# DM420 Two-phase Stepper Motor Driver

## Overview

DM420 two-phase hybrid stepper motor drives, DC 12 ~ 36V power supply for the drive voltage 24V ~ 36V, current is less than2.0A,and the outer diameter of 42 to 57 mm . This drive uses all-digital current loop subdivision control, small torque ripple of the motor, smooth running at low speed, low vibration and noise. When a high-speed can output relatively high torque, high positioning accuracy. Widely used in engraving machines, CNC machine tools, packaging machinery, transmission equipment and other requirements of the higher resolution devices.

Electrical parameters

| | |
|---|---|
| Input voltage | 12-40v input(Peak) |
| Input current | less than 2A |
| Outout current | 0.44A～2.83A(PEAK) |
| Power | 40W |
| Temperature | Working temperature:-10~45℃;Storage temperature:-40~70℃ |
| Wet | No condensation and water droplets |
| Gas | Prohibit combustible gases and conductive dust |
| Weight | 70g |

## Control signal interface

Figure 1 is a schematic wiring drive

1, the control signal definition

PUL: pulse signal input terminal

DIR: stepping direction signal input

+5 V: signal input terminal of the sun

ENBL: Offline enable signal input

Offline enable signal is reset when a valid drive failure, prohibit any valid pulse, the output power of the drive element is closed, no motor holding torque.

2, the control signals connection

PC control signal can be active high, you can also active low. When active high, put all the negative terminal of the control signal as the signal ground together, when active low, put all the positive terminal of the control signals together as a signal common terminal. Now give an example of open collector output and PNP , the interface circuit diagram is as follows:

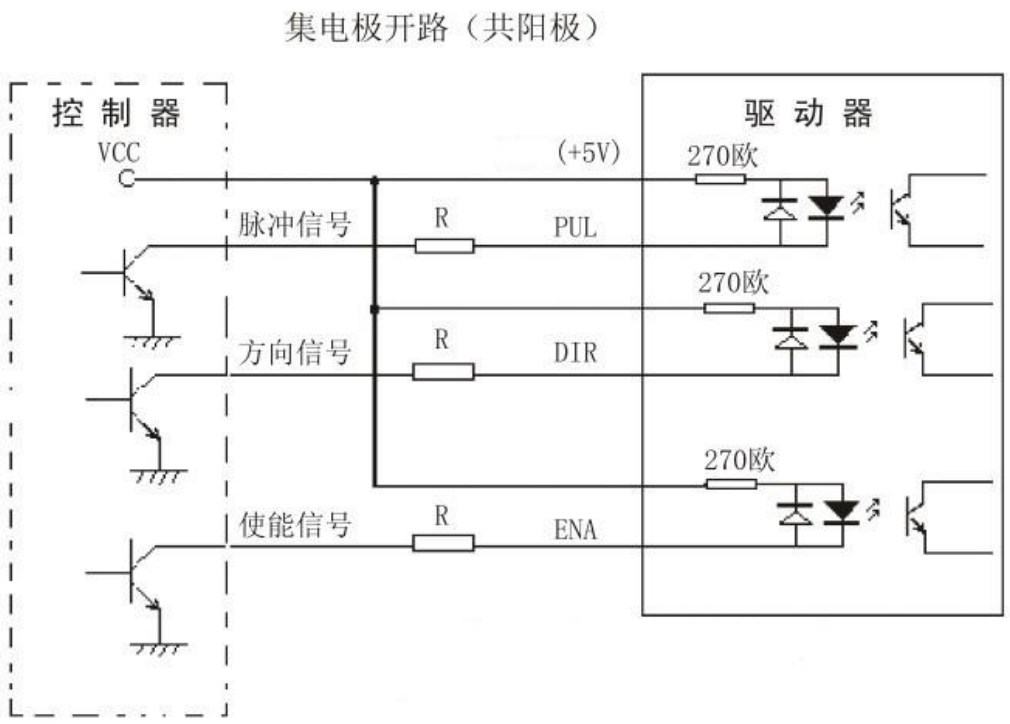



Figure 1. Input interface circuit (common anode connection)
Controller Open collector output

