stepper motor driver-DM860A

Introduction:

DM860A is a type of two-phase hybrid stepping motor driver, The drive voltage of which is from 24VDC to 80VDC. It is designed for use with 2-phase hybrid stepper motor of all kinds with 57mm to 110mm outside diameter and less than 8.0A phase current. This circuit that it adopts is similar to the circuit of servo control which enables the motor run smoothly almost without noise and vibration. Hording torque when DM860A run under high speed is also significantly higher than the other two-phase driver, what's more, the positioning accuracy is also higher. It is widely used in middle and big size numerical control devices such as curving machine, CNC machine, and computer embroider machine, packing machines and so on.

Features:

High performance, low price

Average current control, 2-phase sinusoidal output current drive

Supply voltage from 24VDC to 80VDC

Opto-isolated signal I/O

Overvoltage, under voltage, overcorrect, phase short circuit protection

14 channels subdivision and automatic idle-current reduction

8 channels output phase current setting

Offline command input terminal

Motor torque is related with speed, but not related with step/revolution

High start speed

High hording torque under high speed

Electrical specification:

Input voltage	24-80VDC
Input current	< 6A
Output current	2.8A ~ 7.8A
Consumption	Consumption：80W； Internal Insurance：10A
Temperature	Working Temperature -10 ~ 45℃；Stocking temperature -40℃ ~ 70℃
Humidity	Not condensation, no water droplets
gas	Prohibition of combustible gases and conductive dust
weight	500G

Pins assignments and description:

1) Connector Pins Configurations

Pin Function	Details
PUL +,PUL-	Pulse signal, PUL+ is the positive end of pulses input pinPUL- is the negative end of pulse input pin
DIR+,DIR-	DIR signal: DIR+ is the positive end of direction input pinDIR- is the negative end of direction input pin
ENBL+	Enable signal: ENBL+ is the positive end of direction input pin. This signal is used for enabling/disabling the driver. High level for enabling the driver and low level for disabling the driver.
ENBL-	ENBL- is the negative end of direction input pin. Usually left unconnected (enabled)

2) Pins wiring diagram:

PC's control signals can be active in high and low electrical level. When the high electrical level is active, all control negative signals will be connected together to GND. When low electrical level is active, all control positive signals will be connected together to public port. Now give two examples(Open collector &PNP), please check them:

