

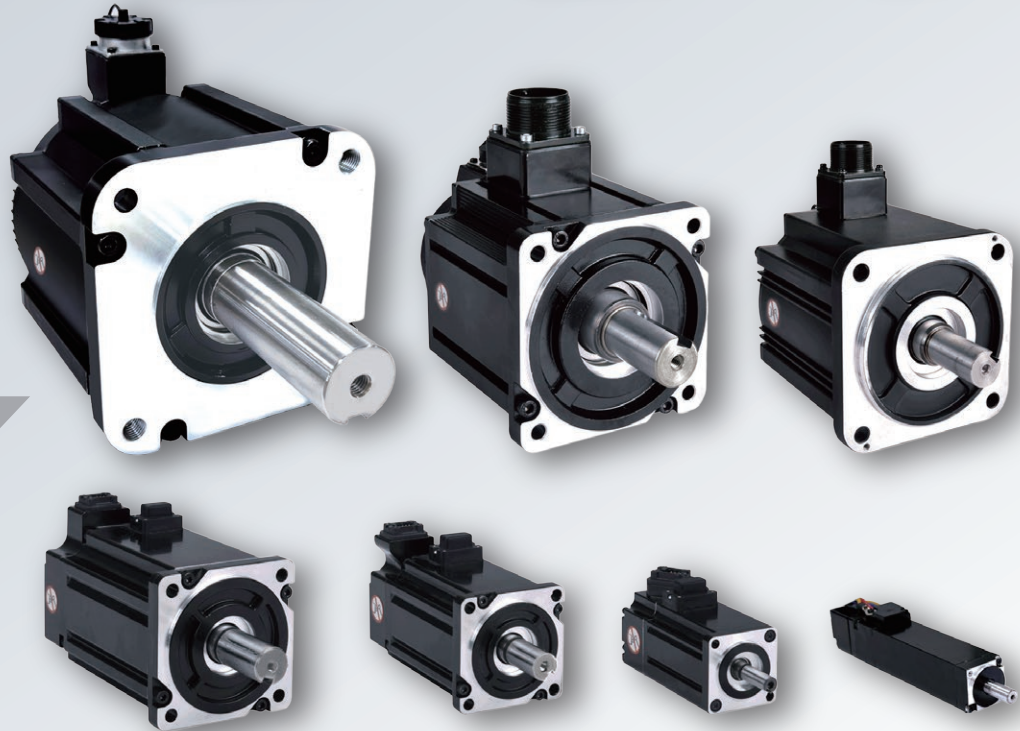
SERVO MOTORS

- 20 mm
- 40 mm
- 60 mm
- 80 mm
- 100 mm
- 130 mm
- 180 mm

SM Series



SM3 Series



Selection Guide: MOONS servo motor has SM and SM3 series.

SM series contains three frame sizes of 40/60/80mm with power ranging from 60W to 1.0kW and supports a wide range of winding options, including 220VAC and low voltage DC inputs.

This series features low temperature rise and is primarily compatible with 2500-line optical encoders, with magnetic encoder options also available.

As the latest generation of servo motors developed by MOONS, the SM3 series ranges in frame sizes from 20mm to 180mm, with power ranging from 30W to 7.5kW. This series exhibits lower cogging torque characteristics and offers multiple inertia types, along with various encoder options.

UL, CE and RoHS certificates are available.

■ Features

SM Series servo motors

- 8-pole design
- Low temperature rise
- Voltage range selection, 24VDC~220VAC
- Frame size: 40/60/80mm
- Power rating: 60W ~ 1000W
- IP65, Class F



SM3 Series servo motors

- 10-pole design(□20, 4-pole)
- Low cogging torque
- More compact, shorter lengths
- High precision encoder
- Voltage range selection, 220VAC, 400VAC
- Frame size: 20/40/60/80/100/130/180mm
- Power rating: 30W ~ 7.5kW
- Low / Medium / High inertia servo motor
- IP67, Class F
- Grade 1 and 2 energy efficiency certifications



■ Applications

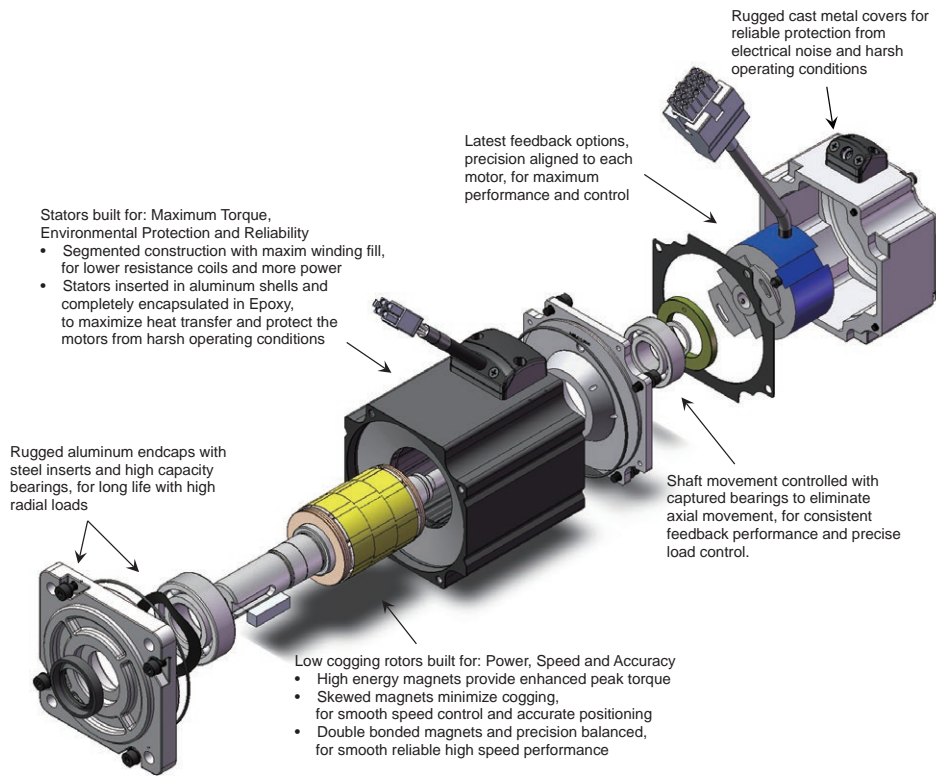
- Industrial Equipment
- Textile
- Packaging
- 3C
- Semiconductor
- Photovoltaic
- Medical

Index

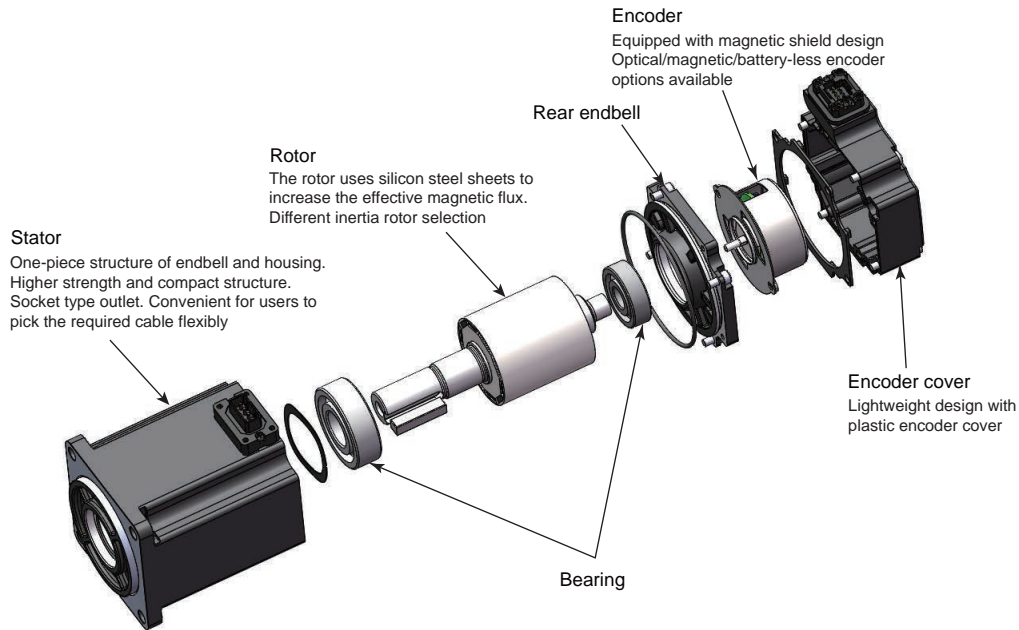
SM Model Numbers	6
SM General Specifications	7
SM040 Series: 40mm.....	8
SM060 Series: 60mm.....	10
SM080 Series: 80mm.....	12
Motor Power Connections	16
Motor Brake Connections.....	16
Feedback Options	17
SM3 Model Numbers	19
SM3 General Specifications	20
20mm Frame Medium Inertia	21
40mm Frame Low Inertia	22
40mm Frame High Inertia.....	23
60mm Frame Low Inertia	24
60mm Frame High Inertia.....	25
80mm Frame Low Inertia	26
80mm Frame High Inertia	27
100mm Frame Low Inertia	28
100mm Frame High Inertia	28
130mm Frame Medium Inertia	30
130mm Frame High Inertia	33
180mm Frame High Inertia	35
Motor Power Connections	37
Motor Brake Connections.....	37
Feedback Options	38
Accessories	41
Allowable load of shaft—Bearing Life	49

Exploded View

● SM Servo Motor



● SM3 Servo Motor—40/60/80mm Frame

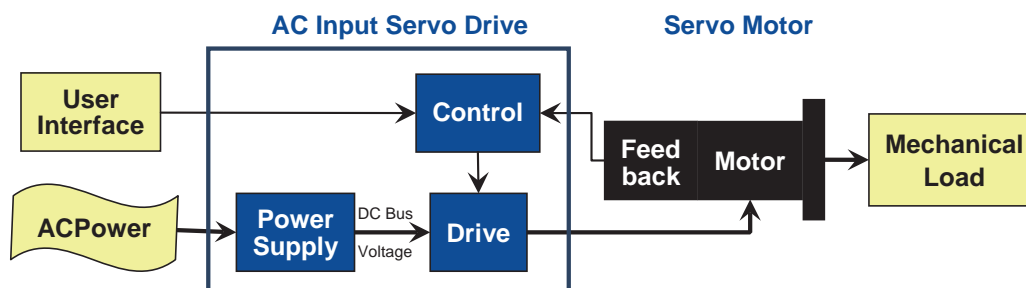


Motor Winding Selection

MOONS' offers a selection of servo motor windings that work well with most drive voltage and current ratings. Speed torque curves for typical motor drive combinations are shown in each motor section of this catalog.

