RS03/06/10-P

Step-Servo System

Hardware Manual

SHANGHAI AMP & MOONS' AUTOMATION CO.,LTD.

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This User Manual is only applicable to the following models.

Models	Communication
	RS-232
RS03-P-A	✓
RS06-P-A	✓
RS10-P-A	✓

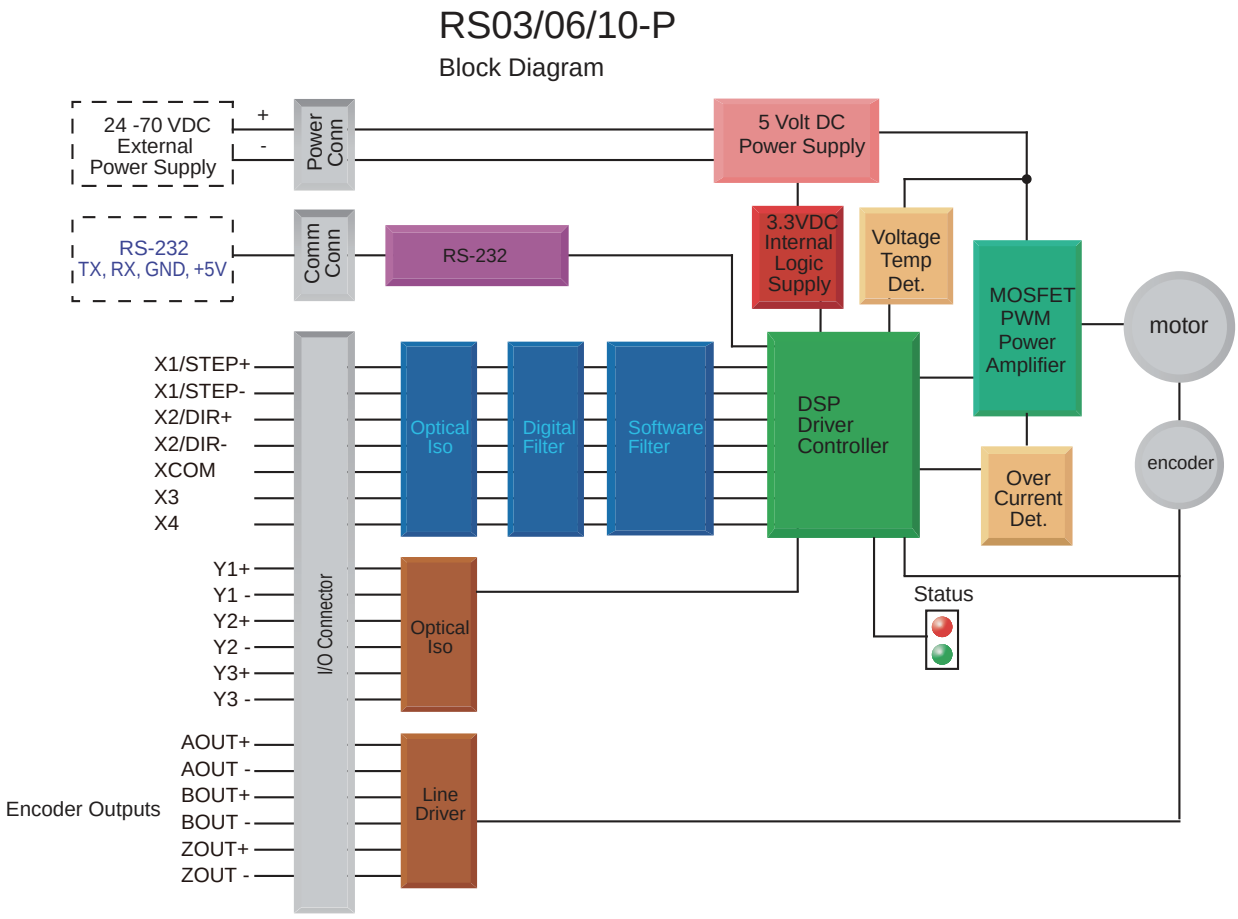
1. Introduction

Thank you for selecting the MOONS' RS series step-servo drive and motor. The step-servo is an innovative revolution for the world of stepper motor; it enhances the stepper motors with servo technology to create a product with exceptional feature and broad capability.

1.1 Features

- Programmable, digital step-servo drive and motor package
- Operates from a 24 to 70 volt DC power supply
- Control modes:
  - Position Control
    - Pulse & Direction
    - CW/CCW Pulse
    - A/B quadrature(Encoder following)
- RS-232 serial communication
- Encoder resolution: 1024 lines (4096 counts/rev) for RS step-servo motor
- RS03 output current: continuous 3A, boost 4A
- RS06 output current: continuous 6A, boost 7.5A
- RS10 output current: continuous 10A, boost 12A
- 4 optically isolated digital inputs, with adjustable bandwidth digital noise rejection filter, 5-24VDC
- 3 optically isolated digital outputs, max 30V/100mA
- Differential encoder signal output (AOUT+/-, BOUT+/-, ZOUT+/-)
  - 26C31 line driver, 20mA sink or source current
- Technological advance
  - Full servo control, Closed loop
  - Efficient, Accurate, Fast, Smooth
  - Intelligent, Compact

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.

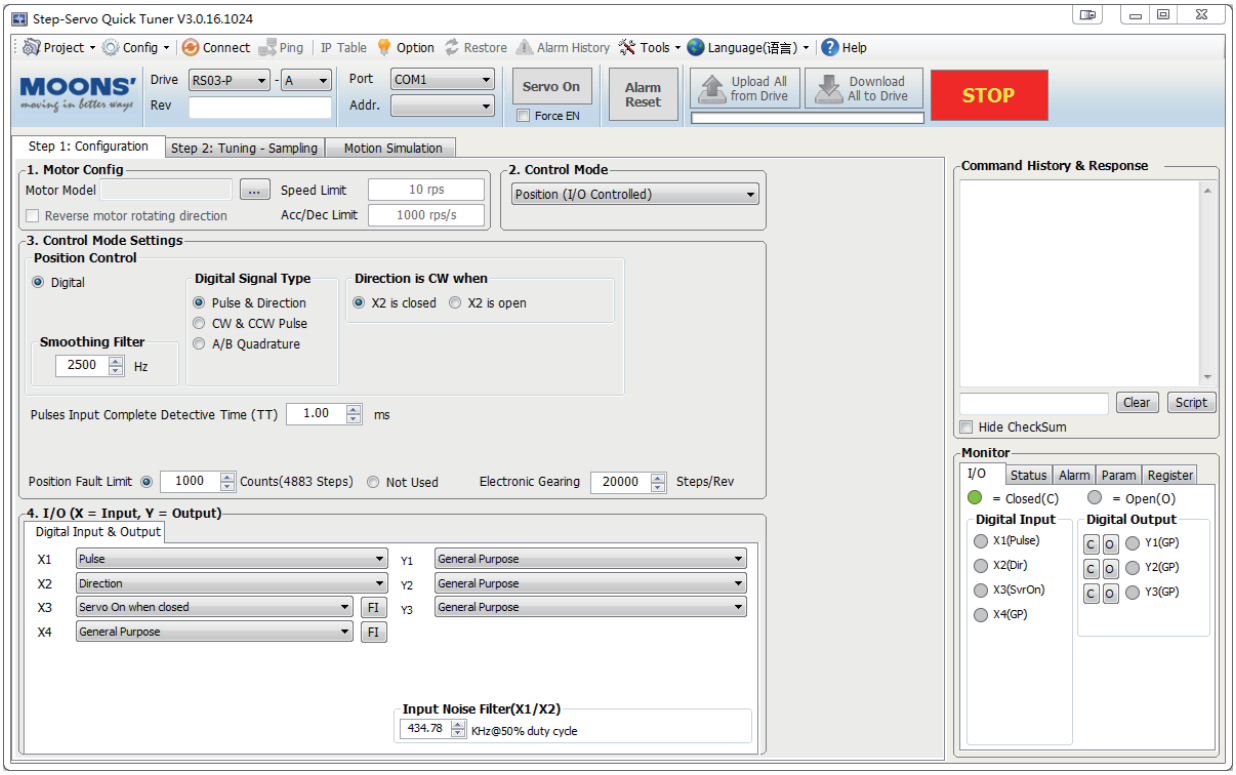
2. Getting Started

The following items are needed:

- A 24-70 Volt DC power supply, see the section below entitled “Choose a Power Supply” for help in choosing the right one.
- A compatible 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/Windows 7/Windows 8 32-bit or 64-bit (Using serial communication port. Need a USB to RS-232 converter if the PC doesn’t have)
- A RS-232 communication cable (included)

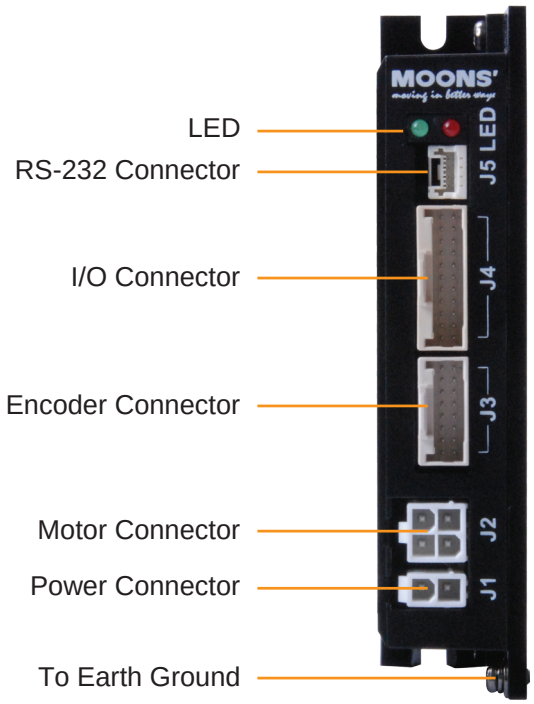
2.1 Installing Software

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' / Step-Servo Quick Tuner
- Connect the drive to PC by RS-232 cable. The section entitled "3.3.1 Choosing the Right COM Port" will help you to choose a right COM port.
- Connect the drive to the Power Supply.
- Connect the motor to the drive.
- Power up the drive.
- The software will recognize your drive, display the model and firmware version and it's ready for action.

The connectors and other points of interest are illustrated below:



Model		
RS03-P-A	RS06-P-A	RS10-P-A

2.2 Mounting the Hardware

Use the M3 or M4 screw to mount the RS series drive .The drive should be securely fastened to a smooth ,flat metal surface the 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 where there is no airflow or where other devices cause the surrounding air to be more than 40° C (104° F).
- Never put the drive where it can get wet.
- Never use the drive where metal or other electrically conductive particles can infiltrate the drive.
- Always provide airflow around the drive. When mounting multiple RS drives near each other, maintain at least 1.5cm of space between drives.

2.3 Choosing a Power Supply

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

2.3.1 Voltage

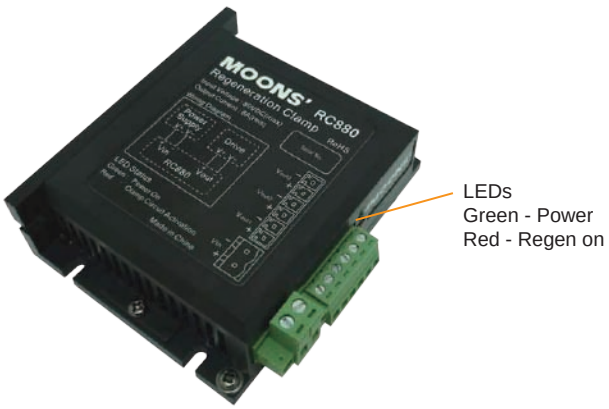
The RS driver is designed to give optimum performance between 24 and 70 Volts DC. Choosing the voltage depends on the performance needed and motor/drive heating that is acceptable and/or does not cause a drive over-temperature. Higher voltages will give higher speed performance but will cause the RS driver to produce higher temperatures. Using power supplies with voltage outputs that are near the drive maximum may significantly reduce the operational duty-cycle.

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. Absolute minimum power supply input is 18 VDC. If the Input supply drops below 18 VDC the low voltage alarm will be triggered. 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.

2.3.2 Regeneration Clamp

If a regulated power supply is being used, there may be a problem with regeneration. When a load decelerates rapidly from a high speed, some of the kinetic energy of the load is transferred back to the power supply, possibly tripping the over-voltage protection of a regulated power supply, causing it to shut down. This problem can be solved with the use of a MOONS' RC880 Regeneration Clamp. It is recommended that an RC880 initially be installed in an application. If the "regen" LED on the RC880 never fl ashes, the clamp is not necessary.

