BL750A Brushless DC Motor Driver

Overview

The BL750A Brushless DC Motor Driver is a high-performance, low-cost driver designed for low-voltage brushless DC motors up to 750W.

- Acceleration/Deceleration Time Setting
- Motor Pole Number Selection
- Open/Closed Loop Control
- Maximum Current Output Setting
- Motor Stall Torque Holding
- Restart Function
- Various Alarm Indicators
- Built-in Potentiometer RV Speed Control
- External Potentiometer Speed Control
- External Analog Signal Speed Control
- Pulse Frequency Speed Control

Electrical Performance and Environmental Indicators

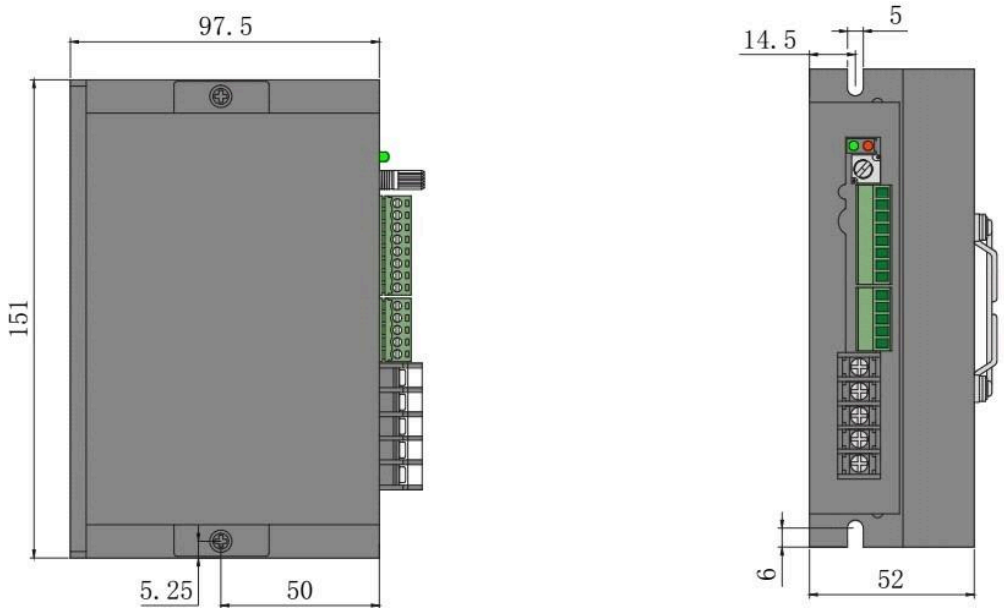
Electrical Parameters

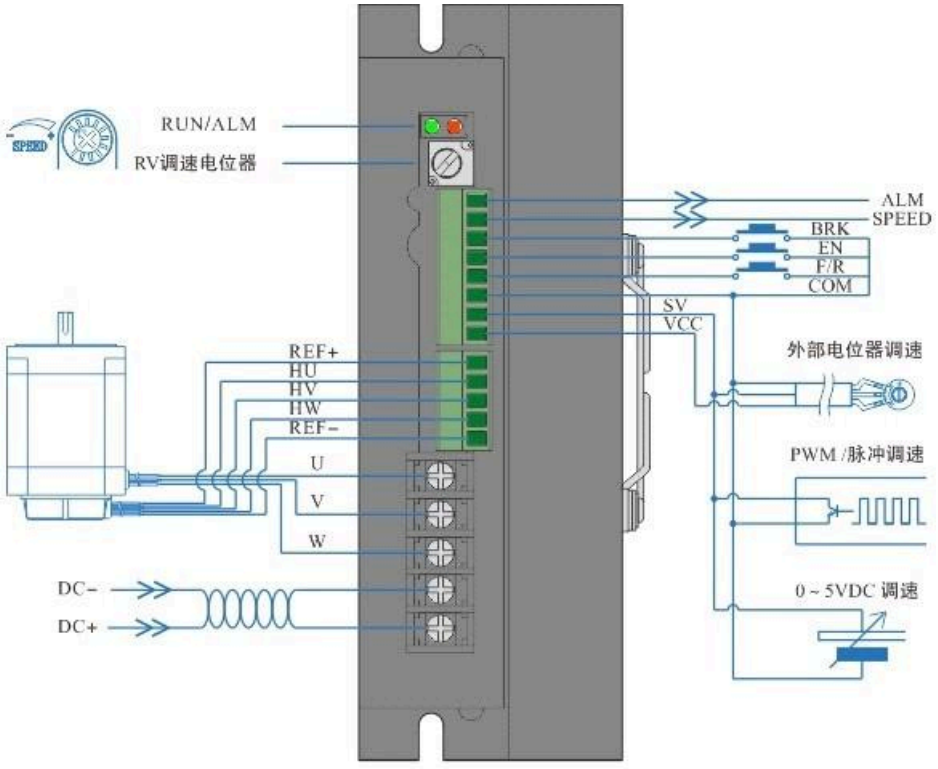
Driver Parameters	Minimum	Typical	Maximum
Input Voltage DC (V)	18	48	52
Output Current (A)	-	-	23
Applicable Motor Speed (rpm)	0	-	20000
Hall Signal Voltage (V)	-	-	5
Hall Drive Current (mA)	-	20	-
External Speed Control Potentiometer (KΩ)	-	10	-

