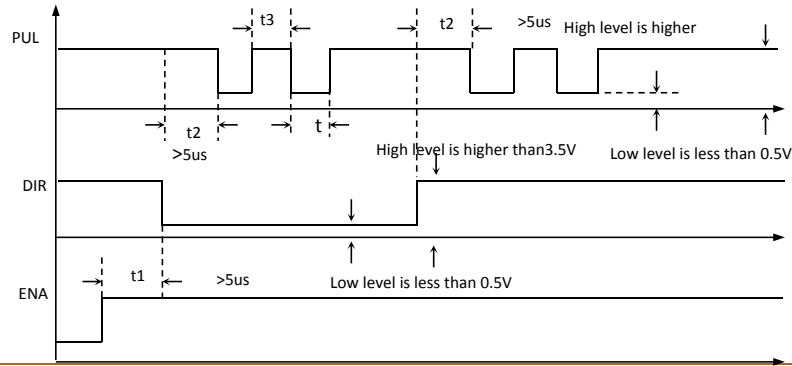


#### Single-ended control signal interface wiring diagram



### Control signal timing diagram

In order to avoid some misoperations and deviations, PUL, DIR and ENA should meet certain requirements, as shown in the figure below



Note: (1) t1: ENA (enable signal) should be advanced at least 5 $\mu$ s in advance of DIR and determined to be high. Generally, it is recommended that ENA+ and ENA- be left floating.

(2) t2: DIR is at least 5 $\mu$ s ahead of the falling edge of PUL to determine its high or low state.

(3) t3: The pulse width is at least not less than 2.5 $\mu$ s.

(4) t4: The low-level width is not less than 2.5 $\mu$ s.

### Control signal mode setting

Pulse trigger edge and single and double pulse selection: Set the rising edge or falling edge of the pulse to be valid through the PC software ProTuner software or the key board; you can also set the single pulse mode or the double pulse mode.

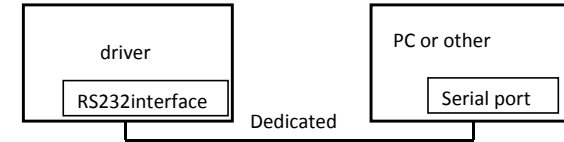
### Encoder wiring

The encoder wiring is provided by the 15-pin extension cable and motor encoder cable provided by our company. The extension cable is directly connected to the motor and the driver without customer wiring. The following table is the interface definition of HBS758 encoder.

DB header pin	Signal	Description
1	EA +	Encoder A channel positive output
2	EB +	Encoder B channel positive
3	GND	Encoder GND input
11	EA -	Encoder A channel negative output

12	EB -	Encoder B channel negative output
13	VCC	Encoder +5V power input

### Serial port connection



note:1. The cable connecting the HBS758 to the PC, text display or STU servo debugger must be a dedicated cable (supplied according to the user's situation). Please confirm before use to avoid damage.

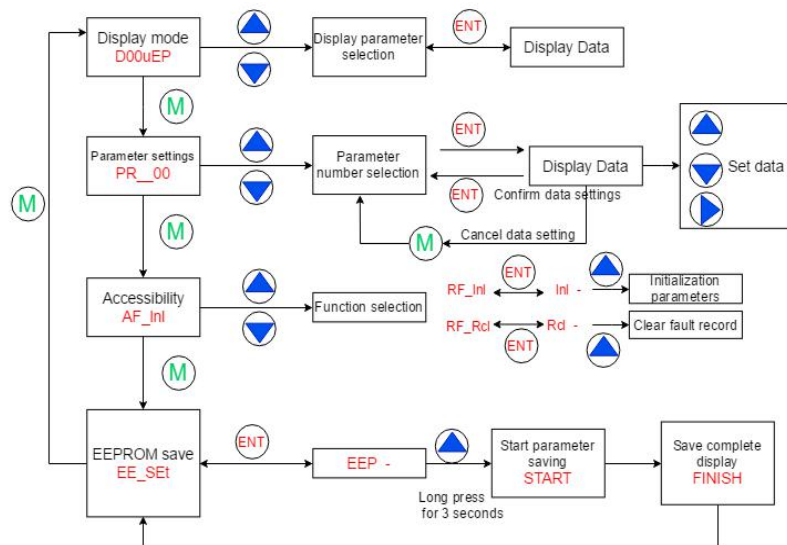
2. When connecting the HBS758 to the PC, it must be ensured that the power supply to the HBS758 is an isolated power source. If you are not sure, please isolate the PC with an isolation transformer to avoid damage to the PC.


