Applied Motion Products
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M5 6S AC SERVO SYSTEM

FUNCTIONAL SAFETY
UL LISTED

Applied Motion Products
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M5 6S SERIES

High Performance AC Servo System

Drive Specification		Motor Specification	
Supply Voltage	Rated Current (Arms)	Frame Size (mm)	Rated Power
220VAC	1.8, 3, 4.5, 6, 10, 13	40, 60, 80, 100, 130	50W ~ 2.5kW
400VAC	13, 17, 21, 26	130, 180	850W ~ 7.5kW

Application

M5 Servo System is widely used in solar processing equipment, battery processing equipment, semiconductor equipment, medical equipment, industrial robots, custom equipment etc.

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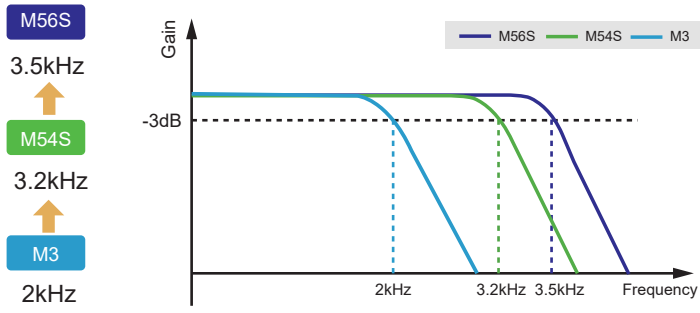
Superior Performance

High Response Frequency

Based on advanced motion control algorithms, the velocity loop bandwidth is up to 3.5kHz, faster instruction tracking and shorter positioning time.

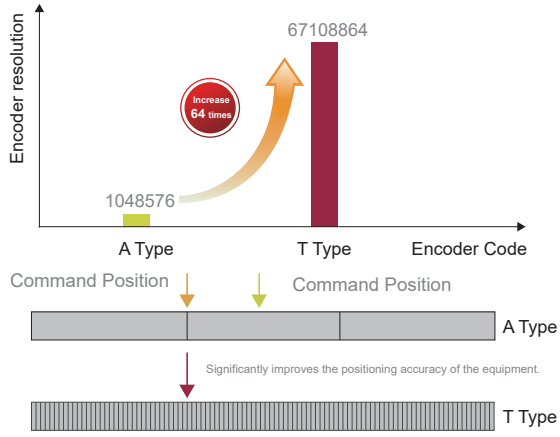


High Precision Positioning

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

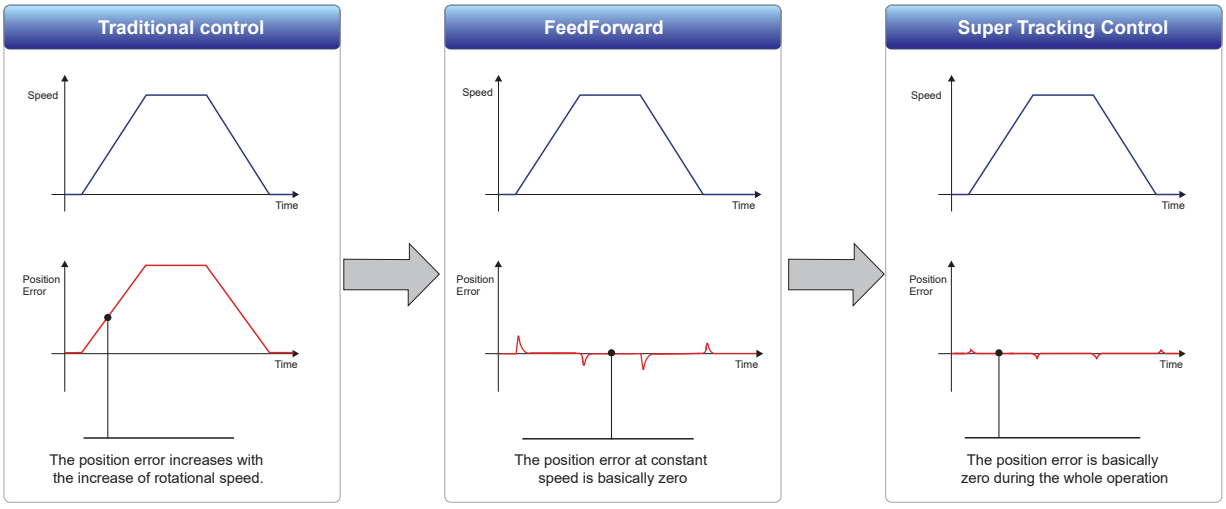
■ 26-bit Absolute Multi-turn Optical Encoder
- ◆ High resolution, up to 67,108,864 divisions pre revolution
- ◆ Optional battery backup for 16-bit multi-turn

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



Super Tracking

Using the super tracking control function, the motor not only runs at a constant speed, the following error is basically zero, and the following error is also close to zero during acceleration and deceleration, improving the trajectory accuracy of high-rigidity equipment.



Easy Set-up

For M56S servo system, our commitment is to improve your work efficiency on every step of the way, from system installation, tuning and maintenance.

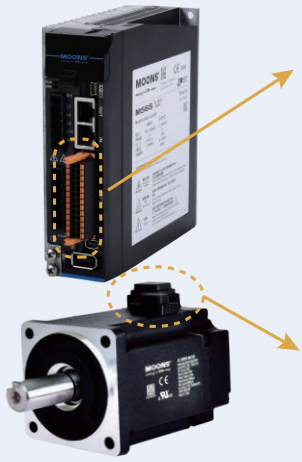
Unpacking

Wiring

Tuning

Commissioning

Easy wiring



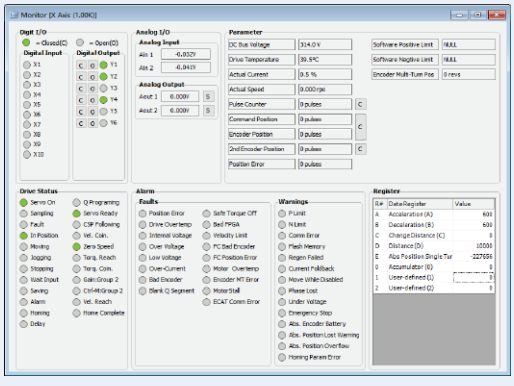
- Spring type I/O and power connector
- Plug-in type IP67 protection level connector

Easy tuning

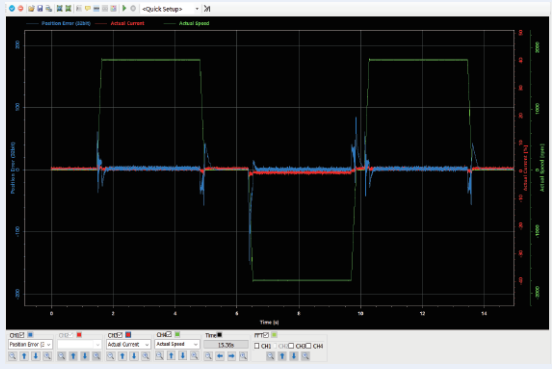
- High speed USB communication between Luna software and drive
- The drive automatically recognizes motors with smart encoder
- Both auto-tuning and tuning-less adjustment function are available
- Stable and smooth operation without complicated gain setting

Friendly software

- Operating Status Monitor



- Real-time Oscilloscope Interface

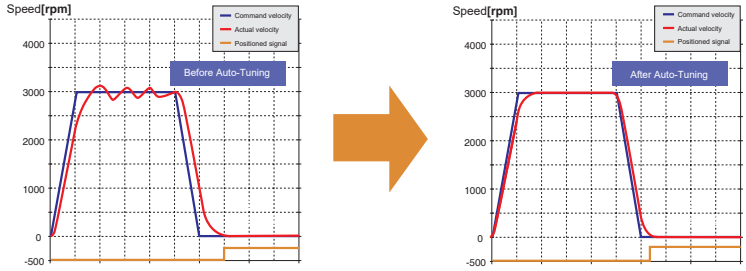


Easy Tuning

Auto-tuning

The real-time 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.

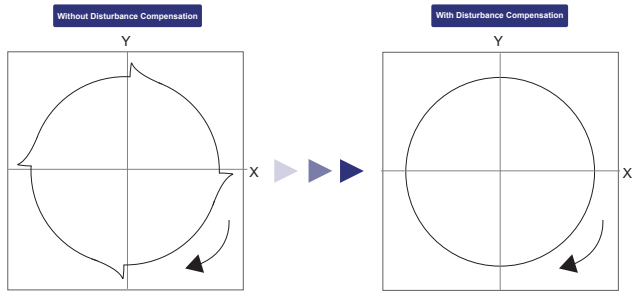
- ◆ No limitation towards any load type and drive control mode.
- ◆ High robustness for maximum control of servo system stability.



External Disturbance Compensation

The external 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 track accuracy in multi-axis synchronous control.

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

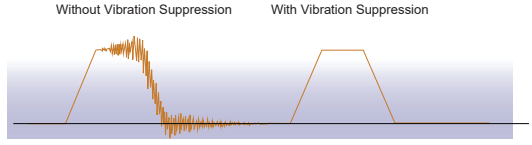


Quadrant protrusion phenomenon in simulating arc trajectories

Notch Filters

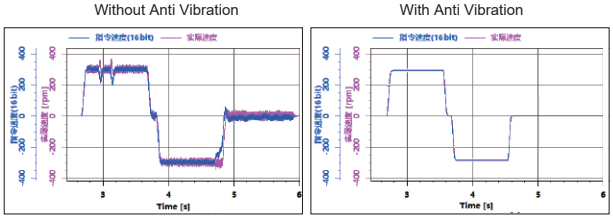
M56S series supply there are 4 notch filters available for suppress mechanical vibration. Filtering frequency range is 100 ~ 4000Hz.

- ◆ 2 sets of automatically set notch filters can search and set resonance frequency automatically.
- ◆ 2 sets of manual notch filters for more adjust options.



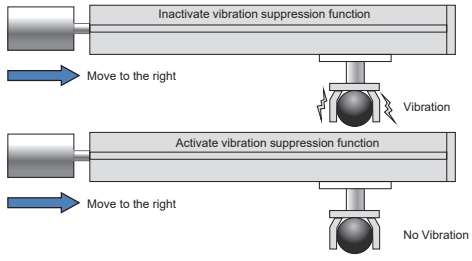
Novel Resonance Suppression

The new resonance suppression function of the M56S series products can effectively suppress the low-frequency vibration caused by the resonance of 100 ~ 1000Hz.



Mechanical End Vibration Suppression

Vibration at the end of the machine will lead to longer system setting time, resulting in the decrease of product precision or production efficiency. M56S servo can suppress vibrations at the end of the machine, shortening tuning time, increasing the system precision and productivity.

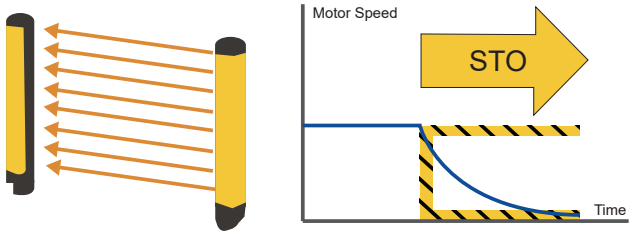


Reliable operation

STO Function Safety

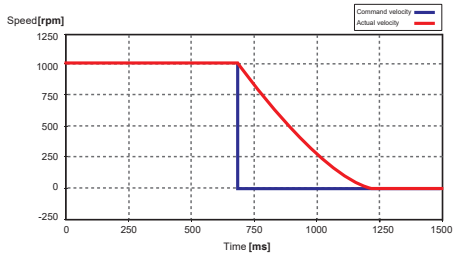
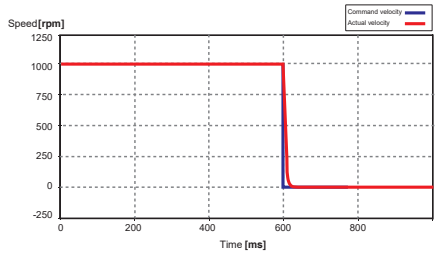
Safe Torque Off (STO) is a hardware level safety protection function. When the STO function is activated, the ability to drive motor current is cut-off. In case of an emergency, this operator can protect human and equipment safety while the drive is continuously powered.

M56S series drive meets UL61800-5-2(SIL 3)，IEC61508(SIL 3)，ISO138491(PL e).



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.

Without Dynamic brake	With Dynamic brake
	
Without Dynamic brake The drive will disable, decelerate and free stop uncontrollable while a fault occurs. The deceleration time and distance are determined by the system inertia and friction.	**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.

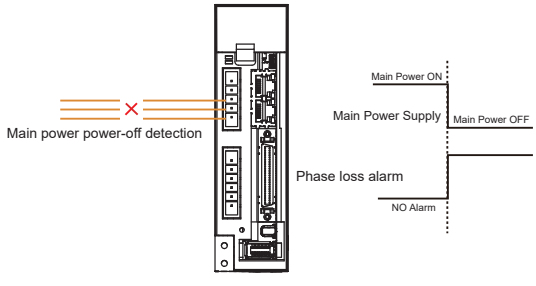
Built-in Regenerative Absorbing Resistor

All M56S drives have built-in regenerative absorbing resistor, it can consume the regenerative energy generated when the motor and load decelerate rapidly, make sure the servo system can stop quickly and operate reliably.

No additional absorbing resistor is required for most applications.

Main Power Power-off & Phase Loss Detection

The power source is monitored during the operation process, it detects whether the main power power-off or phase loss, and provides faster protection measures for the servo system that fail caused by sudden power failure.



What's NEW

Various Product Lineup

- Power Rating: 50W ~ 7.5kW
- Frame Size: 40/60/80/100/130/180mm
- Low / Medium / High Inertia Servo Motor

Low, Medium, High Inertia Servo Motor

The SM3 series of servo motors with the same power provide a variety of moment of inertia options, choosing the right motor is conducive to optimizing the inertia ratio of load to motor and improving mechanical performance.

Widely used in solar, battery, semiconductor, electronics, medical, logistics and other industries.

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 ◆ Large inertia load ◆ Stability improvement during high-speed operation	Suitable for large inertia load ◆ Large inertia belt load ◆ Low speed and high torque ◆ Turntable with a large moment of inertia

Various Encoder Motor

SM3 series servo motors can be equipped with a variety of encoders, according to the needs of the application, choosing the right encoder motor can improve the performance of the equipment and optimize the system cost.

26-bit Absolute Single/Multi-turn Optical Encode

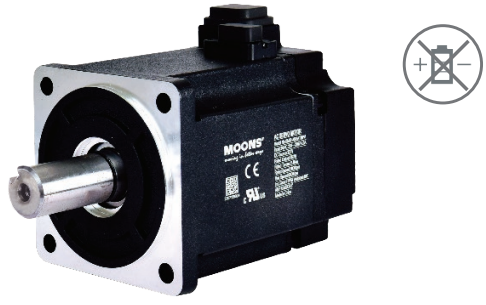
- High resolution, up to 67,108,864 divisions pre revolution
- Optional battery backup for 16-bit multi-turn

21-bit Absolute Single/Multi-turn magnetic Encode

- High resolution, up to 2,097,152 divisions pre revolution
- Optional battery backup for 16-bit multi-turn
- Strong vibration resistance
- Resistant to dust and oil stains
- Anti condensation

17-bit Battery-less Absolute Single/Multi-turn Encoder

- High resolution, up to 131,072 divisions pre revolution
- Battery-less for 16-bit multi-turn
- There is no need to worry about the treatment of lithium metal batteries by sea and air when the equipment is transported



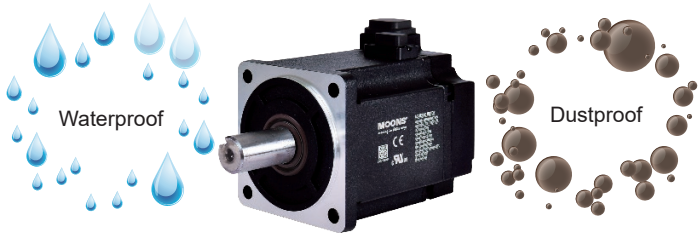
Smaller Size and Higher Efficiency

The servo motor adopts a new structure and magnetic circuit design, making the motor smaller and higher power density; At the same time, the electromagnetic scheme is optimized to improve the efficiency of the servo motor and reduce the heating.

IP67 Protection Level

The SM3 series servo motors meets the IP67 protection level , are designed to protect against water and dust (Except transfixion part of shaft).

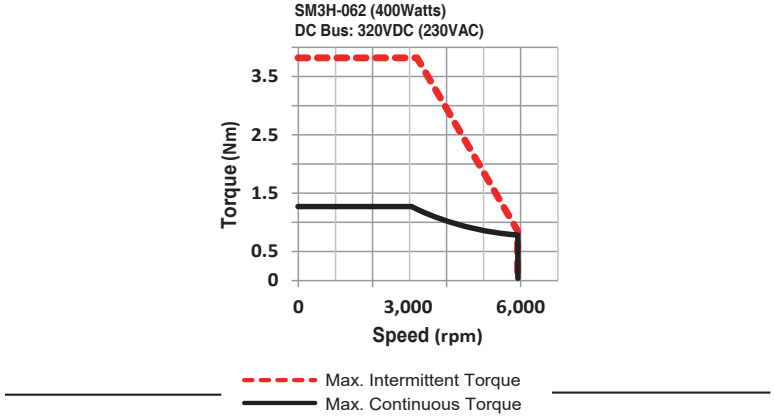
If the transfixion part of shaft needs to meet the IP67 protection level, please install the oil seal or select the servo motor model with oil seal.



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

High Speed Motor with 350% of Rated Torque

- The maximum speed of SM3 series servo motor is 6000rpm.
- 350% peak torque is conducive to providing higher acceleration and deceleration, leading to better manufacture efficiency and capacity.



