HB860HDigital hybrid servo driver

An instruction manual

Product introduction

1、   Summary

HB860H is a new type of hybrid servo driver. It adopts the latest special motor control DSP chip and vector closed-loop control technology to overcome the problem of losing step of open-loop stepper motor thoroughly. It can also significantly improve the high-speed performance of the motor, reduce the heat level of the motor and reduce the vibration of the motor, so as to enhance the machine. The processing speed and accuracy and reduce the consumption of the machine. In addition, when the motor is continuously overloaded, the driver will output an alarm signal with the same reliability as the AC servo system.

2、   Technical characteristics

• A new 32 bit DSP chip for motor control is adopted；

• Advanced vector closed loop control technology is adopted；

• Trapezoidal wave testing function；

• Quiescent current and dynamic current can be set arbitrarily (within 0-8.2A)；

• Drive 86 series hybrid servo motor；

• Optocoupler isolation differential signal input；

• The pulse frequency is up to 200KHz；

• Subdivision settings (800-51200)；

• It has over-current, overvoltage, and tracking error overshoot protection.。

3、 application area

Suitable for various small and medium-sized automation equipment and instruments, such as: engraving machine, stripping machine, marking machine, cutting machine, laser typesetting, plotter, CNC machine tools, automatic assembly equipment. It has a very good application effect in users who expect small noise and high speed.

Electrical, mechanical and environmental indicators

1、 Electrical index

parameter	HB860H			
	minimum value	Typical value	Maximum value	Company
Continuous output current	0	-	8.2	A
Input voltage	+18	60	+80	VAC
Logic input voltage	7	10	20	mA
Pulse frequency	0	-	200	kHz
insulation resistance	500			MΩ
Encoder current is provided			50	mA

2、 Usage environment and parameters

| Cooling mode	Natural cooling or external radiator	
Use of the environment	Application	Try to avoid dust, oil mist and corrosive gases
	temperature	0℃-50℃
	humidity	40-90%RH
	shock	10-55Hz/0.15mm
Keep the temperature	-20℃-65℃	
weight	About 570 grams	
working temperature	The reliable temperature of the driver should be within 50 C, and the motor temperature is less than 70 C	

3、 Mechanical installation dimension drawing
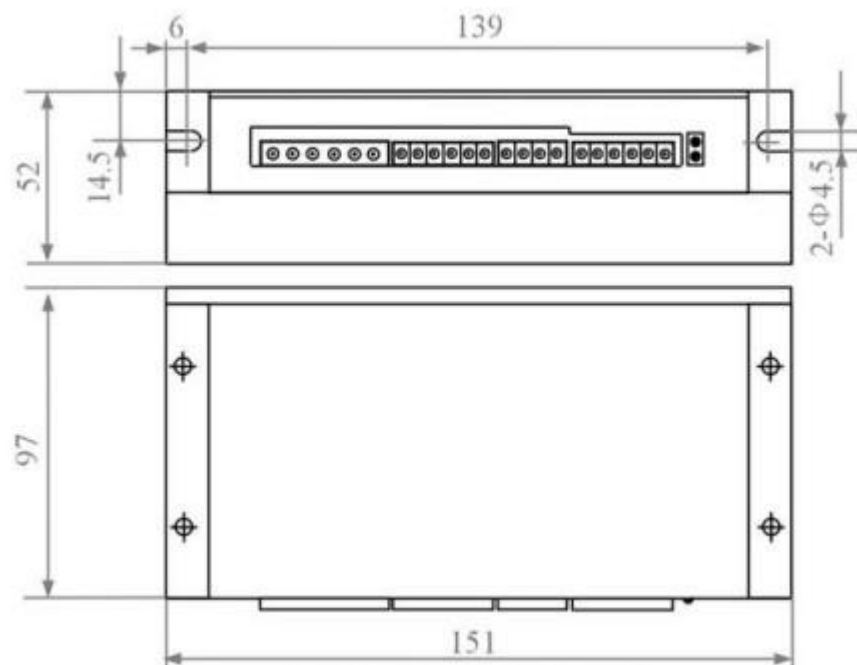
Figure 1 Mechanical installation dimension drawing（Company： m）

Introduction of driver interface and wiring

1、 Interface definition

1） Motor and power input port

Terminal number	Symbol	Name	Explain
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 supply	AC24V-80V
6	AC	Input power supply	And DC24V-110V

2） Encoder signal input port

Terminal number	Symbol	Name	Explain
1	EB+	Motor encoder B positive input	
2	EB-	Motor encoder B negative phase input	
3	EA+	Motor encoder A positive input	
4	EA-	Motor encoder B negative phase input	
5	VCC	Encoder power supply	+5V

Terminal number	Symbol	Name	Explain
6	EGND	Encoder power source	0V

3） Control signal port

Terminal number	Symbol	Name	Explain
1	PUL+	Positive pulse input	5-24V general signal
2	PUL-	Pulse negative input	
3	DIR+	Directional positive input	5-24V general signal
4	DIR-	Directional negative input	
5	ENA+	Enable positive input	5-24V general signal
6	ENA-	Enable negative input	
7	Pend+	In place signal positive output	5-24V general signal
8	Pend-	In place signal negative output	
9	ALM+	Positive output of alarm signal	5-24V general signal
10	ALM-	Alarm signal negative output	

4) State indication

The green LED is the power indicator, which is always on when the driver is connected to the power supply, and goes out when the driver is turned off. The red LED is the fault indicator. When the fault occurs, the indicator flashes in a cycle of 5 seconds. When the fault is cleared by the user, the red RED goes out for a long time. The flashing frequency of red LED is 2Hz, of which LED is bright 200ms and 300ms is eliminated. Red LED flashes in 5 seconds.

