SSDC Multi-axis Series

Step-Servo System
Hardware Manual

SSDC-2XU-ECX(-FC) / SSDC-2XU-ECX-S(-FC)
SSDC-4X-ECX(-FC) / SSDC-4X-ECX-S(-FC)
SSDC-4XU-ECX(-FC) / SSDC-4XU-ECX-S(-FC)



SHANGHAI AMP&MOONS' AUTOMATION CO.,LTD.

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1 Introduction

Thank you for choosing MOONS' SSDC Multi-axis Step-Servo motor driver. SSDC Multi-Axis series is a high-performance bus control 2 or 4 axes Step-Servo motor driver, while integrating the function of intelligent motion controller, can be paired with MOONS' RS, SS series Step-Servo motor. SSDC Multi-axis series drives can run as standard EtherCAT slaves and support CoE (CANopen over EtherCAT).

EtherCAT® is a registered trademark licensed by Beckhoff Automation GmbH.



1.1 Features

- Programmable digital Step-Servo drive
- In-line IO connector for easy wiring
- Input voltage DC:

  SSDC06: 24-70VDC

  SSDC10: 24-70VDC
- Support CANopen over EtherCAT (CoE), which complies with CiA 402 standards. Based on 100BASE-TX cable, 100Mbps baud rate, full duplex mode, high transmission speed, high reliability communication
- Supports Vendor over EtherCAT (VoE) and bus product upgrades
- Supports Profile Position, Profile Velocity, Cyclic Synchronous Position, Cyclic Synchronous Velocity, and Homing modes
- A Dual-port RJ45 connector is used for EtherCAT communication
- The USB mini-B(horizontal)/Type-C(vertical) port is used to configure drive parameters
- Output Current:

  SSDC06-2XU Continuous output current 2*6A(peak of sin), boost current 2x7.5A (1.5s)

  SSDC10-2XU Continuous output current 2x10A(peak of sin), boost current 2x15A (1.5s)

  SSDC06-4X/4XU Continuous output current 4x6A(peak of sin), boost current 4x7.5A (1.5s)

  SSDC10-4X/4XU Continuous output current 4x10A(peak of sin), boost current 4x15A (1.5s)
- I/O

SSDC06/10-2XU/4XU:

3 optically isolated digital input,5~24V

1 optically isolation digital output: maximum withstand voltage 30V, maximum output current 100mA

1 brake direct drive control signal output: maximum withstand voltage 24V, maximum current 1A

SSDC06/10-4X:

5 optically isolated digital signal input,5~24V

2 optically isolation of digital signal output: maximum withstand voltage 30V, maximum output current 100mA

1 brake direct drive control signal output: maximum withstand voltage 24V, maximum current 1A

- With RS, SS Step-Servo motor

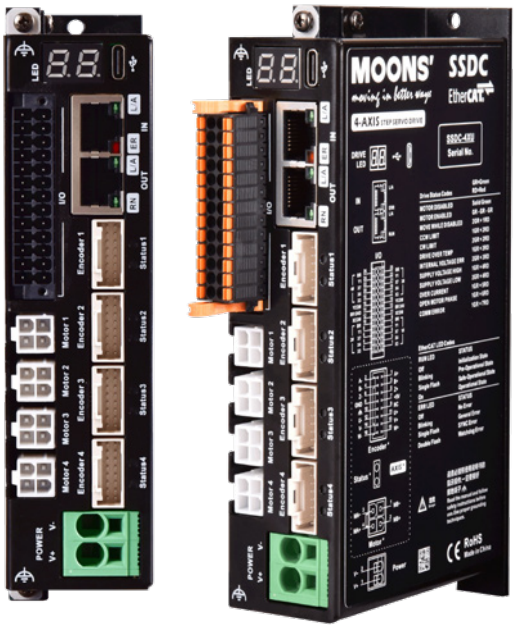
  RS Series: Encoder resolution 4096 counts/rev (AM08/11/17/23/24/34RS motor)

  SS Series: Encoder resolution 20000 counts/rev (AM17/23/24/34SS-N motor)
- Digital, red and green LED display
- STO function (-S version only)

Type	Power Supply	Output Current	Input	Output	Communication	Configuration Port	STO
SSDC06-2XU-ECX	24-70VDC	2x6A max（peak of sin）	2x3 optical isolated input	2X1 optical isolated digital output: 2X1 brake direct drive control signal output	EtherCAT	USB Type-C	NO
SSDC10-2XU-ECX		2x10A max（peak of sin）	2x3 optical isolated input	2X1 optical isolated digital output: 2X1 brake direct drive control signal output	EtherCAT	USB Type-C	NO
SSDC06-2XU-ECX-S		2x6Amax（peak of sin）	2x3 optical isolated input	2X1 optical isolated digital output: 2X1 brake direct drive control signal output	EtherCAT	USB Type-C	Support
SSDC10-2XU-ECX-S		2x10A max（peak of sin）	2x3 optical isolated input	2X1 optical isolated digital output: 2X1 brake direct drive control signal output	EtherCAT	USB Type-C	Support
SSDC06-4X-ECX		4x6A max（peak of sin）	4x5 optical isolated input	4X2 optical isolated digital output: 4X1 brake direct drive control signal output:	EtherCAT	USB mini-B	NO
SSDC10-4X-ECX		4x10A max（peak of sin）	4x5 optical isolated input	4X2 optical isolated digital output: 4x1 brake direct drive control signal output:	EtherCAT	USB mini-B	NO
SSDC06-4X-ECX-S		4x6A max（peak of sin）	4x5 optical isolated input	4X1 optical isolated digital output: 4X1 brake direct drive control signal output	EtherCAT	USB mini-B	Support
SSDC10-4X-ECX-S		4x10A max（peak of sin）	4x5 optical isolated input	4X1 optical isolated digital output: 4X1 brake direct drive control signal output	EtherCAT	USB mini-B	Support
SSDC06-4XU-ECX		4x6A max（peak of sin）	4x3 optical isolated input	4X1 optical isolated digital output: 4X1 brake direct drive control signal output	EtherCAT	USB Type-C	NO
SSDC10-4XU-ECX		4x10A max（peak of sin）	4x3 optical isolated input	4X1 optical isolated digital output: 4X1 brake direct drive control signal output	EtherCAT	USB Type-C	NO
SSDC06-4XU-ECX-S		4x6A max（peak of sin）	4x3 optical isolated input	4X1 optical isolated digital output: 4X1 brake direct drive control signal output	EtherCAT	USB Type-C	Support
SSDC10-4XU-ECX-S		4x10A max（peak of sin）	4x3 optical isolated input	4X1 optical isolated digital output: 4X1 brake direct drive control signal output	EtherCAT	USB Type-C	Support



SSDC06/10-4X-ECX;SSDC06/10-4X-ECX-S



SSDC06/10-4XU-ECX;SSDC06/10-4XU-ECX-S



SSDC06/10-2XU-ECX;SSDC06/10-2XU-ECX-S

1.2 Safety Instruction

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

- You need to make the following preparations:
- A power supply suitable for the drive, please read the section titled “Choose a Power Supply” below to help you choose the right power supply.
- A Step-Servo motor that matches the drive, read the “Recommended Motors” section below.
- A small flat-head screwdriver.
- A computer with Windows 7 / Windows 8 / Windows 10 (32-bit or 64-bit) operating system.
- One USB mini-B or Type-C communication cable for drive parameter configuration.
- A CAT5 cable cable is used to connect the driver to the controller, or the driver to the driver.
- Install the Stepper Suite software (includes USB drivers and can be downloaded from the MOONS’ website).
- Optional motor extension cable (available separately)
- Optional encoder extension cable (available separately)

2.1 Choose a Power Supply

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

2.1.1 Voltage

SSDC Stepper-servo drives and motors perform best when powered with 24 to 48V DC voltage. The choice of voltage depends on the desired performance and acceptable heating of the motor and drive (not to trigger self-overtemperature protection of the drive or damage to the motor due to overheating). Higher power supply voltage can improve the high-speed performance of the motor, but it will also increase the heat output. Therefore, the closer the selected power supply voltage is to the nominal upper limit of the driver, the smaller the operating duty cycle (the proportion of time between running and stopping) that the user is allowed to use, that is, the less time the customer is allowed to continuously run the motor, otherwise the drive will overheat and self-protection.