Each SM or SM3 servo motor winding is designated by a Basic Bus Voltage. This is the nominal drive DC Bus Voltage that the motor winding is designed to work with, and deliver rated peak torque and speeds. A winding with a Basic Bus Voltage closest to the drive DC Bus voltage is usually used.

Drives with AC voltage input usually convert the AC voltage to a DC Bus Voltage with a value that is 1.4 times the AC RMS voltage. The drive then uses this DC Bus Voltage to create the voltages and currents that power the motor. Thus a 230 VAC drive typically has 320 VDC Bus Voltage, and a 115 VAC drive typically has 160 VDC Bus Voltage. Drives with DC input voltage use this as the DC Bus Voltage.



All MOONS' SM servo motor windings can be used with a large range of drive voltages.

A drive DC Bus Voltage above the motor Basic Bus Voltage, allows the motor to deliver torque at higher speeds. To avoid damage to the motor, the motor should never be operated at more than the rated peak torque or maximum rated speed.

If the drive DC Bus Voltage is much higher than the winding Basic Bus Voltage, consider changing to a higher voltage motor winding. This will reduce the motor current, and allow the drive to run cooler, or allow the use of a lower current (less expensive) drive. It's rare for the drive DC Bus Voltage to be more than two times the Basic Bus Voltage of the motor winding. The nominal drive DC Bus Voltage is limited to 350 volts, as this is the insulation voltage rating for SM series motors.

Drive DC Bus Voltages below the motor Basic Bus Voltage will reduce high speed performance. When high speed performance is not needed, this is done to minimize motor current, reduce drive heating, and reduce drive size. This is especially useful for low voltage applications of larger motors, where the maximum motor current is limited by the construction of the motor.

Custom windings are also available. Please contact MOONS' for help with motor selection and recommendations for your application.

SM Model Numbers

SM 040 1 A E2 - K CD- N N V

Series

SM Servo Motor

Frame Size


040 40 mm
060 60 mm
080 80 mm

Motor Length

1	1 Stack	All Frame Sizes
2	2 Stacks	All Frame Sizes
3	3 Stacks	80mm only
4	4 Stacks	80mm only

Winding (See motor rating tables for available windings)

Basic Bus Voltage		
A	320 VDC (230 VAC)	Lower Current
B	240 VDC	
C	160 VDC (115 VAC)	
D	120 VDC	
E	80 VDC	
F	60 VDC	
G	48 VDC	
H	36 VDC	
J	24 VDC	Higher Current



Feedback

S2 2500 ppr Magnetic Encoder with Separate Commutation Signals
SS Other customized models
E2 2500 ppr Optical Encoder with Separate Commutation Signals
MB Absolute Multi Turn Heidenhain EnDat 2.2 Encoder - **SM060 & SM080 Motors**

Shaft

K Standard Keyway

Connections (Lead Style / Connector Style)

CD 300mm (12") Shielded Cables with Non - Sealed Connectors - For Windings up to 6.5 Amps
CF 300mm (12") Shielded Cables with Non - Sealed Connectors - For Windings 6.6 to 12.5 Amps
CM 300mm (12") Shielded Cables with Sealed Metal Connectors
CY 300mm (12") Shielded Cables with Screw Connectors - For Windings up to 20 Amps

Brake

N No Brake
B 24 VDC Brake

Temperature Sensor

N No Sensor

Shaft Seal

V Shaft seal shipped with motor, but not placed on shaft

SM General Specifications

Safety Certification



Motor General Specifications

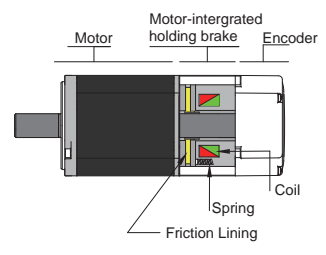
Insulation class	Class F (155°C)	Ambient temperature	Working temperature: 0°C ~ 40°C Storage temperature: -20°C ~ 60°C
Protection level	IP65 (except shaft without seal and non-sealed connectors)	Humidity	Storage and usage: 20 ~ 85%RH (no condensation)
Installation location	Indoors, free from corrosive gas, inflammable 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)	Rotor Poles	8

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.

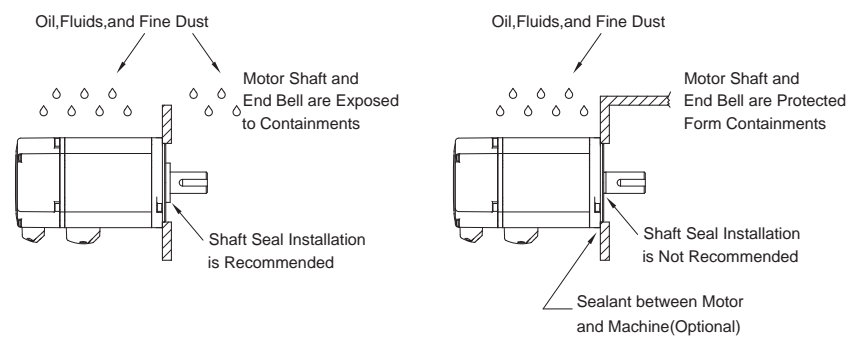
When the brake is powered on, the armature is adsorbed, the brake pad is released, and the motor can operate normally. When the brake is powered off, the armature is released, the brake pad is locked, and the motor can't rotate normally.

Frame	40mm	60mm	80mm
Static Friction Torque (Nm)	0.35	2	4.5
Rated Voltage (VDC)	24		
Rated Current (A)	0.25	0.38	0.61
Engage Time	At nominal air gap @20°C - < 25ms (As brakes are out of box)		
Release Time	Without diode - < 25 ms (During E-stop condition)		
Release Voltage	18.5VDC max.(at 20°C)		



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. Mounting face must have a good finish.



Motor Specification SM040 Series: 40mm, 60-100 Watts

□ Specification

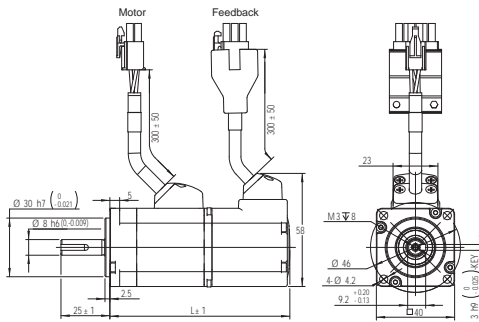
Series		SM0401 - 60 Watt				SM0402 - 100 Watt				
Model & Winding Letter		^ A	^ C	E	^ H	^ A	C	E	^ F	^ H
Base Model Number (with 2500 PPR incremental encoder non-sealed plastic connectors, no brake)		SM0401 AE2-KCD- NNV	SM0401 CE2-KCD- NNV	SM0401 EE2-KCD- NNV	SM0401 HE2-KCD- NNV	SM0402 AE2-KCD- NNV	SM0402 CE2-KCD- NNV	SM0402 EE2-KCD- NNV	SM0402 FE2-KCD- NNV	SM0402 HE2-KCD- NNV
Typical Supply Voltages		208-240 VAC	120 VAC	60-90 VDC	24-48 VDC	208-240 VAC	120 VAC	60-90 VDC	24-80 VDC	12-36VDC
Basic DC Bus Voltage	V (dc)	320	160	80	36	320	160	80	60	36
Rated Output Power	watts	60	60	60	60	100	100	100	100	100
Rated Speed	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3000
Max. Mechanical Speed	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
Rated Torque	Nm	0.19	0.19	0.19	0.19	0.32	0.32	0.32	0.32	0.32
Continuous Stall Torque	Nm	0.19	0.2	0.2	0.2	0.34	0.34	0.34	0.34	0.34
Peak Torque	Nm	0.48	0.48	0.48	0.48	0.93	0.92	0.91	0.91	0.92
Rated Current	A (rms)	0.7	1.4	2.6	5.7	1.2	1.65	3.2	5.2	8.1
Continuous Stall Current	A (rms)	0.7	1.5	2.8	6	1.27	1.8	3.4	5.6	8.7
Peak Current	A (rms)	1.75	3.5	6.5	14.3	3.6	4.95	9.6	15.6	24.3
Voltage Constant ±5%	V (rms) / K rpm	17	8.6	4.6	2.1	16.6	12	6.1	3.8	2.5
Torque Constant ±5%	Nm / A (rms)	0.283	0.143	0.077	0.035	0.271	0.195	0.1	0.061	0.04
Winding Resistance (Line-Line)	Ohm ±10% @25°C	27	6	1.67	0.36	9.7	4.9	1.23	0.48	0.21
Winding Inductance (Line-Line)	mH (typ.)	26	6.6	1.88	0.39	11.5	5.9	1.56	0.58	0.25
Inertia (with encoder)	kg m ²	0.0232 X 10 ⁻⁴				0.0428 X 10 ⁻⁴				
Inertia - With Brake Option	kg m ²	0.0298 X 10 ⁻⁴				0.0494 X 10 ⁻⁴				
Thermal Resistance (mounted)	°C / W	2.9				2.4				
Thermal Time Constant	Minutes	12				14.5				
Heat Sink Size	mm	120 x 120 x 5 Aluminum				120 x 120 x 5 Aluminum				
Shaft Load - Axial	(max.)	50 N / 11 Lb				50 N / 11 Lb				
Shaft Load - Radial (End of Shaft)	(max.)	50 N / 11 Lb				60 N / 13.5 Lb				
Weight (with std. encoder)		0.4 kg / 0.9 Lb				0.55 kg / 1.2 Lb				
Weight - With Brake Option		0.65 kg / 1.4 lb				0.8 kg / 1.8 lb				

Shaft Load: (L₁₀ life, 20,000 hours, 2,000 RPM)

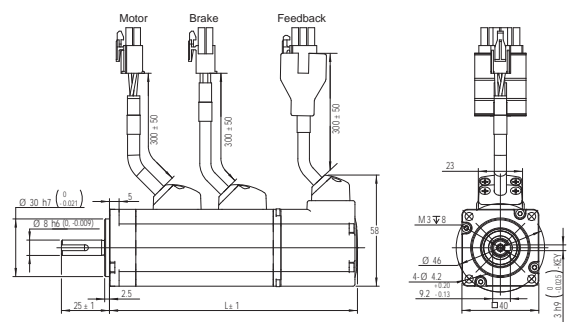
^ Recommended models

□ Dimensions (Unit: mm)

1) Without Brake



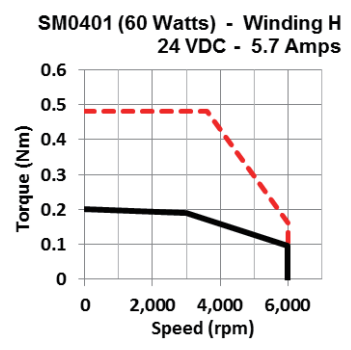
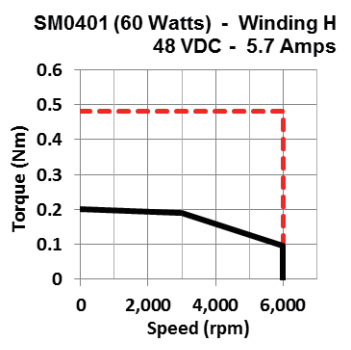
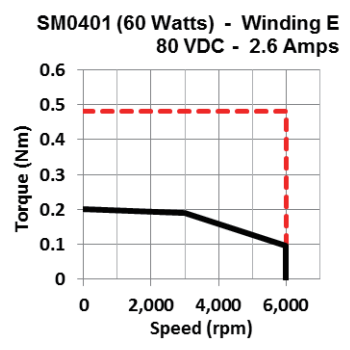
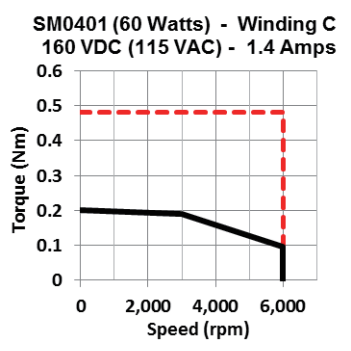
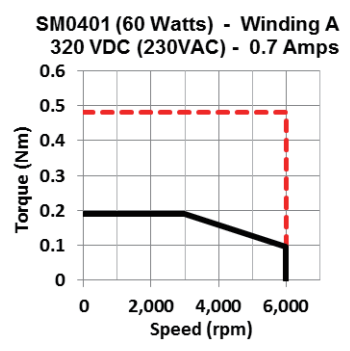
2) With Brake



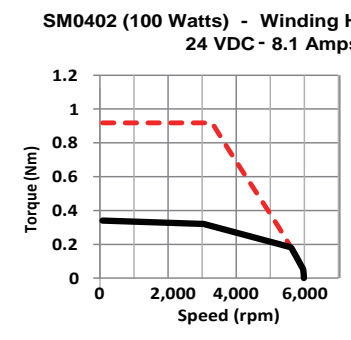
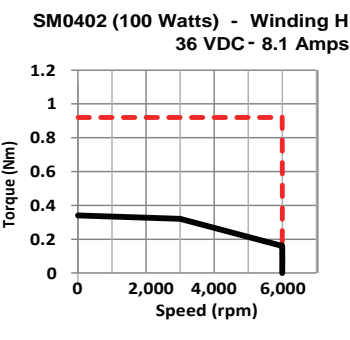
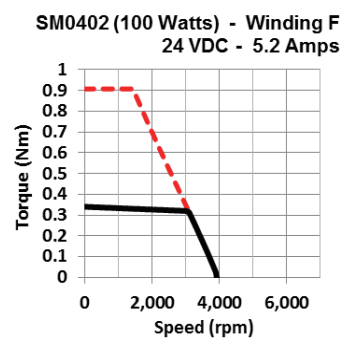
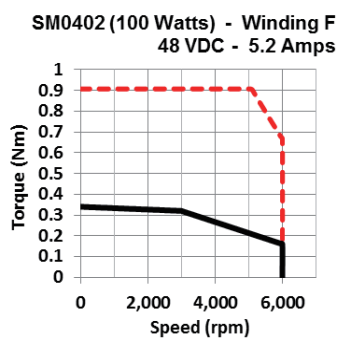
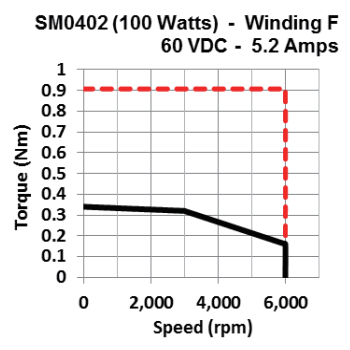
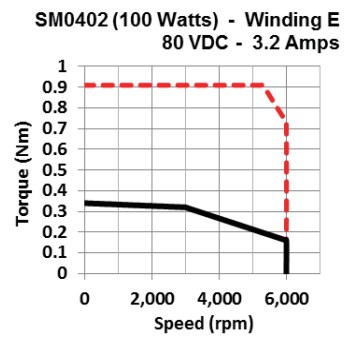
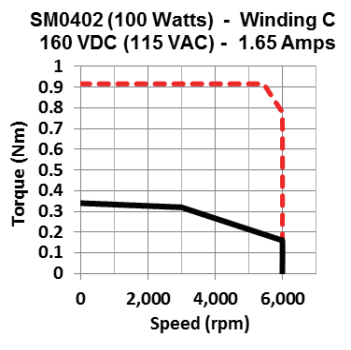
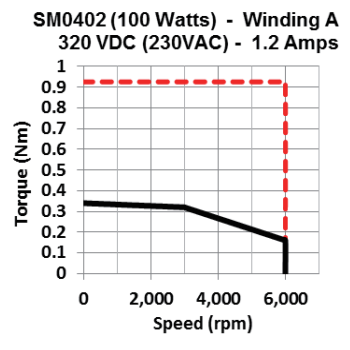
	Without Brake	Feedback	L
SM0401, 60 Watt		E2	92
SM0402, 100 Watt		E2	109
		S2	96

	With Brake	Feedback	L
SM0401, 60 Watt		E2	129
SM0402, 100 Watt		E2	147
		S2	133

□ Torque Curves



----- Max. Intermittent Torque
————— Max. Continuous Torque



Motor Specification SM060 Series: 60mm, 200-400 Watts

□ Specification

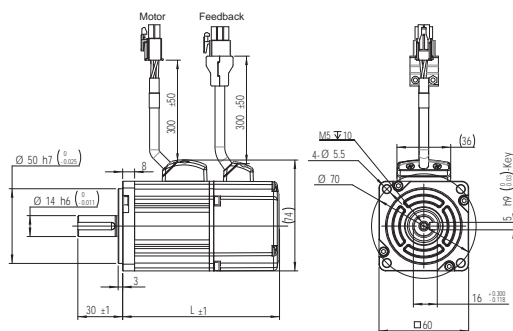
Series		SM0601 - 200 Watt					SM0602 - 400 Watt				
Model & Winding Letter		^ A	^ C	^ E	^ G	H	^ A	C	D	^ F	^ H
Base Model Number (with 2500 PPR incremental encoder non-sealed plastic connectors, no brake)		SM0601 AE2-KCD- NNV	SM0601 CE2-KCD- NNV	SM0601 EE2-KCD- NNV	SM0601 GE2-KCF- NNV	SM0601 HE2-KCY- NNV	SM0602 AE2-KCD- NNV	SM0602 CE2-KCD- NNV	SM0602 DE2-KCF- NNV	SM0602 FE2-KCF- NNV	SM0602 GE2-KCY- NNV
Typical Supply Voltages	V (rms)	208-240 VAC	120 VAC	48-90 VDC	24-60 VDC	24-48VDC	208-240 VAC	120 VAC	60 VDC- 120 VAC	48-80 VDC	36-48VDC
Basic DC Bus Voltage	V (dc)	320	160	80	48	36	320	160	120	60	48
Rated Output Power	watts	200	200	200	200	200	400	400	400	400	400
Rated Speed	rpm	3000	3000	3000	3000	3000	3000	3000	3000	3150	3000
Max. Mechanical Speed	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Rated Torque	Nm	0.64	0.64	0.64	0.64	0.64	1.27	1.27	1.27	1.21	1.27
Continuous Stall Torque	Nm	0.68	0.68	0.68	0.64	0.64	1.27	1.27	1.27	1.21	1.27
Peak Torque	Nm	1.9	1.9	1.9	1.9	1.9	3.8	3.8	3.8	3.6	3.7
Rated Current	A (rms)	1.5	3	5.2	10	16.5	2.75	5.7	6.9	10	18
Continuous Stall Current	A (rms)	1.6	3.2	5.5	10	16.5	2.75	5.7	6.9	10	18
Peak Current	A (rms)	4.5	9	15.6	30	50	8.3	17.1	20.7	30	54
Voltage Constant ±5%	V (rms) / K rpm	27.2	13.6	7.9	4.1	2.4	29	13.8	11.4	7.4	4.3
Torque Constant ±5%	Nm / A (rms)	0.432	0.216	0.125	0.065	0.038	0.484	0.23	0.191	0.123	0.071
Winding Resistance (Line-Line)	Ohm ±10% @25°C	8.6	2.1	0.67	0.192	0.07	3.7	0.85	0.57	0.25	0.089
Winding Inductance (Line-Line)	mH	25	6.1	2	0.56	0.186	12.9	2.9	2	0.84	0.28
Inertia (with encoder)	kg m ²	0.165 X 10 ⁻⁴					0.272 X 10 ⁻⁴				
Inertia - With Brake Option	kg m ²	0.22 X 10 ⁻⁴					0.326 X 10 ⁻⁴				
Thermal Resistance (mounted)	°C / W	1.8					1.43				
Thermal Time Constant	Minutes	15					21				
Heat Sink Size	mm	180 x 180 x 5 Aluminum					180 x 180 x 5 Aluminum				
Shaft Load - Axial	(max.)	70 N / 15 Lb					70 N / 15 Lb				
Shaft Load - Radial (End of Shaft)	(max.)	200 N / 45 Lb					240 N / 54 Lb				
Weight (with std. encoder)		1.1 kg / 2.3 lb					1.4 kg / 3.1 lb				
Weight - With Brake Option		1.6 kg / 3.5 lb					1.9 kg / 4.2 lb				

