MOONS'

moving in better ways

Low Voltage Servo Brushless General Catalog

Low Voltage Servo Drive & Motor
DC Brushless Drive & Motor

Dawn of MOONS' 3A Era

1st A **Motion Products & Motion Control Products for Manufacturing Automation**

MOONS' is a leading manufacturer of the key parts, components and system level products used in manufacturing automation including: Stepper Motor and Drive, Brushless Motor and Drive, AC Servo Motor and Drive, Integrated solutions. We continue to play a major role in the manufacturing automation field with us moving forward to being a system level provider of total motion control solutions.

2nd A **Intelligent LED Driver & Control Technologies for LED Lighting Management Automation**

3rd A **Online Asset Monitoring, Fault Detection and Diagnosis Solutions for EAM Automation**

MOONS' Business Philosophies

• Customer satisfaction

MOONS' aims to enhance customer satisfaction through the provision development of innovative solutions, manufacture of high quality products, and ontime delivery and outstanding customer support.

• Employee satisfaction

MOONS' values and respects our employees input and encourages them to grow together with the company.
We have been working to develop tools and trainings to build a thriving culture of excellence internally to support the future growth of our employees and the company.

• Partnership

MOONS' strongly believes in a true integrated partnership between all partners in business including customers, distributors and all these in supply chain. As a result of our this philosophy, we endeavor to provide the best value contribution to all partners, which can help our partners improve their competiveness to achieve the win-win situation.

To demostrate our commitment to our community and our customers, **MOONS'** has adopted as our official slogan: "Moving in Better Ways". These words have following meanings to **MOONS':**

- **MOONS'** is an excellent global manufacturer of control motor & control motor drive system
- **MOONS'** is a leading global supplier of intelligent LED lighting control system and drive solutions
- **MOONS'** is a well-recognized reliable provider of system solutions for the intelligent system management in large asset-intensive industrial enterprises

We provide superior motion control systems to our global customers through optimizing of product design, engineering, and manufacturing. This is done by strengthening process and quality control and constantly creating solutions using motion control products that are more energy efficient and environmental friendly.

We provide leading-edge LED lighting drivers, controls and management solutions. Our leading lighting control technology makes the drive professional, convenient to use, and more energy efficient in reducing costs and enhancing profits for global customers.

We provide management system solutions for large asset-intensive industries including power generation, petrochemical, metallurgy, coal and large scale agriculture.

- **We are an ambitious and enterprising company**

MOONS' never stops the on-going accelerated pace to improve processes and increase efficiency. Through scientific management methodologies and tools and incorporating advanced technology with senior management experience, we constantly optimize management processes that enable **MOONS'** to maintain on-going growth in competitive markets.

- **We are a cooperative and thriving group**

All members of our team are able to incorporate the concept of moving in better ways during work, they continually upgrade our collective values, and strive for excellence in the process of doing business to improve expertise and gain better opportunities.

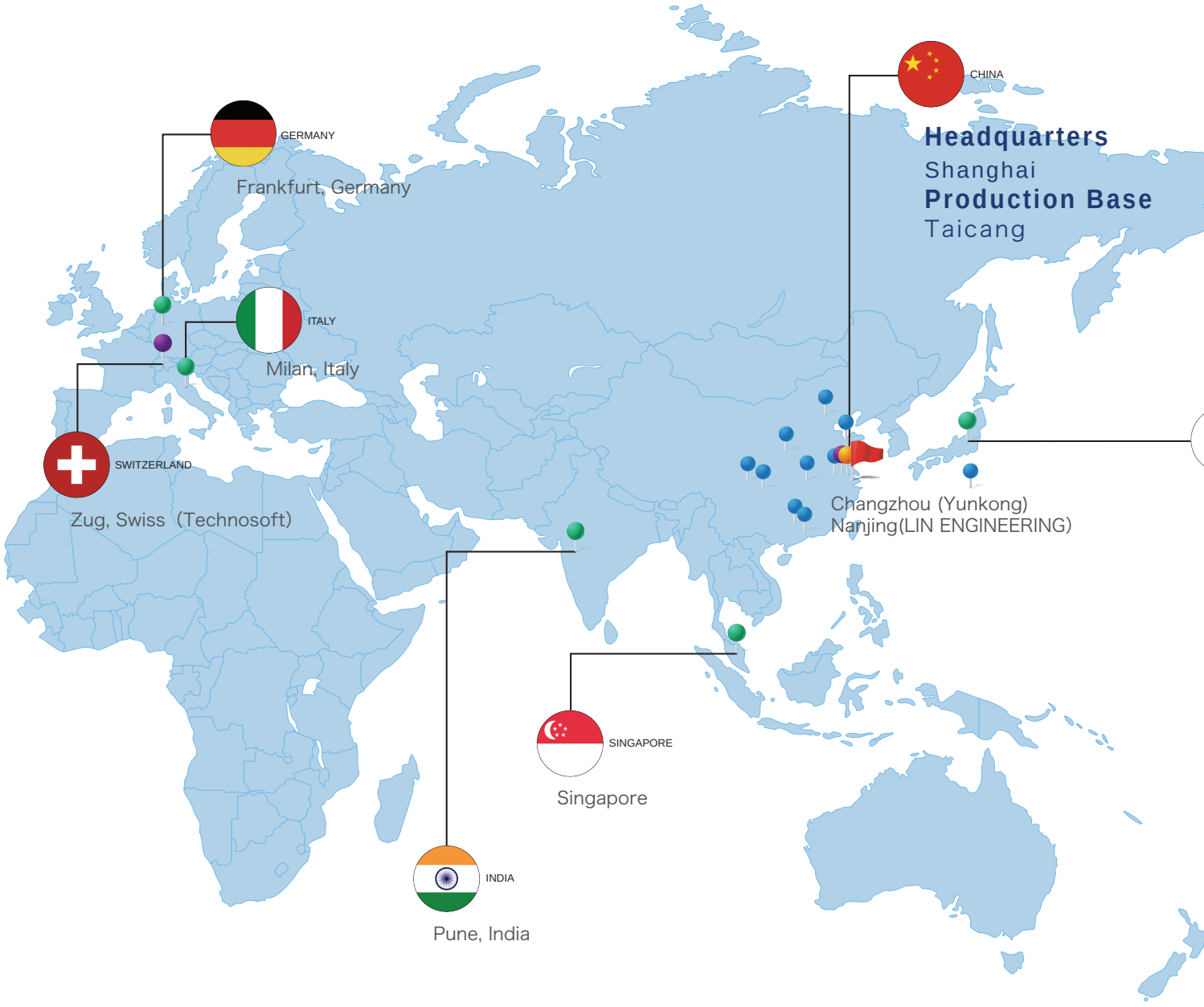
Motion Control Products and Solutions

MOONS' provides a wide range of motion control products and solutions serving the fields of printing, intelligent stage lighting, textile machinery, consumer appliance, banking equipment, factory automation, electronics, semiconductor equipment, packaging machinery, medical equipment and measuring equipment, to name a few.

Entering into the hybrid stepper motor business in 1997, **MOONS'** has grown to where it is now one of the top 5 global manufacturers of stepper motors, and an integrated provider of related motion control products and solutions.

MOONS' has been and is concentrating on technological advancement, product design innovation and improvement for standard and customized motion control products and solutions. Cutting edge technologies, product improvement and scientifically proven management systems permit **MOONS'** to exceed customers' requirements around the world. **MOONS'** supports our growing customer base by providing exceptional quality, application engineering, rapid prototyping, regional warehousing and competitive pricing.

Worldwide Service Network



Headquarters

Production Base

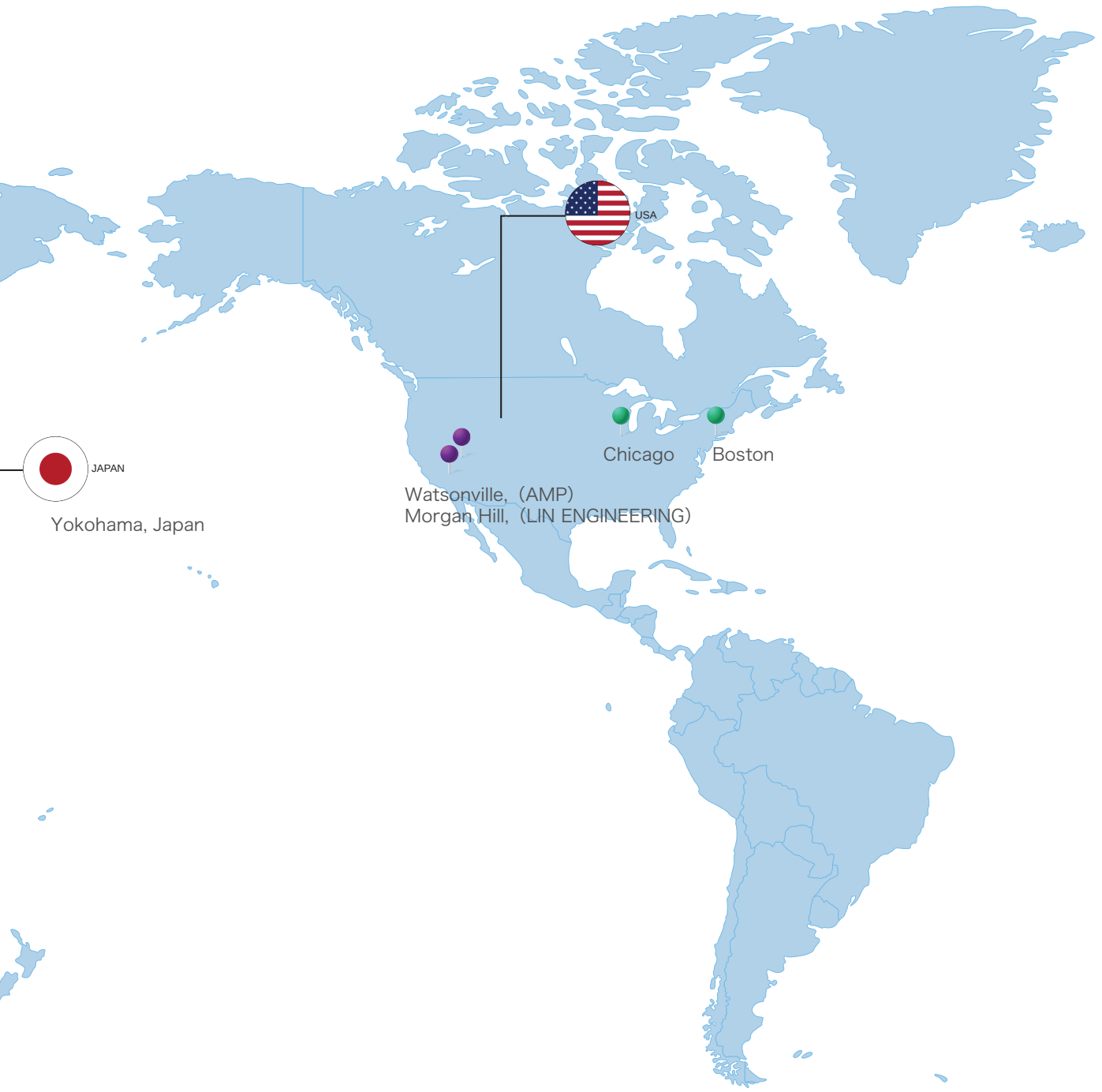
Operation Center

Overseas Sales Subsidiary

Greater China Region

Beijing	Qingdao
Ningbo	Ningjing
Shenzhen	Guangzhou
Wuhan	Xi'an
Chengdu	Chongqing

MOONS'
moving in better ways



MOONS' has set up ten offices in China, as well as subsidiaries in other countries including the United States, Italy, Singapore, Japan and Germany. Our business covers major countries and regions in North America, Europe, Asia and Southeast Asia ensure MOONS' close to where you are.

Products Overview

◇ MBDV Series Servo System

MBDV Series-DC Input Servo Product

Position Control
Velocity Control
Torque Control

Input Voltage: 24-60VDC
Motor Frame Size: 40mm, 60mm, 80mm
Motor Power(W): 100, 200, 400, 750
Encoder: 16-bit, 2500 Lines,1024 Lines incremental encoder
Features:

- Compact size, single and dual-axis design options
- Tuning-less servo and auto-tuning function
- Synchronous shutdown when fault occurs
- Field bus communication watch dog and emergency stop
- Toggle switch for node ID, baud rate and terminating resistor settings
- Wireless Debugging
- STO function safety

Control Modes:

- Field Bus Control,Integrated Daisy chain Interface
- Q Program

Inputs and Outputs:

- 4 Digital Inputs, 2 Digital Outputs, 1 circuit direct drive motor brake output
- Encoder Feedback Output, Supporting pulse division function

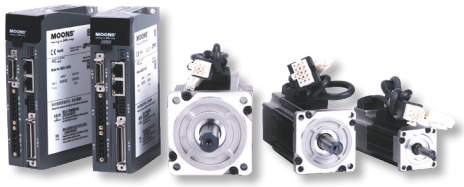
Communications:

CANopen Modbus

CE RoHS Compliant

◇ M2 Series Servo System

M2DC Series-DC Input Servo Product



Position Control
Velocity Control
Torque Control

Input Voltage: 24-60VDC
Motor Frame Size: 40mm, 60mm, 80mm
Motor Power(W): 60, 100, 200, 300, 400, 550, 750
Encoder: 2500 Lines incremental encoder
Features:

- Easy to Use On-line Auto Tuning
- Build-In Soft PLC - Q Programmer
- Multiple Speeds Changeable
- Internal Regeneration Resistors
- Easy to Tuning Software
- Position Tables

Control Modes:

- Pulse Control
- Field Bus Control,Integrated Daisy chain Interface
- Analog Control
- Q Program

Inputs and Outputs:

- 12 Digital Inputs, 6 Digital Outputs
- 2 Line receiver inputs
- 2 Analog Inputs
- Encoder Feedback Ouput

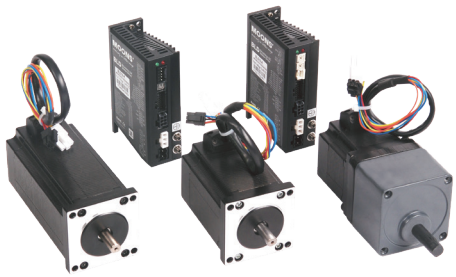
Communications:

SCL eSCL EtherNet/IP Modbus

CE RoHS Compliant

◇ BL Series Brushless Product

BLD Series- Brushless DC Motor & Drives



Velocity Control

Input Voltage: 24-48VDC
Motor Frame Size: 42mm, 57mm
Motor Power(W): 30, 60, 90, 120, 180
Features:

- Wide Speed Control Range
- Compact and High Efficiency
- Low Power Consumption, Low Noise, Low Vibration
- Long Life and Low Maintenance Requirements
- Excellent Speed Stability
- Low Torque Ripple

Control Mode:

- Velocity Control

Inputs and Outputs:

- 8 Digital Inputs, 2 Digital Outputs
- 1 Analog Input

Communication:

SCL Modbus

MBDV Series Servo Products

MBDV series drive is a new generation of high performance and DC powered servo products. It adopts advanced full digital motor control algorithm, it enables high precision position control, accurate speed and torque with low-voltage servo motors. The servo system also adopts a new enhanced high resolution magnetic encoder and a new winding design low-voltage servo motor. The motor frame size includes 40/60/80mm and the rated power range from 100W ~ 750W.

MBDV series products have excellent feedback response and short settling time. It supports tuning-less function, fine-tuning and vibration suppression functions. MBDV servo drive supports Modbus/RTU, CANopen field bus options.

Luna is the software for MBDV drive. It is a windows-based platform for all your configuraiton, tuning and testing requirements. High-speed USB connection as well as wireless connection are also enabled with the MBDV and Luna combination.

Features

- Compact size, single and dual-axis design options
- Wide range of power input, main power voltage 24～60VDC
- Optional AUX power voltage 24VDC ±10%
- Up to rated output current 20Arms, peak current 60Arms for each axis
- Compatible with 100W～750W servo motors
- Featuring both with CANopen & RS485 communication capabilities
- High speed USB communication
- Wireless debugging interface up to 20m transmission distance
- Compatible with full signals & SPI communication type encoder
- Toggle switch for node ID, baud rate and terminating resistor settings
- LED digital display information
- Drive over current, over voltage, over temperature and motor over temperature protection

Highlights

- Built-in software PLC—Q program
- STO complicate with SIL2 level
- Tuning-less and auto-tuning function
- Synchronous shutdown when fault occurs
- Field bus communication watch dog and emergency stop
- Control algorithm to achieve motor collision protection

Features

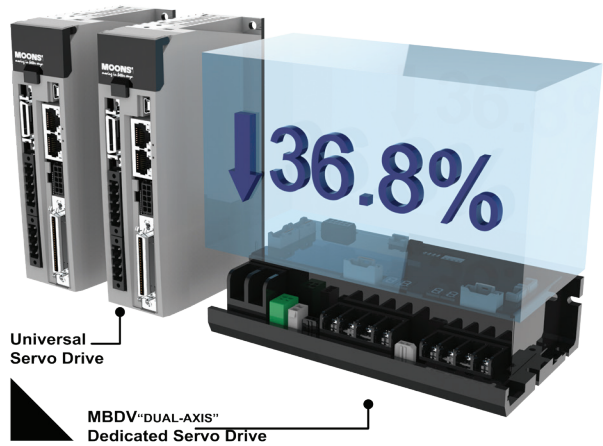
■ High-precision Encoder

Enhanced 16-bit high resolution encoder enables smooth speed control and high precise position control of the servo system. Serial communication encoder is used for high EMI immunity and wiring simplicity.

- ◆ High resolution, up to 65,536 divisions pre revolution
- ◆ Robust design for harsh environment application
- ◆ Stronger anti vibration ability
- ◆ Dust, oil and condensation resistance

■ Compact Design

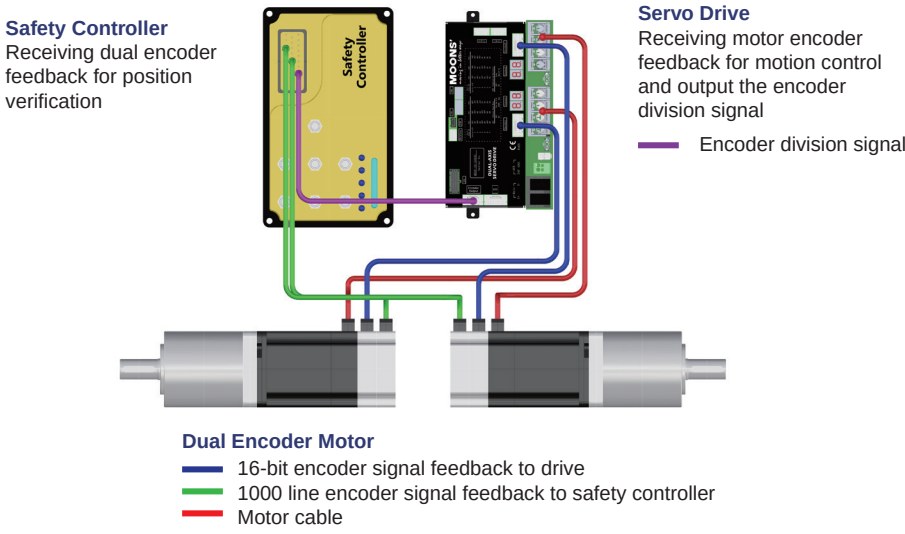
MBDV dual axis design significantly reduces the size of the drive, it is a 36.8% drive size reduction compare to conventional servo drives.



