

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

AMCI

SD17060B-25

STEPPER MOTOR DRIVER

Used with the applicable stepper motor driver configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: AMCI SD17060B official user manual 940-0S064

SD17060B SD17060B-03 SD17060B-25 Stepper Drivers

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User Manual



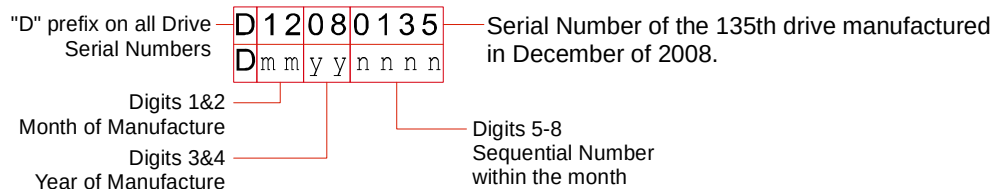
AMCI Motion Control Products

INTRODUCING THE SD17060B

This manual is designed to get you up and running quickly using the SD17060B or SD17060B-25 stepper drivers. As such, it assumes you have some basic knowledge of stepper systems, such as the resolution you want run your motor at, and the reasons why you'd want to use Idle Current Reduction and the reasons why you wouldn't. If these terms or ideas are new to you, we're here to help. AMCI has a lot of information on our website and we are adding more all the time. If you can't find what you're looking for at <http://www.amci.com>, send us an e-mail or call us. We're here to back you up with all of our knowledge and experience.

Applicable Units

This manual applies to all SD17060B drivers manufactured after December of 2008 as well as some SD17060B drivers manufactured during December of 2008. This manual also applies to all SD17060B-03 and SD17060B-25 drivers. You will be able to determine the date of manufacture from the serial number on the driver. Serial numbers for all AMCI drivers are formed from a date code and sequential number. The serial number format is shown below.



For SD17060B Drives...

- If your year of manufacture is 2009 or later, (digits 3 and 4 are "09" or greater), then this manual applies.
- If your month and year of manufacture is December of 2008, (digits 1 through 4 are "1208"), and the sequential number is "0135" or greater, then this manual applies.
- If your month and year of manufacture is December of 2008, (digits 1 through 4 are "1208"), and the sequential number is less than "0135" then most of the information in this manual applies. The only difference is that these older SD17060B drivers require external resistors for input signals greater than 5Vdc. Refer to Appendix A on page 18 for additional information.
- If your month and year of manufacture is November of 2008 or earlier, (digits 1 through 4 are "1108" or less), then most of the information in this manual applies. The only difference is that these older SD17060B drivers require external resistors for input signals greater than 5Vdc. Refer to Appendix A on page 18 for additional information.

For SD17060B-03 Drives...

- The "-03" option was added in February of 2010. This manual applies to all SD17060B-03 units.

For SD17060B-25 Drives...

- SD17060B-25 drivers have different resolution settings than the SD17060B and SD17060B-03. In addition to this change, the SD17060B-25 will only accept 24Vdc input signals. The SD17060B-25 cannot be used in systems that have 5Vdc differential or 12Vdc single ended signals.

SPECIFICATIONS

Driver Type

Two bipolar MOSFET H-bridges with 170Vdc output bus. 20KHz PWM current control.

Physical Dimensions

Width: 2.1 inches max.

Depth: 4.0 inches max.

Height: 6.2 inches

7.0 inches with mounting tabs

Weight

2.4 lbs. (1.1 kg.)

Inputs

Electrical Characteristics for all Inputs:
Differential. 1500 Vac/dc opto-isolated. Can be wired as single ended inputs.

Indexer Motor steps on high going pulse.
250 nS min. pulse width, 2 MHz maximum input frequency. 500 nS minimum dwell time between direction changes.

Disable Programmable Active State (ON or OFF). Disables current to motor. Driver does not accept steps while disabled.

Fault Output

Electrical Characteristics:
Open Collector/Emitter. 1500 Vac/dc opto-isolated. 30Vdc, 20 mA max.

The Fault Output is normally on. Turns off under the following conditions:

Reset The driver initialization is not yet complete on power up.

Short Circuit Motor Phase to Phase or Phase to Earth Ground

Over Temp Heat Sink temperature exceeds 90° C (195° F)

No Motor The motor interlock terminals are not connected.

Pulse Train Input

Switch selectable to CW/CCW or Step/Direction

Motor Current

Switch selectable from 1.0 to 6.3ARMS in 0.1 Amp steps.

Idle Current Reduction

Switch selectable to *Not reduced*, *To 69%*, *To 50%*, or *To 0%*. Motor current is reduced to selected level if a step pulse is not received for one second for the *To 50%*, and *To 0%* settings. For the *To 69%*, setting, current is reduced after 10 milliseconds. Current is restored to full value on next pulse.

