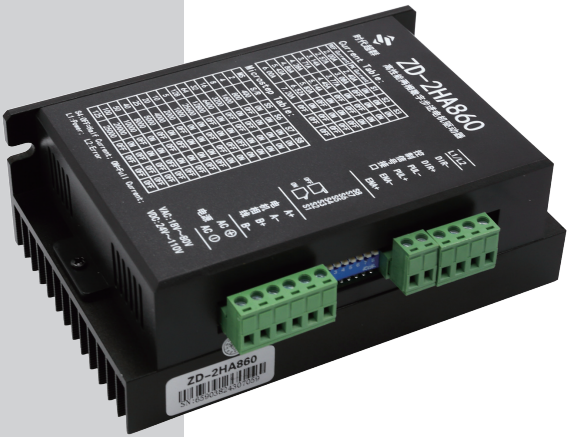
时代超群
Times Brilliant

V1.3

Two-phase AC/DC stepper motor driver

# ZD-2HA860

product manuals




· Read this manual carefully before using this product

· Keep this manual safe for future reference

· The manual images are for reference only. Please refer to the actual product.

# Catalogue



## ! Safety Notes

- This product is a special electrical equipment, which should be installed, debugged, operated and maintained by professional technicians. Improper use will lead to electric shock, fire, explosion and other dangers.
- Do not plug or unplug cables while powered on, and avoid short-circuiting cables during operation, as this may damage the product.
- If the motor needs to change direction during operation, it must first slow down until the motor stops, then change direction and start again. Directly changing direction while the motor is running at high speed will cause damage to the driver.
- The drive is non-sealed. Do not insert screws, metal shavings, or other conductive or flammable materials into it. Protect it from moisture and dust during storage and use.
- The drive is a power device, so keep the working environment ventilated and cool.

## Features and Functions

- The interface adopts ultra-high speed optocoupler isolation
- Strong resistance to high-frequency interference
- Switch between 16 different subcategories
- automatic half flow lock
- 8 current levels adjustable
- Supports offline, enable, and lock features
- overvoltage, undervoltage, overcurrent protection

## Going

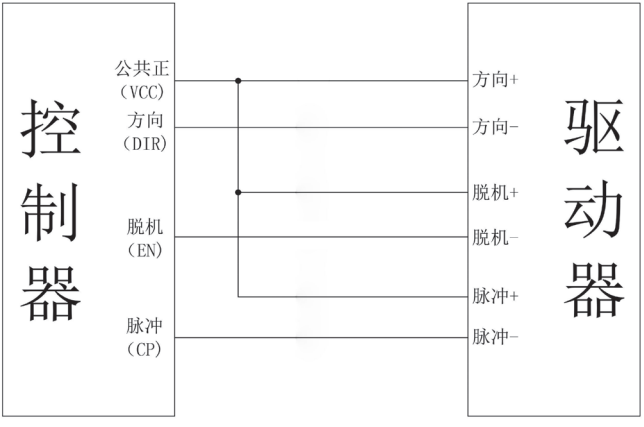
| Project | | Minimum | Specified | Maximum | Unit |
|---|---|---|---|---|---|
| Ambient temperature | | -30 | - | 80 | ℃ |
| Storage temperature | | -55 | - | 150 | V |
| Input voltage (DC) | | 24 | 100 | 110 | V |
| Input voltage (AC) | | 24 | 72 | 80 | V |
| Peak anode current | | 2.4 | - | 7.2 | A |
| Control interface voltage | H | 23 | 24 | 24.5 | V |
| | L | 0 | 0 | 0.5 | V |

# Interface Definition

| Name | Definition | Direction for use |
|---|---|---|
| A+ | A-phase coil | A-phase coil |
| A− | | |
| B+ | | B-phase coil |
| B− | | |
| DIR+ | Direction control terminal | The motor's starting direction is determined by its wiring. Reversing any phase winding (e.g., swapping A+ and A-) can change the motor's initial direction. The DIR operates at 5-24V for high level and 0-0.5V for low level. |
| DIR− | | |
| ENA+ | Off-line control terminal | This input signal enables or disables the function. ENA+ ranges from +5V to 24V, while ENA-is set to low level. |
| ENA− | | |
| PUL− | Pulse input terminal | The rising edge of the pulse is valid. The high level of PUL is 5-24V and the low level is 0-0.5V. |
| PUL+ | | |

