

Y2SD2H-SA01

Analog Control Stepper Driver User Manual



Guangdong Kaifull Electronics Technology Co., Ltd.

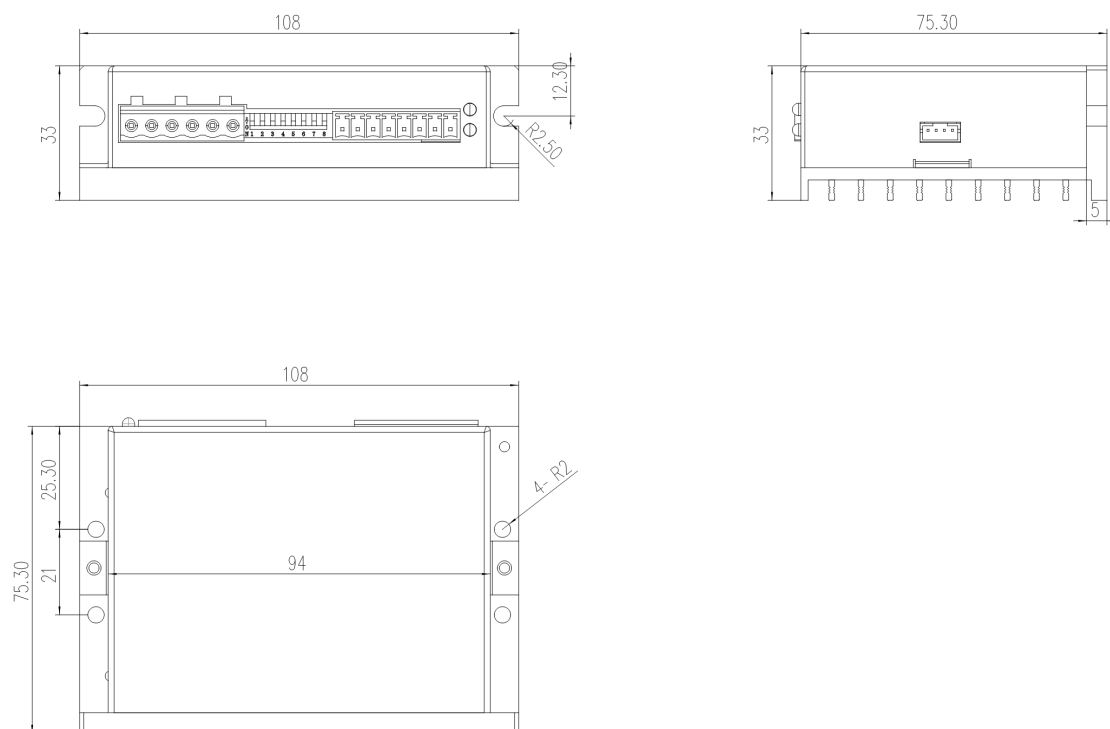
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1 Foreword

- Thank you for choosing Kaifull's product.
- This manual describes the use methods and safety precautions of the product.
- Please read this user manual carefully and use this product correctly and safely.
- After reading, please save it at a suitable place for easy access at any time.
- For technical support, please dial 400-960-1069 or +86-769-23033384.

