



## Specifications

Model	Source Voltage (VDC)	Armature Voltage Range (VDC)	Continuous Armature Current (Amps)	Motor Horsepower Range
DCN300-6	12 24	Up to 95% of Source Voltage**	3*	1/25 - 3/8 1/12 - 3/4

\* Peak current rating is 6 amps for 1 minute.

\*\* Output voltage is 1 VDC less than the input voltage. The 1 VDC drop is a result of a reverse polarity protection diode. This diode can be removed for OEM's who do not need reverse polarity protection.

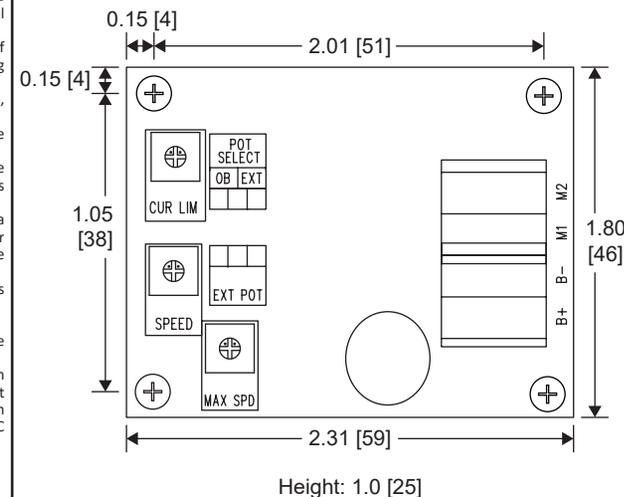
DC Source Voltage Range	10 - 32 VDC
Acceleration Time	0.25 seconds
Deceleration Time	0.25 seconds
Input Impedance (S1 to S2)	>100K ohms
Analog Input Signal Range	0 - 5 VDC
Form Factor	1.01
Load Regulation	1.0% of base speed
Speed Range	80:1
Maximum Vibration 0 - 50 Hz (>50 Hz)	0.5G (0.1G)
Surrounding Air Temperature Range	32 - 104°F / 0 - 40°C
Weight	0.04 lbs / .02 kg

## Safety Warnings

### READ ALL SAFETY WARNINGS BEFORE INSTALLING THIS EQUIPMENT

- **DO NOT INSTALL, REMOVE OR REWIRE THIS EQUIPMENT WITH POWER APPLIED.** Have a qualified electrical technician install, adjust and service this equipment. Follow the National Electrical Code and all other applicable electrical and safety codes, including the provisions of the Occupational Safety and Health Act (OSHA), when installing equipment.
- Avoid direct contact with the printed circuit board or with circuit elements to prevent the risk of serious injury or fatality. Use approved personal protection equipment and insulated tools if working with power applied. Use a non-metallic screwdriver for adjusting the calibration trim pots.
- Reduce the chance of an electrical fire, shock, or explosion by using proper grounding techniques, over-current protection, thermal protection and enclosure. Follow sound maintenance procedures.
- The drive is not diode-protected from reverse battery voltage. You must ensure that the positive terminal is wired to +BAT and the negative terminal is wired to -BAT.
- **Removing DC source power is the only acceptable method for emergency stopping.** Do not use braking, decelerating, or coasting to a stop for emergency stopping. They may not stop a drive that is malfunctioning.
- Applying and removing DC source voltage is recommended for infrequent starting and stopping of a drive only. Braking, decelerating to minimum speed, or coasting to a stop is recommended for frequent starts and stops. Frequent starting and stopping can produce high torque. This may cause damage to motors.
- **Do not disconnect any of the motor leads from the drive** unless power is removed or the drive is disabled. Opening any one lead while the drive is running may damage the drive.
- Under no circumstances should power and logic level wires be bundled together.
- Be sure potentiometer tabs do not make contact with the potentiometer's body. Grounding the input may cause damage to the drive.
- This product does not have internal solid state motor overload protection. It does not contain speed-sensitive overload protection, thermal memory retention, or provisions to receive and act upon signals from remote devices for over temperature protection. If motor protection is needed in the end-use product, it needs to be provided by additional equipment in accordance with NEC standards.

