DM542 2 phase stepper motor driver specification

1.Oerview

DM542 motor driver, powered by AC 18V～50V and suits for 2 phase hybrid stepper motor with driving voltage 24～50V, less than 4.2A current and 42~86mm outside diameter. The subdividing driver adopts ac servo motor driver current close loop control and motor torque fluctuation is small, running very smoothly with low speed , little vibration and noise. When high speed torque is much higher than other two phase drive, high positioning accuracy. Widely used in engraving machine, CNC machine tools, packaging machinery and other resolution demanding devices.

Product Features

1. average current and support controlled and half-current function supported.
2. powered by DC 18~50V
3. Opto-isolation signal input/output
4. have over-voltage, under-voltage, over-current and inter-phase short circuit protected circuit.
5. 16 segment subdivision and half automatic flow function
6.8 different kind of output phase current can be set.
7.have an Off-line command terminal
8.the torque of motor is related to its rotating speed, but not related to steps per revolution
9.offer high starting speed the motor needs
10.offer high torque when the motor rotating at a high speed.

Electrical Parameter

Input Voltage	DC 24~50V input
Input Current	Less than 4 A
Output current	1.0A～4.2A
Power Dissipation	80W; Internal Insurance:6A
Temperature	Working temperature-10~45℃; Storage temparature-40~70℃
Humidity	No dew, no water
Gas	prohibited to have combustible gas and conductive dust
Weight	200g

ATTENTION: Please set the DIP switch before the motor driver on the power. lease set the DIP switch before the motor driver on the power.

Control Signal Port

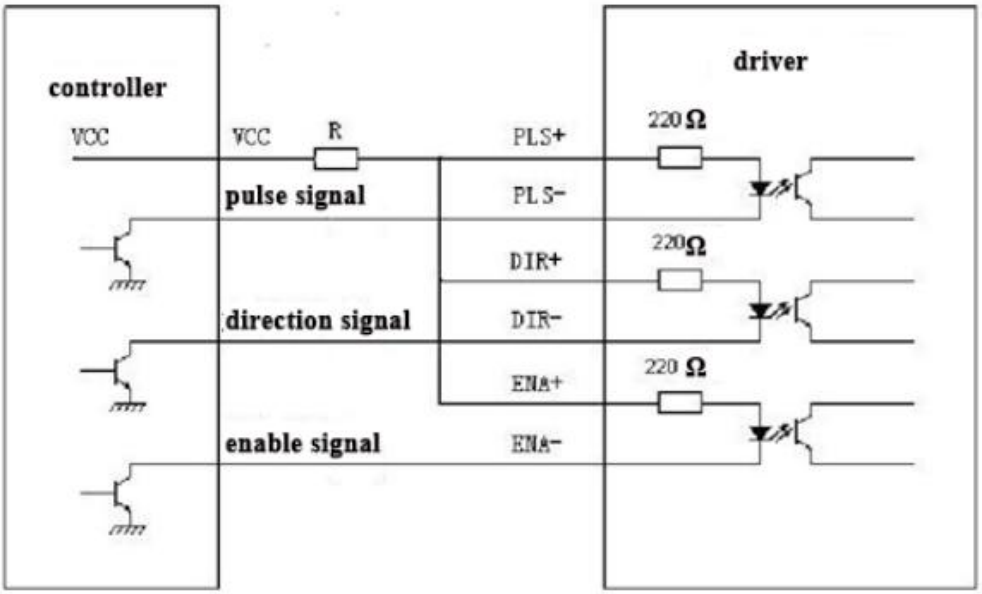
Picture 1 is definition of control signal port