Resolution

SD17060B:

Switch selectable to 200, 400, 1,000, 2,000, 5,000, 10,000, 12,800, 18,000, 20,000, 21,600, 25,000, 25,400, 25,600, 36,000, 50,000, or 50,800 steps per turn.

SD17060B-25:

Switch selectable to 200, 400, 1,000, 1,600, 2,000, 3,200, 5,000, 10,000, 12,800, 18,000, 20,000, 21,600, 25,000, 36,000, 50,000, or 50,800 steps per turn.

Internal Power Fuses

10 Amp Slow Blow. Both Line and Neutral are fused. Fuses are not user replaceable.

Environmental Specifications

Input Power 95 to 132Vac, 50/60 Hz, 5.0 Apk max.

Driver will retain control of motor down to 85Vac at reduced torque.

Ambient Operating Temperature
-4° to 122°F (-20° to 50°C)

Storage Temperature
-40° to 185°F (-40° to 85°C)

Humidity 0 to 95%, non-condensing

Motor Specifications

Type 2 phase hybrid. 4, 6, or 8 lead motor

Insulation Minimum 500Vdc phase-to-phase and phase-to-case

Inductance 0.3 mH minimum. 2.5 to 45 mH recommended

Connectors

All mating connectors are included with driver.

Connector	Wire	Strip Length	Min. Tightening Torque
Indexer	28 - 16 AWG	0.275 inches	1.95 lb-in (0.22 nM)
Motor	24 - 12 AWG	0.275 inches	4.43lb-in (0.5 nM)
Power	24 - 12 AWG	0.275 inches	4.43lb-in (0.5 nM)

MOUNTING THE SD17060B

Outline Drawing

There are two ways to mount the SD17060B.

- The first method is with four #10-32 screws into its side panel.
- The second method is by the mounting tabs. Mounting tabs are for #6 screws.



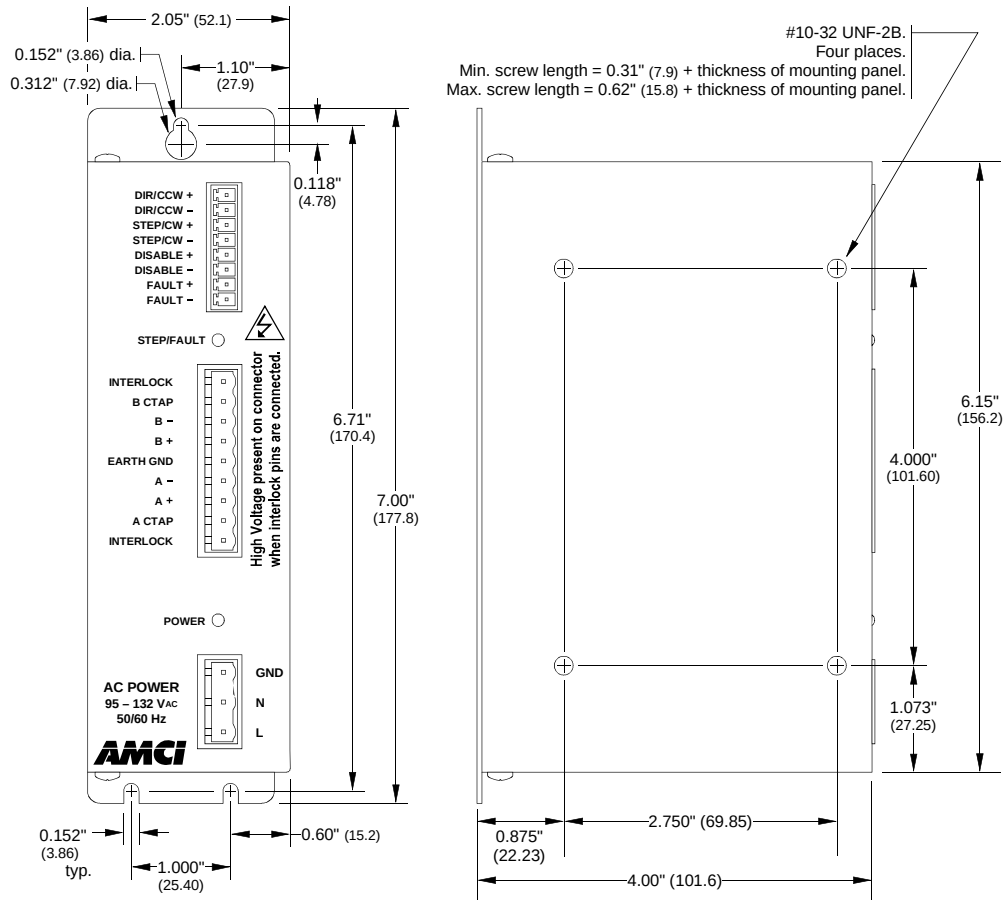
WARNING

Minimum and maximum screw lengths should be observed to prevent a screw from shorting to the PC Board.