2 Installation Dimensions

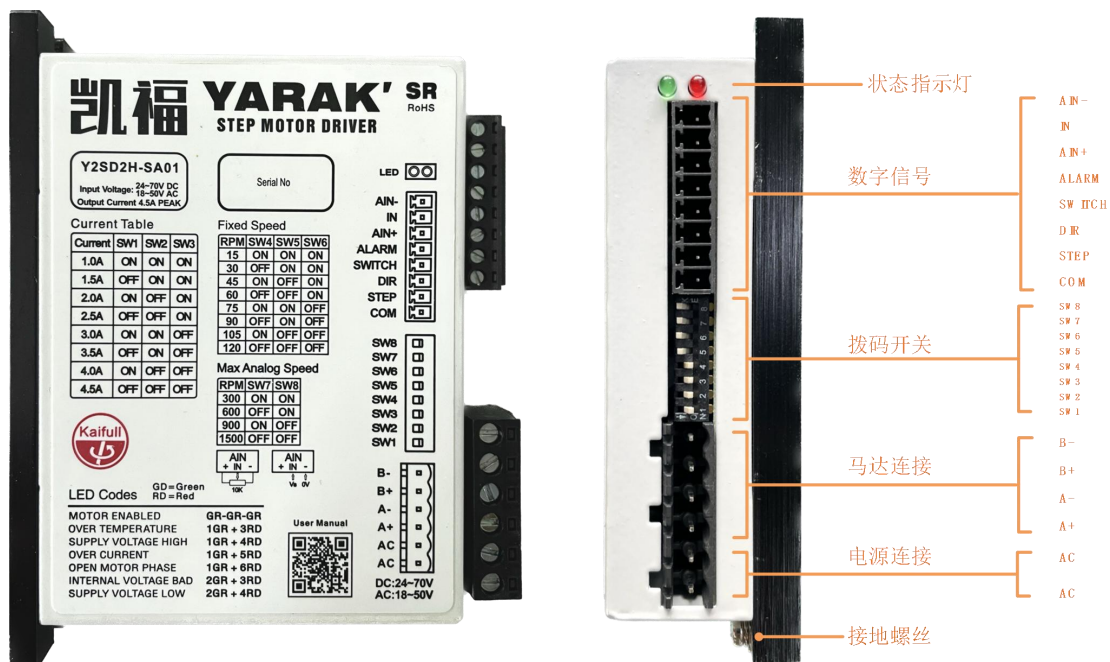


3 Technical Specifications

Technical Specifications		
Installation Dimensions	108 × 75.3 × 33 mm	
Input power	24~70VDC or 18~50VAC	
Current output	1.0~4.5A (peak)	
Adaptive motor	Two-phase stepper motor	
Control mode	Speed mode	
Communication interface	TTL serial port	
Digital signal	Input signal	3 digital inputs; opto-isolator; support 5~24VDC signals 1 analog input; Maximum input voltage 10V; can be connected to a 10KΩ resistor
	Output signal	<u>1 digital output</u> : collector open circuit; opto-isolator; maximum output 100mA@30V;
Current tap position	Dial setting	1.0、1.5、2.0、2.5、3.0、3.5、4.0、4.5A
Speed level	Dial setting	Constant-speed mode: 15, 30, 45, 60, 75, 90, 105, 120 RPM
		Maximum analog speed: 300, 600, 900, 1500RPM
Recommended service environment	Temperature	0 ~ +50 °C
	Humidity	0~ 90%RH below
	Altitude	1000 m below
	environment	No corrosive gases or dust. The product shall not come in contact with water and oil.
Dielectric strength	AC1.5KV between ground wires, capable of withstanding voltage for 1 minute	
Protection grade	IP20	
Weight	0.2KG	

4 Wiring

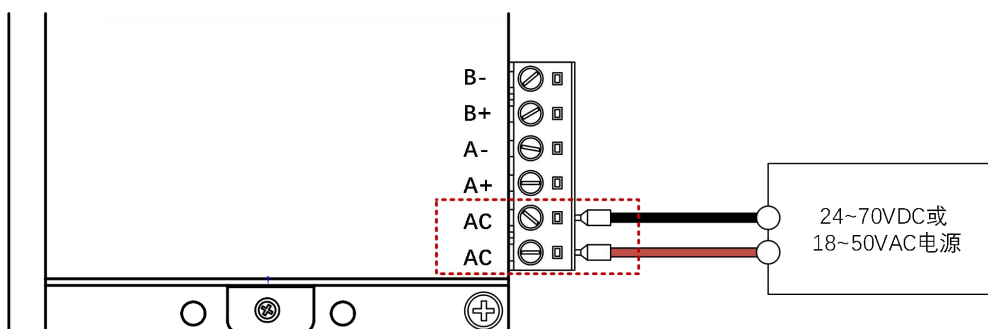
4.1 Wiring diagram



4.2 Power Connection

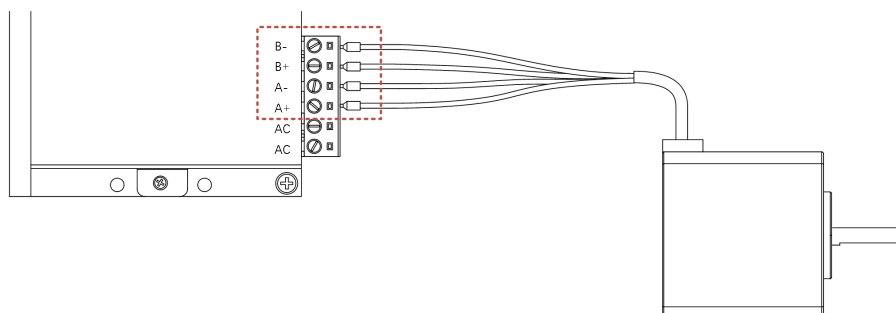
The power supply specification of the driver is 24~70V DC or 18~50V AC. When connecting AC or DC power, you do not need to distinguish between positive and negative poles, and the power cord can be connected to the "AC" interface of the driver.