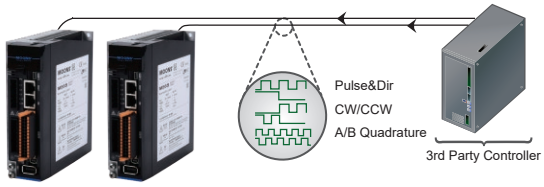
Digital Pulse Position Modes

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

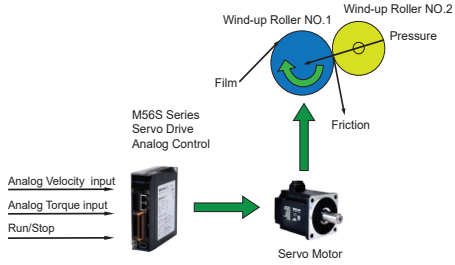


Analog Input / Output Control Modes

Certain models have two analog inputs and two analog outputs.

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

-10V ~ +10V analog outputs can be used to monitor the speed and torque of motor.



Built-in Software PLC — Q Program

Q Programmer is Applied Motions' 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:

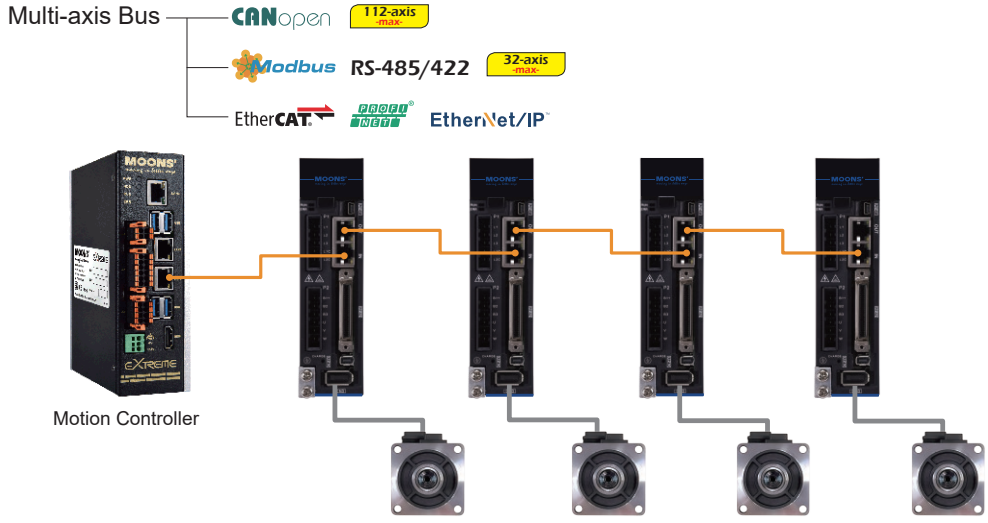
- Motion control commands (relative position, absolute position,homing mode, etc.)
- Multi-tasking
- Conditional Processing (external I/O, internal command)
- Math Calculation (+, -, *, /, &, or)
- Data register manipulation
- Logic motion commands (loop, call functions)

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

Field Bus Control

M56S servo system support various of industrial field bus options such as EtherCAT, CANopen, Modbus/RTU, Modbus/TCP, EtherNet/IP and Profinet.

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



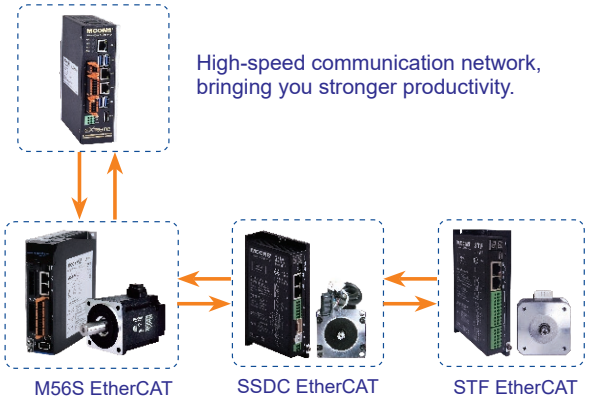
Various of Field Bus

EtherCAT

High Speed, High Efficient

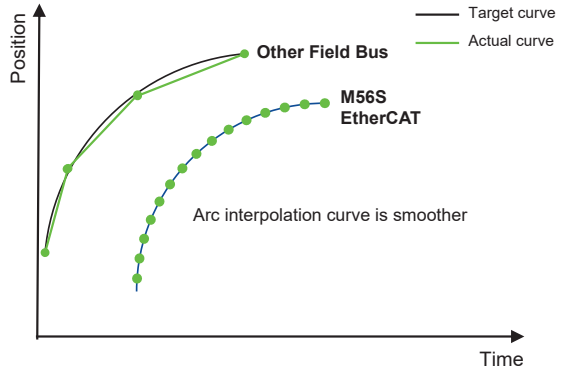
Full duplex, communication baud rate 100Mbps Support CoE(CiA 402 protocol), VoE (Vendor over EtherCAT) Support PP, PV, TQ, CSP, CSV, CST, HM mode, Full closed-loop mode

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



High Performance

The synchronous cycle of M56S series EtherCAT products is up to 0.5ms, which technically makes the position command subdivision smaller, and the equipment movement smoother.



CANopen

Standard CAN bus interface is available in M56S 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

EtherNet/IP

EtherNet/IP is an industrial Ethernet protocol based on Ethernet and TCP/IP. The M56S series of servo drivers provides motion control solutions based on EtherNet/IP communication protocols.

Features	Specification
Physical Layer Standard	Ethernet
Communication Protocol	EtherNet/IP
Bus Connector	RJ45
Communication Rate	Ethernet：10/100Mbps
Control Mode	Position Mode,Velocity Mode,Torque Mode,Homing Mode, Q Program
Support Axis	The number of axes supported on the Ethernet depends on the network configuration.

Modbus

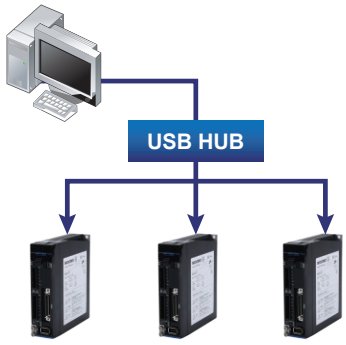
M56S series servo drive supports Modbus communication protocol, it provides an easy motion control platform for modifying drive parameters, and monitor the status of the servo drive.

Features	Specification
Physical Layer Standard	RS-485, Ethernet
Communication Protocol	Modbus/RTU Modbus/TCP
Bus Connector	RJ45
Communication Rate	RS-485: 9600bps, 19200bps, 38400bps, 57600bps, 115200bps
	Ethernet: 10/100Mbps
Control Mode	Position Mode, Velocity Mode, Torque Mode, Homing Mode, Q Program
Support Axis	Modbus/RTU: Up to 32 axis Modbus/TCP: The number of axes supported on the Ethernet depends on the network configuration.

Friendly Software

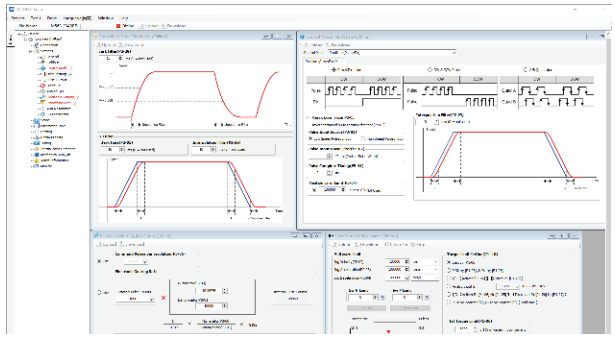
USB Multi-axis Tuning

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



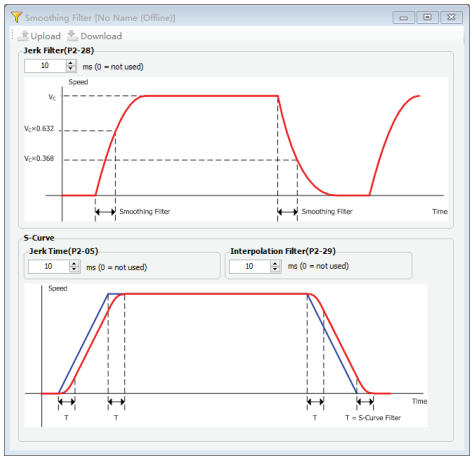
Tree Structure

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



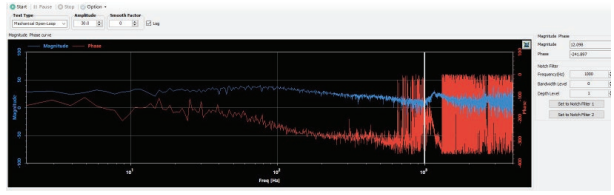
Graphical Setting Interface

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



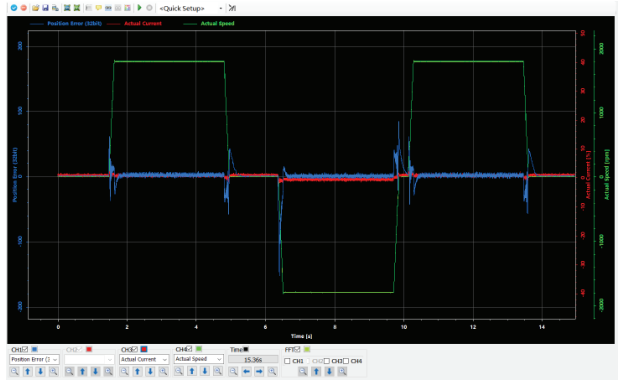
Mechanical Analysis

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

M56 series products are designed to meet the following standards.

		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
		File No.E332730	File No.E525873
CSA Standard		C22.2 No.274.13	CSA C22.2 No.100

Motor General Specifications

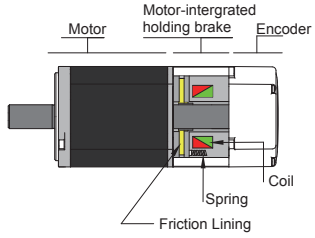
Insulation class	Class F (155℃)	Ambient temperature	Working temperature: 0℃ ~ 40℃ Storage temperature: -20℃ ~ 60℃
Protection level	IP67 (Except transfixion part of shaft)	Humidity	Storage and usage: 20 ~ 85%RH (no condensation)
Installation conditions	indoor installation, avoiding direct sunlight, corrosive 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.

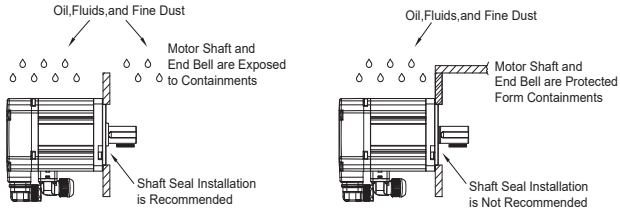
When the brake is powered on, the armature is adsorbed, the brake pad is released, and the motor can operate normally. When the brake is powered off, the armature is released, the brake pad is locked, and the motor can't rotate normally.

Frame	40mm	60mm	80mm	100mm	130mm	180mm
Static Friction Torque (Nm)	0.32	1.5	3.2	8.0	18.5	60
Rated Voltage (VDC)	24					
Power Waste (W @ 20℃)	6.3	7.2	9.6	14.4	24.3	52
Current (A)	0.26	0.3	0.4	0.6	1.05	2.16
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.



Featured Function Application

Full Closed-loop Control

A linear encoder mounted on the device (load) and a high resolution encoder mounted on the motor, the system positioning accuracy of the device can be improved by the full closed-loop control based on dual position feedback. It can also improve servo responsiveness and reliability, and suppress mechanical vibration.

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.

Analog Monitor output

2 analog output, real-time voltage output the command or actual speed, command or actual torque, or the actual position error of the motor.

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.

Numbering System for Servo Drive

M56S - 2 3A0 R F - *

① ② ③ ④ ⑤ ⑥

① M56S Series

② Supply Voltage *1

2 --- Single/Three-Phase 220VAC

3 --- Three-Phase 400VAC

④ Function Type

⑤ Model Type

⑥ Customization

*1 Line to Line Voltage
*2 Use Single/Three-Phase 220VAC input
*3 Available for single-phase while the motor power is under 1.5kW
*4 It will be released in the first quarter of 2024.

③ Current

	Supply Voltage	Current	Rated Current A(rms)	Peak Current A(rms)	Rated Power
*2	2	1A8	1.8	5.4	200W
*2		3A0	3	12	400W
*2		4A5	4.5	15	750W
*2		6A0	6	21	1.0kW
*3		10A	10	30	1.5kW
*3		13A	13	45	2.5kW
	3	13A	13	40	3.0kW
*4		17A	17	42.5	5.0kW
*4		21A	21	52.5	6.0kW
*4		26A	26	65	7.5kW

Control Function Type

Servo Drive

-R RS-485

RS-485

- Support Modbus/RTU
- Pulse Control
- Analog Control
- 2 Analog Inputs*1
- 2 Analog Outputs*1
- Position, Velocity, Torque Control
- Encoder feedback output
- Built-in Q program control function
- Full Closed Loop Control*2
- Support STO(SIL3)*2
- Dynamic Brake*2
- USB(Configuration)

-EC EtherCAT

EtherCAT

- EtherCAT
- 2 Analog Inputs*1
- 2 Analog Outputs*1
- Positon, Velocity, Torque Control
- Built-in Q program control function
- Full Closed Loop Control*2
- Support STO(SIL3)*2
- Dynamic Brake*2
- USB(Configuration)

-C CANopen

CANopen

- CiA 301 & CiA 402 protocols
- 2 Analog Inputs*1
- 2 Analog Outputs*1
- Positon, Velocity, Torque Control
- Built-in Q program control function
- Full Closed Loop Control*2
- Support STO(SIL3)*2
- Dynamic Brake*2
- USB(Configuration)

-IP EtherNet/IP

EtherNet/IP

- EtherNet/IP, Support Modbus/TCP
- 2 Analog Inputs*1
- 2 Analog Outputs*1
- Positon, Velocity, Torque Control
- Built-in Q program control function
- Full Closed Loop Control*2
- Support STO(SIL3)*2
- Dynamic Brake*2
- USB(Configuration)

coming soon...

-PN Profinet

PROFINET

- Support Profinet protocols
- 2 Analog Inputs*1
- 2 Analog Outputs*1
- Positon, Velocity, Torque Control
- Built-in Q program control function
- Full Closed Loop Control*2
- Support STO(SIL3)*2
- Dynamic Brake*2
- USB(Configuration)

coming soon...

*1*2Certain models don't support this function. Please refer to the drive list on page 16 for details.

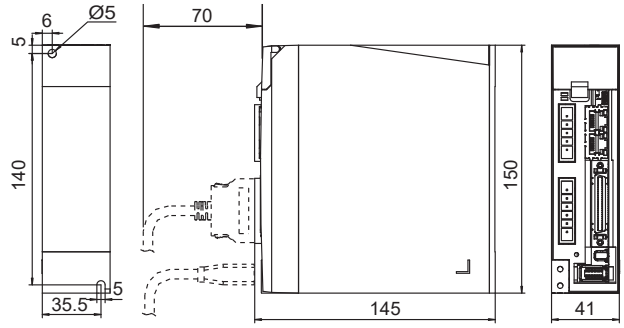
Servo Drive Table

Function Type		-R—RS-485 Type		-EC—EtherCAT Type		-C—CANopen Type		-IP—EtherNet/IP Type		-PN—Profinet Type	
											
Model Type		**F**	**D**	**X**	**N**	**X**	**N**	**X**	**N**	**X**	**N**
Control Mode	Position Mode	●	●	●	●	●	●	●	●	●	●
	Velocity Mode	●	●	●	●	●	●	●	●	●	●
	Torque Mode	●	●	●	●	●	●	●	●	●	●
	Q Program	●	●	●	●	●	●	●	●	●	●
	Full Closed-loop Control	●		●		●		●		●	
Interface	5V Pulse Inputs	●	●								
	24V Pulse Inputs	●	●								
	2 Analog Inputs	●	●	●		●		●		●	
	2 Analog outputs	●		●		●		●		●	
	10 inputs/6 outputs (Digital)	●	●								
	8 inputs/4 outputs (Digital)			●	●	●	●	●	●	●	●
	Encoder Feedback Output	●	●								
	Second Encoder Input	●		●		●		●		●	
Comm Port	USB (Configuration)	●	●	●	●	●	●	●	●	●	●
	RS-485	●	●								
	EtherCAT			●	●						
	CANopen					●	●				
	EtherNet/IP							●	●		
	Modbus TCP							●	●		
	Profinet									●	●
Safty Function	Dynamic Brake	●		●		●		●		●	
	STO	●		●		●		●		●	

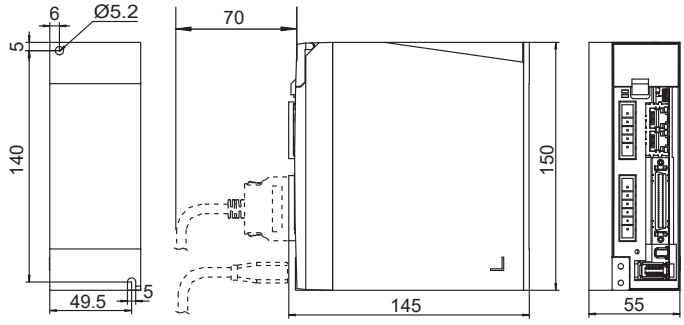
Short delivery Type

Drive Mechanical Dimensions (Unit: mm)

