SSDC-D/IP

Step-Servo System

Hardware Manual

SSDC03/0610-D
SSDC03/0610-D-FC
SSDC03/06/10-IP
SSDC03/06/10-IP-FC

SHANGHAI AMP&MOONS' AUTOMATION CO.,LTD.

Rev. 1.1
08/15/2025

1 Introduction....3
1.1 Features....3
1.2 Block Diagram....5
1.3 Safety Instructions....6
2 Getting Started....7
2.1 Installing Software....8
2.2 Connecting the Drive to Your PC using Ethernet....9
2.3 Connecting the Power Supply....13
2.4 Choosing a Power Supply....14
2.4.1 Voltage....14
2.4.2 Current....15
2.5 Connecting the Motor....25
3 Inputs and Outputs....26
3.1 Digital Inputs....27
3.1.1 X1, X2, X3 and X4 Digital Inputs....27
3.1.2 X5, X6, X7 and X8 digital Inputs....28
3.2 Digital Outputs....29
3.3 Analog Inputs....30
3.4 Encoder output....30
3.5 Secondary Encoder Input....31
4 Mounting the Drive....32
5 LED Error Codes....32
6 Reference Materials....33
6.1 Drive Mechanical Outlines....33
6.2 Technical Specifications....34
6.3 Recommended Motors....35
7 Contacting MOONS'....36

1 Introduction

Thank you for selecting the MOONS' SSDC series Step-Servo drive and motor. SSDC series combines servo technology with a stepper motor to create a product with exceptional feature and broad capability.

The SSDC series is a high performance, intelligent Step-Servo system with multi-axes field bus control.

The eSCL commands, Modbus/TCP commands and EtherNet/IP commands can be used to control the drive and motor in real time. The motion control program can be stored in the drive (Q program) and then the eSCL commands, Modbus/TCP commands or EtherNet/IP commands can be used to call programs flexibly.

This document contains mainly descriptive information about the stepper servo drive:

Model	
★ SSDC03-D-FC	SSDC03-D
★ SSDC06-D-FC	SSDC06-D
★ SSDC10-D-FC	SSDC10-D
★ SSDC03-IP-FC	SSDC03-IP
★ SSDC06-IP-FC	SSDC06-IP
★ SSDC10-IP-FC	SSDC10-IP
★: Conforms to UL certification.	

c UL us

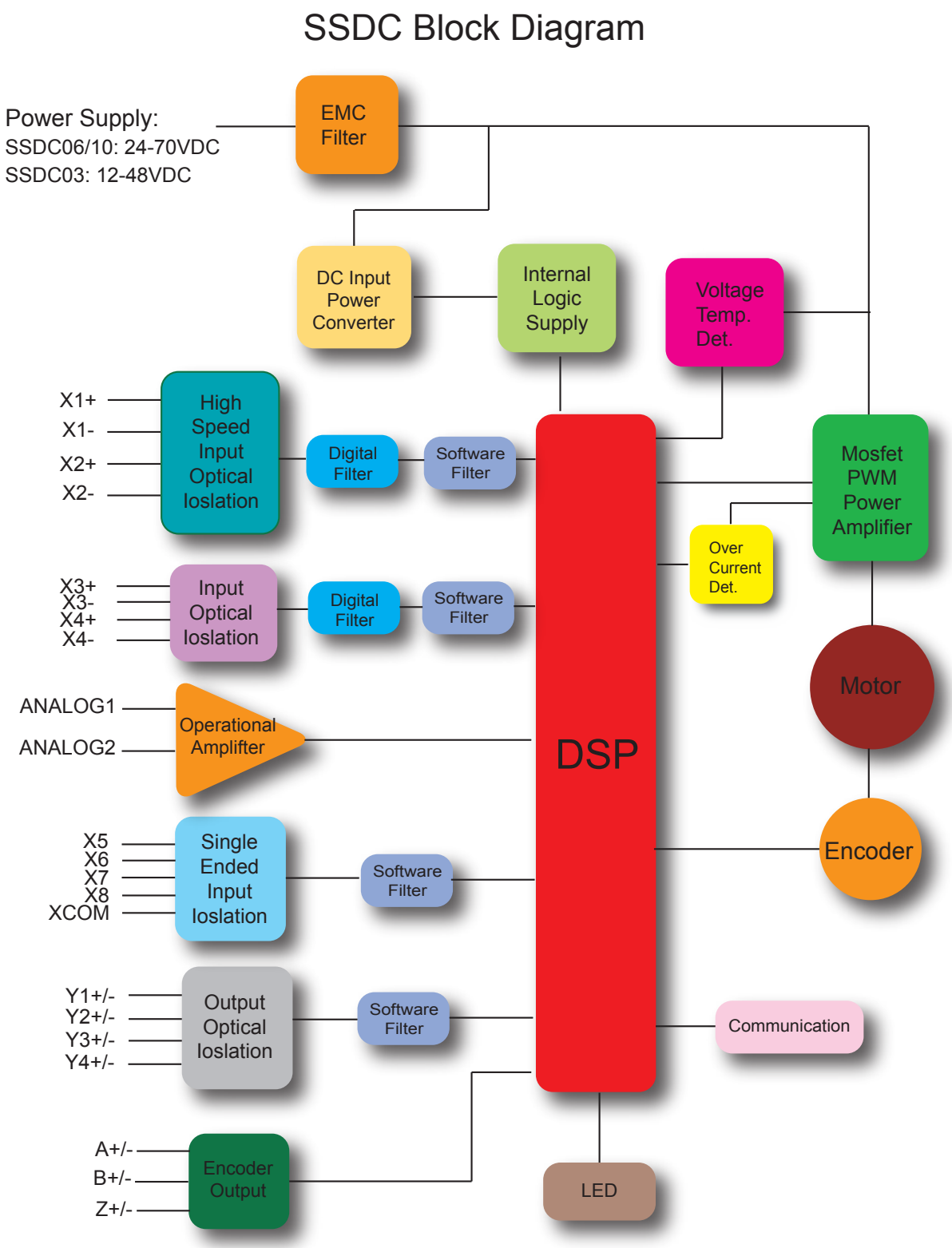
1.1 Features

- Programmable, digital step-servo drive and motor package
- Control modes:
  Velocity Control: Digital signal control, Analog control, eSCL command, Q programming
  Position Control: Digital signal control, Analog control, eSCL command, Q programming
  Torque Control: Analog control, eSCL command, Q programming
- Multi-operation modes:
  Closed-loop Servo control mode, Closed-loop Step control mode, Full closed-loop mode
- Current output
  SSDC03 output current：continuous 3A/phase（peak of sin），boost 4A(1.5s)
  SSDC06 output current：continuous 6A/phase（peak of sin），boost 7.5A(1.5s)
  SSDC10 output current：continuous 10A/phase（peak of sin），boost 15A(1.5s)
- Wide range input voltage:
  SSDC03：12~48VDC
  SSDC06：24~70VDC
  SSDC10：24~70VDC
- Encoder resolution：
  20000 counts/rev (AM17/23/24/34SS-N motor)
  4096 counts/rev (AM11/17/23/24/34RS motor)
- Differential encoder outputs (ENC A+/-, ENC B+/-, ENC Z+/-), 26C31 line driver, 20 mA sink or source max
- Support secondary encoder signal input(single-ended or differential) for full closed-loop control
- Abundant I/O interface
  8 optically isolated digital inputs,5-24VDC
  4 optically isolated digital outputs,max30V/100mA

2 analog inputs can be configured to 0-5V, 0-10V, ±5V or ±10V signal ranges

- Communication
  -D：Dual-port RJ45 connector，eSCL command，Modbus/TCP protocol
  -IP：Dual-port RJ45 connector，eSCL command，EtherNet/IP protocol

1.2 Block Diagram



1.3 Safety Instructions

Only qualified personnel should transport, assemble, install, operate, or maintain this equipment. Properly qualified personnel are persons who are familiar with the transport, assembly, installation, operation, and maintenance of motors, and who meet the appropriate qualifications for their jobs.

To minimize the risk of potential safety problems, all applicable local and national codes regulating the installation and operation of equipment should be followed. These codes may vary from area to area and it is the responsibility of the operating personnel to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. MOONS does not guarantee the products described in this publication are suitable for a particular application, nor do they assume any responsibility for product design, installation, or operation.

Read all available documentation before assembly and operation. Incorrect handling of the products referenced in this manual can result in injury and damage to persons and machinery.

All technical information concerning the installation requirements must be strictly adhered to.

It is vital to ensure that all system components are connected to earth ground. Electrical safety is impossible without a low-resistance earth connection.

This product contains electrostatically sensitive components that can be damaged by incorrect handling. Follow qualified anti-static procedures before touching the product.

During operation keep all covers and cabinet doors shut to avoid any hazards that could possibly cause severe damage to the product or personal health.

During operation, the product may have components that are live or have hot surfaces.

Never plug in or unplug the Integrated Motor while the system is live. The possibility of electric arcing can cause damage.

Be alert to the potential for personal injury. Follow recommended precautions and safe operating practices emphasized with alert symbols. Safety notices in this manual provide important information. Read and be familiar with these instructions before attempting installation, operation, or maintenance. The purpose of this section is to alert users to the possible safety hazards associated with this equipment and the precautions necessary to reduce the risk of personal injury and damage to equipment. Failure to observe these precautions could result in serious bodily injury, damage to the equipment, or operational difficulty.

2 Getting Started

The following items are needed:

- A 12-70VDC power supply, see the section below entitled “Choose a Power Supply” for helping to choose the right one.
- A compatible SS or RS motor, please see the section below entitled “Recommended Motor”
- A small flat blade screwdriver for tightening the connectors screw(included)
- A PC running Microsoft Windows XP/Vista/7/8(Using serial communication port. Prepare an USB to Serial converter if the PC doesn’t have it.
- Install the Step-Servo Quick Tuner software
  (download from MOONS website: www.moonsindustries.com)
- A power cable(included)
- Included a CAT5 cable, used to do the daisy-chain connection. It is also used to configure the drive.
- Optional extended motor cable(Sold separately)
- Optional extended encoder cable(Sold separately)
- Optional extended I/O cable(Sold separately)

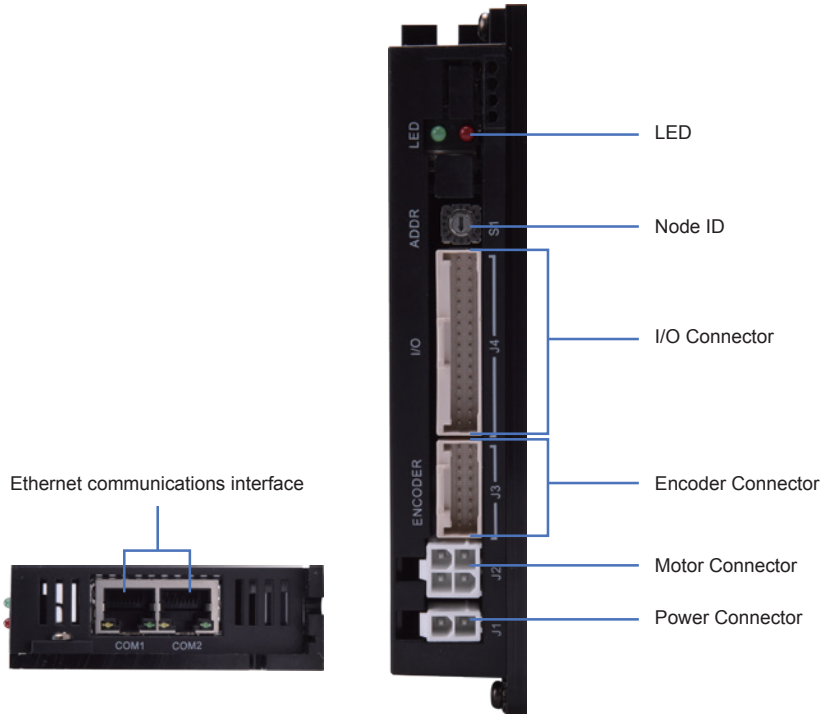
2.1 Installing Software

Step-Servo Quick Tuner is the PC based software application used to configure, and perform servo tuning, drive testing and evaluation of the step-servo products. System servo control gains, drive functionality and I/O configuration are set with ***Step-Servo Quick Tuner***. It also contains an oscilloscope function to help set the servo control gains.

- Download the Step-Servo Quick Tuner from the MOONS' website and install it.
- Launch the software by clicking Start-----Programs ----MOONS'
- connect the drive to PC by communication cable, configure the network on PC. Please see the section below entitled "Connecting the Drive to Your PC using Ethernet".
- Connect the drive to the Power Supply.
- Connect the motor to the drive.
- Power up the drive.
- Click the 'Ping' bottom, the software will recognize your drive, display the model and firmware version and be ready for action.

The connectors and other points of interest are illustrated below:

SSDC-D, Modbus/TCP Communication type / SSDC-IP, EtherNet/IP Communication type



2.2 Connecting the Drive to Your PC using Ethernet

The RJ45 connector of SSDC-D/IP is conformed to 100BASE-TX(100Mbps).

Please use the CAT5 or CAT5e(or higher class) net cable.

This process requires three steps:

- Physically connect the drive to your network (or directly to the PC)
- Set the drive’s IP address
- Set the appropriate networking properties on your PC.

Addresses, Subnets, and Ports

Every device on an Ethernet network must have a unique IP address. In order for two devices to communicate with each other, they must both be connected to the network and they must have IP addresses that are on the same subnet. A subnet is a logical division of a larger network. Members of one subnet are generally not able to communicate with members of another unless they are connected through special network equipment (e.g. router). Subnets are defined by the choices of IP addresses and subnet masks.

If you want to know the IP address and subnet mask of your PC, select Start…All Programs… Accessories…Command Prompt. Then type “ipconfig” and press Enter. You should see something like this:

If your PC’s subnet mask is set to 255.255.255.0, a common setting known as a Class C subnet mask, then your machine can only talk to another network device whose IP address matches yours in the first three octets. (The numbers between the dots in an IP address are called octets.) For example, if your PC is on a Class C subnet and has an IP address of 192.168.0.20, it can talk to a device at 192.168.0.40, but not one at 192.168.1.40. If you change your subnet mask to 255.255.0.0 (Class B) you can talk to any device whose first two octets match yours. Be sure to ask your system administrator before doing this.

Your drive’s IP Address is stored internally in nonvolatile memory. There is a rotary switch to set the IP address. The default addresses are in below table.

	IP Address*
0	10.10.10.10
1	192.168.1.10
2	192.168.1.20
3	192.168.1.30
4	192.168.0.40
5	192.168.0.50
6	192.168.0.60
7	192.168.0.70
8	192.168.0.80
9	192.168.0.90
A	192.168.0.100
B	192.168.0.110
C	192.168.0.120
D	192.168.0.130
E	192.168.0.140
F	DHCP

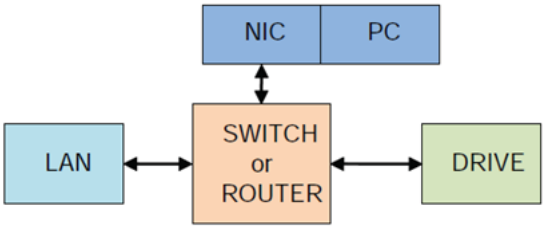
From the SW1 to SWE, you can redefine the IP address by Step-Servo Quick Tuner software. SW0 fixed address “10.10.10.10”, it is a recovery address. If someone were to change the setting and not write it down or tell anyone then you will not be able to communicate with your drive. The only way to “recover” it is to apply power to the drive with the network cable unplugged.

