

# DC Speed Controller

## BC2000-TB



**User Manual**

**Version 1.0**

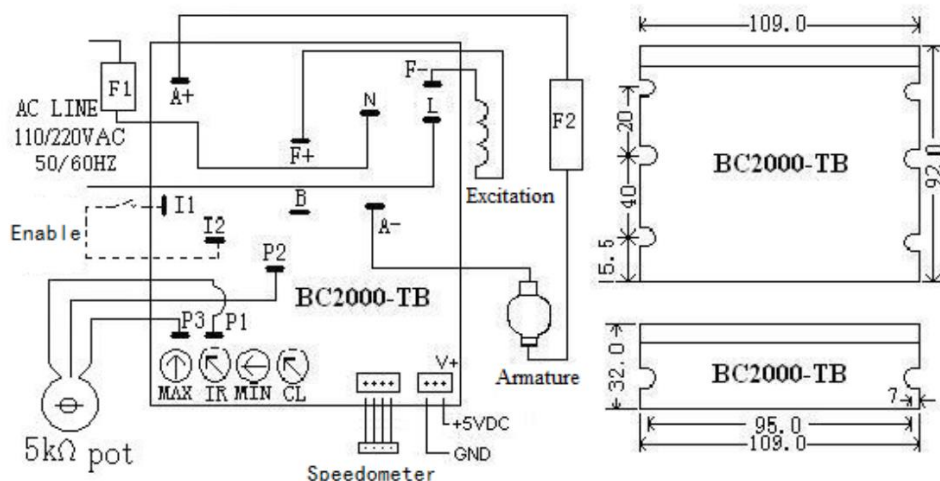
## Features

1. Suitable for 0.05 ~ 1.5KW DC motor drive speed regulation
2. The minimum speed, maximum speed and torque can be adjusted by the potentiometer.
3. Adjustable speed of external potentiometer (0 ~ 90V or 0 ~ 180VDC adjustable)
4. Load compensation potentiometer is set to improve the speed stability accuracy
5. With power indicator (LED2) and fault indicator (LED1), the operation status can be seen at a glance.
6. With current limiting protection, current feedback, delayed start and remote start functions.
7. Speed measurement feedback is available (if speed measurement function is needed, please contact relevant technical personnel of our company).
8. It can be driven by DC voltage (0-10VDC), and the signal must be isolated (the isolation expansion board BC11 or BC15 can be added).

## Attention

1. Before power on, please make sure that the input AC power supply voltage range is 90 ~ 250VAC 50 / 60Hz (AC power supply output by transformer is recommended).
2. Please make sure the wiring is correct before power on (see wiring instructions for details).
3. Please make sure that the maximum output voltage does not exceed the rated voltage of the motor before power on (adjust the max potentiometer).
4. Please make sure that all adjusting potentiometers have been adjusted to the appropriate position before power on (see the adjustment instructions for details).
5. Do not touch any components with hands after power on, and do not touch components immediately after power off (R17A resistance will be hot)
6. After power on, LED2 (green light) will be on, and LED1 (red light) will be on when the drive fails.

## Wiring & Dimension (mm)



## Terminal

1. L and N are AC power input terminals.
2. A + and a — are armature voltage output terminals of DC motor.
3. F + and F — are excitation voltage output terminals of DC motor. (when driving permanent magnet motor, F + and F — can not be connected)
4. P1, P2 and P3 are input terminals of output control potentiometer. tap of the adjustable potentiometer is connected to P2)
5. I1 and I2 are output stop enable switches. (i.e. when I1 and I2 are short circuited, the output is zero, which can not be connected)
6. B and I2 are the feedback inputs of speed measurement. (if you need to use the speed measurement function, please contact the relevant technical personnel of our company)
7. V + and GND are DC + 5V power output terminals.
8. The connector of speedometer can only be used with the 4-bit speedometer and speed sensor of our company.

## Parameters

Input voltage (VAC) 50/60Hz	Motor voltage (VDC)	No additional heat sink		Plus large enough heat sink	
		Maximum DC output current (Amps)	Maximum output powerKW (HP)	Maximum DC output current (Amps)	Maximum output powerKW (HP)
90—130	0—90	6.0	0.375 (0.5)	12.0	0.75 (1)
185—250	0—180		0.75 (1)		1.5 (2)

## Performance

1. Speed regulation ratio 50:1
2. Current limiting range 0 - 150%
3. Load adjustment rate 1%
4. Acceleration time 0.5 - 4.0s
5. Minimum speed adjustment range 0 - 30%
6. Maximum speed adjustment range 50 - 110%
7. Line voltage regulation rate 0.5%
8. Control linearity 2%
9. Speed measurement feedback voltage (optional) 0 - 5 V/krpm
10. Control linearity 2%
11. Maximum ambient temperature (full load) 45°C
12. Maximum instantaneous starting current 3 times the current setting

## Adjustment

1. \*\* All adjustment potentiometers are minimum when they are rotated to the bottom counterclockwise \*\*
2. Maximum speed adjustment (MAX)  
When the maximum speed of the motor is required to be a specific speed, adjust the potentiometer to make the maximum speed meet the control requirements. The adjustable range is 50% - 110% of the rated speed. (i.e. the maximum output DC voltage is set at 180VDC)
3. Minimum speed adjustment (MIN)  
When the motor is required to adjust from non-zero speed, adjust the potentiometer to meet the minimum speed requirements. The adjustable range is 0-30% of the rated speed.
4. Current limit adjustment (CL)  
The potentiometer can adjust the maximum value of the output current, and the adjustable range is 0-150% of the rated current of the motor when the output power is 1.5KW.  
(This function can be used not only as overload protection of motor, but also as torque adjustment of motor)
5. Current feedback adjustment (IR)
  - a) When the load change on the line is small, the potentiometer can be adjusted to the minimum value.
  - b) When the load on the circuit changes greatly, keep the speed change less than 1%.  
Adjust the potentiometer according to the following steps,
  - c) When the motor is no-load, measure the armature voltage of the motor at this time.
  - d) Adjust the potentiometer anticlockwise to restore the armature voltage of the motor to no-load voltage.

## Fuse Selection Table

90VDC Motor power (W)	50	100	150	250	375	500	600	750
180VDC Motor power (W)	100	200	300	500	750	1000	1200	1500
F1 (A)	1.5	3	5	8	12	16	20	24
F2 (A)	0.8	1.5	3	4	6	8	10	12

## Fault

Faults	Check
Motor does not run	Check if the fuse is broken, If fuse broken after replaced, Check for the following 1) Rectifier module breakdown 2) SCR module breakdown 3) Short circuit of motor coil 4) Excessive motor load
Fuse is OK	Open circuit or poor contact of line. The control integrated circuit is damaged.
Abnormal operation of motor	Improper setting of current feedback potentiometer. Component performance change or damage.