1. Definition of control signal

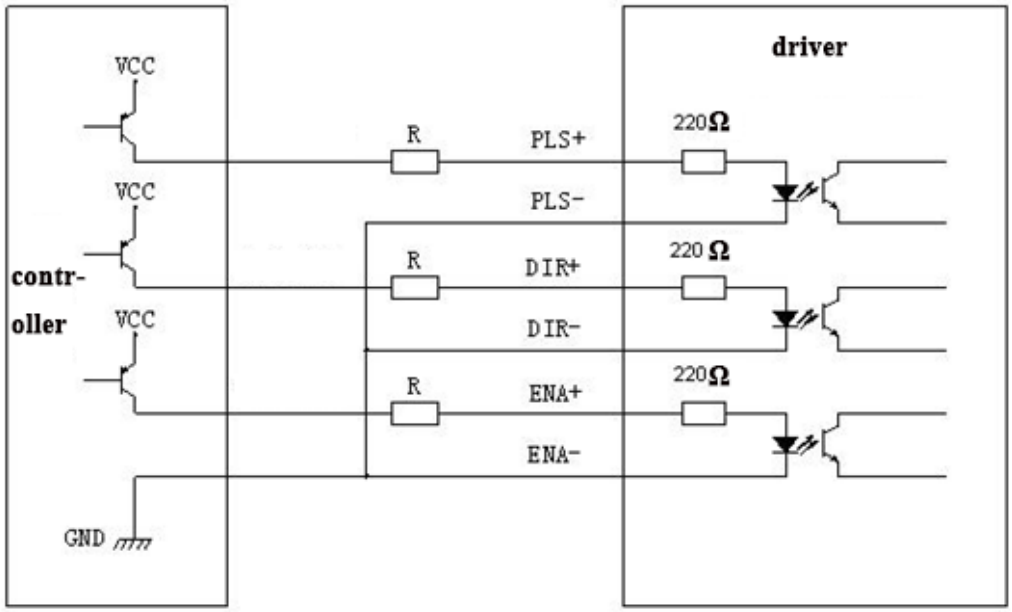
PLS+: Positive terminal of step pulse signal input or positive terminal of forward step pulse
PLS-: Negative terminal of step pulse signal input or negative terminal of forward step pulse
DIR+: Positive terminal of step pulse signal input or positive terminal of reverse step pulse signal
DIR-: Negative terminal of step pulse signal input or positive terminal of reverse step pulse signal
ENA+: Positive terminal of offline reset signal
ENA-: Negative terminal of offline reset signal
when the off-line signal is effective, driver malfunction can be reset. any effective pulse is disabled, The power components for output is shut down, the motor has no holding torque.

Connection of Controlling Signal

As the figure below shows, the pulse signal from the controller can be effective at high level or low level.
When effective at high level, link all the negative side of control signals together to the earth; when effective at low level, link all the positive side of control signals together to the earth.



P1: Input interface circuit(Co-anode connection)
Controller collector open-drain output



P2: Input interface circuit(Co-anode connection)
Controller collector open0drain output

Attention: when VCC is 5V, the resistor R is short circuited.
when VCC is 12V,the resistance value of R is 1K and its power is above 1/8W.
when VCC is 24V, the resistance value of R is 2K and its power is above 1/8W.
The resistance R must be connected to the signal side of the controller.

Function Selection

Pulse count per revolution

Pulse counts per revolution can be set to 400, 800, 1000, 1600, 2000, 3200, 5000, 6400, 10000, 12800, 25000, 25600, 50000 and 51200 by using the DIP Switch (SW5 TO SW8)of motor driver.

SW5	on	off	on	off	on	off	on	off	on	off	on	off	on	off
SW6	on	on	off	off	on	on	off	off	on	on	off	off	on	on
SW7	on	on	on	on	off	off	off	off	on	on	on	on	off	off
SW8	on	on	on	on	on	on	on	on	off	off	off	off	off	off
Pulse/rev	400	800	1600	3200	6400	12800	25600	51200	1000	2000	5000	10000	25000	50000

Selection for Control Way

The DIP SW4 canbe set ON/OFF to decide whether there is half-current function or not.
When the DIP SW4 is set off , there is half current function.
When the DIP is set off, there is no half current function.

Setting output phase current

In order to drive stepper motors of different torque, the value of output phase current (effective value) could be set by turning on/off the DIP switch 1,2 and 3 on the control panel.

Details below:

Output Current (A)				
SW1	SW2	SW3	PEAK	RMS
on	on	on	2.8	2.0
off	on	on	3.5	2.5
on	off	on	4.2	3.0
off	off	on	4.9	3.5
on	on	off	5.7	4.0
off	on	off	6.4	4.6
on	off	off	7.0	5.0
off	off	off	7.8	5.6

Attention: please test the motor driver based on the peak current value.

