

Brushless DC Motor Driver

BLDC-5015 Series

Descriptions

BLDC-5015A brushless DC motor driver is designed by HETAI motor and electric APPLIANCE CO., LTD by ourselves. 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 15 A and 50 VDC 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.



Features

SPWM, Speed/Current alike close loop technology, smooth rotation
Smooth torque output within speed range (8000 rpm Max.)
1-75 Max. Speed regulation ratio
60 degrees/300 degrees/120 degrees/240 degrees electrical angle adjustable
Speed regulation: potentiometer adjust/analog input
Run/Step, Quick Brake, CW/CCW rotation shift
Speed output, Alarm output (O.C.)
Over current, over voltage, stall, missing speed alarm

Mechanical Dimensions

Electrical Parameters (Tj=25 degree Celsius)

Input voltage range	20V – 50 VDC type: 36 VDC
Output current range	Rated 15 A, Peak 30 A(<=3 s)
Driver type	SPWM
Insulation resistance	>500 M
Class insulation	500 V/Minute
Weight about	300 g

Ambient requirement

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

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: DC+, DC Voltage: 24 ~ 50 DC, normally Linear Power Supply applied (appendix), ripple voltage higher than 50 V 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; AVI)

1. Setup speed by potentiometer (RV).The dipswitch SW2 must be ON status to enable this function. CWrotate 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.

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Reference table

SW2	Command to	Speed adjust	Common	Current
ON	RV	CW — speed up, CCW — speed down	-	-
OFF	AVI	0 ~ 5V analog input PWM	0 ~ 5 V voltage 1 KHz duty cycle	<= 5 mA -

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 5 V TTL level.

Run/Stop (ENBL)

ENBL terminal is applied to control motor Run/Stop; Common positive terminal is +5 V.

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 +5 V.

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 50 ms. 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.

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 = $60 \times \text{SPEED}$ (pulse freq.)/pulses per rev. of motor; p.p.r = motor pole pairs $\times 6$

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
DC+, DC-	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, Vcc	Controls input, see below picture
SPEED, ALM	Signal output, (O.C.)

Standard Wiring Diagram