2.1.2 Current

The power input currents required for SSDC Stepper-servo drivers and motors operating at different supply voltages are indicated on the curves below. Under normal circumstances, the input current of the driver power supply is smaller than the current of the drive motor, because the driver itself realizes the energy conversion function, that is, the driver amplifies a high-voltage and small-current signal into a low-voltage and high-current signal through the power switch. The rated voltage of the motor winding is often very small, and the higher the power supply voltage of the driver is than the rated voltage of the motor winding, the smaller the power input current required by the driver.

At the same time, the size of the power input current is also related to the speed and load of the motor during operation, so for specific applications, users need to carry out specific analysis and estimation.

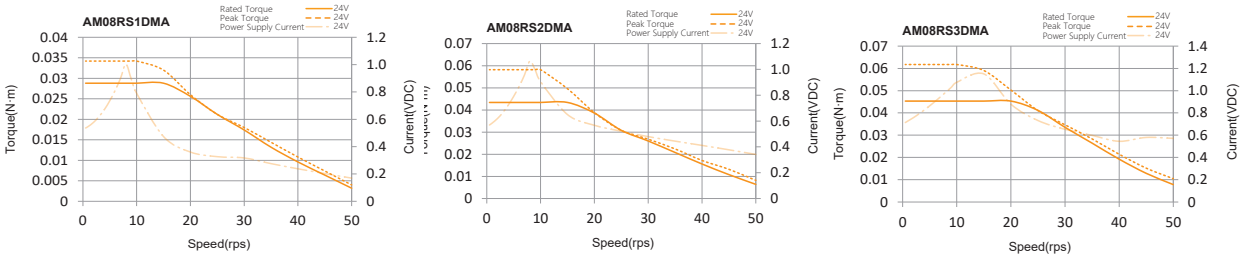
Due to the particularity of multi-axis products, several points need to be considered when selecting the power supply current:

1. Please find the corresponding current curve according to the motor connected to each shaft

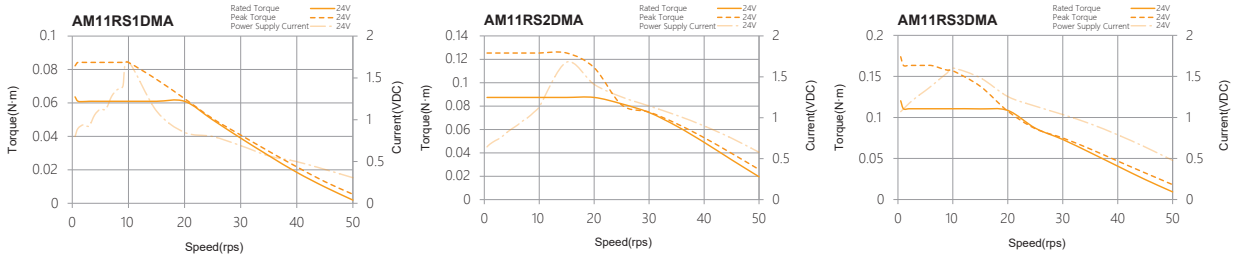
2. Calculate the input current required by each shaft according to the actual running speed and load of each shaft