Shaft Load: (L₁₀ life, 20,000 hours, 2,000 RPM)

^ Recommended models

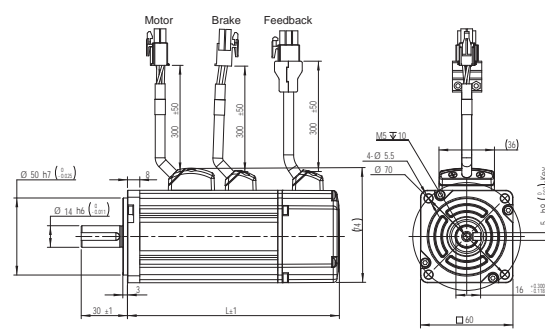
□ Dimensions (Unit: mm)

1) Without Brake



Without Brake	Feedback	L
SM0601, 200 Watt	E2	98
	S2	78
	MB	98
SM0602, 400 Watt	E2	118
	S2	107
	MB	118

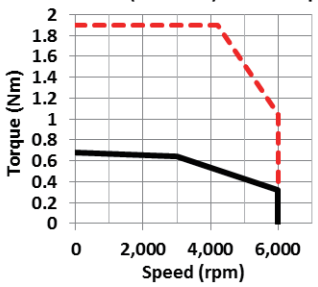
2) With Brake



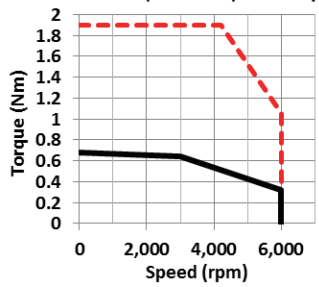
With Brake	Feedback	L
SM0601, 200 Watt	E2	138
	S2	118
	MB	138
SM0602, 400 Watt	E2	158
	S2	147
	MB	158

□ Torque Curves

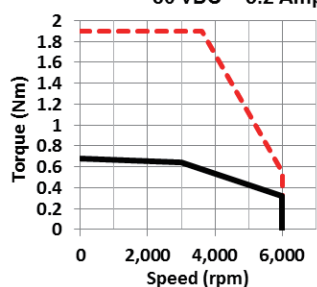
SM0601 (200 Watts) - Winding A
320 VDC (230VAC) - 1.5 Amps



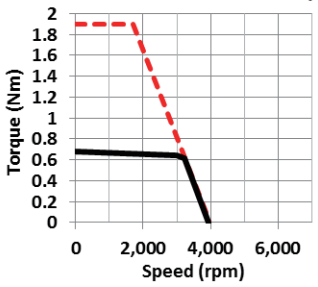
SM0601 (200 Watts) - Winding C
160 VDC (115 VAC) - 3 Amps



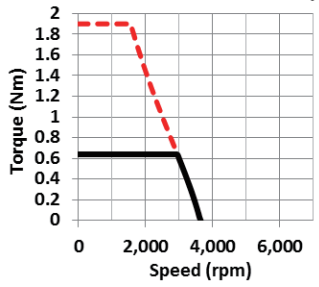
SM0601 (200 Watts) - Winding E
80 VDC - 5.2 Amps



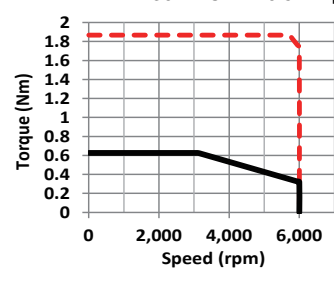
SM0601 (200 Watts) - Winding E
48 VDC - 5.2 Amps



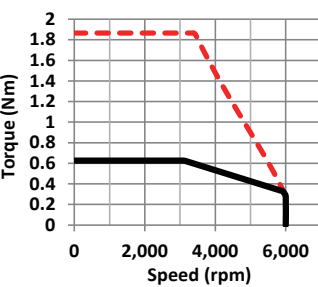
SM0601 (200 Watts) - Winding G
24 VDC - 10 Amps



SM0601 (200 Watts) - Winding H
36 VDC - 16.5 Amps

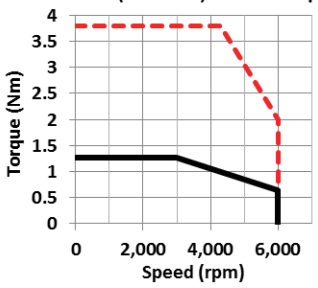


SM0601 (200 Watts) - Winding H
24 VDC - 16.5 Amps

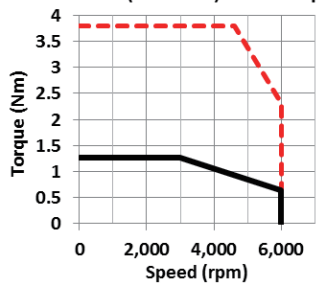


----- Max. Intermittent Torque
————— Max. Continuous Torque

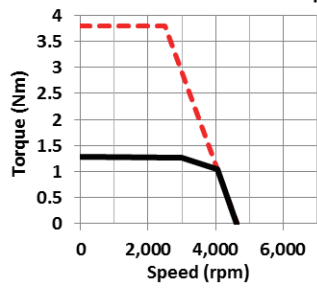
SM0602 (400 Watts) - Winding A
320 VDC (230VAC) - 2.75 Amps



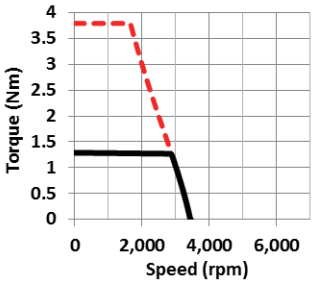
SM0602 (400 Watts) - Winding C
160 VDC (115 VAC) - 5.7 Amps



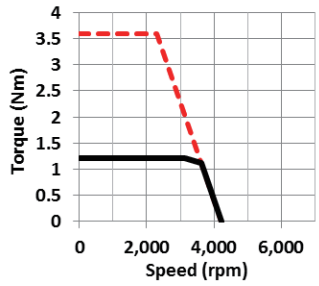
SM0602 (400 Watts) - Winding D
80 VDC - 6.9 Amps



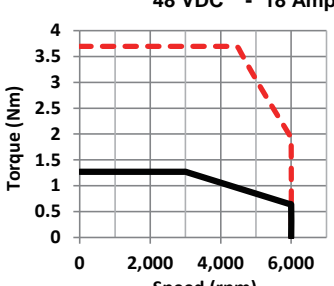
SM0602 (400 Watts) - Winding D
60 VDC - 6.9 Amps



SM0602 (400 Watts) - Winding F
48 VDC - 10 Amps



SM0602 (400 Watts) - Winding G
48 VDC - 18 Amps



Motor Specification SM080 Series: 80mm, 300-550 Watts

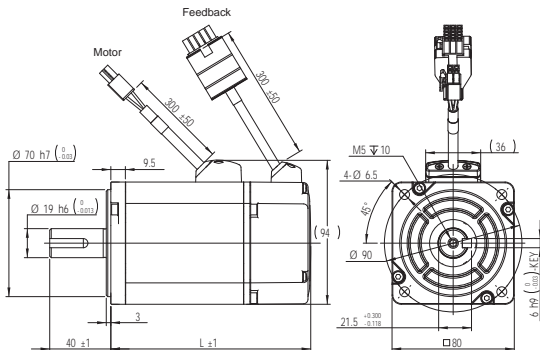
Specification

Series		SM0801 - 300 Watt		SM0802 - 550 Watt		
Model & Winding Letter		^ A	^G	^ A	C	^E
Base Model Number (with 2500 PPR incremental encoder non-sealed plastic connectors, no brake)		SM0801 AE2-KCD- NNV	SM0801 GE2-KCF-NNV	SM0802 AE2-KCD-NNV	SM0802 CE2-KCD-NNV	SM0802 EE2-KCF-NNV
Typical Supply Voltages	V (rms)	208-240 VAC	24-60 VDC	208-240 VAC	120 VAC	60-90 VDC
Basic DC Bus Voltage	V (dc)	320	48	320	160	80
Rated Output Power	watts	300 (250)	300	550	550	550
Rated Speed	rpm	3000	3000	3000	3000	3000
Max. Mechanical Speed	rpm	6000	6000	5500	5500	5500
Rated Torque	Nm	0.95 (0.79)	0.95	1.8	1.8	1.8
Continuous Stall Torque	Nm	1 (0.83)	1	1.9	1.9	1.9
Peak Torque	Nm	2.3 (2.3)	2.3	4.6	4.6	4.6
Rated Current	A (rms)	1.8 (1.5)	10	3	6	10
Continuous Stall Current	A (rms)	1.9 (1.6)	10.6	3.2	6.4	10.7
Peak Current	A (rms)	4.5 (4.5)	25	8.3	17	28
Voltage Constant ±5%	V (rms) / K rpm	34.3	6.2	37.3	18.6	11.2
Torque Constant ±5%	Nm / A (rms)	0.532	0.096	0.586	0.293	0.176
Winding Resistance (Line-Line)	Ohm ±10% @25°C	5.9	0.188	2.7	0.63	0.22
Winding Inductance (Line-Line)	mH	26	0.85	13.9	3.5	1.25
Inertia (with encoder)	kg m ²	0.45 X 10 ⁻⁴		0.63 X 10 ⁻⁴		
Inertia - With Brake Option	kg m ²	0.53 X 10 ⁻⁴		0.71 X 10 ⁻⁴		
Thermal Resistance (mounted)	°C / W	1.48		1.15		
Thermal Time Constant	Minutes	14		19		
Heat Sink Size	mm	240 x 240 x 6 Aluminum		240 x 240 x 6 Aluminum		
Shaft Load - Axial	(max.)	90 N / 20 Lb		90 N / 20 Lb		
Shaft Load - Radial (End of Shaft)	(max.)	200 N / 45 Lb		240 N / 54 Lb		
Weight (with std. encoder)		1.7 kg / 3.7 lb		2.2 kg / 4.8 lb		
Weight - With Brake Option		2.5 kg / 5.4 lb		3.0 kg / 6.5 lb		