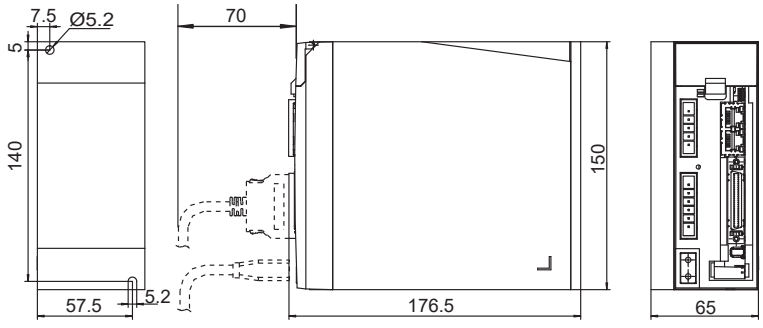
☐ M56S-21A8 ■◆ (200W Type)



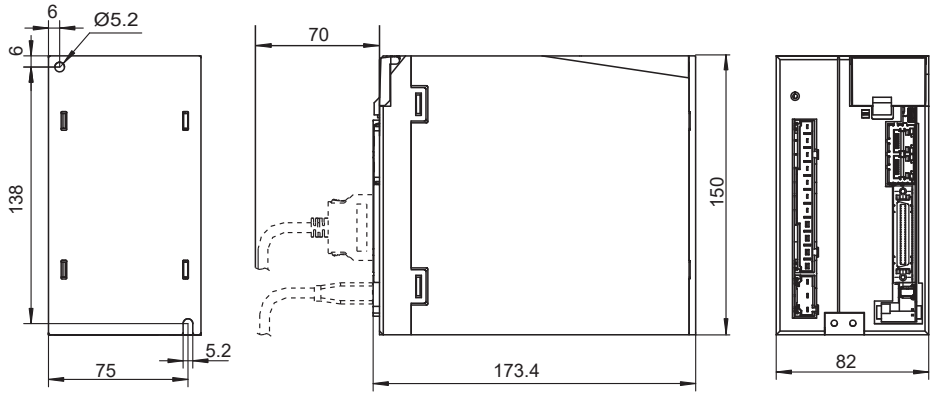
☐ M56S-23A0 ■◆ (400W Type)



☐ M56S-24A5 ■◆ (750W Type)



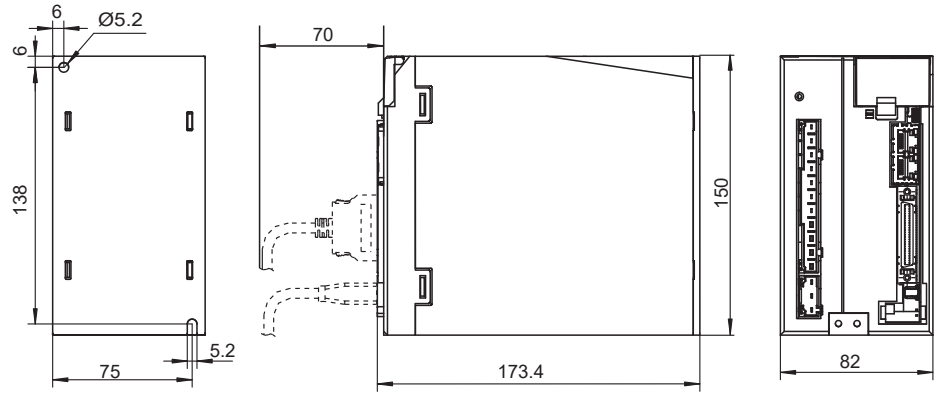
☐ M56S-26A0 ■◆ (1.0kW Type)
M56S-210A ■◆ (1.5kW Type)
M56S-213A ■◆ (2.5kW Type)



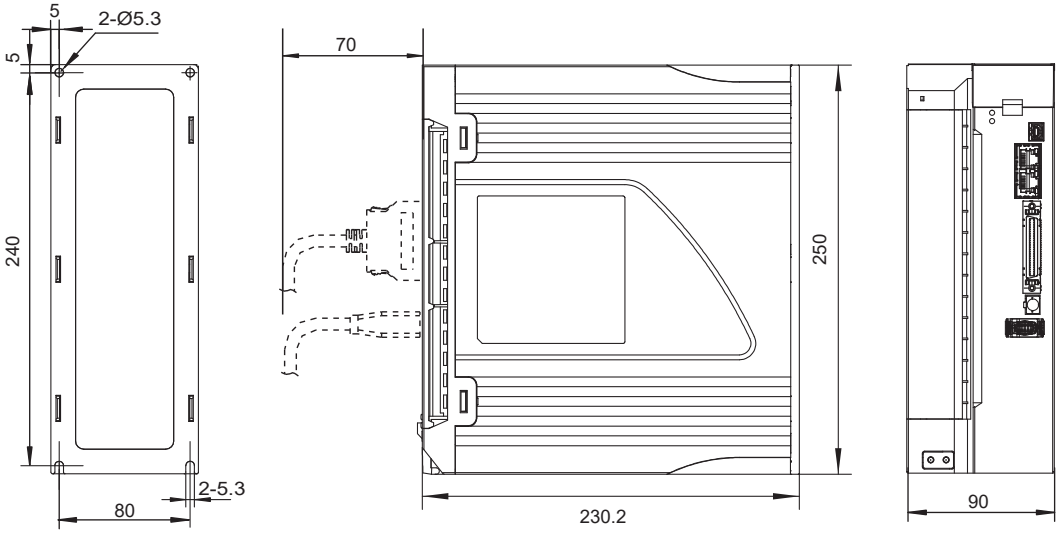
■: Function Type ◆: Model Type

Drive Mechanical Dimensions(Unit: mm)

☐ M56S-313A ■◆ (3.0kW Type)



☐ M56S-317A ■◆ (5.0kW Type)
M56S-321A ■◆ (6.0kW Type)
M56S-326A ■◆ (7.5kW Type)



■: Function Type ◆: Model Type

Numbering System for SM3 Servo Motor

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
18	180mm

Motor Length	
1	1 Stacks
2	2 Stacks
3	3 Stacks
4	4 Stacks
5	5 Stacks

Voltage	
A	220VAC
Y	400VAC

Encoder Type	
T*1	26-bit Absolute Multi-turn Optical Encoder
X	21-bit Absolute Multi-turn Magnetic Encoder
B	17-bit Battery-less Absolute Multi-turn Encoder

Note: *1 For 100/130/180mm frame size motor, the encoder resolution is 23-bit.

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	Standard Keyway without oil seal
V	Standard keyway, oil seal shipped with motor, but not installed
K	Standard 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					
1000	□100		□130	2000 (3000)		
1300					□130	
1500	□100		□130			
1800					□130	
2000	□100		□130			
2500	□100					
2900					□180	
3000			□130			
4400					□180	
5500					□180	
7500					□180	

Drive and Motor Tabel

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 Mot			
									26-bit Absolute Multi-turn Optical Encoder	23-bit Absolute Multi-turn Optical Encoder	21-bit Absolute Multi-turn Magnetic Encoder	
40	High Inertia	50	0.16	0.64	3000	6000	1.4	4.8	SM3H-041AT ☐ P △	—	SM3H-041AX ☐ P △	
	Low Inertia	100	0.32	1.28			1.2	5.9	SM3L-042AT ☐ D △	—	SM3L-042AX ☐ D △	
	High Inertia		0.32	1.28			1.4	5.7	SM3H-042AT ☐ P △	—	SM3H-042AX ☐ P △	
60	Low Inertia	200	0.64	1.9			1.5	5.4	SM3L-061AT ☐ P △	—	SM3L-061AX ☐ P △	
	High Inertia		0.64	2.24			1.7	5.9	SM3H-061AT ☐ P △	—	SM3H-061AX ☐ P △	
	Low Inertia	400	1.27	3.8			2.8	10	SM3L-062AT ☐ P △	—	SM3L-062AX ☐ P △	
	High Inertia		1.27	4.44			2.8	9.8	SM3H-062AT ☐ P △	—	SM3H-062AX ☐ P △	
80	Low Inertia	750	2.4	6.7			4.5	14	SM3L-083AT ☐ P △	—	SM3L-083AX ☐ P △	
	High Inertia		2.4	8.4			4.5	16.7	SM3H-083AT ☐ P △	—	SM3H-083AX ☐ P △	
	Low Inertia	1000	3.2	9.6			5.6	19	SM3L-084AT ☐ P △	—	SM3L-084AX ☐ P △	
100	Low Inertia	1000	3.2	9.6		6000	6.0	21	—	SM3L-102AT ☐ U △	SM3L-102AX ☐ U △	
		1500	4.9	14.7		5700	9.6	30	—	SM3L-103AT ☐ U △	SM3L-103AX ☐ U △	
		2000	6.4	19.2		5600	12.7	44	—	SM3L-104AT ☐ U △	SM3L-104AX ☐ U △	
		2500	8	24		5600	13	45	—	SM3L-105AT ☐ U △	SM3L-105AX ☐ U △	
130	Medium Inertia	1000	4.77	14.3	2000	3000	5.4	16.9	—	SM3M-132AT ☐ U △	SM3M-132AX ☐ U △	
		1500	7.16	21.5			8.5	26	—	SM3M-133AT ☐ U △	SM3M-133AX ☐ U △	
		2000	9.55	28.6			11	32.7	—	SM3M-134AT ☐ U △	SM3M-134AX ☐ U △	
		3000	14.3	42.9			10.5	30	—	SM3M-135YT ☐ M △	SM3M-135YX ☐ M △	
	High Inertia	850	5.39	16.2	1500	3000	6	19	—	SM3H-132AT ☐ U △	SM3H-132AX ☐ U △	
		1300	8.34	25			9.6	29.6	—	SM3H-133AT ☐ U △	SM3H-133AX ☐ U △	
		1800	11.5	34.5			13	45	—	SM3H-134AT ☐ U △	SM3H-134AX ☐ U △	
180	High Inertia	2900	18.5	55.5			10.5	35.3	—	SM3H-182YT ☐ U △	—	
		4400	28	84			16.6	54.3	—	SM3H-183YT ☐ U △	—	
		5500	35	105			20.9	69.9	—	SM3H-184YT ☐ U △	—	
		7500	48	120			25.2	73.4	—	SM3H-185YT ☐ U △	—	

☐ : Brake Options △ : Oil Seal Options Please refer to the numbering system of servo motor on page 19.

◆ : Motor Type Please refer to the numbering system of servo drive on page 15.

tor		Matching Servo Drive				
	17-bit Battery-less Absolute Multi-turn Encoder	-R RS-485 Type	-EC EtherCAT Type	-C CANopen Type	-IP EtherNet/IP Type	-PN Profinet Type
		M56S-21A8R ◆	M56S-21A8EC ◆	M56S-21A8C ◆	M56S-21A8IP ◆	M56S-21A8PN ◆
	SM3L-042AB □ D △					
	SM3L-061AB □ D △					
	SM3L-062AB □ D △	M56S-23A0R ◆	M56S-23A0EC ◆	M56S-23A0C ◆	M56S-23A0IP ◆	M56S-23A0PN ◆
	SM3L-083AB □ D △	M56S-24A5R ◆	M56S-24A5EC ◆	M56S-24A5C ◆	M56S-24A5IP ◆	M56S-24A5PN ◆
	SM3L-084AB □ D △	M56S-26A0RF	M56S-26A0ECX	M56S-26A0CX	M56S-26A0IPX	M56S-26A0PNX
	—					
	—	M56S-210ARF	M56S-210AECX	M56S-210ACX	M56S-210AIPX	M56S-210APNX
	—	M56S-213ARF	M56S-213AECX	M56S-213ACX	M56S-213AIPX	M56S-213APNX
	—					
	—	M56S-26A0RF	M56S-26A0ECX	M56S-26A0CX	M56S-26A0IPX	M56S-26A0PNX
	—	M56S-210ARF	M56S-210AECX	M56S-210ACX	M56S-210AIPX	M56S-210APNX
	—	M56S-213ARF	M56S-213AECX	M56S-213ACX	M56S-213AIPX	M56S-213APNX
		M56S-313ARF	M56S-313AECX	M56S-313ACX	M56S-313AIPX	M56S-313APNX
	—	M56S-26A0RF	M56S-26A0ECX	M56S-26A0CX	M56S-26A0IPX	M56S-26A0PNX
	—	M56S-210ARF	M56S-210AECX	M56S-210ACX	M56S-210AIPX	M56S-210APNX
	—	M56S-213ARF	M56S-213AECX	M56S-213ACX	M56S-213AIPX	M56S-213APNX
	—	M56S-313ARF	M56S-313AECX	M56S-313ACX	M56S-313AIPX	M56S-313APNX
	—	M56S-317ARF	M56S-317AECX	M56S-317ACX	M56S-317AIPX	M56S-317APNX
	—	M56S-321ARF	M56S-321AECX	M56S-321ACX	M56S-321AIPX	M56S-321APNX
	—	M56S-326ARF	M56S-326AECX	M56S-326ACX	M56S-326AIPX	M56S-326APNX

Drive Specification

-R—RS-485 Type
220VAC Specification

Input Power	M56S-21A8 ■◆ M56S-23A0 ■◆ M56S-24A5 ■◆ M56S-26A0RF	Main Circuit	Single / Three-phase, AC200 ~ 240V ±10%, 50/60Hz
		Control Circuit	Single-phase, AC200 ~ 240V ±10%，50/60Hz
	M56S-210ARF M56S-213ARF	Main Circuit	Three-phase, AC200 ~ 240V ±10%，50/60Hz
		Control Circuit	Single-phase, AC200 ~ 240V ±10%，50/60Hz
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 Absolute Multi-turn Optical Encoder ● 21-bit Absolute Multi-turn Magnetic Encoder ● 17-bit Battery-less Absolute Multi-turn Encoder
Second Encoder Feedback*1			A/B/Z phase signal differential input
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, 12bit
		Output*2	2 Analog outputs, -10 ~ +10V, Max.10mA
	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			4 keys (MODE, UP, DOWN, SET) 5 - digital LED Display
Regeneration Resistor			● -F Type Built-in regenerative resistor ● -D Type 750W Built-in regenerative resistor ● 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. Full Closed Loop Control Mode*3, Each control mode 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, Main Power Phase Loss
Dynamic Brake			-F Built in
STO			-F Built in
Weight			M56S-21A8 ■◆：0.8Kg　M56S-26A0RF：1.9Kg M56S-23A0 ■◆：1.1Kg　M56S-210ARF：1.9Kg M56S-24A5 ■◆：1.6Kg　M56S-213ARF：1.9Kg

注：*1，*2，*3 -RD models don't support this function, please refer to page16 Servo Drive Table.

■：Control Function Type　◆：Model Type

Drive Specification

-R—RS-485 Type
400VAC Specification

Input Power	M56S-313ARF M56S-317ARF	Main Circuit	Three-phase, AC380 ~ 480V ±10%，50/60Hz
	M56S-321ARF M56S-326ARF	Control Circuit	Single-phase, AC380 ~ 480V ±10%，50/60Hz
Withstand Voltage			Primary to earth: withstand 1800 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			● 23-bit Absolute Multi-turn Optical Encoder ● 21-bit Absolute Multi-turn Magnetic Encoder
Second Encoder Feedback			A/B/Z phase signal differential input
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, 12bit
		Output	2 Analog outputs, -10 ~ +10V, Max.10mA
	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			4 keys (MODE, UP, DOWN, SET) 5 - digital LED Display
Regeneration Resistor			Built-in regenerative resistor (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. Full Closed Loop Control Mode[*3], Each control mode 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, Main Power Phase Loss
Dynamic Brake			Built in
STO			Built in
Weight			M56S-313ARF：1.9Kg　　M56S-321ARF：3.8Kg M56S-317ARF：3.8Kg　　M56S-326ARF：3.8Kg

Drive Specification

-EC—EtherCAT Type -C—CANopen Type
220VAC Specification

Input Power	M56S-21A8 ■◆ M56S-23A0 ■◆ M56S-24A5 ■◆ M56S-26A0 ■ X	Main Circuit	Single / Three-phase, AC200 ~ 240V ±10%，50/60Hz
		Control Circuit	Single-phase, AC200 ~ 240V ±10%，50/60Hz
	M56S-210A ■ X M56S-213A ■ X	Main Circuit	Three-phase, AC200 ~ 240V ±10%，50/60Hz
		Control Circuit	Single-phase, AC200 ~ 240V ±10%，50/60Hz
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 Absolute Multi-turn Optical Encoder ● 21-bit Absolute Multi-turn Magnetic Encoder ● 17-bit Battery-less Absolute Multi-turn Encoder
Second Encoder Feedback*1			A/B/Z phase signal differential input
I/O	Digital Signal	Input	8 Configurable optically isolate digital general inputs, 24VDC, 20mA
		Output	4 Configurable optically isolate digital general outputs, Max. 30VDC，100mA
	Analog Signal	Input	2 Analog inputs, -10 ~ +10V, 12bit
		Output*2	2 Analog outputs, -10 ~ +10V, Max.10mA
Comm Port	USB		Connection with PC for configuration
	EtherCAT		-EC Control Function Type: EtherCAT Communication
	CANopen		-C Control Function Type: CANopen Communication
Front Panel			4 keys (MODE, UP, DOWN, SET) 5 - digital LED Display
Regeneration Resistor			● -X Type regenerative resistor ● -N Type 750W Built-in regenerative resistor ● 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, Full Closed Loop Control Mode*3, Q programs that are pre-stored in the drive can also be started with EtherCAT instructions -C Control Function Type: Complies with CiA402 standard, Support PP，PV，TQ 和 HM mode, Full Closed Loop Control Mode*3，Q programs that are pre-stored in the drive can also be started with CANopen instructions
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, Full Closed-loop Hybrid Deviation Fault, Main Power Phase Loss
Dynamic Brake			-X Built in
STO			-X Built in
Weight			M56S-21A8 ■◆：0.8Kg　M56S-26A0 ■ X：1.9Kg M56S-23A0 ■◆：1.1Kg　M56S-210A ■ X：1.9Kg M56S-24A5 ■◆：1.6Kg　M56S-213A ■ X：1.9Kg

Note: *1，*2，*3 Certain models don't support this function, please refer to page16 Servo Drive Table.

