MB450A Two-phase hybrid stepping motor driver

Overview

MB450A-type sub-type of two-phase hybrid stepping motor driver, DC power supply for drive voltage 18V ~ 50V, current is less than 4.2A 42 ~ 86 mm diameter two-phase hybrid stepping motor. This drive by AC servo drive current loop subdivision control, the motor torque ripple is small, low-speed smooth running, low vibration and noise. High speed, relatively high output torque, high precision positioning. Widely used in engraving machines, CNC machine tools, packaging machinery, transmission equipment and other devices that require a higher resolution.

Features

1 Average current control, two-phase sinusoidal output current drive
2 DC 18 ~ 50V power supply
3 Opto-isolated input / output
4 Overvoltage, undervoltage, overcurrent, short circuit protection phase
5 Subdivision sixteen files and automatic half current function
6 Eight stalls set the output phase current
7 With offline capabilities
8 High speed start
9 High-speed torque

Electrical parameters

Input Voltage	DC18～50V Input
Input current	＜4A
Output Current	1.0A～4.2A
Power	Power：80W； Internal Insurance：6A
Temperature	Operating：-10～45℃；Storage：-40℃～70℃
Humidity	Not condensation, water droplets can not have
Gas	Prohibition of combustible gases and conductive dust
Weight	200G

Control signal interface

Figure 1 is a wiring diagram drive

1 The control signal definitions

PLS+: Positive Input pulse signal

PLS-: Negative pulse signal input

DIR+: Positive signal input terminal step directions

DIR-: Negative signal input step directions

ENA+: offline enabling the reset signal input is terminal

ENA-: offline enabling the reset signal input negative terminal

Offline enable signal is active reset drive failure, and no effective pulse, the output power of the drive components is closed, no motor to maintain torque.

2 The control signals connections

PC active high control signal can also be active low. When active high, the control signal to the negative side of all connected together as a signal, the low effective, all control signals are connected together as a signal common. Now and PNP open collector output, for example, interface circuit diagram is as follows:

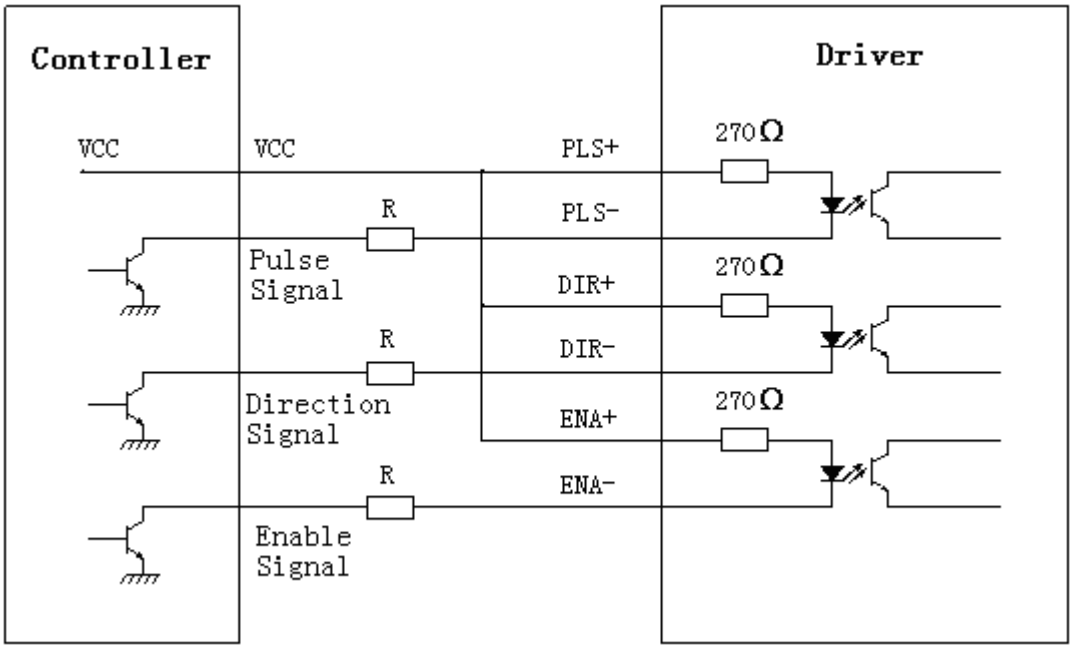


Figure 1. input interface circuit (common anode connection)