3. The input current calculated by each shaft is added to the input power current required by the entire drive

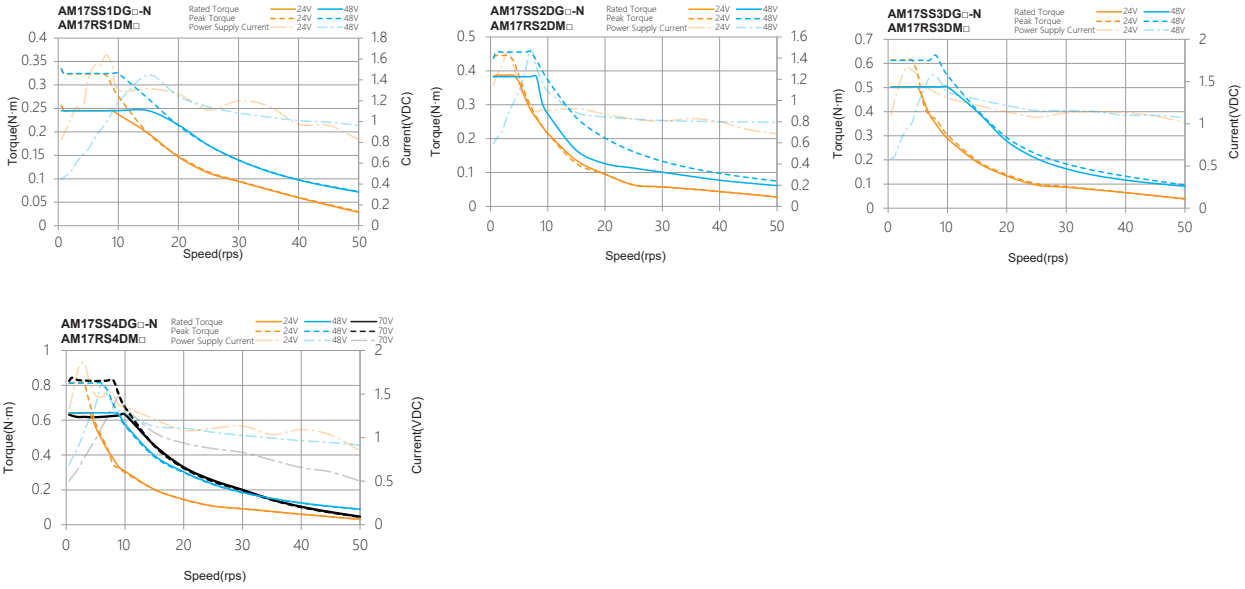
☐ AM08RS Series



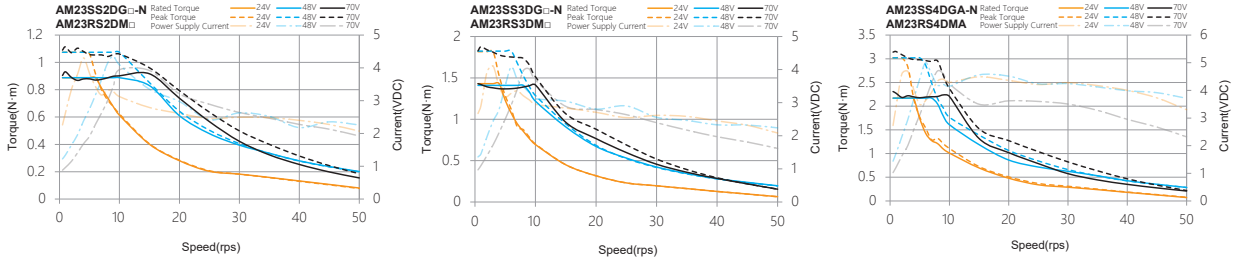
☐ AM11RS Series



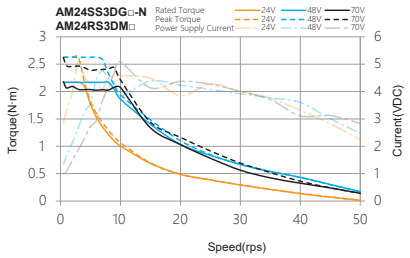
☐ AM17SS/RS Series



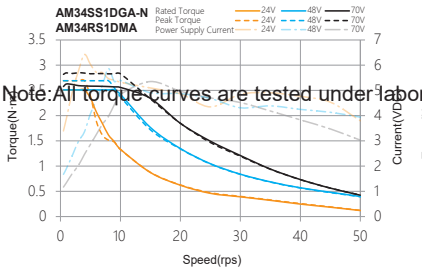
☐ AM23SS/RS Series

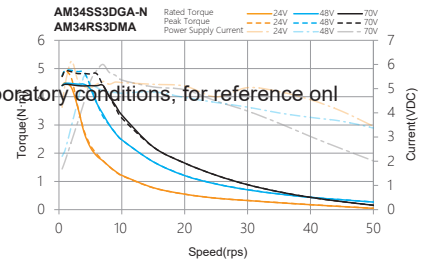


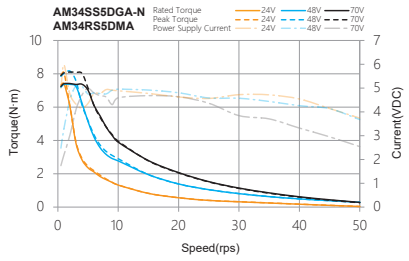
☐ AM24SS/RS Series



☐ AM34SS/RS Series





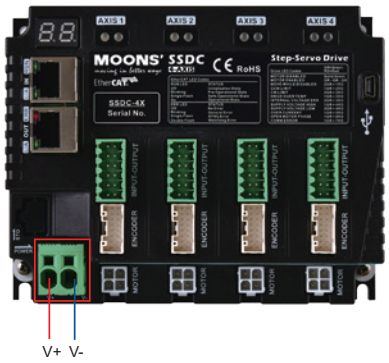


Note:All torque curves are tested under laboratory conditions, for reference onl

2.2 Connect the Power

SSDC multi-axis series products share a power connector, the first on the left side of the connector is the V+ of the power supply, the second is the V- of the power supply, be careful not to connect the reverse.

(Note: Please power on the drive after all the wiring is complete!)



SSDC06/10-4X-ECX
SSDC06/10-4X-ECX-S



SSDC06/10-4XU-ECX
SSDC06/10-4XU-ECX-S



SSDC06/10-2XU-ECX
SSDC06/10-2XU-ECX-S

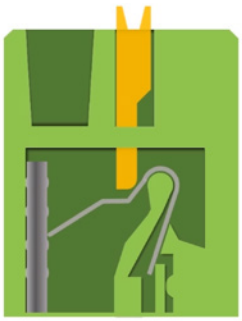
SSDC06/10 Multi-axis series products operating voltage range 24-70VDC

Please read the section entitled “Choose a Power Supply” above to help you choose the right power supply.。

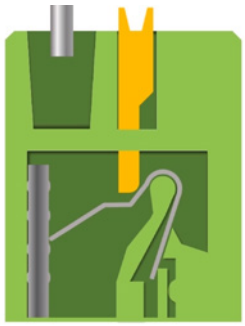
(Note: Do not reverse connect the power supply, please power on the driver after all wiring is complete!)

2.2.1 How to use the Connector

1.The following diagram shows the internal structure of the connector.



2.Insert the terminal block into the connector



3.Metal shrapnel inside the connector can jam the terminals



4.When it is necessary to remove the wire harness, press the orange plastic part to pull out the wire harness terminal



2.3 Installing Software

Stepper Suite is a PC-based Step-Servo application configuration and debugging software that can be used to configure and set various operating modes, adjust servo tuning parameters, and test and evaluate drive performance. The software has powerful functions, user-friendly interface and easy operation. Simple gain adjustment, a variety of control function options, I/O function Settings, motion trajectory simulation to provide customers with the most rich application experience.

• Download and install the Stepper Suite software from the website of MOONS ‘(please click https://www.moons.com.cn /support-training/tools/stepper suite to download the software)

• Click on Start/All Programs/MOONS ‘/ Stepper Suite to run the software (USB driver is already integrated in the software installation package)

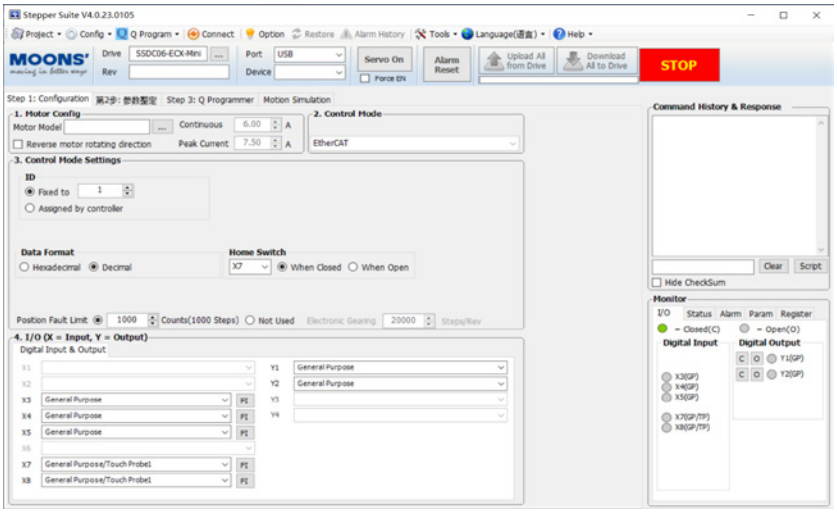
• Connect the drive to the computer via the USB mini communication cable, and note that USB port is selected in the software port

• Connect the drive to the DC power supply

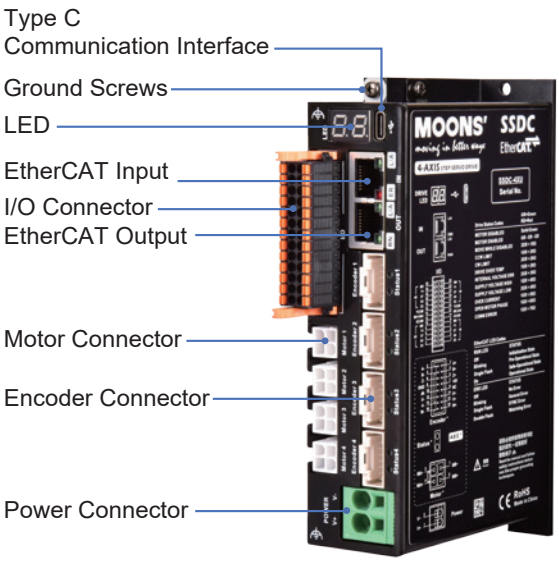
• Connect drive to motor

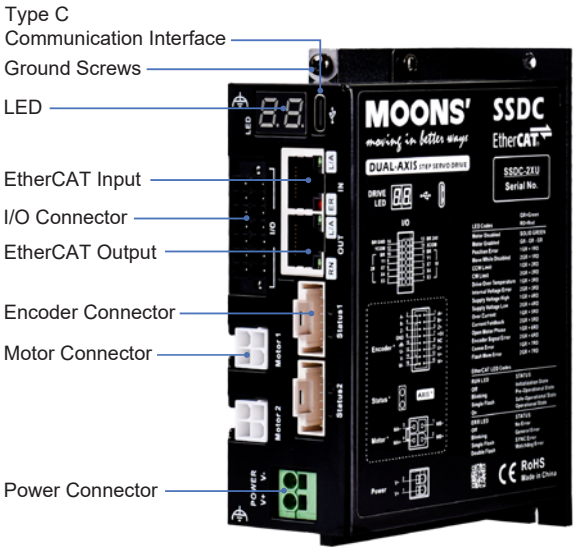
Power on the drive software will automatically recognize the drive model and firmware version, indicating that the drive is ready.