■ Safe

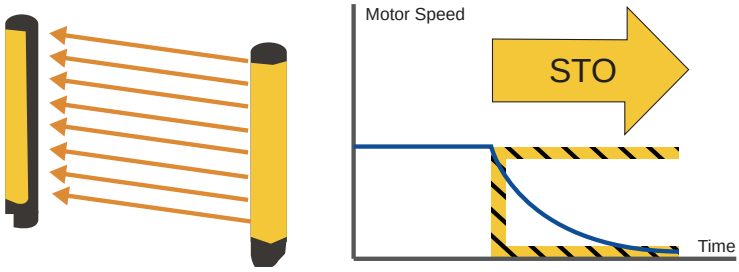
● Dual Encoder Safety System

Dual encoders can provide reliable position and speed feedback for the safe operation of the device, together with the safety controller to achieve the required safety functions of the system.



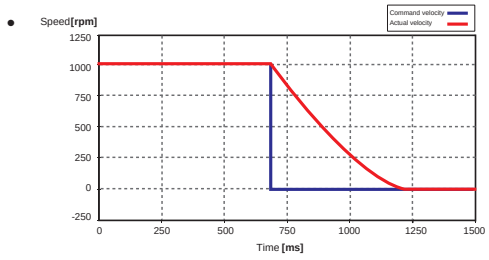
STO

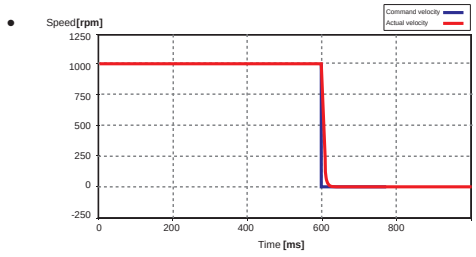
Safe Torque Off (STO) is a hardware level safety protection function. When the STO function is activated, the ability to drive motor current is cut-off. In case of an emergency, this operator can protect human and equipment safety while the drive is continuously powered.
MBDV series drive meets UL61800-5-2(SIL2), IEC61508, ISO138491(PL d).



Dynamic Brake

Dynamic brake is a mechanism that stops the motor with the fastest speed by shorting the motor three-phase in case of an emergency, the intention is to protect the safety of equipment and surrounding. Dynamic brake is driven by motor' s back EMF current. No external power source is needed to engage or disengage the brake function.



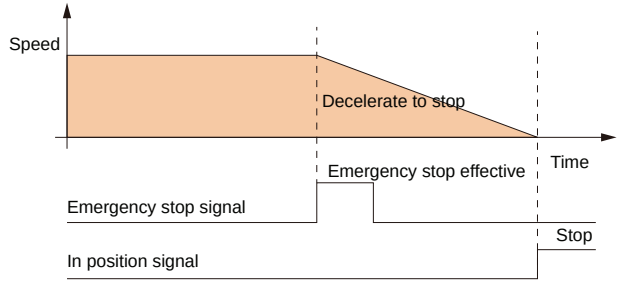


Without Dynamic brake
The drive will switch to disable after the fault alarm goes.Motors will stay in uncontrollable free deceleration status till stop. The deceleration time depends on the fact e.g. speed, inertia, friction while in such status.

Dynamic brake is in effect
The velocity command is set to 0 as soon as the drive is disabled. The actual velocity ramps down immediately as the braking applies.

Emergency Stop

- When the communication between the controller and drive fails during the motor movement, the drive will trigger the watch dog, the motor decelerates according to the set mode.
- When the motor needs to be decelerated and stopped immediately in an emergency situation during movement, it can be triggered by the I/O or field bus control commands, the motor decelerates according to the set mode.



Protection

Over voltage protection

Over current protection

Over temperature protection

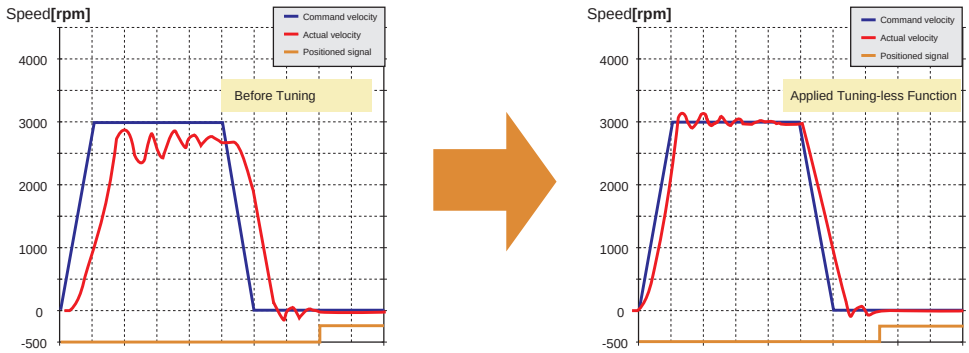
■ Easy Tuning

● Wireless Debugging

MBDV series servo drive is equipped with high-speed USB debugging interface, AGV dedicated drive has a wireless debugging interface which has transmission distance up to 20m, which makes the debugging more convenient.

● Tuning-less Function

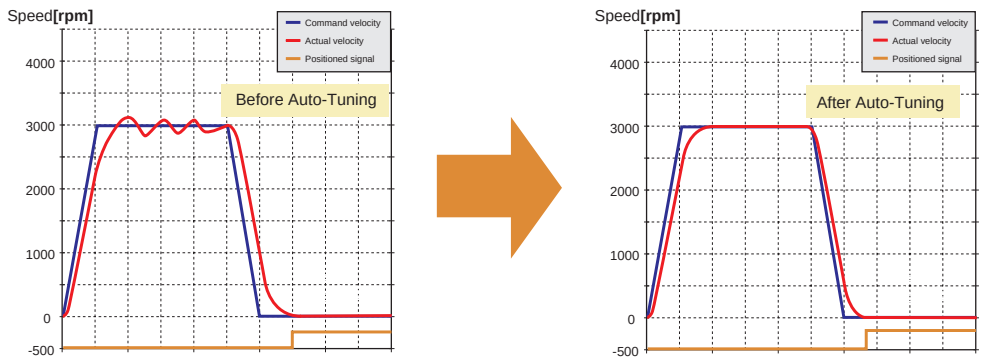
- ◆ No tuning is required for load up to 30 times of the load inertia ratio.
- ◆ No limitation towards any load type and drive control mode.
- ◆ High robustness for maximum control of servo system stability.



● Auto-tuning

The auto-tuning algorithm can automatically identify the load inertia (ratio), gain and vibration suppression parameters in real time.

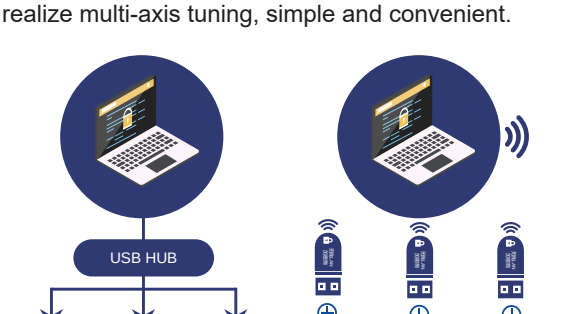
The auto-tuning function can greatly shorten your system tuning time, improve system responsiveness and equipment production efficiency.



Friendly Software

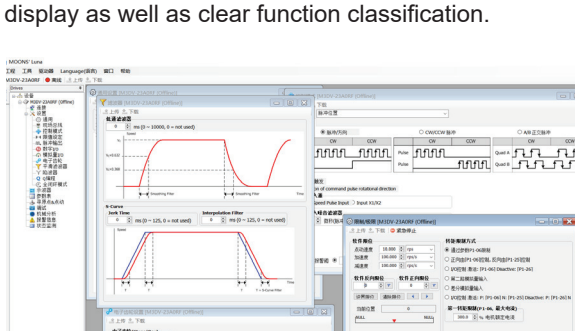
■ Multi-axis Tuning

Based on USB or Wireless communication, it can realize multi-axis tuning, simple and convenient.



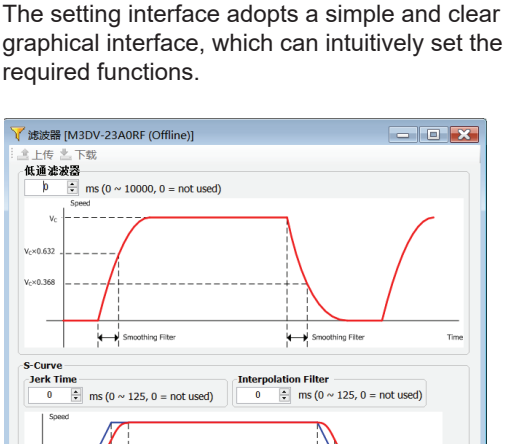
■ Tree Structure

Newly-designed tree-structure software, multi-window display as well as clear function classification.



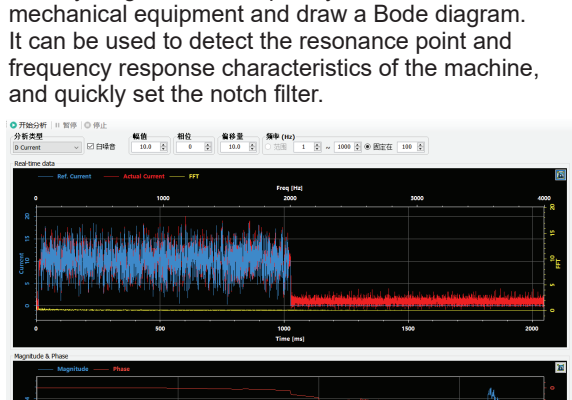
■ Graphical Setting Interface

The setting interface adopts a simple and clear graphical interface, which can intuitively set the required functions.



■ Mechanical Analysis

Quickly diagnose the frequency characteristics of mechanical equipment and draw a Bode diagram. It can be used to detect the resonance point and frequency response characteristics of the machine, and quickly set the notch filter.



■ Powerful Oscilloscope Function

- Real-time data curve display
- Up to 4 channels with 16bit data per channel and 8kHz sampling rate
- Up to 2 channels with 32bit data per channel and 8kHz sampling rate
- In the selected cursor area, the software can display the maximum value, minimum value, root mean square, etc.
- Customizing trigger conditions
- Monitoring the operation status of the drive and the digital inputs and outputs

Field Bus Control

MBDV Servo System support RS-485 Modbus/RTU protocol, CANopen protocal based on CANbus.

■ CANopen

Standard CAN bus interface is available in MBDV series servo drives, which makes it easy to get integrated to a industrial field bus.

Items	Specification
Physical Layer Standard	CiA 303-1 Cabling and connector pin assignment
Communication Protocol	CiA 301 Application Layer and Communication Profile CiA 402 Device Profile Drives and Motion Control
Bus Connector	Molex
Baud Rate	12.5Kbps, 20Kbps, 50Kbps, 125Kbps 250Kbps, 500Kbps, 800Kbps,1Mbps
Communication Objects	SDO, PDO, SYNC, EMCY, NMT, Heartbeat
Control Mode	Profile Position, Profile Velocity, Profile Torque, Homing Mode
PDO Data	4 RxPDOs, 4 TxPDOs
Support Axis	112 axis

■ Modbus

MBDV series servo drives provide the Modbus/RTU communication function with RS-485 interface, which can be used to easily control the motor, set parameters or monitor the status of the drive.

Items	Specifications
Physical Layer Standard	RS-485
Communication Protocol	Modbus/RTU
Bus Connector	Molex
Baud Rate	9600bps, 19200bps, 38400bps, 57600bps, 115200bps
Control Mode	Position Mode, Velocity Mode, Torque Mode, Homing Mode, Q Program
Support Axis	Up to 32 axes

General Specifications

■ Certification Specification

MBDV series products are designed to meet the following standards.

		Drive	Motor
Europe	EMC Command	EN 61800-3	EN 55011
			EN 55014-1
			EN 55014-2
			EN 6100-3-2
			EN 6100-3-3
	LVD	EN 61800-5-1	EN 60034-1
			EN 60034-5
	STO	UL61800-5-2(SIL2)	
		IEC61508	
		ISO13849-1(PL d)	
UL Standard		UL 61800-5-1	UL 1004-1
			UL 1004-6
CSA Standard		C22.2 No.274-13	CSA C22.2 No.100

■ Motor Specification

Insulation Class	Class B (130℃)	Ambient Temperature	Operating 0 to 40°C, Storage -20 to 60°C
IP65 Rating	IP65 (Except transfixion part of shaft)	Ambient Humidity	Operate where the relative humidity range is 20% to 85% and non-condensing
Installation location	Indoor installation, avoiding direct sunlight, corrosive and flammable gas	Altitude	Operating 1,000m
Vibration	Under 49m/s^2, 10 ~ 60Hz(Do not use continuously at resonance frequency)		

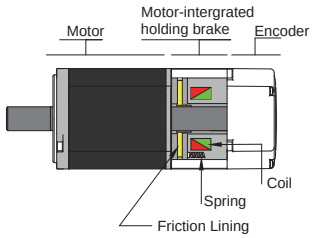
■ Brake Specification

Motor brake is used to prevent motor from rotating by power off the servo system. The most common way of use is in vertical application, when the motor is disabled or powered off, in order to prevent the displacement of the mechanical mechanism driven by the motor due to gravity and other reasons, the servo motor with brake needs to be used.

When the brake is powered on, the armature is adsorbed, the brake pad is released, and the motor can operate normally.

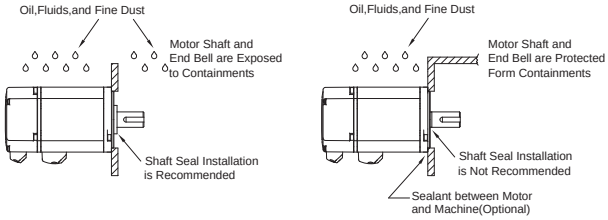
When the brake is powered off, the armature is released, the brake pad is locked, and the motor can't rotate normally.

Frame Size	40mm	60mm	80mm
Static friction torque (Nm)	0.32	1.5	3.2
Rated Voltage (VDC)	24		
Power (W)(20℃)	6.9	7.2	10
Rated Current (A)	0.29	0.3	0.42
Brake Time	< 70ms (Standard air gap, at 20℃)		
Release Time	<25ms		
Release Voltage	18.5VDC max.(at 20℃)		



■ Shaft Seal

Industrial oil seals can block contaminants (oils, impurities) to extend the life of the motor. The oil seal will produce a certain resistance to the motor shaft, about 10% torque will be lost.



Basic Information

■ Numbering System for MBDV Drive

MBDV - 2X - 5 20A C - *

① ② ③ ④ ⑤ ⑥

① MBDV series

② Multi-axis in One
Blank: Single-axis
2X: Dual-axis

③ Supply Voltage
5: 24~60VDC

④ Current
20A Rated Current 20A(RMS)
Peak Current 60A(RMS)

⑤ Control Function Type
C—CANopen

⑥ Customization

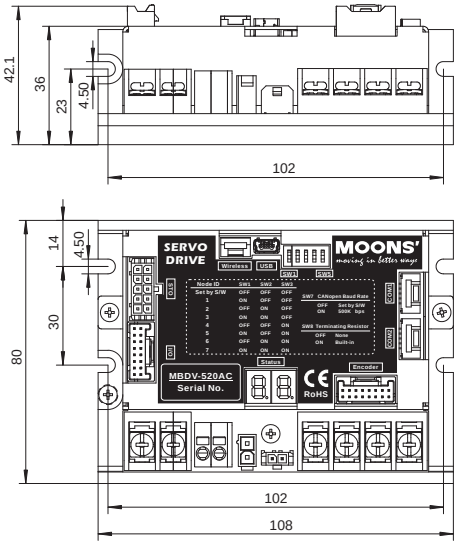
■ Drive Specification

Input Power	Main power supply		24V ~ 60VDC ±10%
	Auxiliary power supply		24VDC±10%
Withstand Voltage			Primary to earth: withstand 500 VAC, 1 min
Environment	Temperature		◆ Ambient temperature: 0°C ~ 50°C (If the ambient temperature of servo drive is higher than 45°C, please install the drive in a well-ventilated location) ◆ Storage temperature: -20°C ~ 65°C
	Humidity		Both operating and storage : 10 ~ 85%RH or less
	Altitude		Lower than 1000m
	Vibration		9.8m/s^2 or less, 10 ~ 60Hz (Do not use continuously at resonance frequency)
Motor Encoder Feedback			◆ 16-bit Incremental magnetic encoder ◆ 2500line Incremental optical encoder
I/O *1	Digital Signal	Input	4 Configurable optically isolate digital general inputs, 5-24VDC, 20mA
		Output	◆ 2 Configurable optically isolate digital general outputs, Max.30VDC, 100mA ◆ Dedicated motor brake control output, Max.30VDC, 500mA
	Pulse Signal*2	Output	3 Line driver output: Encoder A±, B±, Z± feedback output
Comm Port	USB Mini		Connection with PC for configuration
	Wireless		Connection with wireless module to a PC for configuration
	CANopen		CANopen
	RS-485 *3		Modbus/RTU
LED Display			2-digital LED display
Regeneration Resistor			External resistor is available
Control Mode			◆ CANopen communication control mode Complicate with CiA402 Standard and supports PP, PV, PVT,TQ and HM mode ◆ Modbus/RTU communication control mode Command position mode, command speed mode, command torque mode
Control Input Signal			Alarm Reset, CW/CCW Limit, Gain Select, Zero Speed Clamp, Emergency Stop, Torque Limit, Speed Limit, General Purpose Input
Control Output Signal			Warning Output, Fault Output, Servo Ready, Velocity Reached, Torque Reached, Position Reached, Servo-on Status, Brake Release, Dynamic Position Error Following, Positioning Complete, Zero Speed Detected, Velocity Coincidence, Torque Coincidence, Velocity limit, Torque limit, Homing Finished, Soft Limit CW/CCW, General Purpose Output
Protection			Over Current, Over Voltage, Low Voltage, Low Heating, Bad Encoder Feedback,Over Speed, Position Error, Over Load, Emergency Stop, CW/CCW Limit, Communication Abnormal
Dynamic Brake			Built in
STO			Built in
Certification			RoHS、CE
Drive Weight	MBDV-520AC		0.4kg
	MBDV-2X-520AC		0.9kg