Environmental Parameters

Cooling Method	Natural or Forced Cooling
Usage Environment	Avoid dust, oil, and corrosive gases
Operating Temperature	10~50℃
Maximum Humidity	80%RH (no condensation)
Storage Temperature	0~60℃
Maximum Vibration	5.7m/S2 max

Mechanical Dimensions



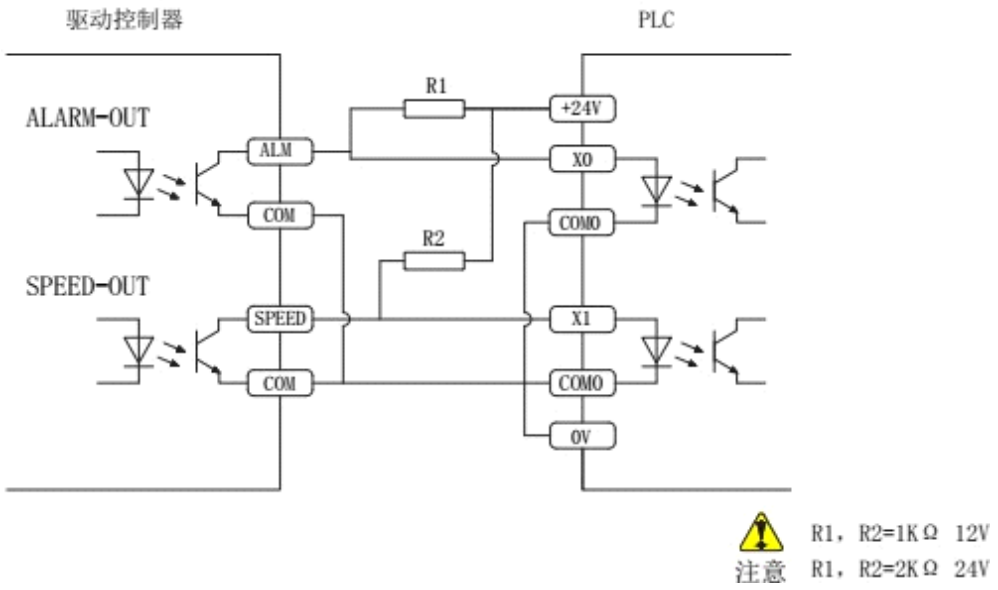


Terminal Description

Terminal	Description
RUN/ALM	Motor or driver control fault signal output. Normal is 5V, fault is 0V.
SPEED	Outputs a pulse frequency corresponding to the motor speed. Use SPEED-OUT to calculate motor speed. Formula: N(rpm) = (F/P) × 60/3. Example: For a 4-pole motor, F = 500Hz, N = 2500 rpm.

Terminal	Description
BRK	Motor brake stop when BRK and COM are disconnected or high level input. Motor runs when shorted or low level input.
EN	Motor slowly stops when EN and COM are disconnected or high level input. Motor runs when shorted or low level input.
F/R	Motor forward rotation when F/R and COM are disconnected or high level input. Motor reverse rotation when shorted or low level input.
COM	Common port (0V reference level).
SV	External speed control potentiometer, external analog signal speed control input, or pulse frequency input.
VCC	External potentiometer interface.
REF+	Brushless DC motor Hall signal power line.
HU	Brushless DC motor Hall signal HU.
HV	Brushless DC motor Hall signal HV.
HW	Brushless DC motor Hall signal HW.
REF-	Brushless DC motor Hall signal ground line.
U	Brushless DC motor U phase.
V	Brushless DC motor V phase.
W	Brushless DC motor W phase.
DC-	DC power input negative.
DC+	DC power input positive (voltage range DC24 ~ 52V).

Operation and Function Settings



Acceleration/Deceleration Time Setting

Set the motor's acceleration and deceleration time using the ACC/DEC potentiometer. Rotate left or right to increase or decrease the time. Range: 0.3 ~ 15S.

Motor Pole Number Setting

Set the motor's pole number using SW2 for better matching with different pole-pair brushless DC motors.
ON = 2P (pole pairs); OFF = 4P (pole pairs).
Set SW2 according to the motor's pole number when using closed-loop control.

Open/Closed Loop Control Setting

Select open or closed-loop control using SW1.
ON = Closed-loop control; OFF = Open-loop control.
Set SW2 according to the motor's pole number when using closed-loop control.

Fine Adjustment Function

When using external analog voltage 0-10V for speed control, use the fine adjustment potentiometer to adjust the speed if the motor speed does not match the set speed. (Fine adjustment potentiometer is only effective for voltage speed control.)