Half current function

Half current function means that if there is no step pulse within 500 ms, the output current of motor driver decreases automatically to 70% of its rated output current in order to prevent the motor heating.

Power Port

+V、GND: Connecting the driver power

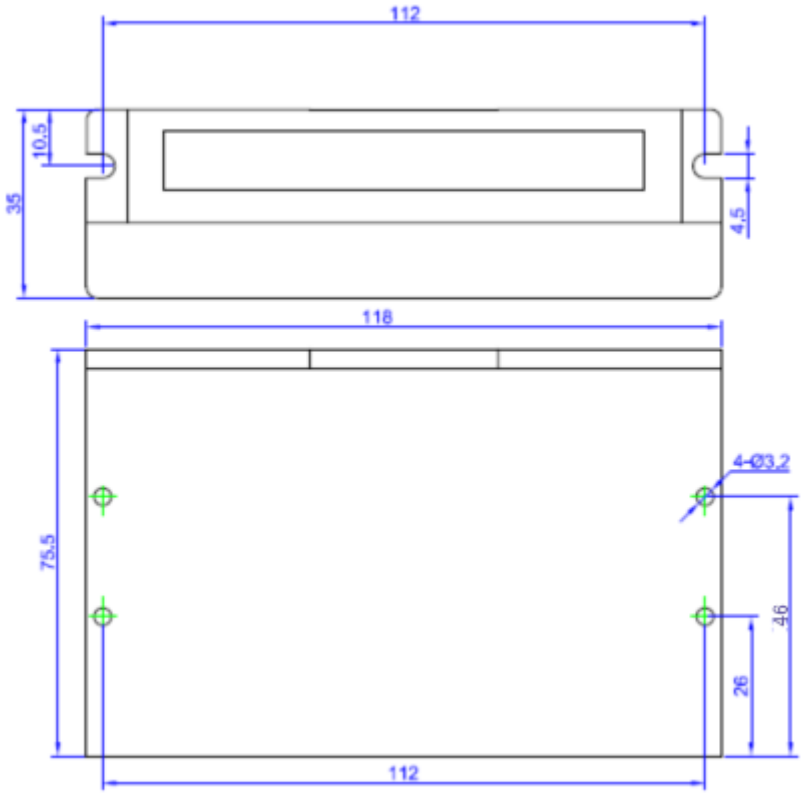
+V: Positive pole for DC power. DC power voltage:16-50V, max current is 5A
GND：Negative pole for DC power

A+ A- B+ B-：Connecting2 phase hybrid stepper motor

the stepper motor is connected to the motor driver in four-wired way. the way of windings are put in parallel or in series ways. the parallel way makes the motor well-performance when at a high speed but requires higher driving current from the motor driver(1.73 times of the winding current).As for the series way, it requires the driving current from the motor driver less(equals the winding current)

Installation

Leave enough space(at least 20mm) around the motor driver when installing. Please don't put the driver near to a heating machine. Avoid the environment with great amount of metallic powder, oil mist, or erosive gases. Avoid the condensing environment. Avoid the vibration occasions.



P3

Fault Diagnosis

Status light indicator

RUN: Green light means a proper functioning
ERR： Red light means a short circuit alarm, over-voltage alarm or a under-voltage alarm

Solution to the error

Fault	Possible Reasons	Solution
LED does not light	Wrong connection of power wires	Check the connection of power wires
	Low supply voltage	Rise the supply voltage up
The motor does not run, and have no torque	Wrong connection of motor wires	Correct the motor line wires
	Off-line signal or the reset signal is enable	使 Disable the reset signal
The motor does not run, but have torque	No input of pulse signal	Adjust the pulse width and signal level
Wrong rotating direction of motor	Wrong phase sequence of power line	Change phase sequence of the power line

	Wrong direction signal	Change the direction signal
The torque of motor is too low	Phase current is set too low	Set the phase current properly
	Acceleration is too high	Reduce the acceleration
	Motor stalling	Trouble shooting
	The driver and motor are not well-matched	Get a well-matched driver

Driver Connection

A complete stepper motor control system consists of : a motor driver, DC power-supply and controller 9pulse source). As the typical system below: