

MBDC050-050301 50V, 30A Brush Controller

User's Guide



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MBDC050-050301 Driver Features

- Maximum Current Limit Setting from 10.0-30.0 Amps
- Vary Speed Using an External 0-5VDC Power Supply
- 2-Quadrant Operation
- Open-Loop Velocity Mode
- Cycle-by-Cycle Over Current Protection
- Requires 20-50VDC Input
- Run/Stop, Freewheel and Direction Inputs
- Selectable Ramp Up
- TTL-CMOS Compatible Inputs
- Screw-Type Terminal Block

General Description

The MBDC050-050301 is a speed controller designed to drive DC Brush Motors at currents up to 30A peak with an input voltage range of 20-50VDC. An internal potentiometer is used to set the peak motor current limit between 10.0-30.0A and an external DC power supply ranging from 0 to 5V can be applied to vary the speed of the motor. The direction of the motor can be preset by the direction control input. When using the run/stop input, there are three ramp up profiles from standstill to select from. The run/stop input will override all other inputs into the driver. This controller features protection from over-current and under voltage. The fault protection is set for a cycle-by-cycle motor turn-off.

Fault Protection

This driver is equipped with a Fault LED to alert the user of the following conditions:

1. Over-Current - the driver is equipped with cycle-by-cycle over current protection.
2. Under Voltage lockout activation at 9.1VDC for the input voltage.
3. Freewheel - when activated, motor will coast to a stop.

The fault protection is set for a cycle-by-cycle motor turn-off. Cycle-by-cycle over current limiting is done by monitoring the peak motor current and upon an over current of the set value of the potentiometer, the motor phases are immediately turned off and held off for the remainder of the internal PWM oscillation. A red Fault LED illuminates to notify the user when an error occurs.

Ordering Information

PART #	DESCRIPTION
MBDC050-050301	BDC Driver, 30A, 20-50VDC
PSA40V4A	DC Power Supply 40VDC at 4.0 Amps
PSA40V8A	DC Power Supply 40VDC at 8.0 Amps

Specifications

VSpeed Control: (TB1, Pin 1)

0VDC - Motor Stopped

5VDC - Max Speed (6.25VDC max)

Control Inputs: (TB1, Pins 2-4)

TTL-CMOS Compatible

Logic "0" = 0-0.8VDC

Logic "1" = OPEN

All inputs (enable and direction) are pulled up through 10k ohm resistors.

Run/Stop: (TB1, Pin 2)

Logic "1" - Motor will not run and if running will decelerate rapidly

Logic "0" - Motor will run

Direction Control: (TB1, Pin 3)

Logic "1" (open) - Counterclockwise

Logic "0" - Clockwise

Freewheel: (TB1, Pin 4)

Logic "1" - Motor is Enabled

Logic "0" - Motor is de-energized and will coast to a stop

Vref: (TB1, Pin 5)

6.25V output @ 30mA maximum.

Power Requirements: (TB2, Pins 3)

20VDC (min) - 50VDC (max)

Output Current Rating:

10.0 - 30.0 Amps peak maximum operating current

5.0 - 15.0 Amps continuous operating current

Operating Temperature:

Case: 0° to +70° C

Motor Connection

Refer to the hookup diagram for typical driver applications. When connecting a motor for the first time, first connect the power input (20-50VDC) to TB2 pin 3 and 4 and make sure the green LED light turns on. Power down the unit and then connect the phases of the motor to pin 1 and 2 of TB2. For the motor to run, Run/Stop (TB1, pin 2) must be connected to ground (TB1, pin 6). An external DC voltage supply (0-5VDC) is connected to Vspeed (TB1, pin 1) and referenced to AGND (pin 6) of TB1 to vary the speed of the motor. Once these connections are made, power up and green LED should turn on and the motor should run.

Speed Adjust Setting (TB1 - pin 1)

The speed of the motor can be adjusted by varying the external DC voltage supply from 0 - 5V applied at pin 1 and referenced to AGND (pin 6 on TB1).

Motor Run/Stop (TB1 - pin 2)

The motor run/stop feature allows the motor to run or to remain stopped. A low signal at pin 2 on TB1 allows the motor to run, while a high signal will cause the motor to be stopped.

Motor Direction (TB1 - pin 3)

The motor direction feature allows the changing of the rotation of the motor. This input should not be changed while the motor is running. An open input causes the motor to turn in the CCW direction, while a low at this input causes the motor to turn in the CW direction.