## Wiring Method

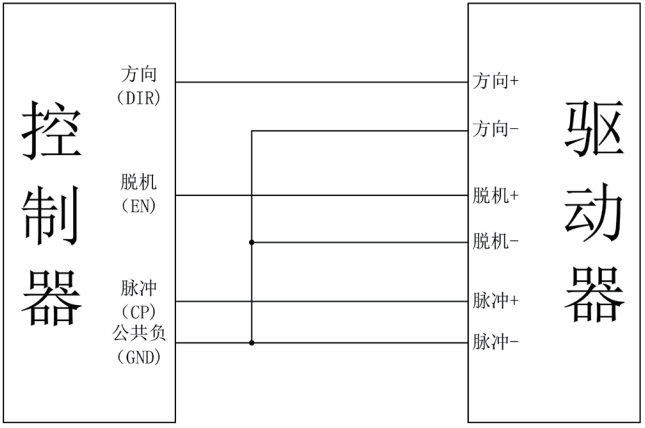
Common Anode Connection




Note: VCC is a common +5V to 24V power supply.

| Control method | |
|---|---|
| Impulse - | Operates with pulses, active on high level; locks the motor and automatically enters half flow when no pulses are present. |
| Direction - | Forward when the input is high or floating; reverse when the input is low. |
| Off-line - | Operates normally with high-level input or floating; offline at low level |

## Common Cathode Connection




Note: VCC is a common +5V to 24V power supply.

| Control method | |
|---|---|
| Impulse + | Operates with pulses, active on low level; locks the motor and automatically enters half flow when no pulses are present. |
| Direction + | Forward when the input is low or floating; reverse when the input is high. |
| Off-line + | Operates normally with low-level input or floating; off when high. |

## Current, subdivision settings

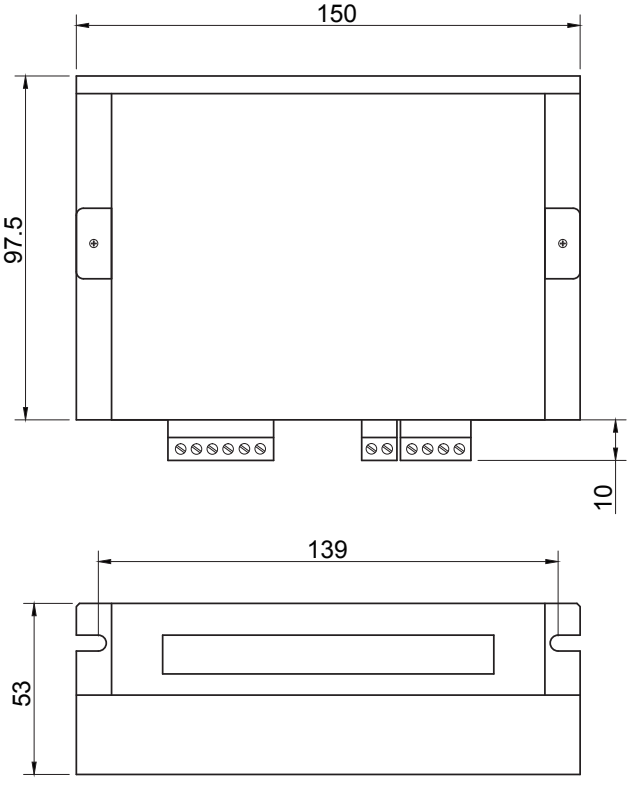
| Pulse/rev | SW5 | SW6 | SW7 | SW8 |
|---|---|---|---|---|
| 400 | ON | ON | ON | ON |
| 800 | OFF | ON | ON | ON |
| 1600 | ON | OFF | ON | ON |
| 3200 | OFF | OFF | ON | ON |
| 6400 | ON | ON | OFF | ON |
| 12800 | OFF | ON | OFF | ON |
| 25600 | ON | OFF | OFF | ON |
| 1000 | ON | ON | ON | OFF |
| 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 |

Note: Pulse/rev refers to the number of pulses required per revolution of the motor.

| REF Current | PK Current | SW1 | SW2 | SW3 |
|---|---|---|---|---|
| 2.00A | 2.40A | ON | ON | ON |
| 2.57A | 3.08A | OFF | ON | ON |
| 3.14A | 3.77A | ON | OFF | ON |
| 3.71A | 4.45A | OFF | OFF | ON |
| 4.28A | 5.14A | ON | ON | OFF |
| 4.86A | 5.83A | OFF | ON | OFF |
| 5.43A | 6.52A | ON | OFF | OFF |
| 6.00A | 6.52A | OFF | OFF | OFF |

Note: Set the current as low as possible while ensuring sufficient torque.