### Drive parameter setting

There are two ways to set the parameters of the HBS758 driver: one is to complete the parameter setting through the RS232 serial communication port of the PC and the special debugging software is used, and the other is to set the parameters directly on the security panel of the driver. There is a set of corresponding motors in the driver. The best default factory configuration parameters, the user only needs to adjust the internal subdivision number of the drive according to the specific usage. For the detailed usage, please refer to the instructions of the Pro Tuner debugging software. The specific adjustable parameters and functions are shown in the following table:

Parameter symbol	Parameter name	Parameter range	Remarks
KcP	Current loop proportional coefficient	0 ~ 65535	Only used for factory settings, no modification
KcI	Current loop integral coefficient	0 ~ 65535	Only used for factory settings, no modification
KpP	Position loop scale factor	0 ~ 65535	Only used for factory settings, no modification
KpI	Position loop integral coefficient	0 ~ 65535	Only used for factory settings, no modification
Kd	Speed loop damping coefficient	0 ~ 100	Only used for factory settings, no modification
Kvff	Speed loop feedforward coefficient	0 ~ 100	Only used for factory settings, no modification
	Percentage of holding current	0 ~ 100%	Factory default settings 40
	Percentage of closed loop current	0 ~ 100%	Factory default settings 100
	Encoder line number	4000	
	Tracking error limit	0 ~ 65535	Factory default settings 1000
	Subdivision	200 ~ 65535	Factory default settings 4000

HBS758 button operation method is as follows



The parameter mode digital tube display  The "00" represents the serial number of the parameter, and the specific meaning is as follows

Parameter Number	Definition	Defaults	Range	Description
00	Current ring Kp	1000	0~65535	
01	Current ring Ki	200	0~65535	
02	Current ring Kc	256	0~1024	
03	Position ring Kp	2500	0~65535	
04	Position ring Ki	500	0~65535	
05	Position ring Kd	200	0~1000	
06	Position ring Kvff	30	0~100	
07	Given resolution of drive position	4000	200~65535	
08	Encoder resolution	4000	200~65535	
09	Tracking error alarm threshold	1000	1~65535	
10	Percentage of holding current	40	0~100	

11	percentage of closed loop current	100	1~100	
12	Hold time	1000	1~65535	
13	Pulse filter enable	0	0/1	
14	Filter time	25600	0~25600	
15	Enable level	1	0/1	
16	Fault output level	1	0/1	
17	single and double pulse selection	0	0/1	
18	Pulse valid edge	0	0/1	
19	Motor rotation direction	1	0/1	
20	Receiving pulse frequency range rotation	0	0/1	
21	Acceleration	200	1~2000	These parameters are used when controlling the rotation of the motor through the button panel
22	Speed stroke	60	1~3000	
23	stroke	100	1~65535	
24	Number of runs	1	1~65535	
25	Start direction	1	0/1	
26	Run interval time	100	1~65535	
27	Whether to reciprocate	1	0/1	
28	Start/stop test	1	0/1	
29	Closed-loop mode selection	1	0/1	
30	Open and close loop mode	1	0/1	
31	Motor flange selection	1	0/1	
32	Automatic setting function	1	0/1	
33	Turn off the out-of-tolerance	0	0/1	

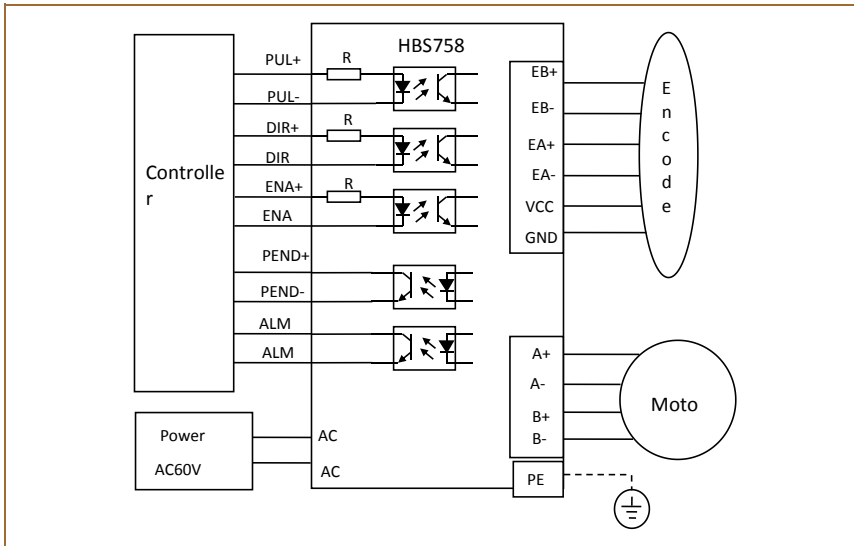
Note: The factory default parameters of the current loop, position loop and speed loop of the drive are the best parameters of the matching motor. Generally, customers do not need to modify it. They only need to select the motor subdivision number and the percentage of open and closed loop current according to the needs of system control.

Typical application wiring diagram

Motor wire color and definition

Pin	Colour	Signal	Description
1	black	A+	
2	red	A-	
3	yellow	B+	
4	blue	B-	

The typical wiring diagram of the DC servo system composed of HBS758 drives is shown in the figure. The recommended power supply is AC 60V.



Mounting dimensions