One of the great features of Ethernet is the ability for many applications to share the network at the same time. Ports are used to direct traffic to the right application once it gets to the right IP address. The UDP eSCL port in our drives is 7775. To send and receive commands using TCP, use port number 7776. You’ll need to know this when you begin to write your own application. You will also need to choose an open (unused) port number for your application. Our drive doesn’t care what that is; when the first command is sent to the drive, the drive will make note of the IP address and port number from which it originated and direct any responses there. The drive will also refuse any traffic from other IP addresses that is headed for the eSCL port. The first application to talk to a drive “owns” the drive. This lock is only reset when the drive powers down.

One final note: Ethernet communication can use one or both of two “transport protocols”: UDP and TCP. eSCL commands can be sent and received using either protocol. UDP is simpler and more efficient than TCP, but TCP is more reliable on large or very busy networks where UDP packets might occasionally be dropped.

Option 1: Connect a Drive to Your Local Area Network

If you have a spare port on a switch or router and if you are able to set your drive to an IP address that is compatible with your network, and not used by anything else, this is a simple way to get connected. This technique also allows you to connect multiple drives to your PC. If you are on a corporate network, please check with your system administrator before connecting anything new to the network. He or she should be able assign you a suitable address and help you get going.



If the default address is not acceptable for you network, you can enter a new IP address using Step-Servo Quick Tuner. If your PC address is not in 192.168.1. subnet, you will have to change your subnet mask to 255.255.0.0 in order to talk to your drive. To change your subnet mask:

1. On Windows XP, right click on “My Network Places” and select properties. On Windows 7, click Computer. Scroll down the left pane until you see “Network”. Right click and select properties. Select “Change adapter settings”

2. You should see an icon for your network interface card (NIC). Right click and select properties.

3. Scroll down until you see “Internet Properties (TCP/IP)”. Select this item and click the Properties button. On Windows 7 and Vista, look for “(TCP/IPv4)”

4. If the option “Obtain an IP address automatically” is selected, your PC is getting an IP address and a subnet mask from the DHCP server. Please cancel this dialog.

5. If the option “Use the following IP address” is selected, life is good. Change the subnet mask to “255.255.0.0” and click OK.

Option 2: Connect a Drive Directly to Your PC

It doesn’t get much simpler than this:

1. Connect one end of a CAT5 Ethernet cable into the LAN card (NIC) on your PC and the other into the drive. You don’t need a special “crossover cable”; the drive will automatically detect the direct connection and make the necessary physical layer changes.

2. The factory default IP address of the drive SW0 is “10.10.10.10”.

3. To set the IP address of your PC:

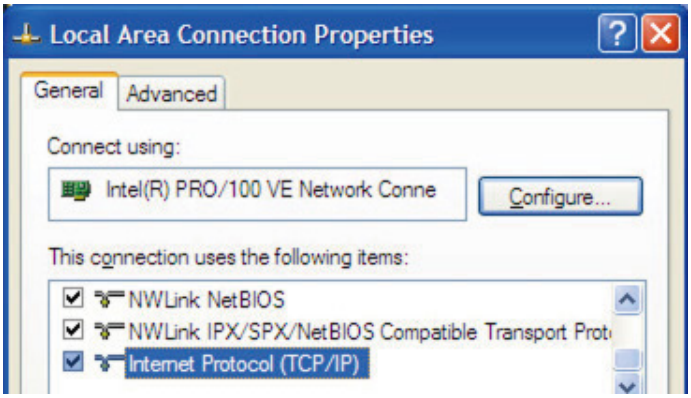
a. On Windows XP, right click on “My Network Places” and select properties.

b. On Windows 7, click Computer. Scroll down the left pane until you see “Network”. Right click and select properties. Select “Change adapter settings”

4. You should see an icon for your network interface card (NIC). Right click and select properties.

a. Scroll down until you see “Internet Properties (TCP/IP)”. Select this item and click the Properties button.

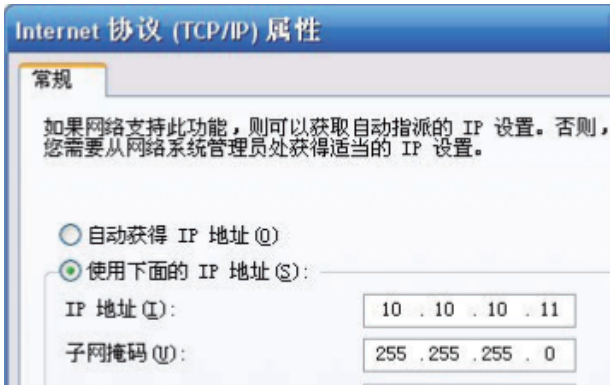
b. On Windows 7 and Vista, look for “(TCP/IPv4)”



5. Select the option “Use the following IP address”. Then enter the address “10.10.10.11”. This will give your PC an IP address that is on the same subnet as the drive. Windows will know to direct any traffic intended for the drive’s IP address to this interface card.

6. Next, enter the subnet mask as “255.255.255.0”.

7. Be sure to leave “Default gateway” blank. This will prevent your PC from looking for a router on this subnet.



Option 3: Use Two Network Interface Cards (NICs)

This technique allows you to keep your PC connected to your LAN, but keeps the drive off the LAN, preventing possible IP conflicts or excessive traffic.

1. If you use a desktop PC and have a spare card slot, install a second NIC and connect it directly to the drive using a CAT5 cable. You don't need a special "crossover cable"; the drive will automatically detect the direct connection and make the necessary physical layer changes.

2. If you use a laptop and only connect to your LAN using wireless networking, you can use the built-in RJ45 Ethernet connection as your second NIC.

3. The factory default IP address of the drive is "10.10.10.10".

4. To set the IP address of the second NIC:

a. On Windows XP, right click on "My Network Places" and select properties.

b. On Windows 7, click Computer. Scroll down the left pane until you see "Network". Right click and select properties. Select "Change adapter settings"

5. You should see an icon for your newly instated NIC. Right click again and select properties.

a. Scroll down until you see "Internet Properties (TCP/IP)". Select this item and click the Properties button.

b. On Windows 7 and Vista, look for "(TCP/IPv4)"

6. Select the option "Use the following IP address". Then enter the address "10.10.10.11". This will give your PC an IP address that is on the same subnet as the drive. Windows will know to direct any traffic intended for the drive's IP address to this interface card.

7. Next, enter the subnet mask as "255.255.255.0". Be sure to leave "Default gateway" blank. This will prevent your PC from looking for a router on this subnet.

8. Because you are connected directly to the drive, anytime the drive is not powered on your PC will annoy you with a small message bubble in the corner of your screen saying "The network cable is unplugged."

2.3 Connecting the Power Supply

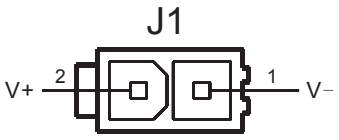
The SSDC series step-servo drive and motor are shipped with a power cable, 2 meters long. Connect the red wire to the positive of the power supply. Connect the black wire to the negative of the power supply. Plug the cable into the power connector of the drive.

(NOTE：Be careful not to reverse the wires. Reversing the connection may open the internal fuse on the drive and void the warranty.)

SSDC03: 12 – 48VDC

SSDC06: 24 – 70VDC

SSDC10: 24 – 70VDC



Power Connector

Connect the chassis to the earth ground through the grounding screws.

The section entitled "2.4 Choosing a Power Supply" will help you to select a right power supply.

2.4 Choosing a Power Supply

The main considerations when choosing a power supply are the voltage and current requirements for the application.

2.4.1 Voltage

The SSDC drive is designed to give optimum performance between 24 and 48 Volts DC. Choosing the voltage depends on the performance needed and motor/drive heating that is acceptable and/or does not cause a drive over-temperature. Higher voltages will give higher speed performance but will cause the RS driver to produce higher temperatures. Using power supplies with voltage outputs that are near the drive maximum may significantly reduce the operational duty-cycle.

SSDC03

For the SSDC03 drive, the extended range of operation can be as low as 11 VDC minimum to as high as 53 VDC maximum. When operating below 11 VDC, the power supply input may require larger capacitance to prevent under-voltage and internal-supply alarms. Current spikes may make supply readings erratic. The supply input cannot go below 11 VDC for reliable operation. This will not fault the drive. Absolute maximum power supply input is 53 VDC at which point an over-voltage alarm and fault will occur. When using a power supply that is regulated and is near the drive maximum voltage of 53 VDC, a voltage clamp may be required to prevent over-voltage when regeneration occurs. When using an unregulated power supply, make sure the no-load voltage of the supply does not exceed the drive’s maximum input voltage of 53 VDC.

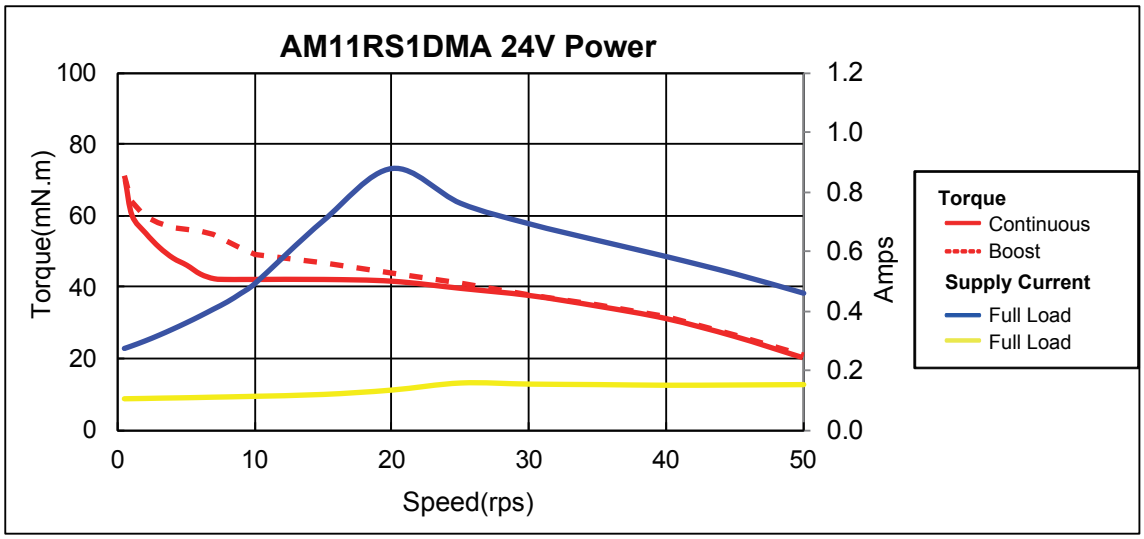
SSDC06/10

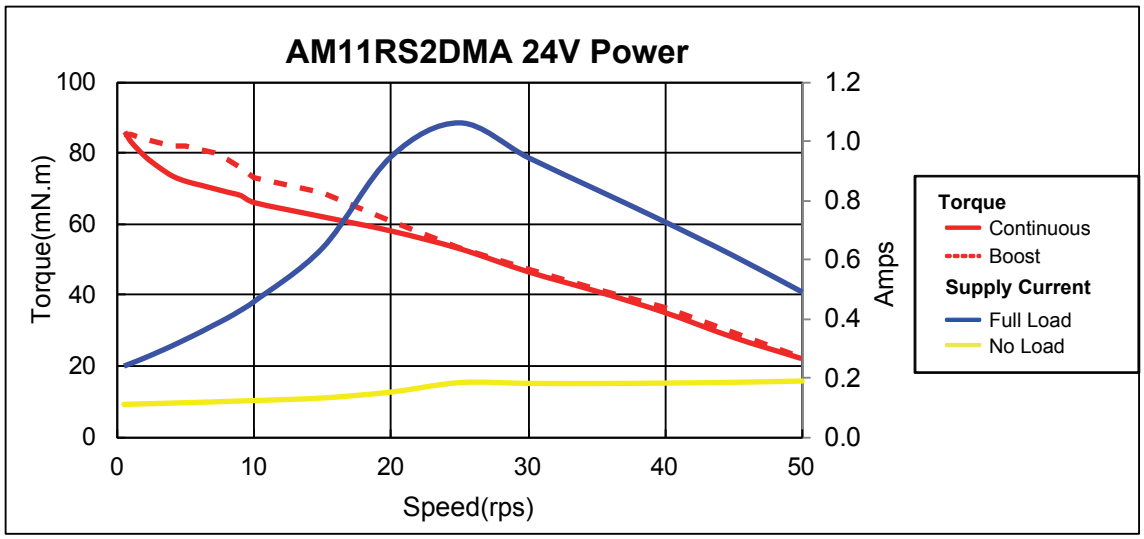
For the SSDC06/10 drive, the extended range of operation can be as low as 18 VDC minimum to as high as 75 VDC maximum. When operating below 18 VDC, the power supply input may require larger capacitance to prevent under-voltage and internal-supply alarms. Current spikes may make supply readings erratic. The supply input cannot go below 18 VDC for reliable operation. This will not fault the drive. Absolute maximum power supply input is 75 VDC at which point an over-voltage alarm and fault will occur. When using a power supply that is regulated and is near the drive maximum voltage of 75 VDC, a voltage clamp may be required to prevent over-voltage when regeneration occurs. When using an unregulated power supply, make sure the no-load voltage of the supply does not exceed the drive’s maximum input voltage of 75 VDC.

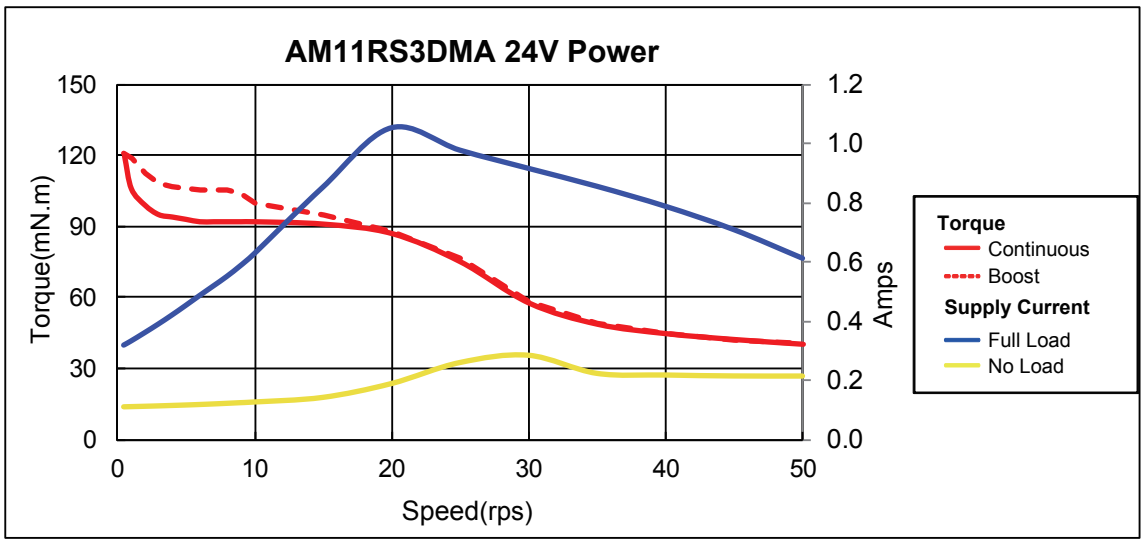
2.4.2 Current

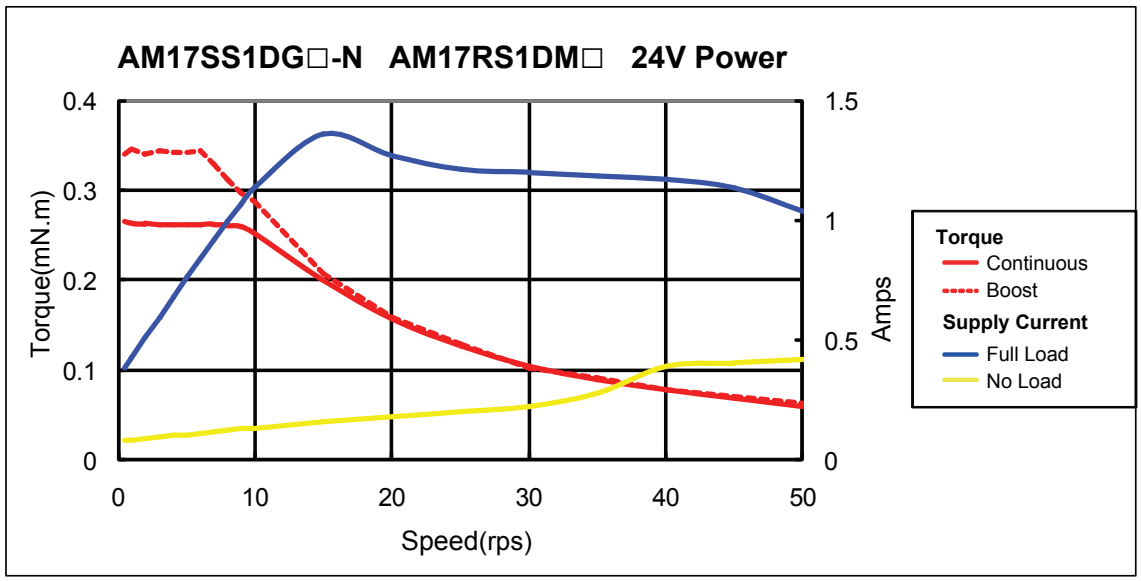
The maximum supply currents required by the SSDC series step servo drive and motor are shown below in chats at different power supply voltage input. The SSDC drive power supply current is lower than the winding currents because it uses switching amplifiers to convert a high voltage and low current into low voltage and high current. The more power supply voltage exceeds the motor voltage, the less current will be required from the power supply.