Shaft Load: (L₁₀ life, 20,000 hours, 2,000 RPM)
^ Recommended models

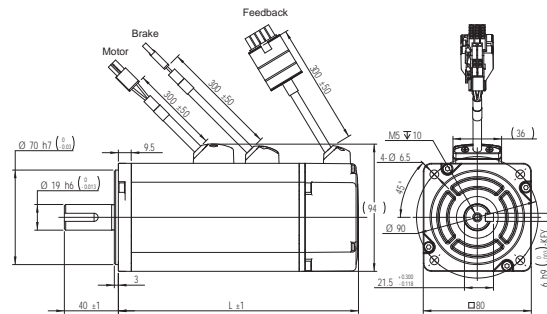
Dimensions (Unit: mm)

1) Without Brake



Without Brake	Feedback	L
SM0801, 300 Watt	E2	101
SM0802, 550 Watt	E2	116

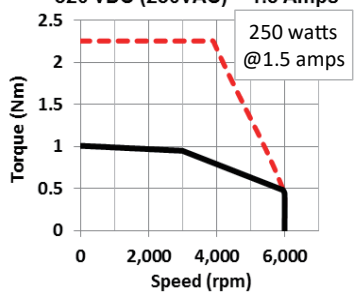
2) With Brake



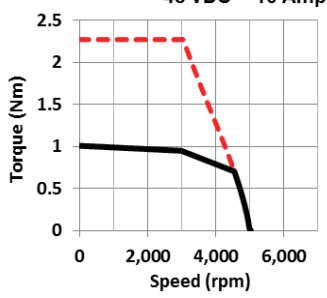
With Brake	Feedback	L
SM0801, 300 Watt	E2	148
SM0802, 550 Watt	E2	163

□ Torque Curves

SM0801 (300 Watts) - Winding A
320 VDC (230VAC) - 1.8 Amps

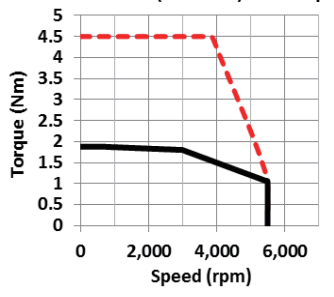


SM0801 (300 Watts) - Winding G
48 VDC - 10 Amps

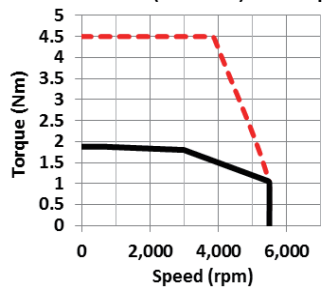


----- Max. Intermittent Torque
————— Max. Continuous Torque

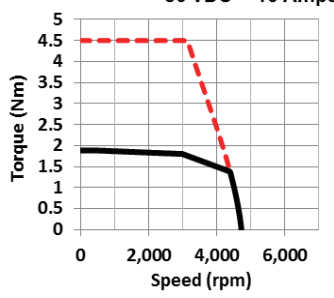
SM0802 (550 Watts) - Winding A
320 VDC (230VAC) - 3 Amps



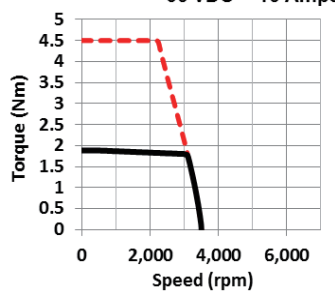
SM0802 (550 Watts) - Winding C
160 VDC (115 VAC) - 6 Amps



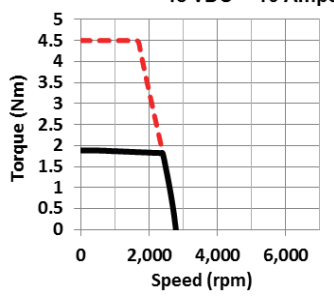
SM0802 (550 Watts) - Winding E
80 VDC - 10 Amps



SM0802 (550 Watts) - Winding E
60 VDC - 10 Amps



SM0802 (550 Watts) - Winding E
48 VDC - 10 Amps



Motor Specification SM080 Series: 80mm, 750-1000 Watts

□ Specification

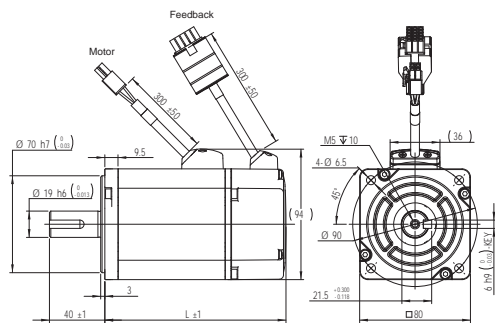
Series		SM0803 - 750 Watt			SM0804 - 1000 Watt		
Model & Winding Letter		^ A	^ C	^ F	^ A	^ C	D
Base Model Number (with 2500 PPR incremental encoder non-sealed plastic connectors, no brake)		SM0803 AE2-KCD-NNV	SM0803 CE2-KCF-NNV	SM0803 FE2-Kxx-NNV	SM0804 AE2-KCD-NNV	SM0804 CE2-KCF-NNV	SM0804 DE2-KCF-NNV
Typical Supply Voltages	V (rms)	208-240 VAC	120 VAC	48-80 VDC	208-240 VAC	120 VAC	48 VDC-120 VAC
Basic DC Bus Voltage	V (dc)	320	160	60	320	160	120
Rated Output Power	watts	750	750	750	1000	1000	1000
Rated Speed	rpm	3000	3000	3000	3000	3000	3300
Max. Mechanical Speed	rpm	5500	5500	5500	5000	5000	5000
Rated Torque	Nm	2.4	2.4	2.4	3.2	3.2	2.9
Continuous Stall Torque	Nm	2.6	2.6	2.4	3.5	3.5	2.9
Peak Torque	Nm	6.9	6.9	6.8	9.3	9.3	8.5
Rated Current	A (rms)	4.5	9	19.3	5.5	11	12.5
Continuous Stall Current	A (rms)	4.9	9.8	19.3	6	12.1	12.5
Peak Current	A (rms)	13.5	27	58	16.5	33	37.5
Voltage Constant ±5%	V (rms) / K rpm	36.6	18.3	8.3	39.5	19.9	15.8
Torque Constant ±5%	Nm / A (rms)	0.543	0.271	0.123	0.581	0.293	0.233
Winding Resistance (Line-Line)	Ohm ±10% @25°C	1.47	0.34	0.086	1.08	0.28	0.21
Winding Inductance (Line-Line)	mH	8.2	2	0.42	6.7	1.69	1.07
Inertia (with encoder)	kg m ²	0.89 X 10 ⁻⁴			1.17 X 10 ⁻⁴		
Inertia - With Brake Option	kg m ²	0.97 X 10 ⁻⁴			1.25 X 10 ⁻⁴		
Thermal Resistance (mounted)	°C / W	1.04			0.97		
Thermal Time Constant	Minutes	22			24		
Heat Sink Size	mm	240 x 240 x 6 Aluminum			240 x 240 x 6 Aluminum		
Shaft Load - Axial	(max.)	90 N / 20 Lb			90 N / 20 Lb		
Shaft Load - Radial (End of Shaft)	(max.)	270 N / 60 Lb			290 N / 65 Lb		
Weight (with std. encoder)		2.6 kg / 5.8 lb			3.1 kg / 6.9 lb		
Weight - With Brake Option		3.4 kg / 7.6 lb			3.9 kg / 8.6 lb		

Shaft Load: (L₁₀ life, 20,000 hours, 2,000 RPM)

^ Recommended models

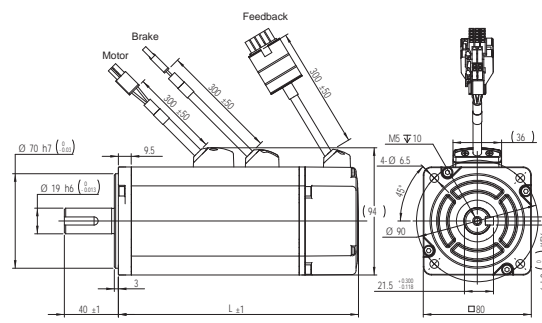
□ Dimensions (Unit: mm)