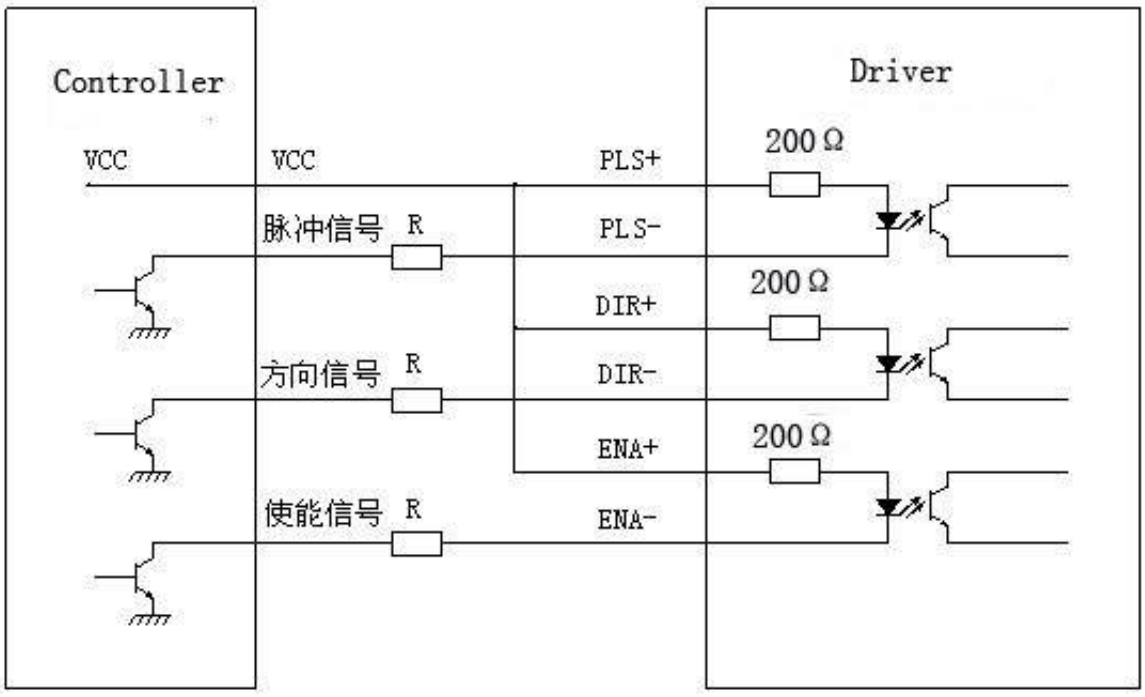

Fig 1. Input port circuit (Yang connection)

PC open connector output

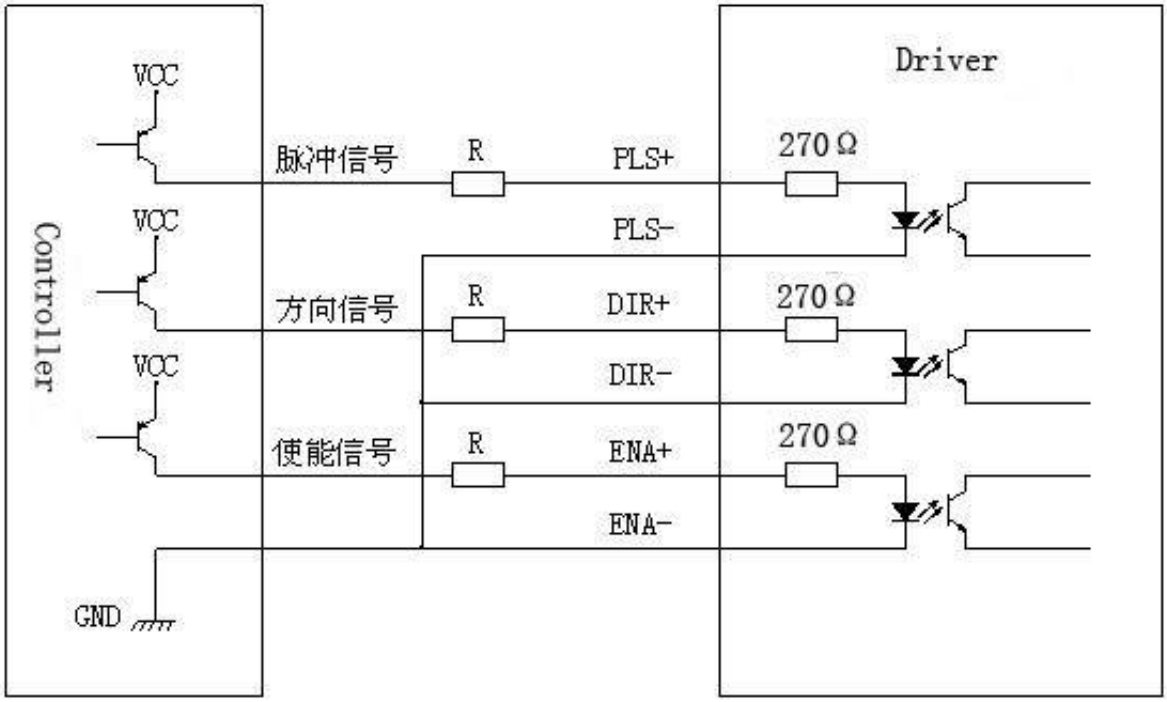

Fig. 2 Input port circuit (Yin connection)

PC PNP output

Note: When VCC=5V, R=0

When VCC=12V, R=1K, > 1/8W

When VCC=24V, R=2K, > 1/8W

R must connect in the control signal part .