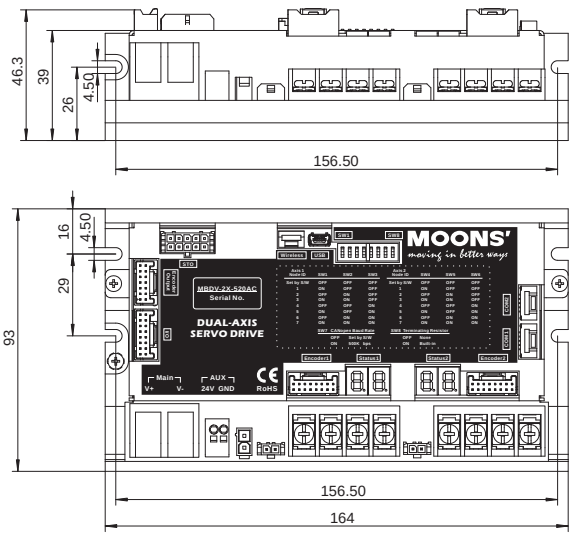
*1 Multi-axis in one drive is described to single-axis
*2 Single-axis drive does not support such function, customization is optional
*3 RS485 and CANopen share the common communication interface

■ Drive Mechanical Dimensions(Unit:mm)

☐ MBDV-520AC

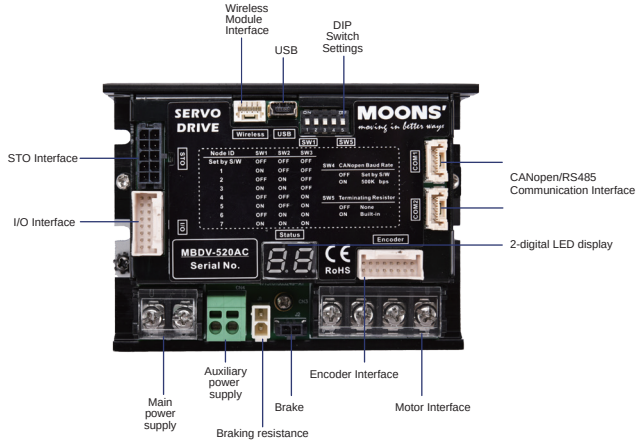


☐ MBDV-2X-520AC

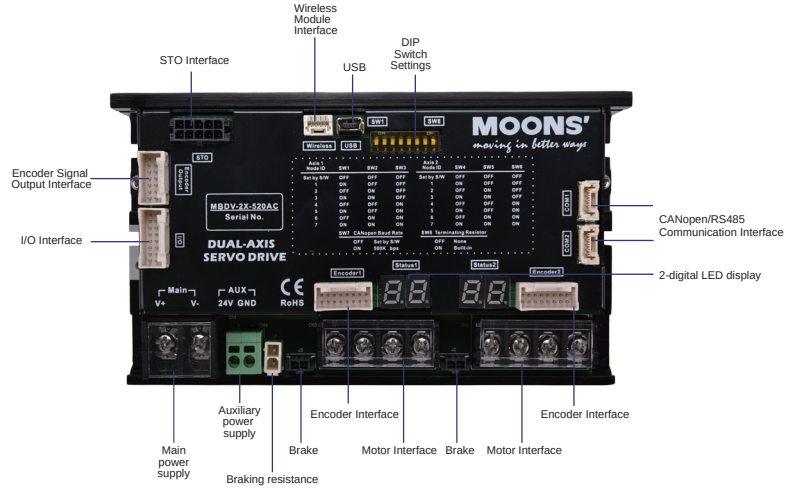


■ MBDV Servo Drive Interface Description

☐ MBDV-520AC



☐ MBDV-2X-520AC



■ Numbering System for Servo Motor

SM 06 02 G SL - KCY - N NV **

- SM: SM Series
- 06: Frame Size

Frame Size
04-□40mm
06-□60mm
08-□80mm

- 02: Motor Length

Motor Length	□40	□60	□80
01		200W	
02	100W	400W	
03			750W

- G: Winding(DC)

Winding(DC)	
G	48V
J	24V

- SL: Encoder Type
  - SL: 16-bit Incremental Magnetic Encoder, Communication type
  - EL: 16-bit Incremental Magnetic Master Encoder, Communication type 1000line Incremental Optical Auxiliary Encoder
- KCY: Shaft and lead type
  - KCY: Standard keyway, motor cable with Y type terminal
- N: Brake
  - N: No brake
  - B: With brake(24VDC)
- **: Custom code

■ Servo Motor Products Standard

Rated Power	24VDC Winding		48VDC Winding	
	Frame Size	Rated Speed (Max.Speed)	Frame Size	Rated Speed (Max.Speed)
W	mm	rpm	mm	rpm
100	□40	3000 (4000)	□40	
200	□60		□60	3000 (4000)
400			□60	
750			□80	

■ Servo Motor Specification——40mm Frame Size, Single Encoder

☐ Specification

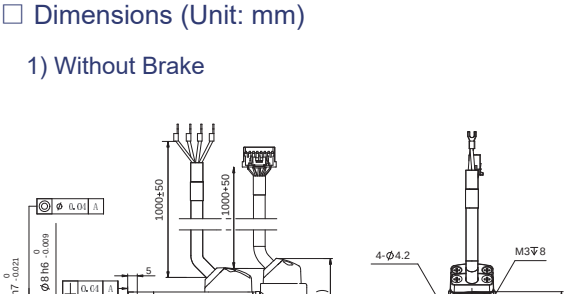
Type		SM0402JSL-KCY- ☐ NV	SM0402GSL-KCY- ☐ NV
Recommended drive input voltage at rated speed(DC-Bus)		24	48
Rated Output Power Rated Speed Max.Speed	watts rpm rpm	100 3000 4500	100 3000 4200
Rated Torque Peak Torque	Nm Nm	0.32 0.96	0.32 0.96
Rated Current Peak Current	A (rms) A (rms)	8.1 24.5	2.9 8.15
Counter-electromotive Constant ±5% Torque Factor ±5% Winding Resistance(Line-Line) Winding Reactor(Line-Line)	V (rms) / K rpm Nm / A (rms) Ohm @25° C mH (typ.)	2.53 0.042 0.23 0.25	7.02 0.116 1.7 1.9
Rotor Inertia Rotor Inertia - With Brake Shaft Load - Axial Shaft Load - Radial (End of Shaft) Weight Weight - With Brake	$Kg{\cdot}m^2$ $Kg{\cdot}m^2$ N (max.) N (max.) kg kg	0.0428×10^{-4} 0.0494×10^{-4} 50 60 0.55 0.8	0.0428×10^{-4} 0.0494×10^{-4} 50 60 0.55 0.8

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

☐ Brake Options

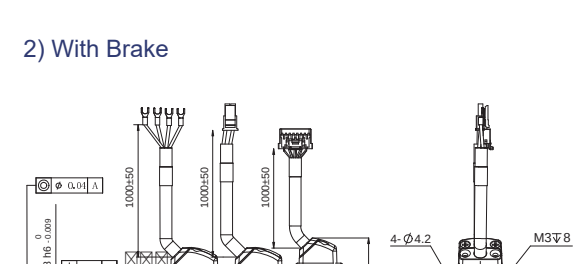
☐ Dimensions (Unit: mm)

1) Without Brake



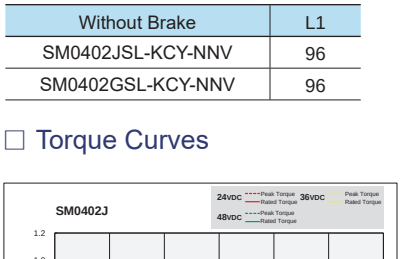
Without Brake	L1
SM0402JSL-KCY-NNV	96
SM0402GSL-KCY-NNV	96

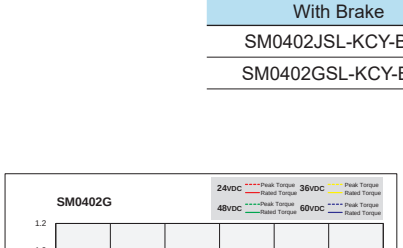
2) With Brake



With Brake	L1
SM0402JSL-KCY-BNV	133
SM0402GSL-KCY-BNV	133

☐ Torque Curves





■ Servo Motor Specification——60mm Frame Size, Single Encoder

☐ Specification

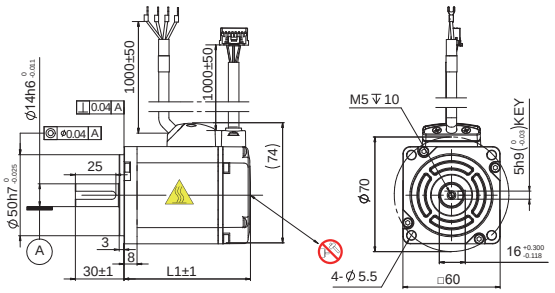
Type		SM0601JSL-KCY- ☐ NV	SM0601GSL-KCY- ☐ NV	SM0602GSL-KCY- ☐ NV
Recommended drive input voltage at rated speed(DC-Bus)		24	48	48
Rated Output Power	watts	200	200	400
Rated Speed	rpm	3000	3000	3000
Max.Speed	rpm	4200	3900	4000
Rated Torque	Nm	0.64	0.64	1.27
Peak Torque	Nm	1.92	1.92	3.81
Rated Current	A (rms)	16.3	6.5	11.8
Peak Current	A (rms)	49	19.3	30.6
Counter-electromotive Constant ±5%	V (rms) / K rpm	2.61	6.52	7.41
Torque Factor ±5%	Nm / A (rms)	0.043	0.108	0.122
Winding Resistance(Line-Line)	Ohm @25° C	0.1	0.52	0.22
Winding Reactor(Line-Line)	mH (typ.)	0.216	1.348	0.625
Rotor Inertia	$Kg{\cdot}m^2$	0.165×10^{-4}	0.165×10^{-4}	0.31×10^{-4}
Rotor Inertia - With Brake	$Kg{\cdot}m^2$	0.22×10^{-4}	0.22×10^{-4}	0.36×10^{-4}
Shaft Load - Axial	N (max.)	70	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	200	200	240
Weight	kg	1.1	1.1	1.6
Weight - With Brake	kg	1.6	1.6	2.0

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

☐ Brake Options

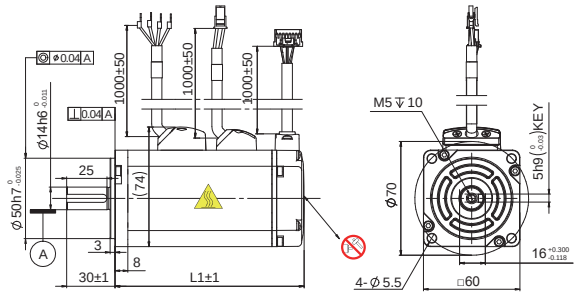
☐ Dimensions (Unit: mm)

1) Without Brake



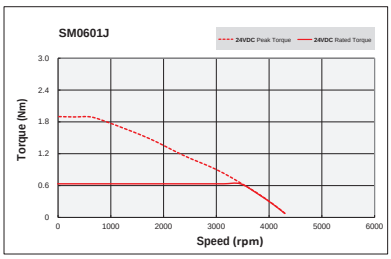
Without Brake	L1
SM0601JSL-KCY-NNV	78
SM0601GSL-KCY-NNV	78
SM0602GSL-KCY-NNV	107

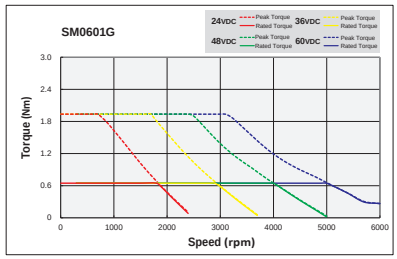
2) With Brake

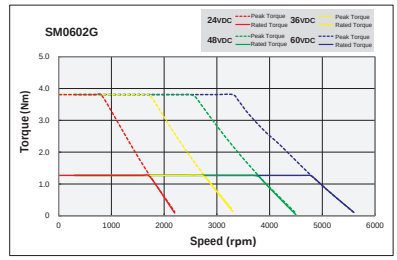


With Brake	L1
SM0601JSL-KCY-BNV	117.5
SM0601GSL-KCY-BNV	117.5
SM0602GSL-KCY-BNV	146.5

☐ Torque Curves







■ Servo Motor Specification——80mm Frame Size, Single Encoder

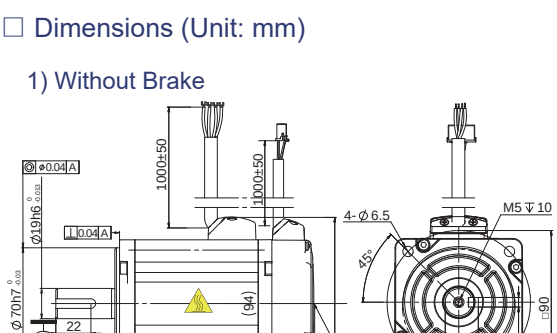
☐ Specification

Type		SM0803GSL-KCY-NNV	SM0803GSL-KCY-BNV
Recommended drive input voltage at rated speed(DC-Bus)		48	48
Rated Output Power Rated Speed Max.Speed	watts rpm rpm	750 3000 3600	750 3000 3600
Rated Torque Peak Torque	Nm Nm	2.4 7.2	2.4 7.2
Rated Current Peak Current	A (rms) A (rms)	18.8 56.7	18.8 56.7
Counter-electromotive Constant ±5% Torque Factor ±5% Winding Resistance(Line-Line) Winding Reactor(Line-Line)	V (rms) / K rpm Nm / A (rms) Ohm ±10%@25° C mH (typ.)	8.36 0.138 0.094 0.366	8.36 0.138 0.094 0.366
Rotor Inertia Shaft Load - Axial Shaft Load - Radial (End of Shaft) Weight	$Kg{\cdot}m^2$ N (max.) N (max.) kg	0.89×10^{-4} 90 270 2.6	0.97×10^{-4} 90 270 3.4

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

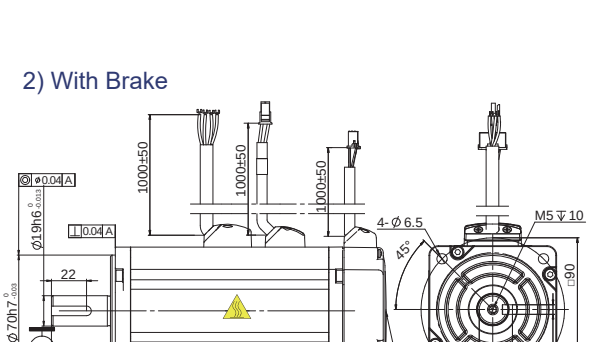
☐ Dimensions (Unit: mm)

1) Without Brake



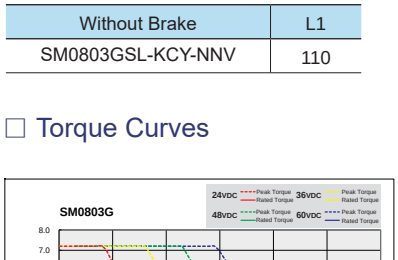
Without Brake	L1
SM0803GSL-KCY-NNV	110

2) With Brake



With Brake	L1
SM0803GSL-KCY-BNV	156.8

☐ Torque Curves



■ Servo Motor Specification——60mm Frame Size, Dual Encoder

☐ Specification

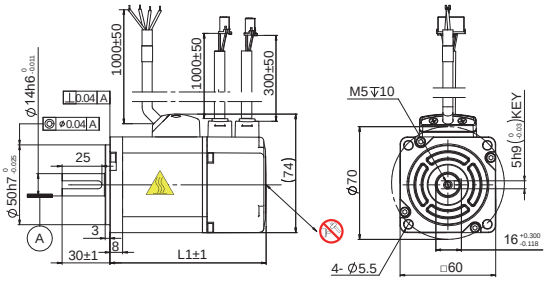
Type		SM0601JEL-KCY- ☐ NV	SM0601GEL-KCY- ☐ NV	SM0602GEL-KCY- ☐ NV
Recommended drive input voltage at rated speed(DC-Bus)		24	48	48
Rated Output Power	watts	200	200	400
Rated Speed	rpm	3000	3000	3000
Max.Speed	rpm	4200	3900	4000
Rated Torque	Nm	0.64	0.64	1.27
Peak Torque	Nm	1.92	1.92	3.81
Rated Current	A (rms)	16.3	6.5	11.8
Peak Current	A (rms)	49	19.3	30.6
Counter-electromotive Constant ±5%	V (rms) / K rpm	2.61	6.52	7.41
Torque Factor ±5%	Nm / A (rms)	0.043	0.108	0.122
Winding Resistance(Line-Line)	Ohm @25° C	0.1	0.52	0.2
Winding Reactor(Line-Line)	mH (typ.)	0.216	1.348	0.625
Rotor Inertia	$Kg{\cdot}m^2$	0.165×10^{-4}	0.165×10^{-4}	0.31×10^{-4}
Rotor Inertia- With Brake	$Kg{\cdot}m^2$	0.22×10^{-4}	0.22×10^{-4}	0.36×10^{-4}
Shaft Load - Axial	N (max.)	70	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	200	200	240
Weight	kg	1.1	1.1	1.6
Weight - With Brake	kg	1.6	1.6	2.0

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

☐ Brake Options

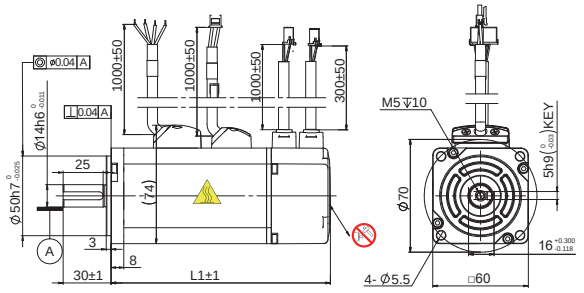
☐ Dimensions (Unit: mm)

1) Without Brake



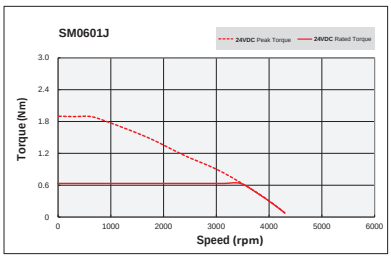
Without Brake	L1
SM0601JEL-KCY-NNV	98
SM0601GEL-KCY-NNV	98
SM0602GEL-KCY-NNV	127