Motor Freewheel (TB1 - pin 4)

The motor freewheel feature allows the de-energizing of the motor phases. An open input at this input causes the motor to run, while a low signal at this input causes the motor to coast to a stop or remain stopped.

Terminal Descriptions

PIN #	DESCRIPTION
1	VSpeed (0-5VDC)
2	Run/Stop
3	Direction
4	Freewheel
5	VRef
6	AGND

TB1: Input Terminals

PIN #	DESCRIPTION
1	Motor Phase OUT 1
2	Motor Phase OUT 2
3	Vin (20-50VDC)
4	PGND

TB2: Input and Motor Terminals

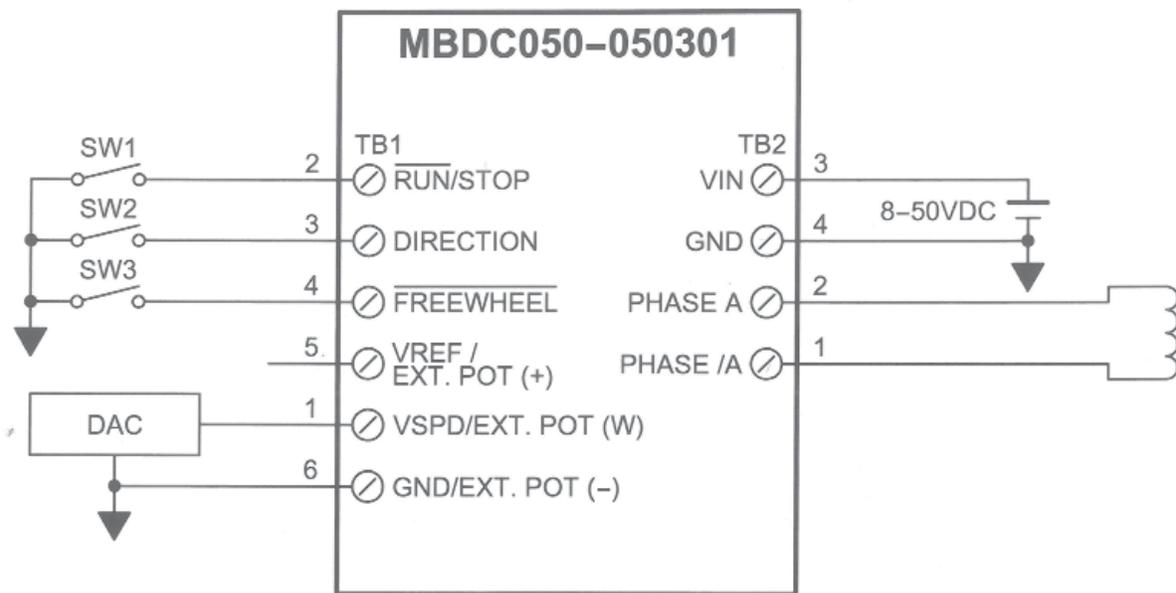
External Potentiometer Setting

Potentiometer Setting	Peak Current (Amps)
0%	10.0A
10%	12.0A
20%	14.0A
30%	16.0A
40%	18.0A
50%	20.0A
60%	22.0A
70%	24.0A
80%	26.0A
90%	28.0A
100%	30.0A

Dip Switch Ramp Settings

Function	ON/OFF	RAMP 1	RAMP 2
Ramp Profile 1 (4 Sec)	Off	Off	Off
Ramp Profile 2 (2 Sec)	Off	Off	On
Ramp Profile 3 (1 Sec)	Off	On	Off
Ramp Profile 4 (500mSec)	Off	On	On
No Ramp	On	---	---