■：Control Function Type ◆：Model Type

Drive Specification

-EC—EtherCAT Type -C—CANopen Type
400VAC Specification

Input Power	M56S-313A ■ X M56S-317A ■ X M56S-321A ■ X M56S-326A ■ X	Main Circuit	Three-phase, AC380 ~ 480V ±10%，50/60Hz
		Control Circuit	Single-phase, AC380 ~ 480V ±10%，50/60Hz
Withstand Voltage			Primary to earth: withstand 1800 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			● 23-bit Absolute Multi-turn Optical Encoder ● 21-bit Absolute Multi-turn Magnetic Encoder
Second Encoder Feedback			A/B/Z phase signal differential input
I/O	Digital Signal	Input	8 Configurable optically isolate digital general inputs, 24VDC, 20mA
		Output	4 Configurable optically isolate digital general outputs, Max. 30VDC，100mA
	Analog Signal	Input	2 Analog inputs, -10 ~ +10V, 12bit
		Output	2 Analog outputs, -10 ~ +10V, Max.10mA
Comm Port	USB		Connection with PC for configuration
	EtherCAT		-EC Control Function Type: EtherCAT Communication
	CANopen		-C Control Function Type: CANopen Communication
Front Panel			4 keys (MODE, UP, DOWN, SET) 5 - digital LED Display
Regeneration Resistor			Built-in regenerative resistor (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, Full Closed Loop Control Mode*3, Q programs that are pre-stored in the drive can also be started with EtherCAT instructions -C Control Function Type: Complies with CiA402 standard, Support PP，PV，TQ 和 HM mode, Full Closed Loop Control Mode*3，Q programs that are pre-stored in the drive can also be started with CANopen instructions
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, Full Closed-loop Hybrid Deviation Fault, Main Power Phase Loss
Dynamic Brake			Built in
STO			Built in
Weight			M56S-313A ■ X：1.9Kg　　M56S-321A ■ X：3.8Kg M56S-317A ■ X：3.8Kg　　M56S-326A ■ X：3.8Kg

Note: ■ : Control Function Type

Drive Specification

-IP—EtherNet/IP Type -PN—Profinet Type
220VAC Specification

Input Power	M56S-21A8 ■◆ M56S-23A0 ■◆ M56S-24A5 ■◆ M56S-26A0 ■ X	Main Circuit	Single / Three-phase, AC200 ~ 240V ±10%，50/60Hz
		Control Circuit	Single-phase, AC200 ~ 240V ±10%，50/60Hz
	M56S-210A ■ X M56S-213A ■ X	Main Circuit	Three-phase, AC200 ~ 240V ±10%，50/60Hz
		Control Circuit	Single-phase, AC200 ~ 240V ±10%，50/60Hz
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 Absolute Multi-turn Optical Encoder ● 21-bit Absolute Multi-turn Magnetic Encoder ● 17-bit Battery-less Absolute Multi-turn Encoder
Second Encoder Feedback*1			A/B/Z phase signal differential input
I/O	Digital Signal	Input	8 Configurable optically isolate digital general inputs, 24VDC, 20mA
		Output	4 Configurable optically isolate digital general outputs, Max. 30VDC，100mA
	Analog Signal	Input	2 Analog inputs, -10 ~ +10V, 12bit
		Output*2	2 Analog outputs, -10 ~ +10V, Max.10mA
Comm Port	USB		Connection with PC for configuration
	EtherNet/IP		-IP Control Function Type: EtherNet/IP、Modbus TCP Communication
	Profinet		-PN Control Function Type: Profinet Communication
Front Panel			4 keys (MODE, UP, DOWN, SET) 5 - digital LED Display
Regeneration Resistor			● -X Type regenerative resistor ● -N Type 750W Built-in regenerative resistor ● All models can be equipped with external absorption resistors
Control Mode			1. Position Mode 2. Velocity Mode 3. orque Mode 4. Full Closed Loop Control Mode*3, 5.The pre-stored Q program in the drive can also be started by command and each control mode can be switched by digital input
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, Full Closed-loop Hybrid Deviation Fault, Main Power Phase Loss
Dynamic Brake			-X Built in
STO			-X Built in
Weight			M56S-21A8 ■◆：0.8Kg　M56S-26A0 ■ X：1.9Kg M56S-23A0 ■◆：1.1Kg　M56S-210A ■ X：1.9Kg M56S-24A5 ■◆：1.6Kg　M56S-213A ■ X：1.9Kg

Note: *1，*2，*3 Certain models don't support this function, please refer to page16 Servo Drive Table.

■：Control Function Type ◆：Model Type

Drive Specification

-IP—EtherNet/IP Type -PN—Profinet Type
400VAC Specification

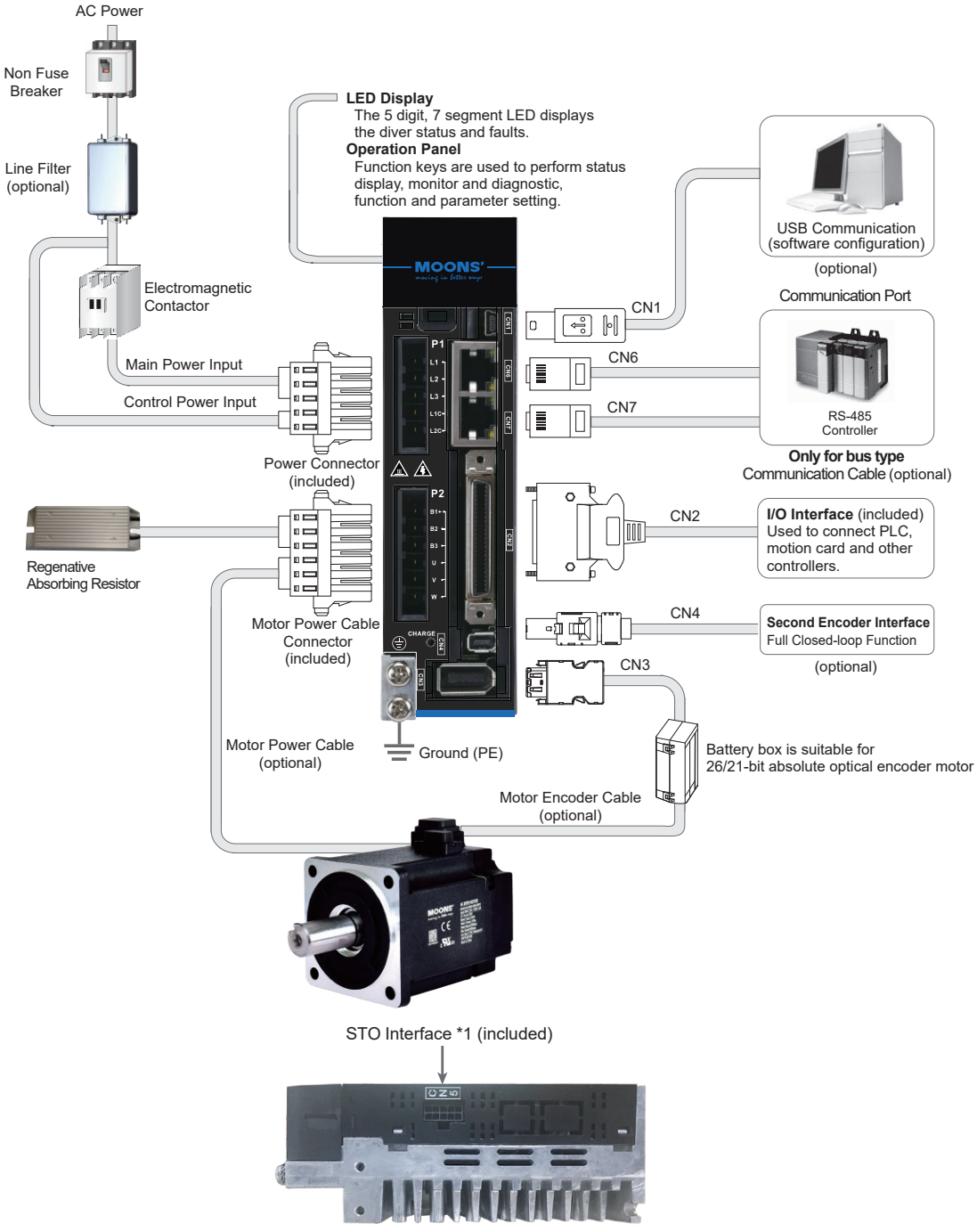
Input Power	M56S-313A ■ X M56S-317A ■ X M56S-321A ■ X M56S-326A ■ X	Main Circuit	Three-phase, AC380 ~ 480V ±10%，50/60Hz
		Control Circuit	Single-phase, AC380 ~ 480V ±10%，50/60Hz
Withstand Voltage			Primary to earth: withstand 1800 VAC, 1 min, (Leakage current: 20 mA) [220V Input]
Environment	Temperature		● 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			● 23-bit Absolute Multi-turn Optical Encoder ● 21-bit Absolute Multi-turn Magnetic Encoder
Second Encoder Feedback			A/B/Z phase signal differential input
I/O	Digital Signal	Input	8 Configurable optically isolate digital general inputs, 24VDC, 20mA
		Output	4 Configurable optically isolate digital general outputs, Max. 30VDC，100mA
	Analog Signal	Input	2 Analog inputs, -10 ~ +10V, 12bit
		Output	2 Analog outputs, -10 ~ +10V, Max.10mA
Comm Port	USB		Connection with PC for configuration
	EtherNet/IP		-IP Control Function Type: EtherNet/IP, Modbus TCP Communication
	Profinet		-PN Control Function Type: Profinet Communication
Front Panel			4 keys (MODE, UP, DOWN, SET) 5 - digital LED Display
Regeneration Resistor			Built-in regenerative resistor (All models can be equipped with external absorption resistors)
Control Mode			1. Position Mode 2. Velocity Mode 3. orque Mode 4. Full Closed Loop Control Mode[*3], 5.The pre-stored Q program in the drive can also be started by command and each control mode can be switched by digital input
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, Full Closed-loop Hybrid Deviation Fault, Main Power Phase Loss
Dynamic Brake			Built in
STO			Built in
Weight			M56S-313A ■ X：1.9Kg　M56S-321A ■ X：3.8Kg M56S-317A ■ X：3.8Kg　M56S-326A ■ X：3.8Kg

Note: ■ : Control Function Type

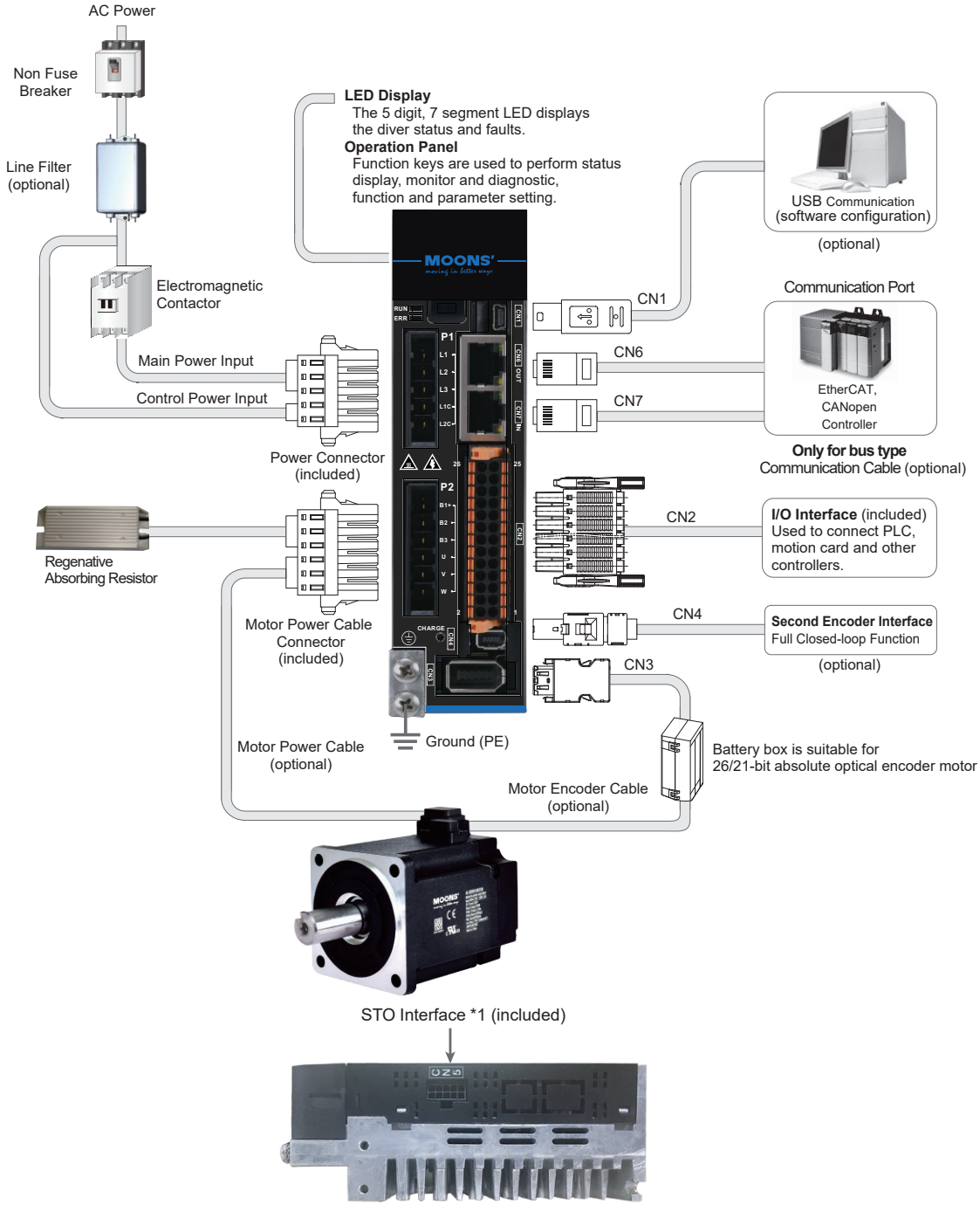
System Configuration

High Density I/O Connector
Model Type: F, D

200/400/750W Type



Note: *1 Certain models don't support this function, please refer to page 16.

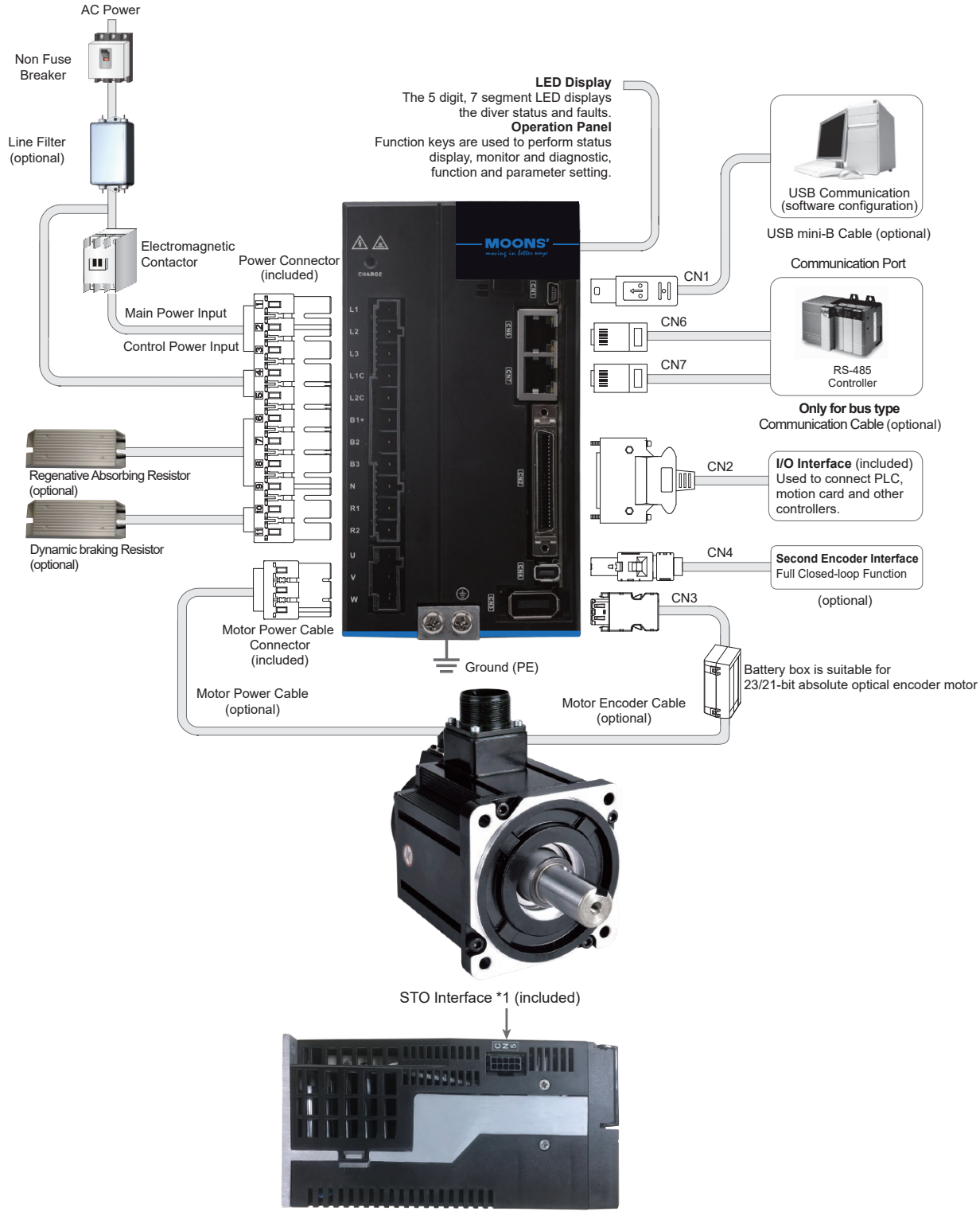


Note: *1 Certain models don't support this function, please refer to page 16.