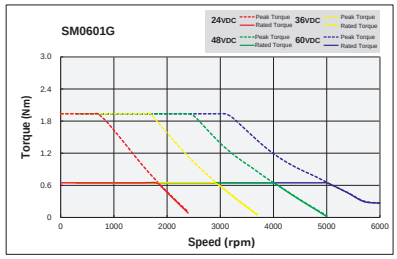
2) With Brake

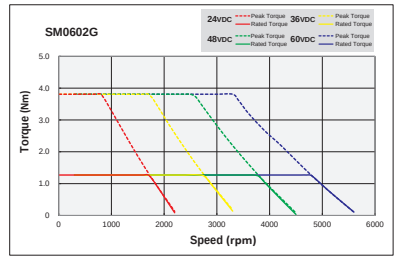


With Brake	L1
SM0601JEL-KCY-BNV	137.5
SM0601GEL-KCY-BNV	137.5
SM0602GEL-KCY-BNV	166.5

☐ Torque Curves







■ Servo Motor Specification——80mm Frame Size, Dual Encoder

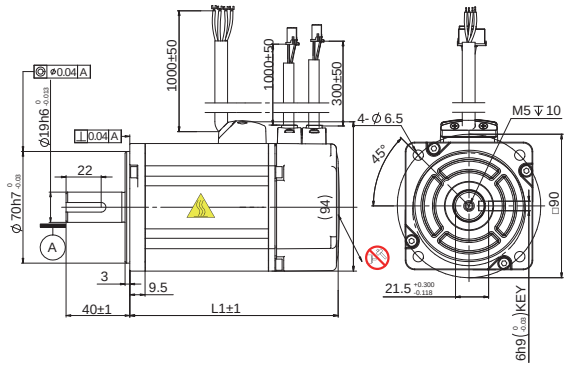
☐ Specification

Type		SM0803GEL-KCY-NNV	SM0803GEL-KCY-BNV
Recommended drive input voltage at rated speed(DC-Bus)		48	48
Rated Output Power Rated Speed Max.Speed	watts rpm rpm	750 3000 3600	750 3000 3600
Rated Torque Peak Torque	Nm Nm	2.4 7.2	2.4 7.2
Rated Current Peak Current	A (rms) A (rms)	18.8 56.7	18.8 56.7
Counter-electromotive Constant ±5% Torque Factor ±5% Winding Resistance(Line-Line) Winding Reactor(Line-Line)	V (rms) / K rpm Nm / A (rms) Ohm ±10%@25° C mH (typ.)	8.36 0.138 0.094 0.366	8.36 0.138 0.094 0.366
Rotor Inertia Shaft Load - Axial Shaft Load - Radial (End of Shaft) Weight	$Kg{\cdot}m^2$ N (max.) N (max.) kg	0.89×10^{-4} 90 270 2.6	0.097×10^{-4} 90 270 3.4

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

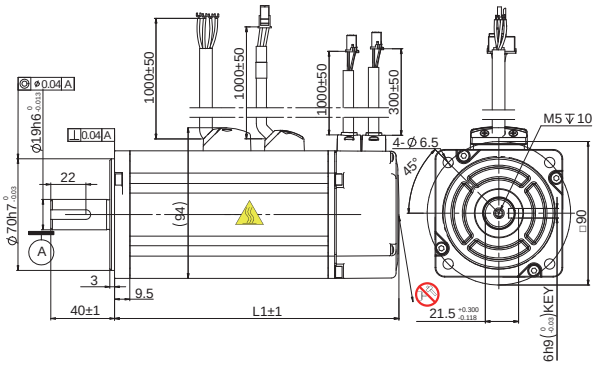
☐ Dimensions (Unit: mm)

1) Without Brake



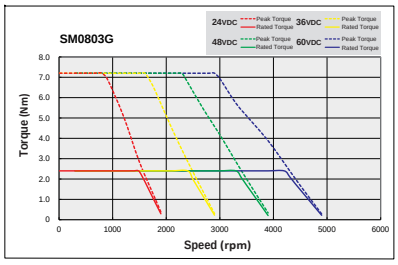
Without Brake	L1
SM0803GEL-KCY-NNV	130.8

2) With Brake

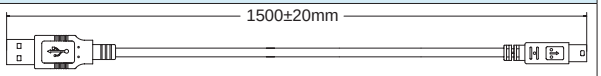
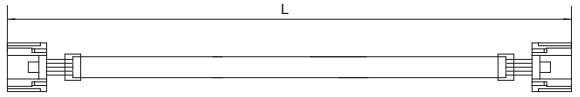
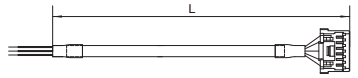
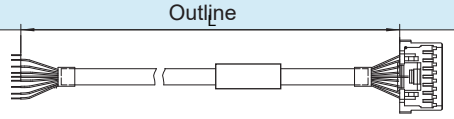


With Brake	L1
SM0803GEL-KCY-BNV	178.8

☐ Torque Curves



Accessories

Mini USB Cable			
Model	Length	Description	Outline
2620-150	1.5m	USB configuration cable connect with PC and servo drive	
Wireless Module			
Model	Length	Description	Outline
MSOP-WLM01	-	For connecting PC and servo drive	
Communication Cable			
Model	Length	Description	Outline
2111-050	0.5m	CANopen / RS485 communication cable	
2111-100	1m		
2111-300	3m		
2111-500	5m		
Encoder Output Signal Cable(For MBDV-2X-520AC)			
Model	Length	Description	Outline
1108-100	1m	14Pin encoder output signal cable	
1108-200	2m		
I/O Signal Cable			
Model	Length	Description	Outline
1653-050	0.5m	16Pin I/O signal cable	
1653-100	1m		
1653-200	2m		
Servo Motor Connector Kit			
Model	Length	Description	Outline
MBDV Motor Connector Kit	1	Motor encoder and brake connector	-
STO Connector Kit			
Model	Length	Description	Outline
STO Connector Kit	-	-	-
Regenerative Resistor Connector Kit			
Model	Specification	Description	Outline
MBDV Regen Connector Kit	1	External regenerative absorbing resistor connector	-
Regenerative Resistor			
Model	Specification	Description	Outline
REG100W10R	100W，10Ω	Regenerative absorbing resistor	-

M2DC Series—DC Servo System

The M2DC Series Servo System from MOONS' features drives that are high on functionality with a range of control options, programmable notch filters, an anti-vibration algorithm and auto-tuning. The drives are designed to be used with MOONS' servo motors in the 60/100/200/300/400/550W/750W power range. The M2DC drives can communicate over Modbus/RTU, Ethernet/IP and Ethernet(eSCL). Using MOONS' Q Programmer software they can create complex motion programs that can be stored in thedrive and then run in a stand-alone mode.

Features:

- 20-60V DC Input
- Easy to Use On-line Auto Tuning
- Internal Regeneration Resistors
- Bulit-In Soft PLC - Q Programmer
- Pulse Position Control Modes
- Anlaog Position, Speed, Torque Modes
- SCL/eSCL Language Communication
- Support Modbus, EtherNet/IP, Ethernet(eSCL) Communication Protocols
- Friendly Tuning Software

M2DC Servo Drive Numbering Information

M2DC - □ □ □ 5 □ - H *

M2DC Servo Drive

Current Code	Continuous Current (RMS)	Peak Current (RMS)
6D0	6.0A	18.0A
10D	10.0A	30.0A
20D	20.0A	50.0A

Voltage Code	Input Voltage
5	24-60VDC

Power Type	
Null	Switching power supply
H	Battery power

Customized Specification

Communication Type	Configuration	Description	Communication
S	USB Mini-B	Basic Type	- - -
Q		Q Type	RS-232
R		Q Type(Modbus/RTU Type)	RS-485
D		eSCL、Modbus/TCP Type	Ethernet
IP		EtherNet/IP、Modbus/TCP Type	Ethernet

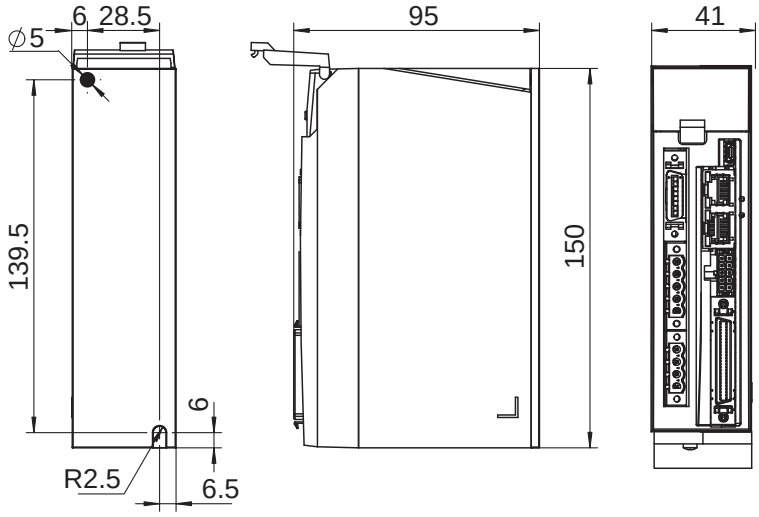
Note: The drive only applies to battery power supply if the power type is -H.
M2DC-20D5□-H support SPS and battery power supply.

Drive Specifications

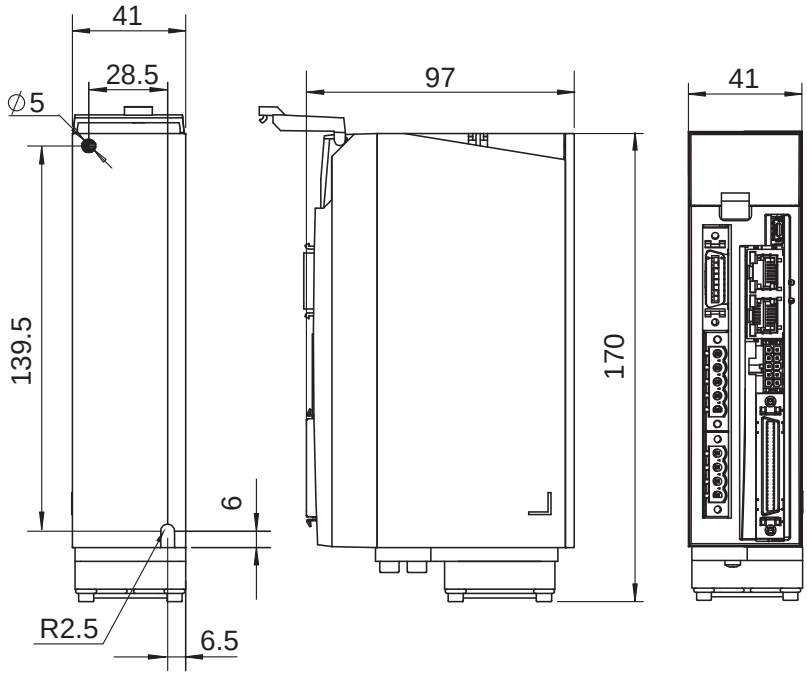
Input Power	M2DC-6D0 M2DC-10D M2DC-20D	Main Circuit	20~60VDC
		Auxiliary power supply	10~60VDC
Withstand Voltage			Primary to earth: withstand 500 VAC, 1 min
Environment	Temperature		◆ Ambient temperature: 0°C to 50°C(If the ambient temperature of servo drive is higher than 40°C, please install the drive in a well-ventilated location) ◆ Storage temperature: -20°C to 65°C
	Humidity		Both operating and storage: 10 to 85%RH or less
	Altitude		Lower than 1000m
	Vibration		9.8m/s^2 or less, 10 to 60Hz (No continuous use at resonance frequency)
Control method			PWM Sinusoidal wave drive
Encoder feedback			2500line incremental optical encoder
I/O	Digital Signals	Input	◆ 8 optical isolated multi function inputs, 5-24VDC, 20mA ◆ 2 optical isolated multi function inputs, 5-24VDC, 20mA
		Output	6 optical isolated multi function outputs, 30VDC max, 20mA
	Analog Signals	Input	2 inputs (12Bit A/D: 2 input)
	Pulse Signals	Input	◆ 2 Photo-coupler inputs: 5 ~ 24V, minimum pulse width 1μs, max. pulse frequency 500KHz ◆ 2 Line receiver inputs: 5V differential signal, minimum pulse width 0.25μs, max. pulse frequency 2MHz
		Output	4 outputs ◆ Line driver: 3 outputs ◆ open collector: 1 output
Communication	USB Mini-B		Connection with PC or 1 : 1 communication to a host.
	RS232		RS-232 Communication
	RS485		RS-485 Communication & Modbus/RTU
	Ethernet		EtherNet/IP，Modbus/TCP，eSCL
Front panel			4 keys (MODE, UP, DOWN, SET) , 5-digit LED display
Regeneration Resistor			Built-in regenerative resistor 20W
Control mode			1. Position mode 2. Analog Velocity mode 3. Analog Position mode 4. Analog Position mode 5. Velocity Change mode 6. Command Torque mode 7. Command Velocity mode 8.Position Tables
Control Input Signal			1. Servo-ON input 2. Alarm clear input 3.CW/CCW Limit 4. Pulse& Direction or CW/CCW input 5. Gain Switch 6. Control mode Switch 7. Pulse Inhibition 8. Gear switch 9. Velocity Change mode 10. Analog input 11. General input
Control Output Signal			1. Alarm output 2. Servo-Ready output 3. External brake release 4. Speed reached output 5. Torque reached output 6. Position reached output 7. TachOut 8. Servo-On status output 9. General output
Certification			RoHS, EN 61800-3, EN 61800-5-1
Drive Mass		M2DC-6D0	0.59kg
		M2DC-10D	0.59kg
		M2DC-20D	0.61kg

M2DC Drive Dimensions (Unit:mm)

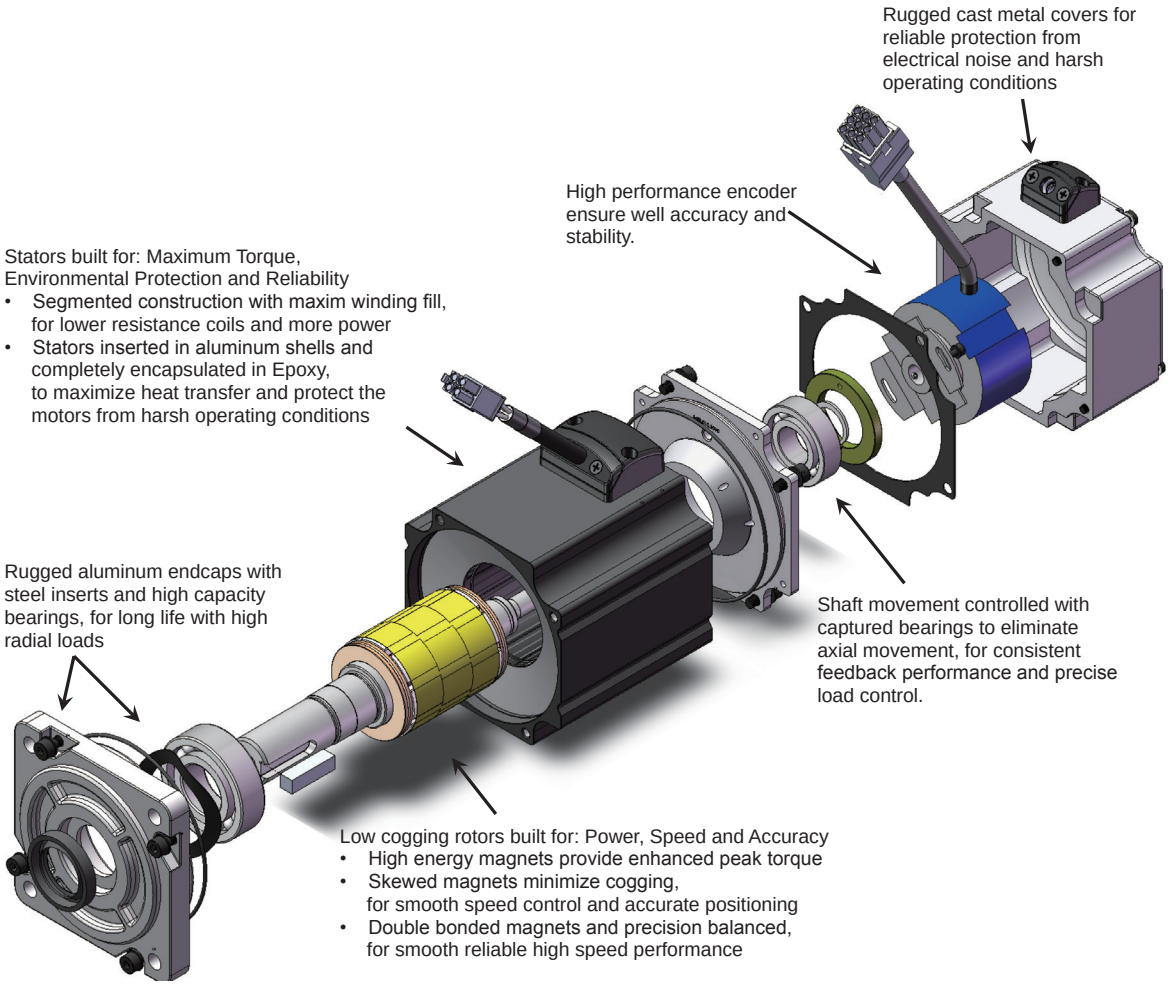
☐ M2DC-6D0/10D



☐ M2DC-20D



AC Servo Motor —SM Series



M2AC Servo Motor Numbering Information

SM 06 02 F E4 - KCD - N NV

SM Series

Frame Size
04-□40mm
06-□60mm
08-□80mm

Motor Length			
	□40	□60	□80
01	60W	200W	300W
02	100W	400W	550W
03			750W

Winding (DC)	
E	80V
F	60V
G	48V
H	36V

Brake Option
N: No Brake
B: 24VDC Brake

Customized Specification

Shaft and Lead/Connector Style
KCD: Standard Keyway, Non-sealed Connector, Windings below 6A
KCF: Standard Keyway, Non-sealed Connector, Windings above 10A

Encoder Type
E4: 2500 line incremental encoder

M2DC Servo Motor Specifications and Dimensions—Frame 40mm

☐ Specifications

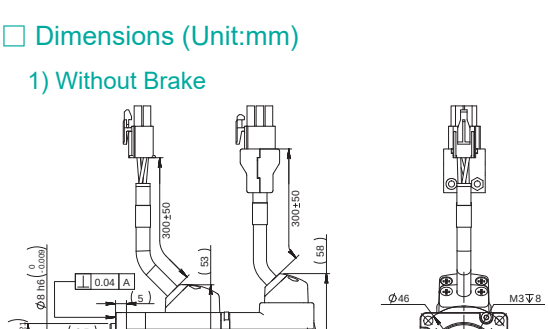
Model		SM0401HE4-KCD-☐NV	SM0402FE4-KCD-☐NV
Recommanded Drive Input Voltage (DC-Bus)		36	60
Rated Output Power	watts	60	100
Rated Speed	rpm	3000	3000
Max. Speed	rpm	6000	6000
Rated Torque	Nm	0.19	0.32
Peak Torque	Nm	0.48	0.91
Rated Current	A (rms)	5.7	5.2
Peak Current	A (rms)	14.3	15.6
Voltage Constant±5%	V (rms) / K rpm	2.1	3.8
Torque Constant±5%	Nm / A (rms)	0.035	0.061
Winding Resistance(Line-Line)	Ohm @25°C	0.36	0.48
Winding Inductance(Line-Line)	mH (typ.)	0.39	0.58
Rotor Inertia	$Kg{\cdot}m^2$	0.0232×10^{-4}	0.0428×10^{-4}
Rotor Inertia - With Brake	$Kg{\cdot}m^2$	0.0298×10^{-4}	0.0494×10^{-4}
Shaft Load - Axial	N (max.)	50	50
Shaft Load - Radial (End of Shaft)	N (max.)	50	60
Weight	kg	0.4	0.55
Weight - With Brake	kg	0.65	0.8