Open collector output controller

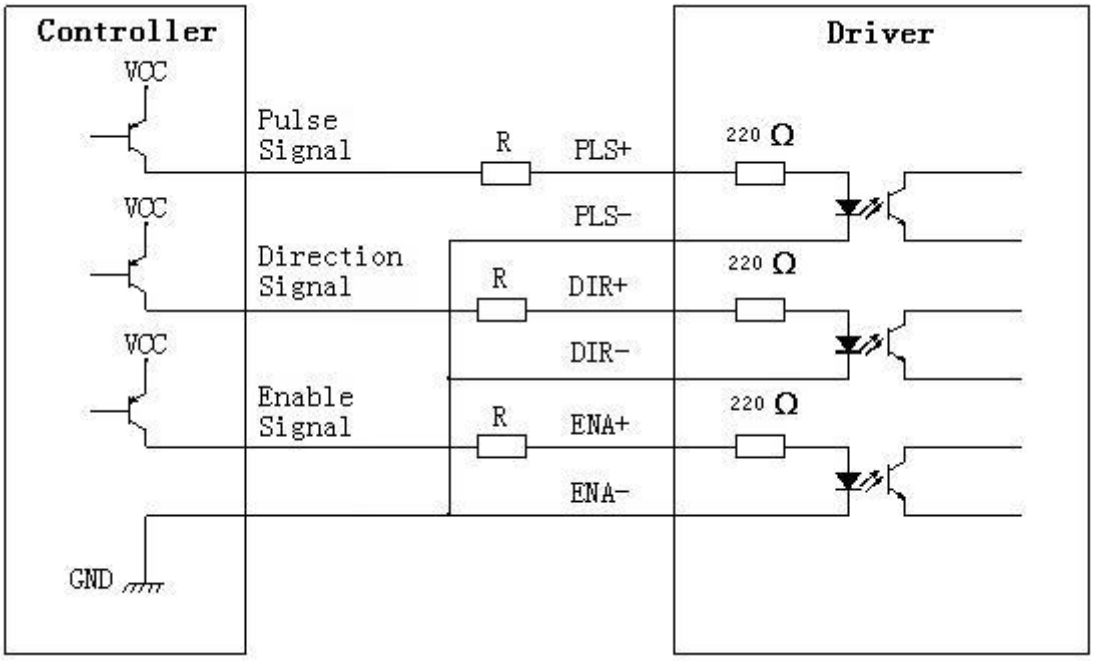


Figure 2. input interface circuit (common cathode connection)

Controller PNP output

Note: VCC is 5V, R shorted;

VCC is 12V, R is 1K, more than 1/8W resistance;

VCC is 24V, R for the 2K, more than 1/8W resistor;

☒R must be connected to the controller terminals.

Function selection (With the drive to achieve on the panel DIP switch, see Figure 1)

1, set the number of motor steps per revolution

Drives the motor, respectively, the number of steps per revolution is set to 200, 400, 500, 800, 1000, 1250, 1600, 2000, 2500, 3200, 4000, 5000, 6400, 8000, 10000, 12800, 25600 step. You can drive through the front panel DIP switch SW5, SW6, SW7, SW8 bit to set the drive number of steps (Table 1):

SW5	off	on	off	on	off	on	off	on	off	on	off	on	off	on	off
SW6	on	off	off	on	on	off	off	on	on	off	off	on	on	off	off

SW7	on	on	on	off	off	off	off	on	on	on	on	off	off	off	off
SW8	on	on	on	on	on	on	on	off	off	off	off	off	off	off	off
Pulse /rev	400	800	1600	3200	6400	12800	25600	1000	2000	4000	5000	8000	10000	20000	25000

Table 1

2, control mode

DIP switches SW4-bit control can be set into two:

Set to "OFF" when, as a semi-streaming capabilities.

Set to "ON" when, for no half-streaming capabilities.

3, set the output phase current

The different torque to drive the stepper motor, the user can drive the panel DIP switch SW1, SW2, SW3 bit to set the drive's output phase current (RMS) per ampere, the switch position corresponds to the output current, different models Drive output current corresponding to different values. Detailed in Table 2.

