MOONS'
moving in better ways

M5 4S AC SERVO SYSTEM

CE RoHS Compliant

M5 4S SERIES

Universal AC Servo System

Drive Specification		Motor Specification	
Supply Voltage	Rated Current (Arms)	Frame Size (mm)	Rated Power
220VAC	3, 4.5, 6	40, 60, 80, 100, 130	50W ~ 1000W

Application

M54S series servo systems are widely used in solar energy processing equipment, battery manufacturing equipment, electronic and semiconductor processing equipment, medical devices, logistics equipment, and customized equipment.

Standard

CE RoHS Compliant

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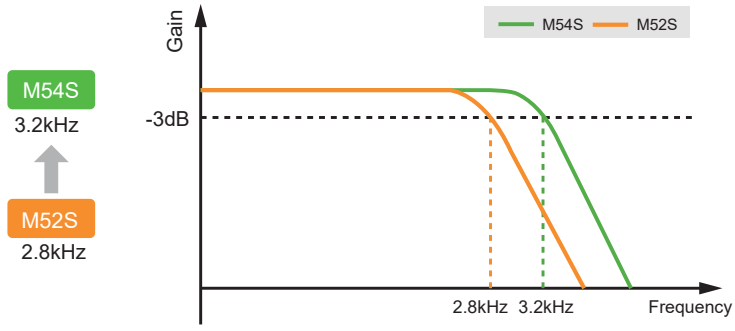
Superior Performance

High Response Frequency

Based on advanced motion control algorithms, the velocity loop bandwidth is up to 3.2kHz, faster command tracking and shorter settling time.

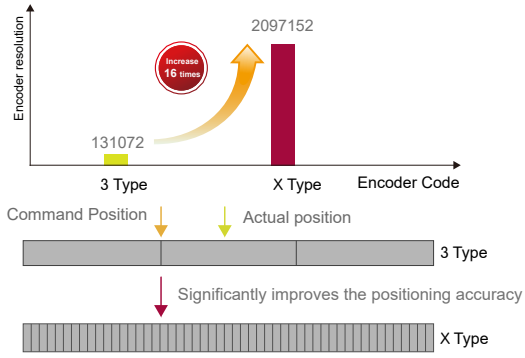


High Precision Positioning

The low cogging torque motor is equipped with a high resolution absolute encoder and built-in high precision position control algorithm, which makes the servo system run more smoothly and with higher accuracy, and significantly improves the positioning accuracy of the equipment.

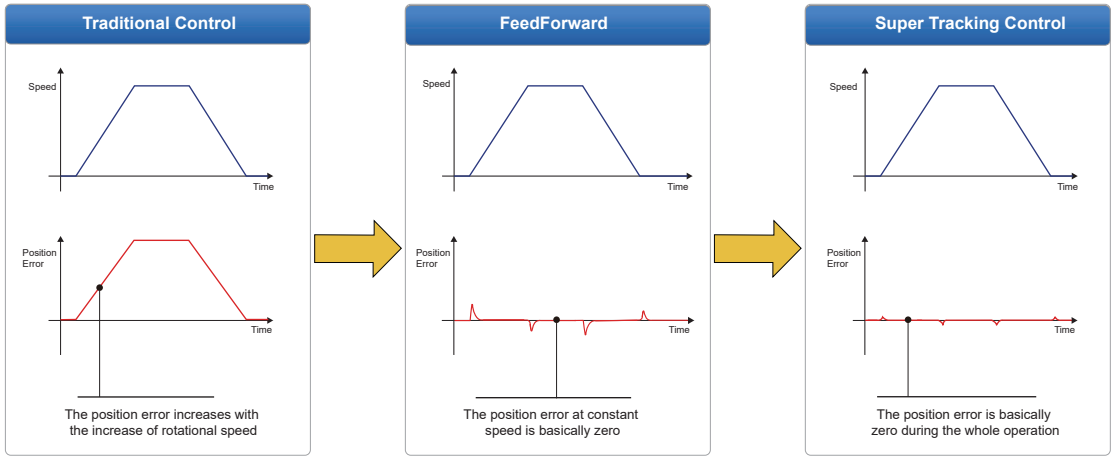
☐ 26-bit Multi-turn Absolute Optical Encoder
- ◆ High resolution, up to 67,108,864 divisions per revolution
- ◆ Optional battery backup for 16-bit multi-turn

☐ 21-bit Multi-turn Absolute Encoder
- ◆ High resolution, up to 2,097,152 divisions per revolution
- ◆ Optional battery backup for 16-bit multi-turn
- ◆ Strong vibration resistance
- ◆ Resistant to dust and oil stains
- ◆ Anti condensation



Super Command Tracking

The super tracking control function enables the motor to run smoothly, where the following error is basically zero at both constant speeds and acceleration/deceleration.



Easy Set-up

The M54S servo system is delicately designed to achieve high efficiency in wiring, commissioning, and maintenance of your system.

Unpacking

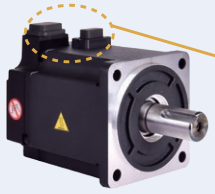
Wiring

Tuning

Commissioning

Easy Wiring

- Spring type I/O and power connector



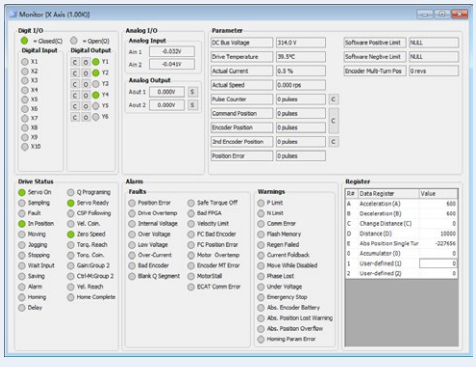
- Plug-in type IP67 protection level connector

Easy Tuning

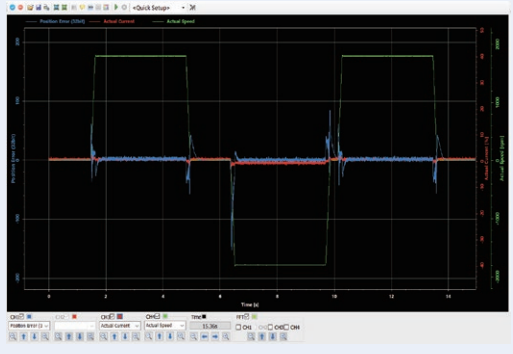
- High speed USB communication between Luna software and drive
- The drive automatically recognizes motors with smart encoder
- Both auto-tuning and tuning-less adjustment function are available
- Stable and smooth operation without complicated gain settings

Friendly Software

- Operating Status Monitor



- Real-time Oscilloscope

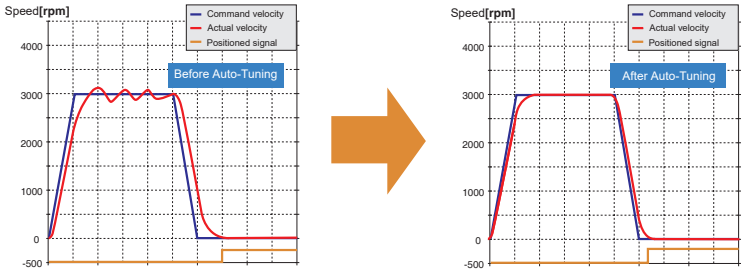


Easy Tuning

Auto-Tuning

The real-time auto-tuning algorithm can automatically identify the load inertia (ratio), tune control gains and enable mechanical resonance suppression function.The auto-tuning function can greatly shorten system tuning time, and responsiveness as well as production efficiency.

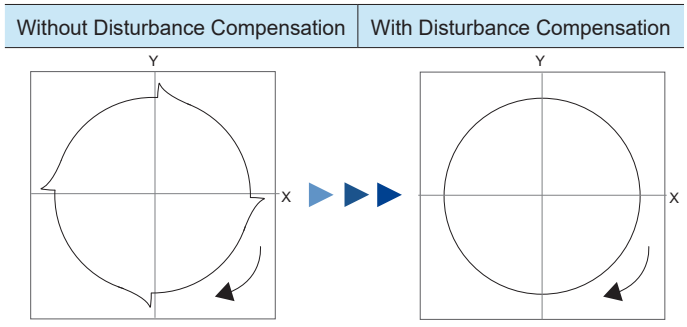
- ◆ Not be constrained by load types and drive control mode.
- ◆ High robustness with the guaranteed system stability margin.



Disturbance Compensation Control

The disturbance compensation can effectively suppress the phenomenon of overquadrant bulge caused by the different friction of the mechanism and the influence of load change, and improve the tracking accuracy in multi-axis synchronous control.

For example, the accuracy of arc trajectory in the interpolation control of XY mechanism can be improved.

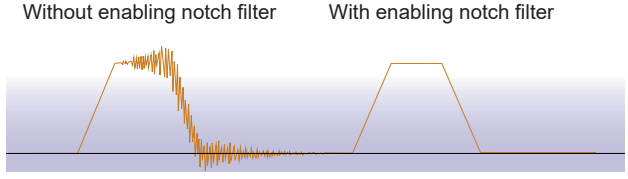


Quadrant protrusion phenomenon in simulating arc trajectories

Notch Filters

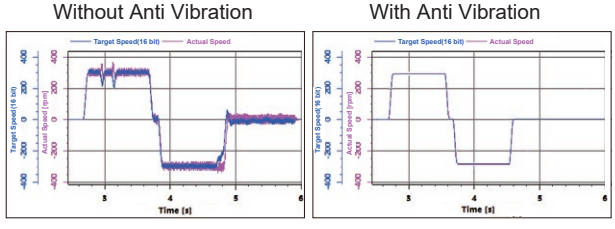
The M54S series provides 4 notch filters to suppress mechanical resonance in the system. The setting frequency range is 100~4000Hz.

- ◆ 2 sets of notch filters with automatically mechanical resonance frequency searching and setting.
- ◆ 2 sets of notch filters with manually frequency setting after analyzing the phenomena by Mechanical Analysis Tool.



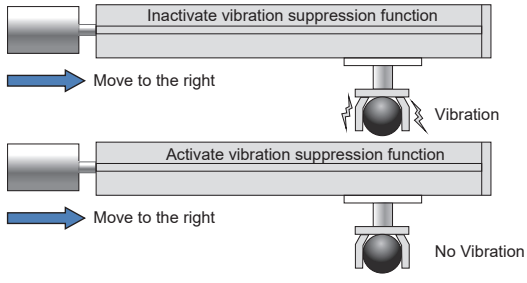
Medium Frequency Vibration Suppression

The Anti Vibration control function in M54S series can effectively suppress the medium-frequency vibration that range is 100~1000Hz.



End-effector Vibration Suppression

The end-effector vibration will lead to longer settling time, which results in decreased machine precision and production efficiency. M54S series can suppress such type of vibration to shorten the settling time as well as increase the control precision and equipment productivity.

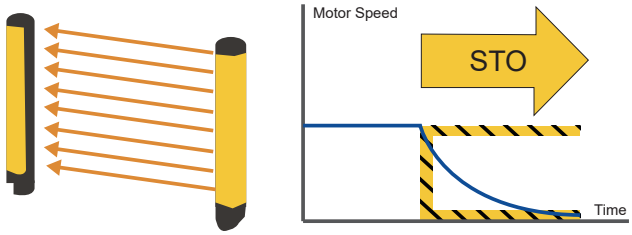


Reliable Operation

STO Functional Safety

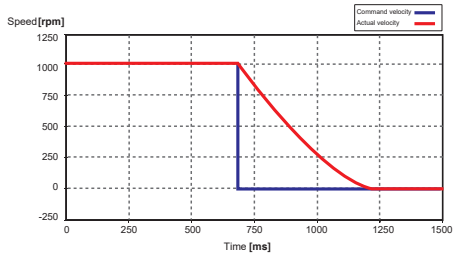
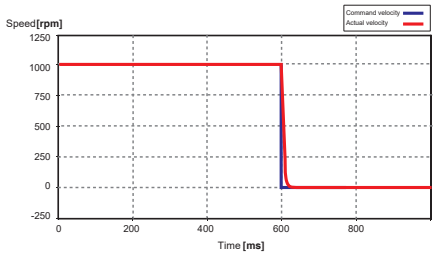
While the STO function is enabled, the drive's hardware circuitry automatically forces all power transistors off to cut off the power of the motor. This function is meant to protect personnel as well as equipment in emergency situations.