NOTE

There are airflow holes in the top and bottom of the enclosure. To ensure adequate convective airflow, the driver must be mounted in the orientation shown in the drawing.



Grounding

The SD17060B must be grounded for proper operation. The **GND** connection on the power connector is connected to the SD17060B enclosure and is a sufficient grounding point for most applications. When mounted the SD17060B on a surface that is electrically conductive and grounded, you should also take steps to ensure that the two are electrically bonded together. If necessary, remove paint for the bolt mounting surfaces of the panel to ensure adequate electrical bonding.

Airflow and Wiring Space

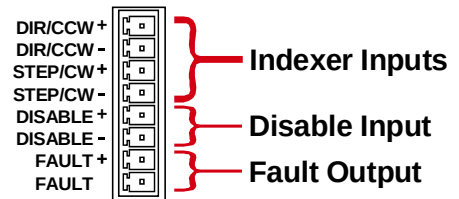
To ensure adequate airflow and wiring space, you need two inches (50 mm) of space above and below the driver, one and one-half inches (37 mm) of space to the left and right of the driver, and one inch (25 mm) of space in front of the driver. These dimensions are typical for convective cooling. If you have an active cooling system such as enclosure fans, you will be able to mount the drivers closer together.

CONNECTING YOUR CONTROLLER

I/O Connector

The I/O connector on the SD17060B accepts inputs from your indexer as well as the Disable Input and Fault Output.

All SD17060B-03 drivers and SD17060B drivers sold after December, 2008, have inputs that accept 5Vdc differential signals and can also be wired to accept single ended sinking or sourcing inputs of up to 24Vdc without the need of an additional current limiting resistor. SD17060B-25 units only have 24Vdc inputs. See [Applicable Units](#) on page 3 for information on determining when your unit was shipped from the AMCI factory.



Input Wiring

All inputs on the SD17060B are low voltage, low power signals. All wiring should use shielded, twisted pair cable such as Belden 9727 instrumentation cable.

The shield of the cable should be grounded at one end only, preferably at the indexer or controller. Do not ground the shields at the SD17060B. If you must splice the cable, do not connect the shields to ground of the junction box.

Indexer Inputs

These inputs can be programmed to accept Step & Direction or CW/CCW pulses. This setting is controlled by SW1-1.

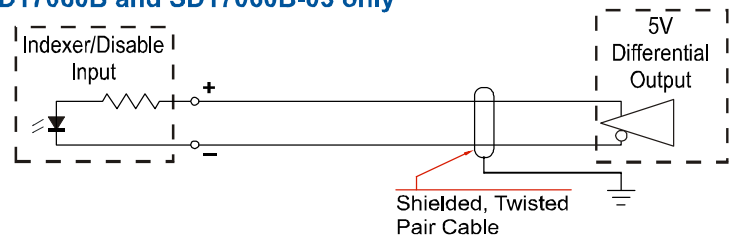
Disable Input

When active, the motor current is off and the driver does not accept indexer pulses. The active state of the Disable Input is set by switch SB1-4.

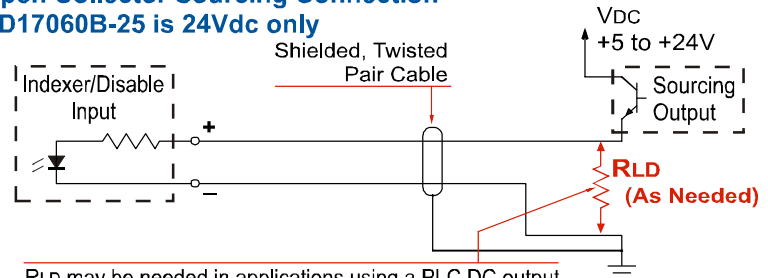
RLD

An additional load resistor may be required on some PLC outputs to improve switching time. A symptom of this problem is that the motor will begin to run rough at high speeds. A 470 or 560 ohm resistor should be used. For 5V and 12V systems use a 1W resistor. For 24V systems use a 2W resistor. These power ratings assume that the output can be normally on. For systems where you are sure the output is always normally off, the wattage ratings can be cut in half.