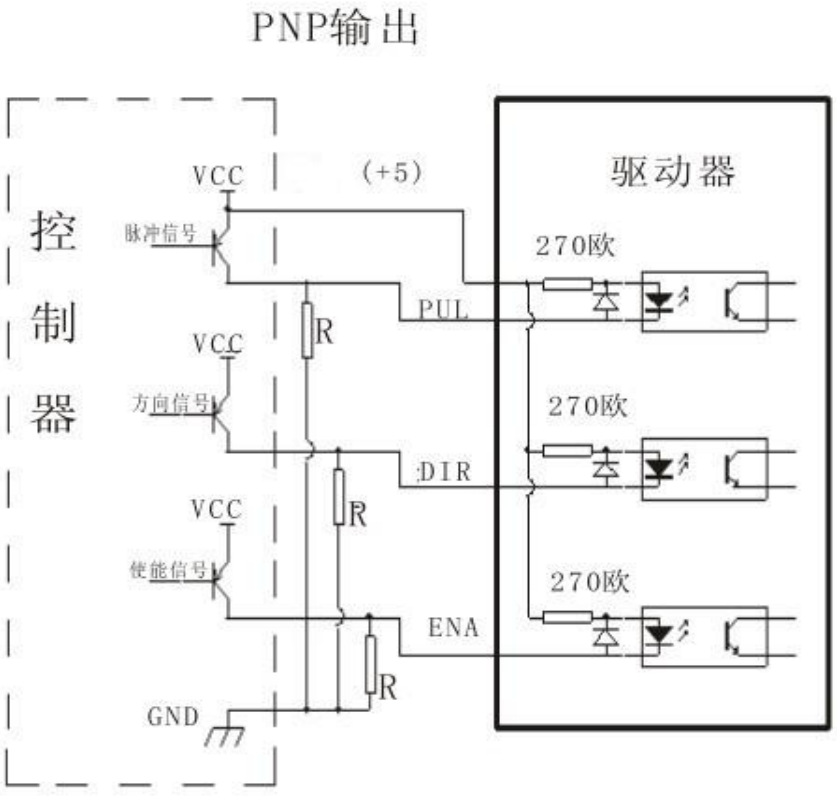


Figure 2. Input interface circuit (common cathode connection)
Controller PNP output

Note: VCC is 5V, R is short;
VCC is 12V, R is 1K, 1/8W greater resistance;
VCC is 24V, R is 2K, more than 1/8W resistor
R must be connected to the controller signals

## Functions (implemented by DIP switches on the drive panel)

1, set the number of steps per motor revolution

Drive motor may be a few steps per revolution are set to 200,400,800,1600,3200,6400,12800,25600 step. Users can drive through the front panel DIP switch SW5, SW6, SW7 bit to set the drive number (Pulse / rev) as shown in Table 1 step:

| SW5condition | ON | OFF | ON | OFF | ON | OFF | ON | OFF |
|---|---|---|---|---|---|---|---|---|
| SW6condition | ON | ON | OFF | OFF | ON | ON | OFF | OFF |
| SW7condition | ON | ON | ON | ON | OFF | OFF | OFF | OFF |
| Pulse/rev | 200 | 400 | 800 | 1600 | 3200 | 6400 | 12800 | 25600 |
| Micro | 1 | 2 | 4 | 8 | 16 | 32 | 64 | 128 |

Table 1

2, the control mode selection

DIP switch SW4 bit can be set to two control modes:

When set to "OFF", the semi-streaming capabilities to none.

When set to "ON", in order to have a semi-streaming capabilities.

Semi-flow function means no step pulse 500ms, the driver output current is automatically reduced to 70% of rated output current is used to prevent motor heat.