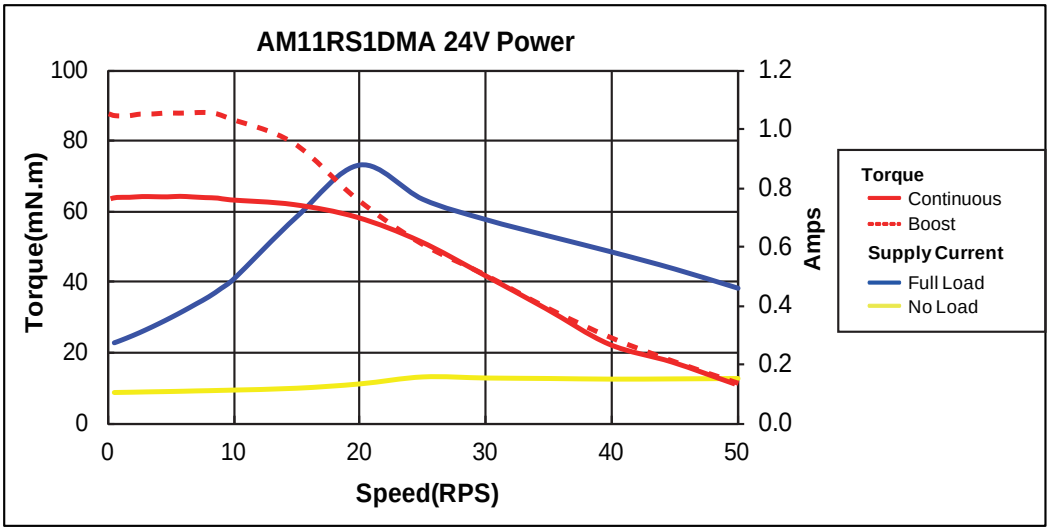


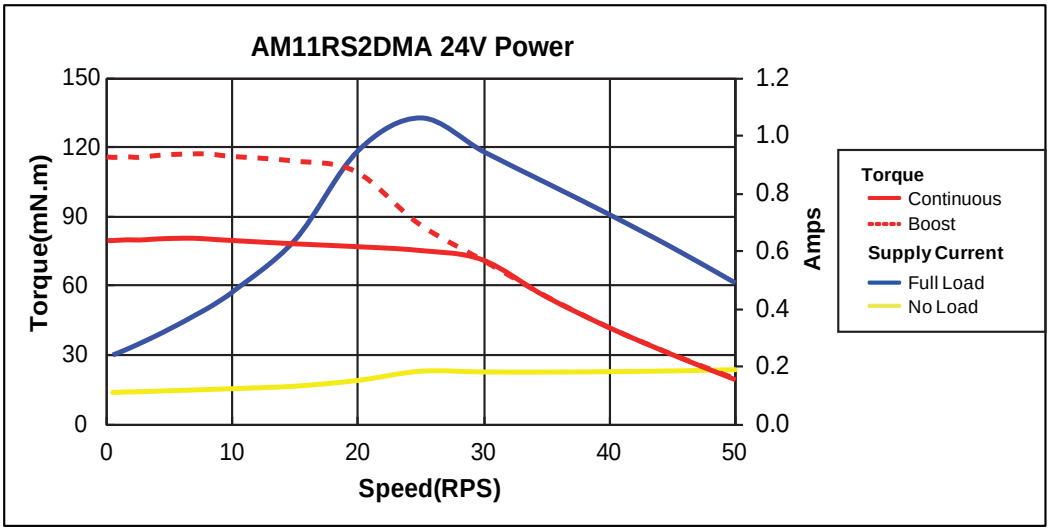
RC880 Regen Clamp

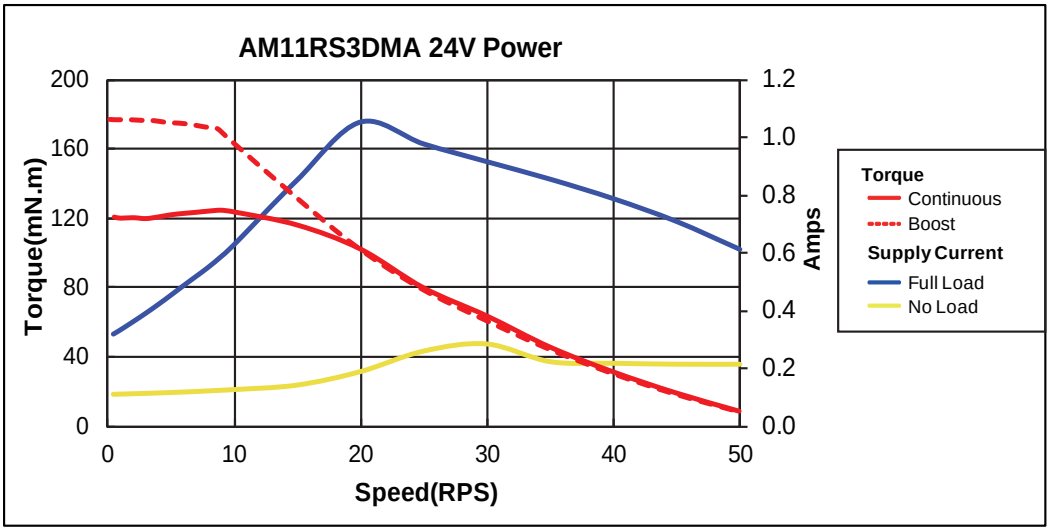
2.3.3 Current

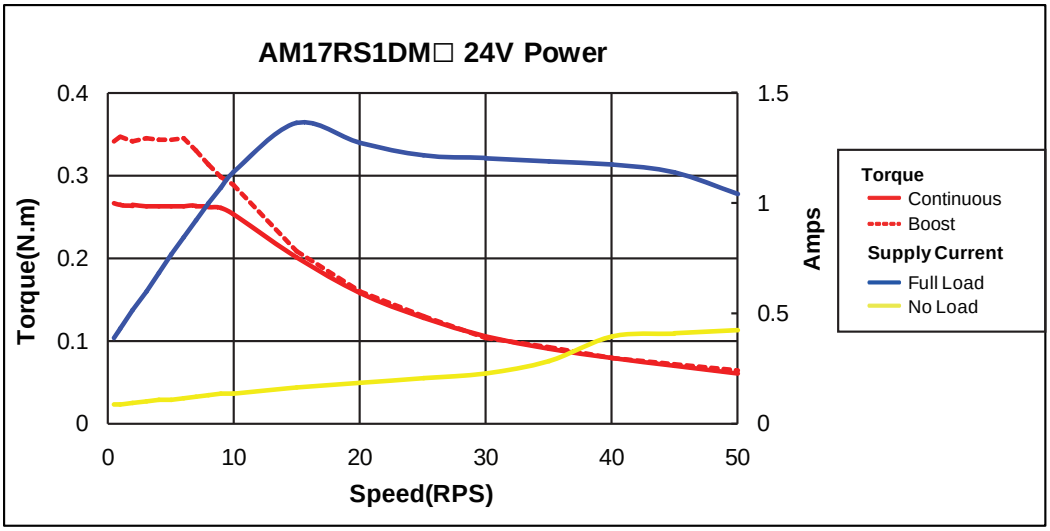
The maximum supply currents required by the RS series step-servo drive and motor are shown below in chats at different power supply voltage input. The RS drive power supply current is lower than the winding currents because it uses switching amplifiers to convert a high voltage and low current into low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

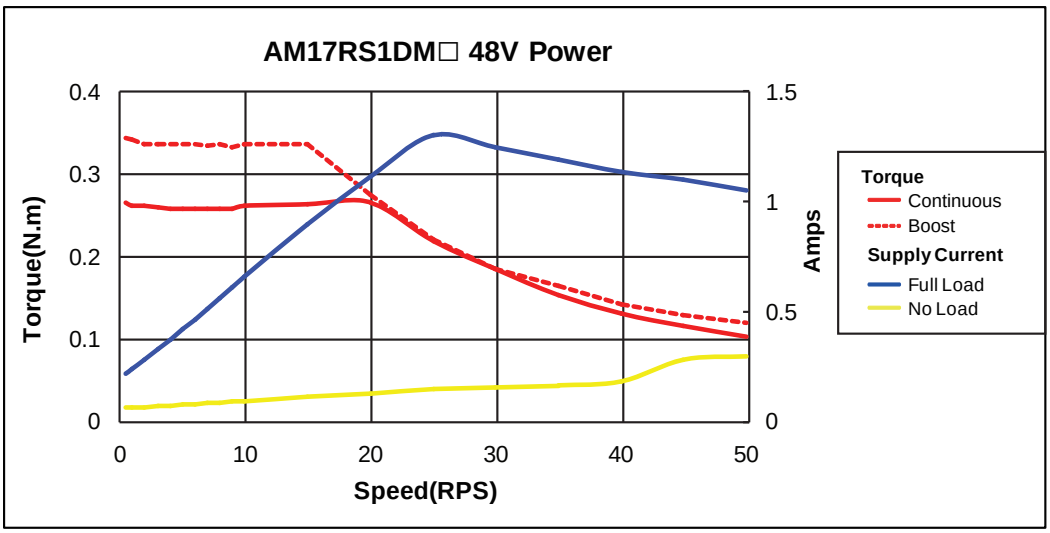
It is important to note that the current draw is significantly different at higher speeds depending on the torque load to the motor. Estimating how much current is necessary may require a good analysis of the load to the motor.

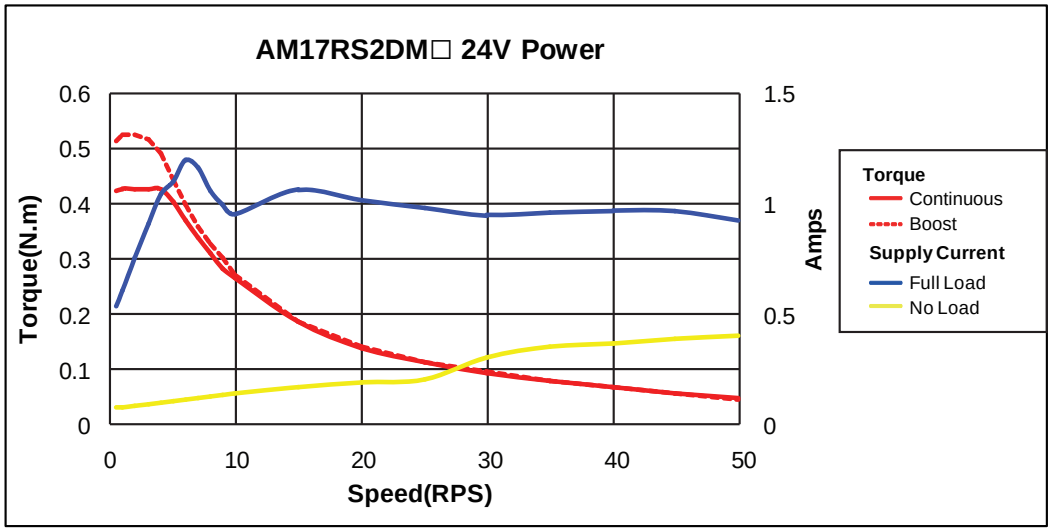


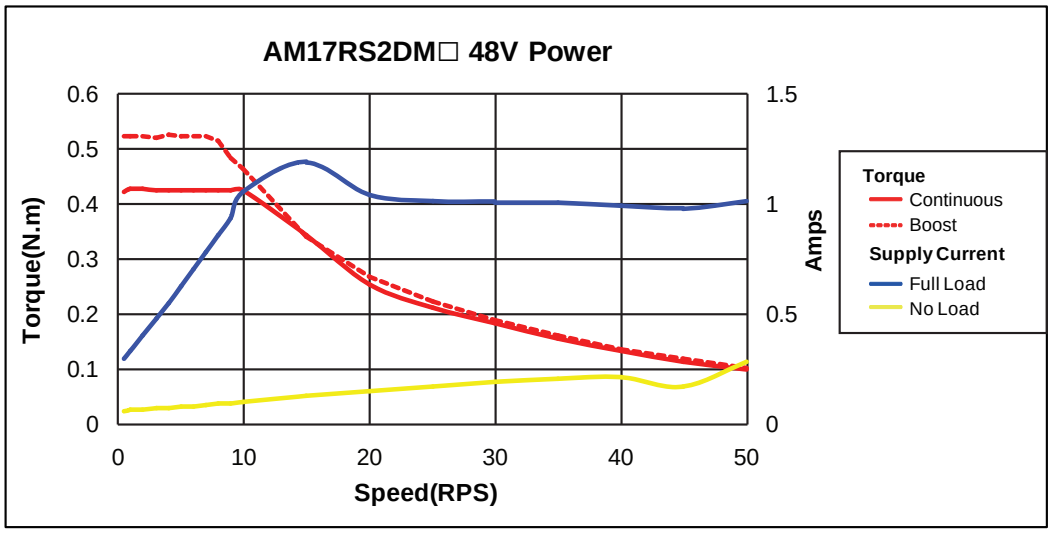


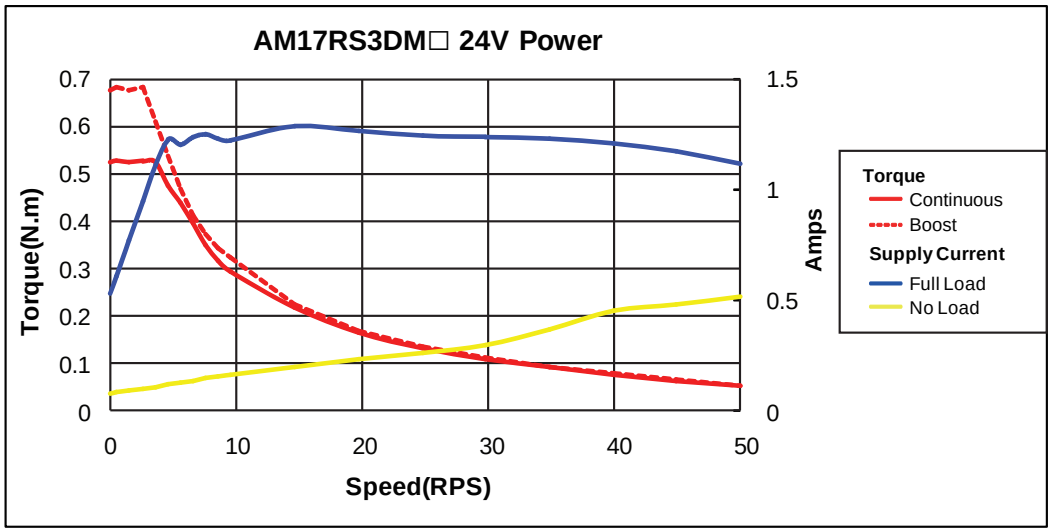

AM11RS3DMA 24V Power
Torque(mN.m)
Amps
Speed(RPS)
Torque
Continuous
Boost
Supply Current
Full Load
No Load

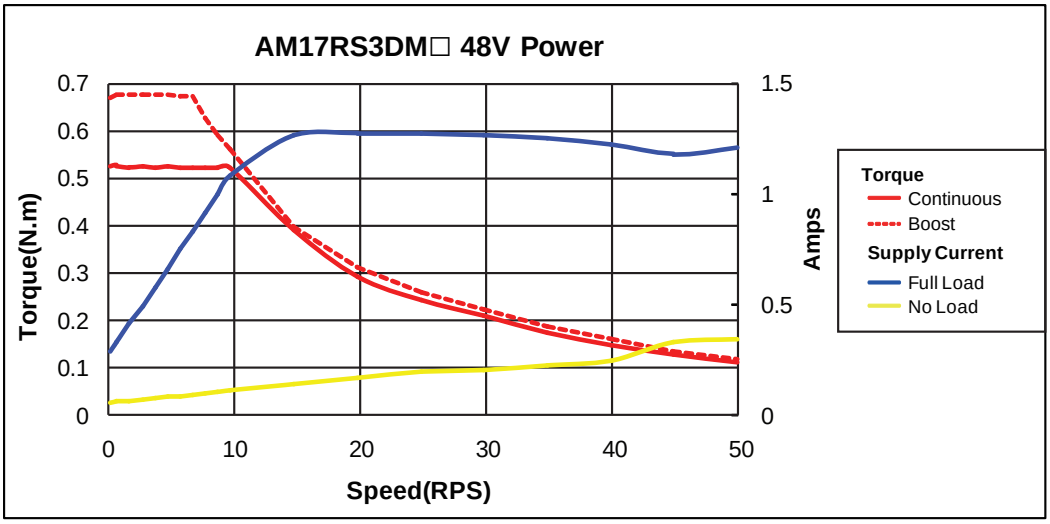

AM17RS1DM□ 24V Power
Torque(N.m)
Amps
Speed(RPS)
Torque
Continuous
Boost
Supply Current
Full Load
No Load

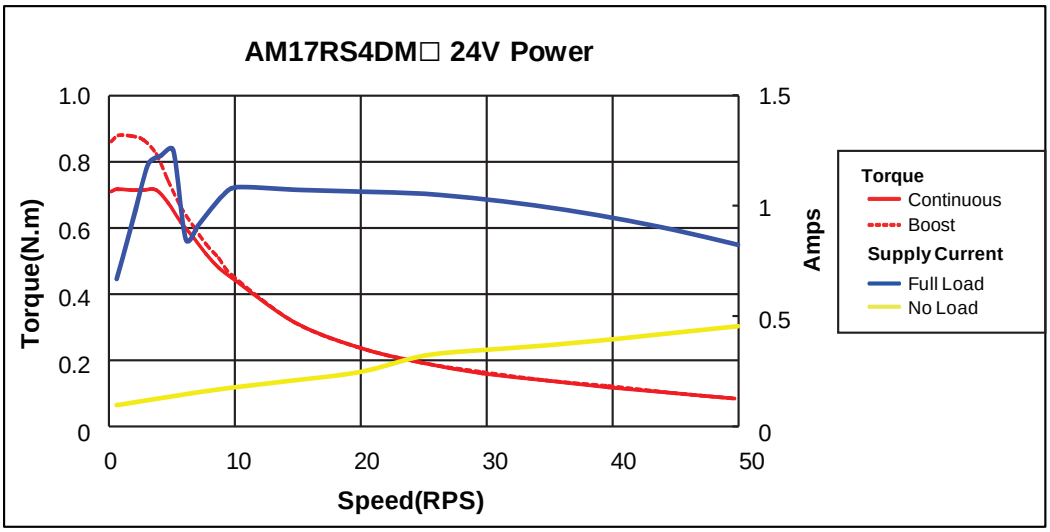

AM17RS1DM□ 48V Power
Torque(N.m)
Amps
Speed(RPS)
Torque
Continuous
Boost
Supply Current
Full Load
No Load