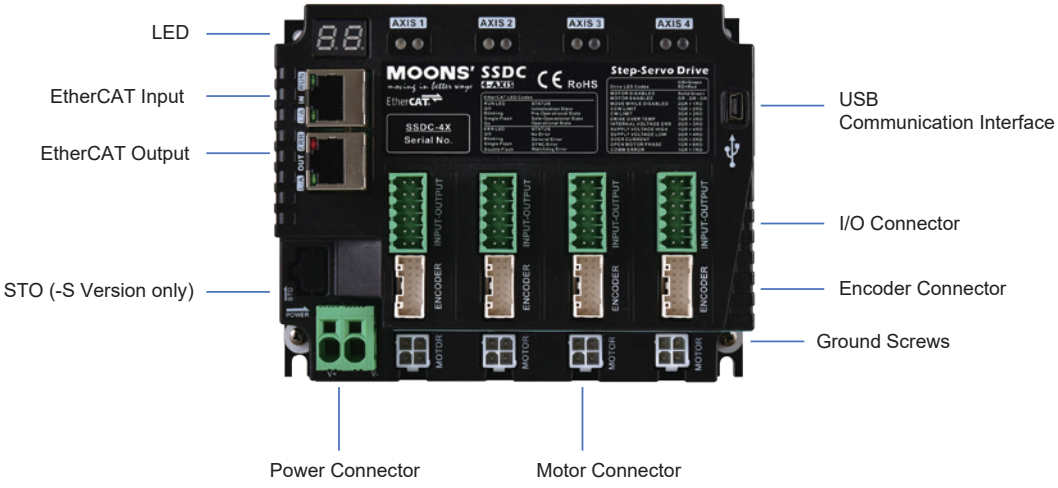
Connectors and other important information are shown below:



Connectors and other important information are shown below：




Type C
Communication Interface
Ground Screws
LED
EtherCAT Input
I/O Connector
EtherCAT Output
Encoder Connector
Motor Connector
Power Connector

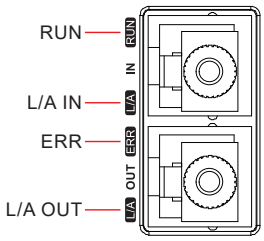

LED
EtherCAT Input
EtherCAT Output
STO (-S Version only)
USB
Communication Interface
I/O Connector
Encoder Connector
Ground Screws
Power Connector
Motor Connector

2.4 Connecting the EtherCAT

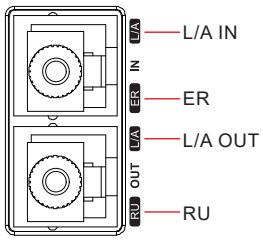
Dual RJ-45 connectors accept standard Ethernet cables and are categorized as 100BASE-TX (100 Mb/sec) ports. CAT5 or CAT5e (or higher) cables should be used. The IN port connects to a master, or to the OUT port of an upstream node. The OUT port connects to a downstream node. If the drive is the last node on a network, only the IN port is used. No terminator is required on the OUT port.

2.4.1 EtherCAT Status Indicator LEDs

The LEDs are used for indicating status of the EtherCAT. STF05/10-ECX-H included two Link/ Activity LED(the right one of every RJ-45), two EtherCAT status LED(RUN and ERR)



SSDC06/10–4X–ECX



SSDC06/10–2XU–ECX
SSDC06/10–4XU–ECX

pin	Signal Definition	pin	Signal Definition
1	TX+	5	(NC)
2	TX-	6	RX-
3	RX+	7	(NC)
4	(NC)	8	(NC)

LED	Color	Status	Description	Instruction
Link/Activity	Green	OFF	no Ethernet connection	Flickering: reveal 50ms，drown 50ms（10Hz）。and so on. Blinking: reveal 200ms，drown 200ms（2.5Hz）。and so on. Single Flash: reveal 200ms，drown 1s。and so on. Double Flash: reveal 200ms，drown 200ms，reveal 200ms，drown 1s。and so on.
		ON	Ethernet is connected	
		Flickering	activity on line	
RUN	Green	OFF	initialization state	
		Blinking	pre-operational state	
		Single Flash	safe-operational state	
		ON	operational state	
ERR	Red	OFF	no error	
		Blinking	general error	
		Single Flash	sync error	
		Double Flash	watch dog error	

2.5 Setting the EtherCAT Node ID

When the drive’s ID is configured to be assigned by master controller in Stepper Suite software, the master controller can set the EtherCAT node Alias ID to address 0004h of SII (Slave Information Interface) EEPROM. The drive can get this ID value from SII EEPROM address 0004h after power up. When the master station does not support automatic host allocation, you can set a fixed EtherCAT ID address through the Stepper Suite software.



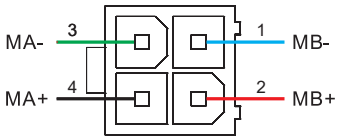
Note: The 7-segment nixie tube displays the address value in decimal notation, and only displays the lower two digits of the address, that is, 0 to 99.

2.6 Connect to the motor

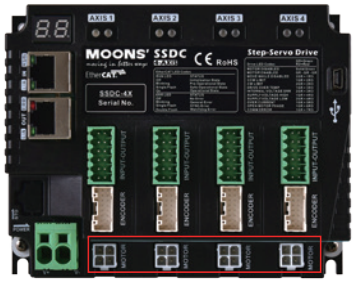
Connect the motor outlet to the motor connector of the driver.

Note: Do not damage or pull the motor outlet line, and do not make the outlet line bear too much force (such as pulling the line to carry the motor), placed under a heavy object or caught.

If you use MOONS’ Stepper-servo motor, please connect the black, green, red and blue wires to MA+, MA-, MB+, MB- of the driver in turn.

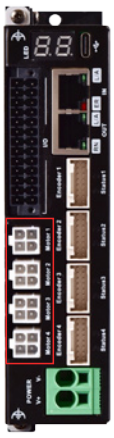


Motor connector on the driver



Motor connector on the driver*4

SSDC06/10-4X-ECX
SSDC06/10-4X-ECX-S



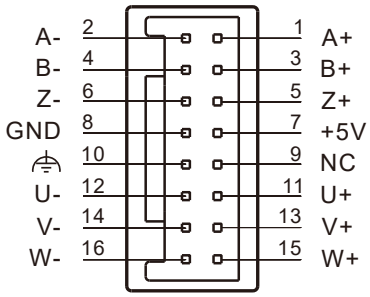
Motor connector on the driver*4

SSDC06/10-4XU-ECX
SSDC06/10-4XU-ECX-S



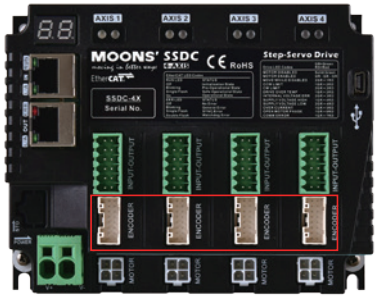
Motor connector on the driver*2

SSDC06/10-2XU-ECX
SSDC06/10-2XU-ECX-S



Encoder connector on the driver

Pin No.	Signal Definition	Pin No.	Signal Definition
2	Encoder signalsA-	1	Encoder signalsA+
4	Encoder signalsB-	3	Encoder signalsB+
6	Encoder signalsZ-	5	Encoder signalsZ+
8	Encoder Power Supply GND	7	Encoder Power Supply5V
10	Shield Ground	9	NC
12	Encoder signals	11	Encoder signalsU+
14	Encoder signalsV-	13	Encoder signalsV+
16	Encoder signalsW-	15	Encoder signalsW+