M54S series drive meets UL61800-5-2(SIL 3), IEC61508(SIL 3), ISO 13849-1(PL e).



Dynamic Brake

The dynamic brake function can be used to quickly stop the motor rotation when a fault occurs at either the motor or the drive. The dynamic brake function is implemented by the short-circuit of all phase windings of the motor, which brings the motor to a stop at the highest deceleration rate so as to protect personnel and equipment effectively.

Without Dynamic Brake	With Dynamic Brake
	
Without Dynamic brake In this scenario, the drive exhibits a fault and is disabled. This results in the motor coming to an uncontrolled deceleration that is influenced purely by external factors such as the speed of the motor before fault, inertia of the system and the friction present in the system.	**Dynamic brake is in effect** In this scenario, the drive exhibits a fault and is disabled. The phases (U/V/W) of the servo motor are shorted and the current generated by the back EMF in the motor windings is used to stop the motor. This greatly reduces deceleration time and protects personnel as well as equipment.

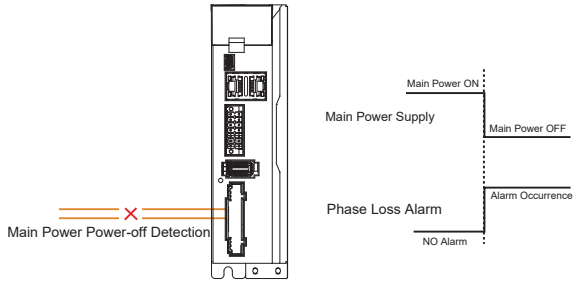
Built-in Regenerative Resistor

750W and 1000W drives have built-in regenerative absorbing resistor, it can consume the regenerative energy when the motor decelerates rapidly to ensure the servo system operates normally in this situation.

No additional regenerative resistor is required for most applications.

Main Power Power-off Detection

The M54S servo drives monitor main power connections. A fault will occur if power-off. This serves as an added protection measure against damage that might result from these issues.



New Motor Features

Various Product Lineup

- Power Rating: 50W ~ 1000W
- Frame Size: 40/60/80/100/130mm
- Low / Medium / High Inertia Servo Motor

Low, Medium, High Inertia Servo Motor

The SM3 series of servo motors offers a variety of rotor inertia options. Selecting the appropriate motor from the SM3 series contributes to achieving an optimal inertia ratio between the load and the motor, which is crucial for improved mechanical performance.

Low Inertia Motor	Medium Inertia Motor	High Inertia Motor
Suitable for most of applications ◆ Low inertia load ◆ High acceleration and deceleration ◆ Quick and frequent starting and stopping	Suitable for applications with low mechanical stiffness ◆ Belt and synchronous belt load ◆ Stability improvement during high-speed operation	Suitable for large inertia load ◆ Large inertia belt load ◆ Turntable with a large moment of inertia ◆ Low speed and high torque

Smaller Size and Higher Efficiency

The servo motor incorporates a new structure and magnetic circuit design, resulting in a smaller size and higher power density. Additionally, the electromagnetic scheme has been optimized to enhance the efficiency of the servo motor and reduce heat generation.

IP67

The SM3 series servo motors are designed to have IP67 protection against dust and water. (except the shaft through hole of the motor mounting face)

If the mounting face of the motor needs to meet the IP67 protection level, please install the oil seal.

Note: The installation of oil seal will bring extra torque loss. It is recommended to reduce the rating of motors with oil seals by 10%.

Various of Control Mode

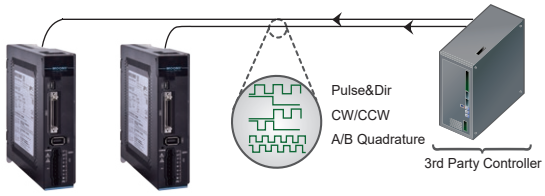
Digital Pulse Position Modes

Support STEP/DIR, CW/CCW pulse and A/B quadrature pulse.

Low-speed Open Collector Pulse Input: 500kHz, 24VDC

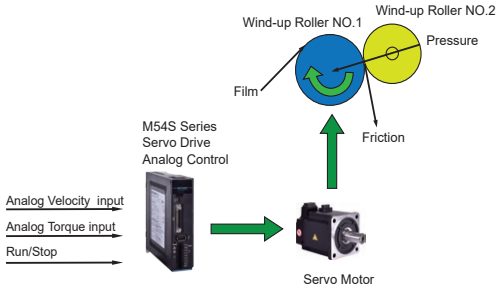
Low-speed Differential Input: 500kHz, 5VDC

High-speed Differential Input: 4MHz, 5VDC



Analog Input Control Modes

Certain models have -10V ~ +10V analog inputs can be used for analog velocity and analog torque control.



Built-in Software PLC — Q Program

Q Programmer is MOONS' own single-axis motion control software based on SCL commands. It can be used to create sophisticated and functional programs that can be saved to a drive's nonvolatile memory, and then run stand-alone, or without a permanent connection to the host. Q drives offer a high level of flexibility and functionality to the machine designer and system integrator.

Features:

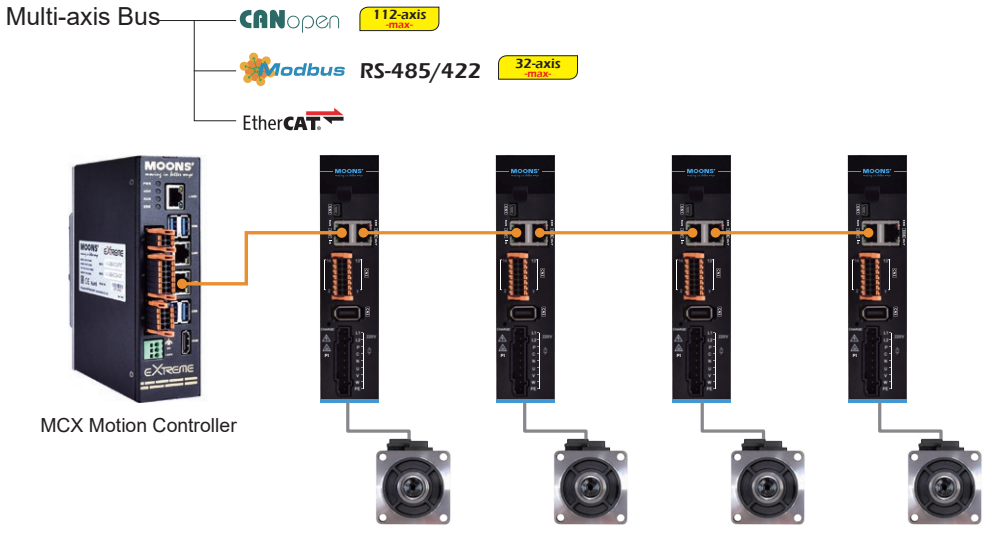
- Motion control commands (relative position, absolute position,homing mode, etc.)
- Multi-tasking
- Conditional Processing (external I/O, internal command)
- Math Calculation (+, -, *, /, &, or)
- Data register manipulation
- Logic motion commands (loop, call functions)

Line	Label	Cmd	Param1	Param2	Comment
1		MT	1		Turn ON Multi-Tasking
2		DL	3		Turn OFF limits
3		PF	2000		Set Position Fault limit
4		CC	2		Set continuous current to 50%
5		CP	2		Also set peak current to same
6		DI	4000		Make distance positive for CW
7		JM	1		Set Jog mode to positioning
8		JS	1		Set Jog speed to 1 rev/sec
9		JA	10		Set Jog accel to 10 rev/sec/sec
10		CJ			Start jogging
11	Label2	TR	x	100	Test Reg "x" against 100
12		QJ	G	#Label1	Jump if greater than
13		TR	x	-100	Test Reg "x" against -100
14		QJ	G	#Label2	Jump if greater than
15	Label1	SM	M		Stop move with max accel (AM)
16		WM			Wait for stop to complete
17		EP	0		Set encoder position to zero
18		VE	1		Set Veolocity to 1 rev/sec
19		DI	-8000		Set home offset distance (CCW)
20		FL			Do a Relative move
21		WM			Wait for move to complete
22		SP	0		Set absolute position to zero
23		AX			Clear any faults just in case
24		WT	0.1		Wait 0.1 seconds
25		ME			Enable servo drive
26		CC	2.5		Set current to normal
27		CP	5		Set peak current to normal
28		MT	0		DisableMulti-Tasking
29		QX	3		Jump to Program 2

Field Bus Control

M54S servo system support various of industrial field bus options such as EtherCAT, CANopen, Modbus RTU.

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



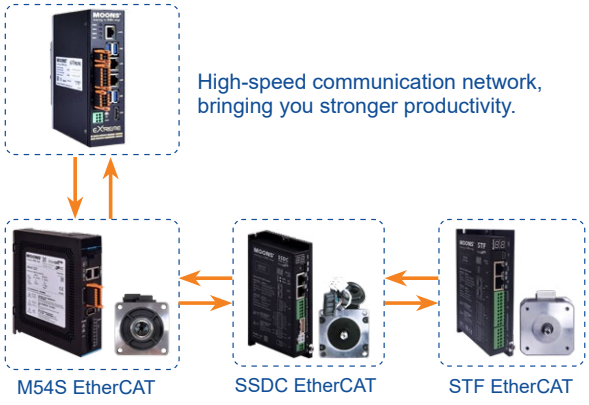
Various of Field Bus

EtherCAT

High Speed, High Efficiency

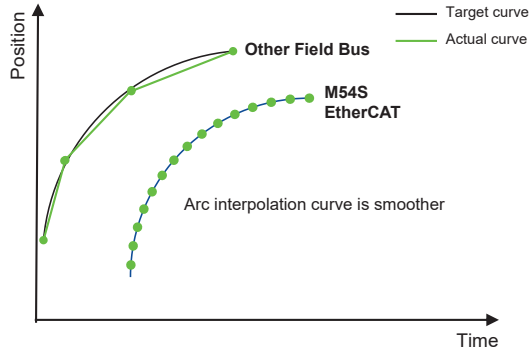
Full duplex, communication baud rate 100Mbps. Support CoE(CiA 402 protocol), VoE (Vendor over EtherCAT) Support PP, PV, TQ, CSP, CSV, CST, HM mode.

Combine with MOONS' EtherCAT stepper series product, we can meet all your motion demands.



High Performance

The synchronous cycle of M54S series EtherCAT products is up to 125μs, which technically makes the position command subdivision smaller, and the equipment movement smoother.



CANopen

Standard CAN bus interface is available in M54S series servo drives, which makes it easy to get integrated to the industrial field bus.

Features	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	RJ45
Communication Rate	12.5Kbps, 20Kbps, 50Kbps, 125Kbps 250Kbps, 500Kbps, 800Kbps, 1Mbps
Message Type	SDO, PDO, SYNC, EMCY, NMT, Heartbeat
Control Mode	Profile Position, Profile Velocity, Profile Torque, Homing Mode, Q Program
PDO Data	4 RxPDOs, 4 TxPDOs
Support Axis	Up to 112 axis

Modbus

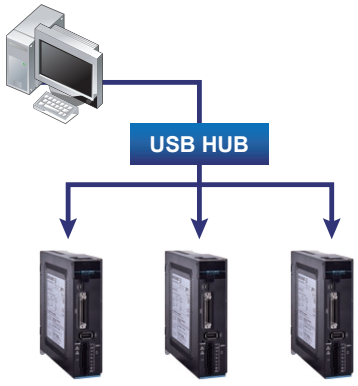
M54S series servo drive supports Modbus RTU communication protocol which is based on RS-485. Through Modbus protocol, it provides an easy motion control platform for modifying drive parameters, and monitor the status of the servo drive.