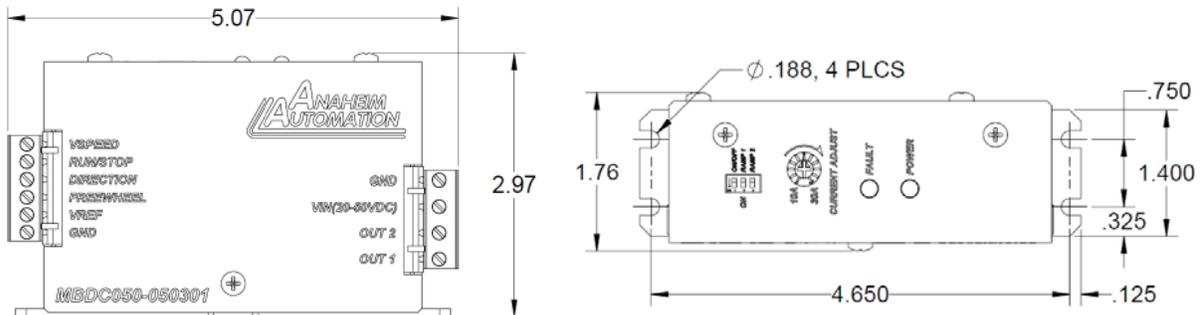
Hookup Drawing



Heating Considerations

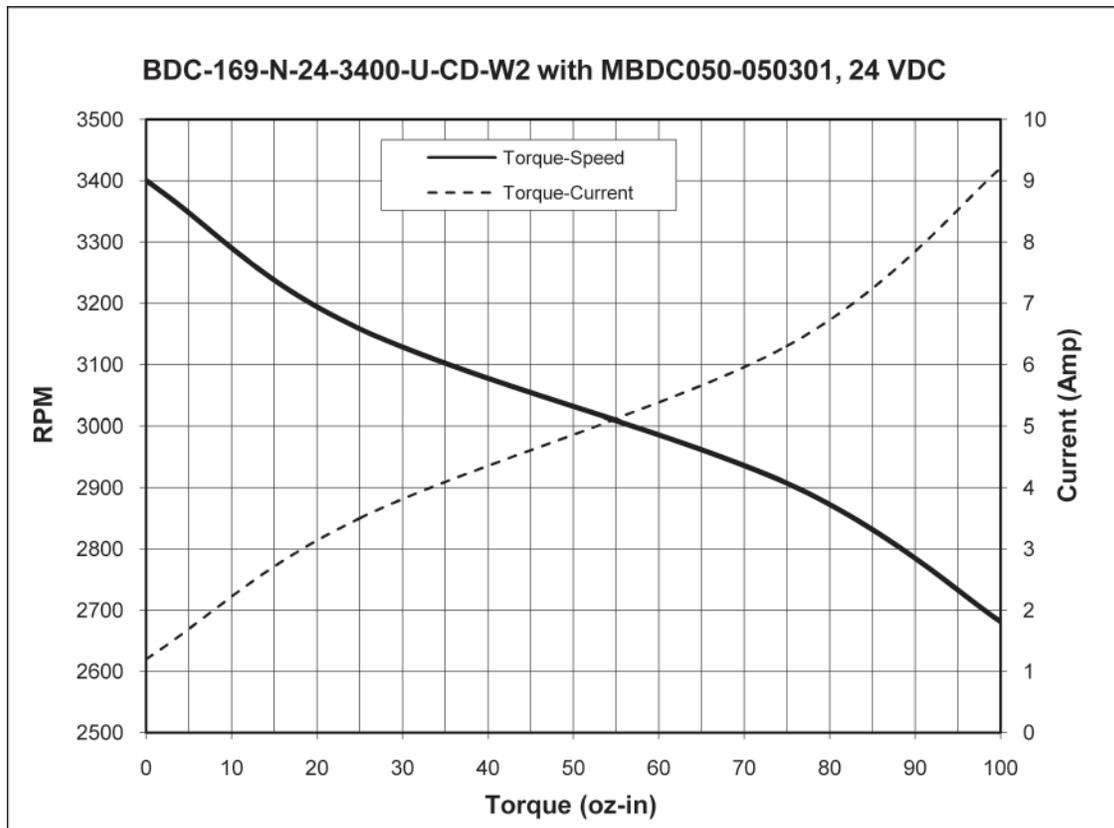
The temperature of the case should never be allowed to rise above 70 degrees Celsius. If necessary, mount the unit to an additional heat sink or air should be blown across the heat sink to maintain suitable temperatures.

Dimensions



All units are in inches

Torque Speed Curves



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TECHNICAL SUPPORT

If you should require technical support or if you have problems using any of the equipment covered by this manual, please read the manual completely to see if it will answer the questions you have. If you need assistance beyond what this manual can provide, contact your Local Distributor where you purchased the unit, or contact the factory direct.

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