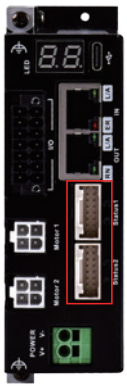
Encoder connector on the driver*4

SSDC06/10-4X-ECX
SSDC06/10-4X-ECX-S



Encoder connector on the driver*4

SSDC06/10-4XU-ECX
SSDC06/10-4XU-ECX-S



Encoder connector on the driver*2

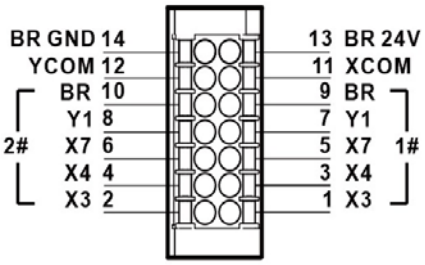
SSDC06/10-2XU-ECX
SSDC06/10-2XU-ECX-S

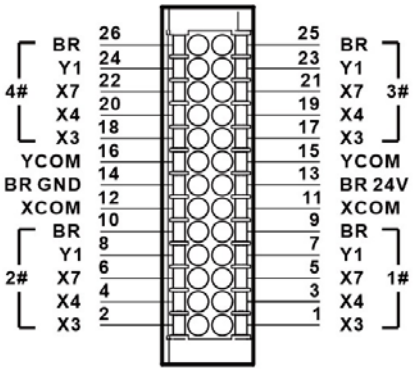
Information on docking connectors, motor extension cords, and encoder extension cords can be found in the "Optional Accessories (purchased separately)" section.

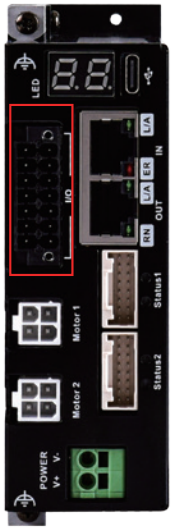
3 Inputs and Outputs

Inputs and outputs of SSDC-2XU/4XU drivers include:

- 3 optically isolated digital signal input, 5~24V
- 1 optically isolation of digital signal output: maximum withstand voltage 30V, maximum current 100mA
- 1 brake direct drive control signal output: maximum withstand voltage 24V, maximum current 1A

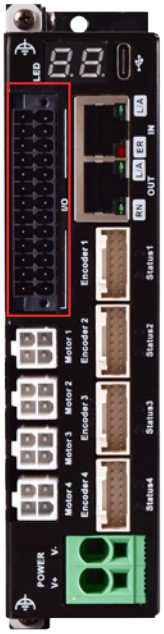






I/O Connector Diagram

SSDC06/10-2XU-ECX
SSDC06/10-2XU-ECX-S



I/O Connector Diagram

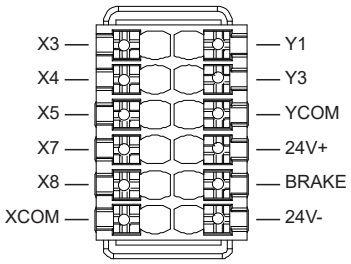
SSDC06/10-4XU-ECX
SSDC06/10-4XU-ECX-S

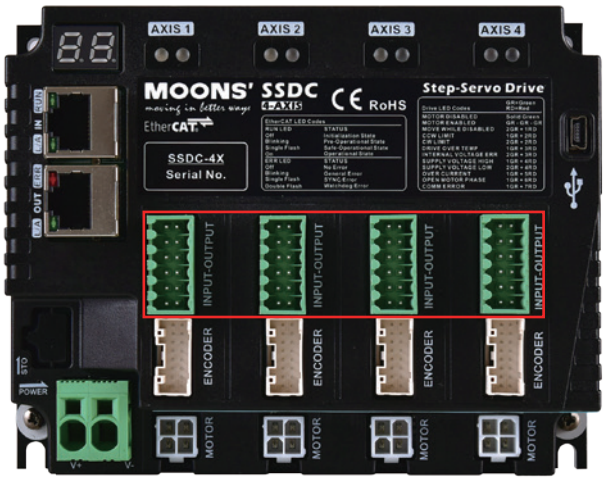
Inputs and outputs of the SSDC-4X drive include:

• 5 optically isolated digital signal input, high 5~24V

• 2 optically isolation of digital signal output: maximum withstand voltage 30V, maximum current 100mA

• 1 brake direct drive control signal output: maximum withstand voltage 24V, maximum current 1A





I/O Connector Diagram

SSDC06/10-4X-ECX

SSDC06/10-4X-ECX-S

3.1 Digital Inputs

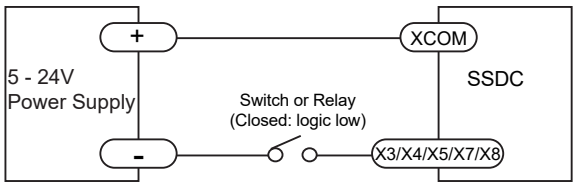
The SSDC multi-axis series drives contain either 3 (-2XU/4XU) or 5 (-4X) digital isolated inputs. The function of each input signal can be configured by the software Stepper Suite. The input signal corresponds to the function as follows:

signal	interface	Function
X3	X3, XCOM	The following optional functions are available: ● CW/CCW direction limit switch input port ● General Purpose input (default)
X4	X4, XCOM	The following optional functions are available: ● CCW/CW direction limit switch input port ● General Purpose input (default)
X5（only-4X）	X5, XCOM	The following functions are available as options: ● General Purpose input (default)
X7	X7, XCOM	The following optional functions are available: ● General Purpose input (default) ● Touch Probe1 input port
X8(only--4X)	X8, XCOM	The following optional functions are available: ● Emergency stop function input port ● General Purpose input (default)

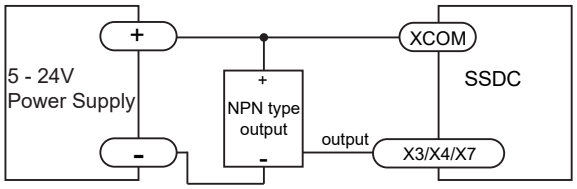
Since the input circuit is an optocoupler isolation circuit, a 5-24V power supply is required. For example, it can be used when connected to a PLC power supply; When using relays or mechanical switches, a power supply is required.

XCOM is the common end of the single-ended input signal. When connecting a source-type (PNP) signal, XCOM needs to be grounded (the negative side of the power supply). When connecting drain type (NPN) signals, XCOM needs to connect to the positive terminal of the power supply.

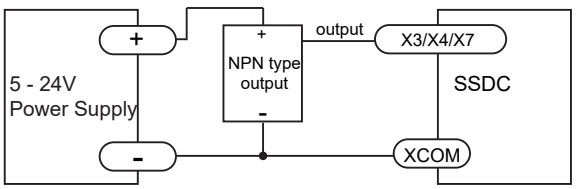
Please use Stepper Suite software to configure X3, X4, X7 functions.