1) Without Brake



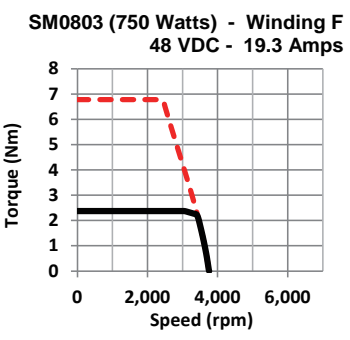
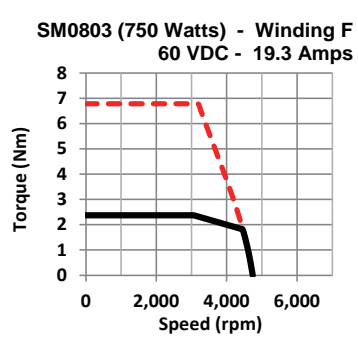
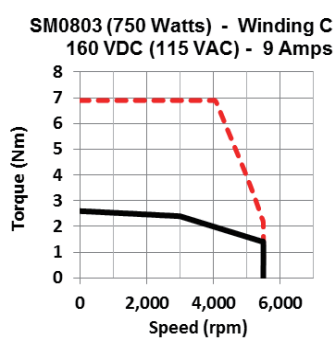
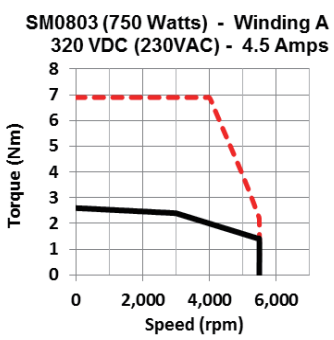
Without Brake	Feedback	L
SM0803, 750 Watt	S2	110
	E2	131
SM0804, 1000 Watt	E2	146

2) With Brake

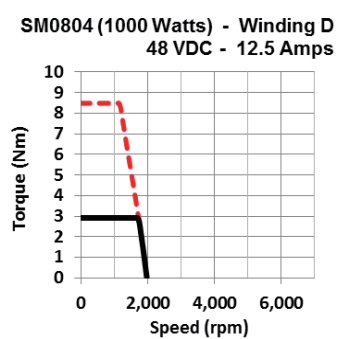
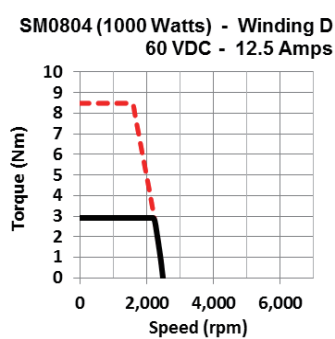
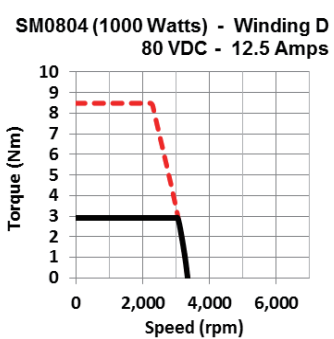
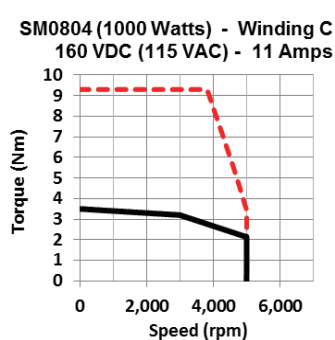
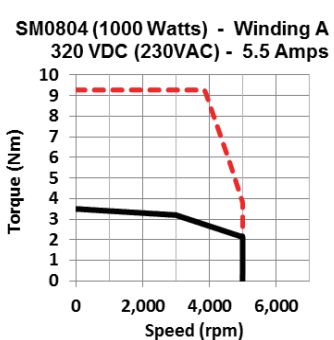


With Brake	Feedback	L
SM0803, 750 Watt	S2	157
	E2	178
SM0804, 1000 Watt	E2	193

□ Torque Curves



----- Max. Intermittent Torque
————— Max. Continuous Torque



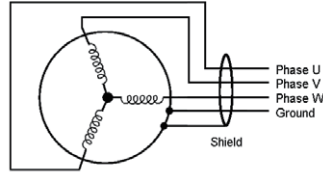
Motor Power Connections

Introduction

SM Series

SM3 Series

SM3 Accessories



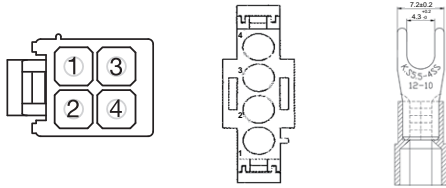
CD & CF Connection Style
300 mm (12") Shielded Cables
with Non-Sealed Plastic Connector

CD windings up to 6.5 amps
4 Pin AMP Housing P/N: 172167-1

CF windings 6.6 to 12.5 amps
4 Pin AMP Housing

CY windings up to 20 amps

P/N: 172167-1 P/N: 350779-1 P/N: SNYSS5-4



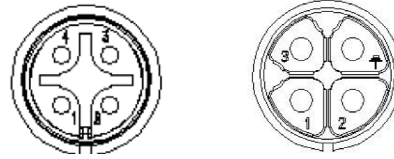
Pin #	Signal	Color (Typ.)	Function
1	Phase U	Red	Motor Power
2	Phase V	Yellow	
3	Phase W	Blue	
4	Ground	Yellow/Green	Ground

CM Connection Style
300 mm (12") Shielded Cables
with Sealed Metal Connector

Motor & Optional Brake
Housing: -CNLINKO

Up to 10amps
LP16-J04PP-01-001

Up to 20amps
LP20-J04PP-01-001



Pin #	Signal	Color (Typ.)	Function
1	Phase U	Red	Motor Power
2	Phase V	Yellow	
3	Phase W	Blue	
4	Ground	Yellow/Green	Ground

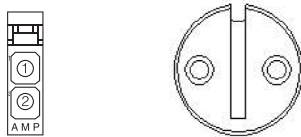
Shield is connected to connector housing
Brake power is not polarity sensitive

Motor Brake Connections

CD & CF Connection Style
300 mm (12") Shielded Cables
with Non-Sealed Plastic Connector

AMP Housing P/N:
172165-1

Housing: -CNLINKO
LP12-J02PP-02-001



PIN	Signal	Color(Typ.)
1	Brake	Red
2	Brake	Black

CM Connection Style
300 mm (12") Shielded Cables
with Sealed Metal Connector

Connections are included with
motor power connector

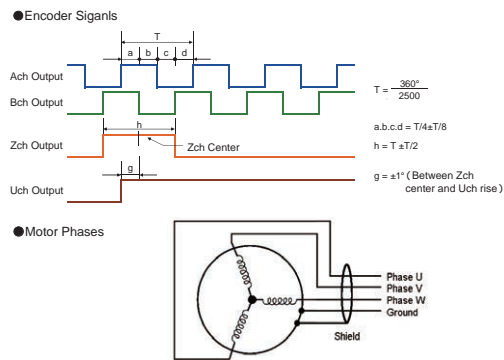
Feedback Options

MOONS' SM series motors are available with a variety of feedback devices. They produce position signals used by the drive to commutate the motor. These signals are aligned with the motor rotor, and used by the drive to know when to best apply power to the motor windings. There are also fine position signals produced every revolution. These are used by the drive to precisely control the angular position of the motor.

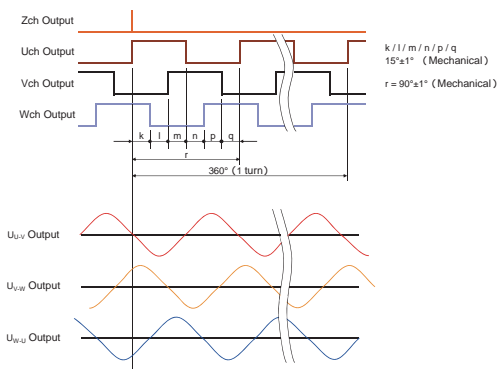
Absolute encoders also record motor position, and some also record motor turns. This allows the motion system to remember the position of the driven machine even if power is lost and then restored.

S2 &E2 Feedback Option 2500 line Magnetic & Optical Encoder

This is a basic feedback device that works with many drives. It produces commutation signals, 2500 position pulses per revolution, and an index pulse per revolution. It has separate wires to connect all the commutation and position signals.



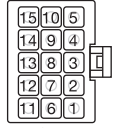
All the timing logics are obtained in CCW rotation as viewed from front shaft.



CD & CF Connection Style 300 mm (12") Shielded Cables with Non-Sealed Plastic Connector

Encoder Connector:
Housing AMP

P/N: 172171-1



Pin #	Signal	Color (Typ.)	Function
1	+5V	Red	Power
2	GND	Black	Ground
3	U+	Brown	Commutation Signal
4	U-	Brown/Black	
5	V+	Gray	
6	V-	Gray/Black	
7	W+	White	Incremental Position Pulse
8	W-	White/Black	
9	A+	Blue/Black	
10	A-	Blue	Index Pulse
11	B+	Green	
12	B-	Green/Black	Index Pulse
13	Z+	Yellow	
14	Z-	Yellow/Black	Index Pulse
15	Shield	Shield	

Shield is connected to motor frame

CM Connection Style 300 mm (12") Shielded Cables with Sealed Metal Connector

Encoder Connector:
Housing: -CNLINKO

LP20-J14PP-01-001



Pin #	Signal	Color (Typ.)	Function
1	A+	Blue	Incremental Position Pulses
2	A-	Blue/Black	
3	B+	Green	Index Pulse
4	B-	Green/Black	
5	Z+	Yellow	Index Pulse
6	Z-	Yellow/Black	
7	U+	Brown	Commutation Signals
8	U-	Brown/Black	
9	V+	Grey	
10	V-	Grey/Black	
11	W+	White	Index Pulse
12	W-	White/Black	
13	+5V	Red	Power
14	GND	Black	Ground

Shield is connected to connector housing

Feedback Options

MB Feedback Option - SM060 & SM080 Motors Absolute Multi Turn Heidenhain EnDat 2.2 Encoder

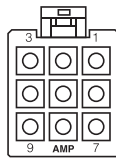
This is an absolute encoder with a resolution of 18 bits (262144) per revolution, and multi-turn counting of 16 bits (0-65,535 turns). It uses EnDat 2.2 to communicate with the drive. Power from an external battery is needed to operate the multi-turn counter and save the multi-turn data when main input power is lost. When the battery is not connected, it continues to function as a full 18 bit single turn absolute encoder.