Peak Output Current Setting

Set the peak output current using the P-sv potentiometer. When the load suddenly increases, the output current will be limited to the set value, reducing the motor speed to protect the motor from damage.
Set the peak output current according to the scale on the right. Range: 4 ~ 25A. The actual peak output current may vary by ±10% from the set value. For safety, set the peak output current slightly lower.
When the load suddenly increases, the peak current limit time is 3S. If the load continues to increase after 3S, the driver will stop working. After 5S, the restart function will activate.

Stall Output Current Limit

When the motor stalls, the output current will be limited to 3A to protect the driver and motor from damage.

Stall Torque Holding Function

When the motor stalls, it has a simple torque holding function.
▲ Stall holding torque is a short-term behavior. Do not use it for braking.

Restart Function

When the motor stalls, the driver will stop working. After 5 seconds, the driver will automatically restart. If a fault occurs again after restarting, an alarm will be triggered, and the protection function will activate, stopping the driver.

Start and Stop

The factory setting for the EN and COM terminals is connected. Connect or disconnect the EN and COM terminals to control the motor's operation and stop.
When the EN and COM terminals are connected, the motor runs. Conversely, the motor slowly stops.
By connecting a switch or using a PLC to control the connection between COM and EN, you can switch the motor's start and stop.

Quick Stop

The factory setting for the BRK and COM terminals is connected. Connect or disconnect the BRK and COM terminals to control the motor's natural operation and quick stop. When the BRK and COM terminals are disconnected, the motor quickly stops. Conversely, the motor runs normally.
By connecting a switch or using a PLC to control the connection between COM and EN, you can switch the motor's start and quick stop.

Direction Control

The factory setting for the F/R and COM terminals is disconnected. When power is applied, the motor rotates forward.
Connect or disconnect the F/R and COM terminals to control the motor's forward and reverse rotation.
When the F/R and COM terminals are disconnected, the motor rotates forward.
When the F/R and COM terminals are connected, the motor rotates in reverse.

When viewed from the motor shaft, clockwise rotation is forward, and counterclockwise rotation is reverse.

Speed Control Method Selection and Setting

Using Built-in Potentiometer RV for Speed Control

Rotate the built-in speed control potentiometer RV clockwise until it clicks, and the motor starts running. Continue rotating clockwise to increase the motor speed.
Rotate the built-in speed control potentiometer RV counterclockwise to decrease the motor speed; continue rotating counterclockwise until it clicks at the limit position. At this point, the built-in speed control potentiometer RV is turned off, and the motor stops running.
When switching to external SV input control mode, the built-in potentiometer RV must be in the off state. That is, rotate the built-in potentiometer RV counterclockwise until it clicks at the limit position.
(Refer to the original document for the diagram of the relationship between the built-in potentiometer and motor speed.)

Using External Potentiometer for Speed Control

When using an external speed control potentiometer, use a suitable potentiometer with a resistance value of 10KΩ. Connect the middle terminal of the potentiometer to the SV terminal, and the other two terminals to VCC and COM respectively.
① At this time, the built-in speed control potentiometer RV must be rotated counterclockwise until it clicks at the limit position.
② Pay attention to the connection order of the potentiometer leads.

Using External Analog Signal for Speed Control DC0~5V

When switching to external SV input control mode, the built-in potentiometer RV must be in the off state. That is, rotate the built-in potentiometer RV counterclockwise until it clicks at the limit position.
(Refer to the original document for the diagram of the relationship between the analog signal voltage and motor speed.)
When the input voltage is about 0.2V, the motor speed is 4% of the maximum speed; when the input voltage is about 5V, the motor speed is at its maximum. The maximum speed depends on the motor specifications and power supply voltage.

Using External Analog Signal for Speed Control DC0~10V

When using an external analog signal DC0~10V for speed control, first adjust the fine adjustment potentiometer before speed control.
When switching to external SV input control mode, the built-in potentiometer RV must be in the off state. That is, rotate the built-in potentiometer RV counterclockwise until it clicks at the limit position.
(Refer to the original document for the diagram of the relationship between the analog signal voltage and motor speed.)
When the input voltage is about 0.2V, the motor speed is 160rpm; when the input voltage is about 5V, the motor speed is 4000rpm.

Using Pulse Frequency for Speed Control

When using pulse frequency for speed control, set SW3 to ON. The built-in potentiometer RV must be in the off state. That is, rotate the built-in potentiometer RV counterclockwise until it clicks at the limit position.
(Refer to the original document for the diagram of the relationship between the pulse frequency and motor speed.)
When the pulse frequency is 0.15KHz, the motor speed is 5% of the maximum speed; when the pulse frequency is 4KHz, the motor speed is at its maximum. The maximum speed depends on the motor specifications and power supply voltage.
When the pulse frequency is 0.15KHz, the motor speed is 150RPM; when the pulse frequency is 4KHz, the motor speed is at its maximum, 4000RPM.