- Applicable power supply wires: Wires with AWG20 (0.5mm²) above



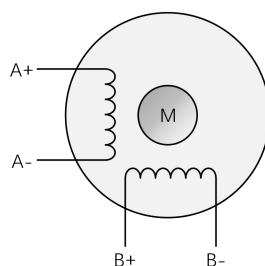
4.3 Motor Connection

The two-phase stepper motor can be divided into three types based on the wiring type: 4-wire system, 6-wire system, and 8-wire system. When connecting the motor, please follow the wiring instructions in the motor specification to connect the motor power wire to the drive motor connection ports A+, A-, B+ and B-.



Connecting the 4-wire motor

When a 4-wire motor is used, you only need to connect the motor lead to the corresponding phase output on the driver one by one.

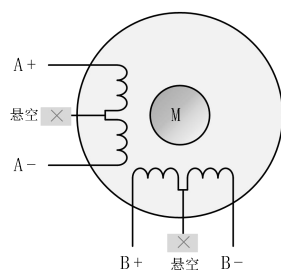


Connecting the 6-wire motor

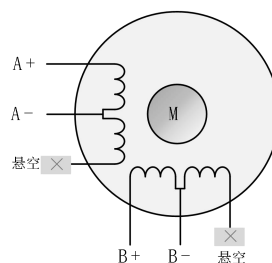
A 6-wire stepper motor is equivalent to adding a center tap at the center of each winding on the winding basis of a 4-wire motor. When a central tap wiring is used, it is called half-wound wiring. On the contrary, it is called full-wound wiring.

The fully wound wiring method is suitable for scenarios where high torque is outputted at a low speed; if the motor needs to run at a high speed, it is recommended to use half-wound wiring.

- Commonly used wiring method: half winding



Full-wound wiring



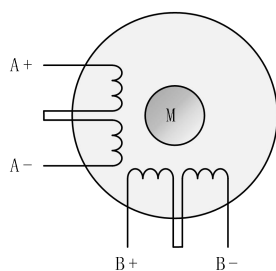
Half-wound wiring

⚠ When the full-wound wiring is used, the motor needs to operate at a current which is lower than the rated current by 30% to avoid overheating

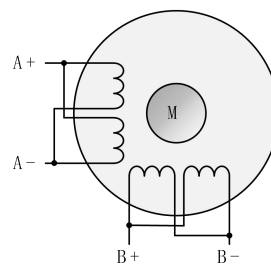
Connecting the 8-wire motor

The 8-wire stepper motor has 4 windings. Connect each two of the windings in series. At this point, the structure is similar to the full-wound wiring of the 6-wire motor, and suitable for scenarios where high torque is outputted at a low speed; when connected in parallel, the motor can achieve high-speed operation while requiring greater current.

- Commonly used wiring method: parallel connection



Series wiring



Parallel wiring

⚠ When the series wiring is used, the motor needs to operate at a current which is lower than the rated current by 50% to avoid overheating

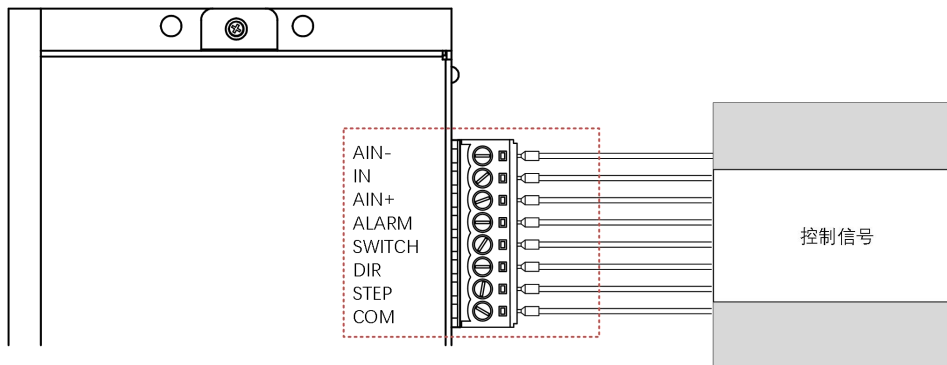


- The motor power wire should not be in the same conduit as the pulse control signal wire. Otherwise it may cause interference and lead to incorrect operation.
- To ensure the normal operation of the motor, please control the distance of the motor power wiring to be within 20 meters.