Differential Connection SD17060B and SD17060B-03 only

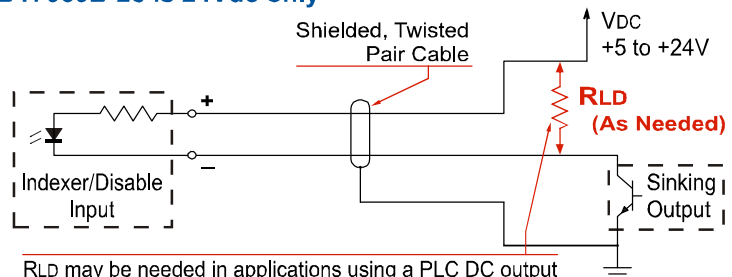


Open Collector Sourcing Connection SD17060B-25 is 24Vdc only



RLD may be needed in applications using a PLC DC output to generate index pulses at high speeds. See the note on this page for more information.

Open Collector Sinking Connection SD17060B-25 is 24Vdc only



RLD may be needed in applications using a PLC DC output to generate index pulses at high speeds. See the note on this page for more information.

CONNECTING YOUR MOTOR

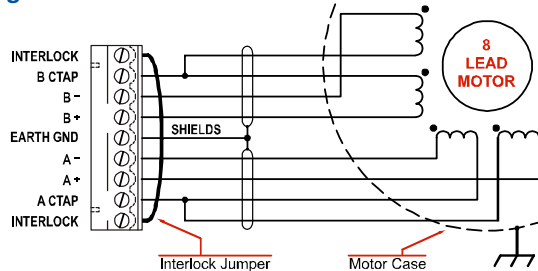
Compatible Motors

The SD17060B will work with many different motors, including those not sold by AMCI. This section assumes that you have already chosen your motor and you are looking for wiring information. No wire colors are given because there is no single industry wide color coding standard for stepper motor wires. You must refer back to your motor data sheets for this information.

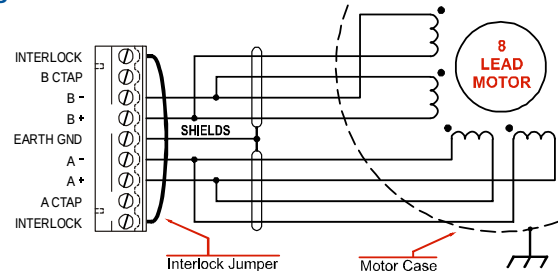
AMCI offers several different stepper motors in sizes 23 and 34. Refer to our website, www.amci.com, for additional information on these products.

Motor Wiring

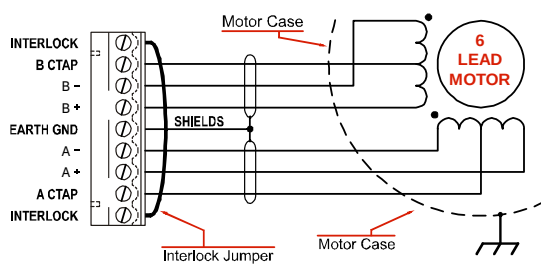
Eight Lead Series Connected



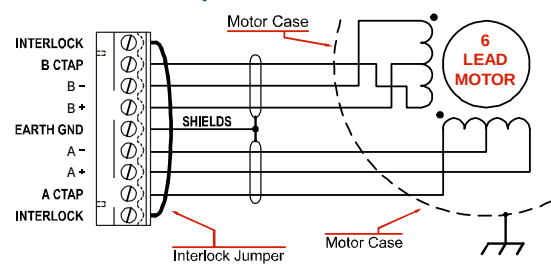
Eight Lead Parallel Connected



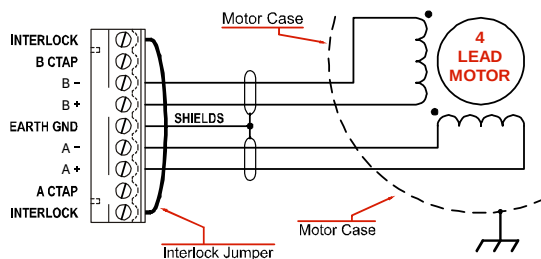
Six Lead Series Connected



Six Lead Center Tap Connected



Four Lead Connected



Refer to the torque vs. speed curves on your motor's specifications sheet to determine if you should wire the motor to the SD17060B in series, parallel, or centertap configuration.

The two center tap pins on the drive are electrically isolated and are for wiring convenience only.

Reversing the $\pm B$ connections will reverse the motor's direction of rotation.

NOTE

- 1) The Interlock jumper is a safety device that is needed for proper operation. The SD17060B will not power the motor without this jumper. When the jumper is installed, up to 170Vdc is present on the connector. Do not use the Interlock for anything other than its intended use as a safety device.
- 2) 170Vdc is present on the connector when power is applied to the motor. Install the supplied rubber boot on the connector during normal operation.
- 3) Motor connections should be tight. Loose connections may lead to arcing which will heat the connector. Phoenix Contact specifies a tightening torque of 4.4 to 5.4 lb-in. (0.5 to 0.6 Nm)