Item		Unit	Value
Main Power	Voltage	VDC	3.6 V to 14
	Current Consumption	mA	80 Max
External battery	Voltage	VDC	3.6 to 5.25
	Lithium Thionyl Chloride, with 3.6 V and 1500 mAh is recommended		
	Typical Service Life	years	over 10
Signals	EnDat version 2.2 (serial two-directional interface). EnDat is a synchronous encoder that has clock signals sent to it by a controller		
Maximum Angular Acceleration		rad/s ²	100,000

CD & CF Connection Style
300 mm (12") Shielded Cables
with Non-Sealed Plastic Connector

Encoder Connector:
Housing AMP

P/N: 172169-1



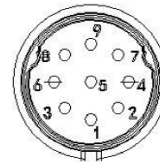
Pin #	Signal	Color (Typ.)	Function
1	Data	Blue	Serial Data
2	Clock	Green	Clock
3	+U Bat	Yellow	Battery
4	Data-	Blue/Black	Serial Data
5	Clock-	Green/Black	Clock
6	-U Bat	Yellow/Black	Battery
7	Up (VCC)	Red	Main Power
8	0V	Black	
9	Shield	Shield	Shield

Shield is connected to motor frame

CM Connection Style
300 mm (12") Shielded Cables
with Sealed Metal Connector

Encoder Connector:
Housing: -CNLINKO

LP20-J09PP-01-001



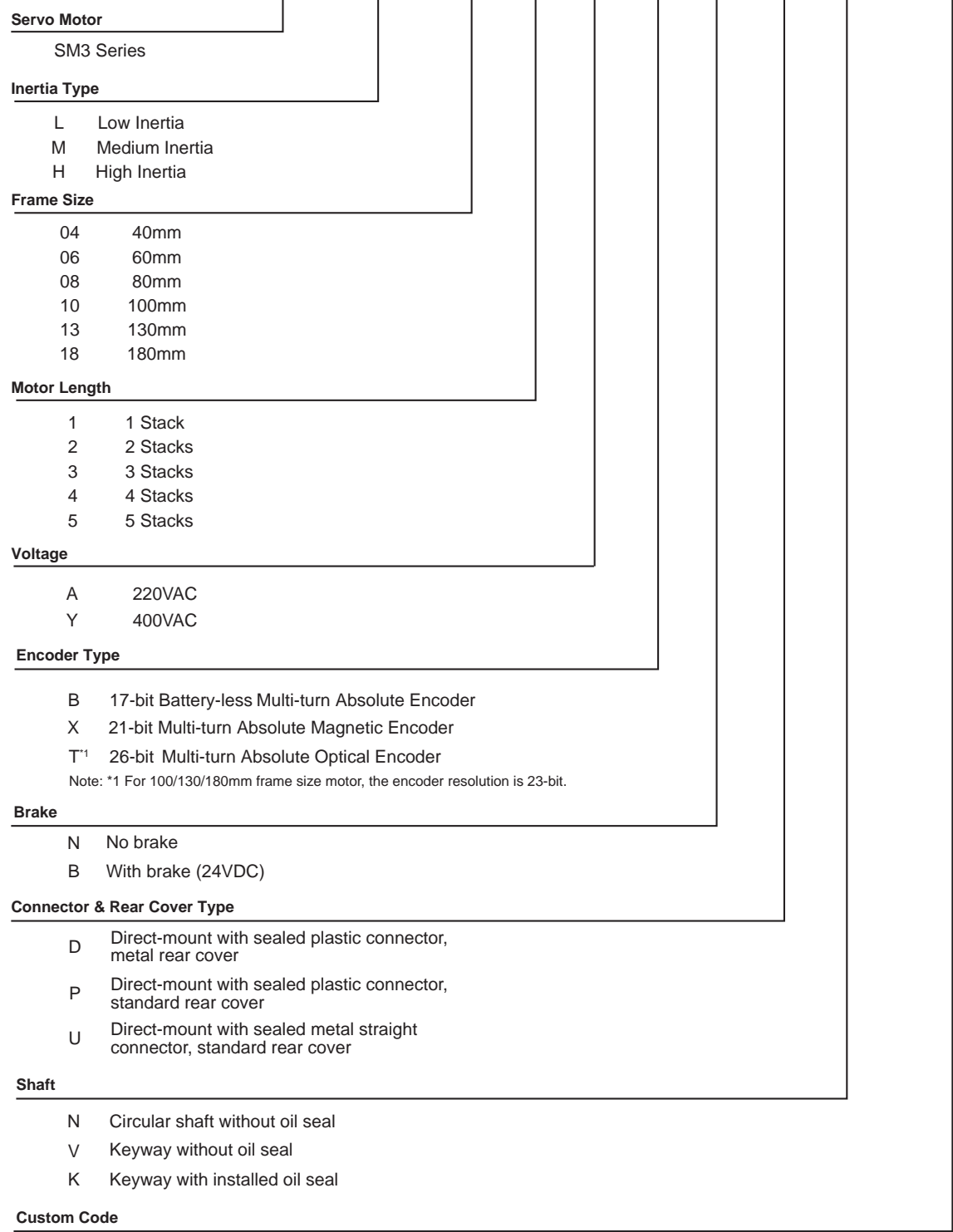
Pin #	Signal	Color (Typ.)	Function
1	Data	Blue	Serial Data
4	Data-	Blue/Black	
2	Clock	Green	Clock
5	Clock-	Green/Black	
3	+U Bat	Yellow	Battery
6	-U Bat	Yellow/Black	
7	Up (VCC)	Red	Main Power
8	0V	Black	

Shield is connected to connector housing
Shield is connected to motor frame

Note: This is an option, but not standard product.

SM3 Model Numbers

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



SM3 General Specifications

● Safety Certification

SM3 series products are designed to meet the following standards.



Note: The 400VAC servo products are currently undergoing UL certification.

● Motor General Specifications

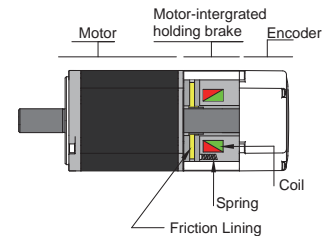
Insulation class	Class F (155°C)	Ambient temperature	Working temperature: 0°C ~ 40°C Storage temperature: -20°C ~ 60°C
Protection level	IP67 (Except transfixion part of shaft)	Humidity	Storage and usage: 20 ~ 85%RH (no condensation)
Installation conditions	Indoor installation, avoiding direct sunlight, 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)	Rotor Poles	10

● 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.

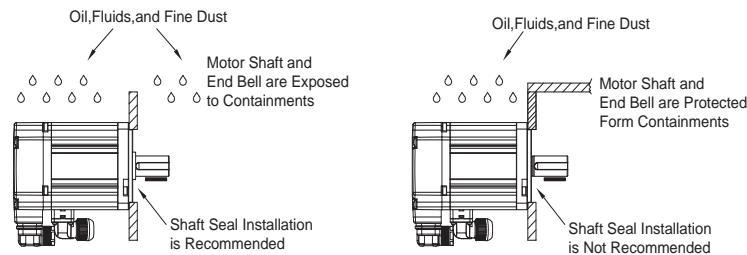
When the brake is powered on, the armature is adsorbed, the brake pad is released, and the motor can operate normally. When the brake is powered off, the armature is released, the brake pad is locked, and the motor can't rotate normally.

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°C)	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°C)					
Release Time	<25ms					
Release Voltage	18.5VDC max.(at 20°C)					



● 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.

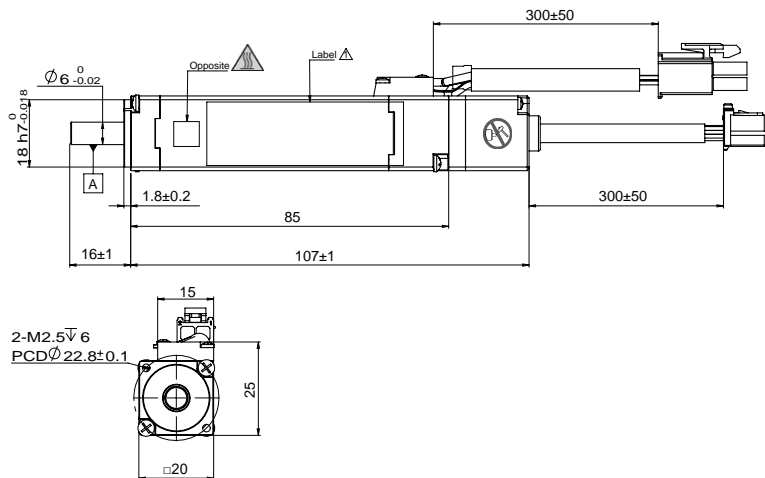


Motor Specification 20mm Frame Medium Inertia 24VDC

□ Specification

Type*		SM3M-023JSNC
Rated Output Power	watts	30
Rated Speed	rpm	3000
Max. Mechanical Speed	rpm	6000
Rated Torque	N·m	0.096(0.066 at S1)
Continuous Stall Torque	N·m	
Peak Torque	N·m	
Rated Current	A (rms)	4.2
Continuous Stall Current	A (rms)	4.2
Peak Current	A (rms)	12.5
Voltage Constant ±5%	V (rms) / K rpm	1.48
Torque Constant ±5%	Nm / A (rms)	0.0228
Winding Resistance (Line-Line)	Ohm ±10% @25°C	0.63
Winding Inductance (Line-Line)	mH (typ.)	0.06
Shaft Load - Axial	Kg·m ²	0.0093×10 ⁻⁴
Heat Sink Size	Kg·m ²	100x100x5
Shaft Load - Axial	N (max.)	30 N / 6.7 Lb
Shaft Load - Radial (End of Shaft)	N (max.)	30 N / 6.7 Lb
Weight	kg	0.23kg / 6.7 Lb