4.4 Control Signal Connection

Y2SD2H-SA01 has 3 digital input signals, 1 analog input signal, and 1 alarm output signal.

- Applicable wires: Wires with AWG24 (0.2mm²) above

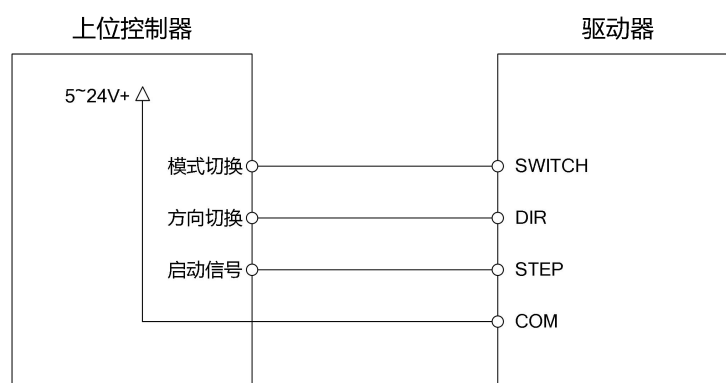


Pin	Definition
AIN-	Analog GND
IN	Analog input
AIN+	Analog 10V output
ALARM	Alarm output
SWITCH	Mode switching signal
DIR	Direction signal
STEP	Starting signal
COM	IO common terminal

4.4.1 Digital input signal connection

IO common end	Definition	When disconnected	When connected
SWITCH	Mode switching signal	Analog speed regulating mode	Constant-speed mode
DIR	Direction signal	Forward	Reverse
STEP	Starting signal	Stop	Start

- NPN type connection method

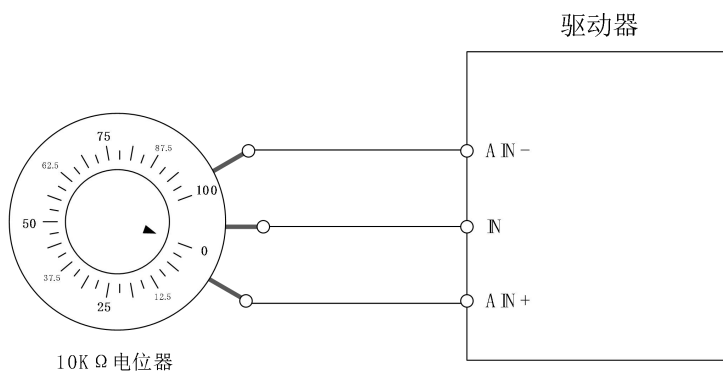


- PNP type connection method

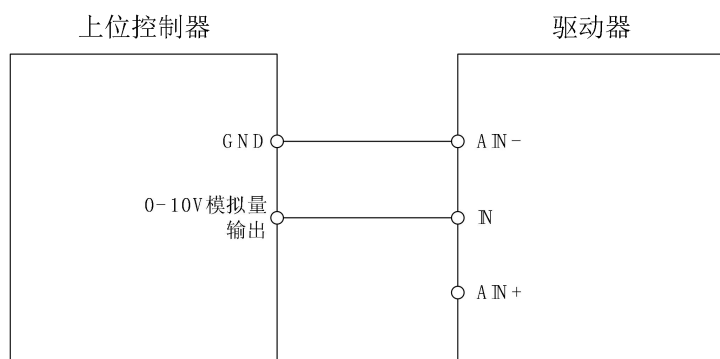


4.4.2 Analog Signal Connection

- Connect the potentiometer
Potentiometer specification: 10K Ω



- Connect the analog signals
⚠ The analog signal range is 0~10V, and if exceeding the range, the driver may be damaged.



