MotionKing

MotionKing (China) Motor Industry Co., Ltd.

BRUSHLESS DC MOTOR DRIVER

BLDC-5020

PWM CONTROL, STABLE WORKING

Summary

With the continuous improvement of the electronic science and technology, our designers adopt the CPLD to this motor driver. The motor drivers apply to the under 15A and 50VDC three phase brushless DC motor; the advantage of this motor driver is maintenance-free, long-life, constant torque and so on. Widely used in textile machinery, medical devices, food machines, electric, power tool, garden machine and other resolution to demand higher equipment.

Feature

● PWM technologies, current-speed double closed-loop, high torque at low speed, stable working.

● Stable output torque at high speed, Max. speed 8000rpm/min.

● Max speed control 1:75, lowest speed could be 60rpm when works with 4 poles. More poles wider speed control.

● Suitable for muitiple-pole setting 60°/300°/120°/240°.

● Two ways to control speed: Potentiometer-control & Analog input.

● Start/Stop, Quick brake, CW/CCW switch input signal (optical-isolated).

● Check speed output, Alarm output signal (optical-isolated, OC output).

● Alarm for over current, over voltage, stall, out of control.

Main Data

Electrical Specifications (Tj＝25ºC)

Input Voltage	24～50V DC
Output Current	Rated 15A, Max.35A（≤3s）。
Drive Mode	SPWM sine wave output
Insulate Resistance	＞500MΩ。
Insulator Strength	500V/min at normal temperature and voltage
Weight	0.4 Kg

Ambient requirement

Cooling	Cooling Self cool
Environment	Keep away from oil, dust, and acid gas
Temperature	0ºC～＋50ºC。
Humidity	＜80％RH
Vibration	5.7m/s^{2,} Max.
Storage temp.	－20ºC～＋125ºC

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Application Notice:

To avoid use in the oil contamination, dust and corrosive gas environment
To lay it in a place with good ventilation
Please note the connection with right power(+ and -) to avoid broken the driver
Please test it when confirm the connection is right

Function description：

Power Supply: VDC、GND
Voltage: 24~50VDC, normally Linear Power Supply applied (appendix),ripple voltage higher than 50V may damage driver. The output current of LPS shall be 60%more than that of driver. In case of switching power supply (strongly recommended) applied, please pay attention to the current shall meet motor's current. Attention: incorrect connection may cause driver damaged.

Speed regulation choice (RV or AVI)
1. Setup speed by potentiometer (RV).The dipswitch SW2 must be ON status to enable this function. CW rotate the potentiometer will increase speed. CCW- speed down.
2. Setup speed by analog input (AVI). The dipswitch SW2 must be OFF status to enable this function. AVI terminal accept 0~5V voltage or PWM signal from controller. AVI terminal with input resistance of 100K, current consumption<=5mA.

Control Signal:

S W 2	Command from	Speed Adjust	Common	Current
O N	RV	CW—speed up, CCW—speed down	—	—
O F F	AVI	0~5V analog input	0～5V analog voltage	≤5mA
O F F	AVI	PWM	1KHz duty cycle	—

IMPORTANT: Only one of above two modes can be used to adjust speed (another mode shall be enabled). Once
AVI terminal applied, (RV) potentiometer shall be CCW turned to Min. position. PWM signal are 5V TTL level.
Run/Stop (ENBL)
ENBL terminal is applied to control motor Run/Stop, Common positive terminal is +5V. Optical coupler short circuit makes motor run, it open circuit make motor stop.
CW/CCW Rotation (F/R)
F/R terminal is applied to shift motor rotate direction, common positive terminal is+5V. Motor runs in CCW when optical coupler is short circuit, motor runs in CW when optical coupler
is open circuit.
Attention: don't change the connection sequence of phase wires of motor to shift rotate direction.
Motor Brake Command (BRK)
BRK terminal applied to stop rotation quickly. Motor will stop normally within 50ms. But inertia of load can't exceed 2 times of motor inertia, otherwise brake will cause driver alarm. Time of acceleration and deceleration must be put into controller in case of too big load inertia, And please don't use brake function in such condition. The optical coupler short circuit will break motor, optical coupler open circuit release motor to run.

Setting motor Hall pole position:

S W 1	Pole Position
O N	120°or 240°Hall signal，the difference between 120°& 240°is opposite rotation direction.
O F F	60° or 300°Hall signal, the difference between 60° & 300°is opposite rotation direction.

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Motor rotation speed output (SPEED)

Pulse generated by driver are proportioned with motor speed,(isolated O.C. output) it can be increased to be a random level. 6 multiple frequency processed output. Motor speed=60×SPEED (pulse freq.)/pulses per rev. of motor; p.p.r=motor pole pairs×6
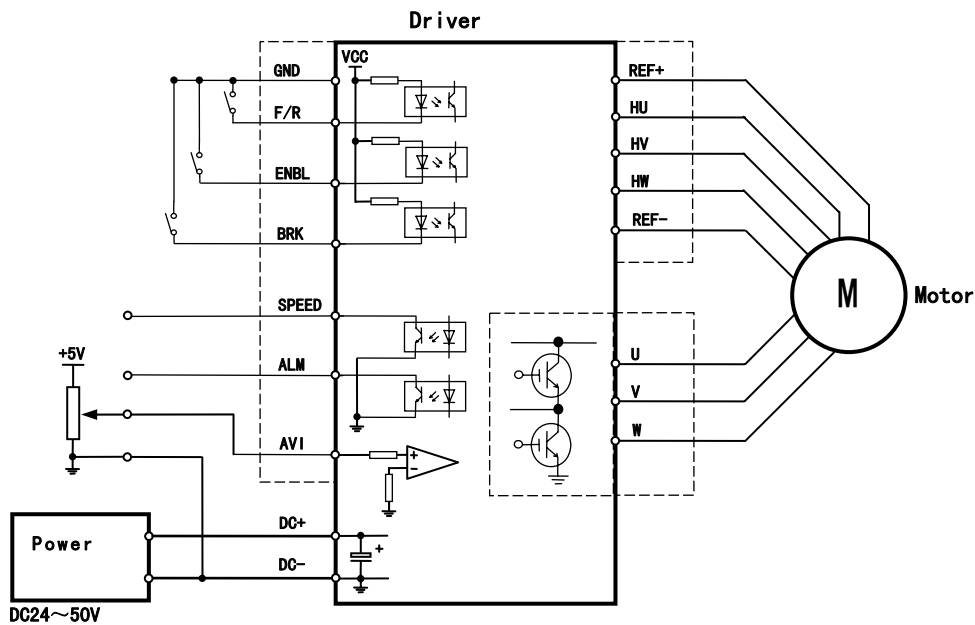
Alarm output (ALM)

Driver will enter protection mode and stop motor running in case of OVER CURRENT, OVER VOLTAGE, SHORT CIUCUIT, MOTOR STALL arise, LED on driver will be light, and ALM signal will be available. Please cut off Driver's power supply, check wiring and voltage. High voltage is not permitted for big inertia motor, as it may cause run/stop frequently and over voltage alarm. Circuit of this function refers to pic. 2.

Terminals Description

Terminal mark	Description
VDC, GND	Voltage supply to driver
U, V, W	To motor leads. Make sure correct connection to motor leads
REF+, REF-, HU, HV, HW	Hall sensor connection, REF+; REF- are for hall power supply. Make sure correct connection to halls.
AVI, ENBL, F/R, BRK, GND	Controls input, see below picture
SPEED, ALM	Signal output,(O.C.)

Typical Wiring Diagram

Dimensions: