

# Ningbo Biote Mechanical Electrical Co.,Ltd

## YBD Series DC Brushless Motor Drivers

### User Manual

Ningbo Biote Mechanical Electrical Co.,Ltd



## Product Overview

This manual provide information on the features, installation, use, and maintenance of YBD series DC brushless motor drivers (controllers). Please read this manual carefully before you use the driver, as it will help you install and use the driver safely and correctly. Please contact us by the contact information on the last page when you have problems in the process of using.

YBD series DC brushless motor driver (controller) adopts FOC vector control technology, which provides excellent DC permanent magnet brushless motor drive control performance. The driver utilizes motor field oriented vector control technology to produce maximum torque over the entire speed range, which improves the product's overcurrent capability and reliability. The product is suitable for speed regulation control of heavy-duty field vehicles, light road vehicles and multi-purpose industrial vehicles, such as the drive control of electric rail flat cars, street-cleaning vehicles, electric forklifts, electric boats, intelligent warehousing and logistics vehicles, hydraulic power units and other industrial electric vehicles and various DC permanent magnet brushless motors.

## Basic Parameters

- Operating frequency: 15.6-16KHz
- Standby power consumption:  $\leq 3W$
- 5V Hall sensor power supply current:  $\leq 40mA$
- Rated operating voltage: 24-120VDC (depending on the model)
- Input current of the controller electric door line power supply:  $\leq 200mA$
- Speed regulation signal input: 0-5V (3-wire resistance or analog signal), 1.2-4.2V (Hall)
- Ambient operating temperature range:  $-25^{\circ}C - 55^{\circ}C$
- Full power output operating temperature range:  $0^{\circ}C - 55^{\circ}C$ , shutdown protection at  $85^{\circ}C$  (driver heat sink temperature)
- 60 minutes continuous motor operating current: 40A-150A (depending on the model).
- 2 minutes continuous motor operating current: 80A-300A (depending on the model).

- Protection grade: IP55
- Type of cooling: natural cooling (the controller shall be installed in a well-ventilated area, and it is recommended that the heat dissipation base plate be firmly attached to the metal surface of the rack to help heat dissipation).
- Adaptive motor: DC permanent magnet brushless motors of Changzhou Yongpei.

## Installation Requirements

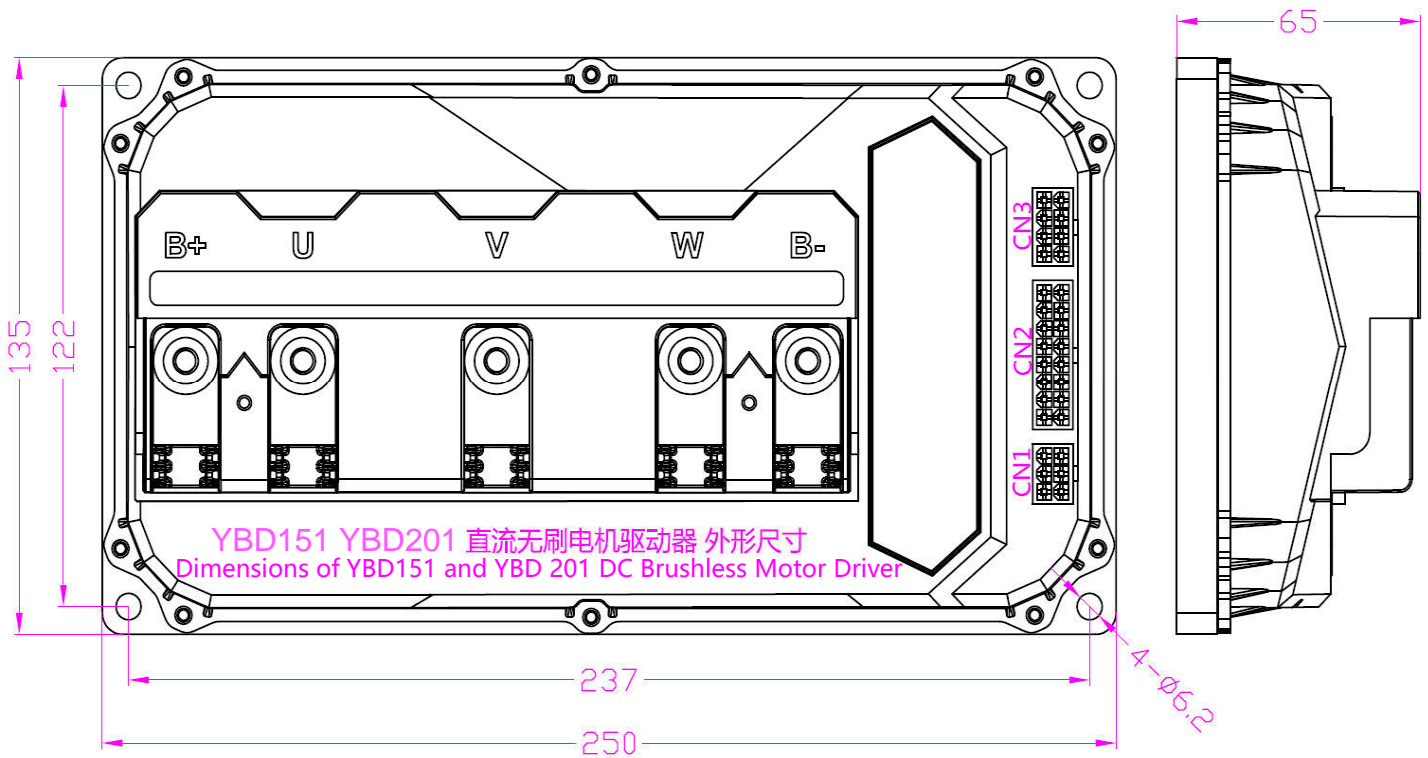
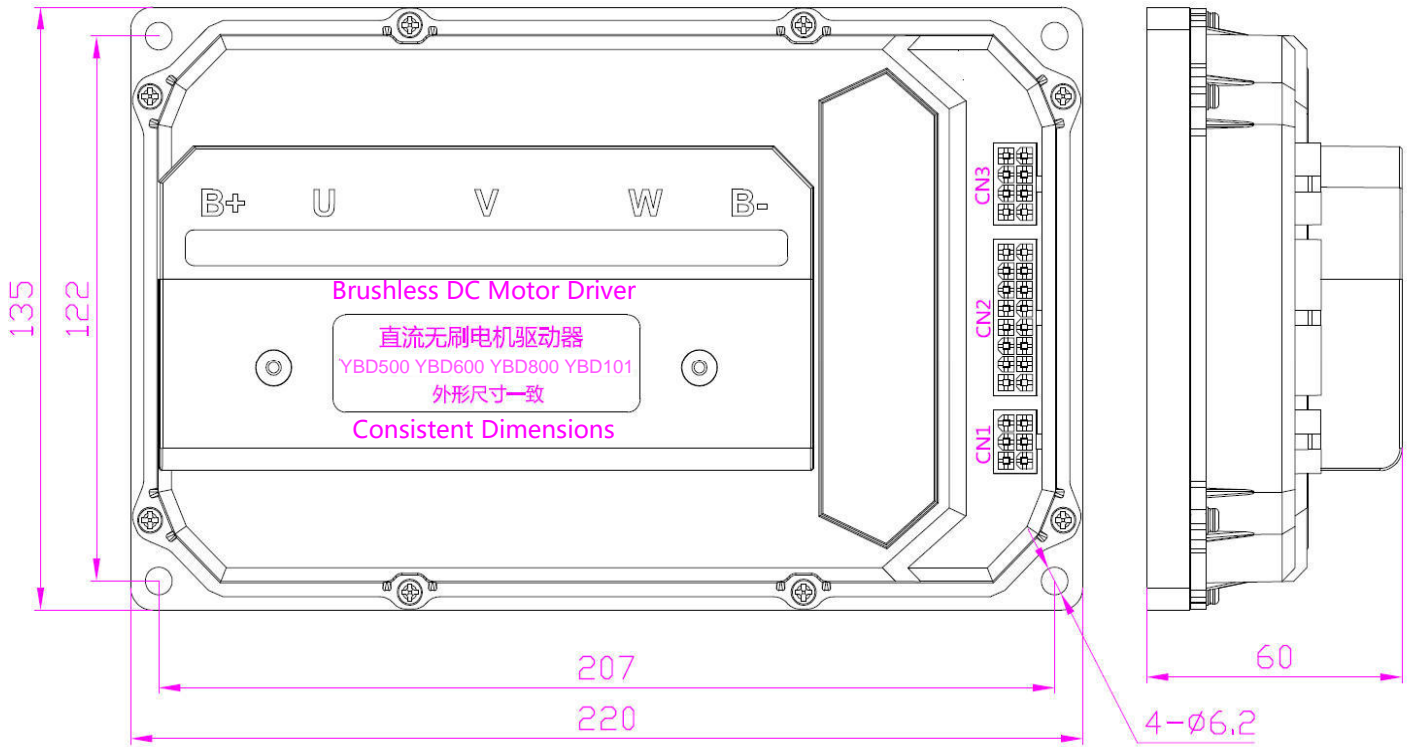
The drive controller can be mounted in any position, but it shall be kept ventilated, clean and dry. If a clean mounting position cannot be found, it shall be covered to protect it from water and other contaminants. The driver shall be installed in a well-ventilated area to ensure its full power output, otherwise forced air cooling shall be added. Installation and use in a narrow and confined space may result in shortened full power running time or over-temperature protection of the controller.

Be sure to disconnect the main power supply before installing or commissioning the driver, and turn on the main power supply only after reliable and correct wiring. The main power supply line (B+ positive pole of power supply, B- negative pole of power supply) and the three-phase output line (U-yellow, V-green, W-blue) **shall correspond to the color of the motor lead wires**, and the nuts shall be tightened to ensure that **the connections are correctly, firmly and reliably**.

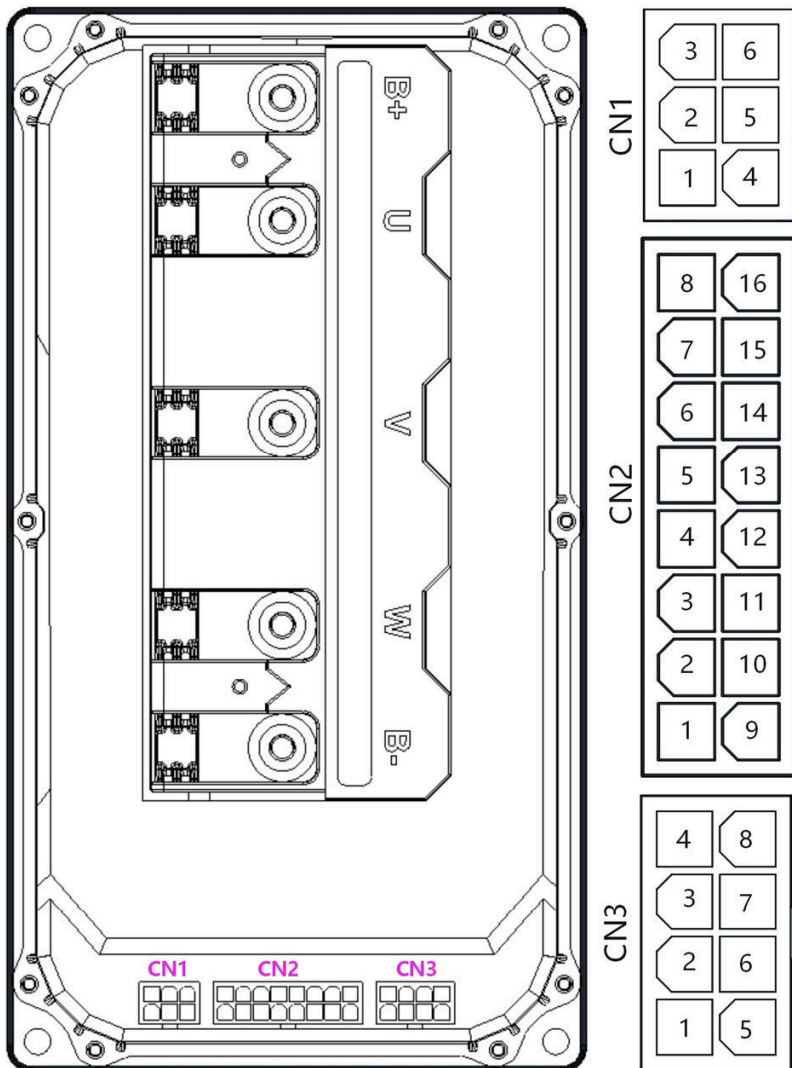
## Precautions

- The motor may lose control in some cases, so the vehicle shall be set up to lift the wheels off the ground before operating the control circuit of the electric vehicle.
- The battery can supply a very high current, so be sure to disconnect the battery circuit before connecting the control circuit. Insulating tools must be used to prevent short-circuit burns.
- Make sure that all wires are correctly connected before powering up, otherwise the controller may be damaged! Please pay special attention to the positive and negative poles of the power supply, and **never reverse the positive and negative poles of the power supply**.

**Driver Dimensions**



## Terminal Lead Definitions and Control Wiring Diagram



Note: CN1: Motor Hall signal interface; CN2: Control signal interface; CN3: Firmware upgrade interface

### Special Notice

1. Please make sure that all wiring are correct before powering up, and never connect the positive and negative poles of the driver power supply in reverse.
2. The driver shall be mounted as close to the motor as possible, since too it will affect the Hall signal acquisition if mounted too far away.
3. The mounting angle of the drive can be arbitrary, but the drive shall be kept clean and dry, and special attention shall be paid to the ventilation and cooling of the driver.
4. Low-voltage control signal wires (thin wires) shall not be in contact with the main power wires (thick wires) during the wiring of the driver, otherwise the driver may be damaged.
5. There is no user-serviceable part inside the driver, and unauthorized opening may damage the driver and may void the driver's warranty.

Make sure to connect the three phase wires of the driver output and the three phase wires of the motor in corresponding colors.

### Motor Driver Main Circuit Wiring Instructions

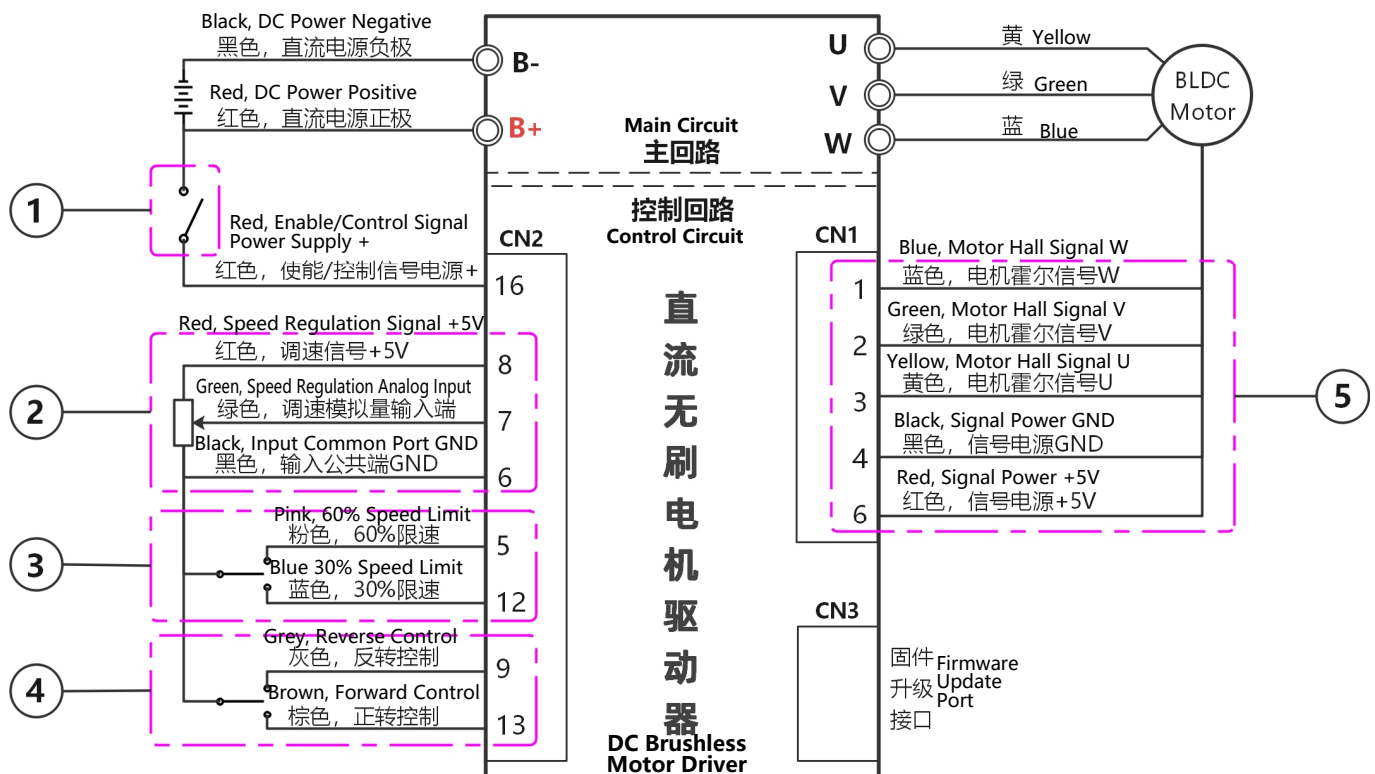
Terminal No.	Description
B+	Red, DC power positive
B-	Black, DC power negative
U	Yellow, motor power line phase U
V	Green, motor power line phase V
W	Blue, motor power line phase W

### Motor Hall Signal Wiring Instructions

Terminal No.	Description
1	Blue, motor Hall signal W
2	Green, motor Hall signal V
3	Yellow, motor Hall signal U
4	Black, signal power GND
5	Blank
6	Red, signal power +5V

### CN2 Control Circuit Signal Wiring Instructions

Terminal No.	Signal	Description
1	Blank	-
2	Blank	-
3	Blank	-
4	GND	Black, input common port
5	M2	Pink, 60% speed limit control signal
6	GND	Black, input common port
7	SP-A	Green, speed regulation analog input
8	E5V	Red, speed regulation signal +5V
9	CCW	Gray, reverse control
10	Blank	-
11	Blank	-
12	M1	Blue, 30% speed limit control signal
13	CW	Brown, forward control
14	Blank	-
15	Blank	-
16	EN	Red, enable/control signal power supply +



## Notes:

- ① The electric door lock/enable signal is connected to the positive pole of the power supply, and the control loop of the inner hole of the driver is in standby state after powering up. The on/off of this signal can be used as the door lock switch or emergency stop signal.
- ② Speed regulation signal input:
  - (1) 3-wire resistance speed regulation, recommended potentiometer resistance value: 4.7KΩ or 5.1KΩ.
  - (2) External analog input speed regulation: 0-5V analog, effective value range of speed regulation: 1.2-4.0V.
  - (3) Inductive linear Hall speed regulation: 1.2-4.0V.
  - (4) Short the red and green wires if there is no need for speed regulation, and run the motor at full speed after 3S smooth soft start. The soft start time is 3S by default, and can be customized for special requirements. When used in conjunction with ③, 30%, 60% and 100% multi-step speed control can be realized.
- ③ For example: If the 30% speed limit signal and GND are shorted, the drive will run at a speed of the given speed of ② x 30%.
- ④ The steering command must be given for the drive to run, and the default idle stop is not given. This signal can be used to control the motor to start/stop and forward/reverse when the speed command is given.
- ⑤ It is recommended that the Hall signal line of the motor be wired separately from the power line to avoid Hall signal interference. When the distance between the motor and the driver is too far, it is recommended to use 5-core shielded signal cable for the Hall signal line, and the thicker cable shall be use for the main power line.

# Contact Us

Thank you for your support to [Ningbo Biote Mechanical Electrical Co.,Ltd](#)

Weekday Contact Phone Number: +86-574-87500231

Mobile Phone Number: +86 13606581120 (WhatsApp & WeChat )

Official Website: <http://www.cnbiote.com>

You can visit our website to view and download product specifications and technical documents to facilitate your selection and use.

Email: [sales@cnbiote.com](mailto:sales@cnbiote.com)

Address: BLDG. 2 NO.456 Xingning RD, NINGBO, CHINA, Ningbo, Zhejiang

**Thank you for your support!**