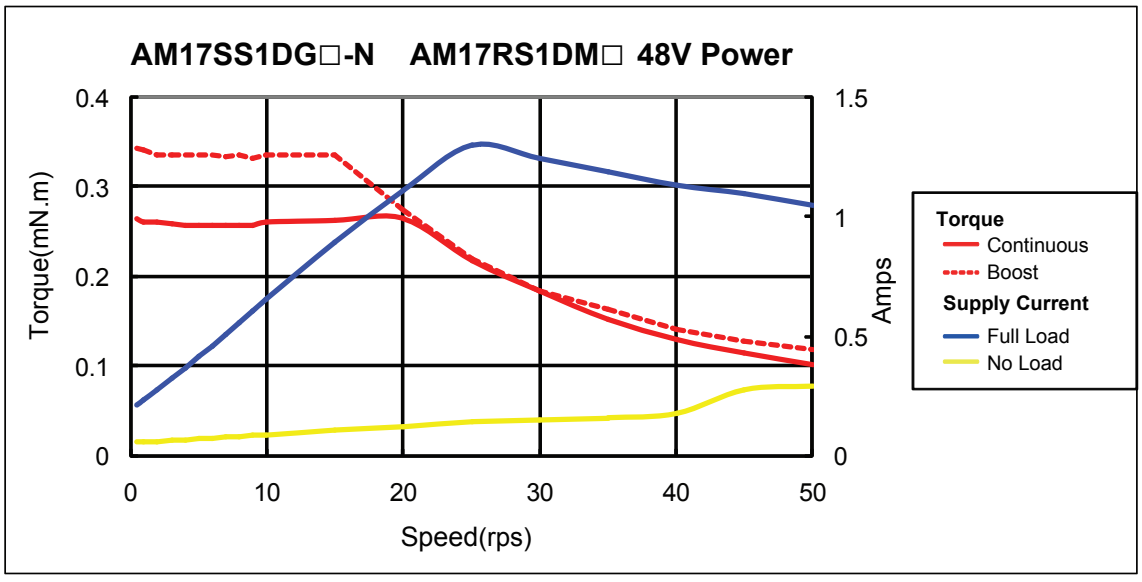
It is important to note that the current draw is significantly different at higher speeds depending on the torque load to the motor. Estimating how much current is necessary may require a good analysis of the load to the motor.

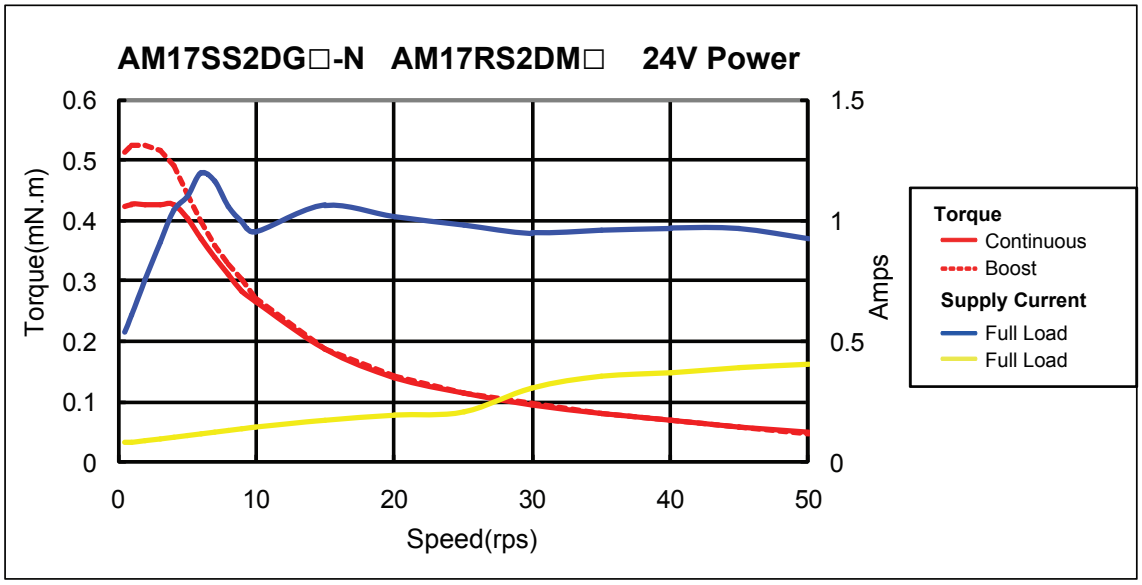


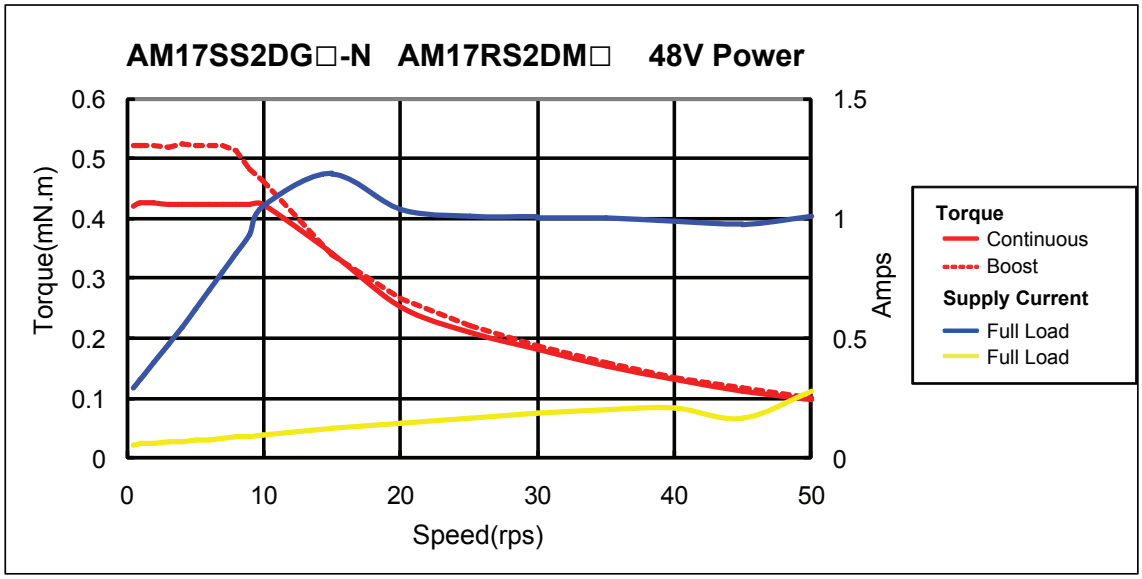


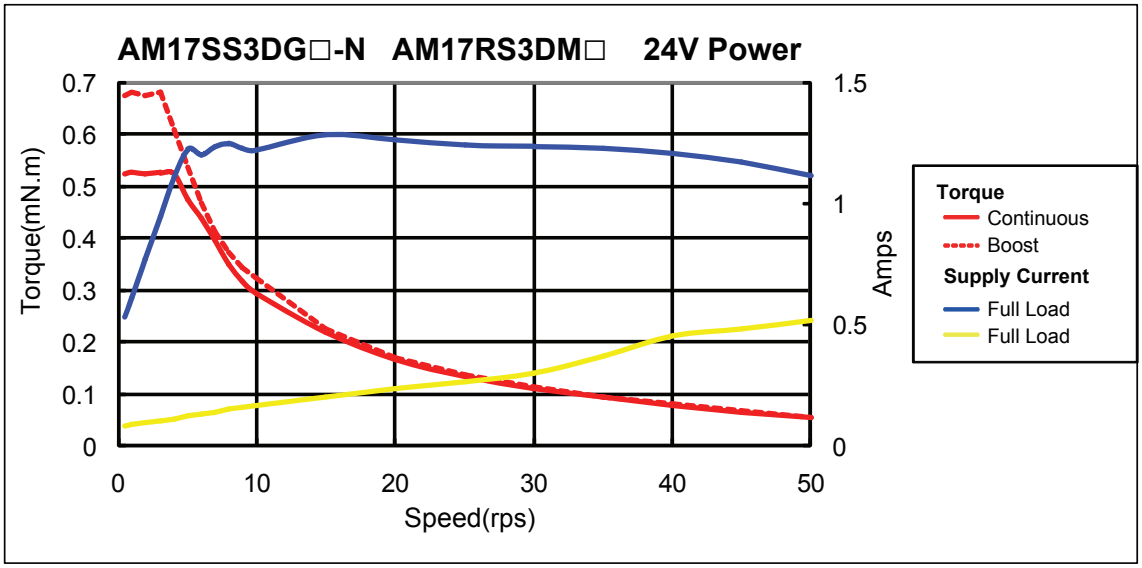

AM11RS3DMA 24V Power
Torque(mN.m)
150
120
90
60
30
0
0
10
20
30
40
50
Speed(rps)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Amps
Torque
Continuous
Boost
Supply Current
Full Load
No Load

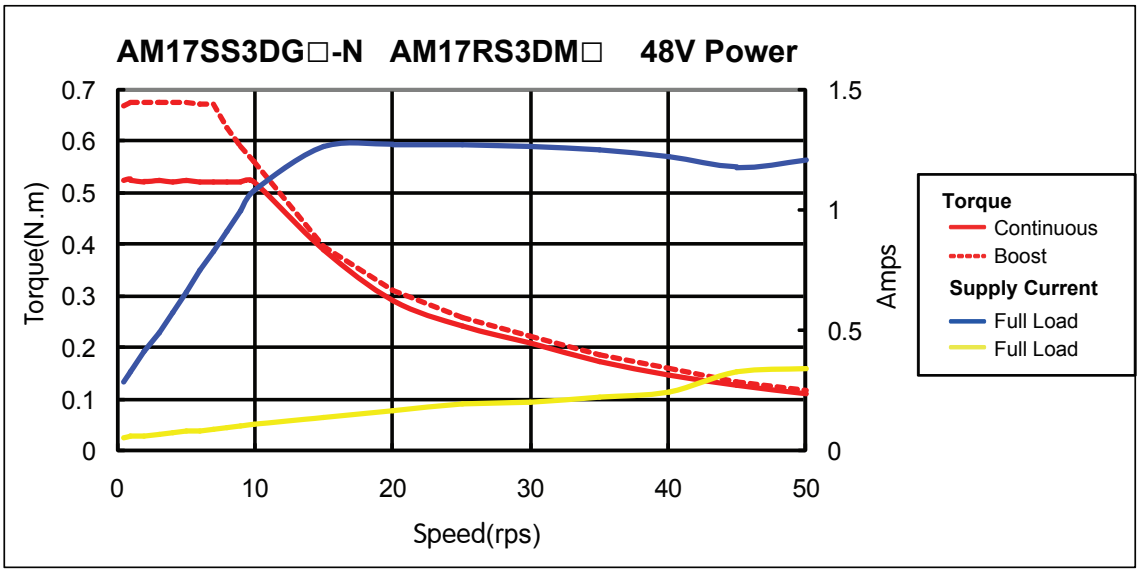

AM17SS1DG□-N AM17RS1DM□ 24V Power
Torque(mN.m)
0.4
0.3
0.2
0.1
0
0
10
20
30
40
50
Speed(rps)
1.5
1
0.5
0
Amps
Torque
Continuous
Boost
Supply Current
Full Load
No Load

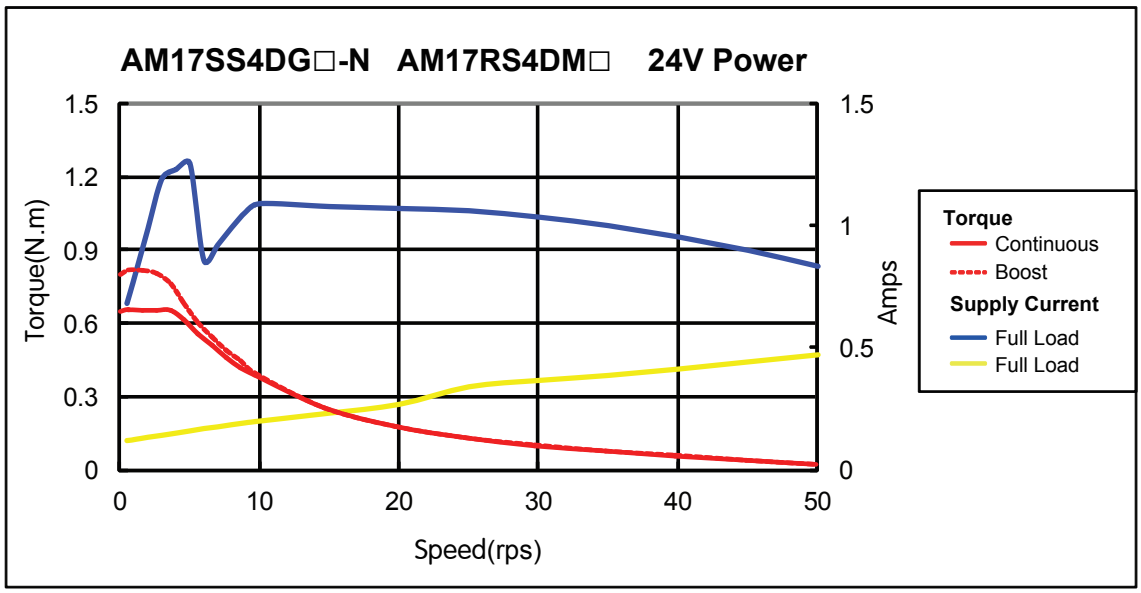

AM17SS1DG□-N AM17RS1DM□ 48V Power
Torque(mN.m)
0.4
0.3
0.2
0.1
0
0
10
20
30
40
50
Speed(rps)
1.5
1
0.5
0
Amps
Torque
Continuous
Boost
Supply Current
Full Load
No Load