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

☐ Brake Options

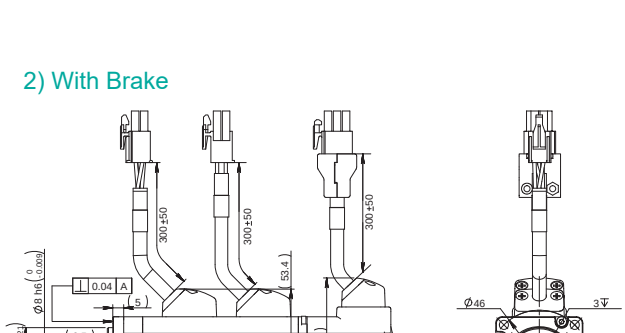
☐ Dimensions (Unit:mm)

1) Without Brake



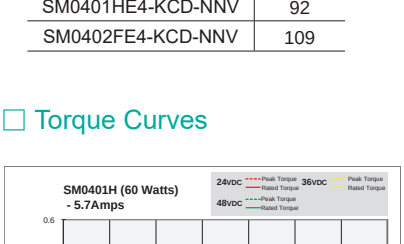
Without Brake	L1
SM0401HE4-KCD-NNV	92
SM0402FE4-KCD-NNV	109

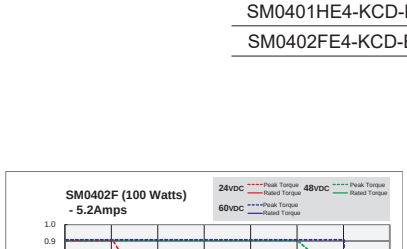
2) With Brake



With Brake	L1
SM0401HE4-KCD-BNV	129
SM0402FE4-KCD-BNV	147

☐ Torque Curves





M2DC Servo Motor Specifications and Dimensions—Frame 60mm

☐ Specifications

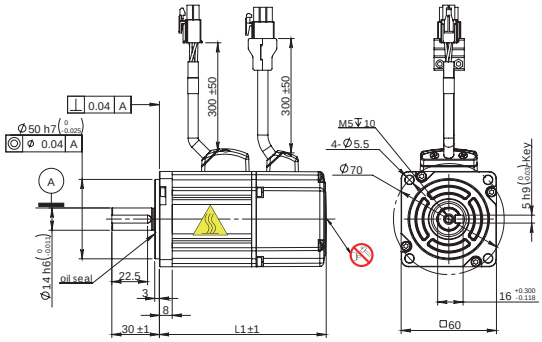
Model		SM0601GE4-KCF- ☐ NV	SM0602FE4-KCF- ☐ NV	SM0602GE4-KCF- ☐ NV
Recommanded Drive Input Voltage (DC-Bus)		48	60	48
Rated Output Power	watts	200	400	400
Rated Speed	rpm	3000	3000	3000
Max. Speed	rpm	6000	6000	4500
Rated Torque	Nm	0.64	1.26	1.27
Peak Torque	Nm	1.9	3.6	3.4
Rated Current	A (rms)	10	10	12
Peak Current	A (rms)	30	30	36
Voltage Constant±5%	V (rms) / K rpm	4.1	7.5	6.3
Torque Constant±5%	Nm / A (rms)	0.065	0.124	0.103
Winding Resistance(Line-Line)	Ohm @25°C	0.192	0.25	0.214
Winding Inductance(Line-Line)	mH (typ.)	0.56	0.84	0.6
Rotor Inertia	$Kg{\cdot}m^2$	0.165×10^{-4}	0.272×10^{-4}	0.272×10^{-4}
Rotor Inertia - With Brake	$Kg{\cdot}m^2$	0.22×10^{-4}	0.326×10^{-4}	0.326×10^{-4}
Shaft Load - Axial	N (max.)	70	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	200	240	240
Weight	kg	1.1	1.4	1.4
Weight - With Brake	kg	1.6	1.9	1.9

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

☐ Brake Options

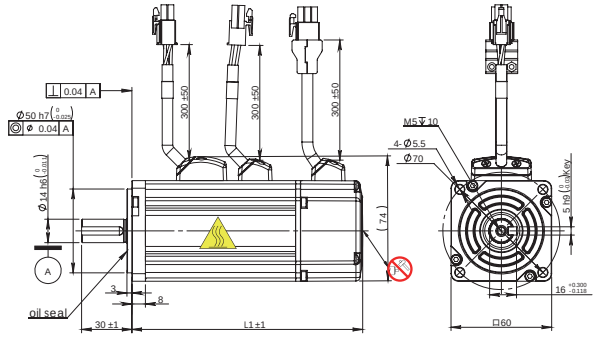
☐ Dimensions (Unit:mm)

1) Without Brake



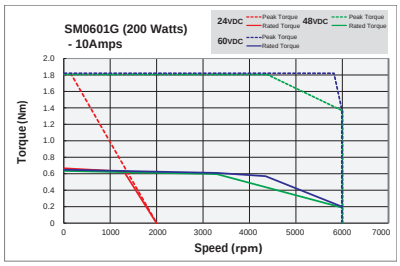
Without Brake	L1
SM0601GE4-KCF-NNV	105
SM0602FE4-KCF-NNV	125
SM0602GE4-KCF-NNV	125

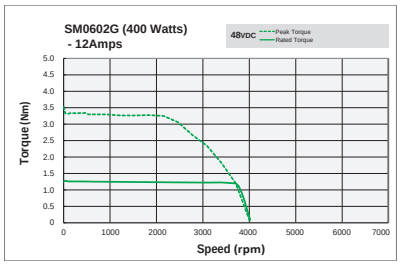
2) With Brake

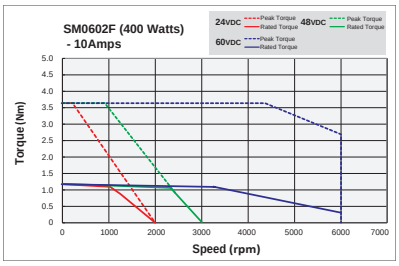


With Brake	L1
SM0601GE4-KCF-BNV	145
SM0602FE4-KCF-BNV	165
SM0602GE4-KCF-BNV	165

☐ Torque Curves







M2DC Servo Motor Specifications and Dimensions—Frame 80mm

☐ Specifications

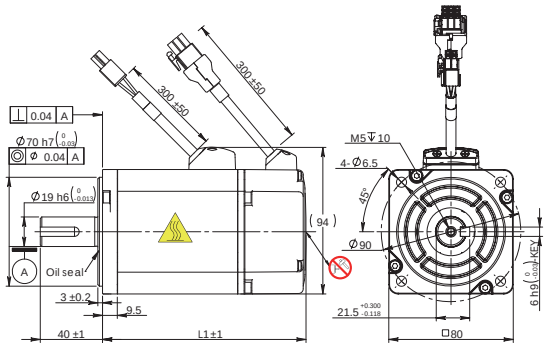
Model		SM0801GE4-KCF-☐NV	SM0802EE4-KCF-☐NV
Recommanded Drive Input Voltage (DC-Bus)		48	80
Rated Output Power	watts	300	550
Rated Speed	rpm	3000	3000
Max. Speed	rpm	6000	5500
Rated Torque	Nm	0.95	1.8
Peak Torque	Nm	2.3	4.6
Rated Current	A (rms)	10	10
Peak Current	A (rms)	25	28
Voltage Constant±5%	V (rms) / K rpm	6.2	11.2
Torque Constant±5%	Nm / A (rms)	0.096	0.176
Winding Resistance(Line-Line)	Ohm @25°C	0.188	0.22
Winding Inductance(Line-Line)	mH (typ.)	0.85	1.25
Rotor Inertia	$Kg{\cdot}m^2$	0.45×10^{-4}	0.63×10^{-4}
Rotor Inertia - With Brake	$Kg{\cdot}m^2$	0.53×10^{-4}	0.71×10^{-4}
Shaft Load - Axial	N (max.)	90	90
Shaft Load - Radial (End of Shaft)	N (max.)	200	240
Weight	kg	1.7	2.2
Weight - With Brake	kg	2.5	3.0

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

☐ Brake Options

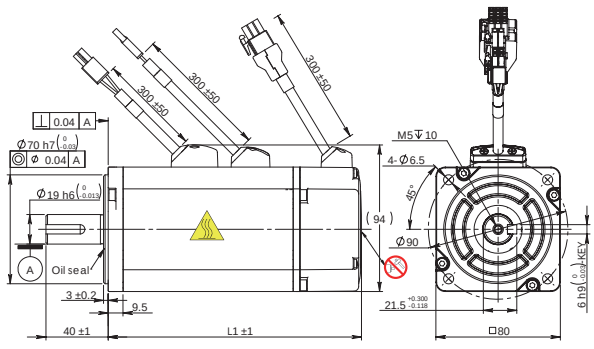
☐ Dimensions (Unit:mm)

1) Without Brake



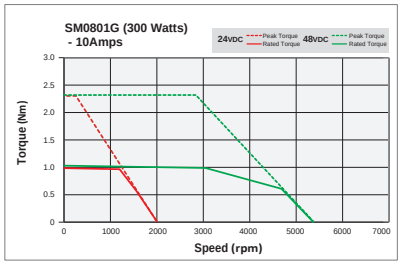
Without Brake	L1
SM0801GE4-KCF-NNV	101
SM0802EE4-KCF-NNV	116

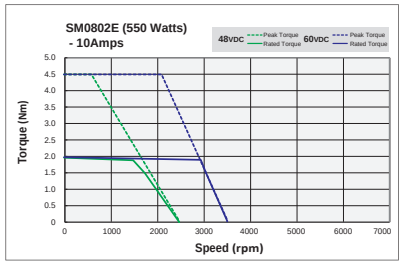
2) With Brake



With Brake	L1
SM0801GE4-KCF-BNV	148
SM0802EE4-KCF-BNV	163

☐ Torque Curves





M2DC Servo Motor Specifications and Dimensions—Frame 80mm

☐ Specifications

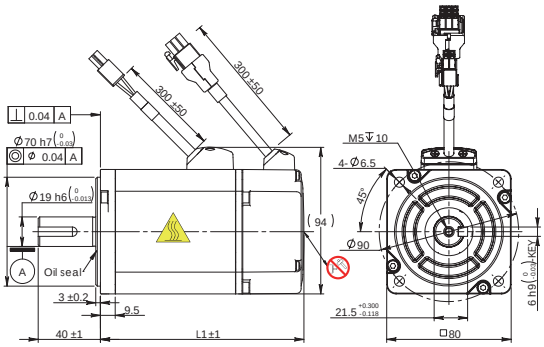
Model		SM0803GE4-KCF- ☐ NV
Recommanded Drive Input Voltage (DC-Bus)		48
Rated Output Power	watts	750
Rated Speed	rpm	3000
Max. Speed	rpm	3600
Rated Torque	Nm	2.4
Peak Torque	Nm	6
Rated Current	A (rms)	22.5
Peak Current	A (rms)	56.5
Voltage Constant±5%	V (rms) / K rpm	7.8
Torque Constant±5%	Nm / A (rms)	0.11
Winding Resistance(Line-Line)	Ohm @25°C	0.06
Winding Inductance(Line-Line)	mH (typ.)	0.43
Rotor Inertia	$Kg{\cdot}m^2$	0.89×10^{-4}
Rotor Inertia - With Brake	$Kg{\cdot}m^2$	0.97×10^{-4}
Shaft Load - Axial	N (max.)	90
Shaft Load - Radial (End of Shaft)	N (max.)	270
Weight	kg	2.6
Weight - With Brake	kg	3.4

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

☐ Brake Options

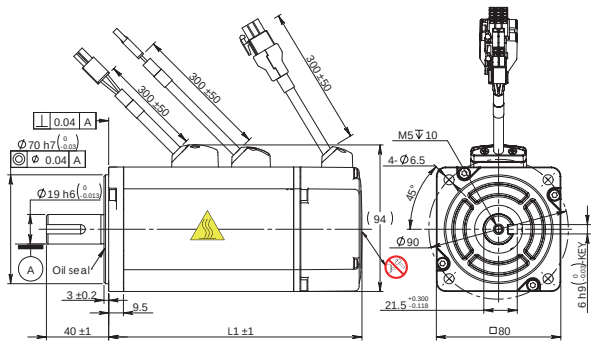
☐ Dimensions (Unit:mm)

1) Without Brake



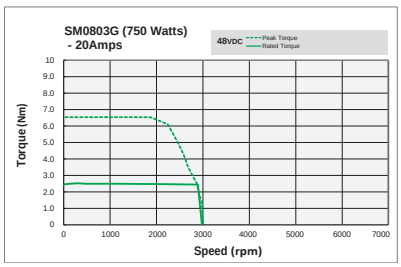
Without Brake	L1
SM0803GE4-KCF-NNV	130.8

2) With Brake



With Brake	L1
SM0803GE4-KCF-BNV	178

☐ Torque Curves



Medium Inertia Motor—Frame 60mm

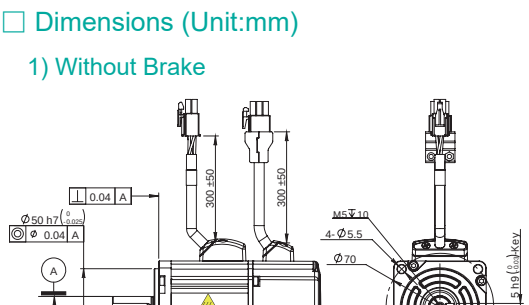
Specifications

Model		SM0602GE4-KCF-NNV-M	SM0602GE4-KCF-BNV-M
Rated Output Power	watts	400	400
Rated Speed	rpm	3000	3000
Max. Speed	rpm	4500	4500
Rated Torque	Nm	1.27	1.27
Peak Torque	Nm	3.4	3.4
Rated Current	A (rms)	12	12
Peak Current	A (rms)	36	36
Voltage Constant±5%	V (rms) / K rpm	6.3	6.3
Torque Constant±5%	Nm / A (rms)	0.103	0.103
Winding Resistance(Line-Line)	Ohm ± 10%@25°C	0.188	0.188
Winding Inductance(Line-Line)	mH (typ.)	0.6	0.6
Rotor Inertia	$Kg{\cdot}m^2$	0.682×10^{-4}	0.72×10^{-4}
Shaft Load - Axial	N (max.)	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	240	240
Weight	kg	1.6	2.1

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

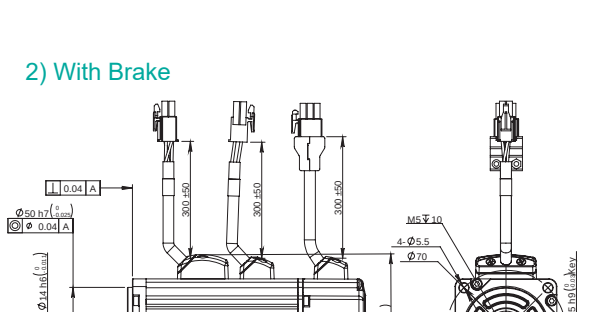
Dimensions (Unit:mm)

1) Without Brake



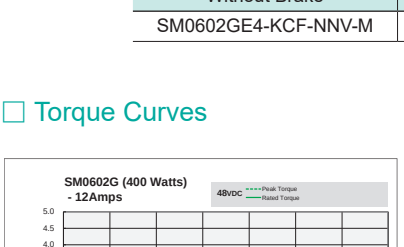
Without Brake	L1
SM0602GE4-KCF-NNV-M	135

2) With Brake



With Brake	L1
SM0602GE4-KCF-BNV-M	175

Torque Curves



Medium Inertia Motor—Frame 80mm

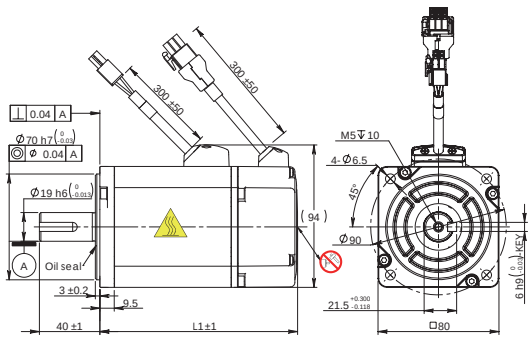
Specifications

Model		SM0803GE4-KCF-NNV-M	SM0803GE4-KCF-BNV-M
Rated Output Power Rated Speed Max. Speed	watts rpm rpm	750 3000 3600	750 3000 3600
Rated Torque Peak Torque	Nm Nm	2.4 6	2.4 6
Rated Current Peak Current	A (rms) A (rms)	22.5 56.5	22.5 56.5
Voltage Constant±5% Torque Constant±5% Winding Resistance(Line-Line) Winding Inductance(Line-Line)	V (rms) / K rpm Nm / A (rms) Ohm ± 10%@25°C mH (typ.)	7.8 0.1 0.06 0.43	7.8 0.1 0.06 0.43
Rotor Inertia Shaft Load - Axial Shaft Load - Radial (End of Shaft) Weight	$Kg{\cdot}m^2$ N (max.) N (max.) kg	1.52×10^{-4} 90 270 2.8	1.56×10^{-4} 90 270 3.4

Note: The torque and maximum speed depend on the DC bus voltage, please choose the proper supply voltage.