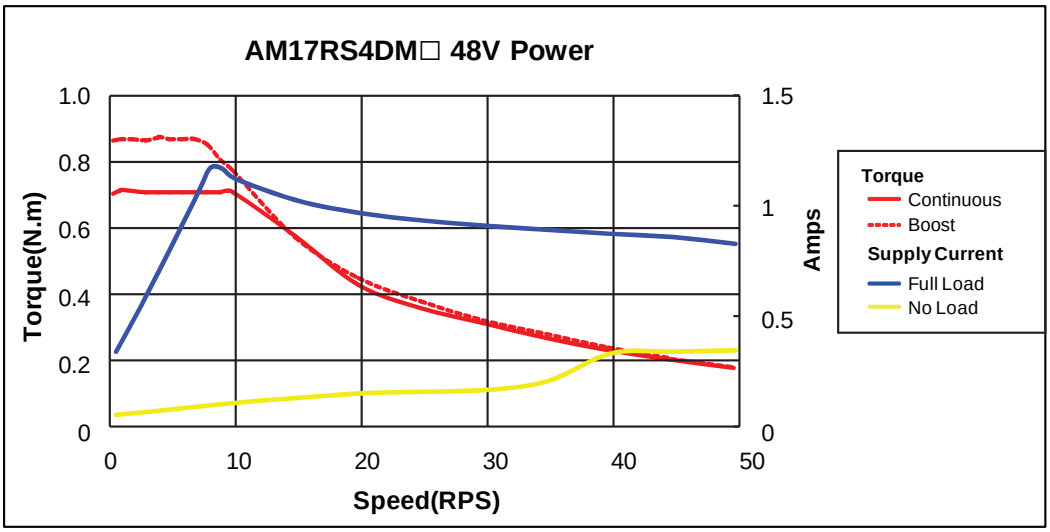

AM17RS2DM□ 24V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.5
1
1.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

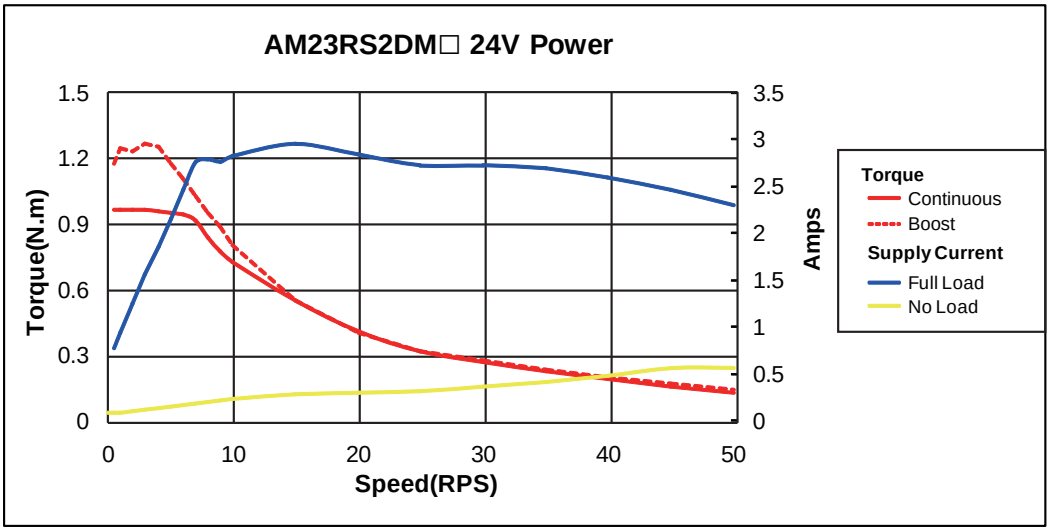

AM17RS2DM□ 48V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.5
1
1.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

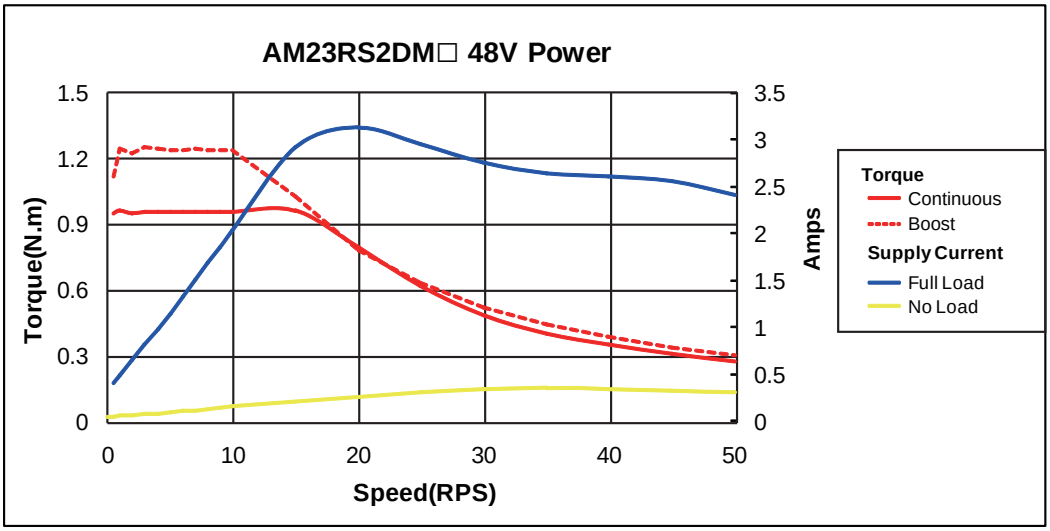

AM17RS3DM□ 24V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.5
1
1.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

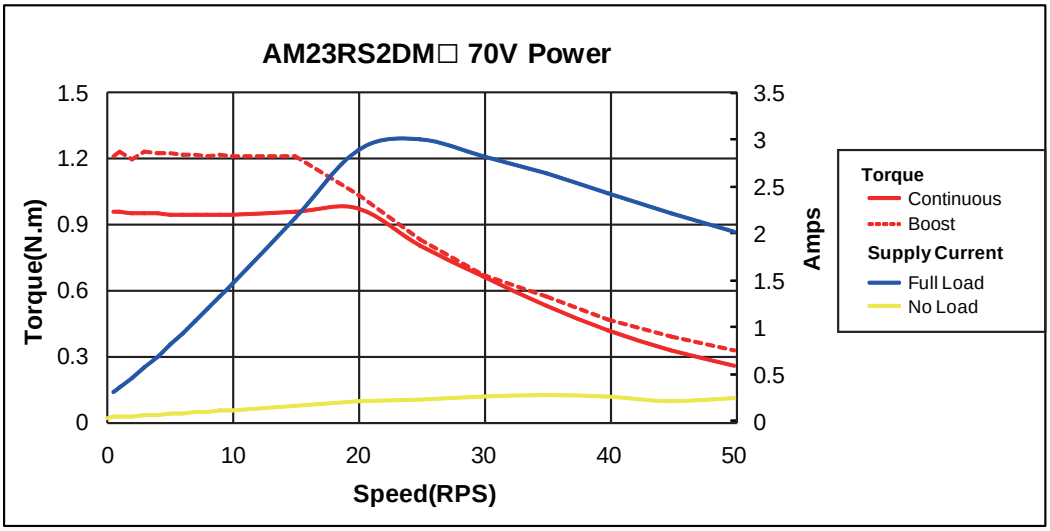

AM17RS3DM□ 48V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.5
1
1.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

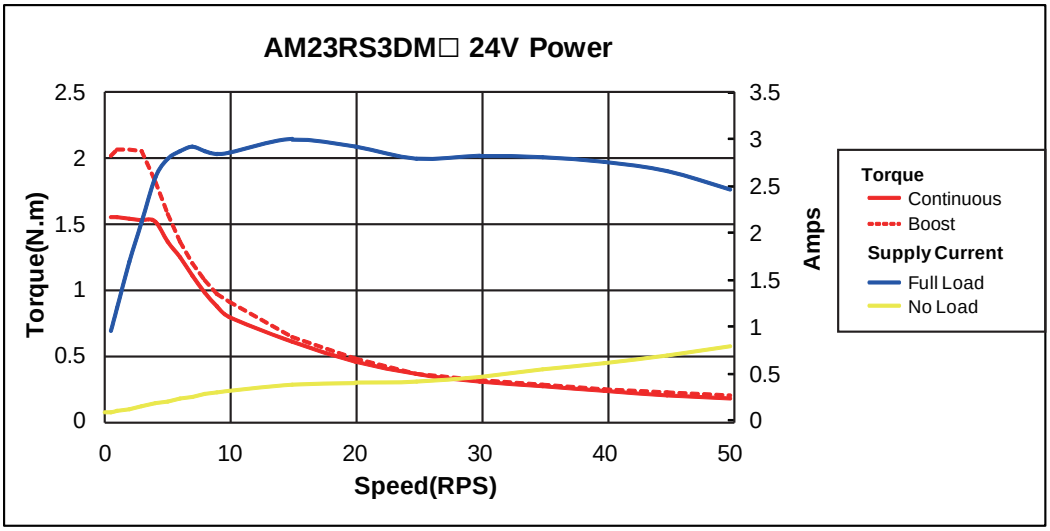

AM17RS4DM□ 24V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.2
0.4
0.6
0.8
1.0
0.5
1
1.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

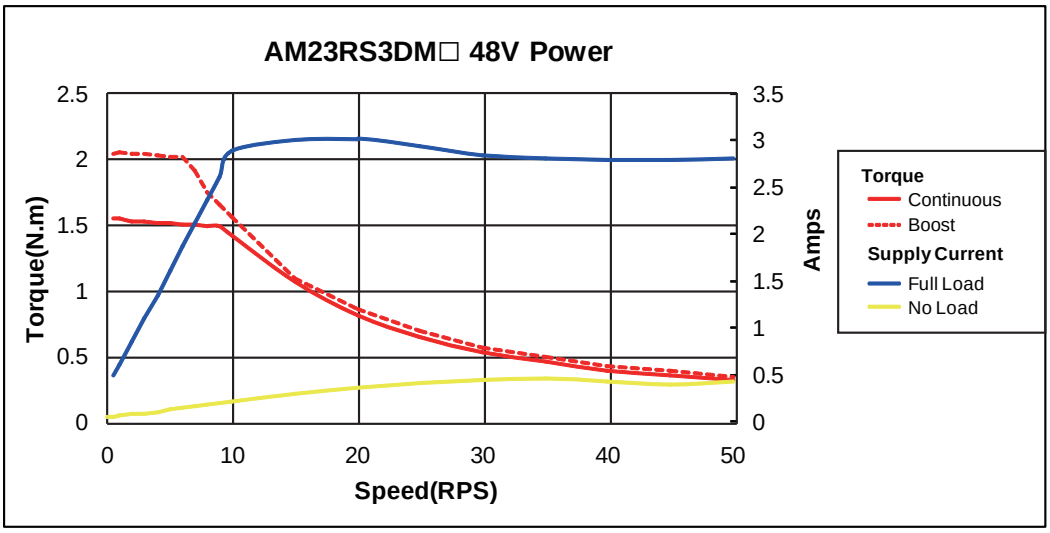

AM17RS4DM□ 48V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.2
0.4
0.6
0.8
1.0
0.5
1
1.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

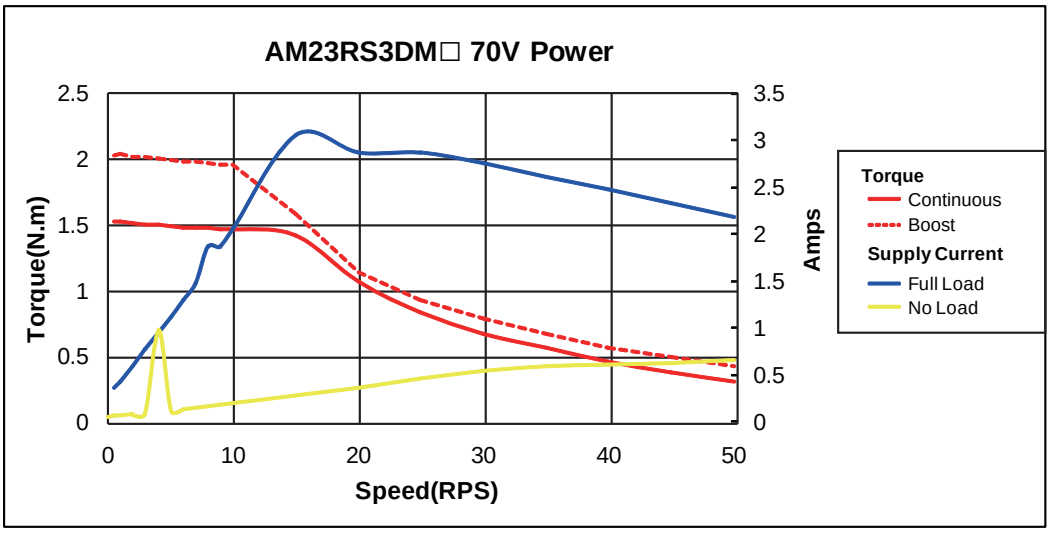

AM23RS2DM□ 24V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.3
0.6
0.9
1.2
1.5
0.5
1
1.5
2
2.5
3
3.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

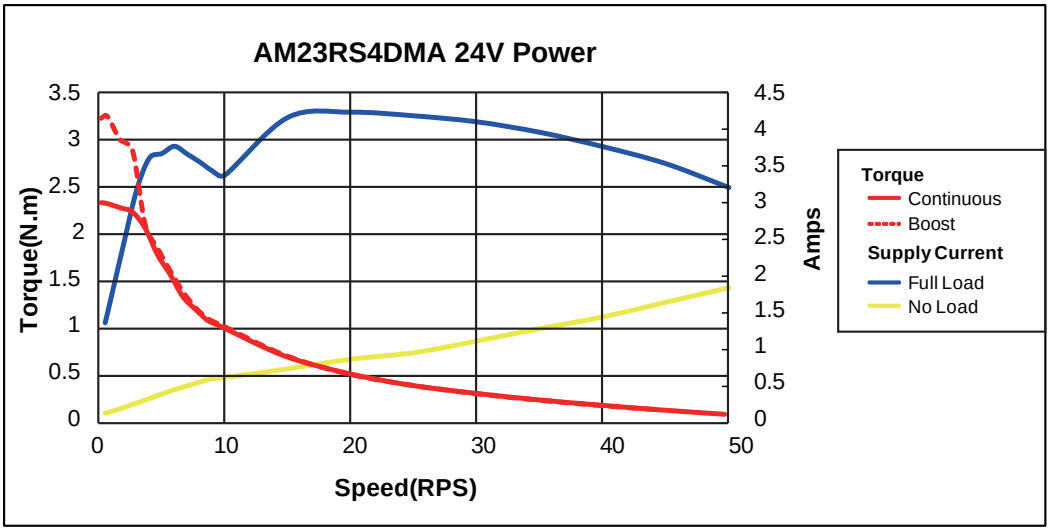

AM23RS2DM□ 48V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.3
0.6
0.9
1.2
1.5
0.5
1
1.5
2
2.5
3
3.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

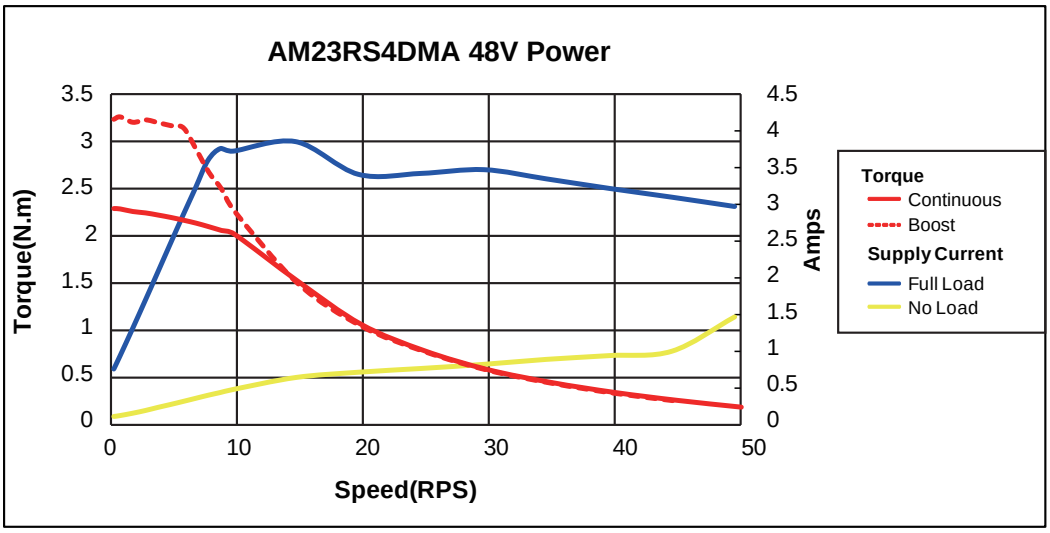

AM23RS2DM□ 70V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.3
0.6
0.9
1.2
1.5
0.5
1
1.5
2
2.5
3
3.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

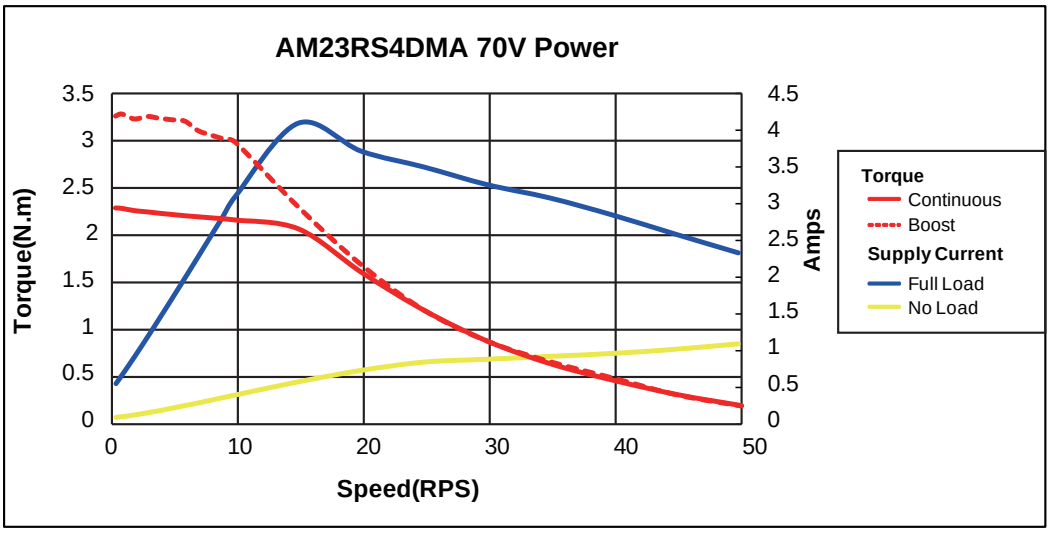

AM23RS3DM□ 24V Power
Torque(N.m)
Amps
Speed(RPS)
Torque
Continuous
Boost
Supply Current
Full Load
No Load

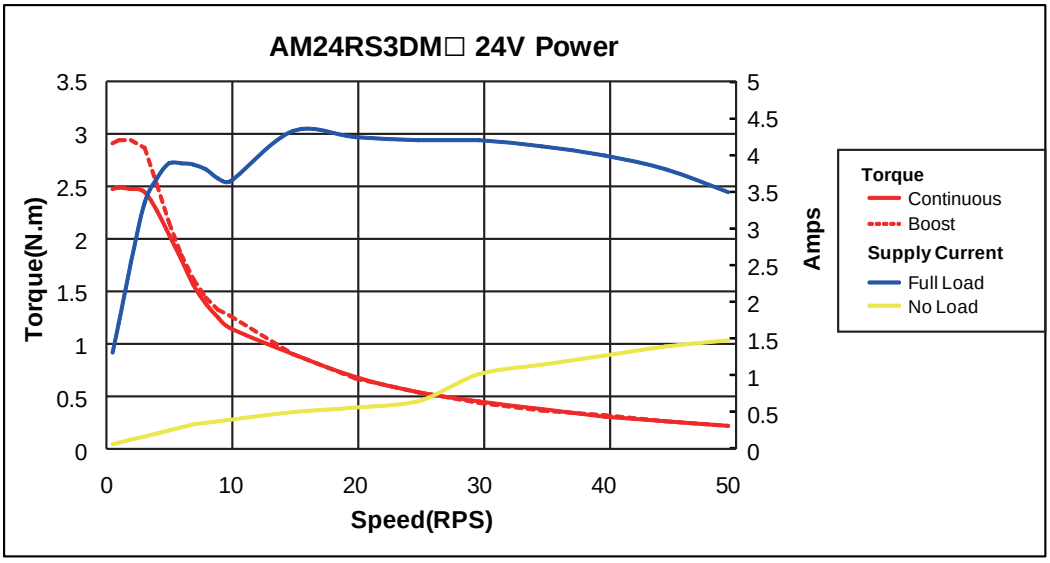

AM23RS3DM□ 48V Power
Torque(N.m)
Amps
Speed(RPS)
Torque
Continuous
Boost
Supply Current
Full Load
No Load

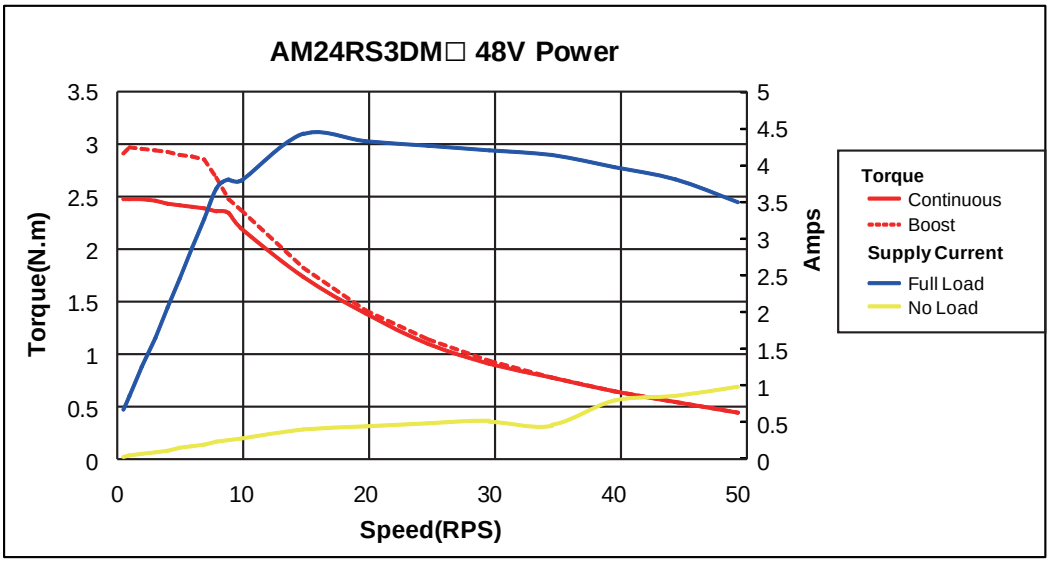

AM23RS3DM□ 70V Power
Torque(N.m)
Amps
Speed(RPS)
Torque
Continuous
Boost
Supply Current
Full Load
No Load

