



DC BRUSHLESS DRIVER

BLDC-5015A user manual

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°/300°/120°/240°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

Parameters

Electrical Parameters (T_j=25°C)

Power	24~50VDC, Capacity: up to motors
Current output	Rated 15A, Peak 45A (≤3s)
Driving mode	SPWM
Insulation Res.	>500MΩ
Dielectric Strength	500V/Minute
Weight	About 300g

Ambient requirement

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

Function description

I Power Supply: DC+ ; DC-

Voltage: 24 ~ 50DC , 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.

I Speed regulation choice(RV ; 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 \leq 5mA.

Reference table

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

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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.

I Run/Stop (ENBL)

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

Optical coupler short circuit make motor run, it open circuit make motor stop.

See below circuit

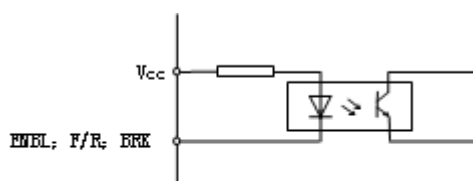


图 1

I CW/CCW Rotation (F/R)

F/R terminal is applied to shift motor rotate direction, common positive terminal is+5V.

Motor run in CCW when optical coupler is short circuit, motor run in CW when optical coupler is open circuit.

Attention: don't change the connection sequence of phase wires of motor to shift rotate direction.

I 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 brake motor, optical coupler open circuit release motor to run.

I Setup different electrical angle

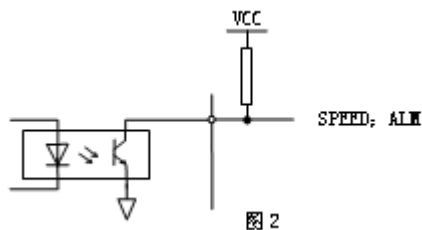
Dipswitch SW1 can be setup to fit motors with different electrical angle

SW1	
ON	120°or 240°hall signal, they are in opposite rotation direction
OFF	60°or 300°hall signal, they are in opposite rotation direction

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



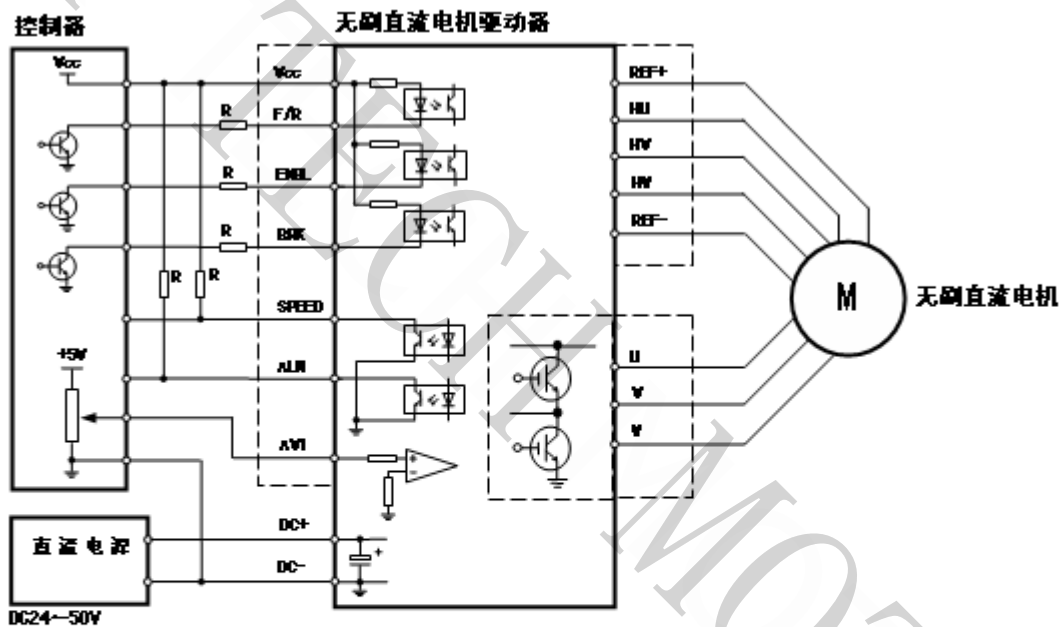
I Alarm output(ALM)

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 refer to pic. 2.

