HS57 步进闭环驱动器

HS57 CLOSED-LOOP STEPPING MOTOR DRIVE

ZZMOTOR



概述

HS57是最新推出的带串口调试功能的数字式混合步进伺服驱动器，采用最新32位DSP控制技术，集成了MODBUS-RTU标准协议规范，用户可通过上位机调试软件设置200-40000内的任意细分以及工作模式等多个参数，极大地丰富了产品的实用功能，能够满足大多数场合的应用需要。HS57驱动器采用类伺服的控制原理，兼容了开环步进和伺服系统的双重优点，彻底解决了开环步进丢步的问题，极大地提升了步进系统的性能，同时降低了电机的发热和低速振动。相对于伺服系统，大大降低了调试难度，具有快速启停，停机无振动等优点，且其体积小、成本低、性价比高，能够满足绝大多数场合的应用。

特点

- ●带串口调试功能
- ●全新32位DSP技术
- ●光隔离差分信号输入
- ●脉冲响应频率最高可达200kHz（更高可改）
- ●精密电流控制使电机发热大为降低
- ●静止时电流自动减半
- ●外置拨码选择驱动器工作模式
- ●体积小，便于安装
- ●内置微细分
- ●细分设定范围200-40000
- ●低振动低噪声
- ●具有过压、欠压、过流等保护功能

电气、机械和环境指标

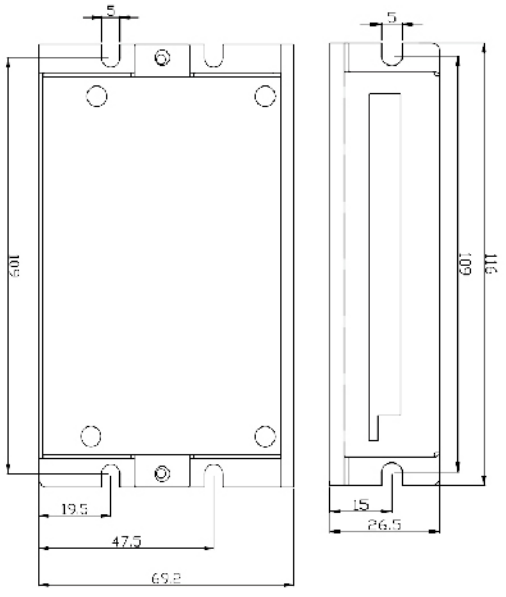
电气指标

说明	HS57			
	最小值	典型值	最大值	单位
输入电源电压	20	36	50	VDC
控制信号输入电流	7	10	16	mA
步进脉冲频率	0	-	200	kHz
绝缘电阻	50			MΩ

使用环境及参数

冷却方式		自然冷却、风扇散热
使用环境	场合	不能放在其他发热的设备旁，要避免粉尘、油雾、腐蚀性气体，湿度太大及强振动场所，禁止有可燃气体和导电灰尘
	温度	0~50°C
	湿度	40~90%RH
	振动	10~55Hz/0.15mm
保存温度		-20°C~65°C

机械安装图



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驱动器接口和接线

控制信号接口

名称	功能
PLS+ PLS-	脉冲控制信号：+5V-+24V均可驱动，上升沿有效，每当脉冲由高变低时，电机走一微步。 为了可靠响应脉冲信号，脉冲宽度应大于2μs。
DIR+ DIR-	方向控制信号：+5V-+24V均可驱动，高/低电平信号。为保证电机可靠换向，方向信号应先于脉冲信号至少5μs建立。 电机的初始运行方向与电机接线有关，互换任一相绕组（如A+、A-交换）可以改变电机初始运行方向。
ENA+ ENA-	使能控制信号：+5V-+24V均可驱动，高/低电平信号。用于使能或禁止电机的运行。当ENA+接+5V，ENA-接低电平时， 驱动器将切断电机各相的电流使电机处于自由状态，此时步进脉冲不被响应。当不需用此功能时，使能信号端悬空即可。 另外，ENA端还可用于清除超差报警信号。