Features	Specification
Physical Layer Standard	RS-485
Communication Protocol	Modbus RTU
Bus Connector	RJ45
Communication Rate	9600bps, 19200bps, 38400bps, 57600bps, 115200bps
Control Mode	Position Mode, Velocity Mode, Torque Mode, Homing Mode, Q Program
Support Axis	Up to 32 axes

Friendly Software

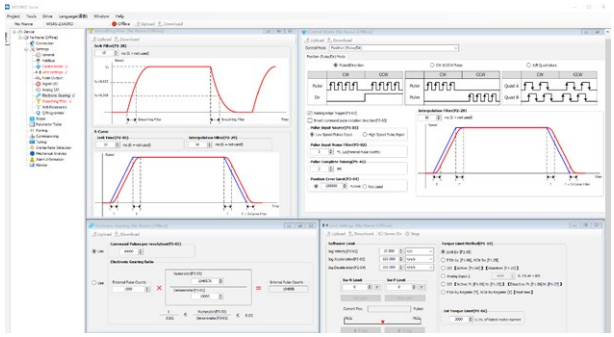
USB Multi-axis Tuning

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



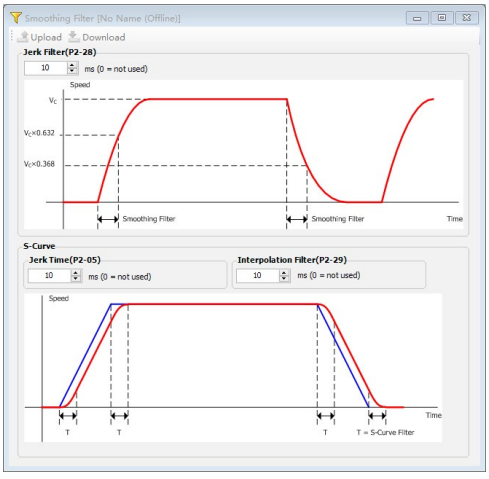
Tree Structure

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



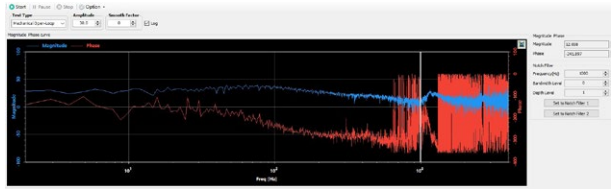
Graphical Setting Interface

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



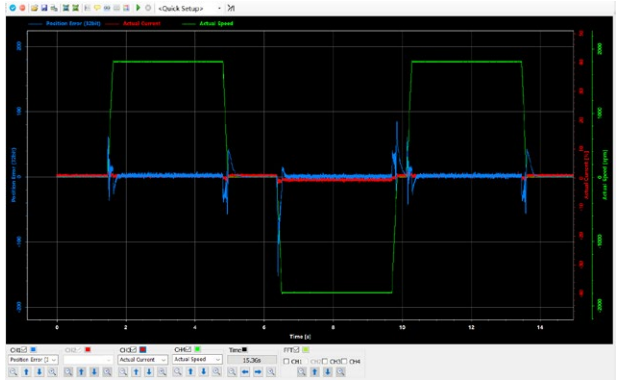
Mechanical Analysis

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, 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



General Specifications

Safety Certification

M54S series products are designed to meet the following standards.

CE RoHS Compliant

		Drive	Motor
Europe	EMC	EN 61800-3	EN 60034-1
			EN 61000-6-2
			EN 61000-6-4
	LVD	EN 61800-5-1	EN 60034-1
			EN 60034-5
Function Safety (STO)		UL61800-5-2(SIL 3)	
		IEC61508(SIL 3)	
		ISO13849-1(PL e)	
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 General Specifications

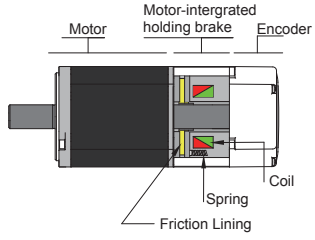
Insulation Class	Class F (155℃)	Ambient Temperature	Working temperature: 0℃ ~ 40℃ Storage temperature: -20℃ ~ 60℃
Protection Level	IP67 (Except transfixion part of shaft)	Humidity	Storage and usage: 20 ~ 85%RH (no condensation)
Installation Conditions	Indoor installation, avoiding direct sunlight, corrosive and flammable gas	Altitude	Derating is not required for altitudes not higher than 1000m Derating 1% for every additional 100m for altitudes between 1000m and 2000m
Vibration	Under 49m/s^2, 10 ~ 60Hz(Do not use continuously at resonance frequency)		

Brake Specifications

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.

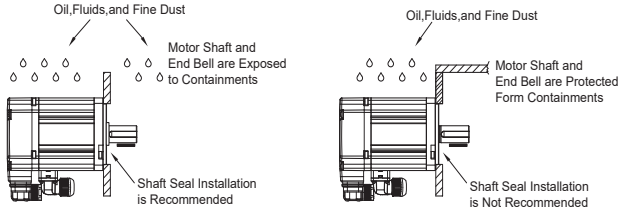
When the brake is powered on, the armature is retracted, the brake pad is released, and the motor can operate normally. When the brake is powered off, the armature is released, the brake pad is locked, and the motor can't rotate.

Frame	40mm	60mm	80mm	100mm	130mm
Static Friction Torque (Nm)	0.32	1.5	3.2	8.0	18.5
Rated Voltage (VDC)	24				
Power Waste (W @ 20℃)	6.3	7.2	9.6	14.4	24.3
Current (A)	0.26	0.3	0.4	0.6	1.05
Braking 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.



More Functions

Position / Velocity / Torque Control

Support position control, velocity control and torque control.

- Position control supports pulse, internal position or communication command for positioning.
- Velocity control supports analog, internal multi-segments velocity or communication commands.
- Torque control supports analog, internal torque or communication commands.

Control Mode Switching

Position control, speed control, and torque control can be switched using an external digital input. The P and R types of drive can switch between 2 control modes.

Gain Switching Function

The gain during operation and stop can be automatically switched under certain conditions. Or freely switch between the two sets of gains via digital input.

Internal Multi-segment Velocity Function

Velocity control is possible with digital inputs. 8 segments of velocity can be saved in the drive, and the corresponding internal velocity control commands can be selected via digital inputs.

Pulse Input Inhibit Function

When the pulse inhibit input signal is valid, the drive ignores the external pulse command and the motor decelerates to stop.

Internal Software Position Limit

In absolute value systems, the software position limit can be set to protect the device without the external limit sensor.

Configurable Input and Output

- The input functions can be assigned to any of the digital input by parameters.
- The output functions can be assigned to any of the digital output by parameters.

Encoder Feedback Output

- The motor encoder feedback and the second encoder feedback are output in A/B/Z pulse mode, and the pulse division output is supported.
- Support for pulse command By-pass output.

Analog Input

Support 2 analog voltage inputs for analog velocity control and torque control.

Touch Probe (Latch) Function

The touch probe function latches the position actual value when an external latch input signal or the external encoder's phase-Z signal turns On.

M54S series drive can latch two positions.

Zero Speed Clamp Function

In the velocity control mode, when the zero speed clamp signal is valid, when the actual speed is less than the zero speed threshold value, the servo motor enters the zero position lock state. At this time, the internal position loop of the drive is actived, and even if the external force rotates the motor, it also returns to the clamping position.

Stop Mode Setting

When the drive servo off or fault, the stop type(free run, reduce speed, dynamic brake) and the status after stopping can be selected.

Moving Command Smoothing Filter

The command smoothing function filters the position command and the speed command, which makes the servo motor run smoother even if the command is abrupt.

Drive Part Numbering

M54S - 2 3A0 R D - ***

① ② ③ ④ ⑤ ⑥

① M54S Series

② Supply Voltage

2 --- Single 220VAC

④ Function Type

⑤ Model Type

⑥ Customization

Blank: Standard Type

STO: STO Function Safety Type

③ Current

Supply Voltage	Current	Rated Current A(rms)	Peak Current A(rms)	Rated Power
2	3A0	3	12	400W
	4A5	4.5	15	750W
	6A0	6	21	1000W

Servo Drive Table

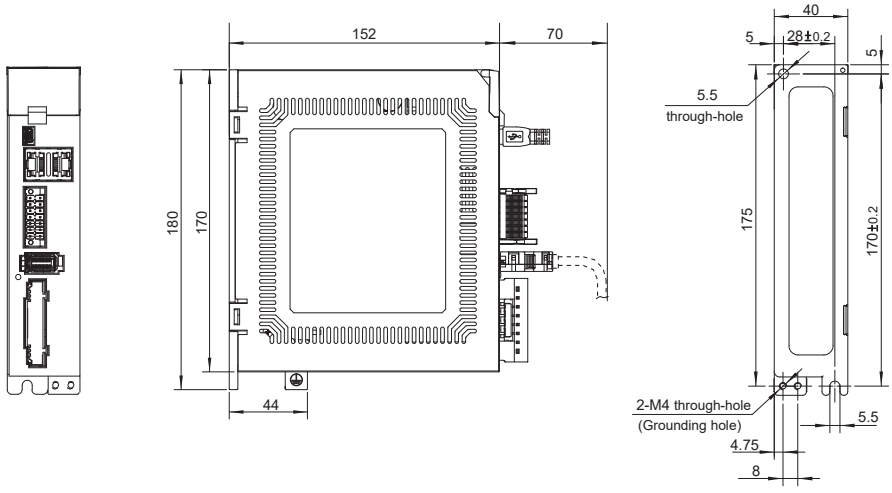
Function Type		-R—RS-485	-EC—EtherCAT	-C—CANopen *1
				
Model Type		**D**	**N**	**N**
Control Mode	Position Mode	●	●	●
	Velocity Mode	●	●	●
	Torque Mode	●	●	●
	Q Program	●	●	●
Interface	5V Pulse Inputs	●		
	24V Pulse Inputs	●		
	1 Analog Input		●	●
	2 Analog Inputs	●		
	10 Inputs/6 Outputs (Digital)	●		
	6 Inputs/3 Outputs (Digital)		●	●
	Encoder Feedback Output	●		
Comm Port	USB (Configuration)	●	●	●
	RS-485	●		
	EtherCAT		●	
	CANopen			●
Safety Function	Dynamic Brake	●	●	●
	STO*2	●	●	●

*1: CANopen model under developing

*2: Please select the model with STO feature.