3, set the output phase current

In order to drive different torque stepper motors, the user can switch SW1 on the drive panel, SW2, SW3 bit to set the drive's output phase current (RMS) amperes, each switch position corresponding output current, different models drive different values of the corresponding output current. Detailed in Table 2.

| SW1 | SW2 | SW3 | PEAK | RMS |
|---|---|---|---|---|
| ON | ON | ON | 0.44 A | 0.31 A |
| OFF | ON | ON | 0.62 A | 0.44 A |
| ON | OFF | ON | 0.74 A | 0.52 A |
| OFF | OFF | ON | 0.86 A | 0.61 A |
| ON | ON | OFF | 1.46 A | 1.03 A |

| | | | | |
|---|---|---|---|---|
| OFF | ON | OFF | 1.69 A | 1.20 A |
| ON | OFF | OFF | 2.14 A | 1.51 A |
| OFF | OFF | OFF | 2.83 A | 2.00 A |

Table2

## Power Interface

1, DC +, DC-: drive power connector

DC +: positive level DC power supply voltage DC 12 ~ 36V. The maximum current is 2A.

DC-: negative DC power level.

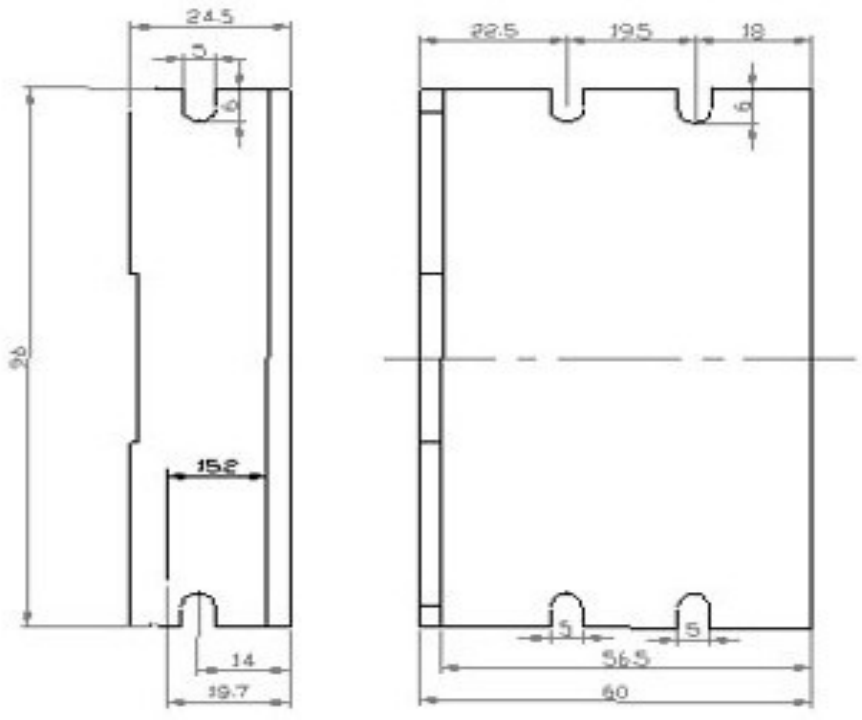
2, A + A-B + B-: connect the two-phase hybrid stepping motor

Connect the drive and two-phase hybrid stepping motors using four-wire system, the motor windings in parallel and series connection, parallel connection, high-speed performance, but the drive current is large (1.73 times the motor winding current),

When connected in series with the drive current is equal to the motor winding currents.

## Installation

Have 20mm of space around, can not be placed next to other heating equipment, to avoid dust, oil mist, corrosive gas, too much humidity and strong vibration. +




## Trouble shooting

1、Status lights indicate

PWR: green light, work light.