3.Function choice (Using DIP pins to achieve this function)

1) Micro step resolution is set by SW 5,6,7,8 of the DIP switch as shown in the following table:

SW5	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
SW6	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF
SW7	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF
SW8	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON
PULSE/RE	400	800	1600	3200	6400	1280	2560	5120	1000	2000	5000	1000	2500	5000	5120

V						0	0	0				0	0	0	0

2) Standstill current setting

SW4 is used for this purpose. OFF meaning that the standstill current is set to be half of the selected dynamic current and ON meaning that standstill is set to be the same as the selected dynamic current.

3) Output current setting:

The first three bits (SW 1, 2, 3)of the DIP switch are used to set the dynamic current. Select a setting

Closest to your motor's required current

Output current (A)				
SW1	SW2	SW3	PEAK	RMS
ON	ON	ON	2.80	2.00
OFF	ON	ON	3.50	2.50
ON	OFF	ON	4.20	3.00
OFF	OFF	ON	4.90	3.50
ON	ON	OFF	5.70	4.00
OFF	ON	OFF	6.40	4.60
ON	OFF	OFF	7.00	5.00
OFF	OFF	OFF	7.80	5.60

4) Semi-flow function:

Semi-flow function is that there is not step pulse after200 ms, the driver output current automatically reduced to 40% of rated output current, which is used to prevent motor h

4. Pins of motor & power:

Motor and power pins	1	A+	Motors wiring	
	2	A-		
	3	B+		
	4	B-		
	5,6	DC+ DC-	Power supply	Power supply ：DC24-80VDCThe peak input current can not up to 6A

5. Mechanical Specification:

To have 20mm of space around ,cannot be placed next to other heating devices. What's more, avoid dust, oil mist, corrosive gas, heavy humidity and high vibration. (Unit=mm)

pic 3

6. Adjustment of troubleshooting

1) , the status on light's indication
PWR: green, normal work light.
ALM: red, failure light, the motor with phase short-circuit, overvoltage and under-voltage protection.

2) Troubles

Alarm indicator	Reasons	Measures
LED off turn	Wrong connection for power	Check wiring of power
	Low-voltages for power	Enlarge voltage of power
Motor doesn't run, without holding torque	Wrong connection of stepper motor	Correct its wiring
	RESET signal is effective when offline	Make RESET ineffective
Motor doesn't run, but maintains holding torque	Without input pulse signal	Adjust PMW & signal level
Motor runs wrong direction	Wrong wires' connection	Change connection for any of 2 wires
	Wrong input direction signal	Change direction setting
Motor's holding torque is too small	Too small relative to current setting	Correct rated current setting
	Acceleration is too fast	Reduce the acceleration
	Motor stalls	Rule out mechanical failure
	Driver does not match with the motor	Change a suitable driver

7. Driver 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

8. APPENDIX

Twelve Month Limited Warranty

LONGS MOTOR. warrants its products against defects in materials and workmanship for a period of 12 months from shipment out of factory .During the warranty period, LONGS MOTOR will either ,at is option, repair or replace products which proved to be defective.

Exclusions

The above warranty does not extend to any product damaged by reasons of improper or inadequate handlings by customer, improper or inadequate customer wirings, unauthorized modification or

misuse .or operation beyond the electrical specifications of the product and/or operation beyond environmental specifications for the product.

Obtaining Warranty Service

To obtain warranty service, a returned material authorization number(RMA)must be obtained from customer service at e-mail:longsmotor@hotmail.com. Before returning product for service. Customer shall prepay shipping charges for products returned to LONGS MOTOR for warranty service, and LONGS MOTOR shall pay for return of products to customer.

Warranty Limitations

LONGS MOTOR makes no other warranty, either expressed or implied, with respect to the product. LONGS MOTOR specifically disclaims the implied warranties of merchantability and fitness for a particular purpose. Some jurisdictions do not allow limitations on how long and implied warranty lasts .so the above limitation or exclusion may to apply to you, however, any implied warranty of merchantability or fitness is limited to the12-month duration of this written warranty.

Product link：https://www.longs-motor.com/?p=1194