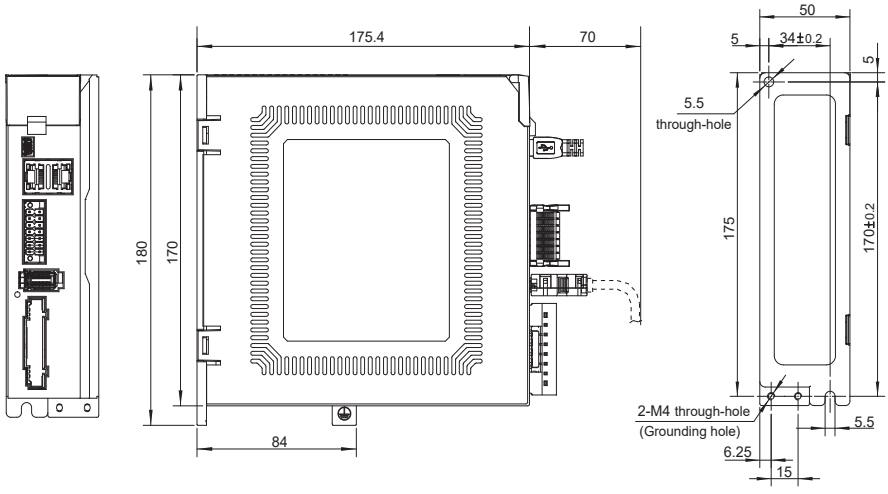
Drive Mechanical Dimensions (Unit: mm)

☐ M54S-23A0 ■◆ (400W)



☐ M54S-24A5 ■◆ (750W)

☐ M54S-26A0 ■◆ (1000W)



■: Function Type ◆: Model Type

Motor Part Numbering

SM3 L - 13 2 A X N U V - *

Servo Motor
SM3 Series

Inertia Type	
L	Low Inertia
M	Medium Inertia
H	High Inertia

Frame Size	
04	40mm
06	60mm
08	80mm
10	100mm
13	130mm

Motor Length	
1	1 Stacks
2	2 Stacks
3	3 Stacks

Voltage	
A	220VAC

Encoder	
T	26-bit multi-turn absolute optical encoder
X	21-bit multi-turn absolute encoder

Brake	
N	No brake
B	With brake(24VDC)

Connector & Rear Cover Type	
D	Direct-mount with sealed plastic connector, metal rear cover
P	Direct-mount with sealed plastic connector, standard rear cover
U	Direct-mount with sealed metal straight connector, standard rear cover

Shaft	
N	Circular shaft without oil seal
V	Keyway without oil seal
K	Keyway with installed oil seal

Custom Code

Motor Products Table

	Low Inertia		Medium Inertia		High Inertia	
Rated Power	Frame Size	Rated Speed (Max.Speed)	Frame Size	Rated Speed (Max. Speed)	Frame Size	Rated Speed (Max. Speed)
W	mm	rpm	mm	rpm	mm	rpm
50					□40	3000 (6000)
100	□40	3000 （6000）			□40	
200	□60				□60	
400	□60				□60	
750	□80				□80	
850					□130	1500(3000)
1000	□80				□80	3000(6000)
1000	□100		□130	2000 (3000)		

Drive and Motor Table

Frame Size (mm)	Inertia Type	Rated Power (watts)	Rated Torque (N·m)	Peak Torque (N·m)	Rated Speed (rpm)	Max. Speed (rpm)	Rated Current A(rms)	Peak Current A(rms)	Matching Servo Motor	Matching Servo Drive		
									26/21-bit Multi-turn Absolute Encoder	-R RS-485	-EC EtherCAT	-C CANopen
40	High Inertia	50	0.16	0.64	3000	6000	1.4	4.8	SM3H-041A ◇☐ P △	M54S-23A0RD M54S-23A0RD-STO	M54S-23A0ECN M54S-23A0ECN-STO	M54S-23A0CN M54S-23A0CN-STO
	Low Inertia	100	0.32	1.28			1.2	5.9	SM3L-042A ◇☐ D △			
	High Inertia		0.32	1.28			1.4	5.7	SM3H-042A ◇☐ P △			
60	Low Inertia	200	0.64	1.9			1.5	5.4	SM3L-061A ◇☐ P △			
	High Inertia		0.64	2.24			1.7	5.9	SM3H-061A ◇☐ P △			
	Low Inertia	400	1.27	3.8			2.8	10	SM3L-062A ◇☐ P △			
	High Inertia		1.27	4.44			2.8	9.8	SM3H-062A ◇☐ P △			
80	Low Inertia	750	2.4	6.7			4.5	14	SM3L-083A ◇☐ P △	M54S-24A5RD M54S-24A5RD-STO	M54S-24A5ECN M54S-24A5ECN-STO	M54S-24A5CN M54S-24A5CN-STO
	High Inertia		2.4	8.4			4.5	16.7	SM3H-083A ◇☐ P △			
	Low Inertia	1000	3.2	9.6			5.6	19	SM3L-084A ◇☐ P △	M54S-26A0RD M54S-26A0RD-STO	M54S-26A0ECN M54S-26A0ECN-STO	M54S-26A0CN M54S-26A0CN-STO
	High Inertia		3.2	11.2			5.9	20.5	SM3H-084A ◇☐ P △			
100	Low Inertia	1000	3.2	9.6			6.0	21	SM3L-102A ◇☐ U △			
130	Medium Inertia	1000	4.77	14.3	2000	3000	5.4	16.9	SM3M-132A ◇☐ U △			
	High Inertia	850	5.39	16.2	1500		6	19	SM3H-132A ◇☐ U △			

◇ : Encoder Options ☐ : Brake Options △ : Oil Seal Options Please refer to the numbering system of servo motor on page 16.

Drive Specification -R—RS485 Type

Input Power	M54S-23A0RD M54S-24A5RD M54S-26A0RD	Main Circuit	Single, AC200 ~ 240V ±10%, 50/60Hz
		Control Circuit	Powered by main circuit
Withstand Voltage			Primary to earth: withstand 1500 VAC, 1 min, (Leakage current: 20 mA) [220V Input]
Environment	Temperature		● Ambient temperature: 0°C ~ 55°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		Derating is not required for altitudes not higher than 1000m Derating 1% for every additional 100m for altitudes between 1000m and 2000m
	Vibration		9.8m/s^2 or less, 10 ~ 60Hz (Do not use continuously at resonance frequency)
Motor Encoder Feedback			26-bit multi-turn absolute optical encoder
			21-bit multi-turn absolute encoder
I/O	Digital Signal	Input	10 Configurable optically isolate digital general inputs, 24VDC, 20mA
		Output	6 Configurable optically isolate digital general outputs, Max. 30VDC, 100mA
	Analog Signal	Input	2 Analog inputs, -10 ~ +10V, 16-bit
	Pulse Signal	Input	2 Pulse Inputs (Optocoupler input, Line Receiver input): ● Optocoupler input: 5 ~ 24V, minimum pulse width 1μs, max. pulse frequency 500KHz ● Line Receiver input: 5V differential signal, minimum pulse width 0.125μs, max. pulse frequency 4MHz
		Output	4 Outputs(3 Line Driver outputs, 1 open collector output) ● Line Driver output: Encoder A、B、Z feedback output ● Open collector output: Encoder Z phase
Comm Port	USB		Connection with PC for configuration
	RS-485		Modbus RTU Communication protocol
Front Panel			5 keys(MODE, RIGHT, UP, DOWN, SET) 5 - digital LED Display
Regeneration Resistor			Built-in regenerative resistor for 750W and above models (All models can be equipped with external absorption resistors)
Control Mode			1. Pulse Position Mode 2. Analog Velocity Mode 3. Analog Torque Mode 4. Internal Position Mode 5. Internal Torque Mode 6. Internal Velocity Mode 7. Command Torque Mode 8. Q programs that are pre-stored in the drive can also be started by digital input or command The control mode from 1 to 7 can be switched by digital input
Control Input Signal			Servo-ON, Alarm Reset, CW/CCW Limit, Control Mode Select, Gain Select, Clear Position Error, Zero Speed Clamp, Command and Velocity input Direction control, Command and Torque input Direction control, Emergency Stop, Homing Switch, Torque Limit, Speed Limit, Pulse Inhibit, Multi-velocity Switch, Start Q Program, 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,Under Voltage, Over Temperature, Bad Encoder Feedback, Over Load, Over Speed, Positon Error, STO, CW/CCW Limit, Full Closed-loop Hybrid Deviation Fault, Communication exception
Dynamic Brake			Built-in
STO *1			Built-in
Weight			M54S-23A0RD: 1.0Kg M54S-24A5RD: 1.3Kg M54S-26A0RD: 1.5Kg

Note: *1 Please select the model with STO feature.

Drive Specification -EC—EtherCAT Type -C—CANopen Type

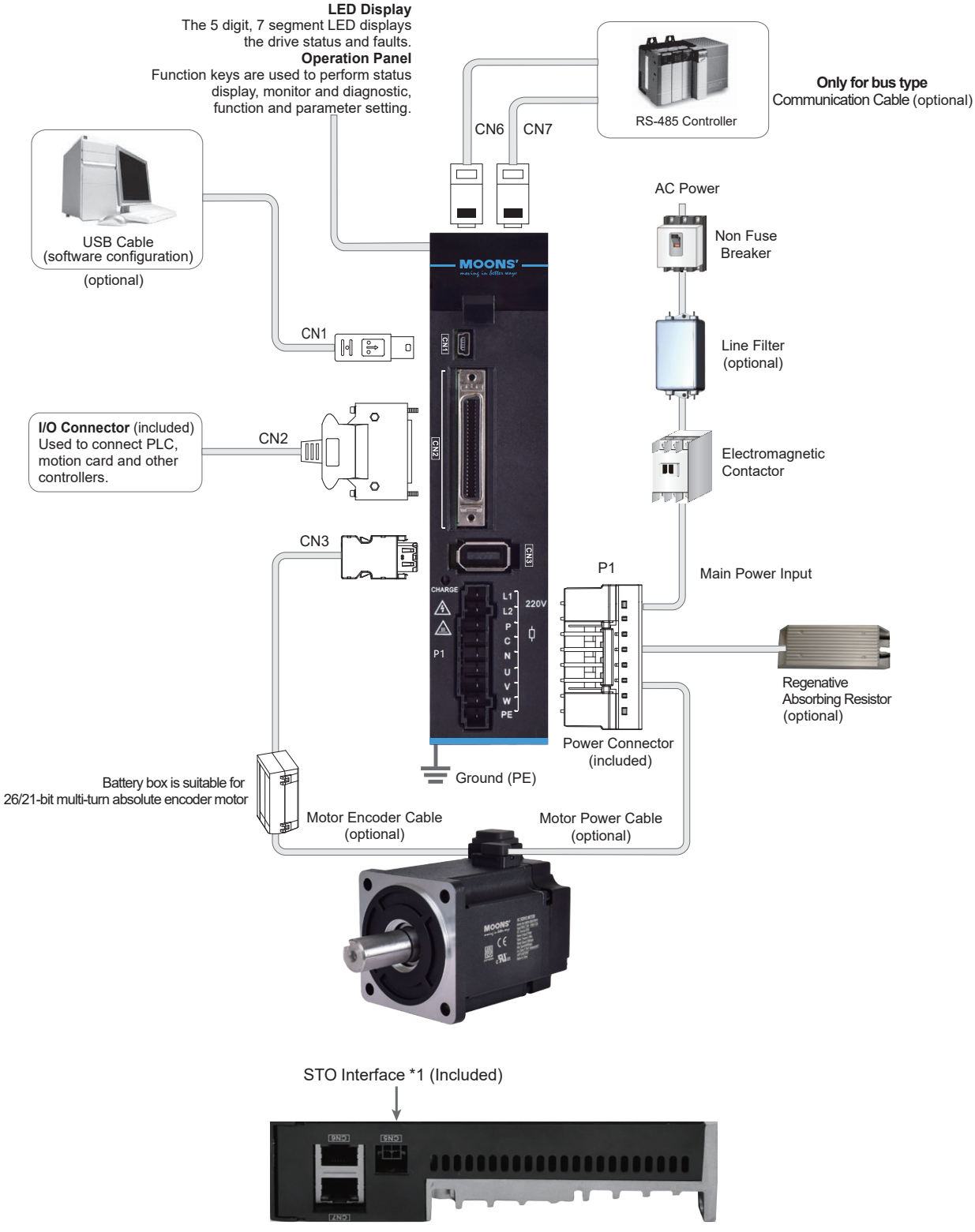
Input Power	M54S-23A0 ■ N M54S-24A5 ■ N M54S-26A0 ■ N	Main Circuit	Single, AC200 ~ 240V ±10%, 50/60Hz
		Control Circuit	Powered by main circuit
Withstand Voltage			Primary to earth: withstand 1500 VAC, 1 min, (Leakage current: 20 mA) [220V Input]
Environment	Temperature		● Ambient temperature: 0°C ~ 55°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		Derating is not required for altitudes not higher than 1000m Derating 1% for every additional 100m for altitudes between 1000m and 2000m
	Vibration		9.8m/s^2 or less, 10 ~ 60Hz (Do not use continuously at resonance frequency)
Motor Encoder Feedback			26-bit multi-turn absolute optical encoder
			21-bit multi-turn absolute encoder
I/O	Digital Signal	Input	6 Configurable optically isolate digital general inputs, 24VDC, 20mA
		Output	3 Configurable optically isolate digital general outputs, Max. 30VDC, 100mA
	Analog Signal	Input	1 Analog input, -10 ~ +10V, 16-bit
Comm Port	USB		Connection with PC for configuration
	EtherCAT		-EC Control Function Type: EtherCAT communication
	CANopen		-C Control Function Type: CANopen communication
Front Panel			5 keys(MODE, RIGHT, UP, DOWN, SET) 5 - digital LED Display
Regeneration Resistor			Built-in regenerative resistor for 750W and above models (All models can be equipped with external absorption resistors)
Control Mode			-EC Control Function Type: CoE(Complies with CiA402 standard), support PP, PV, TQ, CSP, CSV, CST and HM mode, Q programs that are pre-stored in the drive can also be started by command -C Control Function Type: Complies with CiA402 standard, support PP, PV, TQ and HM mode, Q programs that are pre-stored in the drive can also be started by command
Control Input Signal			Alarm Reset, CW/CCW Limit, Gain Select, Zero Speed Clamp, Emergency Stop, CW/CCW 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,Under Voltage, Over Temperature, Bad Encoder Feedback, Over Load, Over Speed, Positon Error, STO, CW/CCW Limit, Communication exception
Dynamic Brake			Built-in
STO*1			Built-in
Weight			M54S-23A0 ■ N: 1.0Kg M54S-24A5 ■ N: 1.3Kg M54S-26A0 ■ N: 1.5Kg