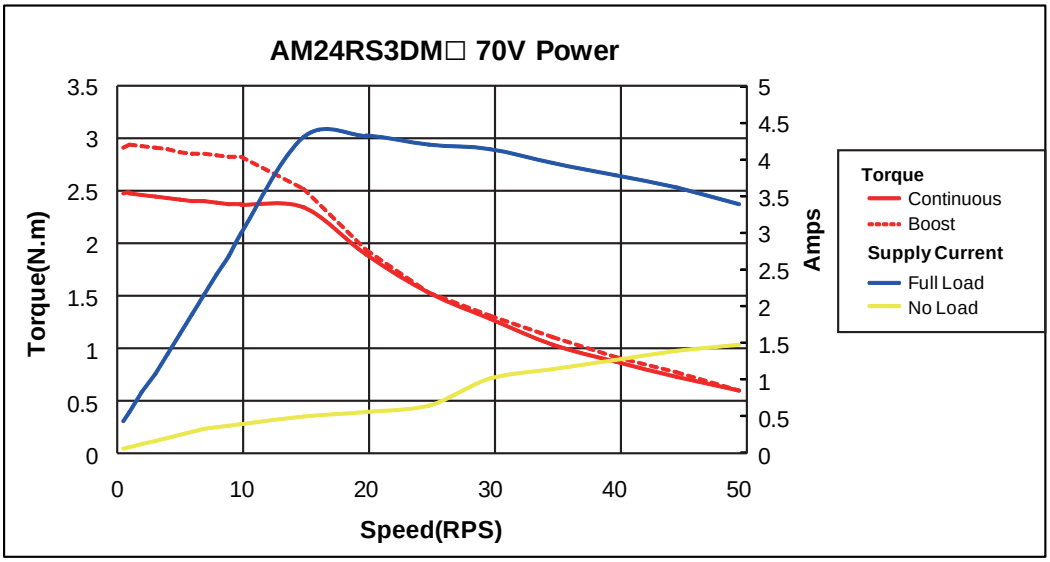

AM23RS4DMA 24V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

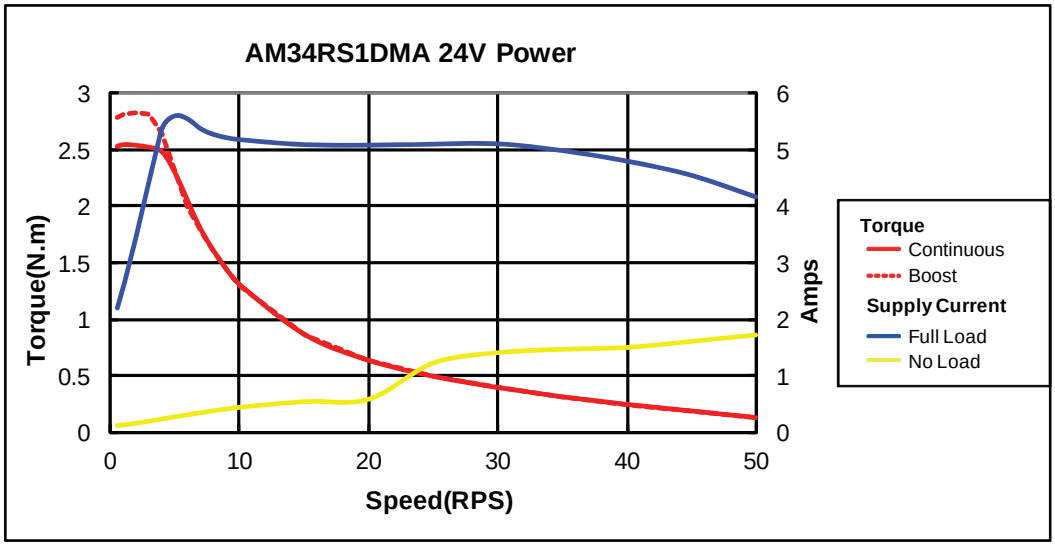

AM23RS4DMA 48V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

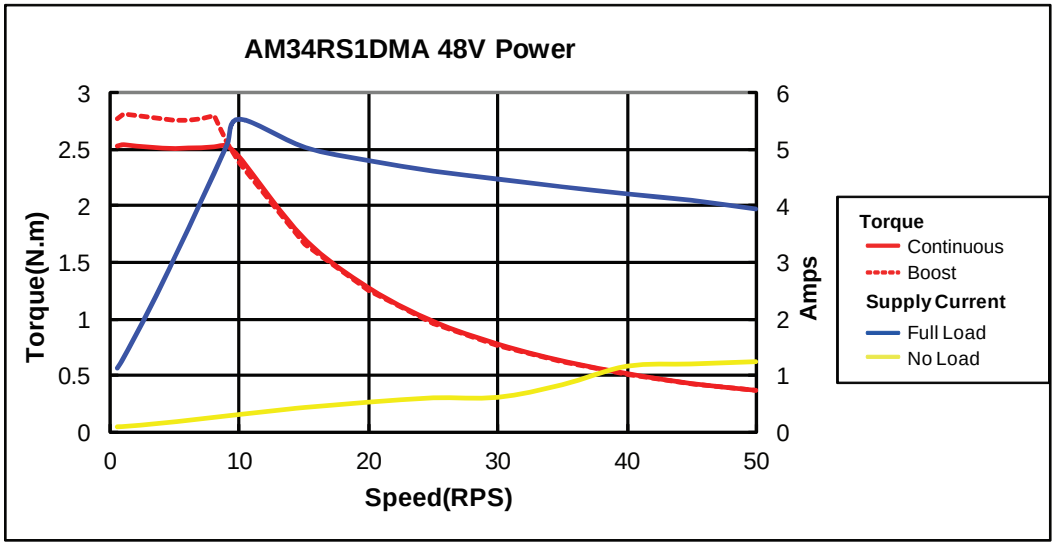

AM23RS4DMA 70V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

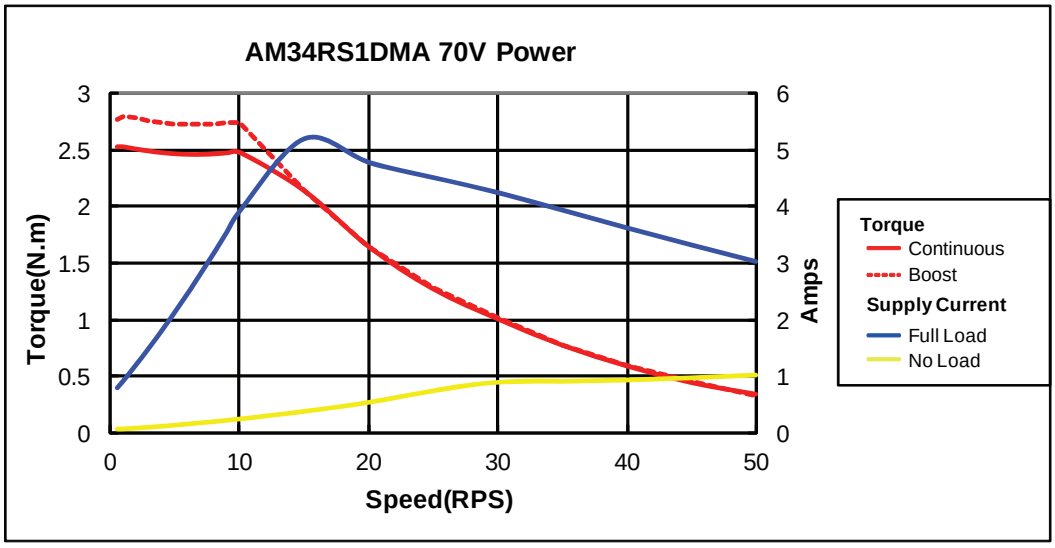

AM24RS3DM□ 24V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

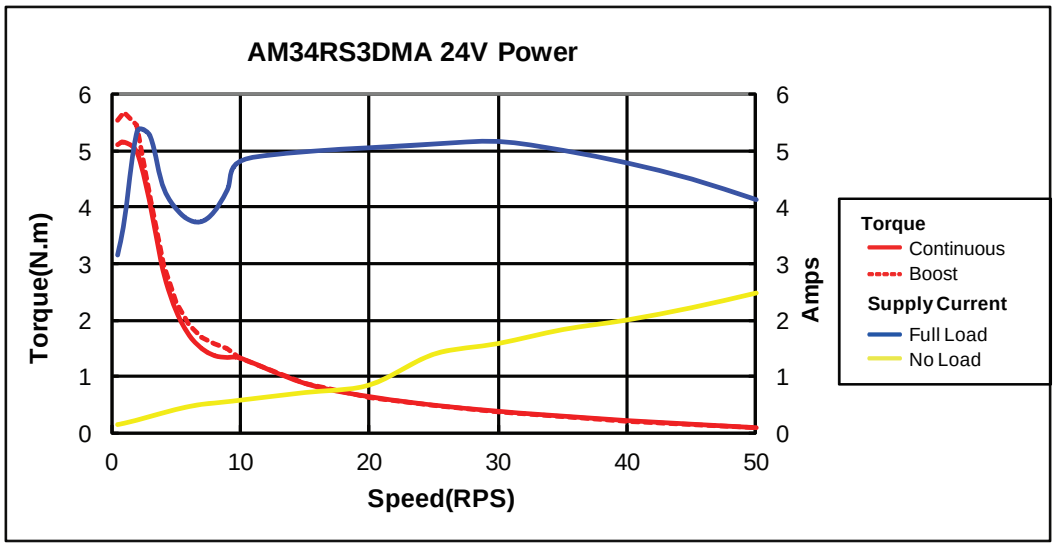

AM24RS3DM□ 48V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

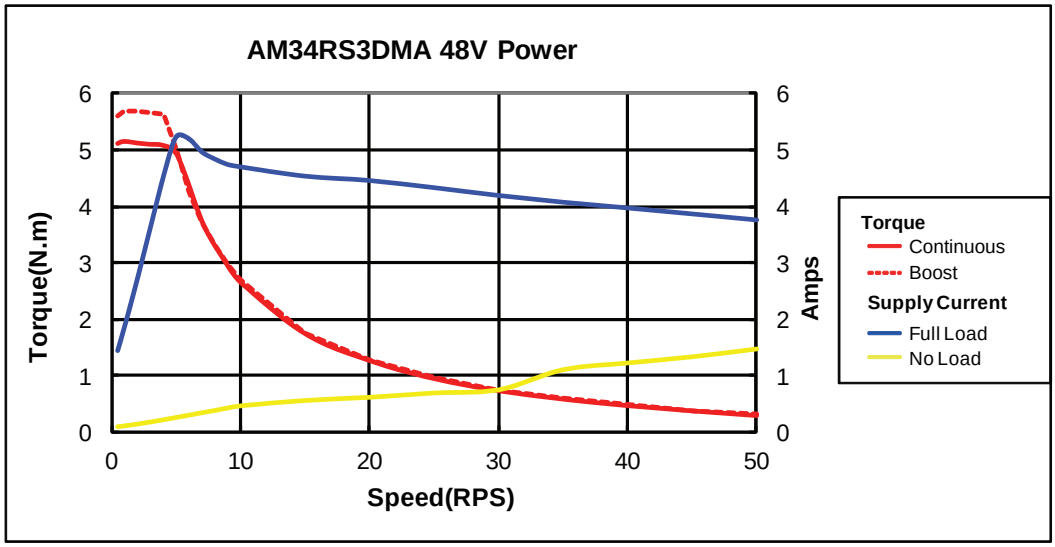

AM24RS3DM□ 70V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

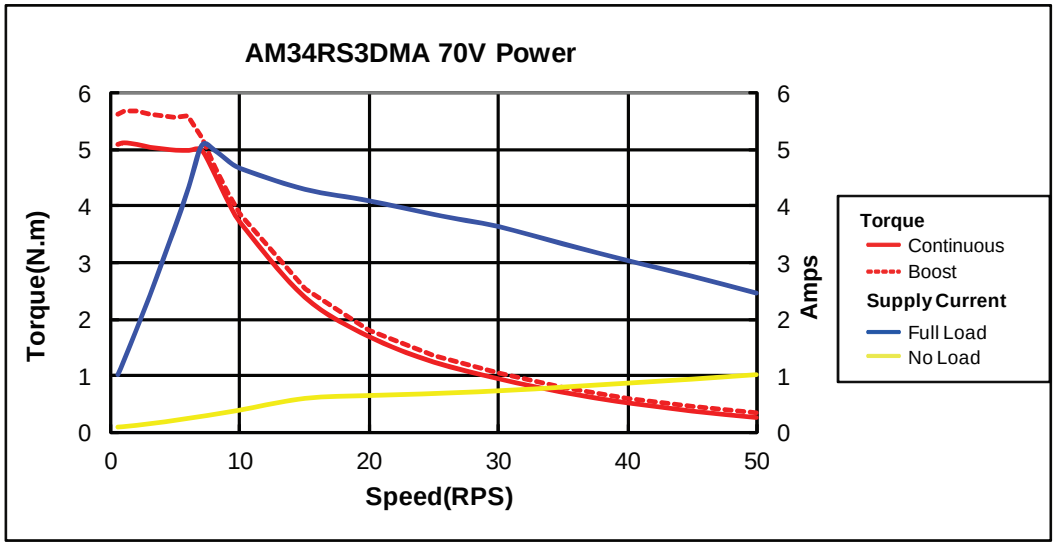

AM34RS1DMA 24V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.5
1
1.5
2
2.5
3
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

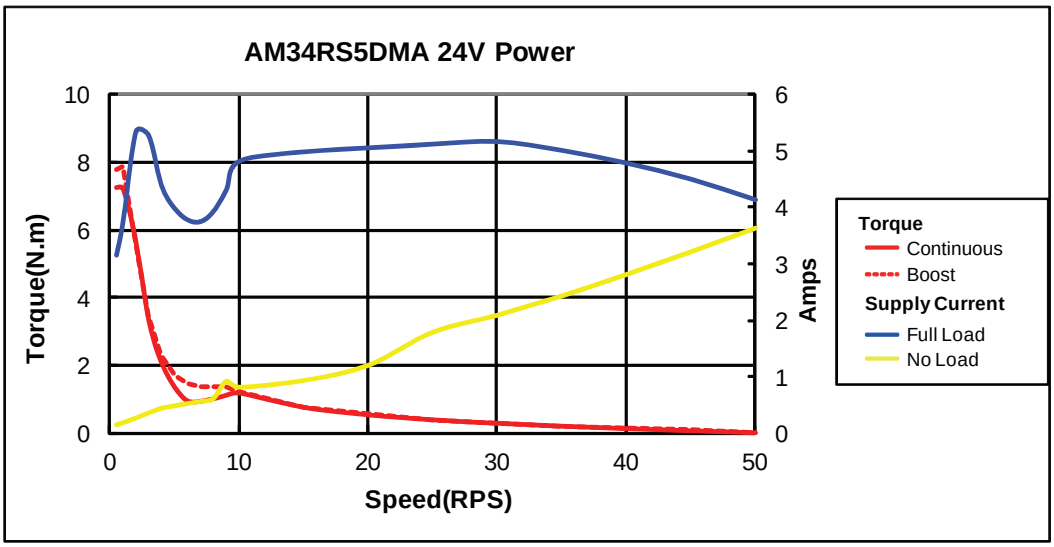

AM34RS1DMA 48V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.5
1
1.5
2
2.5
3
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

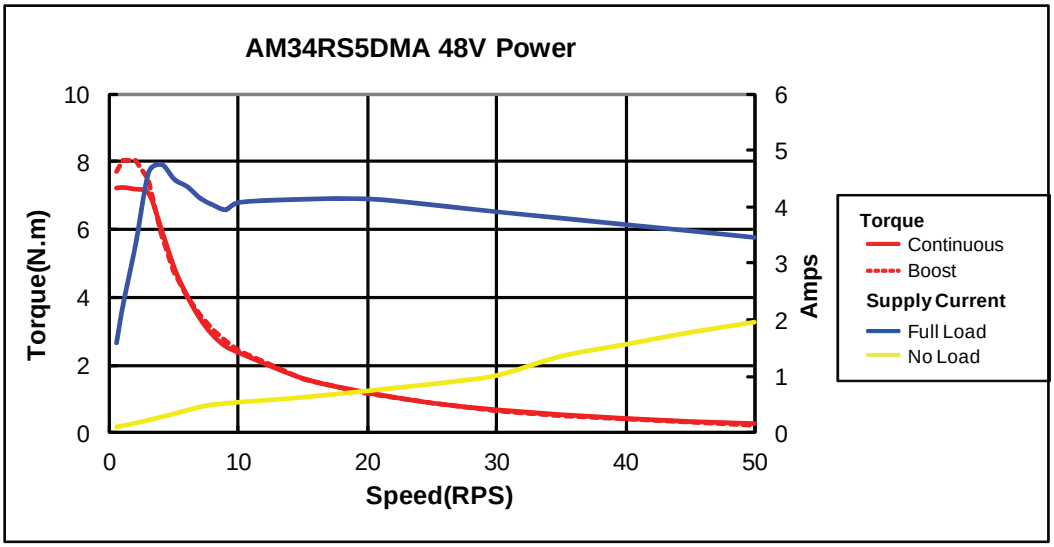

AM34RS1DMA 70V Power
Torque(N.m)
Amps
Speed(RPS)
0
0.5
1
1.5
2
2.5
3
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load

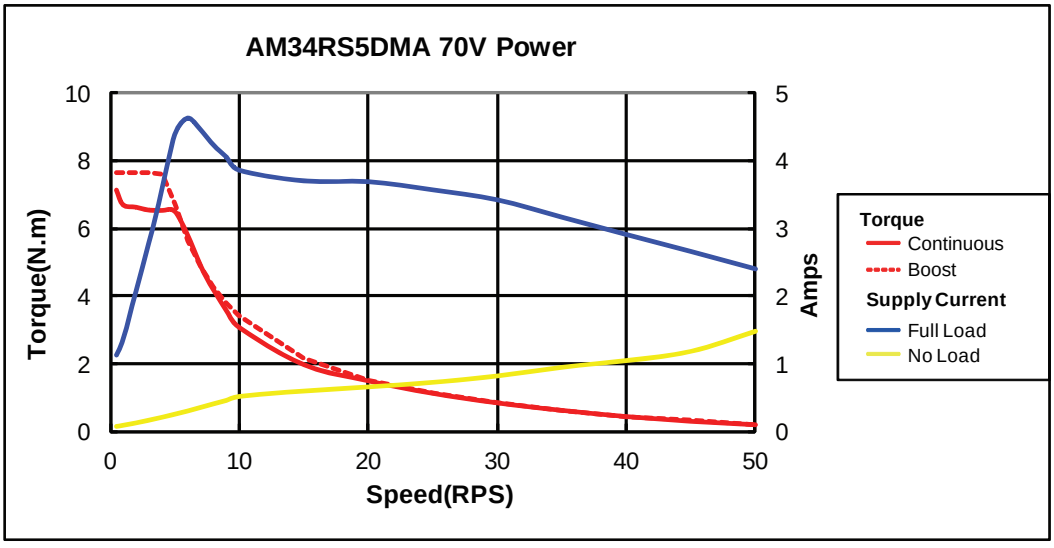

AM34RS3DMA 24V Power
Torque(N.m)
Amps
Speed(RPS)
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load


AM34RS3DMA 48V Power
Torque(N.m)
Amps
Speed(RPS)
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load


AM34RS3DMA 70V Power
Torque(N.m)
Amps
Speed(RPS)
0
1
2
3
4
5
6
0
10
20
30
40
50
Torque
Continuous
Boost
Supply Current
Full Load
No Load


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
No Load


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
No Load


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
No Load

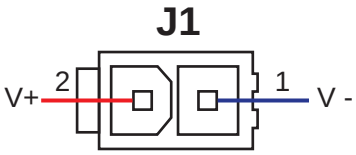
3. Installation/Connections

3.1 Connecting the Power Supply

The RS 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.

The red wire is connected to the V+ of the drive. The black wire is connected to the V- of the drive.

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



Power Connector

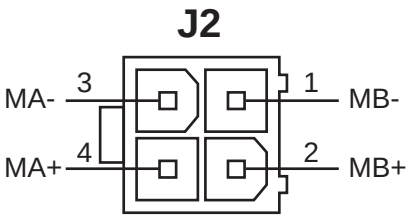
Connect the chassis to the earth ground through the grounding screws.

The section entitled “2.3 Choosing a Power Supply” will help you to select a right power supply.

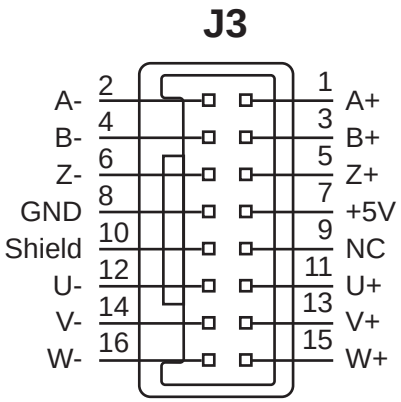
3.2 Connecting the Motor

The 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.

Do not damage or drag the cables on the motor.



Motor connector on the driver



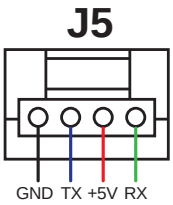
Encoder connector on the driver

3.3 Connecting to the PC using RS-232

The RS series step-servo drive and motor are shipped with a 1.5 meters RS-232 communication cable. The DB9 connector is used to connect to PC. The small end is a crimping connector used to connect to the drive.

Located the RS series step-servo drive and motor within 1.5 meters of the PC. Plug the DB9 connector into the serial COM port of the PC. Plug the small end crimping connector into the RS-232 port of the drive. Do not hot plug.

If the PC doesn't have a RS-232 serial port, a USB to RS232 converter will be needed. You can contact MOONS' to get a USB to RS-232 converter.



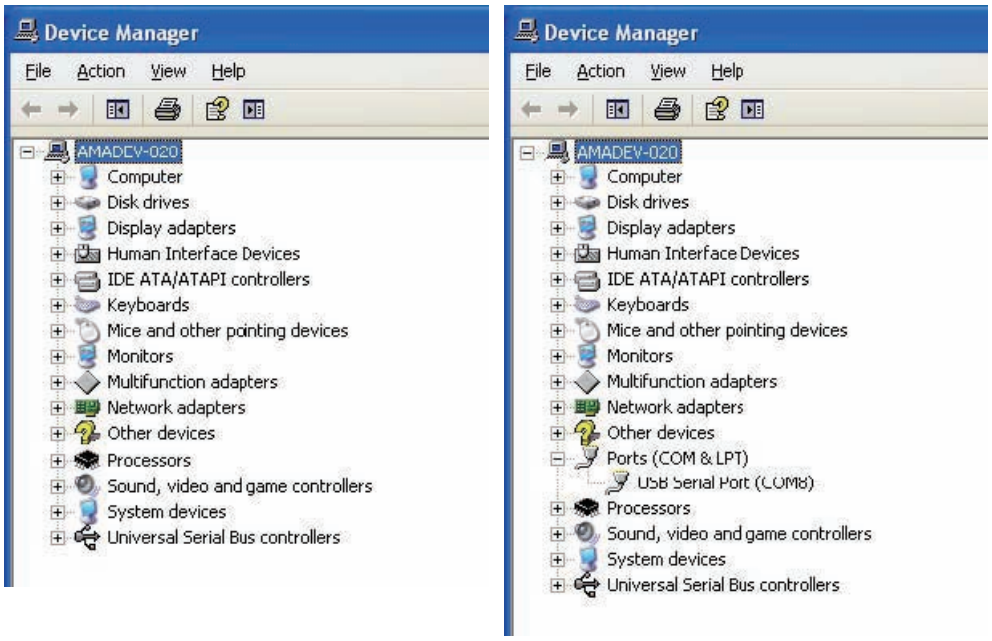
RS03/06/10-P RS-232 Comm port

(View from the driver side)

Driver	Connection
GND	Connects to host GND
TX	Connects to host RX
+5V	Connects to host +5V
RX	Connects to host TX

3.3.1 Choosing the Right COM Port

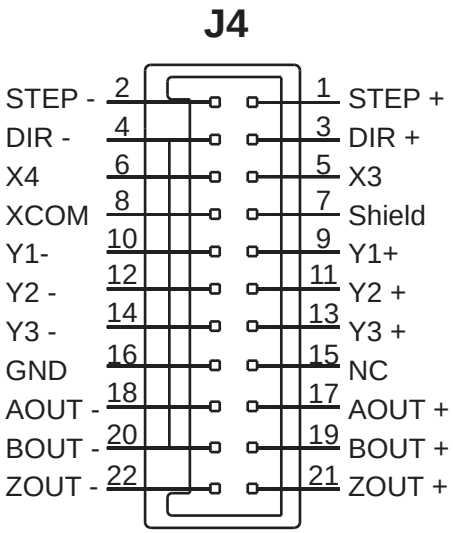
Open the "Device Manager" on the PC. There may or may not be a "Ports" selection. Connect the mini USB cable to the PC. The connected COM port should then be displayed. Choose this new COM(n) port in the Step-Servo Quick Tuner software.