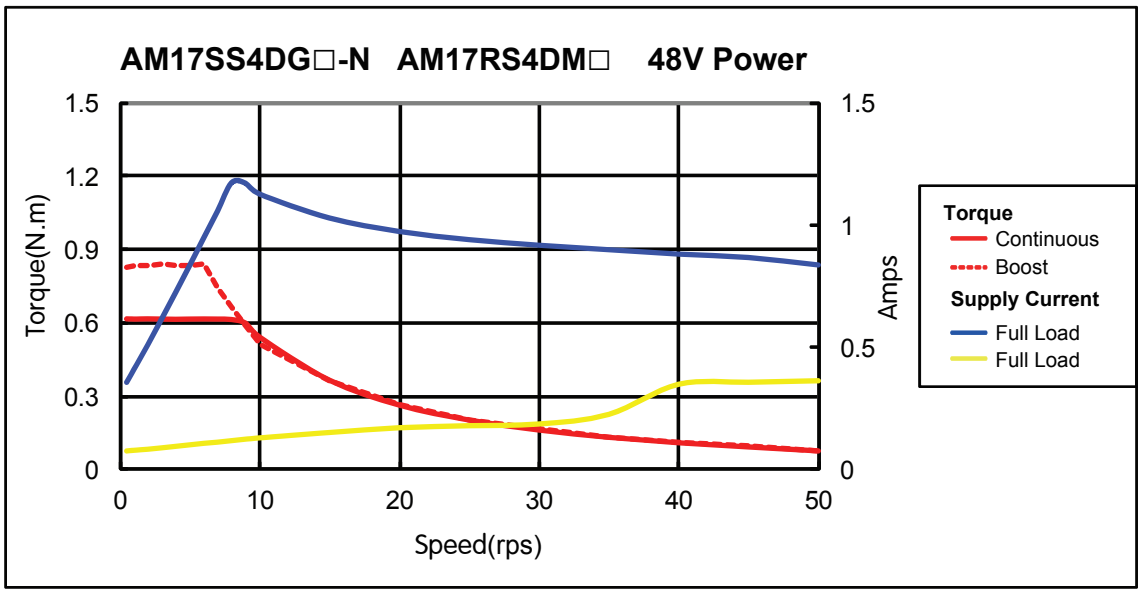

AM17SS2DG□-N AM17RS2DM□ 24V Power
Torque(mN.m)
0.6
0.5
0.4
0.3
0.2
0.1
0
1.5
1
0.5
0
Amps
0
10
20
30
40
50
Speed(rps)
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

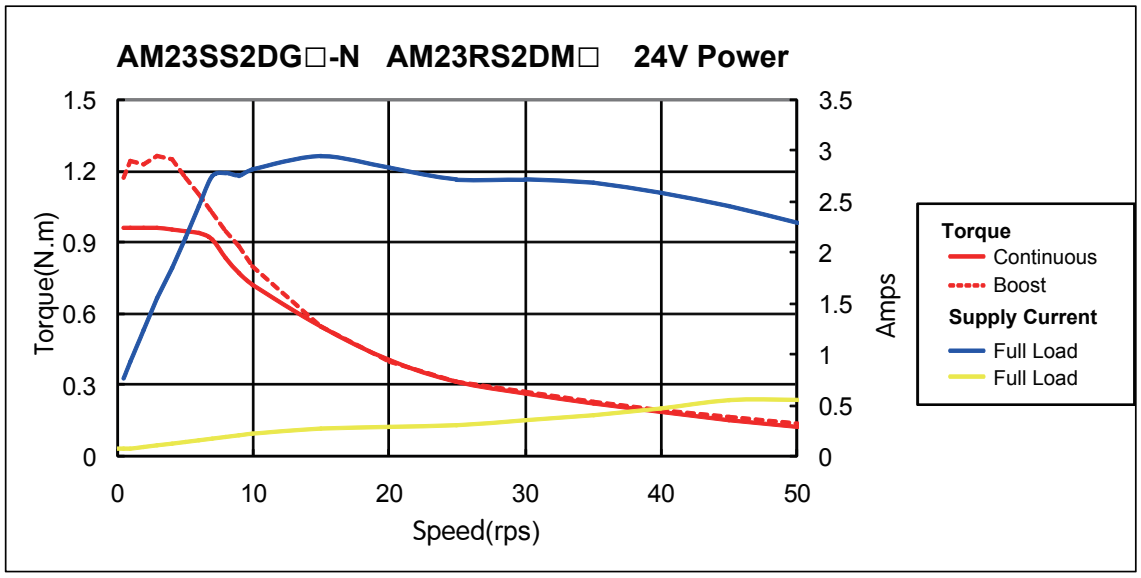

AM17SS2DG□-N AM17RS2DM□ 48V Power
Torque(mN.m)
0.6
0.5
0.4
0.3
0.2
0.1
0
1.5
1
0.5
0
Amps
0
10
20
30
40
50
Speed(rps)
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

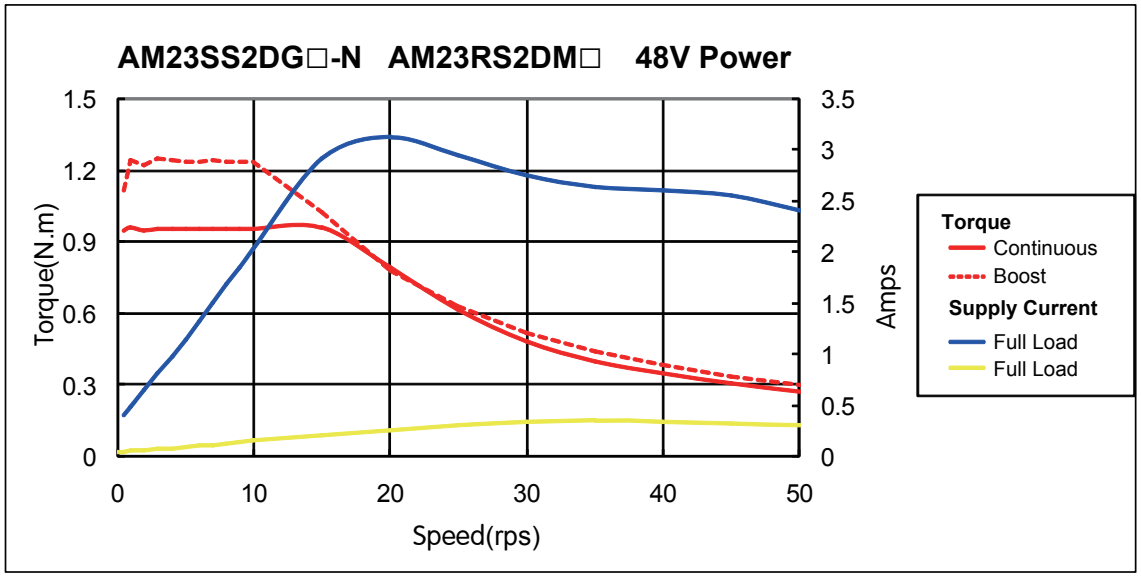

AM17SS3DG□-N AM17RS3DM□ 24V Power
Torque(mN.m)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1.5
1
0.5
0
Amps
0
10
20
30
40
50
Speed(rps)
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

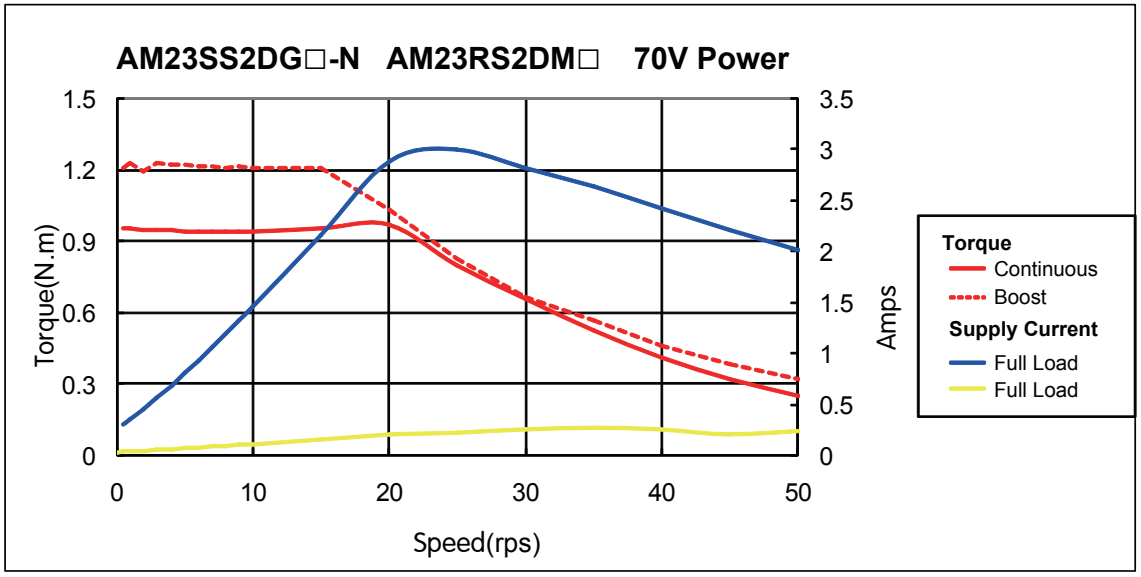

AM17SS3DG□-N AM17RS3DM□ 48V Power
Torque(N.m)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1.5
1
0.5
0
Amps
0
10
20
30
40
50
Speed(rps)
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

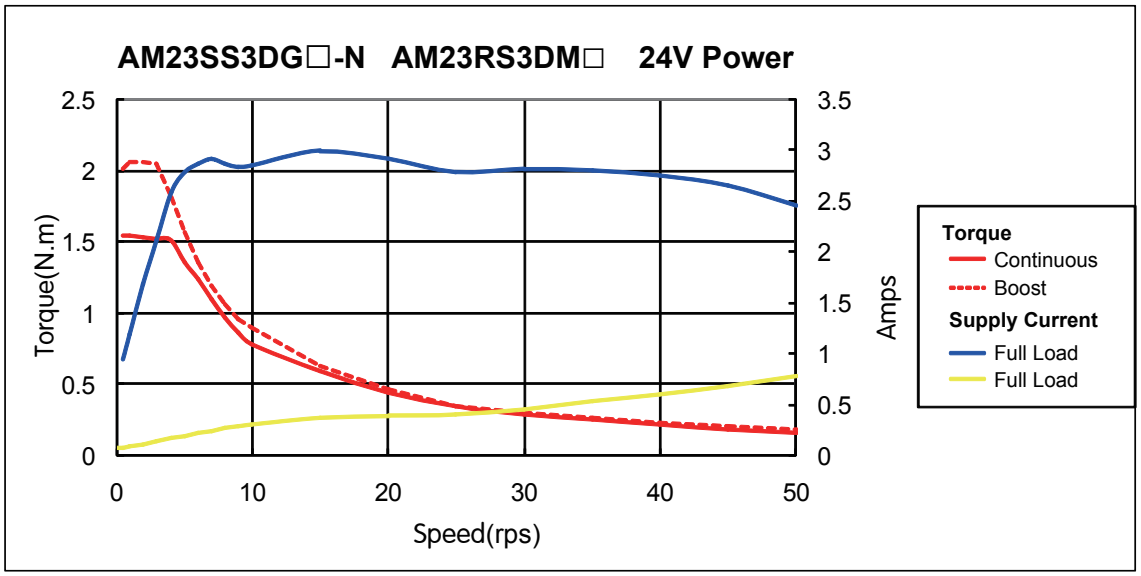

AM17SS4DG□-N AM17RS4DM□ 24V Power
Torque(N.m)
1.5
1.2
0.9
0.6
0.3
0
1.5
1
0.5
0
Amps
0
10
20
30
40
50
Speed(rps)
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

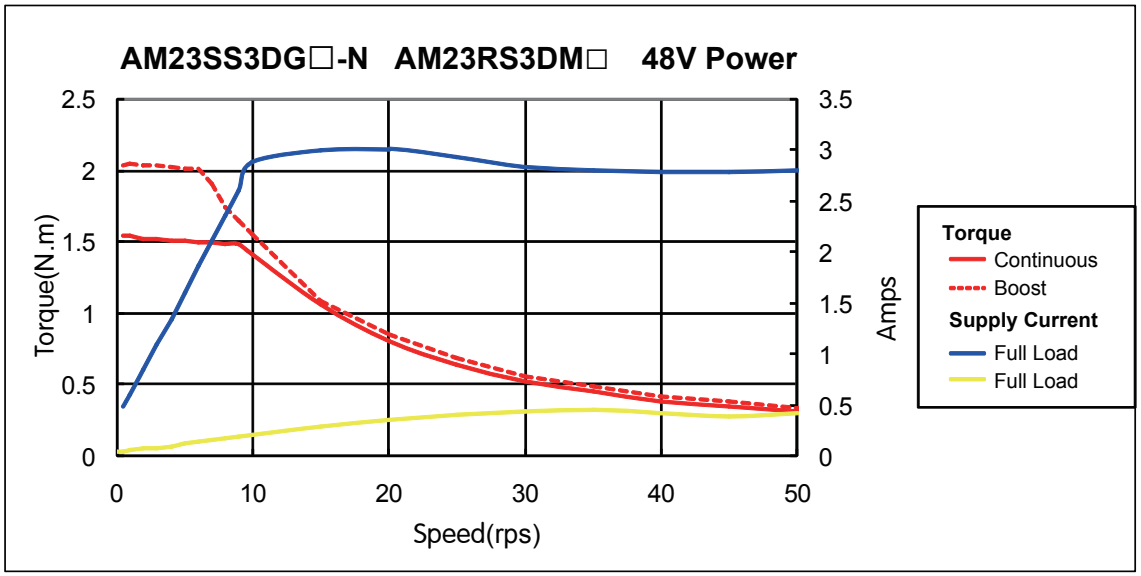

AM17SS4DG□-N AM17RS4DM□ 48V Power
Torque(N.m)
1.5
1.2
0.9
0.6
0.3
0
1.5
1
0.5
0
Amps
0
10
20
30
40
50
Speed(rps)
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