Note: *1 Please select the model with STO feature.
■ : Control Function Type

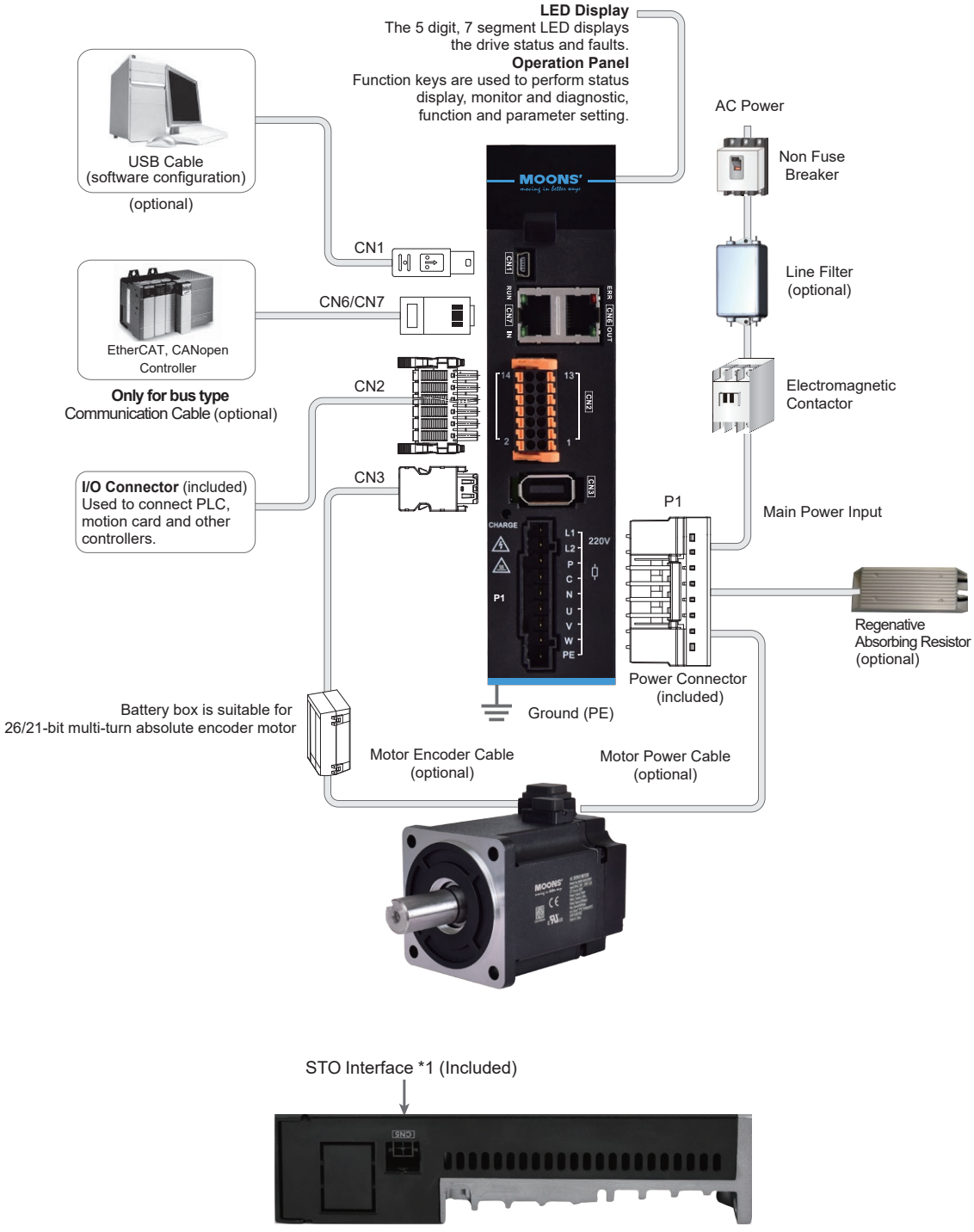
System Configuration

High Density I/O Connector
Model Type: D

400/750/1000W Type



Note: *1 Certain models don't support this function, please refer to page 14.



Note: *1 Certain models don't support this function, please refer to page 14.

Motor Specification — 40mm Frame Low Inertia

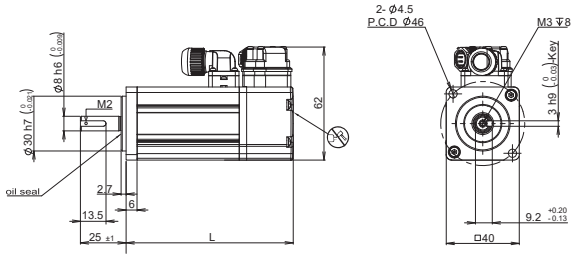
☐ Specifications

Type*		SM3L - 042A ◇☐ D △
Rated Output Power	watts	100
Rated Speed	rpm	3000
Max.Speed	rpm	6000
Rated Torque	N·m	0.32
Peak Torque	N·m	1.28
Rated Current	A (rms)	1.2
Peak Current	A (rms)	5.9
Voltage Constant ± 5%	V (rms) / K rpm	16.8
Torque Constant ± 5%	N·m / A (rms)	0.267
Rotor Inertia	$Kg{\cdot}m^2$	0.038×10^{-4}
Rotor Inertia - With Brake	$Kg{\cdot}m^2$	0.0433×10^{-4}
Shaft Load - Axial	N (max.)	50
Shaft Load - Radial (End of Shaft)	N (max.)	60
Weight	Kg	0.49
Weight - With Brake	Kg	0.73

* ◇ **Encoder Options** ☐ **Brake Options**; △ **Oil Seal Options**

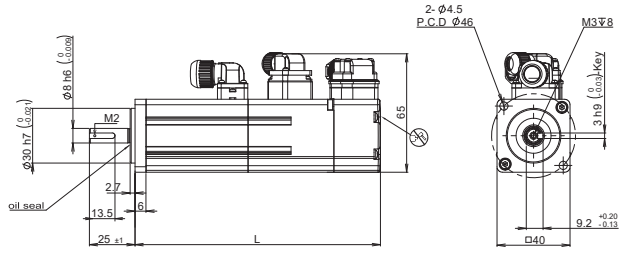
☐ Dimensions (Unit: mm)

1) Without Brake



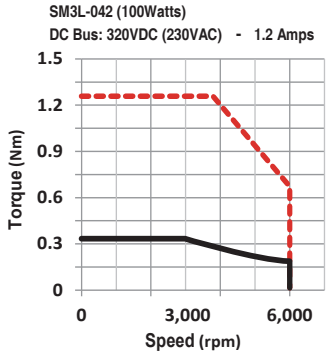
Without Brake	L
SM3L-042A ◇ ND △	91.5

2) With Brake



With Brake	L
SM3L-042A ◇ BD △	134.5

☐ Torque Curves



Max. Intermittent Torque
Max. Continuous Torque

Motor Specification

40mm Frame
High Inertia

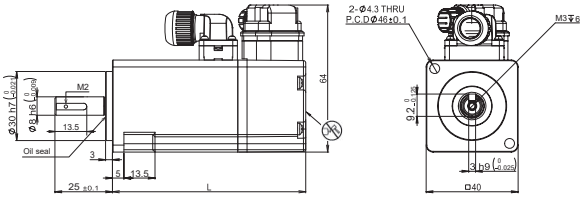
☐ Specifications

Type*		SM3H - 041A ◇☐ P △	SM3H - 042A ◇☐ P △
Rated Output Power	watts	50	100
Rated Speed	rpm	3000	3000
Max.Speed	rpm	6000	6000
Rated Torque	N·m	0.16	0.32
Peak Torque	N·m	0.64	1.28
Rated Current	A (rms)	1.4	1.4
Peak Current	A (rms)	4.8	5.7
Voltage Constant ±5%	V (rms) / K rpm	9.24	14.8
Torque Constant ±5%	N·m / A (rms)	0.277	0.277
Rotor Inertia	$Kg·m^2$	0.0383×10^{-4}	0.0702×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	0.0395×10^{-4}	0.0724×10^{-4}
Shaft Load - Axial	N (max.)	50	50
Shaft Load - Radial (End of Shaft)	N (max.)	60	60
Weight	Kg	0.31	0.42
Weight - With Brake	Kg	0.55	0.66

* ◇ **Encoder Options** ☐ **Brake Options**; △ **Oil Seal Options**

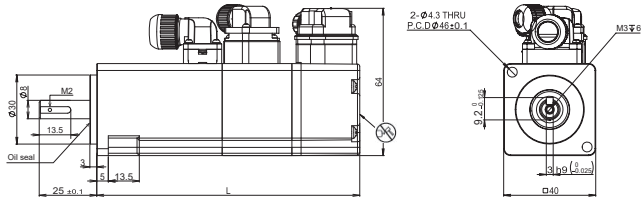
☐ Dimensions (Unit: mm)

1) Without Brake



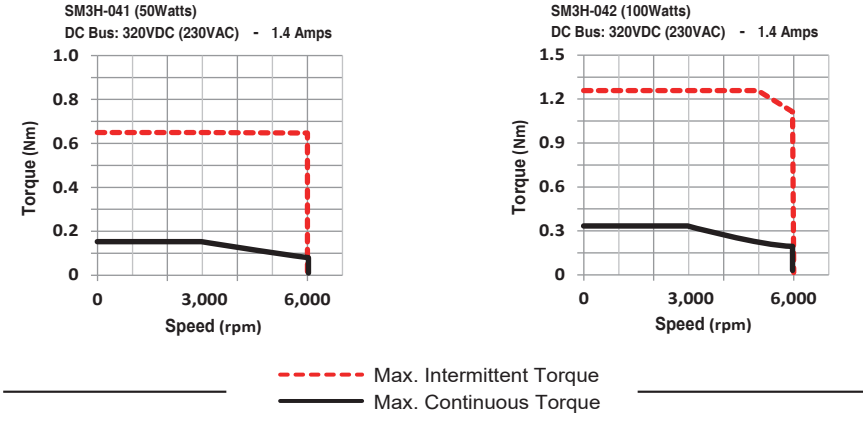
Without Brake	L
SM3H-041A ◇ NP △	70
SM3H-042A ◇ NP △	84

2) With Brake



With Brake	L
SM3H-041 ◇ XBP △	100.3
SM3H-042A ◇ BP △	114.3

☐ Torque Curves



Motor Specification — 60mm Frame Low Inertia

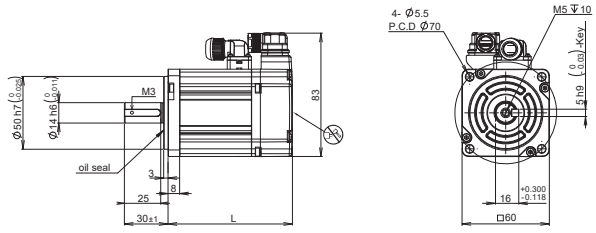
☐ Specifications

Type*		SM3L - 061A ◇☐ P △	SM3L - 062A ◇☐ P △
Rated Output Power	watts	200	400
Rated Speed	rpm	3000	3000
Max.Speed	rpm	6000	6000
Rated Torque	N·m	0.64	1.27
Peak Torque	N·m	1.9	3.8
Rated Current	A (rms)	1.5	2.8
Peak Current	A (rms)	5.4	10
Voltage Constant ± 5%	V (rms) / K rpm	26.5	28.3
Torque Constant ± 5%	N·m / A (rms)	0.427	0.454
Rotor Inertia	$Kg{\cdot}m^2$	0.152×10^{-4}	0.237×10^{-4}
Rotor Inertia - With Brake	$Kg{\cdot}m^2$	0.182×10^{-4}	0.268×10^{-4}
Shaft Load - Axial	N (max.)	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	200	240
Weight	Kg	0.85	1.2
Weight - With Brake	Kg	1.3	1.7