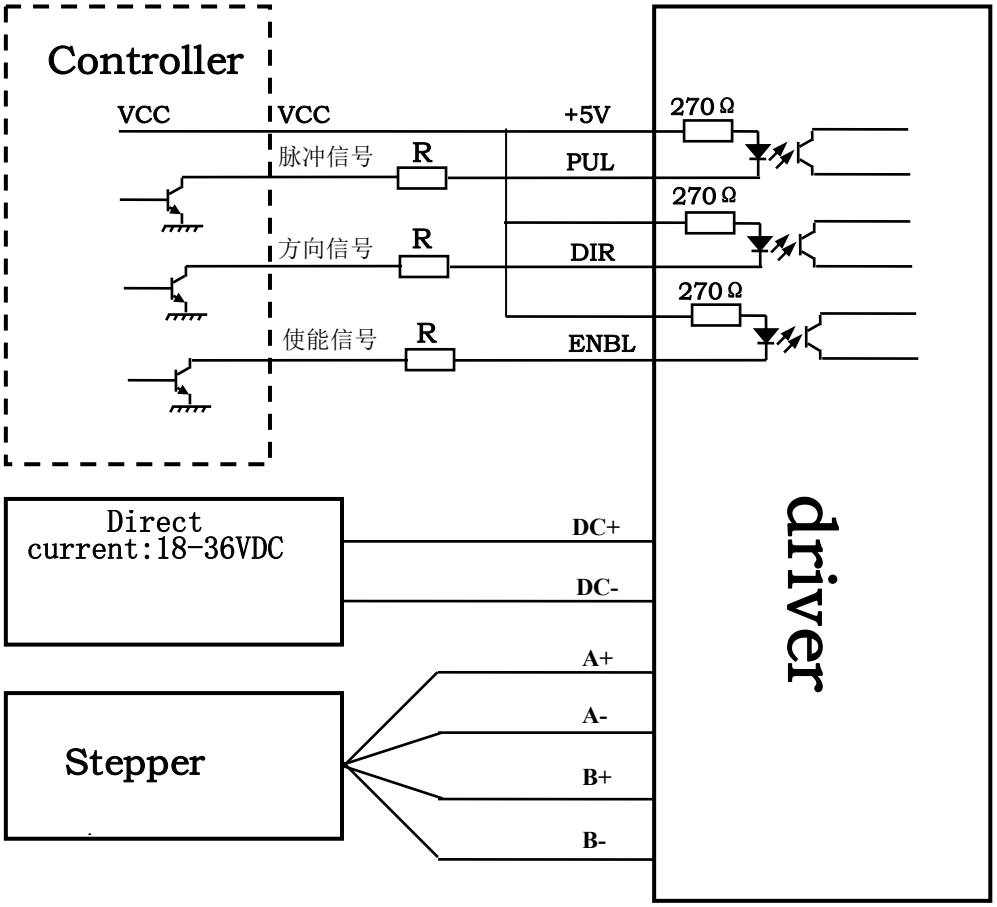
PWR: When out the lights, the fault is off, the motor phase short circuit, overvoltage and under voltage protection.

2、Trouble and Eliminate

| Trouble | Reason | Solution |
|---|---|---|
| LED is not lit | Pick the wrong power | Check the power connection |
| | Low power supply voltage | Improve the supply voltage |
| Motor does not turn, and no holding torque | Wrong motor connection | Correct motor connections |
| | Offline enable RESET signal is active | Make RESET invalid |
| Motor does not turn, but holding torque | No pulse signal input | Pulse width and level adjustment signal |
| Motor rotates in the wrong direction | Power line phase sequence is wrong | Swap any two connected lines |
| | Wrong direction signal input | Change direction setting |
| Motor torque is too small | Phase current is too small | set Phase current correctly |
| | Too fast acceleration | Reduce the acceleration values |
| | Motor stall | Ruled out mechanical failure |
| | The drive does not match the motor | Change the appropriate drive |

## Drive wiring

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


Controller
VCC
VCC
脉冲信号
R
方向信号
R
使能信号
R
+5V
PUL
DIR
ENBL
270Ω
270Ω
270Ω
Direct
current:18-36VDC
DC+
DC-
Stepper
A+
A-
B+
B-
driver