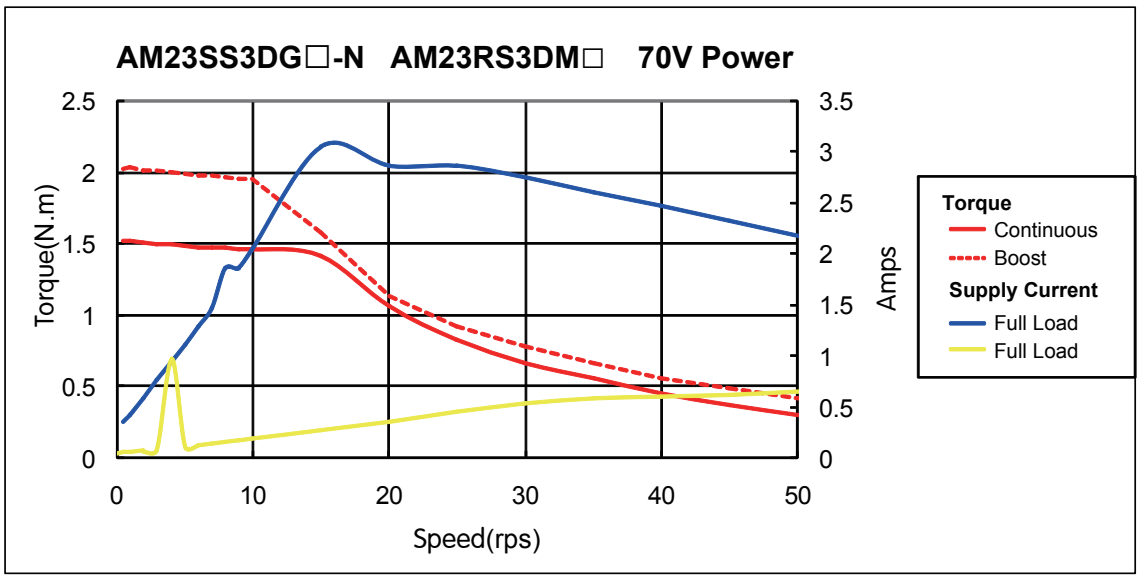

AM23SS2DG□-N AM23RS2DM□ 24V Power
Torque(N.m)
Amps
Speed(rps)
0
0.3
0.6
0.9
1.2
1.5
0.5
1
1.5
2
2.5
3
3.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

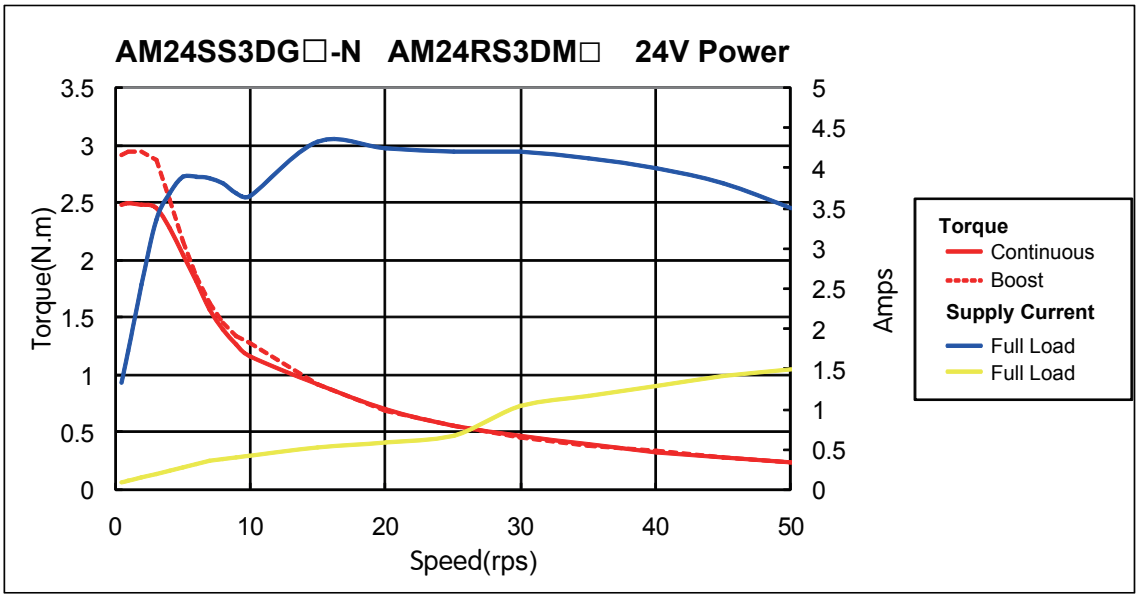

AM23SS2DG□-N AM23RS2DM□ 48V Power
Torque(N.m)
Amps
Speed(rps)
0
0.3
0.6
0.9
1.2
1.5
0.5
1
1.5
2
2.5
3
3.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

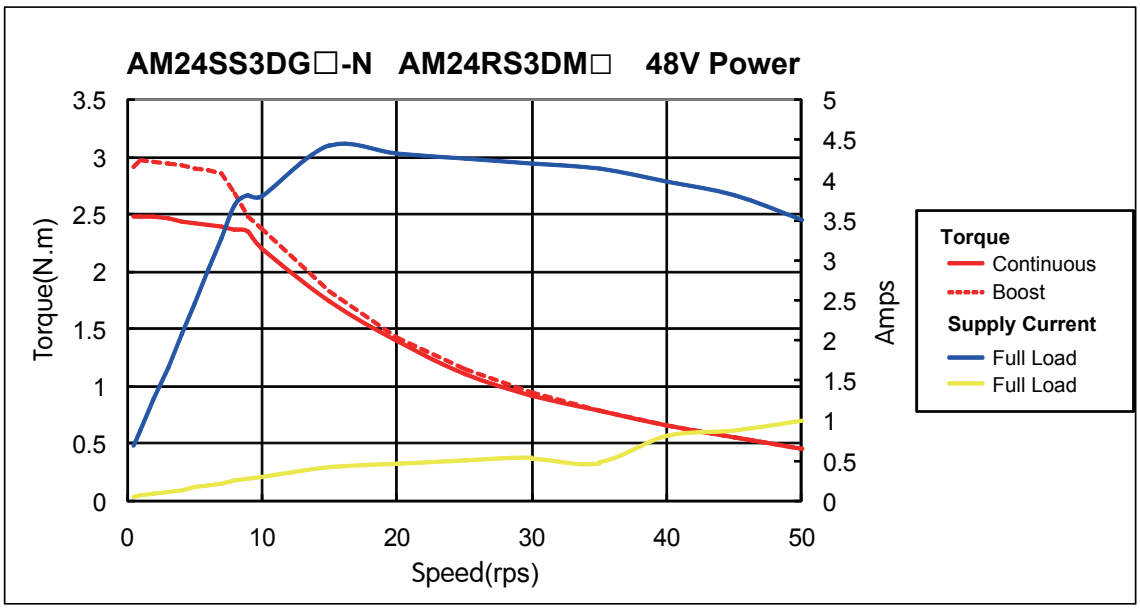

AM23SS2DG□-N AM23RS2DM□ 70V Power
Torque(N.m)
Amps
Speed(rps)
0
0.3
0.6
0.9
1.2
1.5
0.5
1
1.5
2
2.5
3
3.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

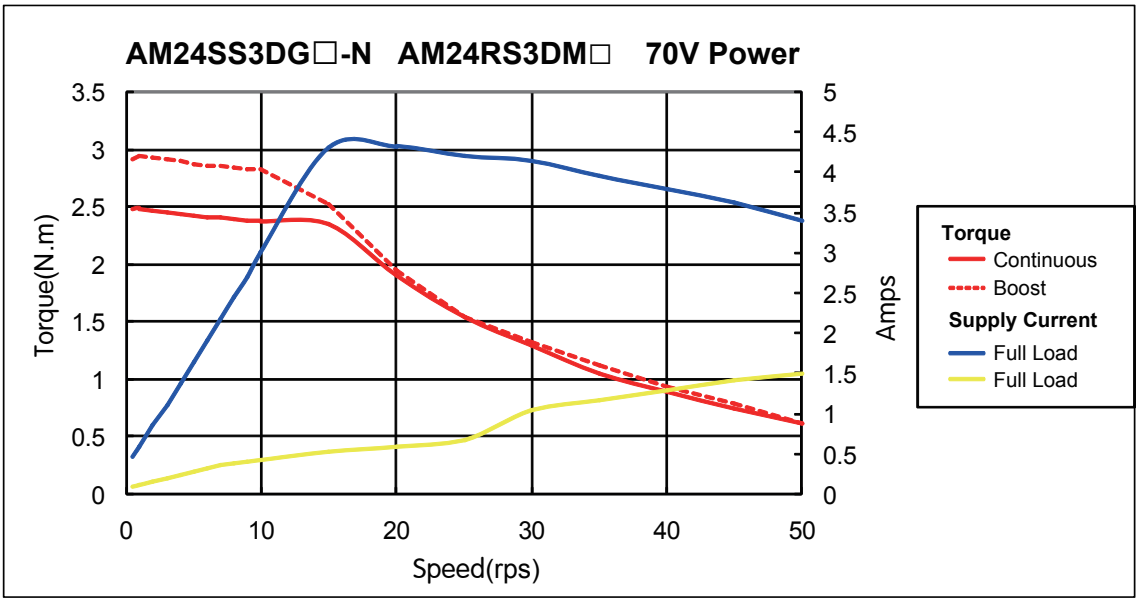

AM23SS3DG□-N AM23RS3DM□ 24V Power
Torque(N.m)
Amps
Speed(rps)
0
0.5
1
1.5
2
2.5
3
3.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

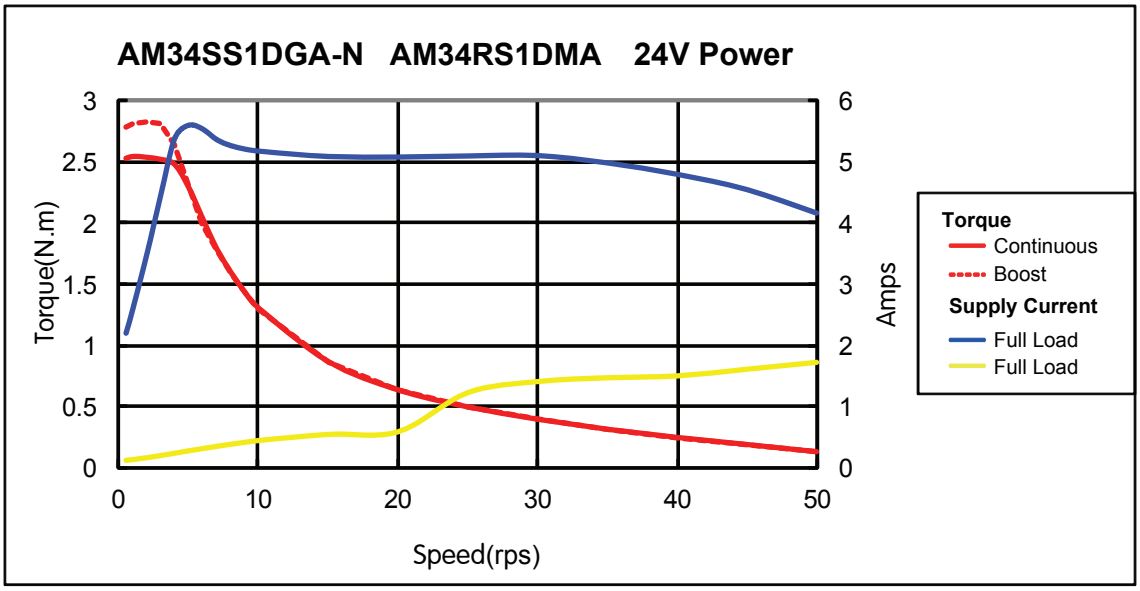

AM23SS3DG□-N AM23RS3DM□ 48V Power
Torque(N.m)
Amps
Speed(rps)
0
0.5
1
1.5
2
2.5
3
3.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

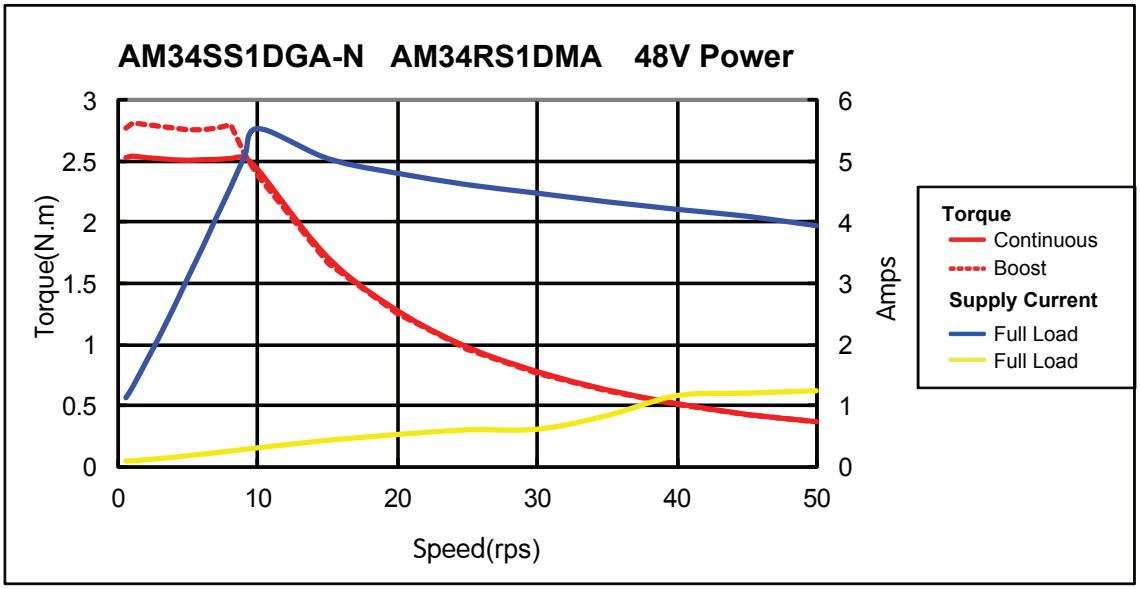

AM23SS3DG□-N AM23RS3DM□ 70V Power
Torque(N.m)
Amps
Speed(rps)
0
0.5
1
1.5
2
2.5
3
3.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

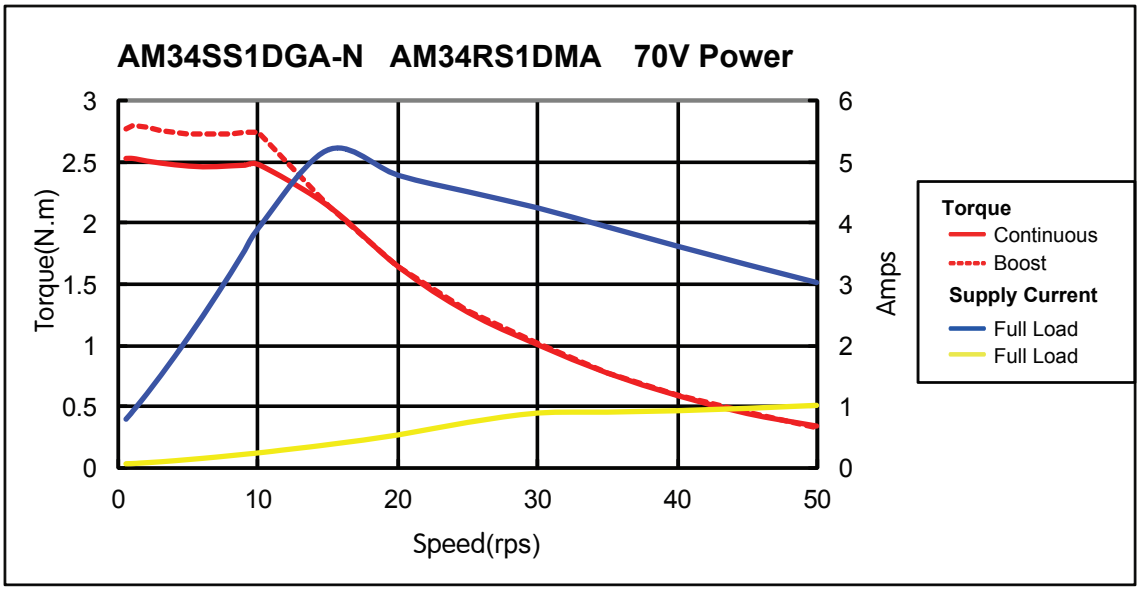

AM24SS3DG□-N AM24RS3DM□ 24V Power
Torque(N.m)
Amps
Speed(rps)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