* ◇ **Encoder Options** ☐ **Brake Options**; △ **Oil Seal Options**

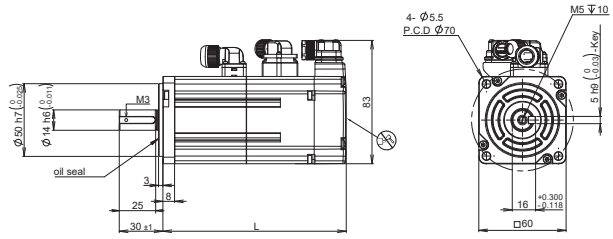
☐ Dimensions (Unit: mm)

1) Without Brake



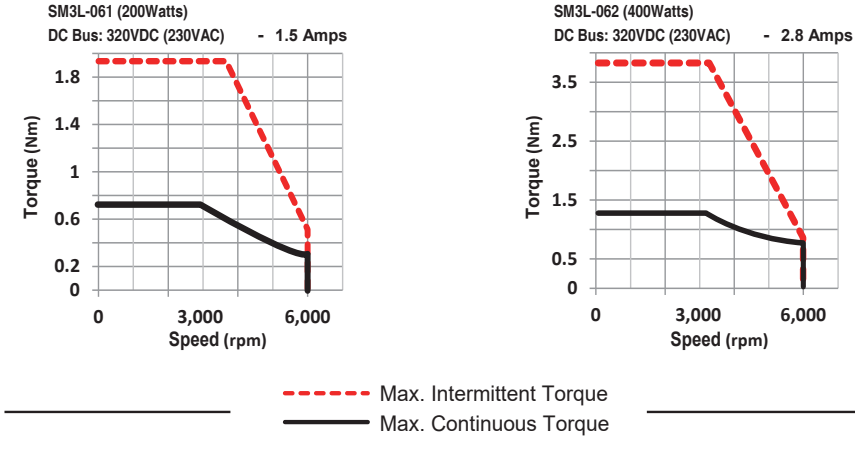
Without Brake	L
SM3L - 061A ◇ NP △	84.5
SM3L - 062A ◇ NP △	103

2) With Brake



With Brake	L
SM3L - 061A ◇ BP △	125
SM3L - 062A ◇ BP △	143.5

☐ Torque Curves



Motor Specification

60mm Frame
High Inertia

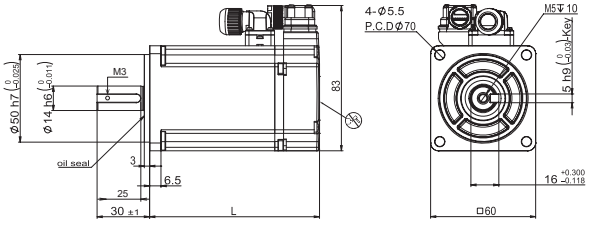
☐ Specifications

Type*		SM3H - 061A ◇☐ P △	SM3H - 062A ◇☐ P △
Rated Output Power	watts	200	400
Rated Speed	rpm	3000	3000
Max.Speed	rpm	6000	6000
Rated Torque	N·m	0.64	1.27
Peak Torque	N·m	2.24	4.445
Rated Current	A (rms)	1.7	2.8
Peak Current	A (rms)	5.9	9.8
Voltage Constant ±5%	V (rms) / K rpm	24.3	28.9
Torque Constant ±5%	N·m / A (rms)	0.376	0.423
Rotor Inertia	$Kg·m^2$	0.31×10^{-4}	0.566×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	0.32×10^{-4}	0.62×10^{-4}
Shaft Load - Axial	N (max.)	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	200	240
Weight	Kg	0.79	1.2
Weight - With Brake	Kg	1.15	1.5

* ◇ **Encoder Options** ☐ **Brake Options**; △ **Oil Seal Options**

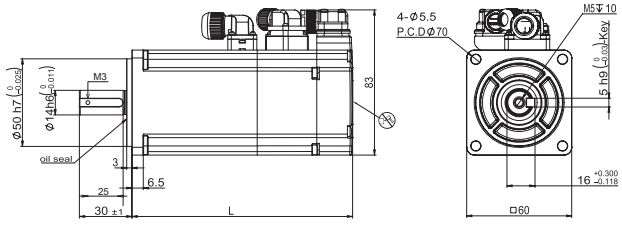
☐ Dimensions (Unit: mm)

1) Without Brake



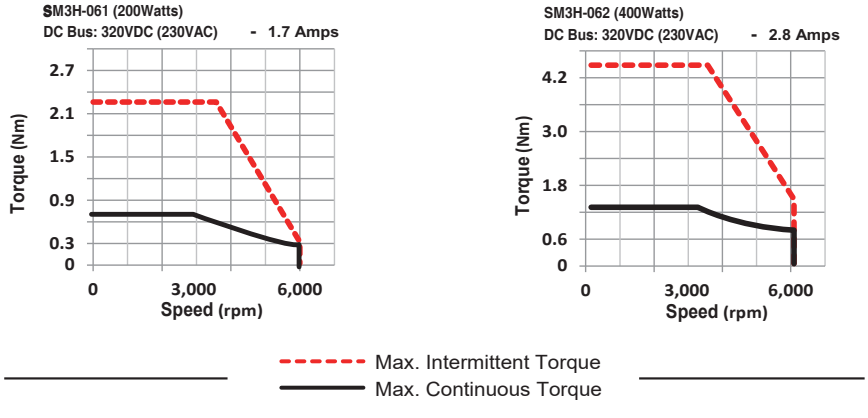
Without Brake	L
SM3H-061A ◇ NP △	77
SM3H-062A ◇ NP △	97

2) With Brake



With Brake	L
SM3H-061A ◇ BP △	106
SM3H-062A ◇ BP △	126

☐ Torque Curves



Motor Specification — 80mm Frame Low Inertia

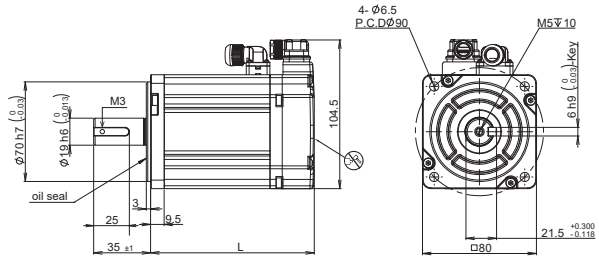
☐ Specifications

Type*		SM3L - 083A ◇☐ P △	SM3L - 084A ◇☐ P △
Rated Output Power	watts	750	1000
Rated Speed	rpm	3000	3000
Max.Speed	rpm	6000	6000
Rated Torque	N·m	2.4	3.2
Peak Torque	N·m	6.7	9.6
Rated Current	A (rms)	4.5	5.6
Peak Current	A (rms)	14	19
Voltage Constant ± 5%	V (rms) / K rpm	33.9	36.65
Torque Constant ± 5%	N·m / A (rms)	0.533	0.63
Rotor Inertia	$Kg{\cdot}m^2$	0.829×10^{-4}	1.01×10^{-4}
Rotor Inertia - With Brake	$Kg{\cdot}m^2$	0.961×10^{-4}	1.12×10^{-4}
Shaft Load - Axial	N (max.)	90	90
Shaft Load - Radial (End of Shaft)	N (max.)	270	270
Weight	Kg	2.29	2.77
Weight - With Brake	Kg	3.1	3.62

* ◇ **Encoder Options** ☐ **Brake Options**; △ **Oil Seal Options**

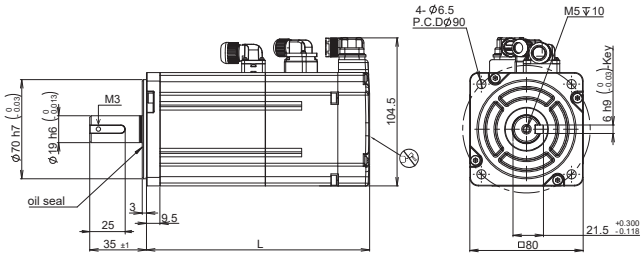
☐ Dimensions (Unit: mm)

1) Without Brake



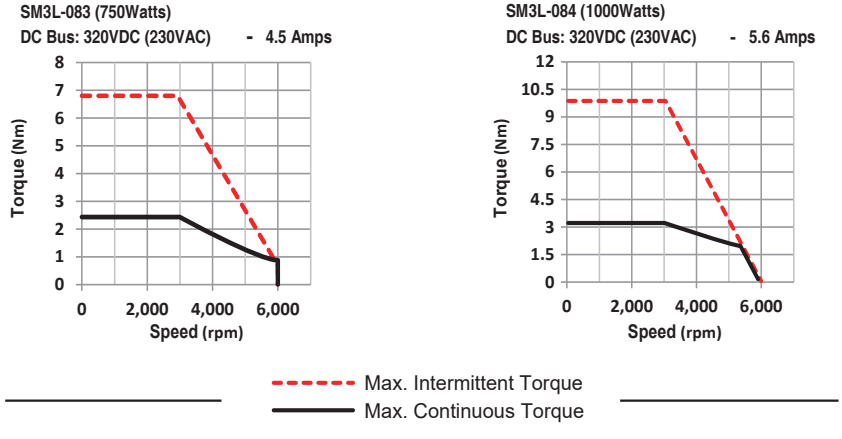
Without Brake	L
SM3L-083A ◇ NP △	115
SM3L-084A ◇ NP △	129

2) With Brake



With Brake	L
SM3L-083A ◇ BP △	157
SM3L-084A ◇ BP △	171

☐ Torque Curves



Motor Specification

80mm Frame
High Inertia

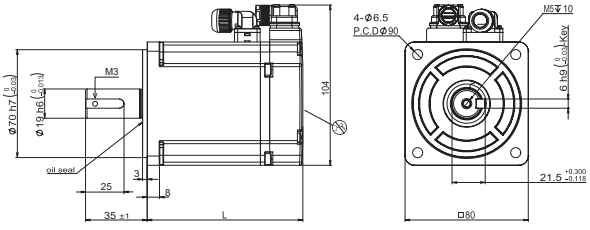
☐ Specifications

Type*		SM3H - 083A ◇☐ P △	SM3H - 084A ◇☐ P △
Rated Output Power	watts	750	1000
Rated Speed	rpm	3000	3000
Max.Speed	rpm	6000	6000
Rated Torque	N·m	2.4	3.2
Peak Torque	N·m	8.4	11.2
Rated Current	A (rms)	4.5	5.9
Peak Current	A (rms)	16.7	20.5
Voltage Constant ±5%	V (rms) / K rpm	32.3	33
Torque Constant ±5%	N·m / A (rms)	0.53	0.55
Rotor Inertia	$Kg·m^2$	1.46×10^{-4}	1.82×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	1.63×10^{-4}	1.96×10^{-4}
Shaft Load - Axial	N (max.)	90	90
Shaft Load - Radial (End of Shaft)	N (max.)	270	270
Weight	Kg	2.1	2.65
Weight - With Brake	Kg	2.85	3.2

* ◇ **Encoder Options** ☐ **Brake Options**; △ **Oil Seal Options**

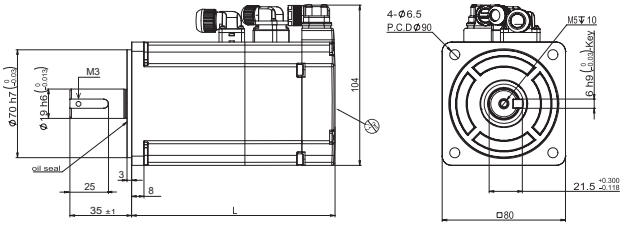
☐ Dimensions (Unit: mm)