3.4 Inputs and Outputs

RS03/06/10-P inputs and outputs include:

- 4 optically isolated digital inputs, with adjustable bandwidth digital noise rejection filter, 5-24VDC
- 3 optically isolated digital outputs, max 30V/100mA
- Differential encoder signal outputs(AOUT+/-, BOUT+/-, ZOUT+/-)



I/O Connector Diagram

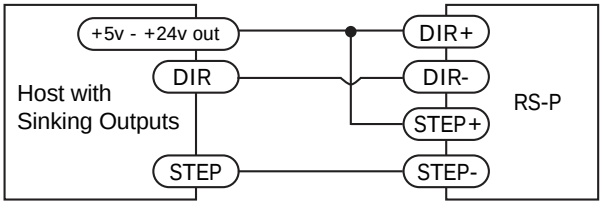
3.4.1 Digital Inputs

3.4.1.1 X1/STEP and X2/DIR High Speed Digital Inputs

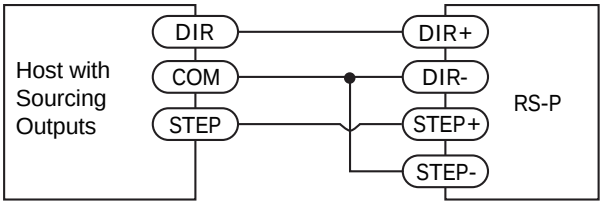
X1/STEP and X2/DIR are high-speed digital inputs operation 5-24V optical isolated differential signal, minimum pulse width 250ns, maximum pulse frequency 2MHz.

- In Pulse and Direction mode, X1/STEP is pulse input and X2/DIR is direction signal input.
- In CW/CCW mode, X1/STEP is CW pulse input and X2/DIR is CCW pulse input.
- In A/B quadrature mode (Encoder following), X1/STEP is signal A input, X2/DIR is signal B input.

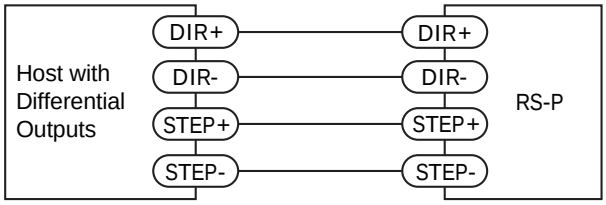
The diagrams below show how to connect the X1/STEP and X2/DIR to various commonly used



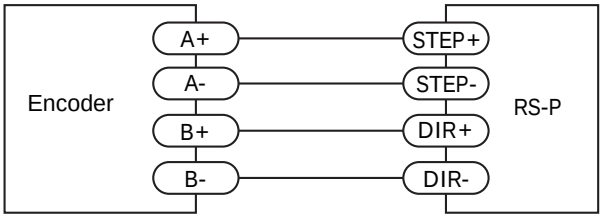
Connecting to Host with Sinking Outputs



Connecting to Host with Sourcing Outputs



Connecting to Host with Differential outputs



Connecting to An Encoder

3.4.1.2 X3/EN, X4/AR Digital Inputs

The X3/EN, X4/AR are digital inputs operation 5-24V optically isolated single-ended signal, sinking or souring, 5-24VDC, minimum pulse width 50 μ s, maximum pulse frequency 10KHz

X3 can be configured as enable signal input to servo on or off the motor and X4 can be configured as alarm reset signal input to clear the alarm and turns to the normal status as servo off.

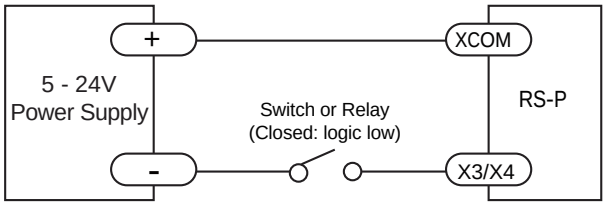
Because the input is an optically isolated circuit, a 5-24V power supply is needed. For example, you can use the power supply of the PLC when you are using a PLC control system, but if you want to connect a relay or mechanical switch to the input, you must need a power supply.

XCOM is an electronics term for a single-ended signal connection to a common voltage. In the case of RS 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 +.

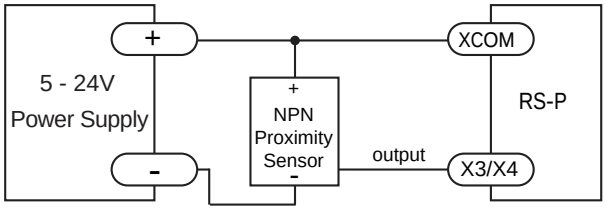
NOTE:

If current is flowing into or out of an input, the logic state of that input is low or closed.
If no current is flowing ,or the input is not connected, the logic state is high or open.

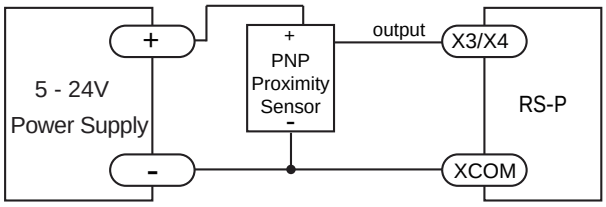
The chats below show how to connect to EN and AR. Please select the polarity of the inputs by using the Step-Servo Quick Tuner.



Connecting to a switch or relay



Connecting a NPN type Proximity Sensor to an Input
(when proximity sensor activates, output goes low)



Connecting a PNP type Proximity Sensot to an input
(when proximity sensor activates, output goes high)

3.4.2 Digital Outputs

3.4.2.1 Y1/ALARM,Y2/IN POSITION,Y3/BRAKE Digital Outputs

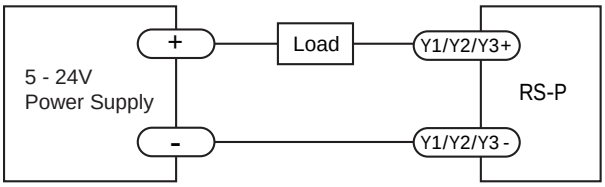
The Y1/alarm, Y2/In-position, Y3/brake are optically isolated digital outputs, single-ended, sinking or souring, max. 30VDC/100mA.

- Y1 can be configured as alarm signal output.
- Y2 can be configured as dynamic in position signal output (dynamic, checking in position all the time.) It can also be configured as static in position signal output (static, checking in position when motor is stopped). It also can be configured as Tach signal output, tach output produce pulses relative to the motor position with configurable resolution. It can also be configured as Timing signal output, timing output produce 50 pulses relative to one turn of motor revolution.
- Y3 can be configured as signal output to release brake. It can be configured as dynamic in position signal output (dynamic, checking in position all the time). It can also be configured as static in position signal output (static, checking in position when motor is stopped).

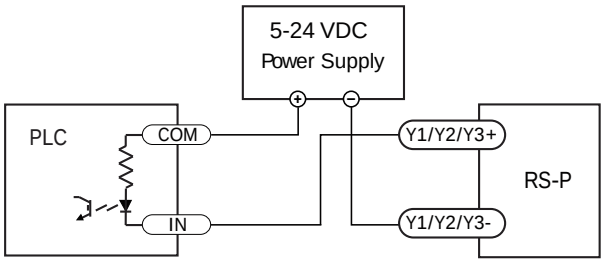
Y1, Y2 and Y3 can be configured by Step-Servo Quick Tuner as general purpose outputs.

The chats below show how to connect to the output:

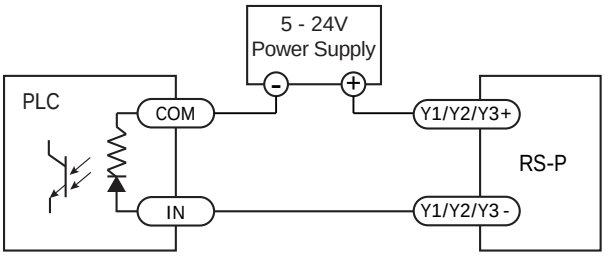
NOTE: Do not connect the outputs to more than 30VDC power supply.
And the current of each output terminal must not exceed 100mA.



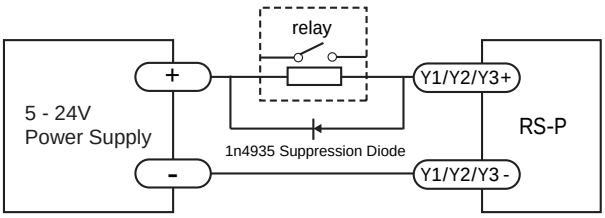
Connecting a Sinking Output



Connecting a sourcing output to a PLC's input



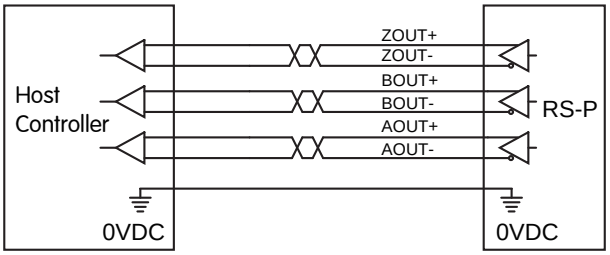
Connecting a Sourcing Output



Driving a Relay

3.4.3 Encoder output

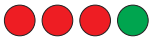
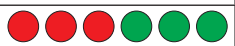
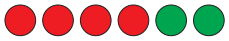
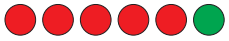
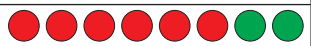
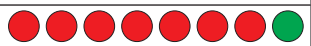
RS03/06/10-P has differential encoder outputs (AOUT+/-, BOUT+/-, ZOUT+/-), with 26C31 line driver, 20 mA sink or source current in max. These signals can be connected to the motion controller to be a feedback of the motor position.



4. Troubleshooting

4.1 LED Error Codes

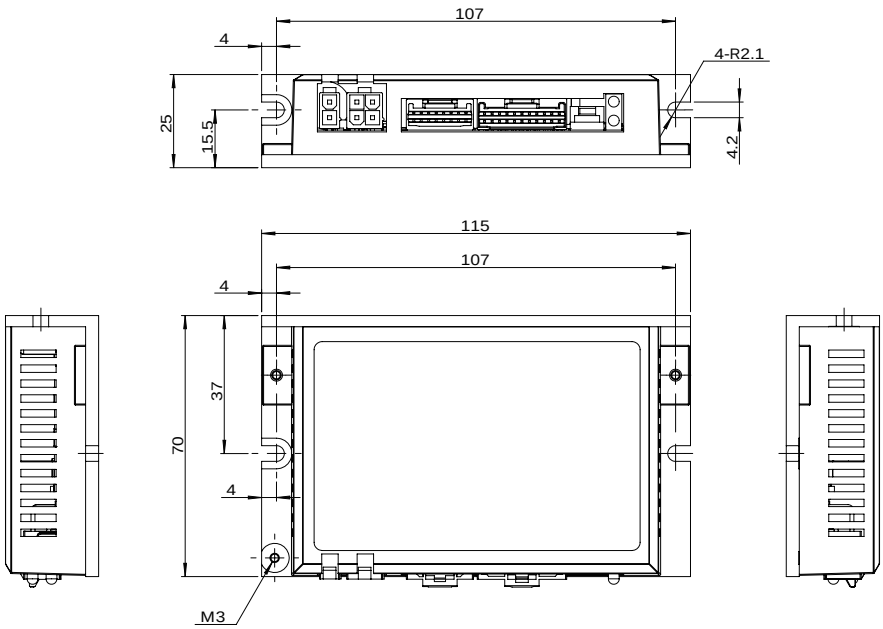
The RS series step-servo package uses red and green LEDs to indicate status. When the motor is enabled, the green LED flashes slowly. When the green LED is solid, the motor is disabled. Errors are indicated by combinations of red and green flashes as shown below.

Code		Error
	Solid green	no alarm, motor disabled
	Flashing green	no alarm, motor enabled
	1 red, 1 green	***position limit***
	1 red, 2 green	move while disabled
	2 red, 1 green	CCW limit
	2 red, 2 green	CW limit
	3 red, 1 green	***drive over temperature***
	3 red, 2 green	***internal voltage out of range***
	3 red, 3 green	blank Q segment
	4 red, 1 green	***power supply overvoltage***
	4 red, 2 green	power supply undervoltage
	5 red, 1 green	***over current***
	6 red, 1 green	***open winding***
	6 red, 2 green	***bad encoder***
	7 red, 1 green	communication error
	7 red, 2 green	flash memory error

NOTE: Items in ***bold italic*** represent drive faults, which automatically disable the motor.