I Terminals description

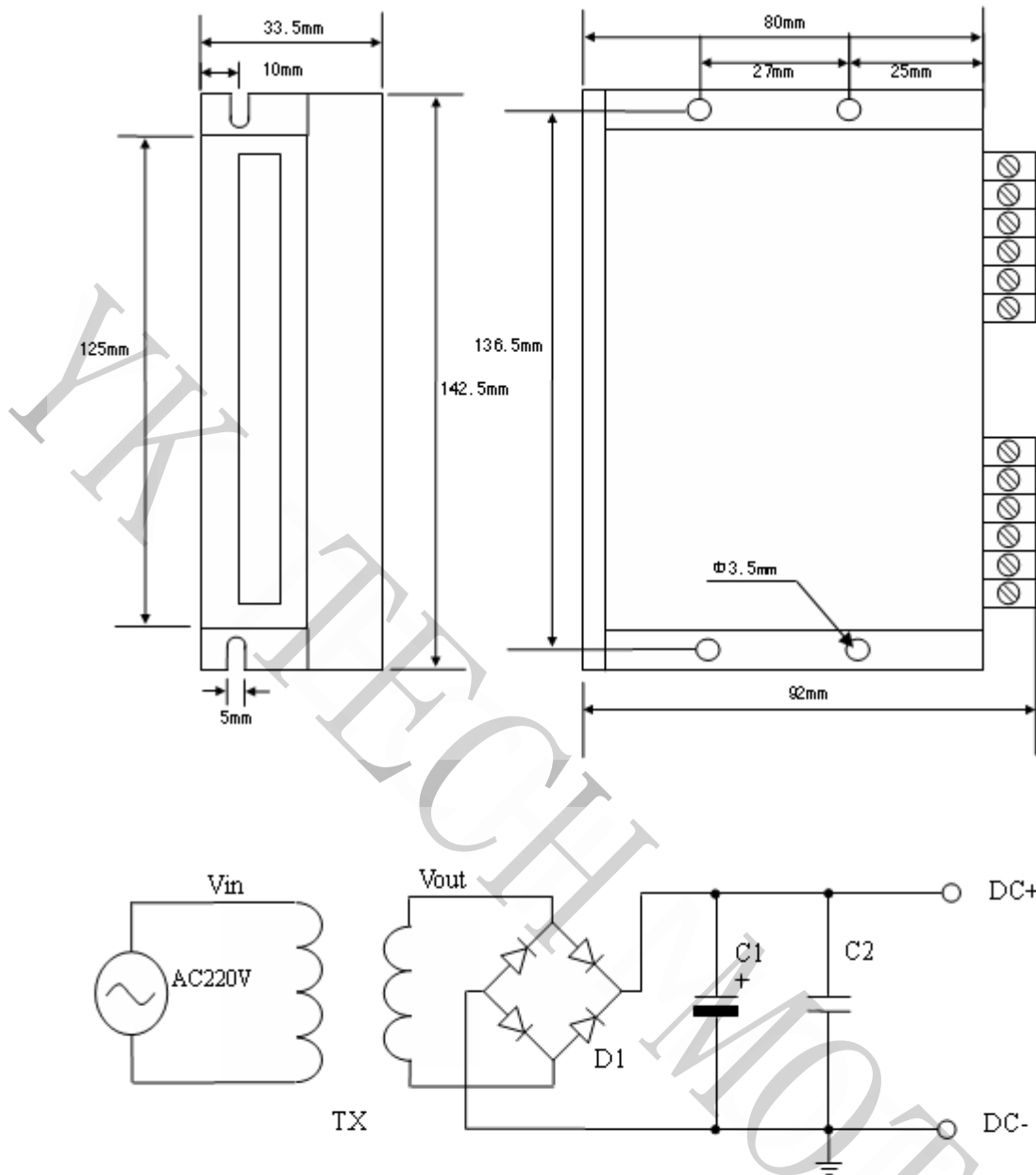
Terminal mark	Description
DC+; DC-	Voltage supply to driver
U; V; W	To motor leads. Make sure correct connection to motor leads.
REF+; REF-; HU; HV; HW	Hall sensor connection, REF+; REF- are for hall power supply. Make sure correct connection to halls.
AVI; ENBL; F/R; BRK; Vcc	Controls input, see below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

I Wiring Diagram



注意:

- 当 VCC 电源为+5V 时, 去掉电阻 R。
- 当 VCC 电源为+12V 时, 电阻 R 选 1K Ω /0.125W。
- 当 VCC 电源为+24V 时, 电阻 R 选 2K Ω /0.125W。
- 驱动器与上位控制器的连接电缆最好选择带屏蔽, 屏蔽层连接标准地或上位控制器接地端。
- 根据驱动器输出电流设置选择电源线和电机电力线的直径, 一般不要小于 1mm² 线径。



图中：

TX 为隔离变压器，根据电源负载确定其参数。一般的，变压器输出电压根据输出直流电压要求而定，整流滤波之后的直流电压 $V_{DC} \approx 1.414 \times V_{out}$ 。当用于 BLDC-5015A 驱动器时，推荐电压器输出为 AC21~28V。其中：变压器容量根据负载电流决定；C1 为电解电容，推荐参数为：100V/2200uF；C2 为无感突波吸收电容，推荐参数为：400V/0.22 uF；D1 整流桥参数根据负载电流及输出电压而定。