# Product dimensions



# FAQ

1. Q: How can I get started with this stepper motor quickly?

Answer: After properly connecting the power supply and motor, connect only the pulse signal (set the frequency below 1K), set the subdivision to 16, and enable direction and offline suspension. The motor will default to forward rotation when powered on. Once operation is confirmed to be correct, sequentially test acceleration (increase frequency), direction, subdivision, and offline functions.

2. Q: What are the effects of reversed power supply?

Answer: The drive may be burned out.

3. Q: When the control signal exceeds 5V, is it necessary to add a series resistor?

Answer: No, this drive supports +5V to 24V.

4. Q: Is it normal for the drive's casing to get hot after prolonged operation?

Answer: Under normal conditions, the casing reaching 90 degrees Celsius at room temperature won't affect performance.

5. Q: The power indicator light is on after connecting the wires, but the motor doesn't rotate. What could be the reason?

Answer: If the wiring is correct but the device still doesn't rotate, this indicates insufficient drive capability in the control unit. This typically occurs when using a microcontroller's IO port for direct control. Ensure the control interface has 5mA drive capability.

6. Q: How to identify the four-wire configuration of a stepper motor?

Answer: Connect any two wires of the motor. If twisting the motor by hand creates resistance, these two wires are the same phase and can be connected to the driver's A+ and A-. If short-circuiting the other two wires still creates resistance, connect them to B+ and B-.

7. Q: Can I add some features or develop new products for this drive?

Answer: Yes, please contact our company.

## Warranty Regulations

This product offers a free warranty for up to 24 months and 2 years of cost-reimbursement repair thereafter. The details are as follows:

- No returns or exchanges within 7 days without valid reason — the product must be in its original condition with no signs of use.
- Free replacement of major components (except the housing) within six months — from the date of purchase or three months after the date of manufacture, whichever is later, as indicated on the warranty label.
- Free repairs for two years — from the date of purchase or three months after the factory date (as specified in the warranty document).
- You can get cost-reimbursement repairs for up to two years after the free warranty period ends.

The above warranty shall not apply under any of the following circumstances:

- Failure to follow the "Safety Precautions" or "Product Operating Conditions" during use, resulting in product damage;
- The warranty is void if the fragile label is damaged or if there are signs of disassembly.
- Product damage caused by irresistible factors such as lightning, earthquake, tsunami, or war;
- Other human-caused damage.

# Time-Superior Series Products

## motor control

### Stepper motor system

The motor diameter of two-phase / three-phase stepping motor is 20 ～ 130mm.

Motor torque: 0.02 ～ 50Nm

Operating voltage of two-phase / three-phase stepper driver:

0 Output current: 0 to 8A for 80VDC and 100 to 220VAC

Division method: Full step to 256 subdivisions, digitally driven control mode

Closed-loop control method for stepper motor drive

### Step controller

1 ~ 6-axis intelligent programmable controller

### Brushless motor system

Brushless electric machine

Motor outer diameter: 42 ～ 110mm

Power: 10 to 1200W

Speed: 1000 ～ 7000rpm

### Brushless drive

Operating voltage: 9 to 60VDC, 100 to 220VAC

### AC servo system

Motor outer diameter: 40 ～ 180mm

Power: 50W to 10KW

Speed: 1000 to 3000rpm

Torque: 0.16 ～ 50Nm

Operating voltage: 24-80VDC, 100-220VAC, 380VAC

## mechanical drive

Reduction gearboxes (precision planetary reducers, gear reducers, worm gear reducers)

Coupling (elastic coupling, plum blossom coupling)

Guide rail slide table (including linear guide rails, ball screw linear guide rails, T-type screw linear guide rails, and precision synchronous belt guide rails), along with linear stepper motors

Motor outer diameter: 20 ～ 60mm

The lead of screw is 1～36mm (T type) and 4～20mm (ball type).

## Switching Mode Power Supply

Taiwan Mingwei's complete series of switching power supplies

Beijing Times Super Group Electric Appliance Technology Co., Ltd.

Address: No.8, Industrial Base, No.58 Liangguan Street, Liangxiang Town, Fangshan District, Beijing, China

Zip code: 102401

Tel: 010-53040777/88/99

Fax: 010-53040766

Web site:http://www.sdcq-micromotor.com