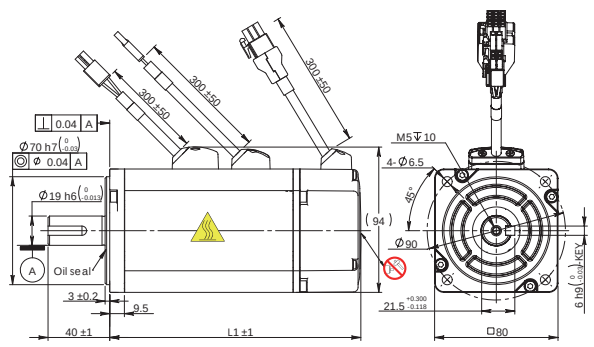
Dimensions (Unit:mm)

1) Without Brake



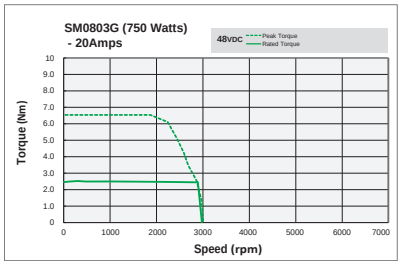
Without Brake	L1
SM0803GE4-KCF-NNV-M	140.8

2) With Brake



With Brake	L1
SM0803GE4-KCF-BNV-M	188

Torque Curves



Gearhead Servo Motors—Frame 40mm

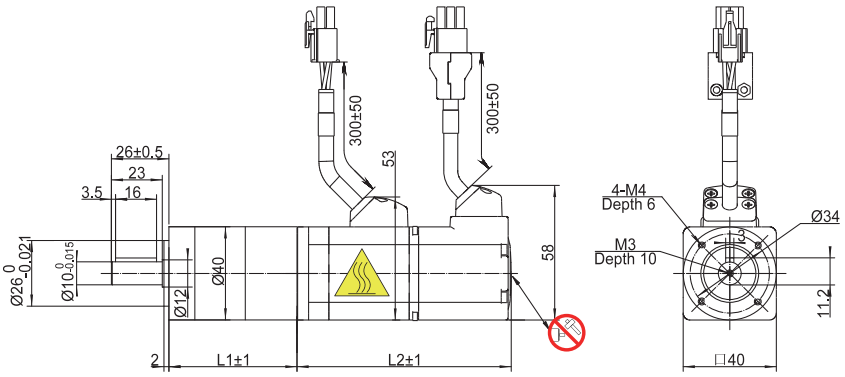
☐ Specifications

Without Brake Type		SM0401HE4-KCD-NNV-PG05A	SM0401HE4-KCD-NNV-PG10A	SM0401HE4-KCD-NNV-PG20A	SM0402FE4-KCD-NNV-PG05A	SM0402FE4-KCD-NNV-PG10A	SM0402FE4-KCD-NNV-PG20A
With Brake Type		SM0401HE4-KCD-BNV-PG05A	SM0401HE4-KCD-BNV-PG10A	SM0401HE4-KCD-BNV-PG20A	SM0402FE4-KCD-BNV-PG05A	SM0402FE4-KCD-BNV-PG10A	SM0402FE4-KCD-BNV-PG20A
Motor Power	W	60			100		
Gear Ratio		5	10	20	5	10	20
Max.Output Torque	N·m	0.95	1.9	3.8	1.6	3.2	6.4
Peak Output Torque	N·m	2.4	4.8	11.4	4.65	9.3	18.6
Max Permissible Output Torque	N·m	6	8	12	6	8	40
Stage		1	1	2	1	1	2
Back lash	arcmin	≤12	≤12	≤15	≤12	≤12	≤15
Efficiency		96%	96%	94%	96%	96%	94%
Rated Output Speed	r/min	600	300	150	600	300	150
Max.Output Speed	r/min	1200	600	300	1200	600	300
Motor Rotor Inertia	$Kg·m^2$	$0.0232x10^{-4}$ *($0.0298x10^{-4}$)			$0.0428x10^{-4}$ *($0.0494x10^{-4}$)		
Gearhead Inertia	$Kg·m^2$	$0.015x10^{-4}$	$0.019x10^{-4}$	$0.019x10^{-4}$	$0.015x10^{-4}$	$0.019x10^{-4}$	$0.019x10^{-4}$
Without Brake L1	mm	67.5	67.5	80.5	67.5	67.5	80.5
Without Brake L2	mm	92	92	92	109	109	109
With Brake L1	mm	67.5	67.5	80.5	67.5	67.5	80.5
With Brake L2	mm	129	129	129	147	147	147
Matching Drive		M2DC-6D05 ☐					

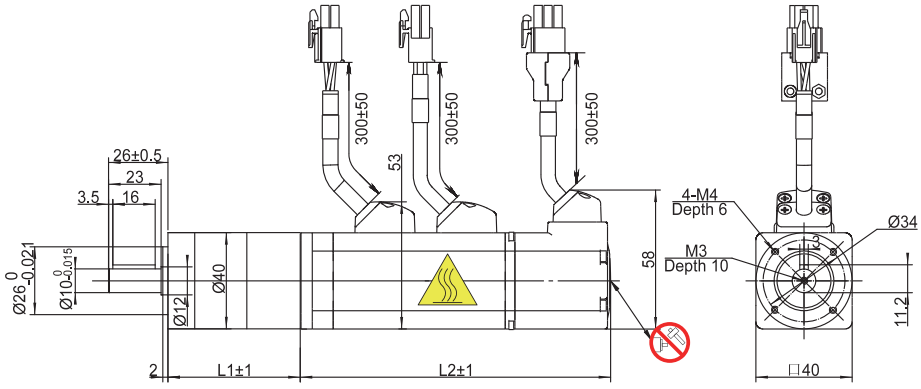
*With brake, ☐ : Communication type

☐ Dimensions (Unit:mm)

1) Without Brake



2) With Brake



Gearhead Servo Motors—60mm Frame

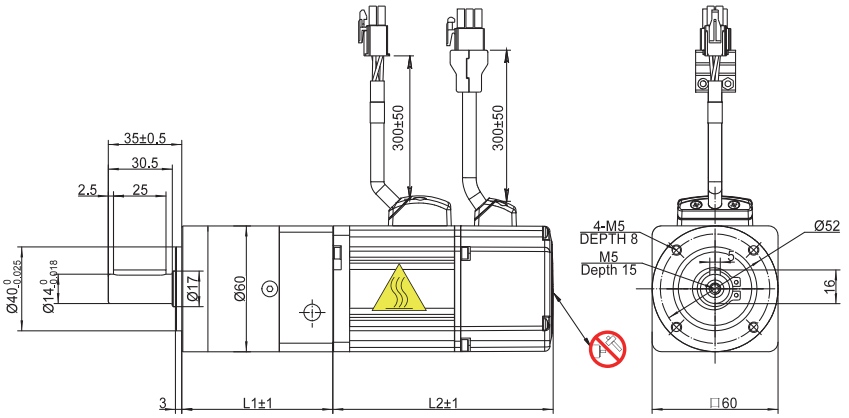
☐ Specifications

Without Brake Type			SM0601GE4-KCF-NNV-PG05A	SM0601GE4-KCF-NNV-PG10A	SM0601GE4-KCF-NNV-PG20A	SM0602FE4-KCF-NNV-PG05A	SM0602FE4-KCF-NNV-PG10A	SM0602FE4-KCF-NNV-PG20A
With Brake Type			SM0601GE4-KCF-BNV-PG05A	SM0601GE4-KCF-BNV-PG10A	SM0601GE4-KCF-BNV-PG20A	SM0602FE4-KCF-BNV-PG05A	SM0602FE4-KCF-BNV-PG10A	SM0602FE4-KCF-BNV-PG20A
Motor Power		W	200			400		
Gear Ratio			5	10	20	5	10	20
Max.Output Torque		N·m	3.2	6.4	12.8	6.35	12.7	25.4
Peak Output Torque		N·m	9.5	19	38	19	38	76
Max Permissible Output Torque		N·m	32	24	88	32	24	88
Stage			1	1	2	1	1	2
Back lash		arcmin	≤10	≤10	≤15	≤10	≤10	≤15
Efficiency			96%	96%	94%	96%	96%	94%
Rated Output Speed		r/min	600	300	150	600	300	150
Max.Output Speed		r/min	1200	600	300	1200	600	300
Motor Rotor Inertia		$Kg·m^2$	$0.165x10^{-4}$ *($0.22x10^{-4}$)			$0.272x10^{-4}$ *($0.326x10^{-4}$)		
Gearhead Inertia		$Kg·m^2$	$0.078x10^{-4}$	$0.054x10^{-4}$	$0.075x10^{-4}$	$0.078x10^{-4}$	$0.054x10^{-4}$	$0.075x10^{-4}$
Without Brake	L1	mm	78.5	78.5	91.5	78.5	78.5	91.5
	L2	mm	105	105	105	125	125	125
With Brake	L1	mm	78.5	78.5	91.5	78.5	78.5	91.5
	L2	mm	145	145	145	165	165	165
Matching Drive			M2DC-10D5 ☐					

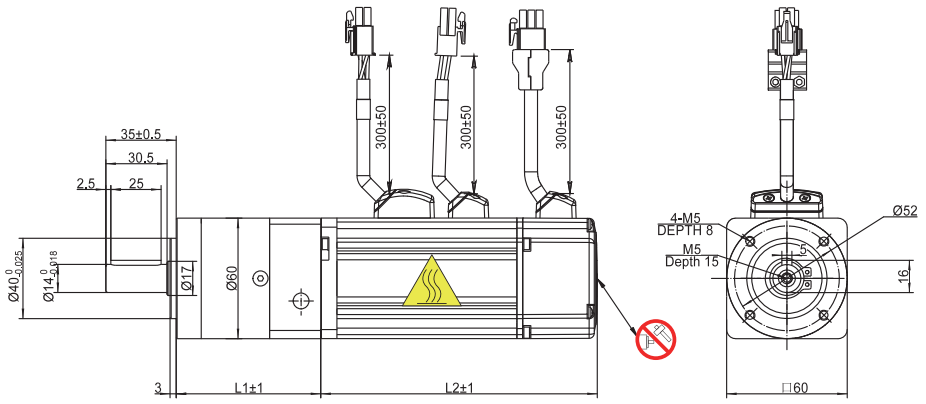
*With brake, ☐ : Communication type

☐ Dimensions (Unit:mm)

1) Without Brake



2) With Brake



Gearhead Servo Motors—Frame 80mm

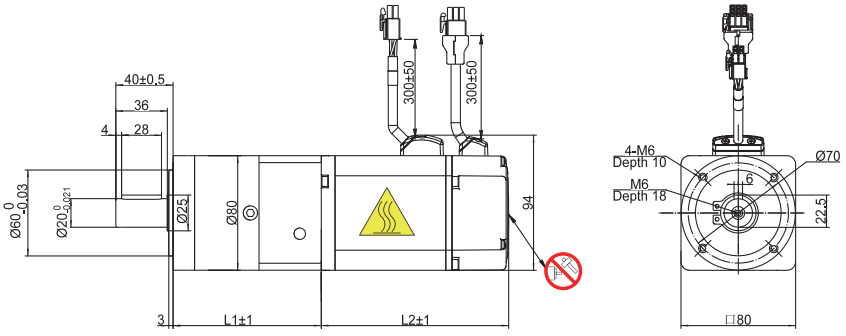
☐ Specifications

Without Brake Type			SM0801GE4-KCF-NNV-PG05A	SM0801GE4-KCF-NNV-PG10A	SM0801GE4-KCF-NNV-PG20A	SM0802EE4-KCF-NNV-PG05A	SM0802EE4-KCF-NNV-PG10A	SM0802EE4-KCF-NNV-PG20A
With Brake Type			SM0801GE4-KCF-BNV-PG05A	SM0801GE4-KCF-BNV-PG10A	SM0801GE4-KCF-BNV-PG20A	SM0802EE4-KCF-BNV-PG05A	SM0802EE4-KCF-BNV-PG10A	SM0802EE4-KCF-BNV-PG20A
Motor Power		W	300			550		
Gear Ratio			5	10	20	5	10	20
Max.Output Torque		N·m	4.75	9.5	19	9	18	36
Peak Output Torque		N·m	11.5	23	46	23	46	92
Max Permissible Output Torque		N·m	100	80	240	100	80	240
Stage			1	1	2	1	1	2
Back lash		arcmin	≤10	≤10	≤15	≤10	≤10	≤15
Efficiency			96%	96%	94%	96%	96%	94%
Rated Output Speed		r/min	600	300	150	600	300	150
Max.Output Speed		r/min	1200	600	300	1100	550	275
Motor Rotor Inertia		$Kg·m^2$	$0.45x10^{-4}$ *($0.53x10^{-4}$)			$0.63x10^{-4}$ *($0.71x10^{-4}$)		
Gearhead Inertia		$Kg·m^2$	$0.45x10^{-4}$	$0.39x10^{-4}$	$0.44x10^{-4}$	$0.45x10^{-4}$	$0.39x10^{-4}$	$0.44x10^{-4}$
Without Brake	L1	mm	104	104	122	104	104	122
	L2	mm	101	101	101	116	116	116
With Brake	L1	mm	104	104	122	104	104	122
	L2	mm	148	148	148	163	163	163
Matching Drive			M2DC-10D5 ☐					

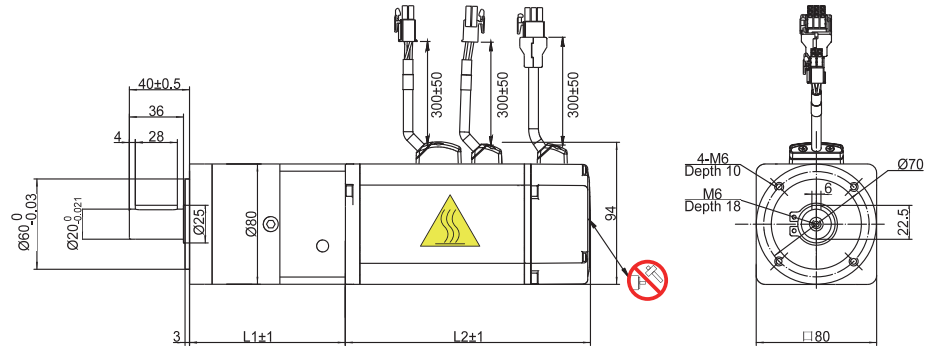
*With brake, ☐ : Communication type

☐ Dimensions (Unit:mm)

1) Without Brake



2) With Brake



Gearhead Servo Motors—80mm Frame

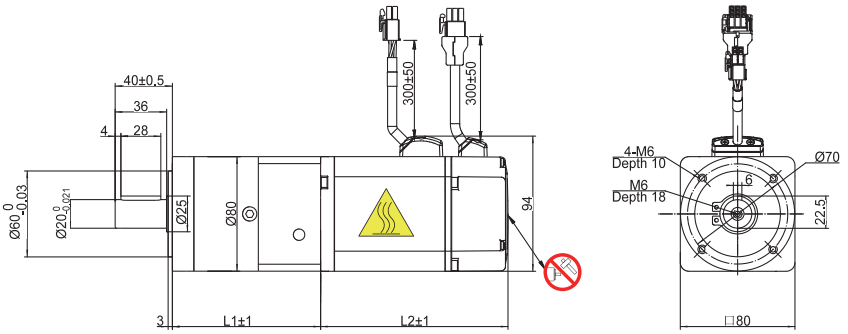
☐ Specifications

Without Brake Type			SM0803GE4-KCF-NNV-PG05A	SM0803GE4-KCF-NNV-PG10A	SM0803GE4-KCF-NNV-PG20A
With Brake Type			SM0803GE4-KCF-BNV-PG05A	SM0803GE4-KCF-BNV-PG10A	SM0803GE4-KCF-BNV-PG20A
Motor Power		W	750		
Gear Ratio			5	10	20
Max.Output Torque		N·m	12	24	48
Peak Output Torque		N·m	30	60	120
Max Permissible Output Torque		N·m	100	80	240
Stage			1	1	2
Back lash		arcmin	≤10	≤10	≤15
Efficiency			96%	96%	94%
Rated Output Speed		r/min	600	300	150
Max.Output Speed		r/min	720	360	180
Motor Rotor Inertia		$Kg·m^2$	$0.89x10^{-4}$ *($0.97x10^{-4}$)		
Gearhead Inertia		$Kg·m^2$	$0.45x10^{-4}$	$0.39x10^{-4}$	$0.44x10^{-4}$
Without Brake	L1	mm	104	104	122
	L2	mm	130.8	130.8	130.8
Without Brake	L1	mm	104	104	122
	L2	mm	178	178	178
Matching Drive			M2DC-20D5 ☐ -H		

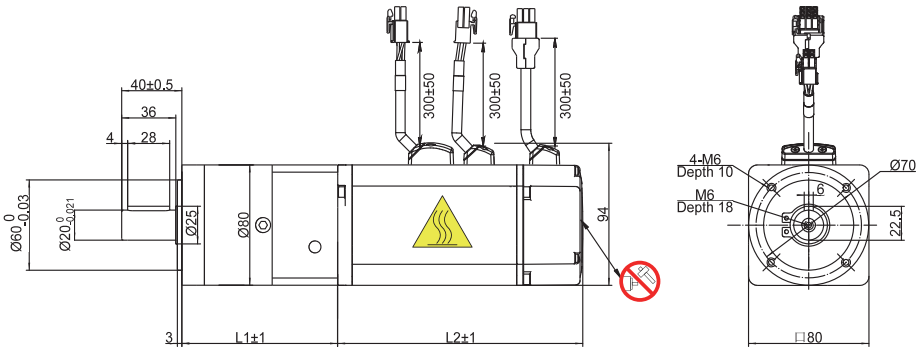
*With brake, ☐ : Communication type

☐ Dimensions (Unit:mm)

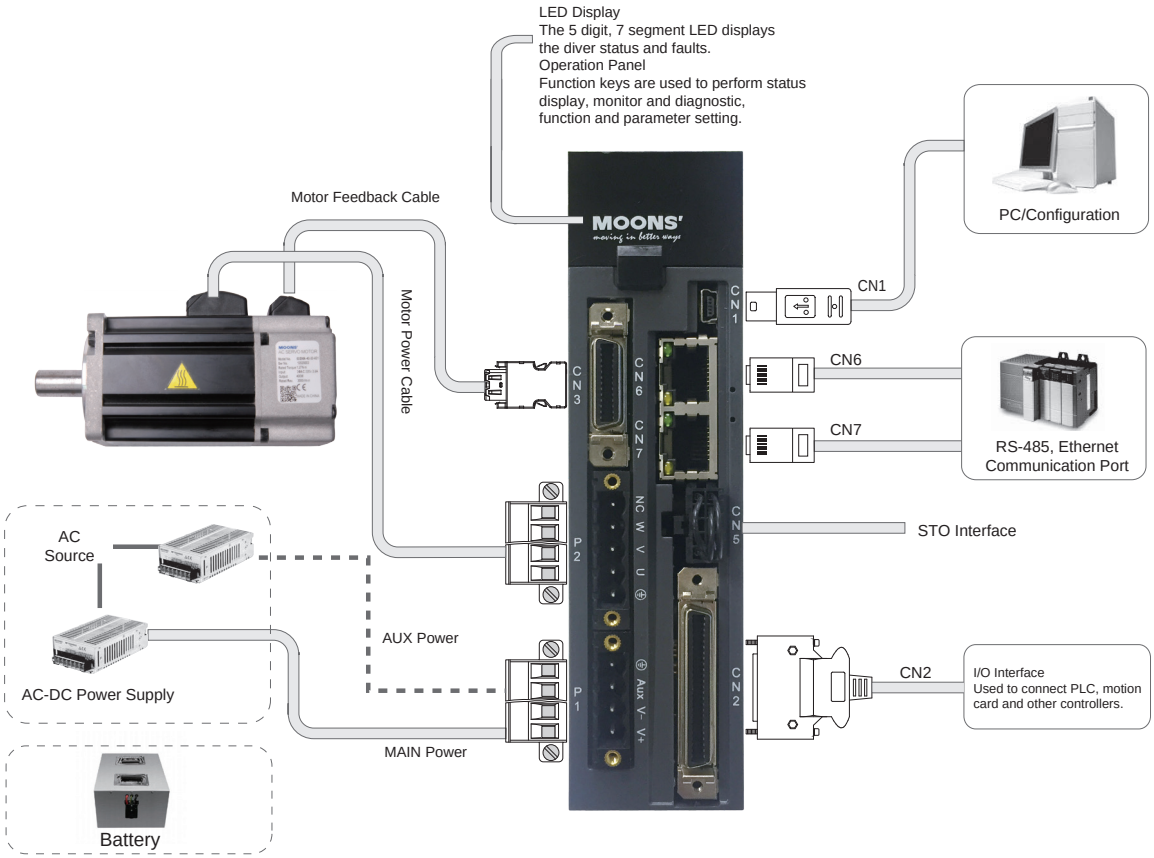
1) Without Brake



2) With Brake



M2DC System Configration



Note: The drive only applies to battery power supply if the power type is -H.
M2DC-20D5□-H support SPS and battery power supply.