Output Current (A)				
SW1	SW2	SW3	PEAK	RMS
on	on	on	1.00	0.71
off	on	on	1.46	1.04
on	off	on	1.91	1.36
off	off	on	2.37	1.69
on	on	off	2.84	2.03
off	on	off	3.31	2.36
on	off	off	3.76	2.69
off	off	off	4.20	3.00

Table 2

4, the semi-flow function

Semi-flow function is non-500ms after the step pulse, the driver output current automatically reduced to 70% of rated output current, is used to prevent motor heat.

Power Interface

1, AC1, AC2, PE: connect the drive power

220VAC input power supply voltage is the maximum current is 5A. Power line cross-section ≥ 1.5 square mm, as short as possible. Driver side and AC2 AC1 termination power supply, while external to series with a 6A fuse. PE ground terminal.

2, A + A-B + B-: to link the two-phase hybrid stepping motor

Drive and two-phase hybrid stepping motor connected by four-wire system, the motor windings in parallel and series connection, and connection method, high-speed performance, but the drive current (the motor winding current 1.73 times), the series connection When the drive current is equal to the motor winding current.

Note: If the power supply without isolation transformer, the need to drive PE ground terminal and the motor reliable grounding.

Installation

To have 20mm of space around, can not be placed next to other heating devices, to avoid dust, oil mist, corrosive gas, humidity, vibration is too large and strong places.

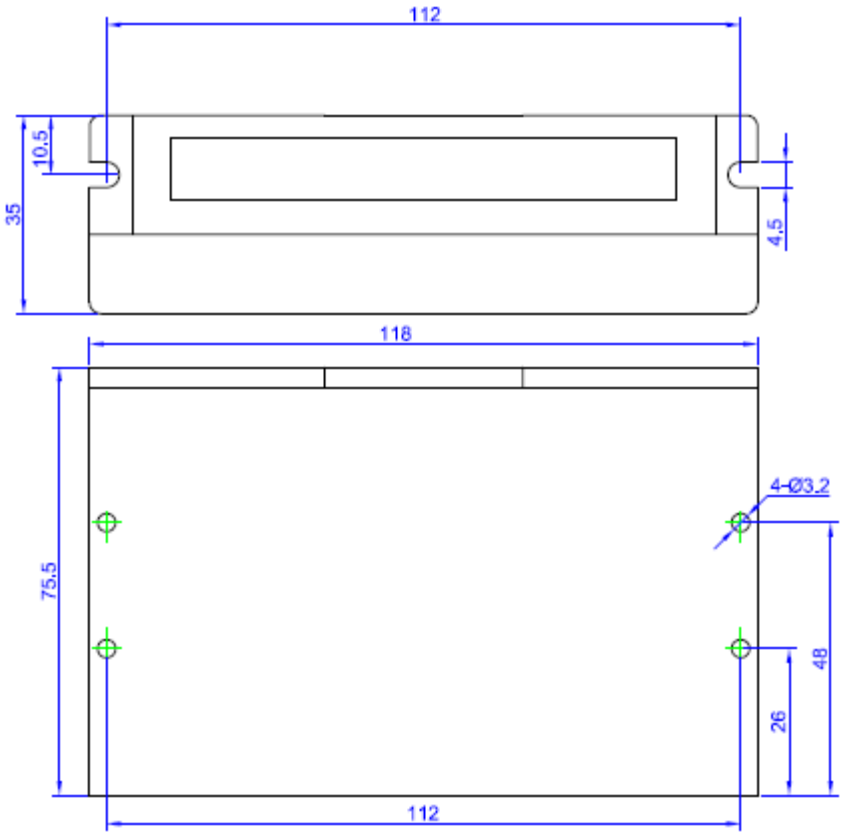


Figure 3

Troubles and its shotting ways

1, the status lights indicate

RUN: green, normal work light.