1) Without Brake



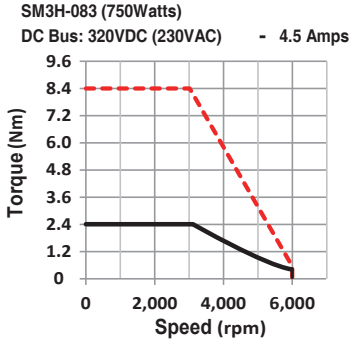
Without Brake	L
SM3H-083A ◇ NP △	101
SM3H-084A ◇ NP △	115

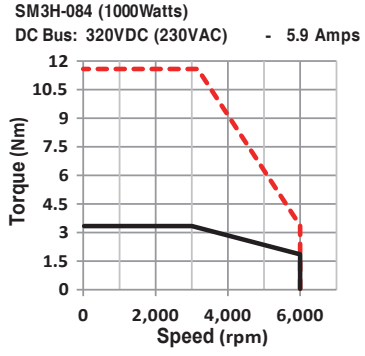
2) With Brake



With Brake	L
SM3H-083A ◇ BP △	132
SM3H-084A ◇ BP △	146

☐ Torque Curves





Max. Intermittent Torque
Max. Continuous Torque

Motor Specification

100mm Frame
Low Inertia

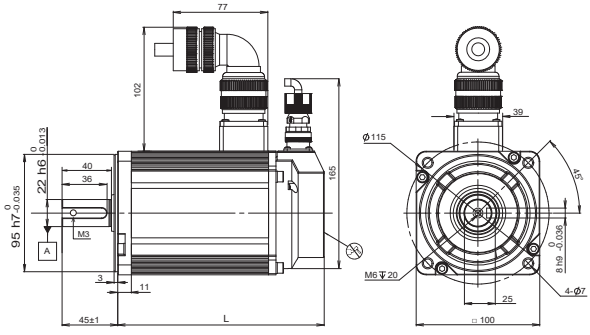
☐ Specifications

Type*		SM3L - 102A ◇☐ U △
Rated Output Power	watts	1000
Rated Speed	rpm	3000
Max.Speed	rpm	6000
Rated Torque	N·m	3.2
Peak Torque	N·m	9.6
Rated Current	A (rms)	6.0
Peak Current	A (rms)	21
Voltage Constant ± 5%	V (rms) / K rpm	33
Torque Constant ± 5%	N·m / A (rms)	0.543
Rotor Inertia	$Kg·m^2$	1.79×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	2.67×10^{-4}
Shaft Load - Axial	N (max.)	90
Shaft Load - Radial (End of Shaft)	N (max.)	270
Weight	Kg	4
Weight - With Brake	Kg	5.2

* ◇ **Encoder Options** ☐ **Brake Options**; △ **Oil Seal Options**

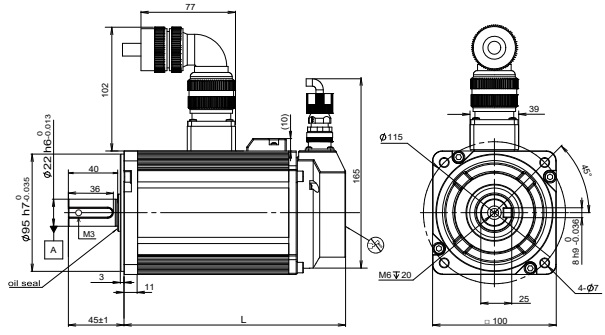
☐ Dimensions (Unit: mm)

1) Without Brake



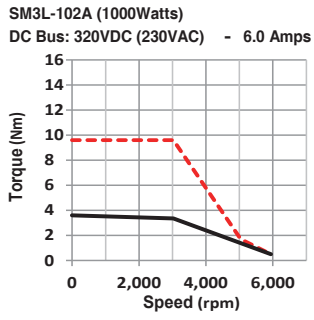
Without Brake	L
SM3L-102A ◇ NU △	137

2) With Brake



With Brake	L
SM3L-102A ◇ BU △	179

☐ Torque Curves



Max. Intermittent Torque
Max. Continuous Torque

Motor Specification

130mm Frame
Medium, High Inertia

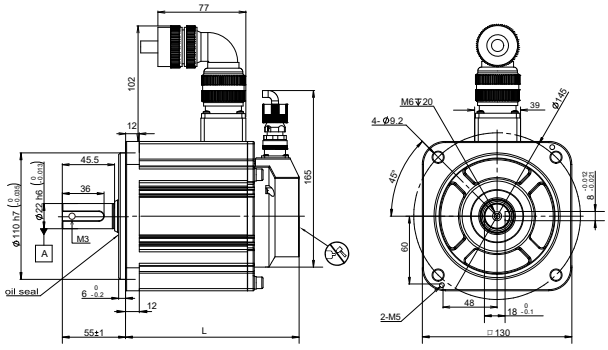
☐ Specifications

Type*		SM3H - 132A ◇☐ U △	SM3M - 132A ◇☐ U △
Rated Output Power	watts	850	1000
Rated Speed	rpm	1500	2000
Max.Speed	rpm	3000	3000
Rated Torque	N·m	5.39	4.77
Peak Torque	N·m	16.2	14.3
Rated Current	A (rms)	6	5.4
Peak Current	A (rms)	19	16.9
Voltage Constant ± 5%	V (rms) / K rpm	55.3	55.3
Torque Constant ± 5%	N·m / A (rms)	0.891	0.883
Rotor Inertia	$Kg{\cdot}m^2$	13×10^{-4}	13×10^{-4}
Rotor Inertia - With Brake	$Kg{\cdot}m^2$	15.2×10^{-4}	15.2×10^{-4}
Shaft Load - Axial	N (max.)	196	196
Shaft Load - Radial (End of Shaft)	N (max.)	490	490
Weight	Kg	5.92	5.33
Weight - With Brake	Kg	7.84	7.25

* ◇ **Encoder Options** ☐ **Brake Options**; △ **Oil Seal Options**

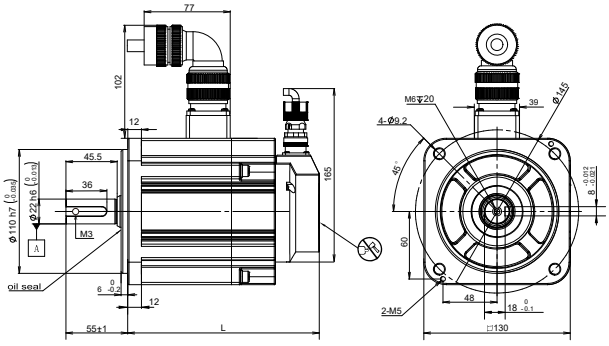
☐ Dimensions (Unit: mm)

1) Without Brake



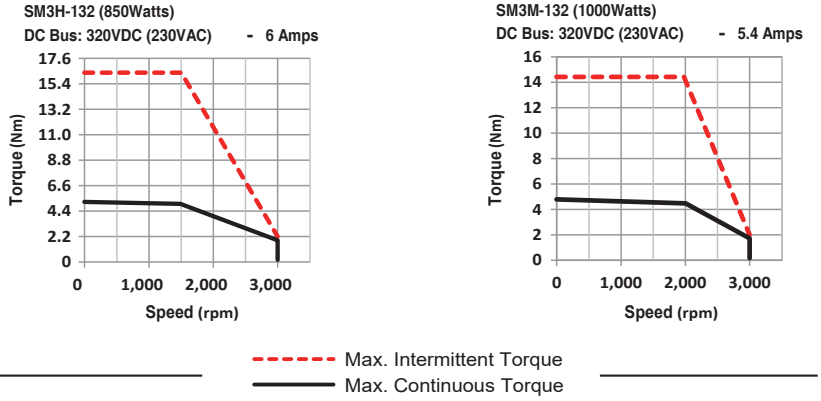
Without Brake	L
SM3H-132A ◇ NU △	138
SM3M-132A ◇ NU △	138

2) With Brake



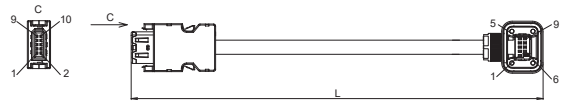
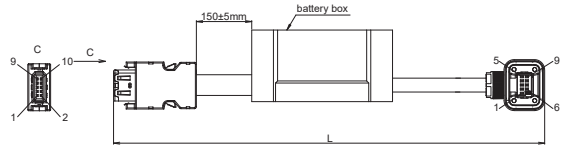
With Brake	L
SM3H-132A ◇ BU △	171
SM3M-132A ◇ BU △	171

☐ Torque Curves



Accessories

Encoder Cables
For 40mm, 60mm, 80mm Frame Size Motor

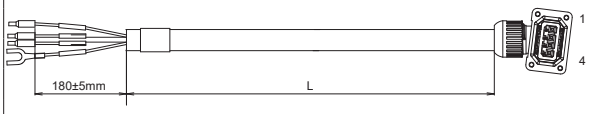
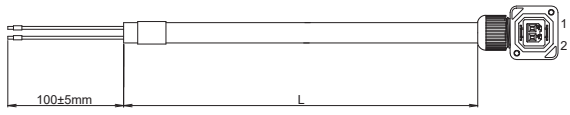
Model*	Length(L)	Description	For Servo Motor*	Outline
2640-0100	1m	Encoder Cables Incremental Encoder Standard Shielded	SM3L-042A ◇□ D △ SM3L-061A ◇□ P △ SM3L-062A ◇□ P △ SM3L-083A ◇□ P △ SM3L-084A ◇□ P △	
2640-0200	2m			
2640-0300	3m			
2640-0400	4m			
2640-0500	5m			
2640-0800	8m			
2640-1000	10m			
2640-1500	15m			
2640-2000	20m			
2640-0100-C10	1m	Encoder Cables Incremental Encoder Flexible Shielded		
2640-0200-C10	2m			
2640-0300-C10	3m			
2640-0400-C10	4m			
2640-0500-C10	5m			
2640-0800-C10	8m			
2640-1000-C10	10m			
2640-1500-C10	15m			
2640-2000-C10	20m			
2639-0100	1m	Encoder Cables With Battery Absolute Encoder Standard Shielded	SM3H-041A ◇□ P △ SM3H-042A ◇□ P △ SM3H-061A ◇□ P △ SM3H-062A ◇□ P △ SM3H-083A ◇□ P △ SM3H-084A ◇□ P △	
2639-0200	2m			
2639-0300	3m			
2639-0400	4m			
2639-0500	5m			
2639-0800	8m			
2639-1000	10m			
2639-1500	15m			
2639-2000	20m			
2639-0100-C10	1m	Encoder Cables With Battery Absolute Encoder Flexible Shielded		
2639-0200-C10	2m			
2639-0300-C10	3m			
2639-0400-C10	4m			
2639-0500-C10	5m			
2639-0800-C10	8m			
2639-1000-C10	10m			
2639-1500-C10	15m			
2639-2000-C10	20m			