输出信号接口

名称	功能
PEND+ PEND-	到位信号输出：电机到达控制指令指定的位置，到位信号输出有效； PEND+接上拉电阻到输出电源正极，PEND-接控制器的信号输入端；最大驱动电流50mA。
ALM+ ALM-	报警信号输出：过流、过压、欠压或位置超差报警发生时，报警信号输出有效； ALM+接上拉电阻到输出电源正极，ALM-接控制器的信号输入端；最大驱动电流50mA。

编码器接口

名称	功能
PB+、PB-	编码器B相输入接口，需注意线序。
PA+、PA-	编码器A相输入接口，需注意线序。
VCC	编码器5V供电电源正端。
EGND	编码器5V供电电源负端。

强电接口

名称	功能
GND	直流电源地
+VDC	电源正极，范围：DC20~50V，推荐+36V
A+、A-	电机A相线圈，需注意线序。
B+、B-	电机B相线圈，需注意线序。

232通讯接口

HS57驱动的串口通讯接口采用RJ12端子，可以通过专用串口电缆线经USB转TTL串口转换工具连接至PC机，禁止带电插拔！通过在PC端，客户可以设置所需要的参数，如电流、细分、工作模式等，具体可看上位机软件界面。

端子号	符号	名称	说明
1	GND	RS232通讯地	0V
2	TXD	RS232发送端	
3	NC	-	内部使用
4	RXD	RS232接收端	
5	NC	-	内部使用
6	NC	-	内部使用

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OVERVIEW

HS57 is the latest digital hybrid step servo driver with serial port debugging function. It adopts the latest 32-bit DSP control technology and integrates MODBUS-RTU standard protocol specifications. Users can set any subdivision within 200-40000 and multiple parameters such as working mode through the host computer debugging software, which greatly enriches the practical functions of the product and can meet the application needs of most occasions. The HS57 driver adopts a servo-like control principle, which is compatible with the dual advantages of open-loop stepping and servo systems, completely solving the problem of open-loop stepping step loss, greatly improving the performance of the stepping system, and reducing the heating and low-speed vibration of the motor. Compared with the servo system, it greatly reduces the difficulty of debugging, has the advantages of fast start and stop, no vibration when shutting down, and its small size, low cost, and high cost performance can meet the application of most occasions.

FEATURES

- With serial port debugging function
- New 32-bit DSP technology
- Optically isolated differential signal input
- The impulse response frequency can reach up to 200kHz (higher can be modified)
- Precise current control greatly reduces motor heating
- The current is automatically halved when stationary
- External dial selects the driver working mode
- Small size, easy to install
- Built-in micro-segmentation
- Subdivision setting range 200-40000
- Low vibration and low noise
- With overvoltage, undervoltage, overcurrent and other protection functions

ELECTRICAL, MECHANICAL AND ENVIRONMENTAL INDICATORS

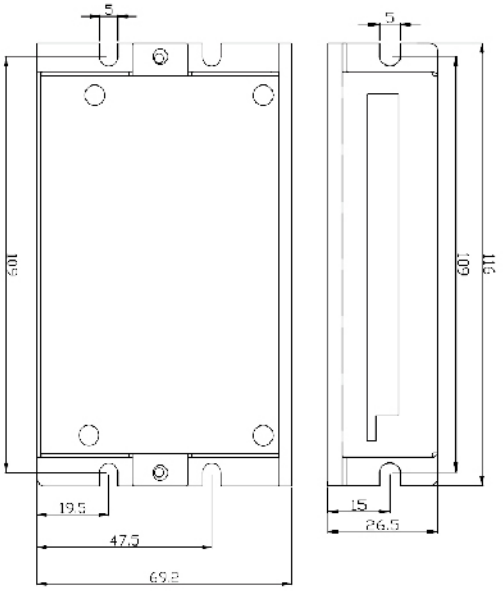
ELECTRICAL SPECIFICATIONS

Illustrate	HS57			
	Minimum	Typical Value	Maximum	Unit
Input power voltage	20	36	50	VDC
Control signal input current	7	10	16	mA
Step pulse frequency	0	-	200	kHz
Insulation resistance	50			MΩ