5. Reference Materials

5.1 Drive Mechanical Outlines



Unit: mm

Model		
RS03-P-A	RS06-P-A	RS10-P-A

5.2 Technical Specifications

Power Amplifier	
Amplifier Type	Dual H-Bridge, 4 Quadrant
Current Control	4 state PWM at 20 KHz
Output Current	RS03: Continuous Current 3A max, Boost Current 4.0A max (1.5s), current limitation auto set-up by attached motor
	RS06: Continuous Current 6A max, Boost Current 7.5A max (1.5s), current limitation auto set-up by attached motor
	RS10: Continuous Current 10A max, Boost Current 12A max (1.5s), current limitation auto set-up by attached motor
Power Supply	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
Filters	Digital 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	Position Mode(Pulse & Direction, CW & CCW Pulse, A/B Quadrature)
Digital Inputs	X1/STEP, X2/DIR: Optically isolated, differential, 5-24VDC; Minimum pulse width = 250 ns,Maximum pulse frequency = 2 MHz; X3, X4: optically isolated, single-ended, sinking or souring, 5-24VDC, minimum pulse width 50μs, maximum pulse frequency 10KHz
Digital Outputs	Y1/Alarm, Y2/In Position, Y3/Brake; Optically isolated, 30V/100 mA max
Encoder Outputs	Differential encoder outputs (AOUT+/-, BOUT+/-, ZOUT+/-), 26C31 line driver, 20 mA sink or source max
Communication	RS-232
Physical	
Ambient Temperature	0 to 40°C (32 to 104°F) when mounted to a suitable heatsink
Ambient Humdity	90% Max., non-condensing
Mass	Approx 0.2 Kg

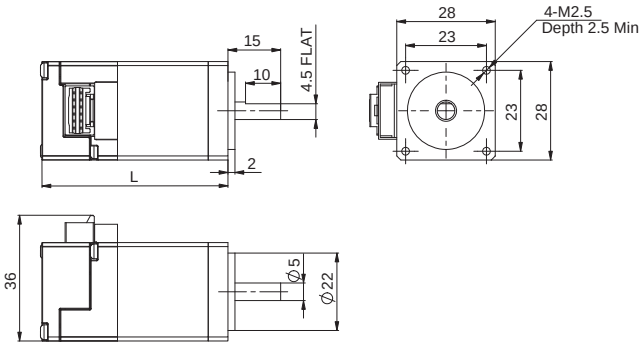
5.3 Recommended Motor

Motor Part Number	Frame Size	Torque (N.m)	Matching Drive
AM11RS1DMA	28	0.065N•m	RS03- P - A
AM11RS2DMA		0.08N•m	
AM11RS3DMA		0.125N•m	
AM17RS1DM☐	42	0.3N•m	
AM17RS2DM☐		0.5N•m	
AM17RS3DM☐		0.6N•m	
AM17RS4DM☐		0.75N•m	
AM23RS2DM☐	56	0.9N•m	RS06- P - A
AM23RS3DM☐		1.5N•m	
AM23RS4DMA		2.5N•m	
AM24RS3DM☐	60	2.5N•m	
AM34RS1DMA	86	2.6N•m	RS10- P -A
AM34RS3DMA		5.2N•m	
AM34RS5DMA		7.2N•m	

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

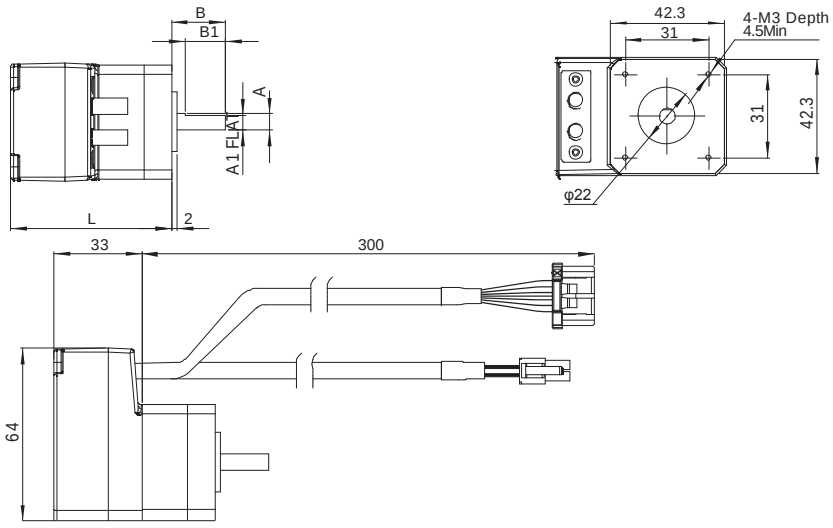
5.4 Motor Outlines

AM11RS



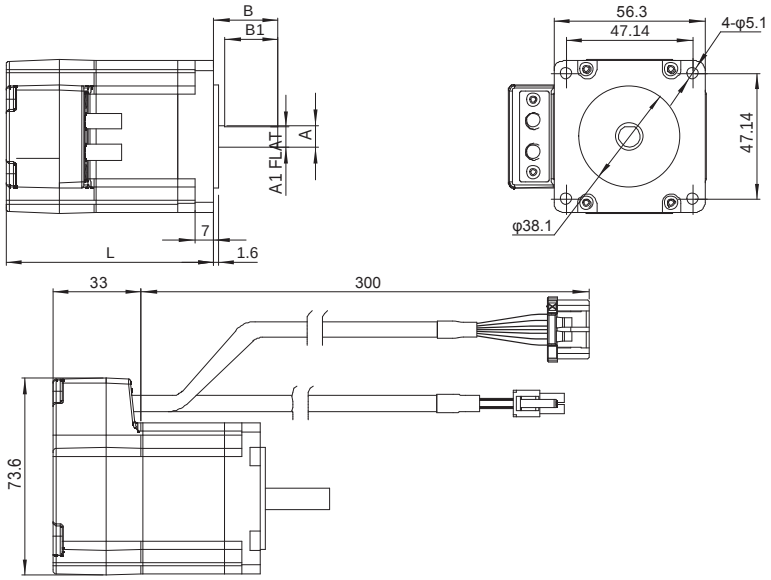
Type(Unit: mm)	
Model	L
AM11RS1DMA	43.8
AM11RS2DMA	52.9
AM11RS3DMA	64.1

AM17RS



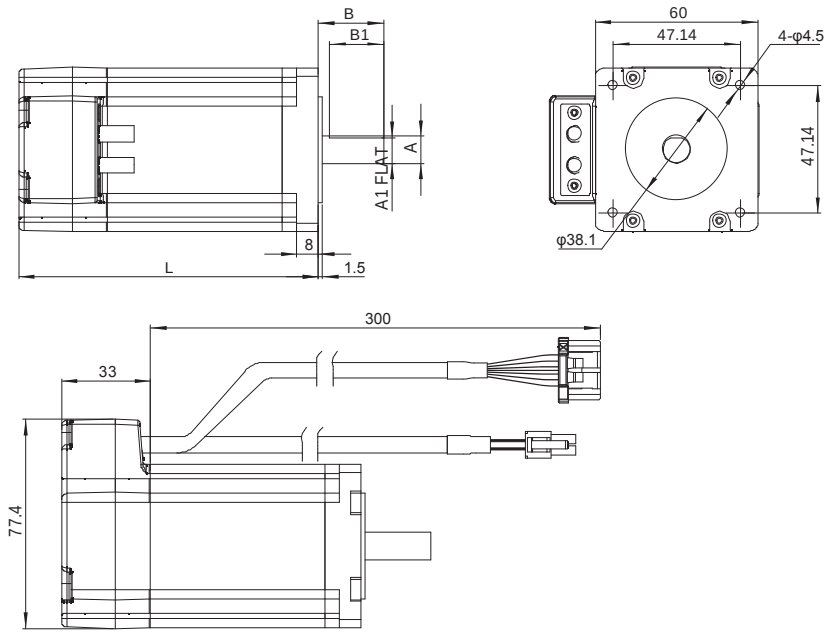
Type(Unit: mm)					
Model	A	A1	B	B1	L
AM17RS1DMA	Φ6	5.5	20	15	59.5
AM17RS1DMB	Φ5	4.5	24	15	59.5
AM17RS2DMA	Φ6	5.5	20	15	65
AM17RS2DMB	Φ5	4.5	24	15	65
AM17RS3DMA	Φ6	5.5	20	15	73.5
AM17RS3DMB	Φ5	4.5	24	15	73.5
AM17RS4DMA	Φ6	5.5	20	15	89
AM17RS4DMB	Φ5	4.5	24	15	89

AM23RS



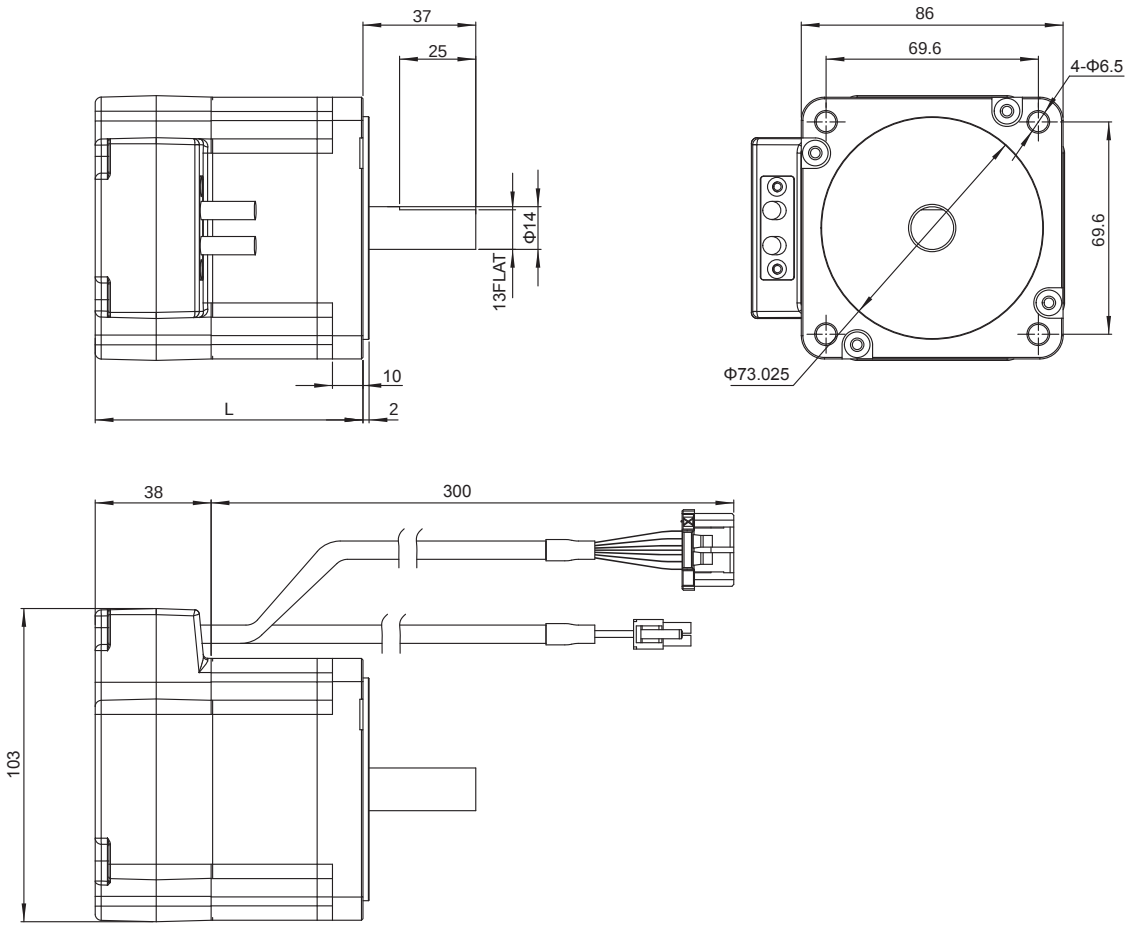
Type(Unit: mm)					
Model	A	A1	B	B1	L
AM23RS2DMA	ϕ8	7.5	24	20	77.5
AM23RS2DMB	ϕ6.35	5.85	20	15	77.5
AM23RS3DMA	ϕ8	7.5	24	20	99.5
AM23RS3DMB	ϕ6.35	5.85	20	15	99.5
AM23RS4DMA	ϕ8	7.5	24	20	102.5

AM24RS



Type(Unit: mm)					
Model	A	A1	B	B1	L
AM24RS3DMA	ϕ10	9.5	24	20	110
AM24RS3DMB	ϕ8	7.5	20	15	110

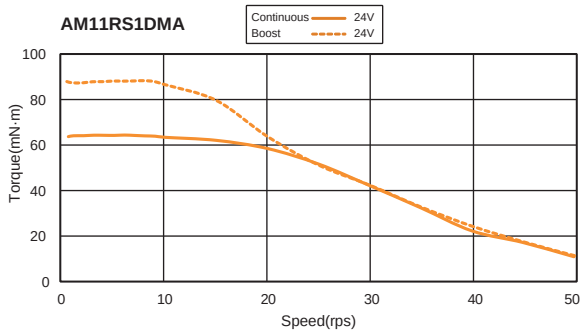
AM34RS

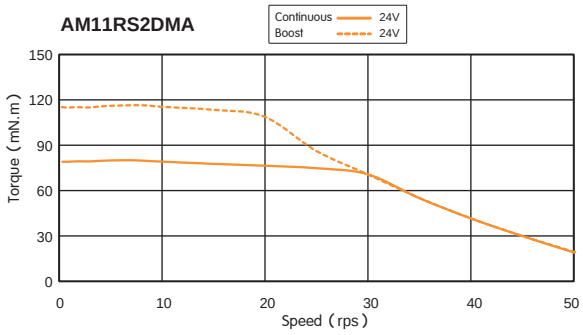


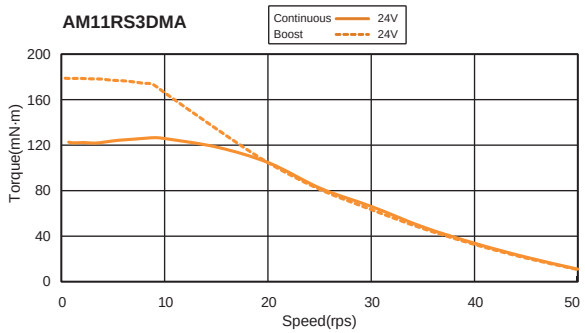
Type(Unit: mm)	
Model	L
AM34RS1DMA	88
AM34RS3DMA	117.5
AM34RS5DMA	147