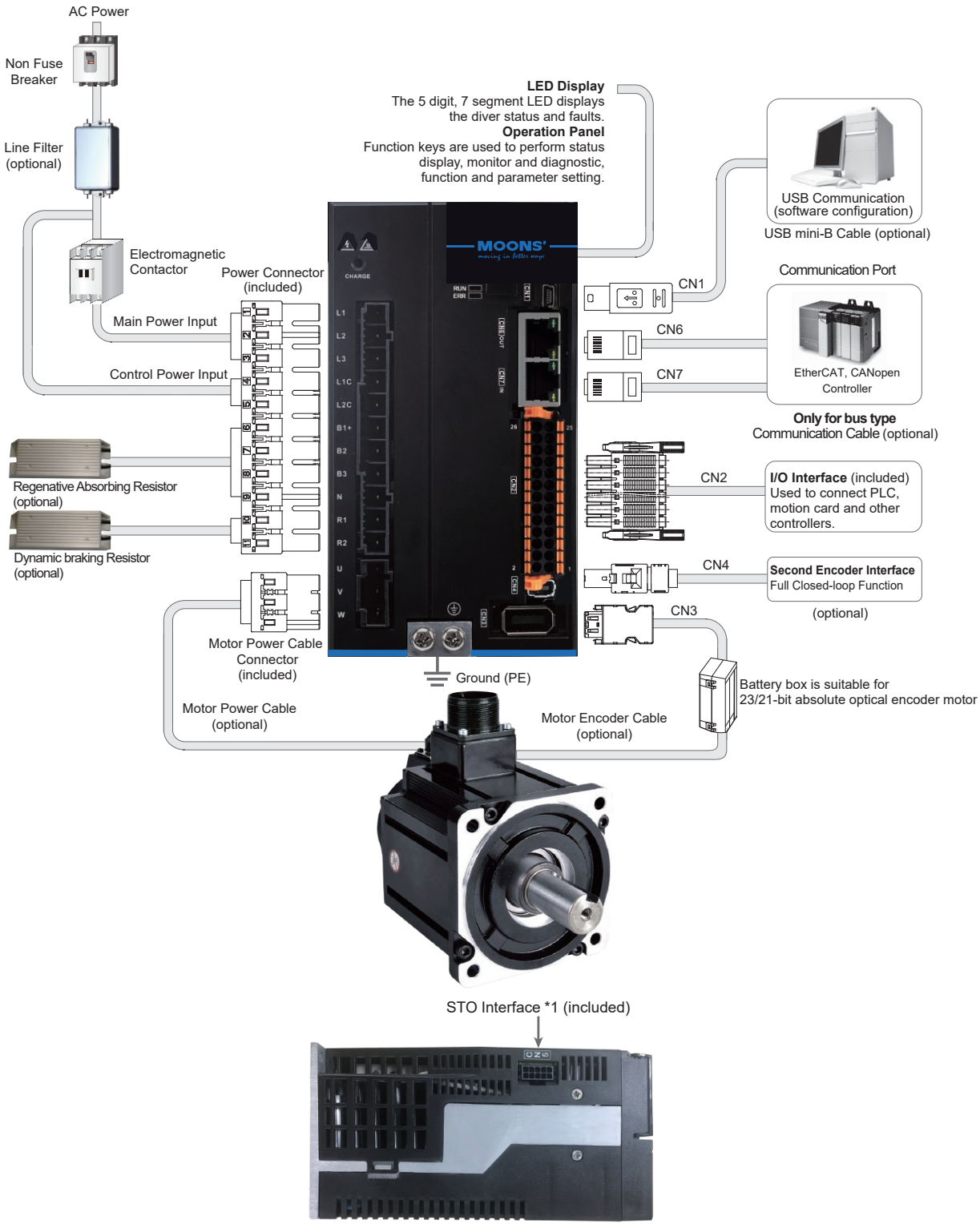
System Configuration

High Density I/O Connector
Model Type: F

1.0/1.5/2.5/3.0kW Type



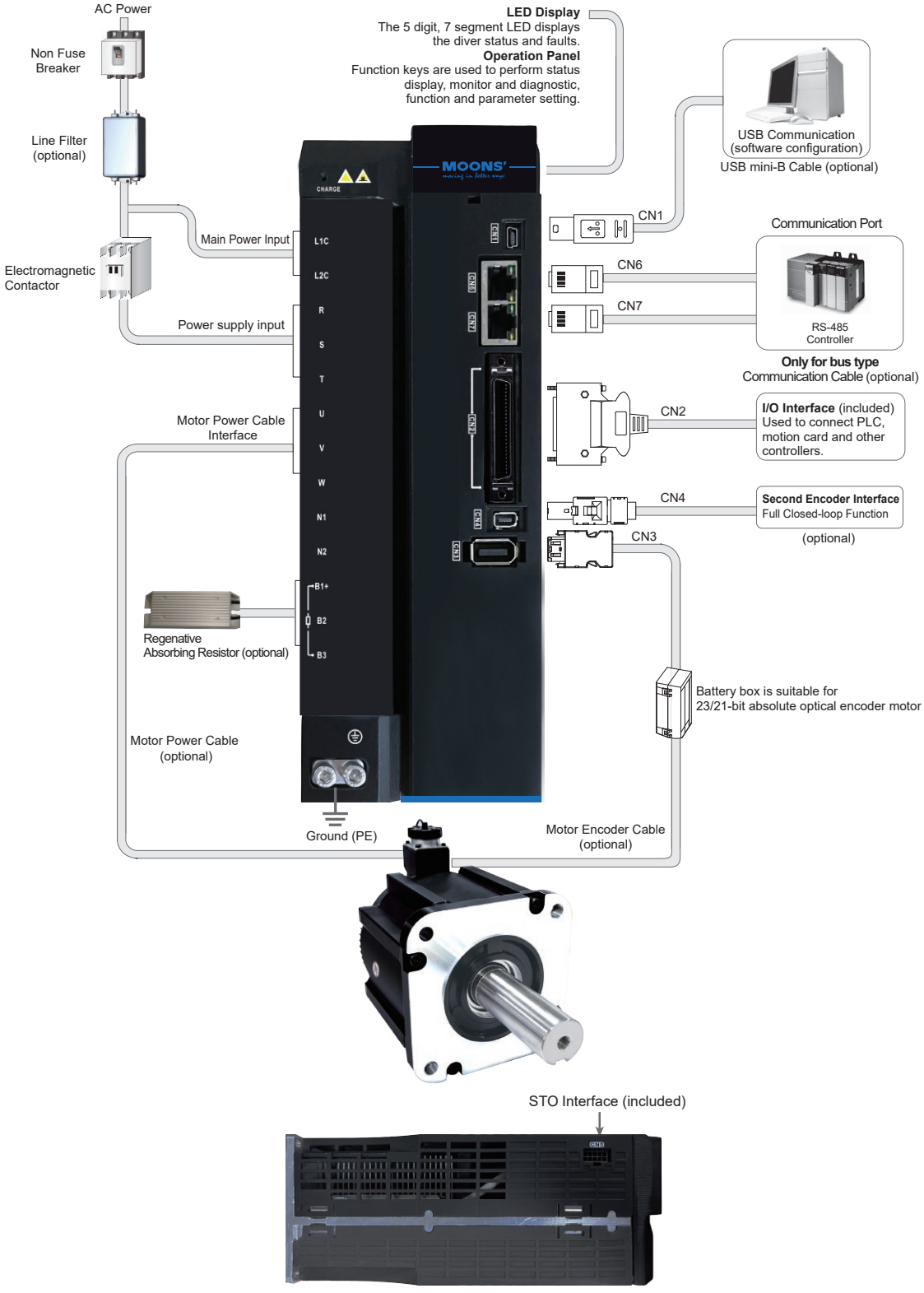
Note: *1 Certain models don't support this function, please refer to page 16.

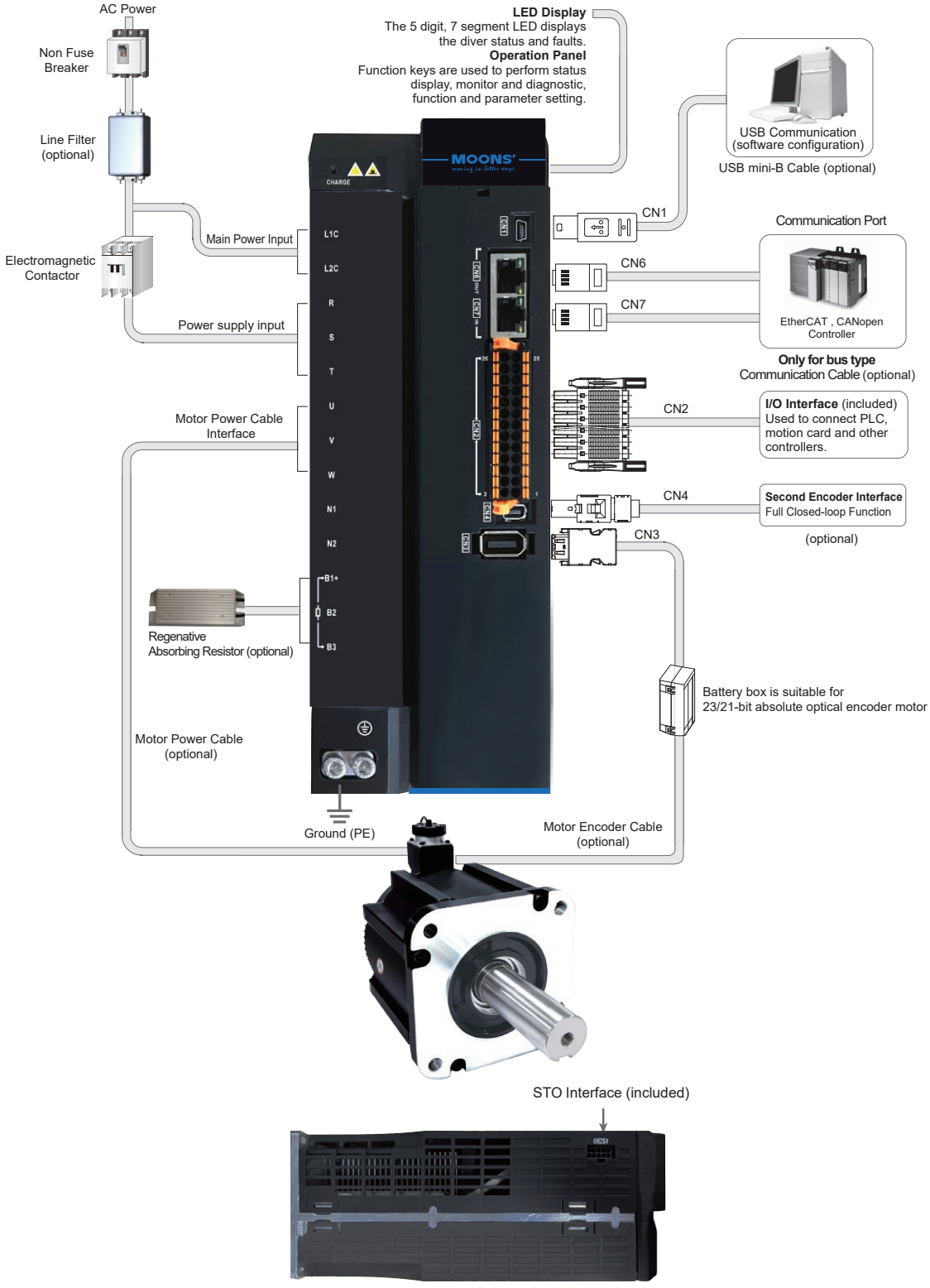

AC Power
Non Fuse Breaker
Line Filter (optional)
Electromagnetic Contactor
Power Connector (included)
Main Power Input
Control Power Input
Regenerative Absorbing Resistor (optional)
Dynamic braking Resistor (optional)
Motor Power Cable Connector (included)
Motor Power Cable (optional)
Ground (PE)
LED Display
The 5 digit, 7 segment LED displays the diver status and faults.
Operation Panel
Function keys are used to perform status display, monitor and diagnostic, function and parameter setting.
MOONS'
CHARGE
RUN
ERR
L1
L2
L3
L1C
L2C
B1+
B2
B3
N
R1
R2
U
V
W
CN1
CN6
CN7
CN2
CN4
CN3
USB Communication (software configuration)
USB mini-B Cable (optional)
Communication Port
EtherCAT, CANopen Controller
Only for bus type
Communication Cable (optional)
I/O Interface (included)
Used to connect PLC, motion card and other controllers.
Second Encoder Interface
Full Closed-loop Function
(optional)
Battery box is suitable for 23/21-bit absolute optical encoder motor
Motor Encoder Cable (optional)
STO Interface *1 (included)

System Configuration

High Density I/O Connector
Model Type: F

5.0/6.0/7.5kW Type




AC Power
Non Fuse Breaker
Line Filter (optional)
Electromagnetic Contactor
Main Power Input
Power supply input
Motor Power Cable Interface
Regenative Absorbing Resistor (optional)
Motor Power Cable (optional)
Ground (PE)
LED Display
The 5 digit, 7 segment LED displays the diver status and faults.
Operation Panel
Function keys are used to perform status display, monitor and diagnostic, function and parameter setting.
USB Communication (software configuration)
USB mini-B Cable (optional)
CN1
Communication Port
CN6
CN7
EtherCAT , CANopen Controller
Only for bus type
Communication Cable (optional)
CN2
I/O Interface (included)
Used to connect PLC, motion card and other controllers.
CN4
Second Encoder Interface
Full Closed-loop Function
(optional)
CN3
Battery box is suitable for 23/21-bit absolute optical encoder motor
Motor Encoder Cable (optional)
STO Interface (included)
MOONS'
CHARGE
L1C
L2C
R
S
T
U
V
W
N1
N2
B1+
B2
B3

Motor Specification

40mm Frame
Low Inertia

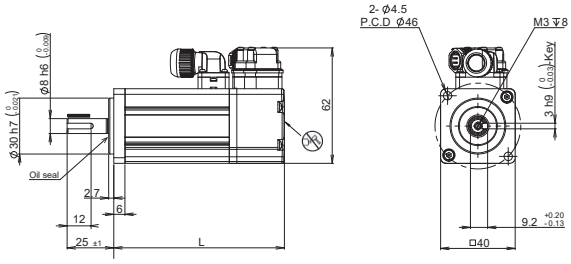
☐ Specification

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	$Kg·m^2$	0.038×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	0.0433×10^{-4}
Shaft Load - Axial	N (max.)	50
Shaft Load - Radial (End of Shaft)	N (max.)	60
Weight	Kg	0.55
Weight - With Brake	Kg	0.8

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

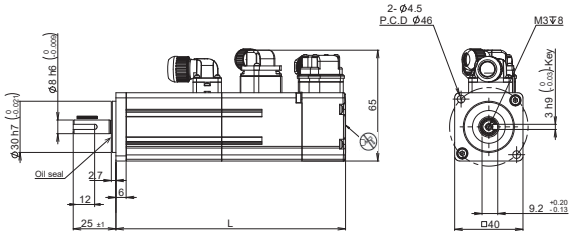
☐ Dimensions (Unit: mm)

1) Without Brake



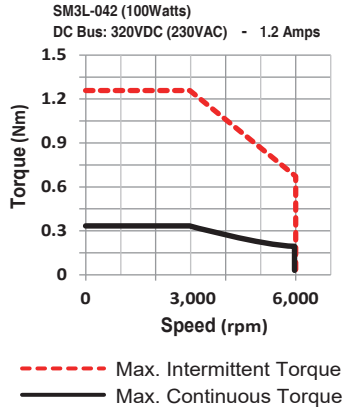
Without Brake	L
SM3L-042A ◇ ND △	91.5
SM3L-042ABND △	100

2) With Brake



With Brake	L
SM3L-042A ◇ BD △	134.5
SM3L-042ABBD △	143

☐ Torque Curves



Motor Specification

40mm Frame
High Inertia

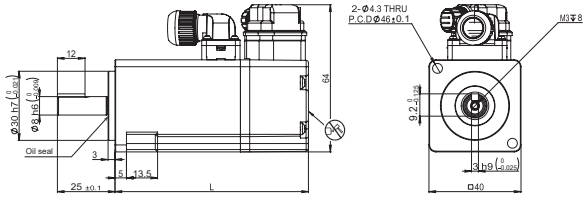
☐ Specification

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	0.45	0.55
Weight - With Brake	Kg	0.55	0.8

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

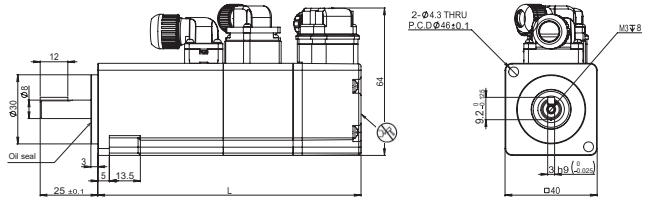
☐ Dimensions (Unit: mm)