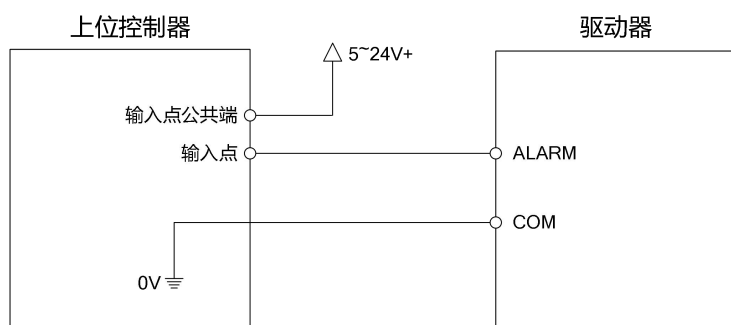
4.4.3 Alarm Output Connection

The alarm output port of Y2SD2H-SA01 is an open-drain output, and the output level depends on the connection of the common terminal "COM"

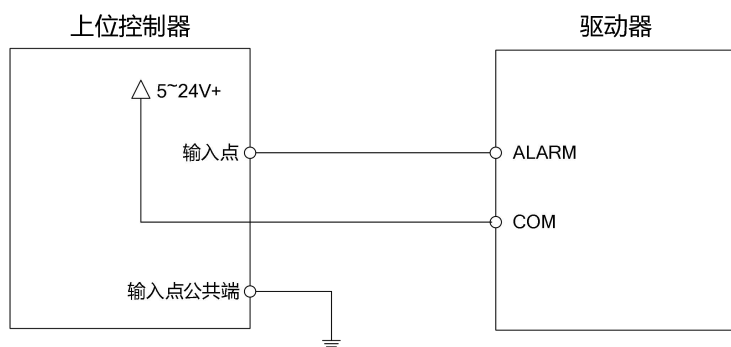
Status of the driver output port during operation:

ALARM	When the drive is normal, it is OFF; when an alarm occurs, it is ON
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- NPN output

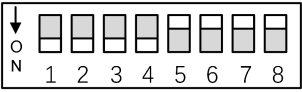


- PNP output



5 Parameter Setting

The dial switches SW1-SW8 on the side of Y2SD2H-SA01 are used to set parameters such as current and speed

							
SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Operating current			Speed in constant-speed mode			Speed in analog mode	

5.1 Operating Current Setting

Y2SD2H-SA01 sets the peak output current through the SW1, SW2, and SW3 dial switches, and users need to set it according to the rated current on the motor specification sheet. (The set current value should be set to be similar to the rated current of the motor.)

Operating current (A)	SW1	SW2	SW3
1.0A	ON	ON	ON
1.5A	OFF	ON	ON
2.0A	ON	OFF	ON
2.5A	OFF	OFF	ON
3.0A	ON	ON	OFF
3.5A	OFF	ON	OFF
4.0A	ON	OFF	OFF
4.5A	OFF	OFF	OFF



- Generally, setting a larger current can increase the torque output of the motor, while also generating greater heat and noise.
- The set current should not exceed 1.5 times the rated current of the motor. Otherwise it may cause the motor to burn out.

5.2 Speed setting in constant-speed mode

When the IO input port "SWITCH"=OFF, the control mode is constant-speed mode, and the motor speed is set by the dial switches SW4, SW5, and SW6, in rpm.

RPM	SW4	SW5	SW6
15	ON	ON	ON
30	OFF	ON	ON
45	ON	OFF	ON
60	OFF	OFF	ON
75	ON	ON	OFF
90	OFF	ON	OFF
105	ON	OFF	OFF
120	OFF	OFF	OFF

5.3 Maximum speed setting in analog mode

When the IO input port "SWITCH"=ON, the control mode is analog speed regulation mode, at this time, the maximum motor speed is the motor speed when analog=10V, set by the dial switches SW7 and SW8, in rpm.

RPM	SW7	SW8
300	ON	ON
600	OFF	ON
900	ON	OFF
1500	OFF	OFF

6 Alarm Code

The driver displays statuses through a combination of flashing green and red LED indicator lights, with the specific meaning as follows:

LED indicator light	Meaning	Resolution
Green light normally on	Motor not enabled	-
Green light flashing	Motor enabled normally	-
4 red lights and 1 green light	Excessively high bus voltage	1. Check whether the supply voltage of the driver is too high; 2. In case of overvoltage during movement, the motor deceleration time can be increased.
4 red LED lights and 2 green LED lights	Excessively low bus voltage	Check whether the supply voltage of the driver is too low;
5 red lights +1 green light	Motor overcurrent	1. Check whether the motor has been damaged; 2. Check whether the set current of the driver is too high;
6 red lights +1 green light	Motor open circuit	1. Check whether the motor wiring is correct; 2. Check whether the motor has been damaged
3 red lights +2 green lights	Internal voltage error	Check whether the power of the switching power supply is sufficient

7 Contact Kaifull



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