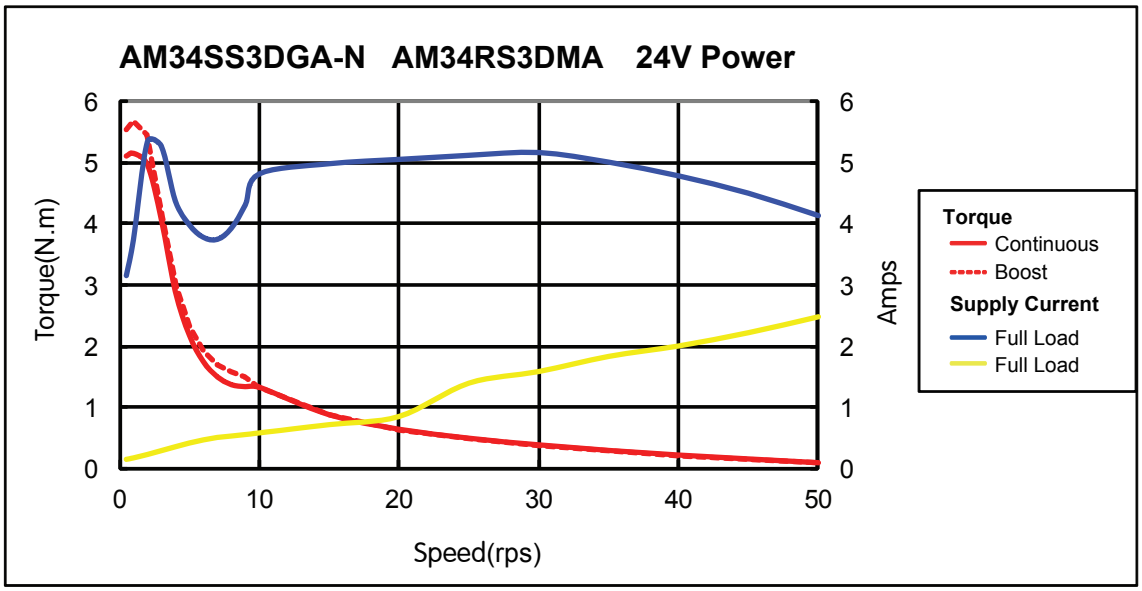

AM24SS3DG□-N AM24RS3DM□ 48V Power
Torque(N.m)
Amps
Speed(rps)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

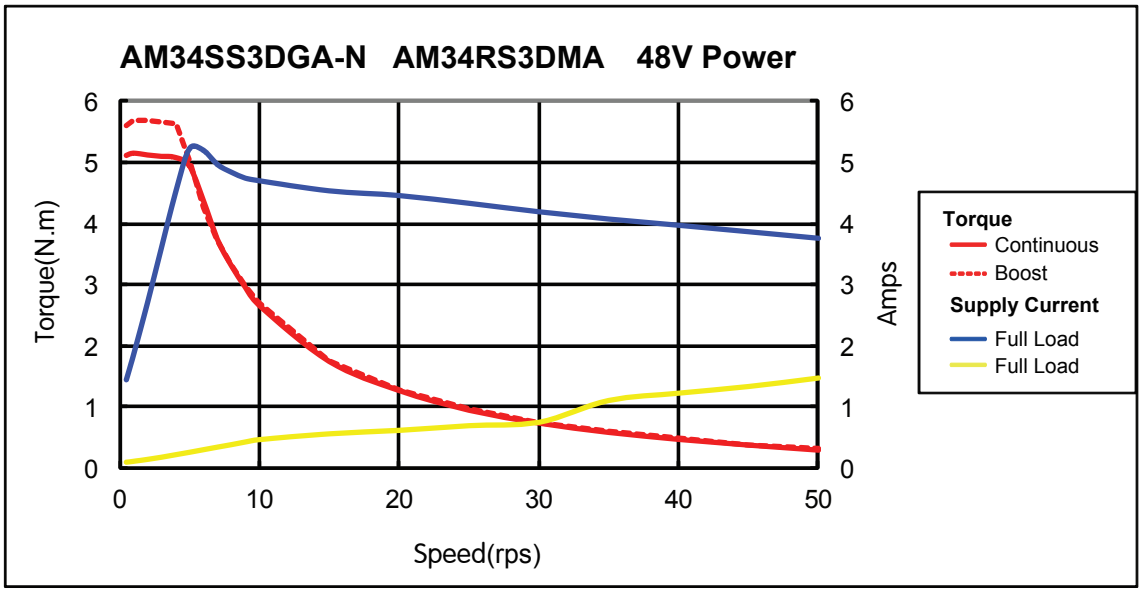

AM24SS3DG□-N AM24RS3DM□ 70V Power
Torque(N.m)
Amps
Speed(rps)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

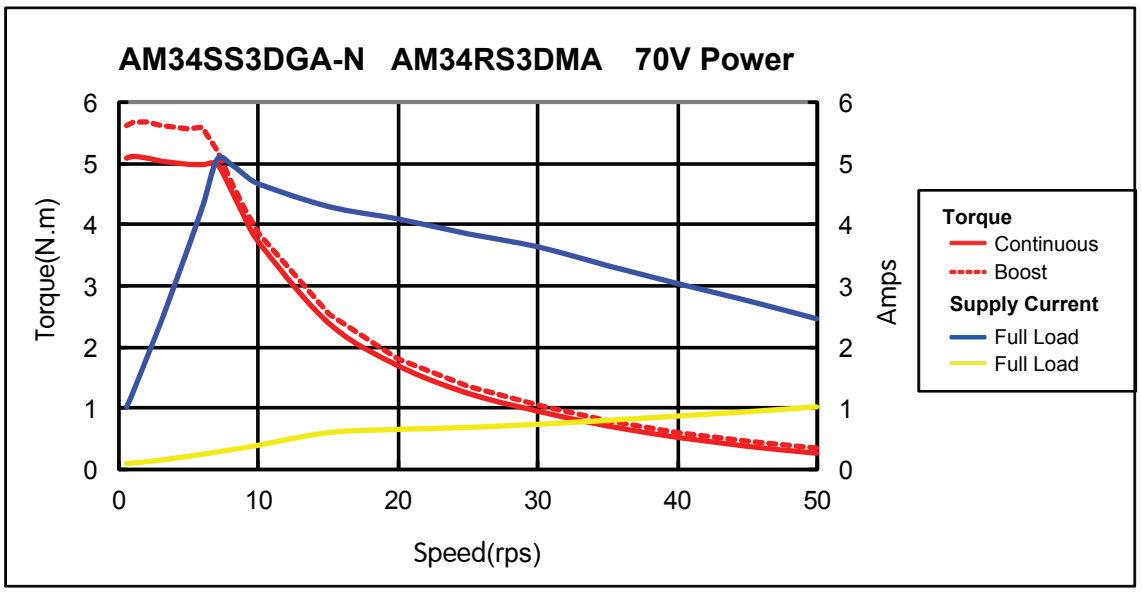

AM34SS1DGA-N AM34RS1DMA 24V Power
Torque(N.m)
Amps
Speed(rps)
0
0.5
1
1.5
2
2.5
3
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

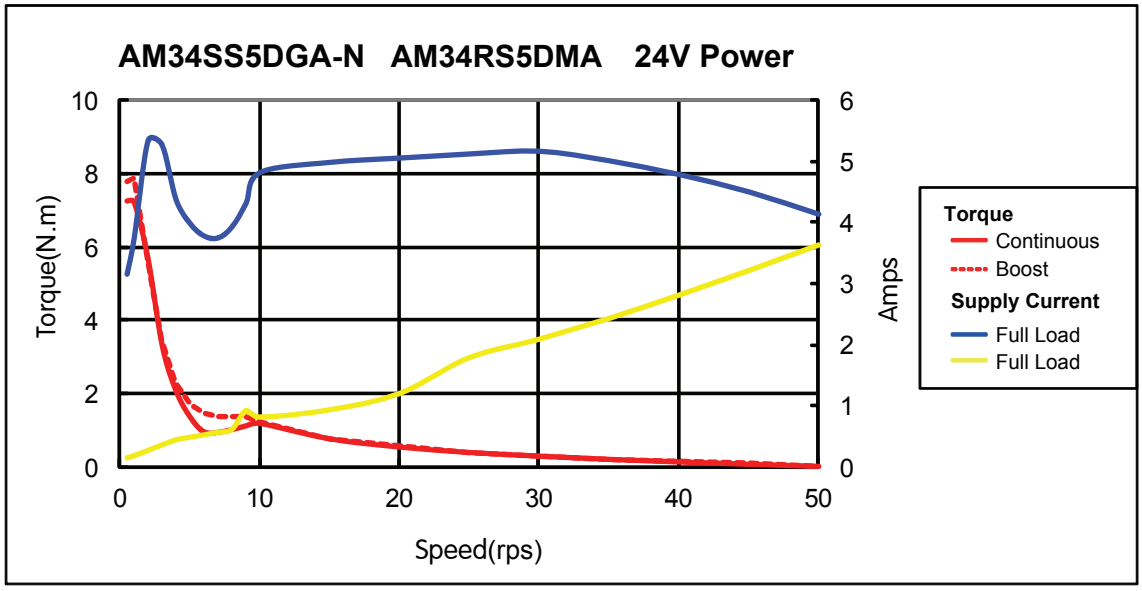

AM34SS1DGA-N AM34RS1DMA 48V Power
Torque(N.m)
Amps
Speed(rps)
0
0.5
1
1.5
2
2.5
3
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

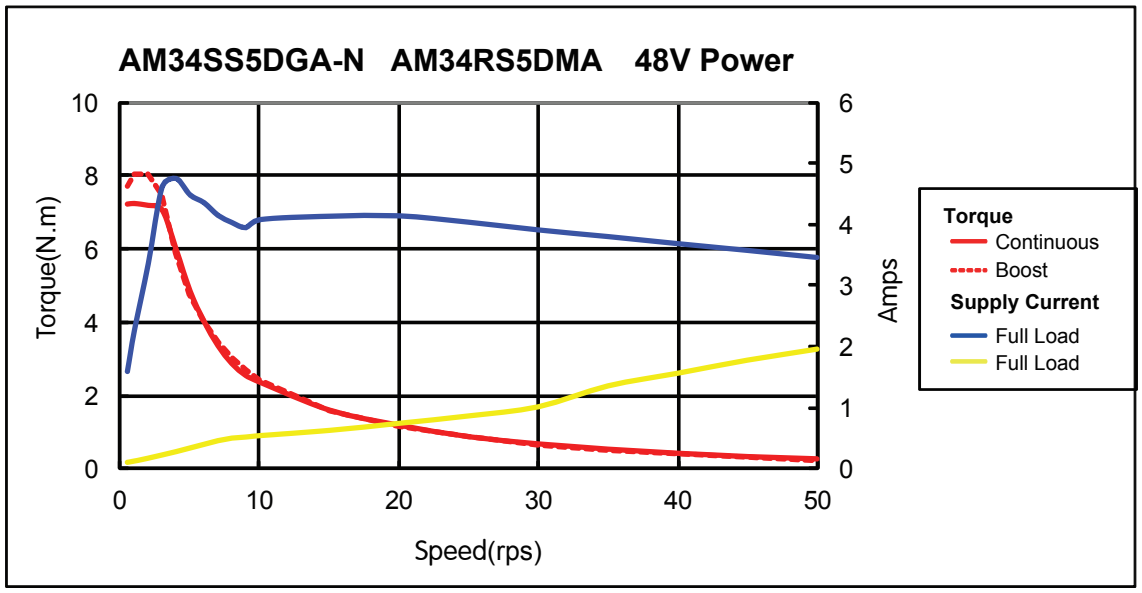

AM34SS1DGA-N AM34RS1DMA 70V Power
Torque(N.m)
Amps
Speed(rps)
0
0.5
1
1.5
2
2.5
3
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

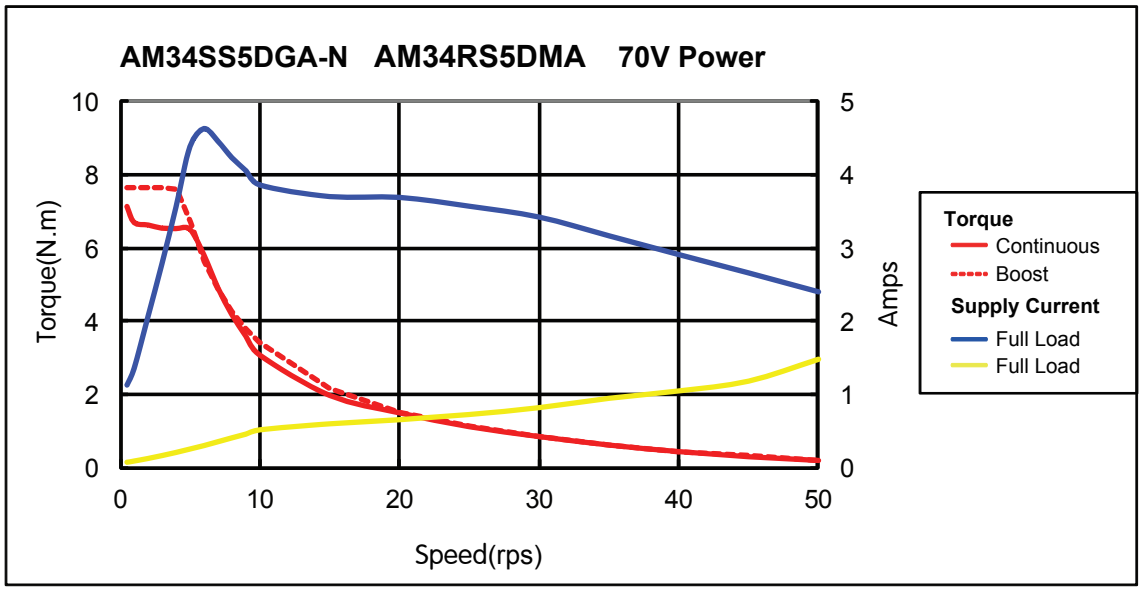

AM34SS3DGA-N AM34RS3DMA 24V Power
Torque(N.m)
Amps
Speed(rps)
0
10
20
30
40
50
0
1
2
3
4
5
6
Torque
Continuous
Boost
Supply Current
Full Load
Full Load


AM34SS3DGA-N AM34RS3DMA 48V Power
Torque(N.m)
Amps
Speed(rps)
0
10
20
30
40
50
0
1
2
3
4
5
6
Torque
Continuous
Boost
Supply Current
Full Load
Full Load


AM34SS3DGA-N AM34RS3DMA 70V Power
Torque(N.m)
Amps
Speed(rps)
0
10
20
30
40
50
0
1
2
3
4
5
6
Torque
Continuous
Boost
Supply Current
Full Load
Full Load


AM34SS5DGA-N AM34RS5DMA 24V Power
Torque(N.m)
Amps
Speed(rps)
0
2
4
6
8
10
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

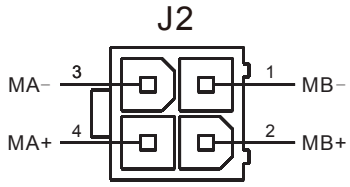

AM34SS5DGA-N AM34RS5DMA 48V Power
Torque(N.m)
Amps
Speed(rps)
0
2
4
6
8
10
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load


AM34SS5DGA-N AM34RS5DMA 70V Power
Torque(N.m)
Amps
Speed(rps)
0
2
4
6
8
10
0
1
2
3
4
5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
Full Load

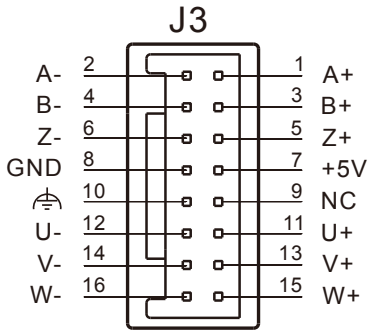
2.5 Connecting the Motor

The SS/RS motors have two cables. One is the motor power cable, the other one is the encoder feedback cable. Plug the motor power cable into the motor connector on the drive and plug the encoder feedback cable into the encoder feedback connector on the drive.