1) Without Brake



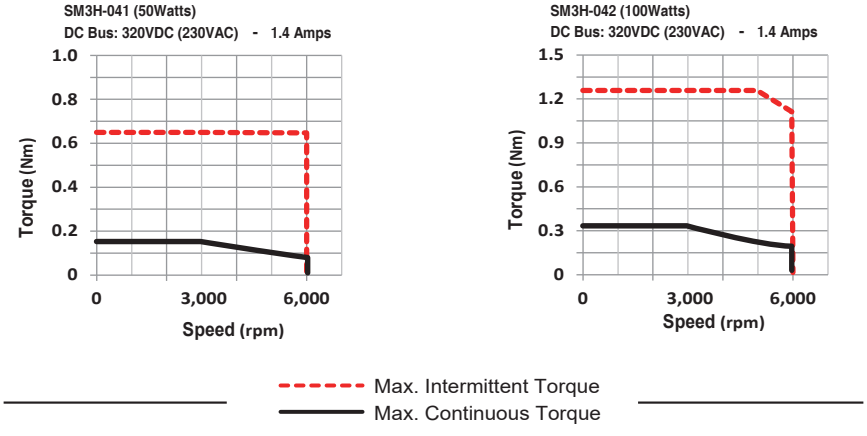
Without Brake	L
SM3H-041A ◇ NP △	70
SM3H-042A ◇ NP △	84

2) With Brake



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

☐ Torque Curves



Motor Specification

60mm Frame
Low Inertia

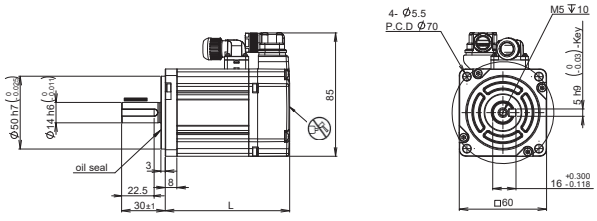
☐ Specification

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	$Kg·m^2$	0.152×10^{-4}	0.237×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	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	1.1	1.4
Weight - With Brake	Kg	1.5	1.9

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

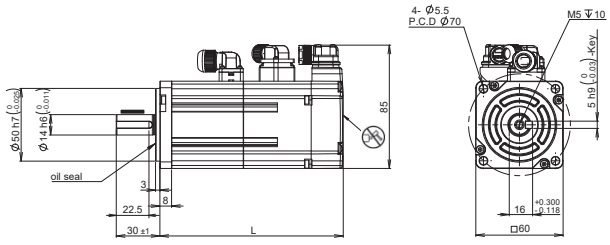
☐ Dimensions (Unit: mm)

1) Without Brake



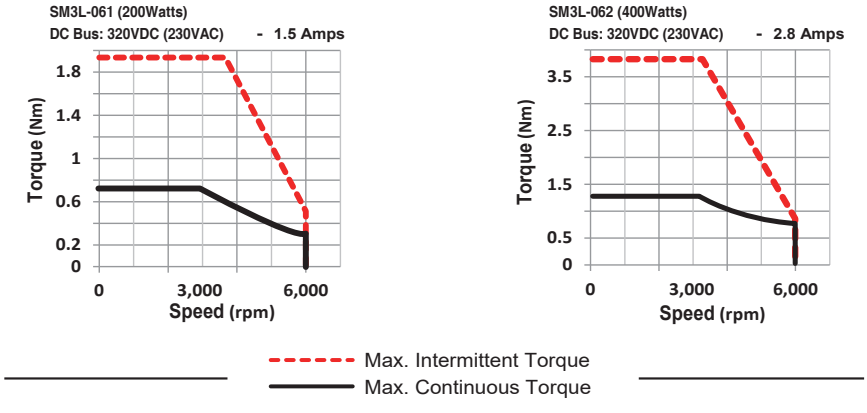
Without Brake	L
SM3L - 061A ◇ NP △	84.5
SM3L - 061ABND △	85.5
SM3L - 062A ◇ NP △	103
SM3L - 062ABND △	104

2) With Brake



With Brake	L
SM3L - 061A ◇ BP △	125
SM3L - 061ABBD △	126
SM3L - 062A ◇ BP △	143.5
SM3L - 062ABBD △	144.5

☐ Torque Curves



Motor Specification

60mm Frame
High Inertia

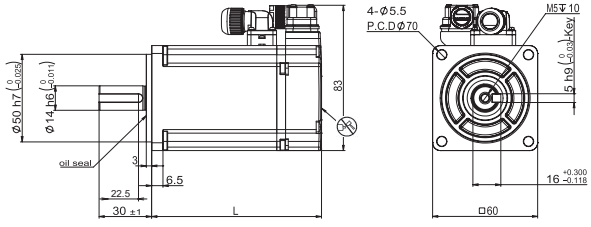
☐ Specification

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	0.8	1.4
Weight - With Brake	Kg	1.2	1.7

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

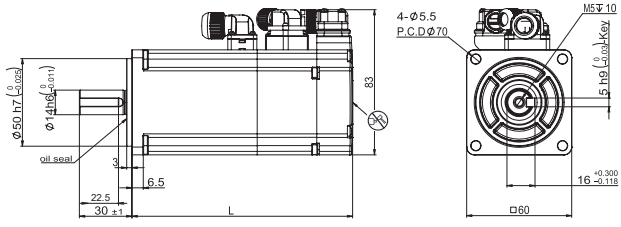
☐ Dimensions (Unit: mm)

1) Without Brake



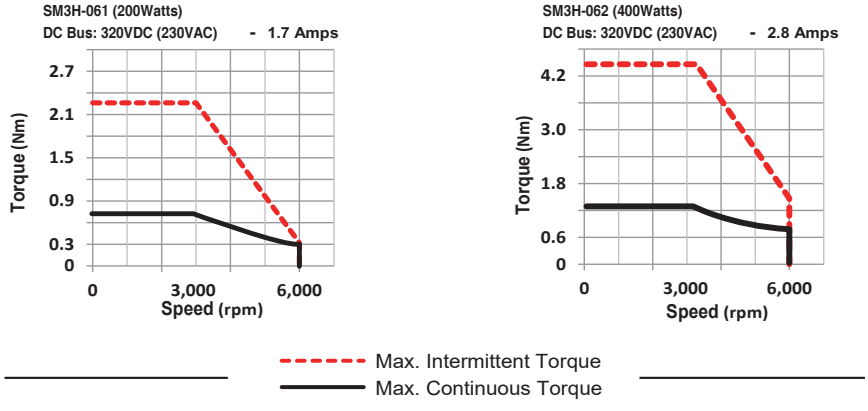
Without Brake	L
SM3H-061A ◇ NP △	77
SM3H-062A ◇ NP △	97

2) With Brake



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

☐ Torque Curves



Motor Specification

80mm Frame
Low Inertia

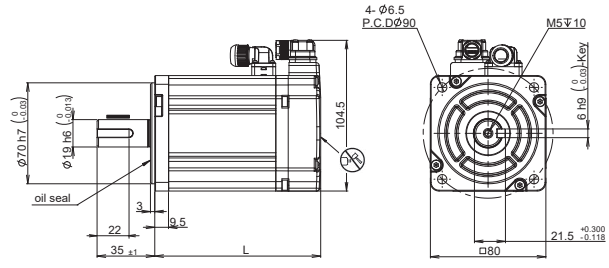
☐ Specification

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	$Kg·m^2$	0.829×10^{-4}	1.01×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	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	2.6	2.8
Weight - With Brake	Kg	3.4	3.6

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

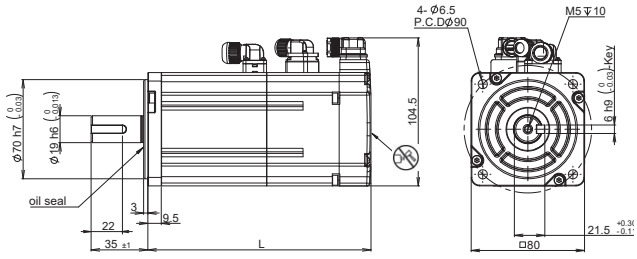
☐ Dimensions (Unit: mm)

1) Without Brake



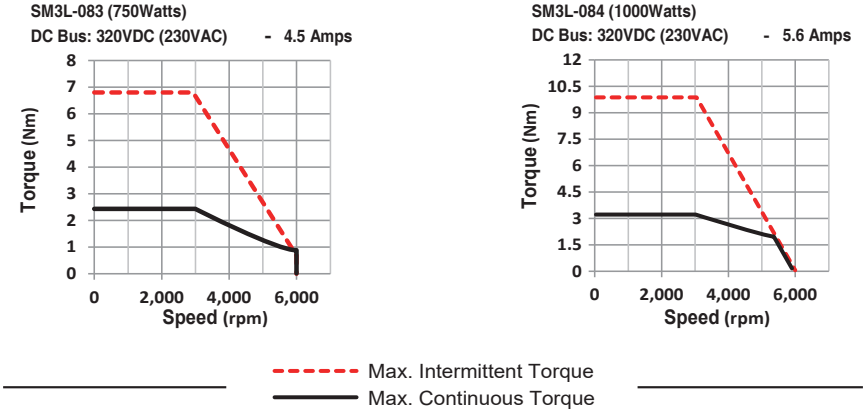
Without Brake	L
SM3L-083A ◇ NP △	115
SM3L-083ABND △	115
SM3L-084A ◇ NP △	129
SM3L-084ABND △	129

2) With Brake



With Brake	L
SM3L-083A ◇ BP △	157
SM3L-083ABBD △	157.5
SM3L-084A ◇ BP △	171
SM3L-084ABBD △	171.5

☐ Torque Curves



Motor Specification

80mm Frame
High Inertia

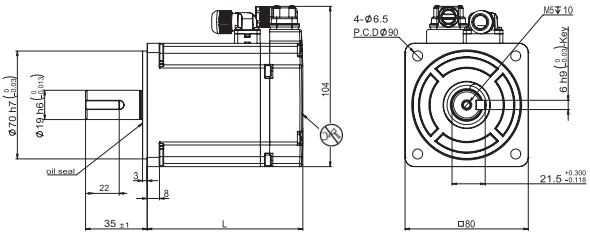
☐ Specification

Type*		SM3H - 083A ◇☐ P △
Rated Output Power	watts	750
Rated Speed	rpm	3000
Max.Speed	rpm	6000
Rated Torque	N·m	2.4
Peak Torque	N·m	8.4
Rated Current	A (rms)	4.5
Peak Current	A (rms)	16.7
Voltage Constant ±5%	V (rms) / K rpm	32.3
Torque Constant ±5%	N·m / A (rms)	0.53
Rotor Inertia	$Kg·m^2$	1.46×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	1.63×10^{-4}
Shaft Load - Axial	N (max.)	90
Shaft Load - Radial (End of Shaft)	N (max.)	270
Weight	Kg	2.6
Weight - With Brake	Kg	3.2

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

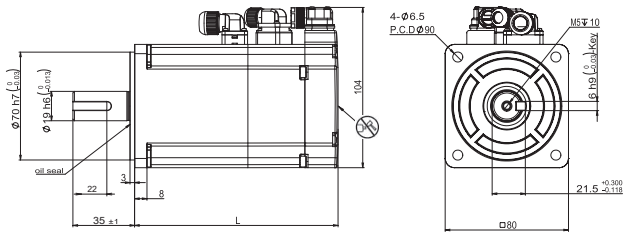
☐ Dimensions (Unit: mm)

1) Without Brake



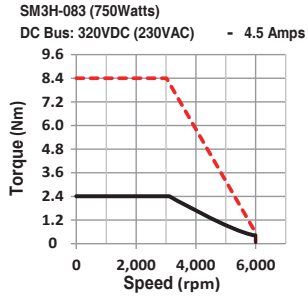
Without Brake	L
SM3H-083A ◇ NP △	101

2) With Brake



With Brake	L
SM3H-083A ◇ BP △	132

☐ Torque Curves



Max. Intermittent Torque
Max. Continuous Torque

Motor Specification

100mm Frame
Low Inertia

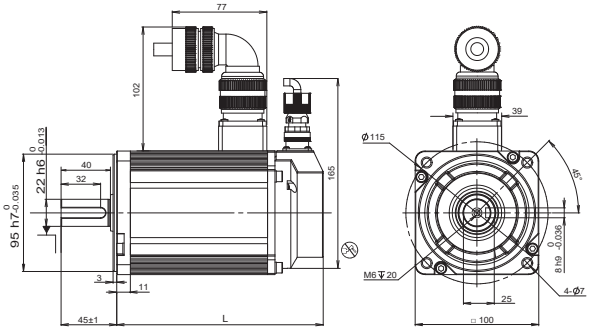
☐ Specification

Type*		SM3L - 102A ◇☐ U △	SM3L - 103A ◇☐ U △	SM3L - 104A ◇☐ U △	SM3L - 105A ◇☐ U △
Rated Output Power	watts	1000	1500	2000	2500
Rated Speed	rpm	3000	3000	3000	3000
Max.Speed	rpm	6000	5700	5600	5600
Rated Torque	N·m	3.2	4.9	6.4	8
Peak Torque	N·m	9.6	14.7	19.2	24
Rated Current	A (rms)	6.0	9.6	12.7	13
Peak Current	A (rms)	21	36.5	44	45
Voltage Constant ± 5%	V (rms) / K rpm	32.9	34.1	34.3	37.4
Torque Constant ± 5%	N·m / A (rms)	0.543	0.563	0.565	0.61
Rotor Inertia	$Kg·m^2$	1.79×10^{-4}	2.37×10^{-4}	2.98×10^{-4}	3.68×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	2.67×10^{-4}	3.25×10^{-4}	3.86×10^{-4}	4.56×10^{-4}
Shaft Load - Axial	N (max.)	90	90	90	90
Shaft Load - Radial (End of Shaft)	N (max.)	270	270	270	270
Weight	Kg	4	4.6	5.2	6.2
Weight - With Brake	Kg	5.2	5.8	6.4	7.6

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

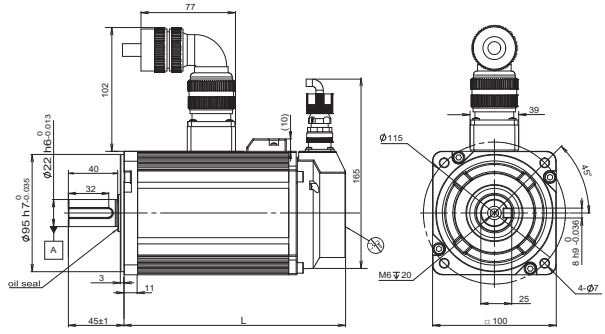
☐ Dimensions (Unit: mm)

1) Without Brake



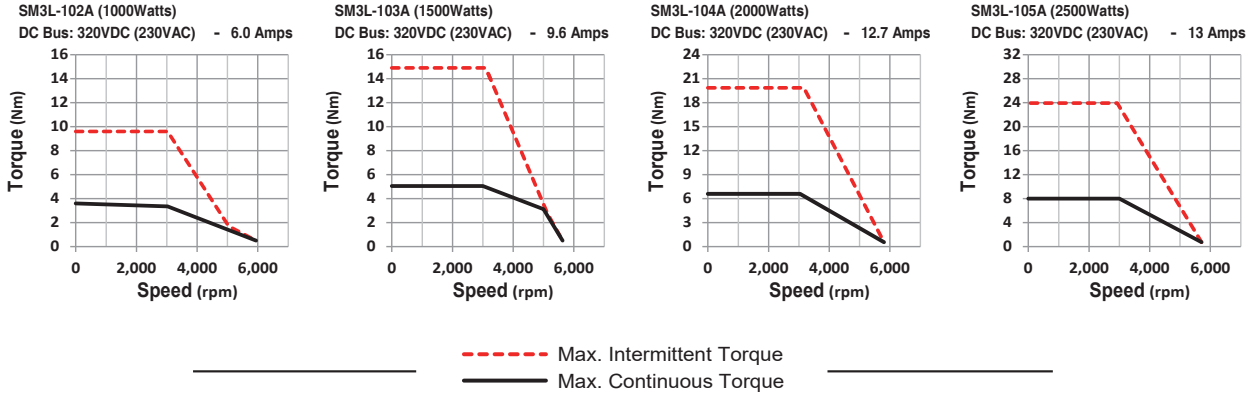
Without Brake	L
SM3L-102A ◇ NU △	137
SM3L-103A ◇ NU △	152
SM3L-104A ◇ NU △	168
SM3L-105A ◇ NU △	186

2) With Brake



With Brake	L
SM3L-102A ◇ BU △	179
SM3L-103A ◇ BU △	194
SM3L-104A ◇ BU △	210
SM3L-105A ◇ BU △	228

☐ Torque Curves



Motor Specification

130mm Frame
High Inertia

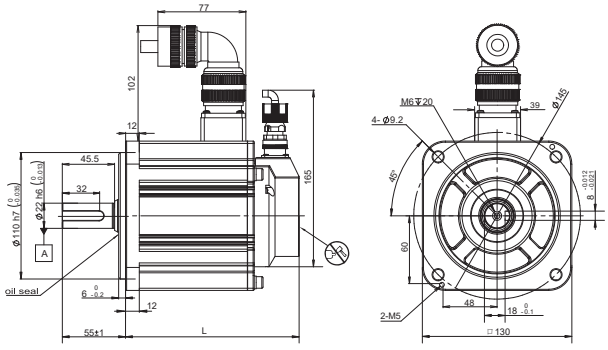
☐ Specification

Type*		SM3M - 132A ◇☐ U △	SM3M - 133A ◇☐ U △	SM3M - 134A ◇☐ U △
Rated Output Power	watts	1000	1500	2000
Rated Speed	rpm	2000	2000	2000
Max.Speed	rpm	3000	3000	3000
Rated Torque	N·m	4.77	7.16	9.55
Peak Torque	N·m	14.3	21.5	28.6
Rated Current	A (rms)	5.4	8.5	11
Peak Current	A (rms)	16.9	26	32.7
Voltage Constant ±5%	V (rms) / K rpm	55.3	54.2	55.5
Torque Constant ±5%	N·m / A (rms)	0.883	0.843	0.87
Rotor Inertia	$Kg·m^2$	13×10^{-4}	18.3×10^{-4}	24.4×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	15.2×10^{-4}	20.5×10^{-4}	26.6×10^{-4}
Shaft Load - Axial	N (max.)	196	343	396
Shaft Load - Radial (End of Shaft)	N (max.)	490	686	980
Weight	Kg	6.2	7.3	9.1
Weight - With Brake	Kg	8.5	9.5	11.4