USE ENVIRONMENT AND PARAMETERS

Cooling method		Natural cooling, fan cooling
Usage Environment	occasion	Do not place it near other heating equipment. Avoid dust, oil mist, corrosive gas, high humidity and strong vibration. Flammable gas and conductive dust are prohibited.
	temperature	0~50°C
	humidity	40~90%RH
	vibration	10~55Hz/0.15mm
Storage temperature		-20°C~65°C

MECHANICAL INSTALLATION DRAWING



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DRIVER INTERFACE AND WIRING

CONTROL SIGNAL INTERFACE

Name	Function
PLS+ PLS-	Pulse control signal: +5V-+24V can be driven, rising edge is effective, every time the pulse changes from high to low, the motor takes a microstep. In order to reliably respond to the pulse signal, the pulse width should be greater than 2μs.
DIR+ DIR-	Direction control signal: can be driven by +5V-+24V, high/low level signal. To ensure reliable commutation of the motor, the direction signal should be established at least 5μs before the pulse signal. The initial running direction of the motor is related to the motor wiring. Interchanging any phase winding (such as A+ and A-) can change the initial running direction of the motor.
ENA+ ENA-	Enable control signal: +5V-+24V can be driven, high/low level signal. Used to enable or disable the operation of the motor. When ENA+ is connected to +5V and ENA- is connected to a low level, the driver will cut off the current of each phase of the motor to put the motor in a free state, and the step pulse will not be responded to at this time. When this function is not needed, the enable signal terminal can be left floating. In addition, the ENA terminal can also be used to clear the out-of-tolerance alarm signal.

OUTPUT SIGNAL INTERFACE

Name	Function
PEND+ PEND-	In-position signal output: When the motor reaches the position specified by the control instruction, the in-position signal output is valid; PEND+ is connected to the pull-up resistor to the positive pole of the output power supply, and PEND- is connected to the signal input terminal of the controller; the maximum driving current is 50mA.
ALM+ ALM-	Alarm signal output: When overcurrent, overvoltage, undervoltage or position out-of-tolerance alarm occurs, the alarm signal output is valid; ALM+ is connected to the pull-up resistor to the positive pole of the output power supply, and ALM- is connected to the signal input terminal of the controller; the maximum driving current is 50mA.

ENCODER INTERFACE

Name	Function
PB+、PB-	Encoder B phase input interface, please pay attention to the line sequence.
PA+、PA-	Encoder A phase input interface, please pay attention to the line sequence.
VCC	Encoder 5V power supply positive terminal.
EGND	Negative terminal of the encoder 5V power supply.

STRONG POWER INTERFACE

Name	Function
GND	DC power ground
+VDC	Positive power supply, range: DC20~50V, recommended +36V
A+、A-	For the motor A phase coil, pay attention to the line sequence.
B+、B-	For the motor B phase coil, pay attention to the line sequence.

232 COMMUNICATION INTERFACE

The serial communication interface of the HS57 driver uses an RJ12 terminal, which can be connected to the PC through a dedicated serial cable via a USB to TTL serial conversion tool. Do not plug or unplug the power supply! On the PC side, customers can set the required parameters, such as current, subdivision, working mode, etc. For details, please refer to the upper computer software interface.

Terminal No.	Symbol	Name	Illustrate
1	GND	RS232 communication ground	0V
2	TXD	RS232 transmitter	
3	NC	-	Internal Use
4	RXD	RS232 Receiver	
5	NC	-	Internal Use
6	NC	-	Internal Use

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概述

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特点

- ●带串口调试功能
- ●全新32位DSP技术
- ●光隔离差分信号输入
- ●脉冲响应频率最高可达200kHz（更高可改）
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- ●静止时电流自动减半
- ●外置拨码选择驱动器工作模式
- ●体积小，便于安装
- ●内置微细分
- ●细分设定范围200-40000
- ●低振动低噪声
- ●具有过压、欠压、过流等保护功能