(NOTE:Do not damage or drag the cables on the motor.)



Motor connector on the driver



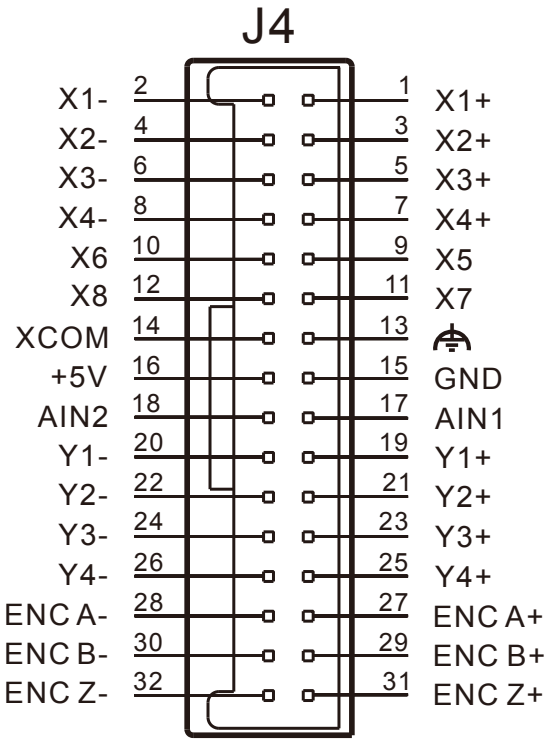
Encoder connector on the driver

Please check the information of mating connectors, extended motor cable and extended encoder cable in below section ” Optional Accessories (Sold separately)”

3 Inputs and Outputs

SSDC inputs and outputs include：

- 8 optically isolated digital inputs,5 - 24VDC logic
- 4 Optically isolated, Open Collector, 30V/100 mA max,
- 2 analog inputs can be configured to 0-5V, 0-10V, ±5V or ±10V signal ranges
- Differential encoder outputs (A±, B±, Z±), 26C31 line driver, 20 mA sink or source max
- Secondary encoder signal input(single-ended or differential) for full closed-loop control



I/O Connector Diagram

3.1 Digital Inputs

3.1.1 X1, X2, X3 and X4 Digital Inputs

X1, X2: Optically isolated, differential, 5-24VDC; Minimum pulse width = 250ns, Maximum pulse frequency = 2MHz;

X3, X4: Optically isolated, differential, 5-24VDC; Minimum pulse width = 100 μ s, Maximum pulse frequency = 5KHz

X1 can be configured as general purpose input

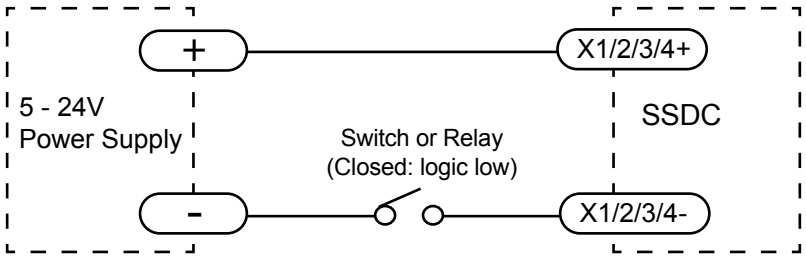
X2 can be configured as general purpose input

X3 can be configured as CW limit sensor input or general purpose input

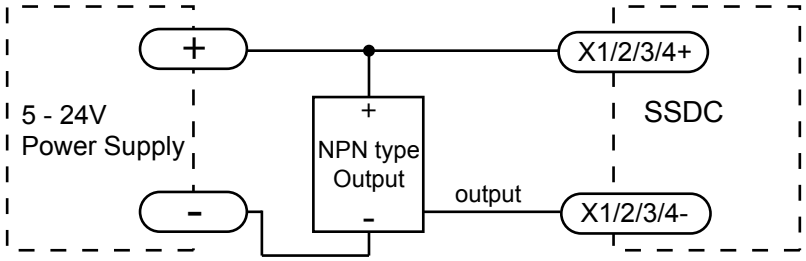
X4 can be configured as CCW limit sensor input or general purpose input

Please use ***Step-Servo Quick Tuner*** software to configure the function of X1, X2, X3 and X4.

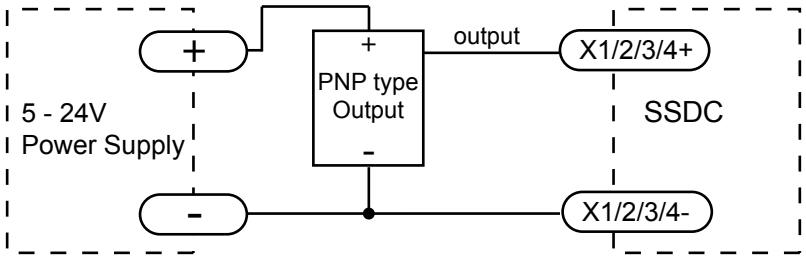
The diagrams below show how to connect the X1, X2, X3 and X4 to various commonly used devices.



Connecting a switch or relay to an input



Connecting a NPN type output to an input



Connecting a PNP type output to an input

3.1.2 X5, X6, X7 and X8 digital Inputs

X5 ~ X8: Optically isolated, differential, 5-24VDC; Minimum pulse width = 100 μ s, Maximum pulse frequency = 5KHz;

X5 can be configured as servo on input or general purpose input

X6 can be configured as alarm reset signal input or general purpose input

X7 can be configured as Touch Probe 1 trigger input or general purpose input

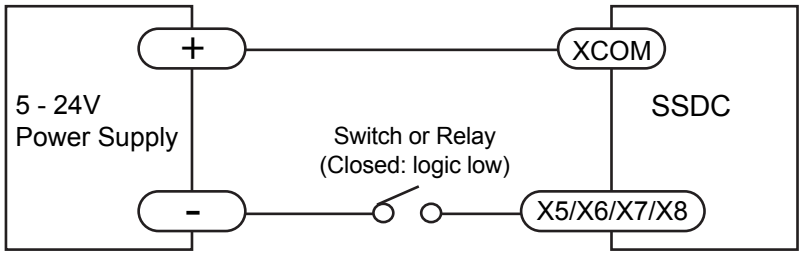
X8 can be configured as Touch Probe 2 trigger input or general purpose input

Because the input is an optically isolated circuit, a 5-24V power supply is needed. For example, you can use the power supply of the PLC when you are using a PLC control system, but if you want to connect a relay or mechanical switch to the input, you must need a power supply.

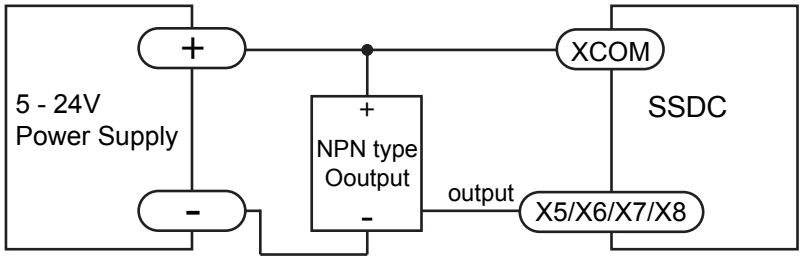
XCOM is an electronics term for a single-ended signal connection to a common voltage. In the case of SS series, if you are using a sourcing(PNP) input signals, you need to connect XCOM to the ground(power supply -),if you are using a sinking(NPN) input signals ,the XCOM need to connect to the power supply +.

Please use ***Step-Servo Quick Tuner*** software to configure the function of X5, X6, X7 and X8

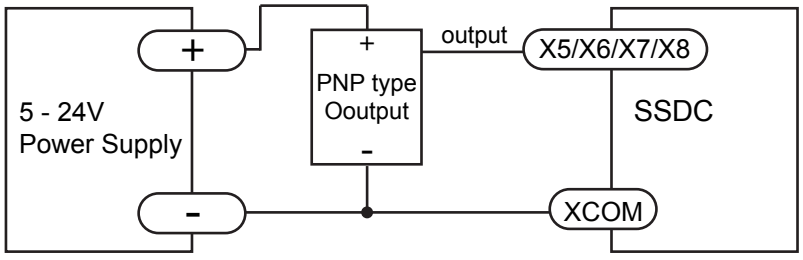
The diagrams below show how to connect the X5, X6, X7 and X8 to various commonly used devices.



Connecting a switch or relay to an input



Connecting a NPN type output to an input



Connecting a PNP type output to an input

3.2 Digital Outputs

Y1, Y2, Y3 and Y4 Digital Outputs

Y1 can be configured as alarm signal output. It can also be configured as static in position signal output(static, checking in position when motor is stopped) ,or as dynamic in position signal output (dynamic, checking in position all the time.)

Y2 can be configured as Tach signal output, tach output produce pulsed relative to the motor position with configurable resolution. It can also be configured as static in position signal output(static, checking in position when motor is stopped) ,or as dynamic in position signal output (dynamic, checking in position all the time.),or as Timing signal output(50 pulses per rotation)

Y3 can be configured as signal output to release brake. It can also be configured as static in position signal output(static, checking in position when motor is stopped) ,or as dynamic in position signal output (dynamic, checking in position all the time.)

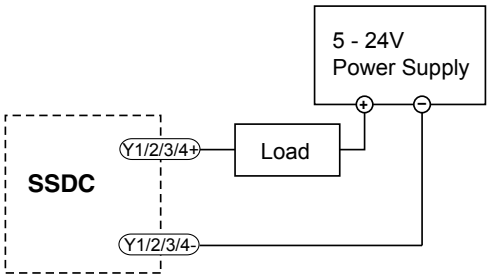
Y4 can be configured as static in position signal output(static, checking in position when motor is stopped) ,or as dynamic in position signal output (dynamic, checking in position all the time.)

Y1, Y2, Y3 and Y4 can be configured by Step-Servo Quick Tuner.

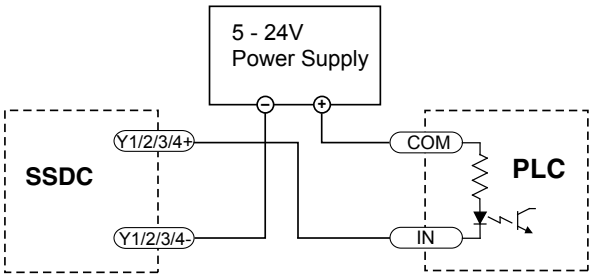
The chats below show how to connect to the output:

(NOTE: Do not connect the outputs to more than 30VDC power supply.

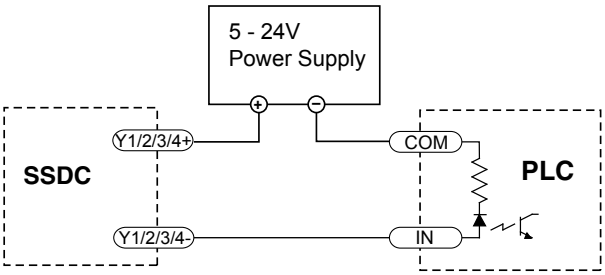
And the current of each output terminal must not exceed 100mA.)



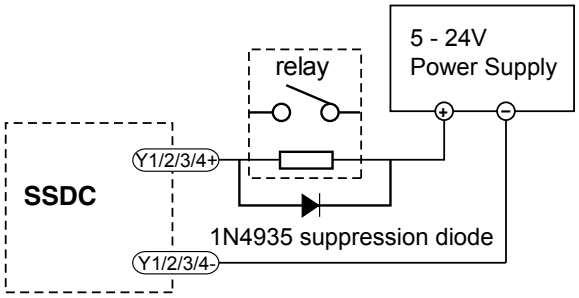
Connecting a sourcing output to load



Connecting a sinking output to PLC's input



Connecting a sourcing output to PLC's input



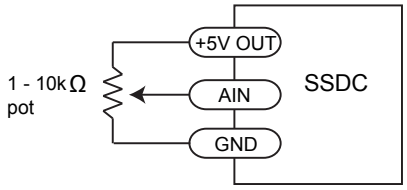
Driving a relay

3.3 Analog Inputs

SSDC series drive has two analog signal inputs which can accept signal range of 0-5V, 0-10V, ±5V and ±10V. The drive can be configured to operate at velocity mode or position mode that is proportional to the analog input.

Use the ***Step-Servo Quick Tuner*** to configure the input range, offset, deadband and noisy filter frequency.

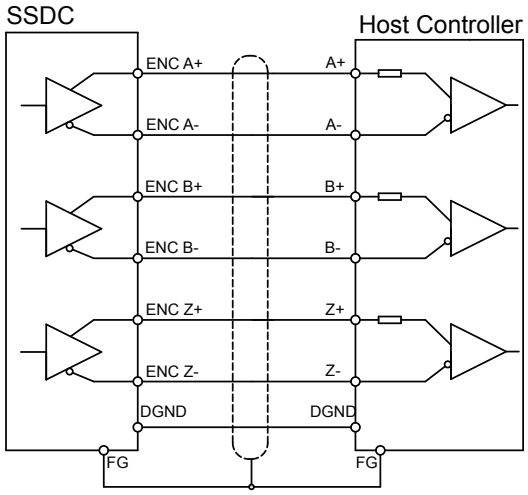
SSDC series provides a +5V/100mA limit power supply that can be used to power external devices such as potentiometer. It is not the most accurate supply for reference, for more precise readings use an external supply that can provide the desired accuracy.



Connecting a potentiometer to an analog input

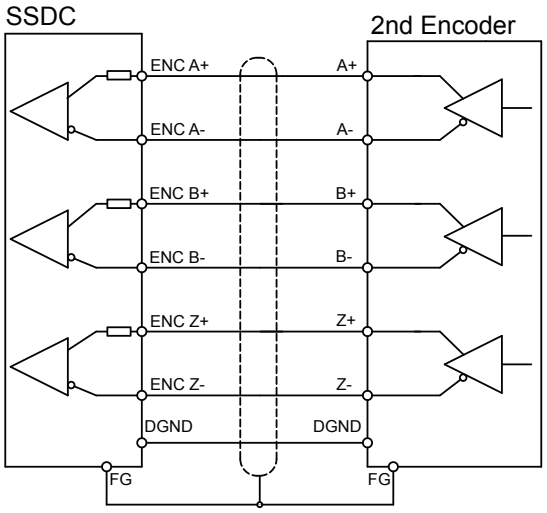
3.4 Encoder output

SSDC has differential encoder outputs (ENC A+/-, ENC B+/-, ENC Z+/-), with 26C31 line driver, 20 mA sink or source current in max. These signals can be connected to the motion controller to be a feedback of the motor position.



3.5 Secondary Encoder Input

SSDC series supports 2-way encoder feedback, one way connect to the motor encoder position feedback, the other way connect to the load side position feedback such as scale, connect to the ENC A+/-, ENC B+/-, ENC Z+/-.