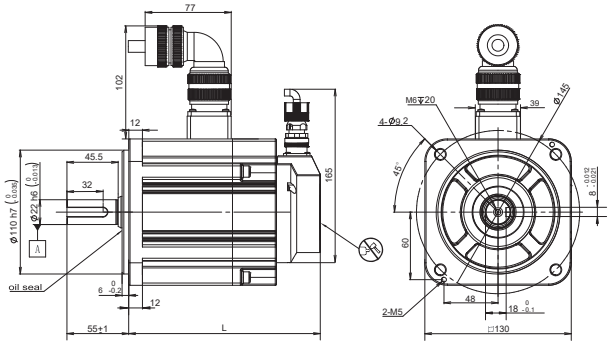
* ◇ **Encoder Options**; ☐ **Brake Options**; △ **Oil Seal Options**

☐ Dimensions (Unit: mm)

1) Without Brake



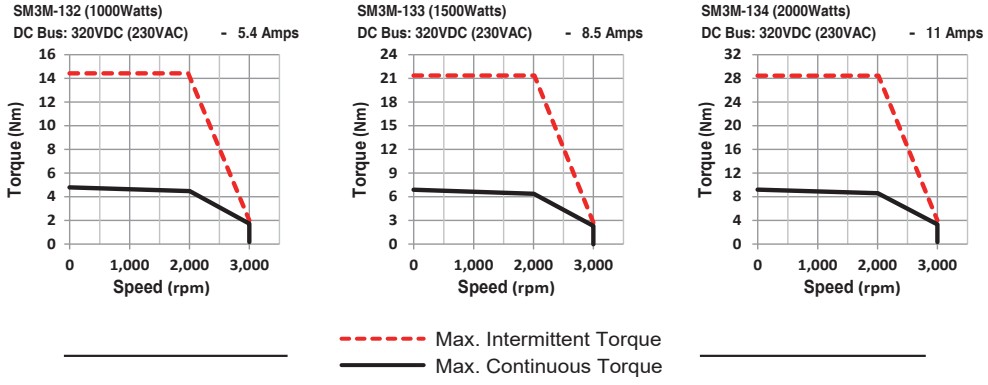
2) With Brake



Without Brake	L
SM3M-132A ◇ NU △	138
SM3M-133A ◇ NU △	155
SM3M-134A ◇ NU △	169

With Brake	L
SM3M-132A ◇ BU △	171
SM3M-133A ◇ BU △	185
SM3M-134A ◇ BU △	202

☐ Torque Curves



Motor Specification

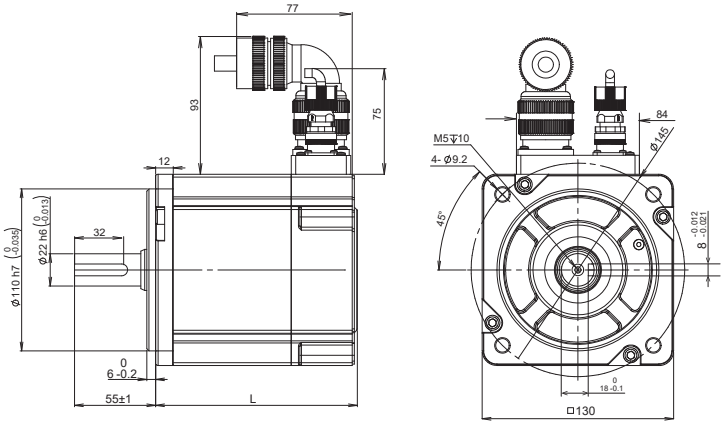
130mm Frame
Medium Inertia

☐ Specification

Type*		SM3M - 135Y ◇☐ M △
Rated Output Power	watts	3000
Rated Speed	rpm	2000
Max.Speed	rpm	3000
Rated Torque	N·m	14.3
Peak Torque	N·m	42.9
Rated Current	A (rms)	10.5
Peak Current	A (rms)	30
Voltage Constant ±5%	V (rms) / K rpm	93.2
Torque Constant ±5%	N·m / A (rms)	1.47
Rotor Inertia	$Kg·m^2$	36.4×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	38.6×10^{-4}
Shaft Load - Axial	N (max.)	396
Shaft Load - Radial (End of Shaft)	N (max.)	980
Weight	Kg	12.5
Weight - With Brake	Kg	14.7

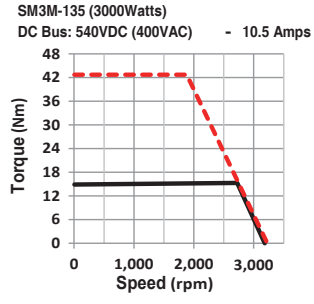
* ◇ **Encoder Options**; ☐ **Brake Options**; △ **Oil Seal Options**

☐ Dimensions (Unit: mm)



Model		L
Without Brake	SM3M-135Y ◇ NM △	205
With Brake	SM3M-135Y ◇ BM △	238

☐ Torque Curves



Max. Intermittent Torque
Max. Continuous Torque

Motor Specification

130mm Frame
High Inertia(Low Speed, High Torque)

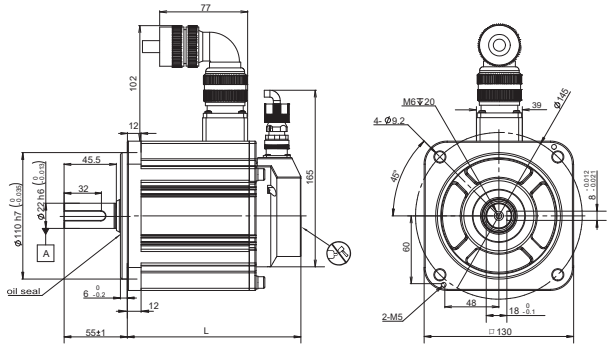
☐ Specification

Type*		SM3H - 132A ◇☐ U △	SM3H - 133A ◇☐ U △	SM3H - 134A ◇☐ U △
Rated Output Power	watts	850	1300	1800
Rated Speed	rpm	1500	1500	1500
Max.Speed	rpm	3000	3000	3000
Rated Torque	N·m	5.39	8.34	11.5
Peak Torque	N·m	16.2	25	34.5
Rated Current	A (rms)	6	9.6	13
Peak Current	A (rms)	19	29.6	45
Voltage Constant ±5%	V (rms) / K rpm	55.3	54.2	51
Torque Constant ±5%	N·m / A (rms)	0.891	0.869	0.88
Rotor Inertia	$Kg·m^2$	13×10^{-4}	18.3×10^{-4}	24.4×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	15.2×10^{-4}	20.5×10^{-4}	26.6×10^{-4}
Shaft Load - Axial	N (max.)	196	343	396
Shaft Load - Radial (End of Shaft)	N (max.)	490	686	980
Weight	Kg	6.2	7.3	9.1
Weight - With Brake	Kg	8.5	9.5	11.4

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

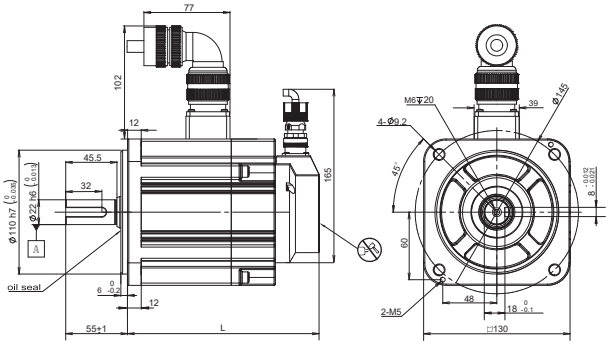
☐ Dimensions (Unit: mm)

1) Without Brake



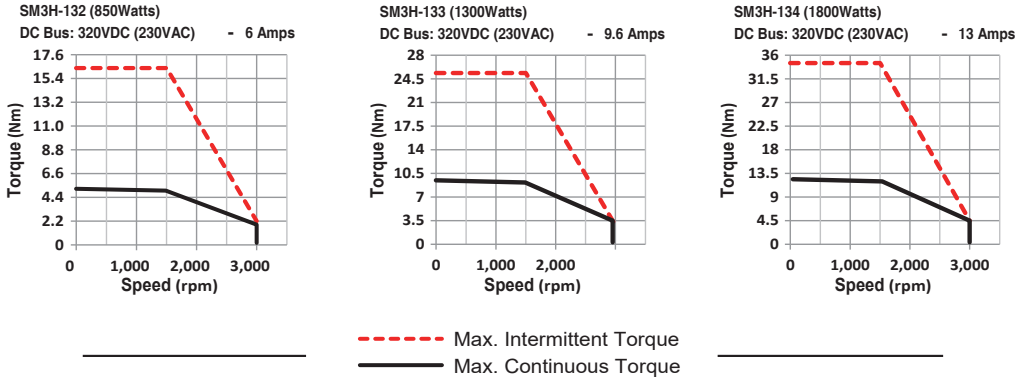
Without Brake	L
SM3H-132A ◇ NU △	138
SM3H-133A ◇ NU △	152
SM3H-134A ◇ NU △	169

2) With Brake



With Brake	L
SM3H-132A ◇ BU △	171
SM3H-133A ◇ BU △	185
SM3H-134A ◇ BU △	202

☐ Torque Curves



Motor Specification

180mm Frame
High Inertia

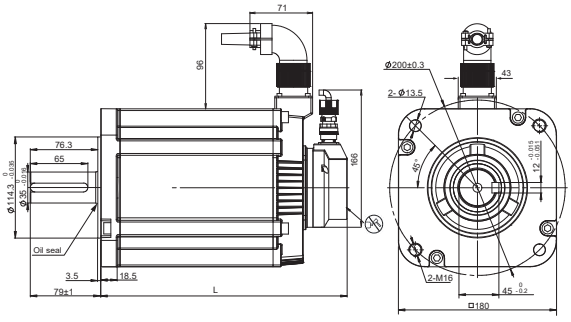
☐ Specification

Type*		SM3H - 182Y ◇☐ U △	SM3H - 183Y ◇☐ U △
Rated Output Power	watts	2900	4400
Rated Speed	rpm	1500	1500
Max.Speed	rpm	3000	3000
Rated Torque	N·m	18.5	28
Peak Torque	N·m	55.5	84
Rated Current	A (rms)	10.5	16.7
Peak Current	A (rms)	35.5	54.7
Voltage Constant ± 5%	V (rms) / K rpm	115	117
Torque Constant ± 5%	N·m / A (rms)	1.76	1.68
Rotor Inertia	$Kg·m^2$	46×10^{-4}	67.5×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	51×10^{-4}	72.5×10^{-4}
Shaft Load - Axial	N (max.)	490	490
Shaft Load - Radial (End of Shaft)	N (max.)	1470	1470
Weight	Kg	13.9	17.4
Weight - With Brake	Kg	15.9	19.4

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

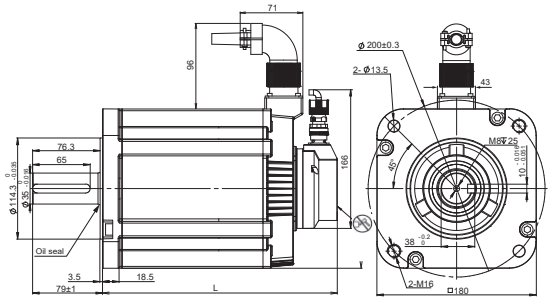
☐ Dimensions (Unit: mm)

1) Without Brake



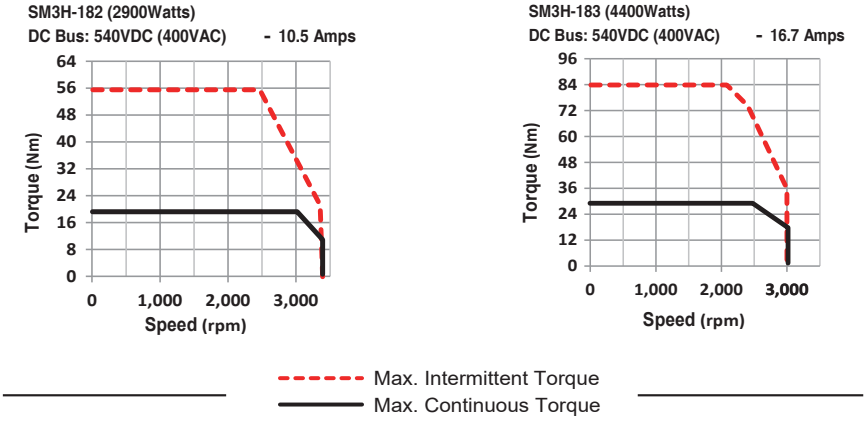
Without Brake	L
SM3H-182Y ◇ NU △	190
SM3H-183Y ◇ NU △	215

2) With Brake



With Brake	L
SM3H-182Y ◇ BU △	245
SM3H-183Y ◇ BU △	265

☐ Torque Curves



Motor Specification

180mm Frame
High Inertia

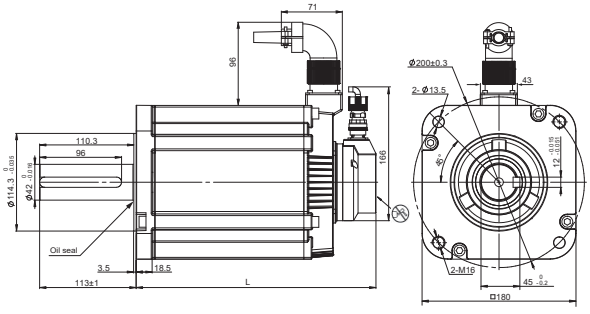
☐ Specification

Type*		SM3H - 184Y ◇☐ U △	SM3H - 185Y ◇☐ U △
Rated Output Power	watts	5500	7500
Rated Speed	rpm	1500	1500
Max.Speed	rpm	3000	3000
Rated Torque	N·m	35	48
Peak Torque	N·m	105	120
Rated Current	A (rms)	20.9	25.2
Peak Current	A (rms)	70	73.4
Voltage Constant ±5%	V (rms) / K rpm	114	115
Torque Constant ±5%	N·m / A (rms)	1.67	1.93
Rotor Inertia	$Kg·m^2$	89×10^{-4}	125×10^{-4}
Rotor Inertia - With Brake	$Kg·m^2$	92×10^{-4}	145×10^{-4}
Shaft Load - Axial	N (max.)	588	588
Shaft Load - Radial (End of Shaft)	N (max.)	1764	1764
Weight	Kg	21	26.8
Weight - With Brake	Kg	23	28.9

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

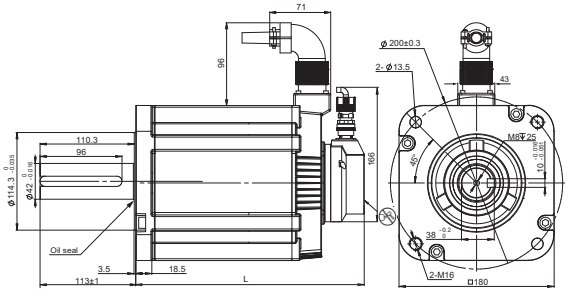
☐ Dimensions (Unit: mm)

1) Without Brake



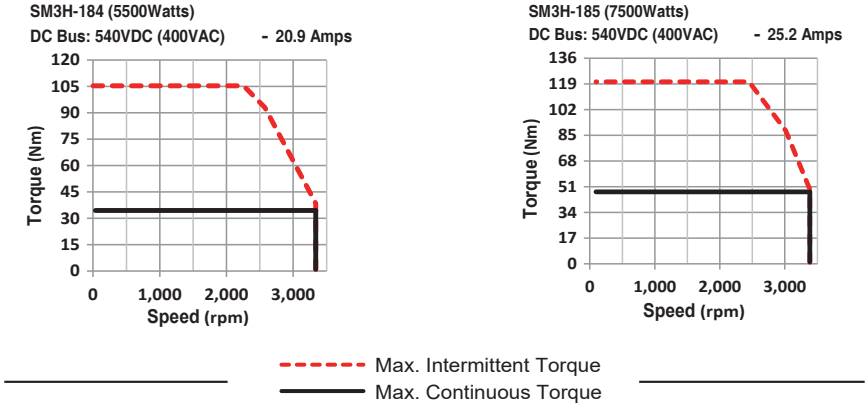
Without Brake	L
SM3H-184Y ◇ NU △	230
SM3H-185Y ◇ NU △	281

2) With Brake



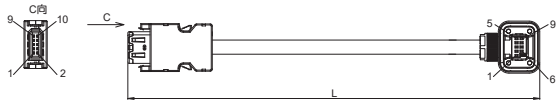
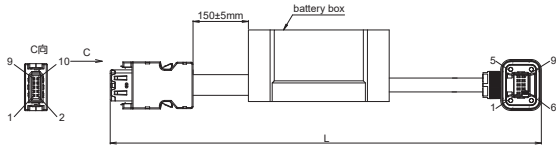
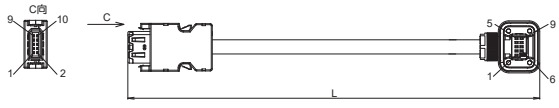
With Brake	L
SM3H-184Y ◇ BU △	280
SM3H-185Y ◇ BU △	316