电气、机械和环境指标

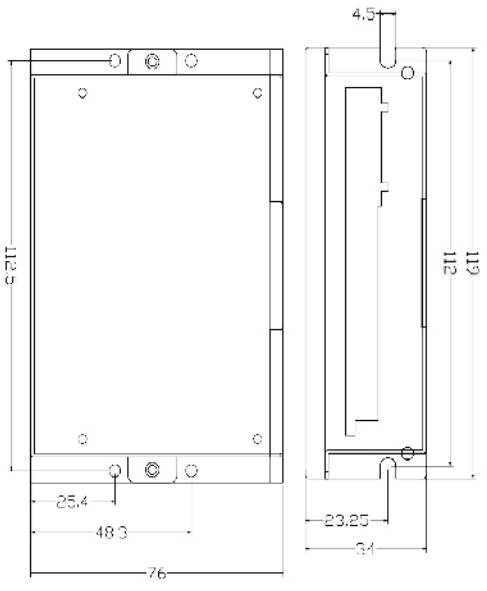
电气指标

说明	HS86			
	最小值	典型值	最大值	单位
输入电源电压	20	60	80	VAC
控制信号输入电流	7	10	16	mA
步进脉冲频率	0	-	200	kHz
绝缘电阻	50			MΩ

使用环境及参数

冷却方式		自然冷却、风扇散热
使用环境	场合	不能放在其他发热的设备旁，要避免粉尘、油雾、腐蚀性气体，湿度太大及强振动场所，禁止有可燃气体和导电灰尘
	温度	0~50°C
	湿度	40~90%RH
	振动	10~55Hz/0.15mm
保存温度		-20°C~65°C

机械安装图



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驱动器接口和接线

控制信号接口

名称	功能
PLS+ PLS-	脉冲控制信号：+5V-+24V均可驱动，上升沿有效，每当脉冲由高变低时，电机走一微步。 为了可靠响应脉冲信号，脉冲宽度应大于2μs。
DIR+ DIR-	方向控制信号：+5V-+24V均可驱动，高/低电平信号。为保证电机可靠换向，方向信号应先于脉冲信号至少5μs建立。 电机的初始运行方向与电机接线有关，互换任一相绕组（如A+、A-交换）可以改变电机初始运行方向。
ENA+ ENA-	使能控制信号：+5V-+24V均可驱动，高/低电平信号。用于使能或禁止电机的运行。当ENA+接+5V，ENA-接低电平时， 驱动器将切断电机各相的电流使电机处于自由状态，此时步进脉冲不被响应。当不需用此功能时，使能信号端悬空即可。 另外，ENA端还可用于清除超差报警信号。

输出信号接口

名称	功能
PEND+ PEND-	到位信号输出：电机到达控制指令指定的位置，到位信号输出有效； PEND+接上拉电阻到输出电源正极，PEND-接控制器的信号输入端；最大驱动电流50mA。
ALM+ ALM-	报警信号输出：过流、过压、欠压或位置超差报警发生时，报警信号输出有效； ALM+接上拉电阻到输出电源正极，ALM-接控制器的信号输入端；最大驱动电流50mA。

编码器接口

名称	功能
PB+、PB-	编码器B相输入接口，需注意线序。
PA+、PA-	编码器A相输入接口，需注意线序。
VCC	编码器5V供电电源正端。
EGND	编码器5V供电电源负端。

强电接口

名称	功能
AC1、AC2	交流输入电源，AC20V-80V(DC30V-110V)
A+、A-	电机A相线圈，需注意线序。
B+、B-	电机B相线圈，需注意线序。

232通讯接口

HS86驱动的串口通讯接口采用PH2.0-7P的端子，可以通过专用串口电缆线经USB转TTL串口转换工具连接至PC机，禁止带电插拔！通过在PC端，客户可以设置所需要的参数，如电流、细分、工作模式等，具体可看上位机软件界面。

端子号	符号	名称	说明
1	NC	-	内部使用
2	NC	-	内部使用
3	GND	RS232通讯地	0V
4	NC	-	内部使用
5	NC	-	内部使用
6	TXD	RS232发送端	
7	RXD	RS232接收端	