## Dimensions



ALL DIMENSIONS IN INCHES [MILLIMETERS]

## Installation

### Mounting

- Components are sensitive to electrostatic discharge. Avoid direct contact with the circuit components.
- Protect from dirt, moisture, and accidental contact.
- Provide sufficient room for access to the terminal block and calibration trim pots.
- Mount away from heat sources. Operate within the surrounding air temperature range.
- Prevent loose connections by avoiding excessive vibration.
- Mount in either a horizontal or vertical plane. Four 0.19" (5 mm) wide slots in the board accept #8 pan head screws.

**Wiring:** Use 18 - 24 AWG wire for logic wiring. Use 16-20 AWG wire for DC source (+BAT, -BAT) and motor (A1, A2) wiring.

**Shielding Guidelines:** As a general rule, it is recommended to shield all conductors. If it is not practical to shield power conductors, it is recommended to shield all logic-level leads. If shielding of logic-level leads is not practical, the user should twist all logic leads with themselves to minimize induced noise. It may be necessary to earth ground the shielded cable. If noise is produced by devices other than the drive, ground the shield at the drive end. If noise is generated by the drive, ground the shield at the end away from the drive. Do not ground both ends of the shield.

**Fusing:** An external line fuse is required for protection. Use fast acting fuses rated for at least 150% of the maximum armature voltage and current. Fuse the positive terminal.

## Connections

### Input Power

Connect the DC input power leads to terminals B+ (positive) and B- (negative).

### Motor

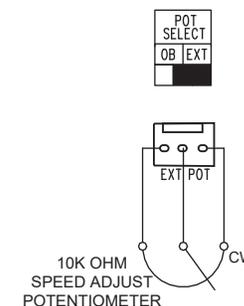
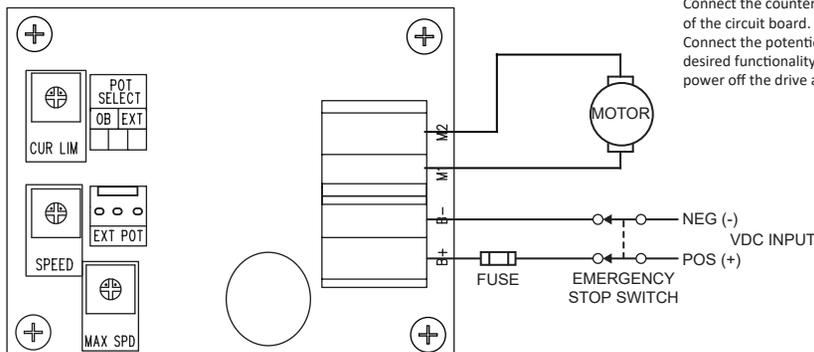
Connect the DC armature leads to terminals A1 and A2. If the motor does not spin in the desired direction, power down the drive and reverse these connections.

### On-board Trim Pot

If no remote speed control is desired, jumper OB on the POT SELECT jumper. Use the SPEED trim pot to set the motor speed.

### Speed Potentiometer

Jumper EXT on the POT SELECT jumper to use a 10K ohm, 1/4 W potentiometer for speed control. Connect the counter-clockwise end of the potentiometer to the EXT POT terminal closest to the outside of the circuit board. Connect the potentiometer wiper to the middle terminal of the EXT POT header. Connect the potentiometer supply to the inside terminal. If the potentiometer works inversely of desired functionality, (i.e. to increase motor speed, you must turn the potentiometer counterclockwise), power off the drive and swap the outer connections.



# Startup

## STARTUP

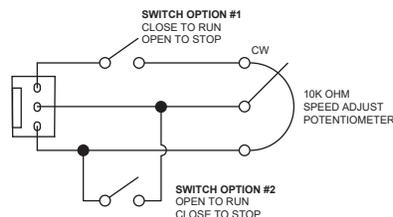
- Verify that no foreign conductive material is present on the printed circuit board.