☐ Torque Curves



Accessories

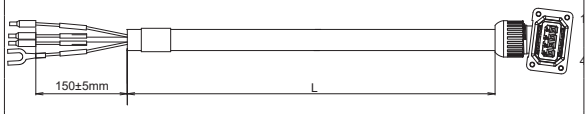
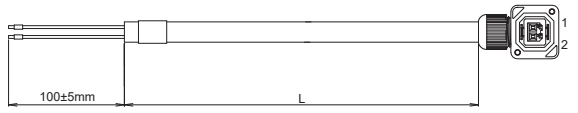
Encoder Cables
For 40mm, 60mm, 80mm Frame Size Motor

Model*	Length(L)	Description	For Servo Motor*	Outline
2640-0100	1m	Encoder Cables Incremental Encoder Standard	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		
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	SM3H-041A ◇☐ P △ SM3H-042A ◇☐ P △ SM3H-061A ◇☐ P △ SM3H-062A ◇☐ P △ SM3H-083A ◇☐ 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		
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			
2641-0100	1m	Encoder Cables Without Battery Absolute Encoder Standard	SM3L-042AB ☐ D △ SM3L-061AB ☐ D △ SM3L-062AB ☐ D △ SM3L-083AB ☐ D △ SM3L-084AB ☐ D △ SM3M-062AB ☐ D △ SM3M-083AB ☐ D △	
2641-0200	2m			
2641-0300	3m			
2641-0400	4m			
2641-0500	5m			
2641-0800	8m			
2641-1000	10m			
2641-1500	15m			
2641-2000	20m			
2641-0100-C10	1m	Encoder Cables Without Battery Absolute Encoder Flexible		
2641-0200-C10	2m			
2641-0300-C10	3m			
2641-0400-C10	4m			
2641-0500-C10	5m			
2641-0800-C10	8m			
2641-1000-C10	10m			
2641-1500-C10	15m			
2641-2000-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

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	SM3L-042A ◇ □ D △ SM3L-061A ◇ □ P △ SM3L-062A ◇ □ P △ SM3L-083A ◇ □ P △ SM3H-041A ◇ □ P △ SM3H-042A ◇ □ P △ SM3H-061A ◇ □ P △ SM3H-062A ◇ □ P △ SM3H-083A ◇ □ 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	SM3L-042AB □ D △ SM3L-061AB □ D △ SM3L-062AB □ D △ SM3L-083AB □ D △ SM3L-084AB □ D △ SM3M-062AB □ D △ SM3M-083AB □ D △	
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	Motor Cables With Brake Cable Standard	SM3L-042A ◇ BD △ SM3L-061A ◇ BP △ SM3L-062A ◇ BP △ SM3L-083A ◇ BP △ SM3L-084A ◇ BP △ SM3H-041A ◇ BP △ SM3H-042A ◇ BP △ SM3H-061A ◇ BP △ SM3H-062A ◇ BP △ SM3H-083A ◇ 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	Motor Cables With Brake Cable Flexible	SM3L-042ABBD △ SM3L-061ABBD △ SM3L-062ABBD △ SM3L-083ABBD △ SM3L-084ABBD △ SM3M-062ABBD △ SM3M-083ABBD △	
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			

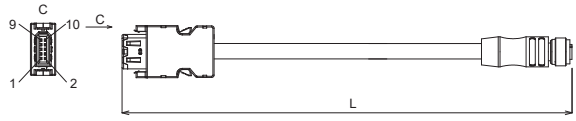
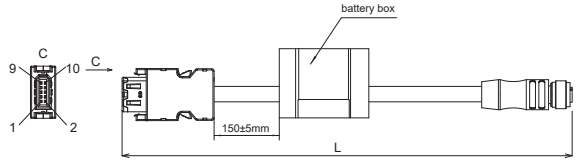
*** ◇ Encoder Options □ Brake Options △ Oil Seal Options**

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

注：SM3L-084A ◇ □ P △ Normal Power cable 1645-XXXX series, Flexible Power cable 1645-XXXX-C10 series.

Accessories

Encoder Cables (Straight Plug)
For 100mm, 130mm, 180mm Frame Size Motor

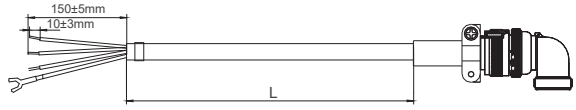
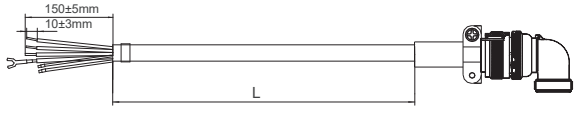
Model*	Length(L)	Description	For Servo Motor*	Outline
2643-0100	1m	Encoder Cables Incremental Encoder Standard	SM3L-102A ◇□ U △ SM3L-103A ◇□ U △ SM3L-104A ◇□ U △ SM3L-105A ◇□ U △ SM3M-132A ◇□ U △ SM3M-133A ◇□ U △ SM3M-134A ◇□ U △ SM3M-135Y ◇□ M △	
2643-0300	3m			
2643-0500	5m			
2643-1000	10m			
2643-1500	15m			
2643-2000	20m			
2643-0100-C10	1m	Encoder Cables Incremental Encoder Flexible		
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	SM3H-132A ◇□ U △ SM3H-133A ◇□ U △ SM3H-134A ◇□ U △ SM3H-182Y ◇□ U △ SM3H-183Y ◇□ U △ SM3H-184Y ◇□ U △ SM3H-185Y ◇□ U △	
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		
2642-0300-C10	3m			
2642-0500-C10	5m			
2642-1000-C10	10m			
2642-1500-C10	15m			
2642-2000-C10	20m			

*** ◇ Encoder 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

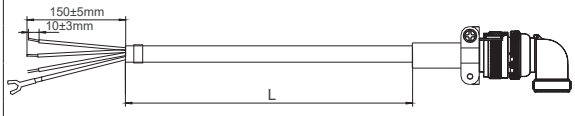
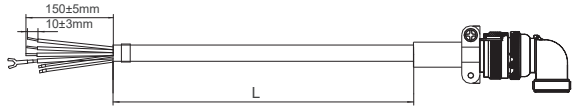
Model*	Length(L)	Description	For Servo Motor*	Outline
1658-0100	1m	Motor Cables Standard	SM3L-102A ◇ NU △ SM3M-132A ◇ NU △ SM3H-132A ◇ NU △	
1658-0300	3m			
1658-0500	5m			
1658-1000	10m			
1658-1500	15m			
1658-2000	20m			
1658-0100-C10	1m	Motor Cables Flexible		
1658-0300-C10	3m			
1658-0500-C10	5m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

*** ◇ Encoder Options △ Oil Seal Options**

*** Flexible -C10 10 million times**
Test Conditions: Bend Radius 100mm, Frequency 40 times/min, Distance 1000mm

Accessories

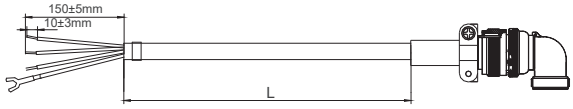
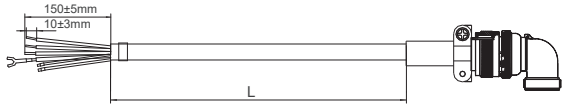
Motor Power Cables (Angled Plug)
For 100mm Frame Size 1.5kW Motor; 130mm Frame Size 1.3/1.5kW Motor

Model*	Length(L)	Description	For Servo Motor*	Outline
1656-0100	1m	Motor Cables Standard	SM3L-103A ◇ NU △ SM3M-133A ◇ NU △ SM3H-133A ◇ NU △	
1656-0300	3m			
1656-0500	5m			
1656-1000	10m			
1656-1500	15m			
1656-2000	20m			
1656-0100-C10	1m	Motor Cables Flexible		
1656-0300-C10	3m			
1656-0500-C10	5m			
1656-1000-C10	10m			
1656-1500-C10	15m			
1656-2000-C10	20m			
1662-0100	1m	Motor Cables With Built-in Brake Cable Standard	SM3L-103A ◇ BU △ SM3M-133A ◇ BU △ SM3H-133A ◇ BU △	
1662-0300	3m			
1662-0500	5m			
1662-1000	10m			
1662-1500	15m			
1662-2000	20m			
1662-0100-C10	1m	Motor Cables With Built-in Brake Cable Flexible		
1662-0300-C10	3m			
1662-0500-C10	5m			
1662-1000-C10	10m			
1662-1500-C10	15m			
1662-2000-C10	20m			

*** ◇ Encoder Options △ Oil Seal Options**

*** Flexible -C10 10 million times**
Test Conditions: Bend Radius 100mm, Frequency 40 times/min, Distance 1000mm

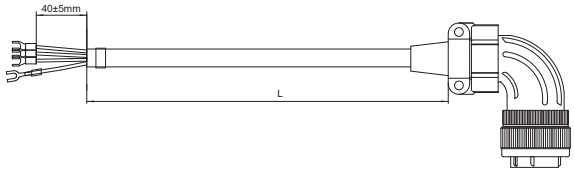
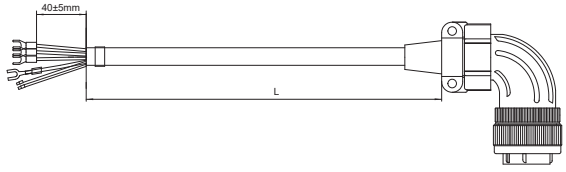
Motor Power Cables (Angled Plug)
For 100mm Frame Size 2.0/2.5kW Motor, 130mmFrame Size 1.8/2.0/3.0kW Motor

Model*	Length(L)	Description	For Servo Motor*	Outline
1650-0100	1m	Motor Cables Standard	SM3L-104A ◇ NU △ SM3L-105A ◇ NU △ SM3M-134A ◇ NU △ SM3M-135Y ◇ NM △ SM3H-134A ◇ NU △	
1650-0300	3m			
1650-0500	5m			
1650-1000	10m			
1650-1500	15m			
1650-2000	20m			
1650-0100-C10	1m	Motor Cables Flexible		
1650-0300-C10	3m			
1650-0500-C10	5m			
1650-1000-C10	10m			
1650-1500-C10	15m			
1650-2000-C10	20m			
1652-0100	1m	Motor Cables With Built-in Brake Cable Standard	SM3L-104A ◇ BU △ SM3L-105A ◇ BU △ SM3M-134A ◇ BU △ SM3M-135Y ◇ BM △ SM3H-134A ◇ BU △	
1652-0300	3m			
1652-0500	5m			
1652-1000	10m			
1652-1500	15m			
1652-2000	20m			
1652-0100-C10	1m	Motor Cables With Built-in Brake Cable Flexible		
1652-0300-C10	3m			
1652-0500-C10	5m			
1652-1000-C10	10m			
1652-1500-C10	15m			
1652-2000-C10	20m			

* ◇ Encoder Options △ Oil Seal Options
* Flexible -C10 10 million times
Test Conditions: Bend Radius 100mm, Frequency 40 times/min, Distance 1000mm

Accessories

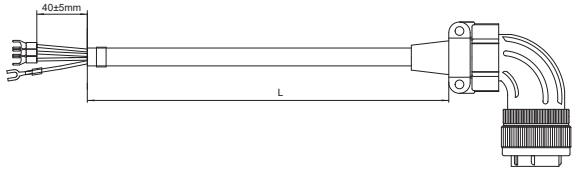
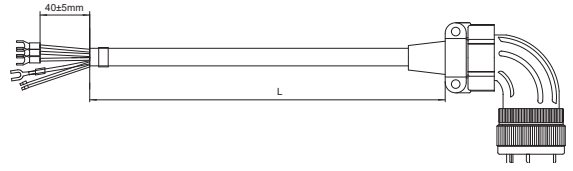
Motor Power Cables (Angled Plug)
For 180mm Frame Size 2.9/4.4kW Motor

Model*	Length(L)	Description	For Servo Motor*	Outline
1666-0100	1m	Motor Cables Standard	SM3H-182Y ◇ NU △ SM3H-183Y ◇ NU △	
1666-0300	3m			
1666-0500	5m			
1666-1000	10m			
1666-1500	15m			
1666-2000	20m			
1666-0100-C10	1m	Motor Cables Flexible		
1666-0300-C10	3m			
1666-0500-C10	5m			
1666-1000-C10	10m			
1666-1500-C10	15m			
1666-2000-C10	20m			
1668-0100	1m	Motor Cables With Built-in Brake Cable Standard	SM3H-182Y ◇ BU △ SM3H-183Y ◇ BU △	
1668-0300	3m			
1668-0500	5m			
1668-1000	10m			
1668-1500	15m			
1668-2000	20m			
1668-0100-C10	1m	Motor Cables With Built-in Brake Cable Flexible		
1668-0300-C10	3m			
1668-0500-C10	5m			
1668-1000-C10	10m			
1668-1500-C10	15m			
1668-2000-C10	20m			

*** ◇ Encoder Options △ Oil Seal Options**

*** Flexible -C10 10 million times**
Test Conditions: Bend Radius 100mm, Frequency 40 times/min, Distance 1000mm

Motor Power Cables (Angled Plug)
For 180mm Frame Size 5.5/7.5kW Motor

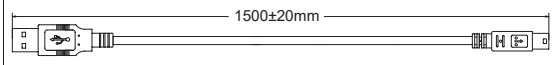
Model*	Length(L)	Description	For Servo Motor*	Outline
1667-0100	1m	Motor Cables Standard	SM3H-184Y ◇ NU △ SM3H-185Y ◇ NU △	
1667-0300	3m			
1667-0500	5m			
1667-1000	10m			
1667-1500	15m			
1667-2000	20m			
1667-0100-C10	1m	Motor Cables Flexible		
1667-0300-C10	3m			
1667-0500-C10	5m			
1667-1000-C10	10m			
1667-1500-C10	15m			
1667-2000-C10	20m			
1669-0100	1m	Motor Cables With Built-in Brake Cable Standard	SM3H-184Y ◇ BU △ SM3H-185Y ◇ BU △	
1669-0300	3m			
1669-0500	5m			
1669-1000	10m			
1669-1500	15m			
1669-2000	20m			
1669-0100-C10	1m	Motor Cables With Built-in Brake Cable Flexible		
1669-0300-C10	3m			
1669-0500-C10	5m			
1669-1000-C10	10m			
1669-1500-C10	15m			
1669-2000-C10	20m			

* ◇ Encoder Options △ Oil Seal Options
* Flexible -C10 10 million times
Test Conditions: Bend Radius 100mm, Frequency 40 times/min, Distance 1000mm

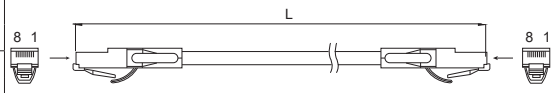
Accessories

Servo Drive Accessories

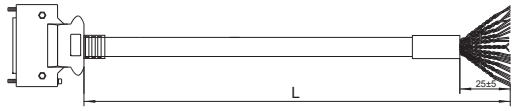
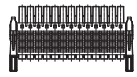
USB Cable

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

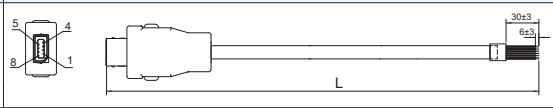
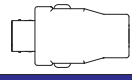
CN6/CN7 Communication Daisy Chain Cable

Model	Length (L)	Description	Outline
2012-030	0.3m	Twisted-pair, Standard type	
2012-300	3m		
2013-030	0.3m	Twisted-pair, Shielded type	
2013-300	3m		

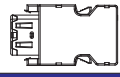
IO Connector, I/O Signal Cable

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-CN226P	-	CN2 26pin push-in spring I/O connector	

Second Encoder Connector, Full Closed-loop Accessories

Model	Length (L)	Description	Outline
1643-300	3m	CN4 Secondary encoder feedback cable Shielded type	
1643-500	5m		
1643-300-C05	3m		
1643-500-C05	5m		
MSOP-CN408P	-	CN4 Secondary encoder feedback connector	

Motor Encoder Connector (Drive Side)

Model	Length	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(Single Phase)	-

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, 20Ω	Regenerative absorbing resistor	-
REG200W120R	200W, 120Ω		
REG300W120R	300W, 120Ω		

Dynamic Brake Resistor (1.0/1.5/2.5/3 kW Type)

Model	Specification	Description	Outline
DBR80W3R5	80W，3.5Ω	External dynamic brake resistor	-

Drive Connector Kit

Model	Description	Outline
MSOP-DRPWKITA	200/400/750W drive P1, P2 JST handle lever	-
MSOP-DRPWKITB	1.0/1.5/2.5/3.0kW drive P1, P2 JST handle lever	-

STO Connector Kit

Model	Specification	Description	Outline
STO Connector Kit	-	-	-

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)	
MSOP-MTKITE	180mm frame size motor (angle plug type)	

WHY CHOOSE APPLIED MOTION?

Connected. We provide communication options for EtherNet/IP, EtherCAT, Modbus and CANopen networks, as well as the easy-to-use SCL protocol for open networks over Ethernet, RS-485 and RS-232 connections.

Customized. If you're looking for motor, drive or integrated motor solutions tailored to your specific design requirements, we have the product line, manufacturing capabilities and experience to provide it for you.

Closed-Loop. Our StepSERVO™ closed-loop stepper technology greatly improves upon traditional step motor performance by providing more torque, faster acceleration, higher system accuracy, better efficiency and quieter operation.

In Stock. Our warehouse in California is filled with motors and drives to meet your production needs. Same day shipments and quick turnaround on prototypes mean your machine life cycle will be well-supported from beginning to end.

Experience. Our technical support and sales staff have the expertise available from years of experience in the motion control and factory automation industries. This experience is just a phone call away.

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