5.5 Torque Curves

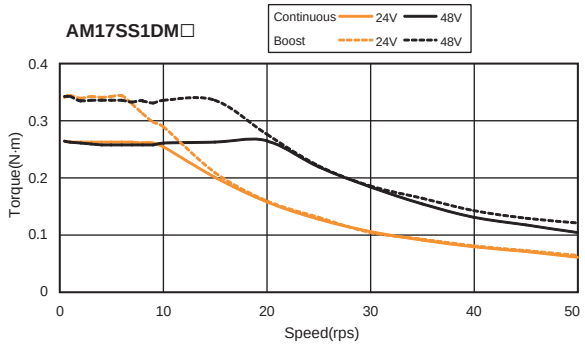
AM11RS Series

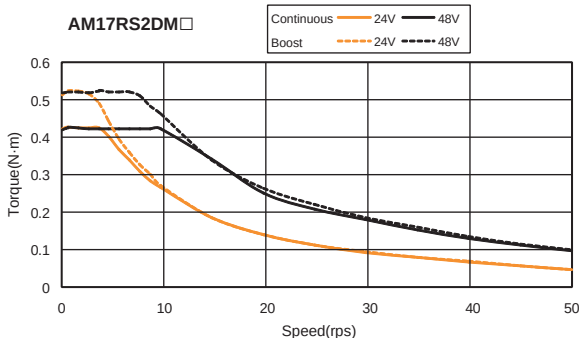


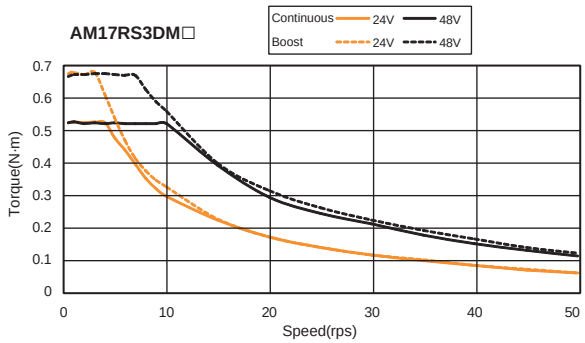


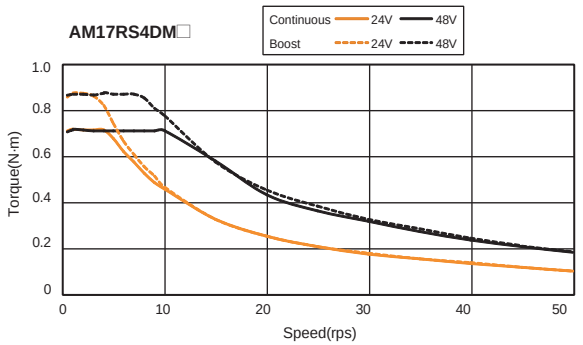


AM17RS Series

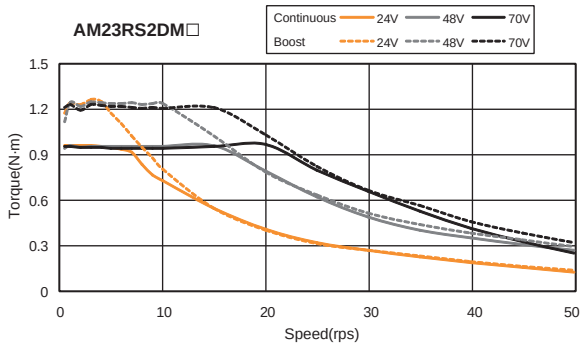


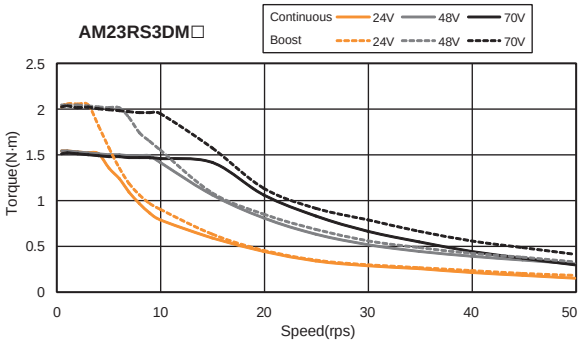


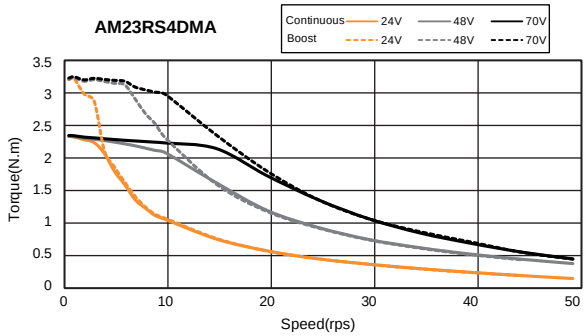




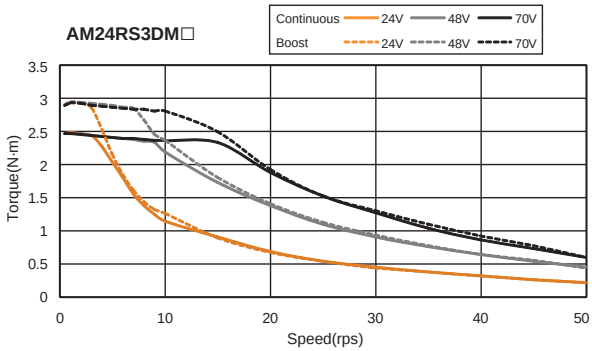
AM23RS Series



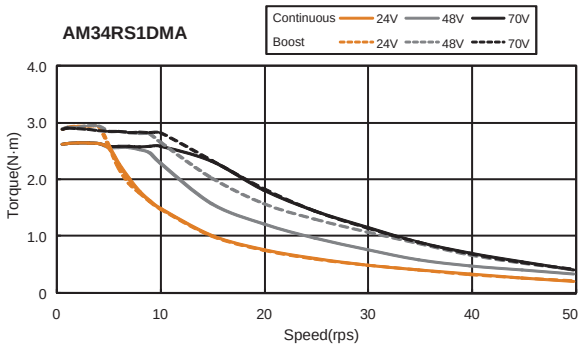


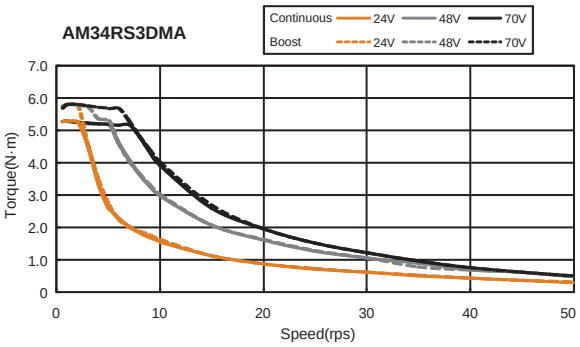


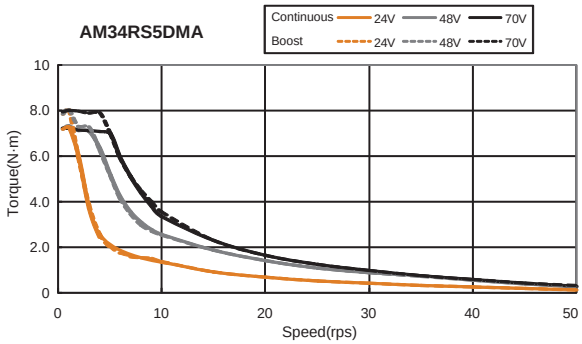
AM24RS Series



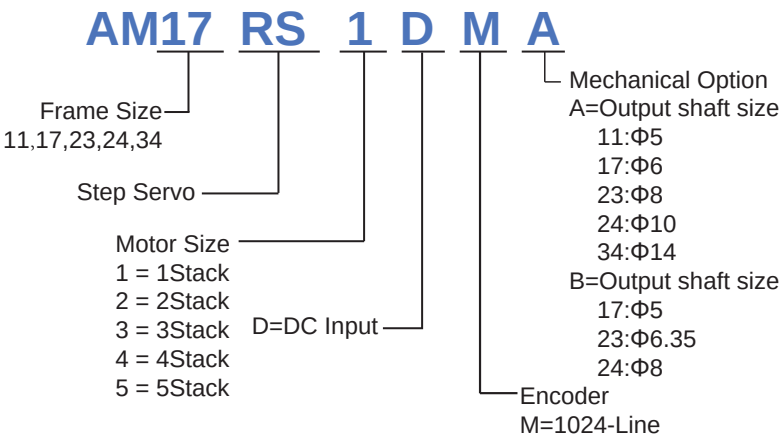
AM34RS Series



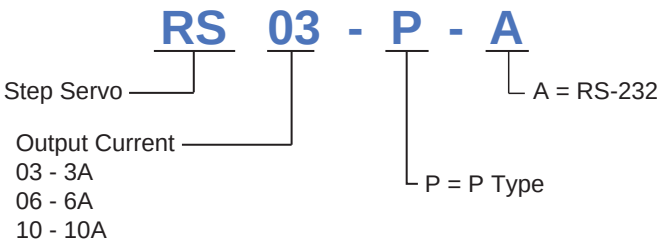




5.6 Motor Numbering System



5.7 Drive Numbering System



6. Accessories

6.1 Standard Accessories

P/N	Catagory	Technical Specification
1103-200	Cable	Power Supply Cable
2101-150	Cable	RS-232 Communication Cable

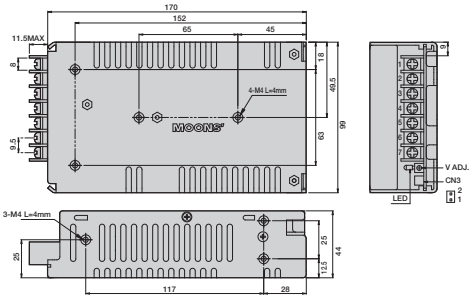
6.2 Optional Accessories (Sold separately)

P/N	Catagory	Technical Specification
MF150A24AG-V	Switching Power Supply	150W, 24V
MF320A48AG-V	Switching Power Supply	320W, 48V
RC880	Regenaration Clamp	80VDC Max. 50W
MS-USB-RS232-01	USB Converter	USB-RS232
1115-☐☐☐	Cable	I/O Cable (for RS-P drives)
2103-☐☐☐	Cable	Motor Extension Cable for AM17/23/24/34RS motor
2109-☐☐☐	Cable	Motor Extension Cable for AM11RS motor
2116-☐☐☐	Cable	Encoder Extension Cable for AM17/23/24/34RS motor
2118-☐☐☐	Cable	Encoder Extension Cable for AM11RS motor

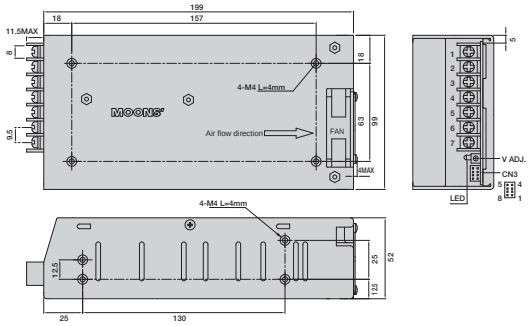
Switching Power Supplier

MOONS' recommend to use following switching power supplies

P/N:MF150A24AG-V 150W,24VDC



P/N:MF320A48AG-V 320W,48VDC

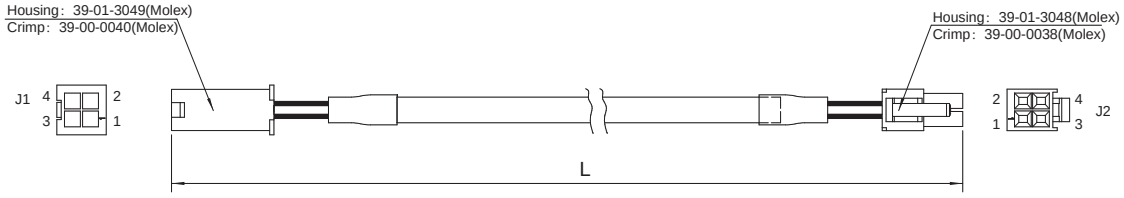


USB Converter

Model: MS-USB-RS232-01

Description: USB-RS232 converter

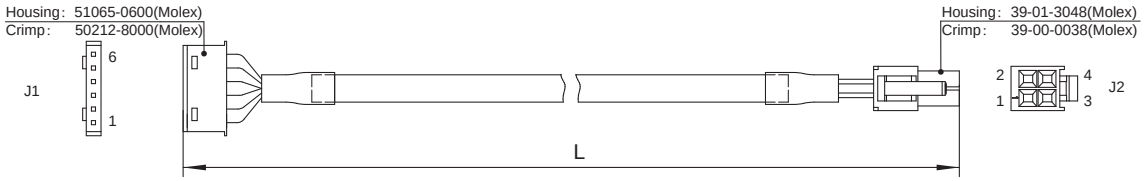
Motor Extension Cable for AM17/23/24/34RS motor



P/N	Length (L)
2103-100	1M
2103-300	3M
2103-500	5M
2103-1000	10M

Wiring Diagram		
PIN（J1）	Colour(Signal)	PIN（J2）
1	Blue（B-）	1
2	Red（B+）	2
3	Green（A-）	3
4	Black（A+）	4

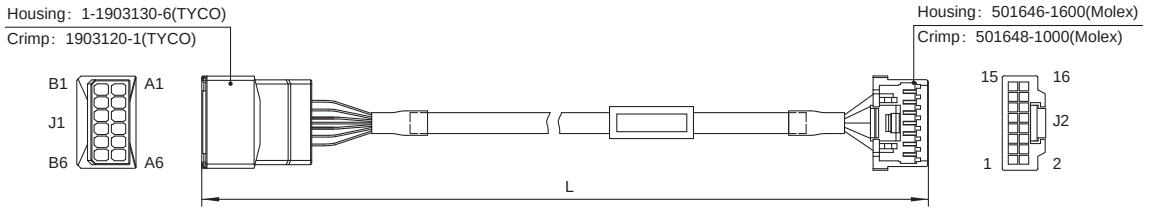
Motor Extension Cable for AM11RS motor



P/N	Length (L)
2109-100	1M
2109-300	3M
2109-500	5M
2109-1000	10M

Wiring Diagram		
PIN（J1）	Colour(Signal)	PIN（J2）
1	Blue（B-）	1
3	Red（B+）	2
4	Green（A-）	3
6	Black（A+）	4

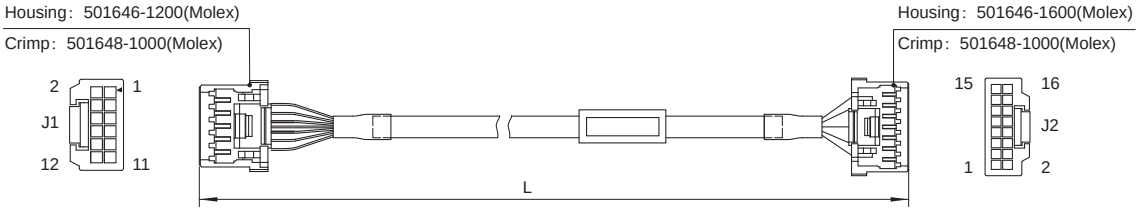
Encoder Extension Cable for AM17/23/24/34RS motor



P/N	Length
2116-100	1M
2116-300	3M
2116-500	5M
2116-1000	10M

Wiring Diagram		
PIN（J1）	Colour(Signal)	PIN（J2）
A6	Blue（A+）	1
B6	Blue/Black（A-）	2
A5	Green（B+）	3
B5	Green/Black（B-）	4
A4	Yellow（Z+）	5
B4	Yellow/Black（Z-）	6
A3	Red（+5V）	7
B3	Black（GND）	8
	Brown（U+）	
	Brown/Black（U-）	
	Gray（V+）	
	Gray/Black（V-）	
A2	White（W+）	15
B2	White/Black（W-）	16
A1	Shield	10

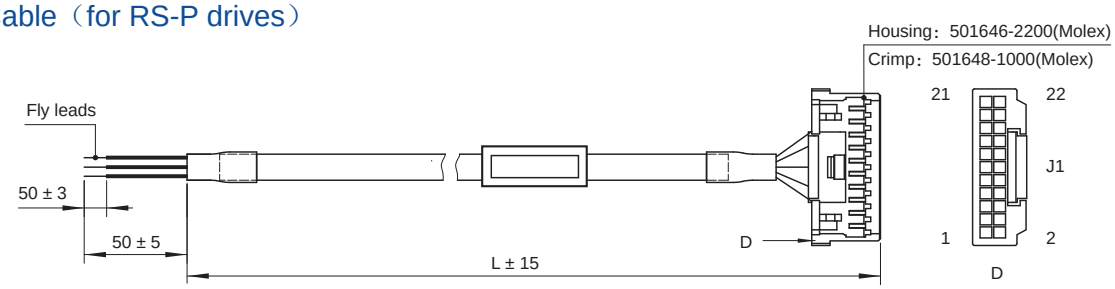
Encoder Extension Cable for AM11RS motor



P/N	Length
2118-100	1M
2118-300	3M
2118-500	5M
2118-1000	10M

Wiring Diagram		
PIN（J1）	Colour(Signal)	PIN（J2）
10	Blue（A+）	1
9	Blue/Black（A-）	2
8	Green（B+）	3
7	Green/Black（B-）	4
6	Yellow（Z+）	5
5	Yellow/Black（Z-）	6
3	Red（+5V）	7
4	Black（GND）	8
	Brown（U+）	
	Brown/Black（U-）	
	Gray（V+）	
	Gray/Black（V-）	
1	White（W+）	15
2	White/Black（W-）	16
12	Shield	10

I/O Cable（for RS-P drives）



P/N	Length (L)
1115-030	30 CM
1115-100	1 M
1115-200	2 M

Wiring Diagram			
PIN（J1）	Colour(Signal)	PIN（J1）	Colour(Signal)
1	Blue/White（STEP+）	12	Gray/Black（Y2-）
2	Blue/Black（STEP-）	13	Purple/White（Y3+）
3	Green/White（DIR+）	14	Purple/Black（Y3-）
4	Green/Black（DIR-）	15	NC
5	Purple（X3）	16	Black（GND）
6	Blue（X4）	17	Red/White（AOUT+）
7	Shield	18	Red/Black（AOUT-）
8	Brown（XCOM）	19	Orange/White（BOUT+）
9	Brown/White（Y1+）	20	Orange/Black（BOUT-）
10	Brown/Black（Y1-）	21	Yellow/White（ZOUT+）
11	Gray/White（Y2+）	22	Yellow/Black（ZOUT-）

7. Contacting MOONS'

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Fax: +81 (0)45 4755787