Notes:

(1) t1：ENA (enabling signal) should be DIR at least 5 μs in advance. In general, it is recommended that ENA+ and ENA- be suspended.

(2) t2：DIR At least PUL ahead of time, the falling edge 5 μs determines its state is high or low.

(3) t3：The pulse width is not less than 2.5 μs.

(4) t4: Low level width is less than 2.5 μs.
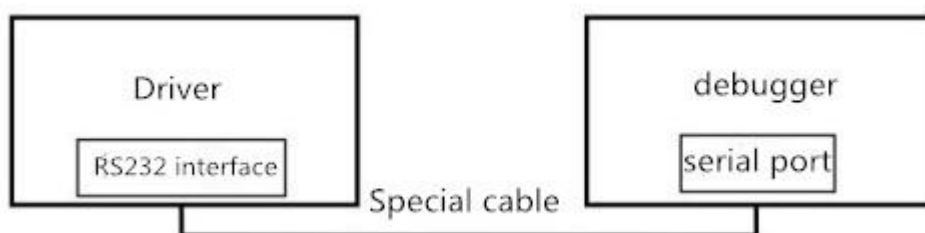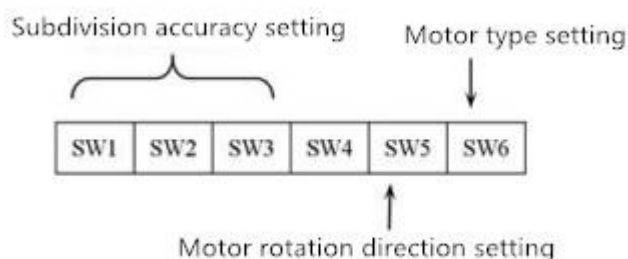
3.、Serial port connection

Fig. 6 schematic diagram of parameter debugging wiring

Dial switch settings

The driver uses a six-digit dialing switch to set the subdivision accuracy, the control signal along the effective direction of rotation and the motor setting, which is described in detail as follows:

Subdivision setting

Step / circle	SW1	SW2	SW3	SW4
Defauit	on	on	on	on
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

Driver parameter setting

The parameter setting of HB860H drive must be modified through the connection between special debugger and RS232 serial communication port. There is a set of

best default factory configuration parameters of corresponding motor in the drive. Users only need to adjust the internal subdivision of the drive according to the specific usage. Please check the debugger usage. bright

Note: The default parameters of current loop, position loop and speed loop are the best parameters of the matching motor. Customers do not need to modify them. They only need to select the motor subdivision and the percentage of open and closed loop current according to the need of system control. For example, in the case of belt drive, it is necessary to adjust the rigidity of motor, current loop, position loop and speed loop to improve the effect. If unable to adjust to the best effect, we can call our service telephone for consultation and adjustment, we have professional and technical personnel to solve such problems for you.

Typical application wiring diagram

The typical wiring diagram of the DC servo system composed of HB860H drivers is shown in Figure 7. The power supply is recommended for the size range. The higher the voltage, the better the high speed performance.
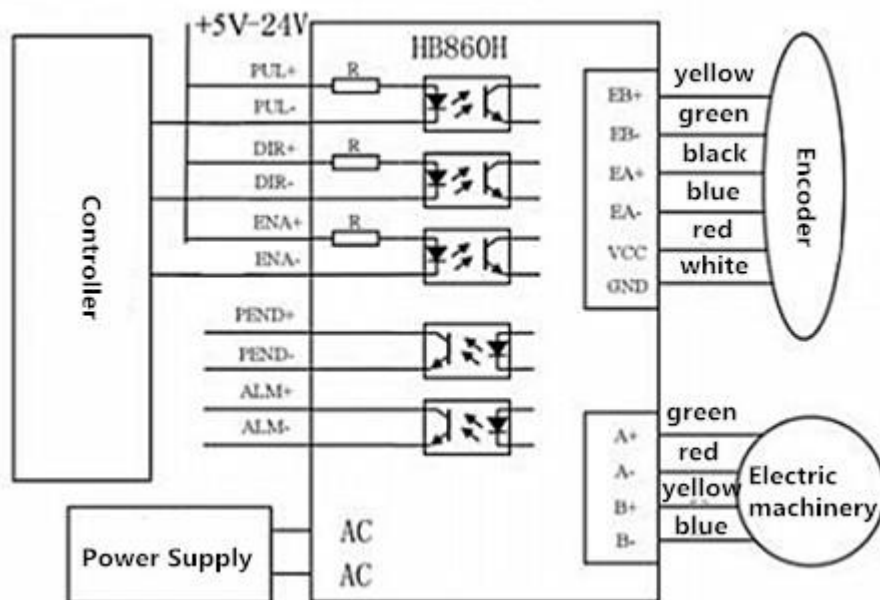

Figure. 7 typical wiring diagram

1、 Color and definition of lead for hybrid servo motor encoder

Pin	colour	signal	describe
1	yellow	EB+	Encoder B channel positive output
2	green	EB-	Encoder B channel negative output
3	black	EA+	Encoder A channel positive output
4	brown	EA-	Encoder A channel negative output
5	red	VCC	Encoder +5V power input
6	white	GND	Encoder GND input

2、 Color and definition of mixed servo motor line

Pin	colour	signal	describe
1	green	A+	A phase motor winding +
2	red	A-	A phase motor winding -
3	yellow	B+	B phase motor winding +
4	blue	B-	B phase motor winding -