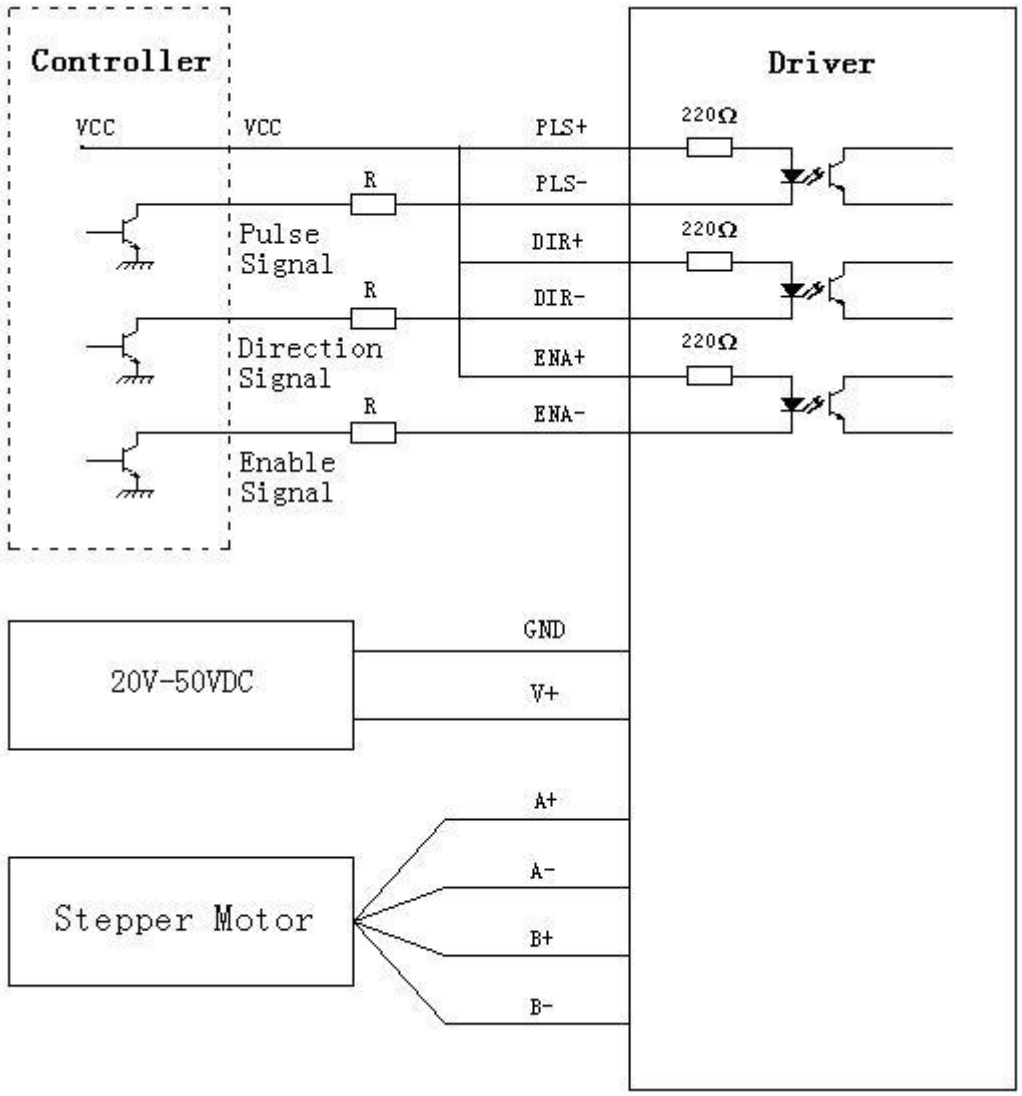
ERR: red, light failure, the motor phase short circuit, overvoltage and undervoltage, drive over temperature (heat sink temperature exceeds 75 degrees.)

2, Troubles

Failure	Reason	Solutions
LED off	Pick the wrong power supply	Check the power connection connection
	Low supply voltage	Improve the power supply voltage
Motor does not turn, and not to keep the torque	Electrical connections not	Correct motor connections
	RESET signal to enable the effective offline	The RESET is not valid
Motor does not turn, but maintain the torque	No pulse signal input	Adjust the pulse width and signal level
The direction of motor rotation error	Pick the wrong phase sequence power lines	Swap any two connected lines
	Right direction signal input	Change the direction set
Motor torque is too small	Too small relative to current setting	Phase current is set correctly
	Acceleration too fast	Reduce the acceleration
	Motor stall	Ruled out mechanical failure
	Does not match with the motor drive	For a suitable driver

Drive wiring

A complete stepper motor control system with stepper drives, DC power supply and controller (pulse source). The following is a typical system wiring diagram:


Controller
Driver
VCC
VCC
PLS+
PLS-
DIR+
DIR-
ENA+
ENA-
220Ω
220Ω
220Ω
R
R
R
Pulse
Signal
Direction
Signal
Enable
Signal
20V-50VDC
GND
V+
Stepper Motor
A+
A-
B+
B-