4 Mounting the Drive

Use the M3 or M4 screw to mount the SSDC series drive .The drive should be securely fastened to a smooth, flat metal surface will help conduct heat away from the chassis. If this is not possible, forced airflow from a fan maybe required to prevent the drive from overheating.

- Never use the drive in a place where there is no air flow or the surrounding air is more than 40℃.
- Never put the drive where it can get wet or where metal or other electrically conductive particle particles can get on the circuitry.
- Always provide air flow around the drive. When mounting multiple SSDC drives near each other, maintain at least 2cm of space between drives.

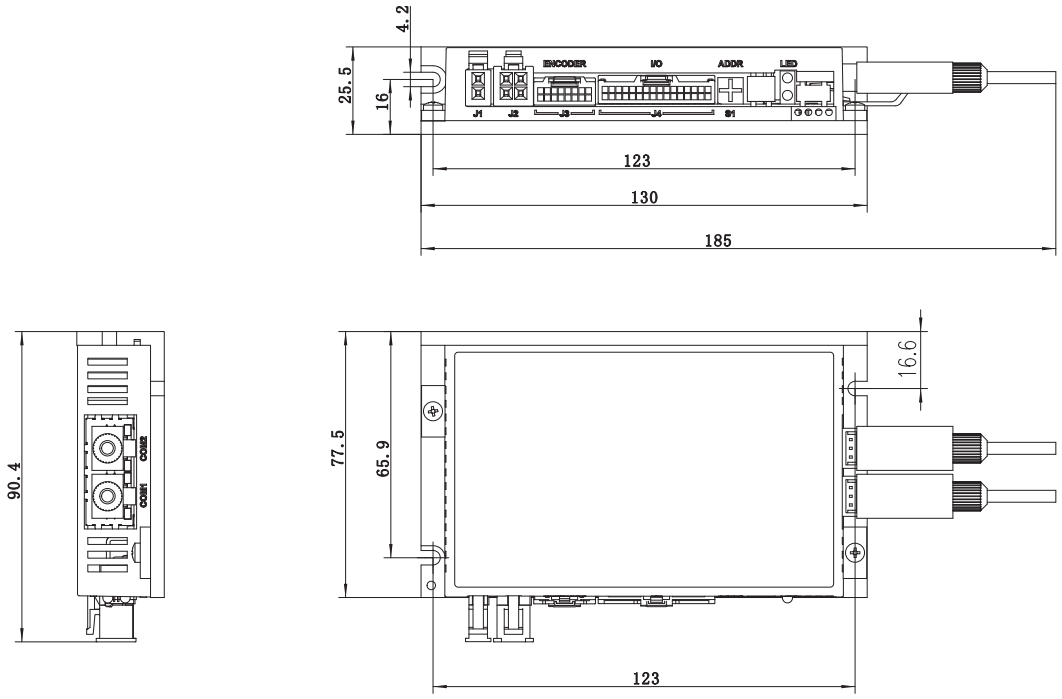
5 LED Error Codes

The SSDC series step-servo package uses red and green LEDs to indicate status. When the motor is enabled, the green LED flashes slowly. When the green LED is solid, the motor is disabled. Errors are indicated by combinations of red and green flashes as shown below.

Code		Error
	Solid green	MOTOR_DISABLED
	Flashing green	MOTOR_ENABLED
	1 red, 1 green	POSITION_LIMIT
	1 red, 2 green	MOVE WHILE DISABLED
	1 red, 3 green	XML_READ_FAILED
	1 red, 4 green	VOLTAGE_HIGH_WARNING
	2 red, 1 green	CCW_LIMIT_TRIP
	2 red, 2 green	CW_LIMIT_TRIP
	2 red, 3 green	INITIAL_POWERUP_ERROR
	2 red, 4 green	ECAT_FAULTS
	3 red, 1 green	OVER_TEMPERATURE
	3 red, 2 green	INTERNAL_VOLTAGE
	3 red, 3 green	Q_PROGRAM_BLANK
	3 red, 4 green	FH_CONFIG_NG
	3 red, 8 green	EMERGENCY_STOP
	4 red, 1 green	VOLTAGE_HIGH
	4 red, 2 green	VOLTAGE_LOW
	5 red, 1 green	OVER_CURRENT
	5 red, 2 green	CURRENT_LIMIT
	5 red, 4 green	COMM OFF LINE
	6 red, 1 green	OPEN_WINDING
	6 red, 2 green	HALL_ENCODER_BAD
	6 red, 3 green	SAFE_TORQUE_OFF & FC POSITION LIMIT
	6 red, 4 green	FC_ENCODER_BAD
	7 red, 1 green	COMM_ERROR
	7 red, 2 green	SAVE_FAILED

6 Reference Materials

6.1 Drive Mechanical Outlines



(Unit:mm)

Model		
SSDC03-D	SSDC06-D	SSDC10-D
SSDC03-D-FC	SSDC06-D-FC	SSDC10-D-FC
SSDC03-IP	SSDC06-IP	SSDC10-IP
SSDC03-IP-FC	SSDC06-IP-FC	SSDC10-IP-FC

6.2 Technical Specifications

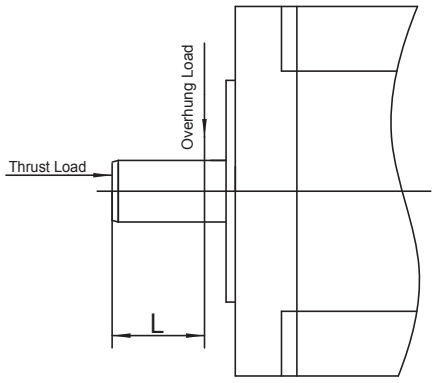
Power Amplifier	
Amplifier Type	Dual H-Bridge, 4 Quadrant
Current Control	4 state PWM at 20 KHz
Output Current	SSDC03: Continuous Current 3A max, Boost Current 4A max (1.5s), current limitation auto set-up by attached motor
	SSDC06: Continuous Current 6A max, Boost Current 7.5A max (1.5s), current limitation auto set-up by attached motor
	SSDC10: Continuous Current 10A max, Boost Current 15A max (1.5s), current limitation auto set-up by attached motor
Power Supply	SSDC03: External nominal 12 - 48 volt DC power supply required, Absolute maximum input voltage range 10 - 53 VDC
	SSDC06: External nominal 24 - 70 volt DC power supply required, Absolute maximum input voltage range 18 - 75 VDC
	SSDC10: External nominal 24 - 70 volt DC power supply required, Absolute maximum input voltage range 18 - 75 VDC
Protection	Over-voltage, under-voltage, over-temp, motor/winding shorts (phase-to-phase, phase-to-ground)
Controller	
Electronic Gearing	Software selectable from 200 to 51200 steps/rev in increments of 2 steps/rev
Encoder Resolution	20000 counts/rev(for AM17/23/24/34SS-N motors)
	4096 counts/rev(for AM11/17/23/24/34RS motors)
Speed Range	Up to 3000rpm
Filters	Digital input noise filter, Analog input noise filter, Smoothing filter, PID filter, Notch filter
Non-Volatile Storage	Configurations are saved in FLASH memory on-board the DSP
Modes of Operation	-D type: eSCL Mode, Q, Modbus/TCP
	-IP type: EtherNet/IP, Q
Digital Inputs	8 digital inputs
	X1, X2: Optically isolated, differential, 5-24VDC; Minimum pulse width = 250ns, Maximum pulse frequency = 2MHz;
	X3, X4: Optically isolated, differential, 5-24VDC; Minimum pulse width = 100 μ s, Maximum pulse frequency = 5KHz;
	X5 ~ X8: Optically isolated, differential, 5-24VDC; Minimum pulse width = 100 μ s, Maximum pulse frequency = 5KHz;
Digital Outputs	4 digital outputs
	Y1 ~ Y4; Optically isolated, Open Collector, 30V/100 mA max, Maximum pulse frequency = 10KHz
Analog Inputs	Two analog inputs
	Analog resolution: 12bit
	Each input can accept a signal range of 0 to 5 VDC, ±5 VDC, 0 to 10 VDC or ±10 VDC
Encoder Outputs	Differential encoder outputs (A ± , B ± , Z ±), 26C31 line driver, 20 mA sink or source max
+5V Output	4.8~5V, 100 mA max
Communication	Dual-port RJ45 Ethernet
Physical	
Ambient Temperature	0 to 40° C (32 to 104° F) when mounted to a suitable heatsink
Ambient Humidity	90% Max., non-condensing

6.3 Recommended Motors

	Model	Drive P/N	Torque	Rotor Inertia	Encoder Resolution	Maximum Speed	Mass	Frame Size	Permissible Overhung Load(N)					Permissible Thrust Load
									Distance(L) from Shaft End(mm)					
			N·m	gcm²	counts/rev	RPM	g	mm	0	5	10	15	20	
	AM08RS1DMA	SSDC03	0.03	1.6	4096	3000	50	20	12	15	20	-	-	Less than the motor mass
	AM08RS2DMA		0.042	2.9			70							
	AM08RS3DMA		0.05	4.2			90							
	AM11RS1DMA		0.065	9			118	28	20	25	34	52	-	
	AM11RS2DMA		0.08	12			168							
	AM11RS3DMA		0.125	18			218							
★	AM17RS1DM □	SSDC03 or SSDC06	0.26	38			390	42	35	44	58	85	-	
★	AM17RS2DM □		0.42	57			440							
★	AM17RS3DM □		0.52	82			520							
★	AM17RS4DM □		0.7	123			760							
★	AM17SS1DG □ -N		0.26	38	20000		390							
★	AM17SS2DG □ -N		0.42	57			440							
★	AM17SS3DG □ -N		0.52	82			520							
★	AM17SS4DG □ -N		0.7	123			760							
★	AM23RS2DM □	SSDC06 or SSDC10	0.95	260	4096		850	56	63	75	95	130	190	
★	AM23RS3DM □		1.5	460			1250							
★	AM23RS4DMA		2.4	365			1090							
★	AM23SS2DG □ -N		0.95	260	20000		850							
★	AM23SS3DG □ -N		1.5	460			1250							
★	AM23SS4DGA-N		2.4	365			1090							
★	AM24RS3DM □ -N		2.5	900	4096		1650	60	90	100	130	180	270	
★	AM24SS3DG □ -N		2.5	900	20000		1650							
★	AM34RS1DMA	SSDC10	2.7	915	4096		2000	86	260	290	340	390	480	
★	AM34RS3DMA		5.2	1480			3100							
★	AM34RS5DMA		7.0	2200			4200							
	AM34SS1DGA-N		2.7	915	20000		2000							
	AM34SS3DGA-N		5.2	1480			3100							
	AM34SS5DGA-N		7.0	2200			4200							

□: A or B, refer to motor part numbering system

★ : UL certified models are detailed in the appendix.



7 Contacting MOONS'

Customer Service Center

+86-400-820-9661

MOONS' Headquarter

Building 7, Lane 88, Minbei Road, Minhang District, Shanghai, 201107, P.R.China

MOONS' Taicang

No. 18 Yingang Rd, Fuqiao Town, Taicang City Jiangsu Province, 215434, P.R. China

Domestic Office

Beijing
Room 1206, Jing Liang Mansion, No.16 Middle Road of East,3rd Ring, Chaoyang District, Beijing 100022, P.R. China

Qingdao
Room1913,Scientific and Technological Innovation Builing,Floor19, No.171, ShanDong Road,Shibei District,QingDao, Shangdong Province, 266033, P.R. China

Xi'an
Room 1006, Tower D, Wangzuo International City, No.1 Tangyan Road, Xi'an, Shanxi Province, 710065, P.R. China

Wuhan
Room 3001, World Trade Tower, No.686 Jiefang Avenue, Jianghan District, Wuhan, Hubei Province, 430022, P.R. China

Hefei
Room 1521, Building B, CBC Tuoji Plaza, Jinggang Road, Shushan District, Hefei, Anhui Province, 230088, P.R. China

Nanjing
Room 1101-1102, Building 2, New Town Development Center, No.126 Tianyuan Road , Moling Street, Jiangning District, Jiangsu Province, China, 211106, P.R. China

Suzhou
Room 1103-1105, North Building 4, Huizu Plaza, 758 Nanhuan East Rd, Gusu District, Suzhou,Jiangsu Province, 215007, P.R. China

Ningbo
Room 309, Tower B, Taifu Plaza, 565 Jiangjia Road, Jiangdong District, Ningbo, Zhejiang Province, 315040, P.R. China

Chengdu
Room 3907, Maoye Plaza, No.19, Dongyu Street, Jinjiang Distrit, Chengdu Sichuan Province, 610066, P.R. China

Chongqing
Room 2108, South yuanzhu Buliding 20, No.18 Fuquan Rd., Jiangbei District, Chongqing, 400000, P.R. China

Guangzhou
Room 4006, Tower B, China Shine Plaza, 9 Linhe Xi Road, Tianhe District, Guangzhou, Guangdong Province, 510610, P.R. China

Dongguan
Room 1106-1207, Building 5, Linrunzhigu, No.1 RD 5th Rd, Songshan Lake, Dongguan, Guangdong Province, 523000, P.R. China

Shenzhen
Room 3901, Building A, Zhongguan Times Square,No 4168 Liuxian Avenue, Nanshan District, Shenzhen, Guangdong Province, 518000, P.R. China

North America

USA

MOONS' INDUSTRIES (AMERICA), INC. (Chicago)
1113 North Prospect Avenue, Itasca, IL 60143, USA

MOONS' INDUSTRIES (AMERICA), INC. (Boston)
36 Cordage Park Circle, Suite 310 Plymouth, MA 02360, USA

APPLIED MOTION PRODUCTS, INC. (Morgan Hill)
18645 Madrone Parkway. Morgan Hill, CA 95037, USA

LIN ENGINEERING, Inc. (Morgan Hill)
16245 Vineyard Blvd., Morgan Hill, CA 95037, USA

Europe

Germany

AMP & MOONS' AUTOMATION (GERMANY) GMBH
Kaiserhofstr. 15
60313 Frankfurt am Main Germany

Italy

MOONS' INDUSTRIES (EUROPE) HEAD QUARTER S.R.L.
Via Torri Bianche n.1 20871 Vimercate(MB) Italy

Switzerland

TECHNOSOFT SA
Avenue des Alpes 20
CH 2000 Neuchâtel Switzerland

U.K

MOONS' INDUSTRIES (UK), LIMITED
Rooms 4&5, 1st Floor, Greenbank, London Road, Reading, UK. RG1 5AQ

Asia

Singapore

MOONS' INDUSTRIES (SOUTH-EAST ASIA) PTE. LTD.
33 Ubi Avenue 3 #08-23 Vertex Singapore 408868

Japan

MOONS' INDUSTRIES JAPAN CO., LTD.
Room 602, 6F, Shin Yokohama Koushin Building,
2-12-1, Shin-Yokohama, Kohoku-ku, Yokohama, Kanagawa,
Japan 222-0033

India

MOONS' INTELLIGENT MOTION SYSTEM INDIA PVT. LTD.
Room. 908, 9th Floor, Amar Business Park,
Tal. Haveli, Baner, Pune, India 411045

Vietnam

MOONS' INDUSTRIES (VIETNAM) COMPANY LIMITED.
Factory C1&D1, Lot IN3-11 * A, VSIP Hai Phong Industrial Park,
Lap Le Ward, Thuy Nguyen City, Hai Phong City, Vietnam.

https://www.moonsindustries.com/
E-mail:ama-info@moons.com.cn
MOONS'
moving in better ways

- All the specifications, technical parameters of the products provided in this catalog are for reference only, subject to change without notice. For the latest details, please contact our sales department.