*** ◇ Encoder Options □ Brake Options △ Oil Seal Options**

*** Flexible -C10 10 million times**
Test Conditions: Bend Radius 50mm, Frequency 40 times/min, Distance 1000mm

Accessories

Motor Power Cables, Motor Brake Cables
For 40mm, 60mm, 80mm Frame Size Motor

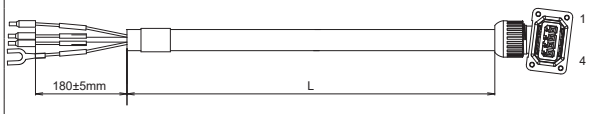
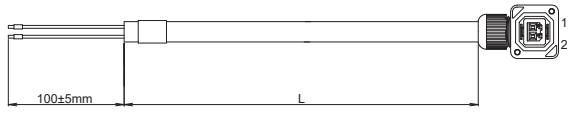
Model*	Length(L)	Description	For Servo Motor*	Outline
1672-0100	1m	Motor Cables Standard Unshielded	SM3L-042A ◇☐ D △ SM3L-061A ◇☐ P △ SM3L-062A ◇☐ P △ SM3L-083A ◇☐ P △ SM3L-084A ◇☐ P △	
1672-0200	2m			
1672-0300	3m			
1672-0400	4m			
1672-0500	5m			
1672-0800	8m			
1672-1000	10m			
1672-1500	15m			
1672-2000	20m			
1672-0100-C10	1m	Motor Cables Flexible Unshielded	SM3H-041A ◇☐ P △ SM3H-042A ◇☐ P △ SM3H-061A ◇☐ P △ SM3H-062A ◇☐ P △ SM3H-083A ◇☐ P △ SM3H-084A ◇☐ P △	
1672-0200-C10	2m			
1672-0300-C10	3m			
1672-0400-C10	4m			
1672-0500-C10	5m			
1672-0800-C10	8m			
1672-1000-C10	10m			
1672-1500-C10	15m			
1672-2000-C10	20m			
1674-0100	1m	Brake Cables Standard Unshielded	SM3L-042A ◇ BD △ SM3L-061A ◇ BP △ SM3L-062A ◇ BP △ SM3L-083A ◇ BP △ SM3L-084A ◇ BP △	
1674-0200	2m			
1674-0300	3m			
1674-0400	4m			
1674-0500	5m			
1674-0800	8m			
1674-1000	10m			
1674-1500	15m			
1674-2000	20m			
1674-0100-C10	1m	Brake Cables Flexible Unshielded	SM3H-041A ◇ BP △ SM3H-042A ◇ BP △ SM3H-061A ◇ BP △ SM3H-062A ◇ BP △ SM3H-083A ◇ BP △ SM3H-084A ◇ BP △	
1674-0200-C10	2m			
1674-0300-C10	3m			
1674-0400-C10	4m			
1674-0500-C10	5m			
1674-0800-C10	8m			
1674-1000-C10	10m			
1674-1500-C10	15m			
1674-2000-C10	20m			

*** ◇ Encoder Options ☐ Brake Options △ Oil Seal Options**

*** Flexible -C10 10 million times**
Test Conditions: Bend Radius 50mm, Frequency 40 times/min, Distance 1000mm

Accessories

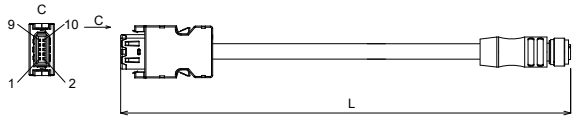
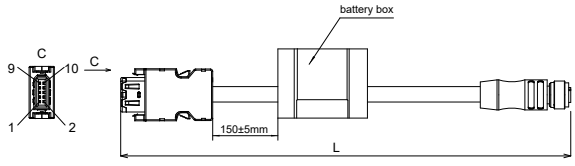
Motor Power Cables, Motor Brake Cables
For 40mm, 60mm, 80mm Frame Size Motor

Model*	Length(L)	Description	For Servo Motor*	Outline
1672-0100-S	1m	Motor Cables Standard Shielded	SM3L-042A ◇□ D △ SM3L-061A ◇□ P △ SM3L-062A ◇□ P △ SM3L-083A ◇□ P △ SM3L-084A ◇□ P △	
1672-0200-S	2m			
1672-0300-S	3m			
1672-0400-S	4m			
1672-0500-S	5m			
1672-0800-S	8m			
1672-1000-S	10m			
1672-1500-S	15m			
1672-2000-S	20m			
1672-0100-C10-S	1m	Motor Cables Flexible Shielded	SM3H-041A ◇□ P △ SM3H-042A ◇□ P △ SM3H-061A ◇□ P △ SM3H-062A ◇□ P △ SM3H-083A ◇□ P △ SM3H-084A ◇□ P △	
1672-0200-C10-S	2m			
1672-0300-C10-S	3m			
1672-0400-C10-S	4m			
1672-0500-C10-S	5m			
1672-0800-C10-S	8m			
1672-1000-C10-S	10m			
1672-1500-C10-S	15m			
1672-2000-C10-S	20m			
1674-0100-S	1m	Brake Cables Standard Shielded	SM3L-042A ◇ BD △ SM3L-061A ◇ BP △ SM3L-062A ◇ BP △ SM3L-083A ◇ BP △ SM3L-084A ◇ BP △	
1674-0200-S	2m			
1674-0300-S	3m			
1674-0400-S	4m			
1674-0500-S	5m			
1674-0800-S	8m			
1674-1000-S	10m			
1674-1500-S	15m			
1674-2000-S	20m			
1674-0100-C10-S	1m	Brake Cables Flexible Shielded	SM3H-041A ◇ BP △ SM3H-042A ◇ BP △ SM3H-061A ◇ BP △ SM3H-062A ◇ BP △ SM3H-083A ◇ BP △ SM3H-084A ◇ BP △	
1674-0200-C10-S	2m			
1674-0300-C10-S	3m			
1674-0400-C10-S	4m			
1674-0500-C10-S	5m			
1674-0800-C10-S	8m			
1674-1000-C10-S	10m			
1674-1500-C10-S	15m			
1674-2000-C10-S	20m			

*** ◇ Encoder Options □ Brake Options △ Oil Seal Options**

*** Flexible -C10 10 million times**
Test Conditions: Bend Radius 50mm, Frequency 40 times/min, Distance 1000mm

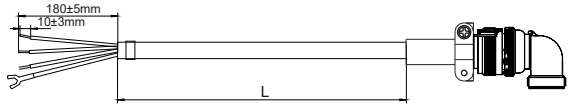
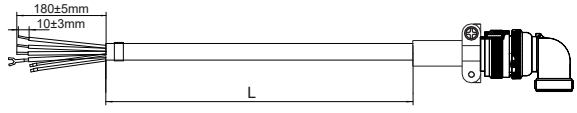
Encoder Cables (Straight Plug)
For 100mm, 130mm Frame Size Motor

Model*	Length(L)	Description	For Servo Motor*	Outline
2643-0100	1m	Encoder Cables Incremental Encoder Standard Shielded	SM3L-102A ◇□ U △ SM3M-132A ◇□ U △ SM3H-132A ◇□ U △	
2643-0300	3m			
2643-0500	5m			
2643-1000	10m			
2643-1500	15m			
2643-2000	20m			
2643-0100-C10	1m	Encoder Cables Incremental Encoder Flexible Shielded		
2643-0300-C10	3m			
2643-0500-C10	5m			
2643-1000-C10	10m			
2643-1500-C10	15m			
2643-2000-C10	20m			
2642-0100	1m	Encoder Cables With Battery Absolute Encoder Standard Shielded		
2642-0300	3m			
2642-0500	5m			
2642-1000	10m			
2642-1500	15m			
2642-2000	20m			
2642-0100-C10	1m	Encoder Cables With Battery Absolute Encoder Flexible Shielded		
2642-0300-C10	3m			
2642-0500-C10	5m			
2642-1000-C10	10m			
2642-1500-C10	15m			
2642-2000-C10	20m			

* ◇ **Encoder Options** □ **Brake Options** △ **Oil Seal Options**
* **Flexible -C10 10 million times**
  Test Conditions: Bend Radius 50mm, Frequency 40 times/min, Distance 1000mm

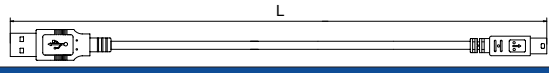
Accessories

Motor Power Cables (Angled Plug)
For 100mm Frame Size 1.0kW Motor; 130mm Frame Size 0.85/1.0kW Motor

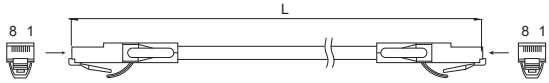
Model*	Length(L)	Description	For Servo Motor*	Outline
1658-0100	1m	Motor Cables Standard Unshielded	SM3L-102A ◇ NU △ SM3M-132A ◇ NU △ SM3H-132A ◇ NU △	
1658-0300	3m			
1658-0500	5m			
1658-1000	10m			
1658-1500	15m			
1658-2000	20m			
1658-0100-S	1m	Motor Cables Standard Shielded		
1658-0300-S	3m			
1658-0500-S	5m			
1658-1000-S	10m			
1658-1500-S	15m			
1658-2000-S	20m			
1658-0100-C10	1m	Motor Cables Flexible Unshielded		
1658-0300-C10	3m			
1658-0500-C10	5m			
1658-1000-C10	10m			
1658-1500-C10	15m			
1658-2000-C10	20m			
1658-0100-C10-S	1m	Motor Cables Flexible Shielded		
1658-0300-C10-S	3m			
1658-0500-C10-S	5m			
1658-1000-C10-S	10m			
1658-1500-C10-S	15m			
1658-2000-C10-S	20m			
1660-0100	1m	Motor Cables With Built-in Brake Cable Standard Unshielded	SM3L-102A ◇ BU △ SM3M-132A ◇ BU △ SM3H-132A ◇ BU △	
1660-0300	3m			
1660-0500	5m			
1660-1000	10m			
1660-1500	15m			
1660-2000	20m			
1660-0100-S	1m	Motor Cables With Built-in Brake Cable Standard Shielded		
1660-0300-S	3m			
1660-0500-S	5m			
1660-1000-S	10m			
1660-1500-S	15m			
1660-2000-S	20m			
1660-0100-C10	1m	Motor Cables With Built-in Brake Cable Flexible Unshielded		
1660-0300-C10	3m			
1660-0500-C10	5m			
1660-1000-C10	10m			
1660-1500-C10	15m			
1660-2000-C10	20m			
1660-0100-C10-S	1m	Motor Cables With Built-in Brake Cable Flexible Shielded		
1660-0300-C10-S	3m			
1660-0500-C10-S	5m			
1660-1000-C10-S	10m			
1660-1500-C10-S	15m			
1660-2000-C10-S	20m			

* ◇ **Encoder Options** □ **Brake Options** △ **Oil Seal Options**
* **Flexible -C10 10 million times**
Test Conditions: Bend Radius 50mm, Frequency 40 times/min, Distance 1000mm

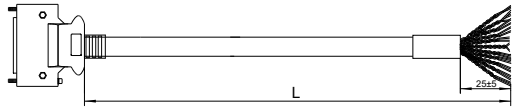
USB Cable

Model	Length (L)	Description	Outline
2620-150	1.5m	USB configuration cable connect with PC	

CN6/CN7 Communication Daisy Chain Cable

Model	Length (L)	Description	Outline
2013-030	0.3m	Twisted-pair, Shielded type	
2013-300	3m		

IO Connector, I/O Signal Cable

Model	Length (L)	Description	Outline
1644-100	1m	CN2 50pin high density I/O cable Shielded type	
1644-200	2m		
1644-300	3m		
M2-50P	-	CN2 50pin high density I/O connector	
MSOP-CN214P	-	CN2 14pin push-in spring I/O connector	

Motor Encoder Connector (Drive Side)

Model	Length (L)	Description	Outline
MSOP-CN310P	-	CN3 Motor encoder connector	

EMI Filter

Model	Specification	Description	Outline
MSOP-EMI020	250VAC，20A	EMI filter for AC power of drive side	-

Absolute Encoder System Battery Kit

Model	Specification	Description	Outline
MSOP-BA01	Battery	For motor with battery absolute encoder	-
MSOP-BAKIT01	Batteries and battery cases		

External Regenerative Resistor

Model	Specification	Description	Outline
REG100W120R	100W，120Ω	Regenerative absorbing resistor	-
REG200W120R	200W，120Ω		
REG300W120R	300W，120Ω		

Drive Connector Kit

Model	Description	Outline
MSOP-P109P	P1 Power Connector, JST handle lever	-

Motor Connector Kit (Motor Side)

Model	Description	Outline
MSOP-MTKITA	80mm and lower frame size motor (without brake connector)	-
MSOP-MTKITD	80mm and lower frame size motor (with brake connector)	
MSOP-MTKITF	100mm/130mm frame size motor (angle plug type)	

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