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

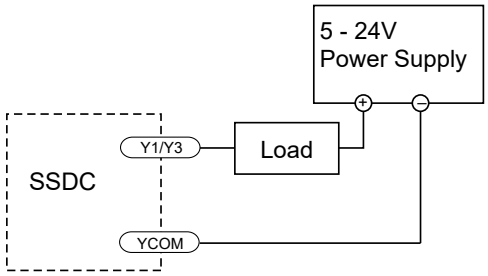
The SSDC multi-axis series drives contain either 1 (-2XU/4XU) or 2 (-4X) digital isolated outputs. The function of each output signal can be configured by the software Stepper Suite, and the output signal corresponds to the function as follows:

signa	interface	Function
Y1	Y1, YCOM	The following functions are available as options: ● Driver error signal output ● Driver error signal output ● Static in place signal output ● Dynamic in-place signal output ● General-purpose output (default)
Y3（only--4X）	Y3, YCOM	The following functions are available as options: ● Pulse signal output (Tach Out) ● Static in-place signal output ● Dynamic in-place signal output ● General-purpose output (default)

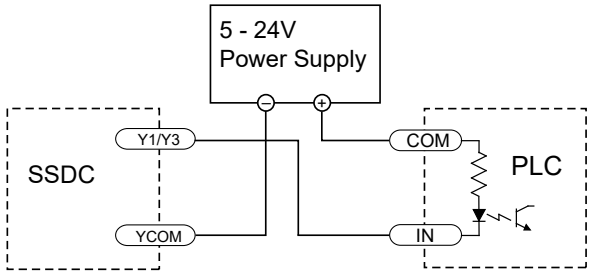
Please use Stepper Suite software to configure Y1,Y3 functions.

The following figure lists the common wiring methods of Y1 and Y3 output:

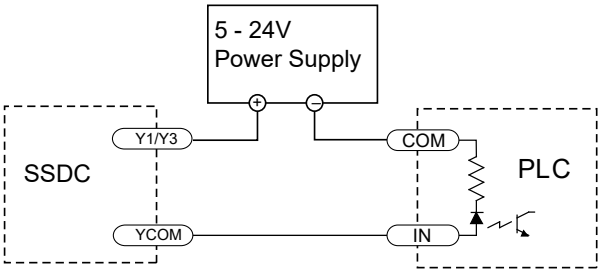
Warning: Do not connect the output to DC voltage above 30V, and the current flowing into the output should not exceed 100mA



Connecting a sourcing output to load



Connecting a sinking output to PLC's input



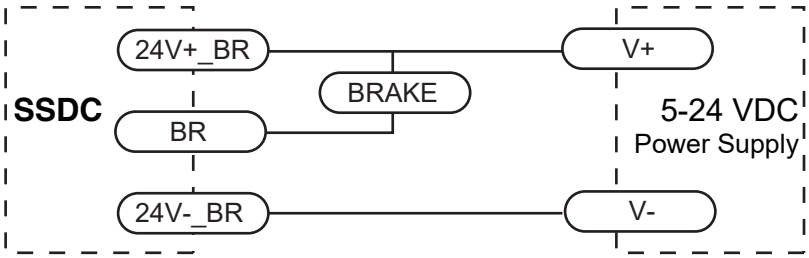
Connecting a sourcing output to PLC's input

3.3 Y2 Brake Out

SSDC multi-axis series driver includes 1 brake direct drive output, photoelectric isolation. The brake output signal function can be configured by the software Stepper Suite.

Y2 brake signal output wiring:

Warning: Do not connect the output to more than 24V DC voltage, the current flowing into the output do not exceed 1A.



Y2 brake signal output wiring

3.4 STO Function（Only –S Type）

The multi-axis series has a STO version, the -S model

Safe Torque Off is a hardware-level safety protection feature. When the STO function works, the hardware circuit of the driver will trigger, forcing the power tube inside the driver to close, thus interrupting the motor power without damaging the driver or the surrounding motor components, preventing the motor from working, and the driver is in a non-enabled state, which is a hardware level safety protection device, which can protect the safety of people and equipment in emergency situations.

3.4.1 Advantages of STO functionality

Improve machine safety

reduces the cost and time of machine certification

Reduce safety devices on the machine

Simplify wiring and reduce costs

Drivers with integrated STO safe torque Off feature do not require additional relays to interrupt the power supply to the drive because the power supply is directly interrupted by the STO safe torque off input.

3.4.2 STO standard

STO features must meet specific safety standards, rated by SIL(Safety integrity Level) and PL(Performance)

SIL (Safety Integrity Level) - Safety integrity level certification is based on IEC61508, IEC61511, IEC61513, IEC13849-1, IEC62061, IEC61800-5-2 and other standards, in accordance with the provisions of international standards, IEC61508 divides SIL into 4 levels, namely SIL1, SIL2, SIL3 and SIL4, including two levels of products and systems, distinguished by the probability of dangerous failure per hour, of which SIL4 level is the highest, for the general process control industry, the common SIL level is SIL2/SIL3.

PL stands for Safety Performance Level, which defines the ability to control safety-related parts of a system so that they perform safety functions under predictable conditions. There are five levels: a, b, c, d, e, and PLe is the highest.

The STO function of SSDC multi-axis series products can reach SIL3 level and PLe level

3.4.3 STO function precautions

1) If you do not need to use the STO function, please ensure that the STO docking terminal equipped with the factory is correctly inserted in the port

2) To use the STO function, please make sure to understand the working mechanism and safety precautions of STO

3) After triggering the STO function, due to the presence of external forces (such as vertical axis load), the motor will rotate due to external forces. Therefore, ensure that the stepper/stepper servo motor with brake is used in this case and the brake control circuit is properly connected

4) After triggering the STO function, the motor will stop freely, so it should be noted that the stopping distance will increase under the action of inertia

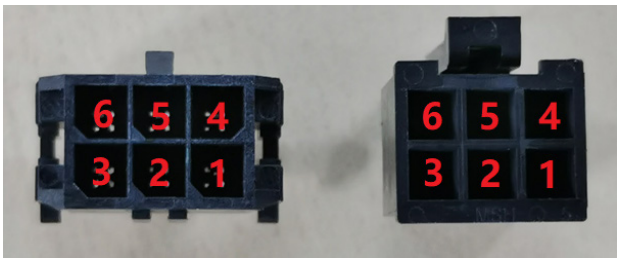
5) After triggering the STO function, please note that the drive internal power tube will be cut off the output, but the drive power will not be cut off. Therefore, ensure that the power supply is cut off when troubleshooting.

6) After the STO function is triggered, the driver will be in the alarm state and the motor will not be enabled.

7) After the STO input signal is restored to normal, the drive will still be in the alarm disabled state.

8) If the STO is triggered during the operation of the motor, the regeneration voltage may be too large due to the large size of the motor frame or the high speed of the motor, which may lead to the damage of the drive. In this case, in order to prevent damage due to regenerative voltage, please connect our regenerative resistor RC880.

3.4.4 STO function pin definition



Signal Name	connectorsPin No.	Function
SF1+	6	Input 1 for triggering the STO function To trigger the STO function, turn off the optocoupler of this input circuit.
SF1-	3	
SF2+	5	Input 2 for triggering the STO function To trigger the STO function, turn off the optocoupler of this input circuit.
SF2-	2	
V+	4	Power supply for drive outputs For applications where the STO function is not used and you do not want to connect a safety input signal.
V-	1	

3.4.5 Logical relationship between STO function and input signal

SF1 input state	SF2 input state	STO functional state
ON	ON	no-trigger
ON	OFF	trigger
OFF	ON	trigger
OFF	OFF	trigger

Note: Conduction ON input voltage requires 24VDC, (each input signal has a minimum current capacity of 5mA) OFF The input voltage must be 0 to 5VDC or left blank.

4 Mounting the Drive

The SSDC multi-axis series drives can be mounted through the narrow sides of the heat sink using M3 or M4 screws. If possible, it is best to secure the drive to a smooth, flat metal surface, which helps to dissipate heat from the drive. If this is not possible, it may be necessary to dissipate heat through a fan to avoid overheating the drive.