Drive Motor Matching Table

Servo Drive			
			
Basic Type	M2DC-6D05S	M2DC-10D5S	M2DC-20D5S-H
Q Program Type (RS-232 Communication)	M2DC-6D05Q	M2DC-10D5Q	M2DC-20D5Q-H
Q Program Type (RS-485 Communication)	M2DC-6D05R	M2DC-10D5R	M2DC-20D5R-H
eSCL	M2DC-6D05D	M2DC-10D5D	M2DC-20D5D-H
EtherNet/IP	M2DC-6D05IP	M2DC-10D5IP	M2DC-20D5IP-H

Matching Motor				
	 40 Frame, 60W, 100W	 60 Frame, 200W, 400W	 80 Frame, 300W, 550W	 80 Frame, 750W
Without Brake	SM0401HE4-KCD-NNV SM0402FE4-KCD-NNV	SM0601GE4-KCF-NNV SM0602FE4-KCF-NNV SM0602GE4-KCF-NNV SM0602GE4-KCF-NNV-M	SM0801GE4-KCF-NNV SM0802EE4-KCF-NNV	SM0803GE4-KCF-NNV SM0803GE4-KCF-NNV-M
With Brake	SM0401HE4-KCD-BNV SM0402FE4-KCD-BNV	SM0601GE4-KCF-BNV SM0602FE4-KCF-BNV SM0602GE4-KCF-BNV SM0602GE4-KCF-BNV-M	SM0801GE4-KCF-BNV SM0802EE4-KCF-BNV	SM0803GE4-KCF-BNV SM0803GE4-KCF-BNV-M

Gearhead Motor				
Without Brake	SM0401HE4-KCD-NNV-PG**A SM0402FE4-KCD-NNV-PG**A	SM0601GE4-KCF-NNV-PG**A SM0602FE4-KCF-NNV-PG**A	SM0801GE4-KCF-NNV-PG**A SM0802EE4-KCF-NNV-PG**A	
With Brake	SM0401HE4-KCD-BNV-PG**A SM0402FE4-KCD-BNV-PG**A	SM0601GE4-KCF-BNV-PG**A SM0602FE4-KCF-BNV-PG**A	SM0801GE4-KCF-BNV-PG**A SM0802EE4-KCF-BNV-PG**A	

Note: For the latest details, Please contact our company.
** Standard gear ratios are 5:1; 10:1 and 20:1.

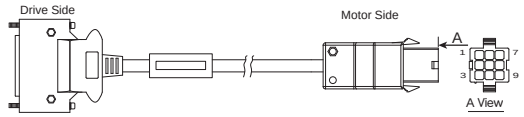
Accessories(Requisite)				
IO Connector		M2-50P		
USB mini-B Configuration		2620-150		
Standard* Cable	Motor power	1630-X00	1627-X00	1641-X00
	Encoder	2627-X00		
	Brake***	1602-X00		
Flexible** Cable	Motor power	1631-X00	1628-X00	1642-X00
	Encoder	2621-X00		
	Brake***	1602-X00-C05 (Note)		

*** It is a requisite when selecting a motor with brake.
Note: Please contact us when you select flexible brake cable.

Encoder Cables

◆ Standard Type

P/N	Description
2627-100	M2 Common Encoder Cable, Shielded, 1m
2627-300	M2 Common Encoder Cable, Shielded, 3m
2627-500	M2 Common Encoder Cable, Shielded, 5m
2627-1000	M2 Common Encoder Cable, Shielded, 10m



◆ Flexible Encoder Cable - Extra Type

P/N	Description
2621-100	M2 Flexible Encoder Cable, 1m
2621-300	M2 Flexible Encoder Cable, 3m
2621-500	M2 Flexible Encoder Cable, 5m
2621-1000	M2 Flexible Encoder Cable, 10m

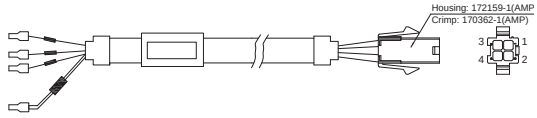
Note: Min. band radius: 100mm; Travel distance: 600mm; Lifetime: 5,000,000c

Connect to drive TYCO 3-2232346-1	Signal	Colour	Connect to Motor AMP 172161-1
1	A+/U+	Blue	1
2	B+/V+	Green	2
3	Z+/W+	Yellow	3
14	A-/U-	Blue/Black	4
15	B-/V-	Green/Black	5
16	Z-/W-	Yellow/Black	6
11	+5V	Red	7
24	GND	Black	8
26	Shield	Shield	9

Motor Power Cable—For 40mm(60W/100W) Frame

◆ Standard Type

P/N	Description
1630-100	M2DC-6D0 Common Motor Cable, 1m
1630-300	M2DC-6D0 Common Motor Cable, 3m
1630-500	M2DC-6D0 Common Motor Cable, 5m
1630-1000	M2DC-6D0 Common Motor Cable, 10m



◆ Flexible Motor Cable - Extra Type

P/N	Description
1631-100	M2DC-6D0 Flexible Motor Cable, extra type, Shielded, 1m
1631-300	M2DC-6D0 Flexible Motor Cable, extra type, Shielded, 3m
1631-500	M2DC-6D0 Flexible Motor Cable, extra type, Shielded, 5m
1631-1000	M2DC-6D0 Flexible Motor Cable, extra type, Shielded, 10m

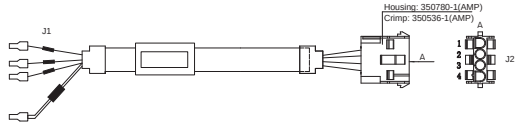
Note: Min. band radius: 100mm; Travel distance: 600mm; Lifetime: 5,000,000c

Connect to drive 5452571(Phoenix)	Signal	Colour	Connect to Motor AMP 172159-1
U	U	Red	1
V	V	Yellow	2
W	W	Blue	3
⏚	PE	Yellow/Green	4

Motor Power Cable—For 60mm(200W/400W), 80mm(300W/550W) Frame

◆ Standard Type

P/N	Description
1627-100	M2DC-10D Common Motor Cable, Shielded, 1m
1627-300	M2DC-10D Common Motor Cable, Shielded, 3m
1627-500	M2DC-10D Common Motor Cable, Shielded, 5m
1627-1000	M2DC-10D Common Motor Cable, Shielded, 10m



◆ Flexible Motor Cable - Extra Type

P/N	Description
1628-100	M2DC-10D Flexible Motor Cable, extra type, Shielded, 1m
1628-300	M2DC-10D Flexible Motor Cable, extra type, Shielded, 3m
1628-500	M2DC-10D Flexible Motor Cable, extra type, Shielded, 5m
1628-1000	M2DC-10D Flexible Motor Cable, extra type, Shielded, 10m

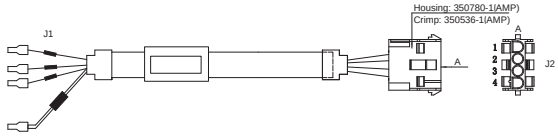
Note: Min. band radius: 100mm; Travel distance: 600mm; Lifetime: 5,000,000c

Connect to drive 5452571(Phoenix)	Signal	Colour	Connect to Motor AMP 350780-1
U	U	Red	1
V	V	Yellow	2
W	W	Blue	3
⏚	PE	Yellow/Green	4

Motor Power Cable—For 80mm(750W) Frame

◆ Standard Type

P/N	Description
1641-100	M2DC-20D Common Motor Cable, Shielded, 1m
1641-300	M2DC-20D Common Motor Cable, Shielded, 3m
1641-500	M2DC-20D Common Motor Cable, Shielded, 5m



◆ Flexible Motor Cable - Extra Type

P/N	Description
1642-100	M2DC-20D Flexible Motor Cable, extra type, Shielded, 1m
1642-300	M2DC-20D Flexible Motor Cable, extra type, Shielded, 3m
1642-500	M2DC-20D Flexible Motor Cable, extra type, Shielded, 5m

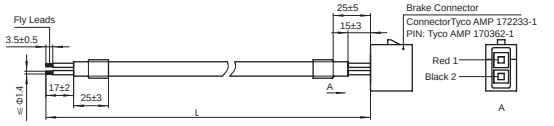
Note: Min. band radius: 100mm; Travel distance: 600mm; Lifetime: 5,000,000c

Connect to drive 5452571(Phoenix)	Signal	Colour	Connect to Motor AMP 350780-1
U	U	Red	1
V	V	Yellow	2
W	W	Blue	3
⏚	PE	Yellow/Green	4

Motor Brake Cable

◆ Standard Type

P/N	Description
1602-100	M2 Motor Brake Cable, 1m
1602-300	M2 Motor Brake Cable, 3m
1602-500	M2 Motor Brake Cable, 5m
1602-1000	M2 Motor Brake Cable, 10m



◆ Flexible Motor Cable - Extra Type

P/N	Description
1602-100-C05	M2 Flexible Motor Brake cable, 1m
1602-300-C05	M2 Flexible Motor Brake cable, 3m
1602-500-C05	M2 Flexible Motor Brake cable, 5m
1602-1000-C05	M2 Flexible Motor Brake cable, 10m

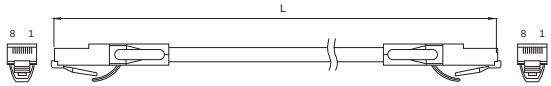
Note: Min. band radius: 100mm; Travel distance: 600mm; Lifetime: 5,000,000c

USB mini-B Configuration Cable

Description	P/N	Num.	Manufacturer	Details
USB mini-B Configuration Cable	2620-150	1	MOONS'	For connector CN1

CN6\CN7 RS-485 Daisy Chain Cable

P/N	Description
2012-030	Common type, Twisted-pair, 0.3m
2012-300	Common type, Twisted-pair, 3m
2013-030	Shielded type, Twisted-pair, 0.3m
2013-300	Shielded type, Twisted-pair, 3m



Connector Accessories

◆ I/O Connector-CN2

P/N	M2-50P

◇ Includes

Item	P/N	Num.	Manufacturer	Details
Connector (drive side)	5-2232346-1	1	TYCO	For I/O connector CN2

◆ Power Connector Kit(Below 6A)

P/N	M2 Motor Connector Kit

◇ Includes

Item	P/N	Num.	Manufacturer	Details
Connector (drive side)	3-2232346-1	1	TYCO	For encoder connector CN3
Connector	172159-1	1		For motor power connector
Connector	172233-1	1		For motor brake connector
Connector PIN	170362-1	6		For motor power connector
Connector	172161-1	1		For motor encoder connector
Connector PIN	770834-1	9		

◆ Motor Connector Kit(Above 10A)

P/N	M2 Motor Connector Kit2

◇ Includes

Item	P/N	Num.	Manufacturer	Details
Connector	350780-1	1	TYCO	For motor power connector
Connector PIN	350536-1	4		For motor power connector
Connector	172233-1	1		For motor brake connector
Connector PIN	170362-1	2		For motor brake connector
Connector	172161-1	1		For motor encoder connector
Connector PIN	770834-1	9		For motor encoder connector
Connector (drive side)	3-2232346-1	1		For encoder connector CN3

◆ Encoder Connector-CN3

P/N	M2-26P

◇ Includes

Item	P/N	Num.	Manufacturer	Details
Connector (drive side)	3-2232346-1	1	TYCO	For encoder connector CN3

◆ STO Connector Kit

P/N	STO Connector Kit

◇ Includes

Item	P/N	Num.	Manufacturer	Details
Connector	43025-1000	1		
Connector PIN	43030-0005	10		

◆ P1 Power Connector

P/N	5452570

◆ P2 Motor Power Connector

P/N	5452571

Certification specification

		Drive	Motor
Europe	EMC Command	EN 61800-3	EN 55011
			EN 55014-1
			EN 55014-2
			EN 6100-3-2
			EN 6100-3-3
	LVD	EN 61800-5-1	EN 60034-1
			EN 60034-5
	STO	UL61800-5-2(SIL2)	
		IEC61508	
		ISO13849-1(PL d)	
UL Standard		UL 61800-5-1	UL 1004-1
			UL 1004-6
CSA Standard		C22.2 No.274-13	CSA C22.2 No.100

Motor Specification

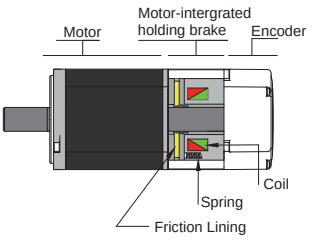
Encoder Type	2500ppr Incremental encoder	Ambient Temperature	Operating 0 to 40°C, Storage -20 to 80°C
Insulation Class	Class B (130℃)	Ambient Humidity	Operate where the relative humidity range is 20% to 85% and non-condensing
IP65 Rating	IP65 (Incremental encoder)	Altitude	Operating 1,000m
Installation location	Indoor installation, avoiding direct sunlight, corrosive and flammable gas	Vibration	49m/s^2, 10Hz-60Hz (DO NOT use the drive for extended periods of time at the resonance point.)

Brake Specification

A holding brake is used to stop the load from moving when power is lost. Typical applications include vertical axis that would drop if power is lost. Holding brakes are not intended to slow a motor that is spinning. The motor should be stopped and then the brake applied.

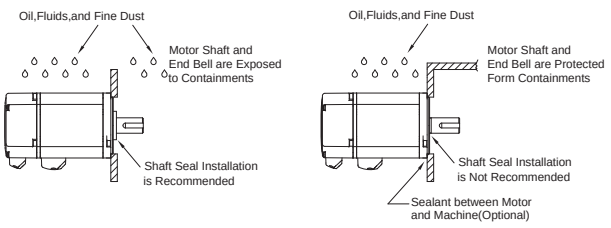
With no power, a spring presses a friction plate into a stationary plate, whitch produces holding torque. When power is applied to the brake coil, the brake solenoid pulls the friction plate away from the stationary plate, whitch allows the motor to turn.

Frame Size	40mm	60mm	80mm
Static friction torque (Nm)	0.32	1.5	3.2
Rated Voltage (VDC)	24VDC		
Power (W)(20℃)	6.9	7.2	10
Rated Current (A)	0.29	0.3	0.42
Brake Time	Standard air gap, below 20℃<25ms		
Release Time	<25ms		
Release Voltage	18.5VDC max.(at 20℃)		

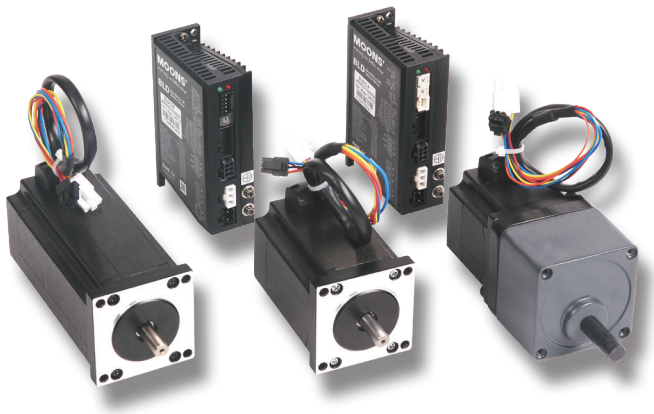


Shaft Seal

Industrial oil seals can block contaminants (oils, impurities) to extend the life of the motor. The oil seal will produce a certain resistance to the motor shaft, about 10% torque will be lost.