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ELECTRICAL, MECHANICAL AND ENVIRONMENTAL INDICATORS

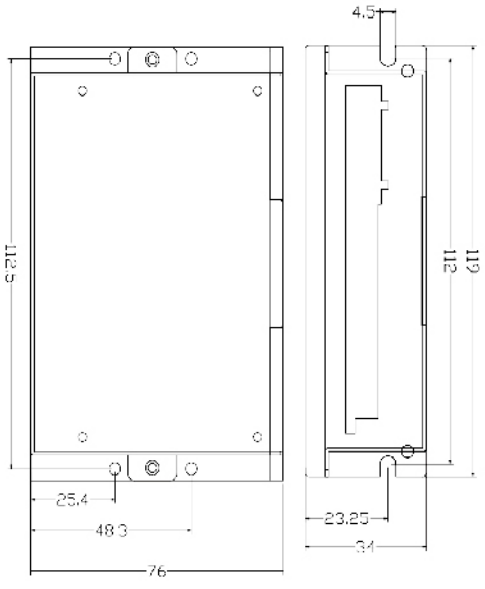
ELECTRICAL SPECIFICATIONS

Illustrate	HS86			
	Minimum	Typical Value	Maximum	Unit
Input power voltage	20	60	80	VAC
Control signal input current	7	10	16	mA
Step pulse frequency	0	-	200	kHz
Insulation resistance	50			MΩ

USE ENVIRONMENT AND PARAMETERS

Cooling method		Natural cooling, fan cooling
Usage Environment	occasion	Do not place it near other heating equipment. Avoid dust, oil mist, corrosive gas, high humidity and strong vibration. Flammable gas and conductive dust are prohibited.
	temperature	0~50°C
	humidity	40~90%RH
	vibration	10~55Hz/0.15mm
Storage temperature		-20°C~65°C

MECHANICAL INSTALLATION DRAWING



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DRIVER INTERFACE AND WIRING

CONTROL SIGNAL INTERFACE

Name	Function
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ENA+ ENA-	Enable control signal: +5V-+24V can be driven, high/low level signal. Used to enable or disable the operation of the motor. When ENA+ is connected to +5V and ENA- is connected to a low level, the driver will cut off the current of each phase of the motor to put the motor in a free state, and the step pulse will not be responded to at this time. When this function is not needed, the enable signal terminal can be left floating. In addition, the ENA terminal can also be used to clear the out-of-tolerance alarm signal.

OUTPUT SIGNAL INTERFACE

Name	Function
PEND+ PEND-	In-position signal output: When the motor reaches the position specified by the control instruction, the in-position signal output is valid; PEND+ is connected to the pull-up resistor to the positive pole of the output power supply, and PEND- is connected to the signal input terminal of the controller; the maximum driving current is 50mA.
ALM+ ALM-	Alarm signal output: When overcurrent, overvoltage, undervoltage or position out-of-tolerance alarm occurs, the alarm signal output is valid; ALM+ is connected to the pull-up resistor to the positive pole of the output power supply, and ALM- is connected to the signal input terminal of the controller; the maximum driving current is 50mA.

ENCODER INTERFACE

Name	Function
PB+、PB-	Encoder B phase input interface, please pay attention to the line sequence.
PA+、PA-	Encoder A phase input interface, please pay attention to the line sequence.
VCC	Encoder 5V power supply positive terminal.
EGND	Negative terminal of the encoder 5V power supply.

STRONG POWER INTERFACE

Name	Function
AC1、AC2	AC input power, AC20V-80V (DC30V-110V)
A+、A-	For the motor A phase coil, pay attention to the line sequence.
B+、B-	For the motor B phase coil, pay attention to the line sequence.

232 COMMUNICATION INTERFACE

The serial communication interface of the HS86 driver uses a PH2.0-7P terminal, which can be connected to the PC through a dedicated serial cable and a USB to TTL serial conversion tool. Do not plug or unplug the power supply! On the PC side, customers can set the required parameters, such as current, subdivision, working mode, etc. For details, please refer to the upper computer software interface.

Terminal No.	Symbol	Name	Illustrate
1	NC	-	Internal Use
2	NC	-	Internal Use
3	GND	RS232 communication ground	0V
4	NC	-	Internal Use
5	NC	-	Internal Use
6	TXD	RS232 transmitter	
7	RXD	RS232 Receiver	