- Do not install the driver in a place without ventilation or where the ambient temperature is higher than 40℃.



- Do not install the driver in a humid area, or where metal debris or other conductive objects can easily enter the driver and cause a short circuit.
- Ensure that there is sufficient airflow around the drive.
- When installing multiple SSDC drives, ensure that the space distance between the drives is at least 2cm.

5 Alarm Code

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

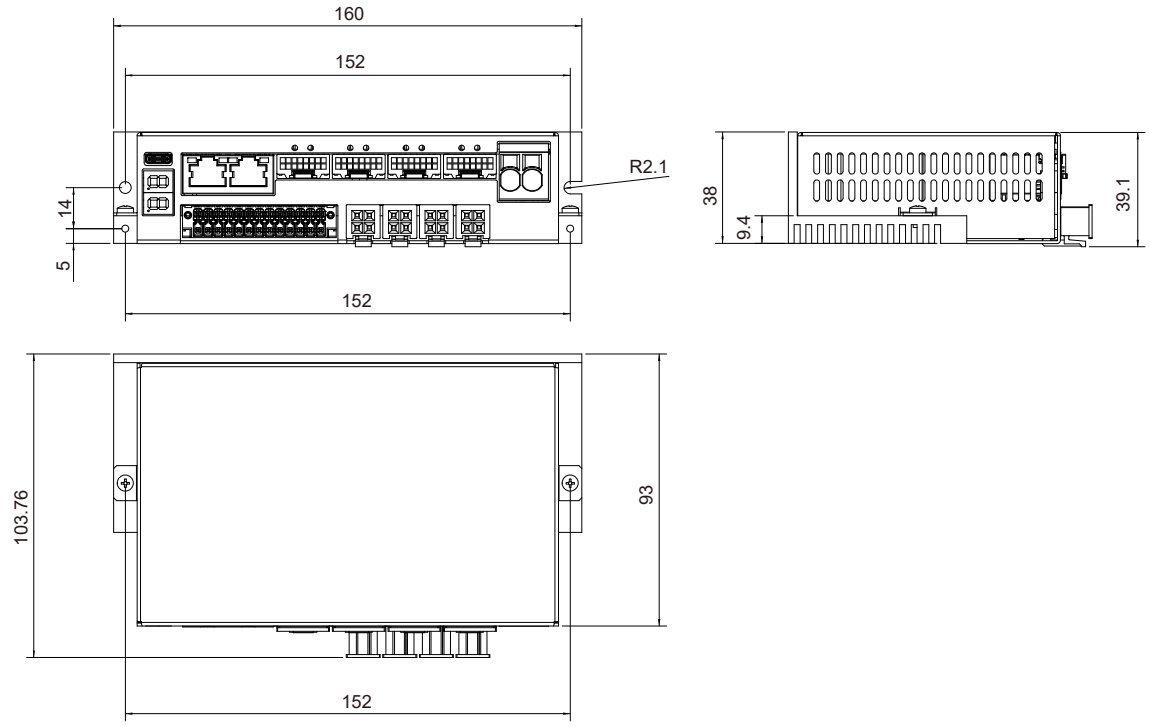
6.1 Technical Specifications

Power Amplifier	
Amplifier Type	Dual H-Bridge
Current Control	PWM
Output Current (peak of sin)	SSDC06-2XU-ECX：Continuous Current 2x6A max，Boost Current 2x7.5A max (1.5s)；current limitation auto set-up by attached motor
	SSDC10-2XU-ECX：Continuous Current 2x10A max，Boost Current 2x15A max (1.5s)；current limitation auto set-up by attached motor
	SSDC06-2XU-ECX-S：Continuous Current 2x6A max，Boost Current 2x7.5A max (1.5s)；current limitation auto set-up by attached motor
	SSDC10-2XU-ECX-S：Continuous Current 2x10A max，Boost Current 2x15A max (1.5s)；current limitation auto set-up by attached motor
	SSDC06-4X-ECX：Continuous Current 4x6A max，Boost Current 4x7.5A max (1.5s)；current limitation auto set-up by attached motor
	SSDC10-4X-ECX：Continuous Current 4x10A max，Boost Current 4x15A max (1.5s)；current limitation auto set-up by attached motor
	SSDC06-4X-ECX-S：Continuous Current 4x6A max，Boost Current 4x7.5A max (1.5s)；current limitation auto set-up by attached motor
	SSDC10-4X-ECX-S：Continuous Current 4x10A max，Boost Current 4x15A max (1.5s)；current limitation auto set-up by attached motor
	SSDC06-4XU-ECX：Continuous Current 4x6A max，Boost Current 4x7.5A max (1.5s)；current limitation auto set-up by attached motor
	SSDC10-4XU-ECX：Continuous Current 4x10A max，Boost Current 4x15A max (1.5s)；current limitation auto set-up by attached motor
	SSDC06-4XU-ECX-S：Continuous Current 4x6A max，Boost Current 4x7.5A max (1.5s)；current limitation auto set-up by attached motor
	SSDC10-4XU-ECX-S：Continuous Current 4x10A max，Boost Current 4x15A max (1.5s)；current limitation auto set-up by attached motor
Power Supply	SSDC06/10-2XU-ECX: 24 - 70 VDC SSDC06/10-2XU-ECX-S: 24 - 70 VDC SSDC06/10-4X-ECX: 24 - 70 VDC SSDC06/10-4X-ECX-S: 24 - 70 VDC SSDC06/10-4XU-ECX: 24 - 70 VDC SSDC06/10-4XU-ECX-S: 24 - 70 VDC
Input Voltage Range	SSDC06/10-2XU-ECX: 18-75 VDC SSDC06/10-2XU-ECX-S: 18-75 VDC SSDC06/10-4X-ECX: 18-75 VDC SSDC06/10-4X-ECX-S: 18-75 VDC SSDC06/10-4XU-ECX: 18-75 VDC SSDC06/10-4XU-ECX-S: 18-75 VDC
Protection	Over-voltage, under-voltage, over-temp, motor/winding shorts (phase-to-phase, phase-to-ground)