BLD Series—Brushless DC Motor Drive System



Features

- Wide speed control range
- Excellent speed stability
- Compact and High efficiency
- Low power consumption, Low noise, Low vibration
- Long life and Low maintenance requirement
- Low cogging torque, Low torque ripple

Features

◇ DC Input

Input Voltage: 24-48VDC

◇ Various Velocity Commands

- Internal Analog velocity control
- External Analog velocity control
- Multi-velocity control by digital input
- SCL commanded velocity control

◇ Sine-waveform Current Control

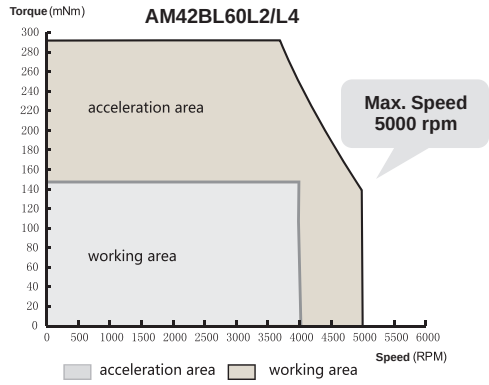
◇ 200% Overload Torque Output

◇ Velocity Control Range 150-4500rpm

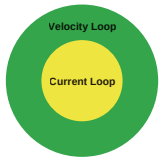
- Velocity control range of 150-4500rpm, Velocity ratio 1:30

◇ Excellent Velocity Stability

- Velocity Regulation (under load) is ±0.5%



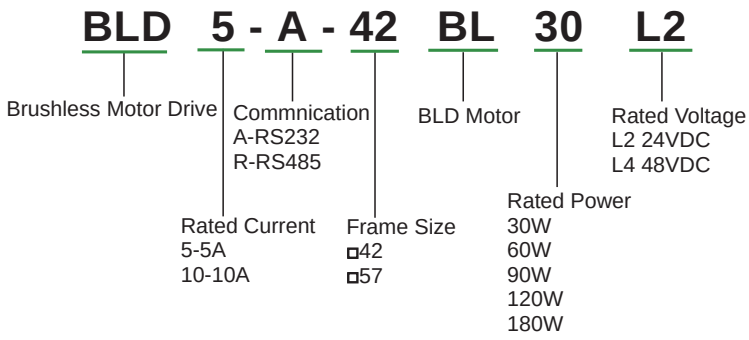
◇ Dual Closed-loop Control



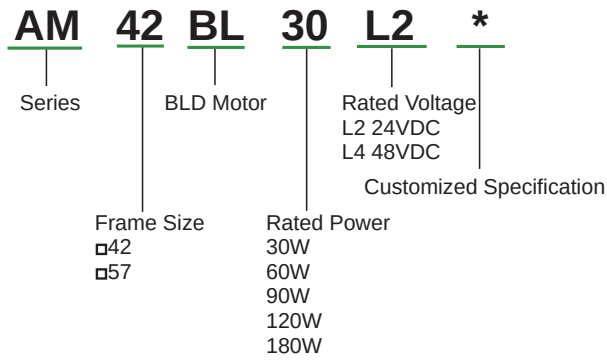
◇ Ultimate Performance

- Low heat
- Low noise
- Low vibration
- Low cogging torque
- Support RS-232&RS-485 Communiction Control

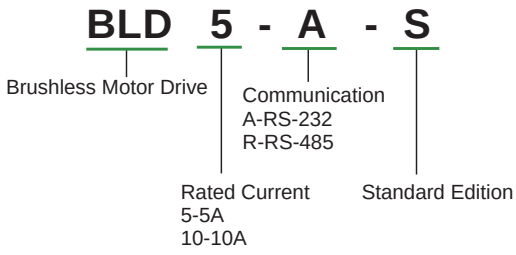
Brushless Drive Numbering Information



Brushless Motor Numbering Information



Brushless Drive Numbering Information*



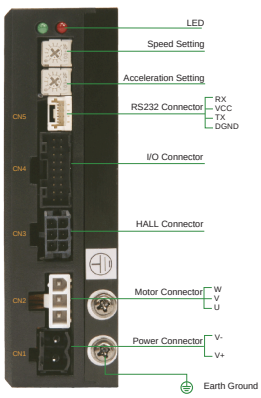
*: Standard drive, suitable for third-party brushless motor

Drive Specifications

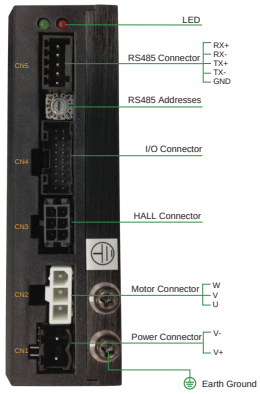
		Unit	Min.	Typical	Max.
Power Supply		VDC	12	-	48
Output Current	BLD5	A(rms)	0.1	-	5
	BLD10		0.1		10
Under Voltage Protection		V	-	8.5	
Over Voltage Protection		V	-	62	-
Input Signal Voltage		V	5	5-24	28
Input Analog Voltage		V	0	-	5
Output Maximum Output Current		mA	-	-	100
Output Maximum Range		V	-	-	30
Speed Control Range		RPM	150	-	4500*

* Limited by the maximum rated speed of the motor

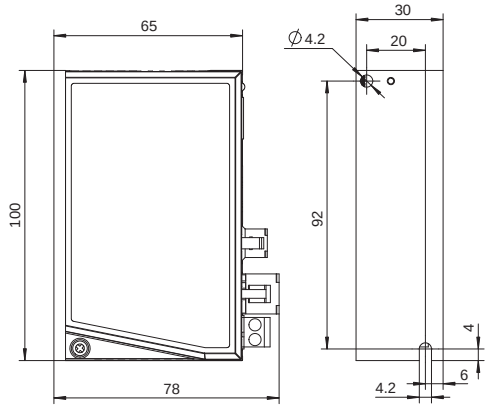
Dimensions (Unit: mm)



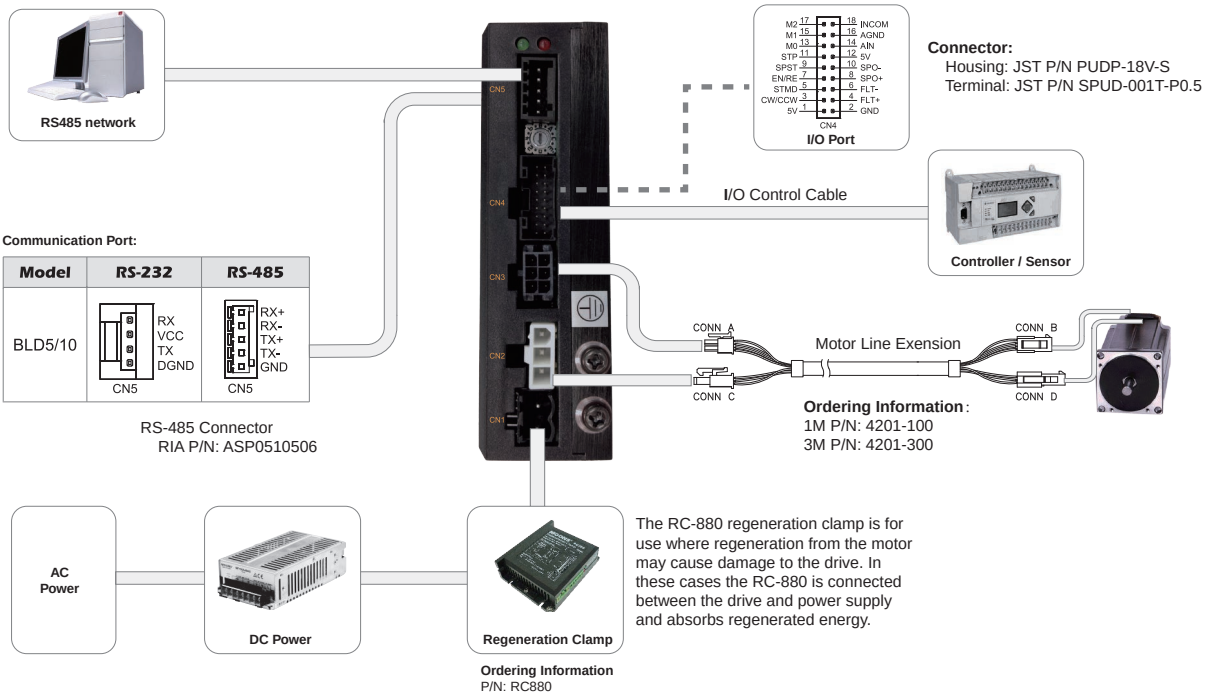
BLD5/10-A



BLD5/10-R



System Configuration



The RC-880 regeneration clamp is for use where regeneration from the motor may cause damage to the drive. In these cases the RC-880 is connected between the drive and power supply and absorbs regenerated energy.

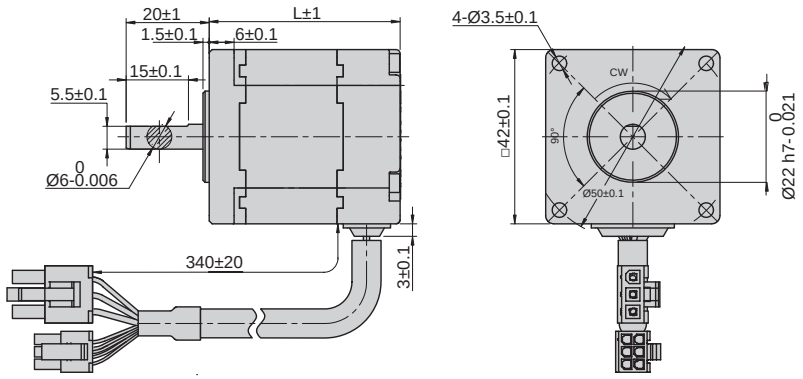
Motor Specifications

☐ Frame 42mm

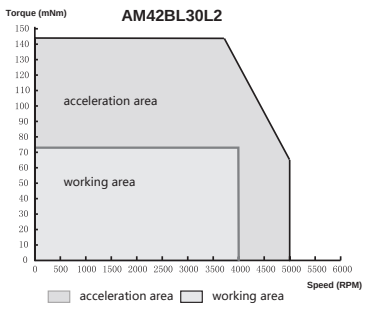
	Unit	Type		
		AM42BL30L2	AM42BL60L2	AM42BL90L2
Length	mm	46	70	100
Input Voltage	VDC	24	24	24
Rated Power	W	30	60	90
Phases		3		
Rated Speed	RPM	4000		
Max. Speed	RPM	5000		
Rated Torque	Nm	0.072	0.144	0.215
Peak Torque	Nm	0.144	0.288	0.43
Rated Current	Arms	1.67	3.28	4.92
Peak Current	Arms	3.34	6.56	9.84
Voltage Constant	Vrms/Krpm	2.95	3.00	3.00
Torque Constant	Nm/Arms	0.043	0.044	0.044
Inertia	$g.cm^2$	39	72	114
Resistance ± 10%(25℃)	Ω	1.34	0.68	0.40
Inductance	mH	1.15	0.60	0.37
Sensor	Hall			
Insulation class	E			
Protective Rating	IP40			
Storage Temperature	-25~+70℃			
Operating Temperature	0~+50℃			
Operating Humidity	85% RH or below (noncondensing)			
Operating Environment	Indoors, away from direct sunlight, corrosive gas and flammable gas			
Altitude	1000m or below			

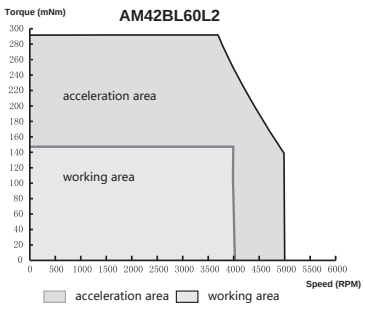
Dimensions (Unit: mm)

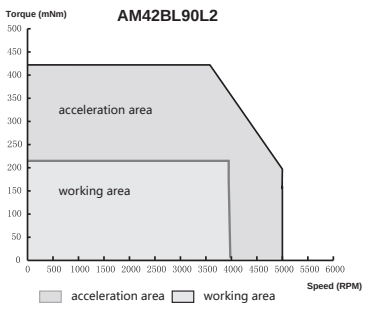
Seires	Length
	mm
AM42BL30	46
AM42BL60	70
AM42BL90	100



Torque Curves







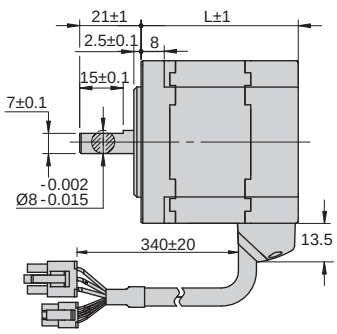
Motor Specifications

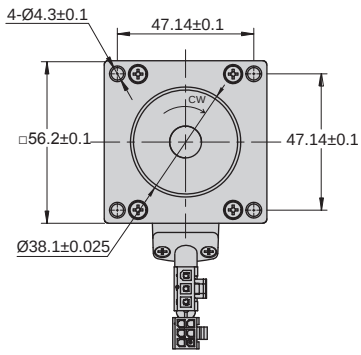
☐ Frame 57mm

	Unit	Type	
		AM57BL120L2	AM57BL180L4
Length	mm	82.5	120.5
Input Voltage	VDC	24	48
Rated Power	W	120	180
Phases		3	
Rated Speed	RPM	4000	
Max. Speed	RPM	5000	
Rated Torque	Nm	0.29	0.43
Peak Torque	Nm	0.58	0.86
Rated Current	Arms	6.9	4.5
Peak Current	Arms	13.8	9.0
Voltage Constant	Vrms/Krpm	3.00	6.45
Torque Constant	Nm/Arms	0.042	0.096
Inertia	$g.cm^2$	279	456
Resistance ± 10%(25℃)	Ω	0.18	0.44
Inductance	mH	0.18	0.54
Sensor	HALL		
Insulation class	E		
Protective Rating	IP40		
Storage Temperature	-25~+70℃		
Operating Temperature	0~+50℃		
Operating Humidity	85% RH or below (noncondensing)		
Operating Environment	Indoors, away from direct sunlight, corrosive gas and flammable gas		
Altitude	1000m or below		

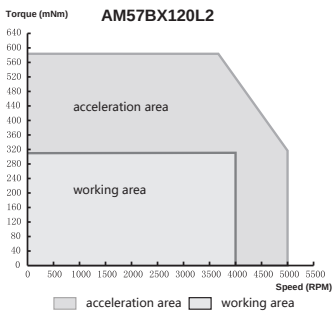
Dimensions (Unit: mm)

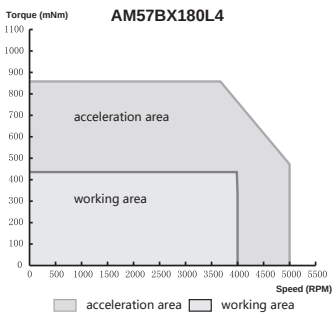
Series	Length
	mm
AM57BL60	54.5
AM57BL120	82.5
AM57BL180	120.5





Torque Curves





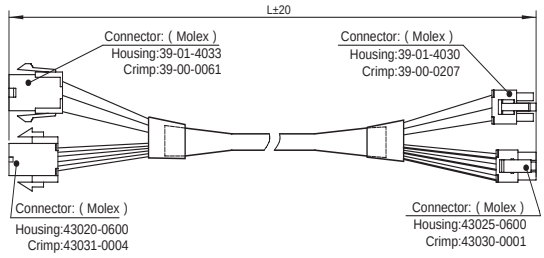
Ordering Information

BLD Drive Type	BLD Motor Type	Power	Voltage	RS-232	RS-485
BLD5-A-42BL30L2	AM42BL30L2	30W	24VDC	√	
BLD5-R-42BL30L2	AM42BL30L2				√
BLD5-A-42BL60L2	AM42BL60L2	60W		√	
BLD5-R-42BL60L2	AM42BL60L2				√
BLD10-A-42BL90L2	AM42BL90L2	90W		√	
BLD10-R-42BL90L2	AM42BL90L2				√
BLD10-A-57BL120L2	AM57BL120L2	120W		√	
BLD10-R-57BL120L2	AM57BL120L2				√
BLD10-A-57BL180L4	AM57BL180L4	180W	48VDC	√	
BLD10-R-57BL180L4	AM57BL180L4				√

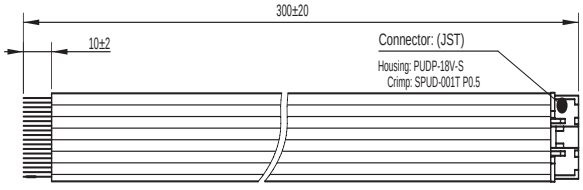
Optional Accessories

☐ Motor Extension Cable

P/N	Length
4201-100	1m
4201-300	3m



☐ I/O Control Cable: P/N 1201-030



I/O Control and Function Description

1	+5V USER	2	GND
3	X1	4	Y1+
5	X2	6	Y1-
7	X3	8	Y2+
9	X4	10	Y2-
11	X5	12	+5V USER
13	X6	14	Analog In
15	X7	16	AGND
17	X8	18	INCOM

PIN	Signal Type	Signal Name	Symbols	Function
1	Power	+5V USER		Provide maximum +5V 100mA power to user
2		GND		External control signal GND
18		INCOM		Digital input common (Sink /Source)
3	Inputs	CW/CCW	X1	CW/CCW
5		STMD(STOP MODE)	X2	Stop Mode Choose,Select how to stop the motor
7		EN/RE(Enable/Reset)	X3	Motor Enable / Disable
9		SPST(SPEED-SET)	X4	Internal / External Analog Speed Selection (Only BLD5/10-A)
11		STOP	X5	Motor Start&Stop
13		M0	X6	Eight changeable speeds (0, 500, 1000, 2000, 3000, 3500, 4000, 4500 r/min)
15		M1	X7	
17		M2	X8	
12	Analog Inputs	Analog VCC	-	External Analog Control
14		Analog In	-	
16		Analog GND	-	
4	Outputs	Fault+	Y1+	Alarm Output
6		Fault-	Y1-	
8		Speed Out+	Y2+	Speed output: the default value is 6 counts/rev
10		Speed Out-	Y2-	
-		MOVE	-	This signal will output when the motor is rotating.
-		VA	-	This signal will output when the motor speed reaches the setting speed.
-		Fault2	-	This signal will output when the drive overload.
-		Warning	-	This signal will output when the drive has an alarm.
-		TLC	-	This signal will output when the motor speed reaches the setting speed.
-		IDLE	-	General output

Potentiometer&LED

Speed Setting

This potentiometer can be used for adjusting speed. The velocity range can be set in BLD Configurator software. The default range is 150 to 4500rpm.

Acceleration Setting

This potentiometer can be used for adjusting acceleration and deceleration. The acceleration and deceleration range are same and can be configured in BLD Configurator software. The default range is 0 to 3000rps^2

Status LED Codes

Code		Error
	Solid Green	Motor Disabled
	Flashing Green	Motor Enabled
	1 Red, 2 Green	Can't Move (Disabled)
	3 Red, 1 Green	Drive Over Temperature
	3 Red, 2 Green	Bad Internal Voltage
	4 Red, 1 Green	Supply Voltage High
	4 Red, 2 Green	Supply Voltage Low
	5 Red, 1 Green	Over Current
	5 Red, 2 Green	Over Load
	6 Red, 1 Green	Open Motor Phase
	6 Red, 2 Green	Bad Hall Signal
	7 Red, 1 Green	Comm Error
	7 Red, 2 Green	Save Failed

Customer Service Center

400-820-9661

MOONS' Headquarter

168 Mingjia Road, Minhang District, Shanghai
201107, P.R. China

Domestic Offices

Shenzhen
Room 3901, Floor 39, Tower A, Zhongguan Times Square, No.4168, Liuxian Avenue, Pingshan Community, Taoyuan Street, Nanshan District, Shenzhen 518000, P.R. China

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

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

Qingdao
Room 1710, Zhuoyue Tower, No.16 Fengcheng Road, Shibei District, Qingdao 266000 P.R. China

Wuhan
Room 3001, World Trade Tower, 686 Jiefang Avenue, Jianghan District, Wuhan 430022, P.R. China

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

Xi'an
Room 1006, Tower D, Wangzuo International City, 1 Tangyan Road, Xi'an 710065, P.R. China

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

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

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

North America Company

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

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

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

LIN ENGINEERING, INC.
16245 Vineyard Blvd., Morgan Hill, CA 95037 USA

European Company

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

AMP & MOONS' AUTOMATION (GERMANY) GMBH
Börsenstr. 14
60313 Frankfurt am Main Germany

South-East ASIA Company

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

Japan Company

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

India Company

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

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https://www.moonsindustries.com/
E-mail:ama-info@moons.com.cn

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