1. Turn the speed adjust potentiometer full counterclockwise (CCW).
2. Apply DC source voltage.
3. Slowly advance the speed adjust potentiometer clockwise (CW). The motor slowly accelerates as the potentiometer is turned CW. Continue until the desired speed is reached.
4. Remove DC source voltage from the drive to coast the motor to a stop.

# Operation

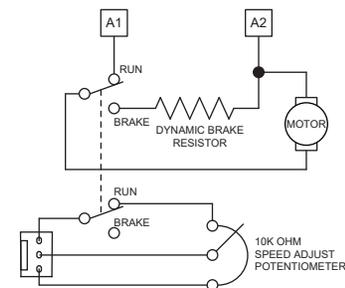
## Run/Stop Switch - Coast or Decelerate to Zero Speed

Either of the two options shown below can be used to coast a motor to zero speed. Opening Switch Option #1, or closing Switch Option #2, decelerates the motor from set speed to zero speed. Closing Switch Option #1, or opening Switch Option #2, will accelerate the motor to set speed. If two methods of starting and stopping are required, both options can be used concurrently.



## Run/Stop Switch - Dynamic Brake to Zero Speed

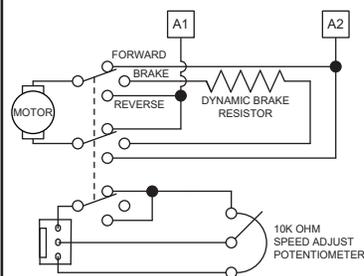
Dynamic braking may be used to rapidly stop a motor. For the RUN/BRAKE switch, use a two pole, two position switch rated for at least the armature voltage rating and 150% of the armature current rating. For the dynamic brake resistor, use a high power, wirewound resistor. Sizing the dynamic brake resistor depends on load inertia, motor voltage, and braking time. Use a lower-value, higher-wattage dynamic brake resistor to stop a motor more rapidly.



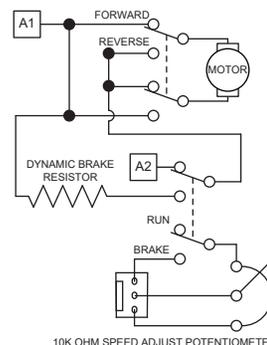
## Reversing with a Dynamic Brake

A dynamic brake may be used when reversing the motor direction. Use a three pole, three position switch rated for at least the armature voltage rating and 150% of the armature current rating. For the dynamic brake resistor, use a high power, wirewound resistor. Sizing the dynamic brake resistor depends on load inertia, motor voltage, and braking time. Use a lower-value, higher-wattage dynamic brake resistor to stop a motor more rapidly.

**The motor must come to a complete stop before changing directions.**



3P3T Relay for Forward/Brake/Reverse



Two DPDT Switches for Independent Run/Brake & Forward/Reverse Switches

# Calibration

**Maximum Speed (MAX SPD):** The MAX SPD setting determines the maximum motor speed when the speed adjust potentiometer is set for maximum speed. To calibrate the MAX SPD:

1. Set the MAX SPD trim pot full CCW.
2. Set the speed adjust potentiometer for maximum speed.
3. Adjust the MAX SPD trim pot until the desired maximum speed is reached.

**Torque (CUR LIM):** The CUR LIM setting determines the maximum torque for accelerating and driving the motor. To calibrate the CUR LIM:

1. With the power disconnected from the drive, connect a DC ammeter in series with the armature.
2. Set the CUR LIM trim pot to minimum (full CCW).
3. Set the speed adjust potentiometer to maximum speed (full CW).
4. Carefully lock the motor armature. Be sure that the motor is firmly mounted.
5. Apply line power. The motor should be stopped.
6. Slowly adjust the CUR LIM trim pot CW until the armature current is 150% of motor rated armature current. **Continuous operation beyond this rating may damage the motor.**
7. Turn the speed adjust potentiometer CCW.
8. Remove line power.
9. Remove the stall from the motor.
10. Remove the ammeter in series with the motor armature if it is no longer needed.