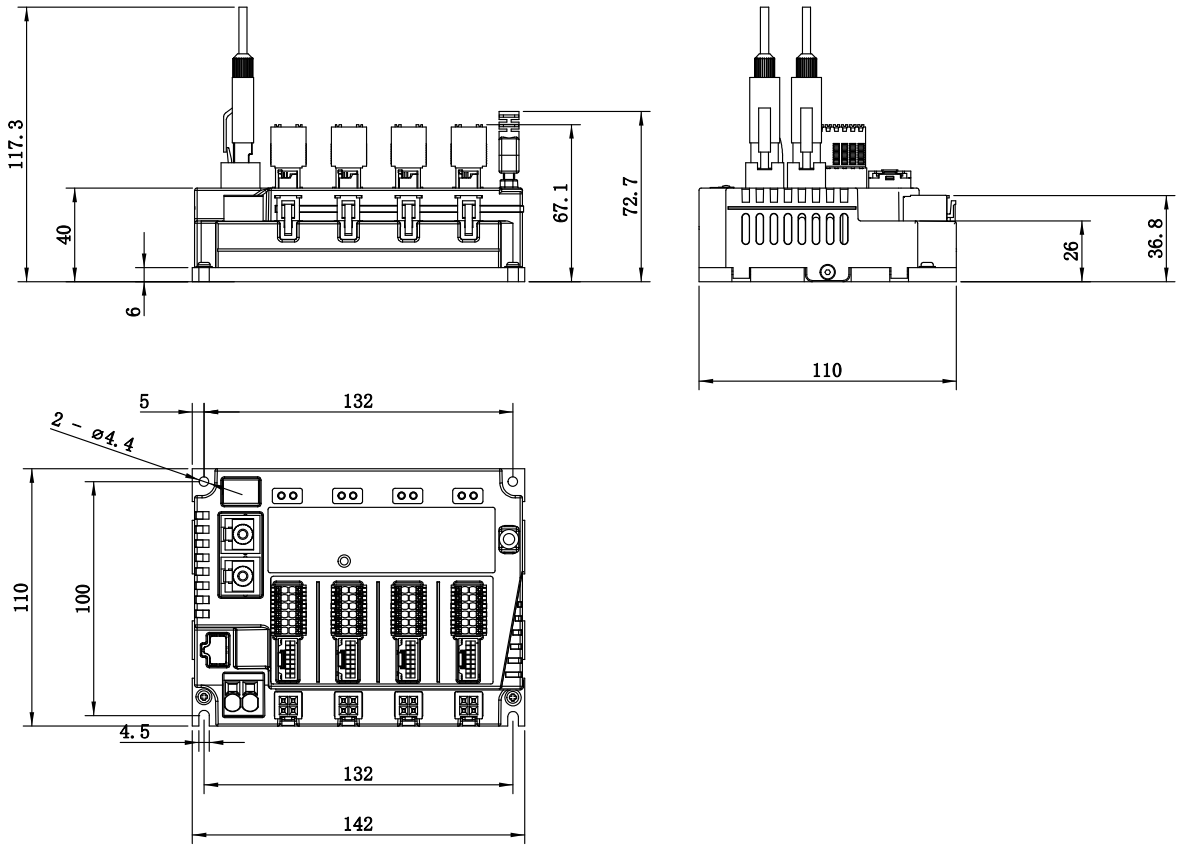
Controller	
Micro-Step Level	The software is adjustable and can be configured to any even number between 200-51200 steps/rev
Electronic Gearing & Encoder Resolution	4096 counts/rev(for AM08/11/17/23/24/34RS motors)
	20000 counts/rev(for AM17/23/24/34SS-N motors)
Speed Range	Up to 3000rpm
Filters	Digital input noise filter, Analog input noise filter, Smoothing filter, PID filter, Notch filte
Non-Volatile Storage	Configuration parameters are stored in the external EEPROM of the DSP
Protocol	CoE conform CiA402, VoE(Supports update the firmware over EtherCAT)
Modes of Operation	Profile Position, Profile Velocity, Profile Torque, Cyclic Synchronous Position, Cyclic Synchronous Velocity and Homing mode
Digital Inputs	SSDC-2XU: 2x3 optical isolation input X3,X4,X7: optically isolation, single-end input, high level can receive 5-24V DC level, minimum pulse width 100us, maximum pulse frequency 5KHz
	SSDC-4X: 4x5 optical isolation input X3,X4,X5,X7,X8：optically isolation, single-end input, high level can receive 5-24V DC level, minimum pulse width 100us, maximum pulse frequency 5KHz
	SSDC-4XU: 4x3 optical isolation input X3,X4,X7：optically isolation, single-end input, high level can receive 5-24V DC level, minimum pulse width 100us, maximum pulse frequency 5KHz
Digital Outputs	SSDC-2XU: 2x2 optically isolation output Y1: photoelectric isolation, open collector, 30V, 100mA Y2: Brake direct drive, photoelectric isolation, 24V, 1A
	SSDC-4X: 4x3 optically isolation output Y1,Y3：optically isolation, open collector, 30V, 100mA Y2: Brake direct drive, photoelectric isolation, 24V, 1A
	SSDC-4XU: 4x2 optically isolation output Y1：optically isolation, open collector, 30V, 100mA Y2: Brake direct drive, optically isolation, 24V, 1A
Communication	EtherCAT(Dual-port RJ45）and USB mini-B（-4X）/Type-C(-2XU/4XU) (for configuration)
Physical	
Ambient Temperature	0 to 40° C (32 to 104° F) when mounted to a suitable heatsink
Ambient Humidity	90% Max., non-condensing

6.2 Drive Dimensions

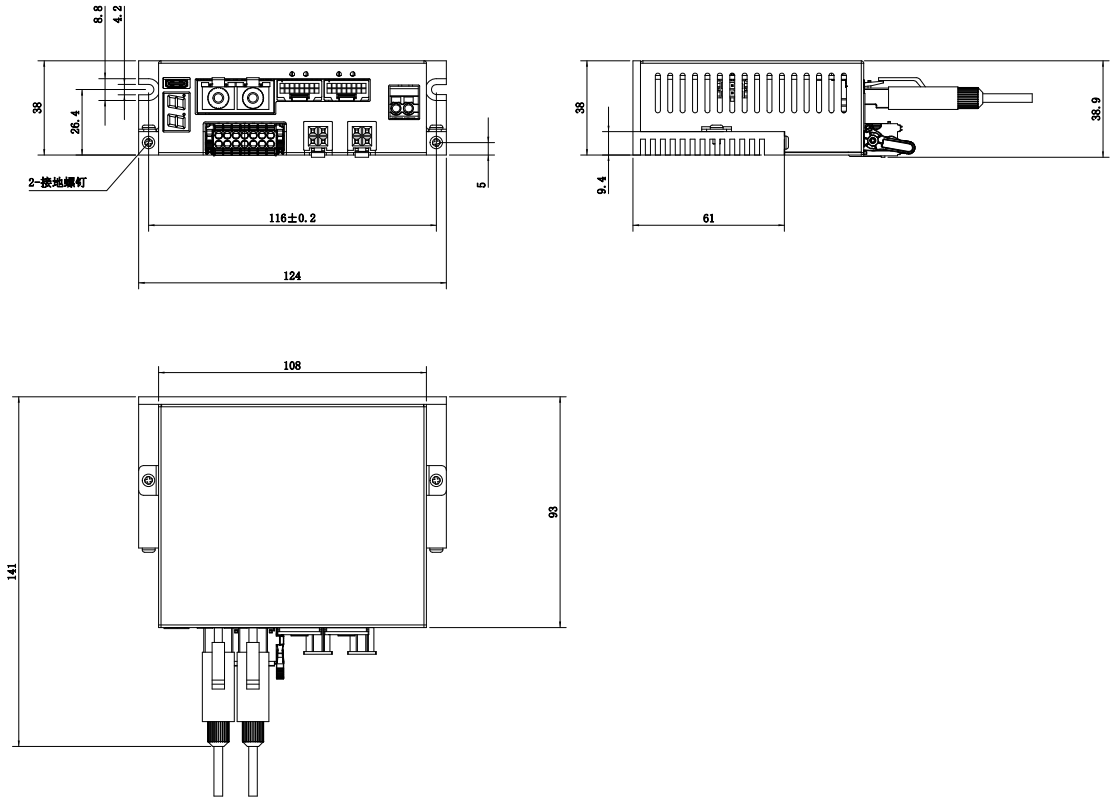
☐ SSDC-4XU Unit:mm



☐ SSDC-4X Unit:mm



☐ SSDC-2XU Unit:mm

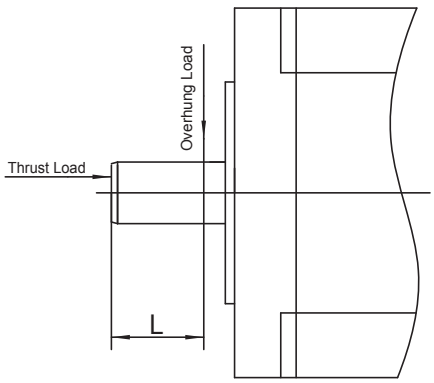


6.3 Recommended Motors

	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.



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