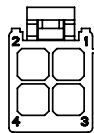
□ Dimensions (Unit: mm)



Type	L
SM3M-023JSNC	107

□ Motor Connection:

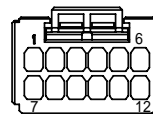
Motor Power Conector:
Housing TE 172167-1
Terminal TE 170360-1



PIN#	Signal	Colour(Typ.)
1	Phase U	Red
2	Phase V	Black
3	Phase W	Blue
4	Ground	Yellow/Green

□ Encoder Connection:

Encoder Conector:
Housing TE 1-1827864-6
Terminal TE 1871303-1



PIN#	Signal	Colour(Typ.)
1	5V	Red
2	GND	Black
3	A+	Blue
4	A-	Blue/Black
7	Z+	Green
8	Z-	Green/Black
9	B+	White
10	B-	White/Black
12	Shield	Shield

Motor Specification 40mm Frame 220VAC
Low Inertia

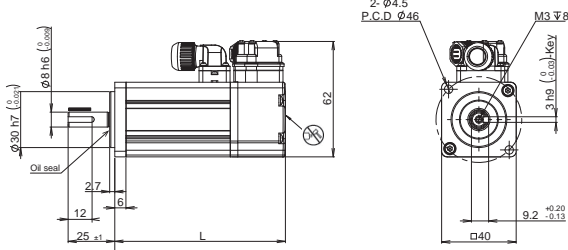
□ Specification

Type*		SM3L - 042A ◇ □ D △
Rated Output Power	watts	100
Rated Speed	rpm	3000
Max.Speed	rpm	6000
Rated Torque	Nm	0.32
Peak Torque	Nm	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%	Nm / A (rms)	0.267
Winding Resistance (Line-Line)	Ohm ±10% @25°C	11.1
Winding Inductance (Line-Line)	mH (typ.)	15.6
Rotor Inertia	Kg·m ²	0.038×10 ⁻⁴
Rotor Inertia - With Brake	Kg·m ²	0.0433×10 ⁻⁴
Thermal Resistance (mounted)	°C / W	1.63
Thermal Time Constant	Minutes	7
Heat Sink Size	mm	200 x 200 x 6 Aluminum
Shaft Load - Axial	N (max.)	50
Shaft Load - Radial (End of Shaft)	N (max.)	60
Weight	kg	0.49
Weight - With Brake	kg	0.73

* ◇ Encoder Options □ Brake Options △ Oil seal Option

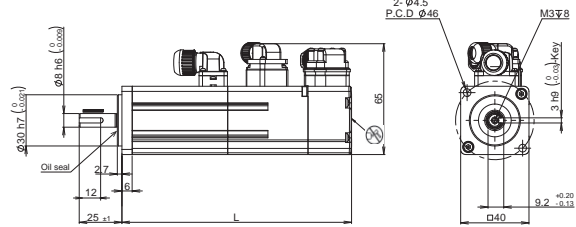
□ Dimensions (Unit: mm)

1) Without Brake



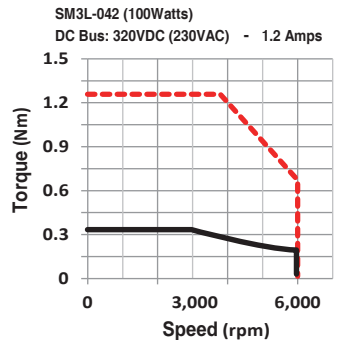
Without Brake	L
SM3L-042A ◇ ND △	91.5
SM3L-042ABND △	100

2) With Brake



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

□ Torque Curves



----- Max. Intermittent Torque
————— Max. Continuous Torque

Motor Specification 40mm Frame High Inertia 220VAC

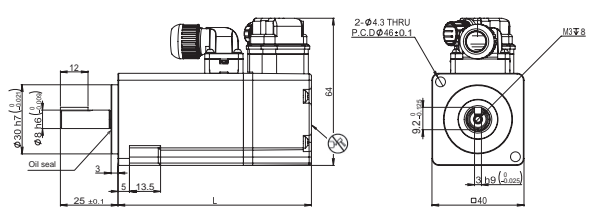
□ Specification

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	Nm	0.16	0.32
Peak Torque	Nm	1.64	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%	Nm / A (rms)	0.11	0.277
Winding Resistance (Line-Line)	Ohm ±10% @25°C	8.18	10.45
Winding Inductance (Line-Line)	mH (typ.)	7.92	11.7
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
Thermal Resistance (mounted)	°C / W	1.63	1.63
Thermal Time Constant	Minutes	7	7
Heat Sink Size	mm	200 x 200 x 6 Aluminum	200 x 200 x 6 Aluminum
Shaft Load - Axial	N (max.)	50	50
Shaft Load - Radial (End of Shaft)	N (max.)	60	60
Weight	kg	0.31	0.42
Weight - With Brake	kg	0.55	0.66

* ◊ Encoder Options □ Brake Options △ Oil seal Option

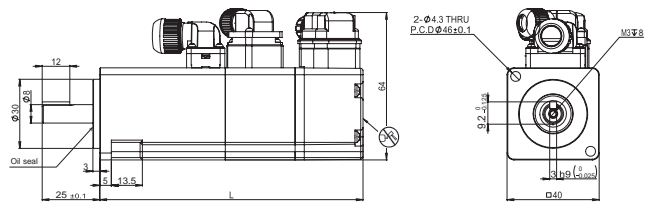
□ Dimensions (Unit: mm)

1) Without Brake



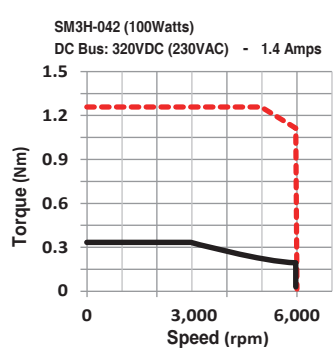
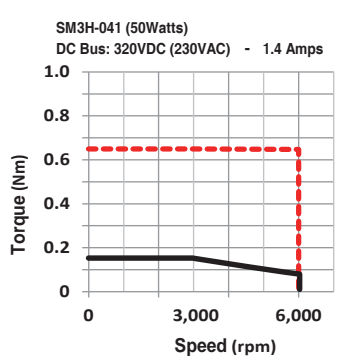
Without Brake	L
SM3H-041A ◊ NP △	70
SM3H-042A ◊ NP △	84

2) With Brake



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

□ Torque Curves



----- Max. Intermittent Torque
 ————— Max. Continuous Torque

Motor Specification **60mm Frame** **220VAC**
Low Inertia

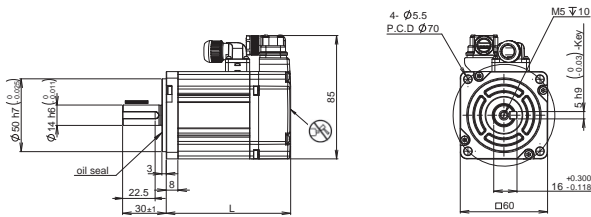
□ Specification

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	Nm	0.64	1.27
Peak Torque	Nm	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%	Nm / A (rms)	0.427	0.454
Winding Resistance (Line-Line)	Ohm ±10% @25°C	7.38	3.57
Winding Inductance (Line-Line)	mH (typ.)	22.5	13.8
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
Thermal Resistance (mounted)	°C / W	1.64	1.21
Thermal Time Constant	Minutes	7	12
Heat Sink Size	mm	250 x 250 x 6 Aluminum	250 x 250 x 6 Aluminum
Shaft Load - Axial	N (max.)	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	200	240
Weight	kg	0.85	1.2
Weight - With Brake	kg	1.3	1.7

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

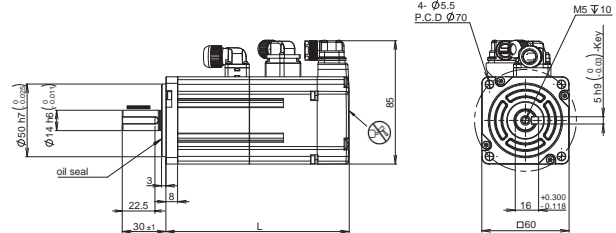
□ Dimensions (Unit: mm)

1) Without Brake



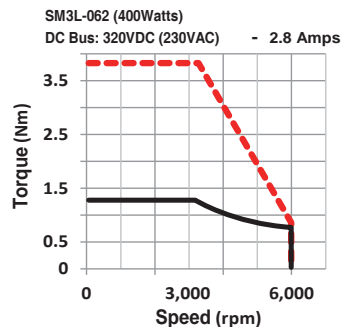
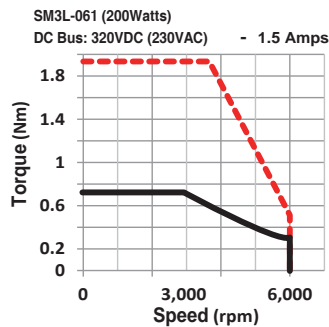
Without Brake	L
SM3L - 061A ◇ NP △	85
SM3L - 061ABND △	
SM3L - 062A ◇ NP △	104
SM3L - 062ABND △	

2) With Brake



With Brake	L
SM3L - 061A ◇ BP △	126
SM3L - 061ABBD △	
SM3L - 062A ◇ BP △	144
SM3L - 062ABBD △	

□ Torque Curves



----- Max. Intermittent Torque
————— Max. Continuous Torque

Motor Specification 60mm Frame High Inertia 220VAC

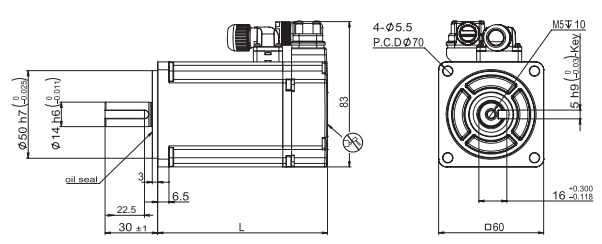
□ Specification

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	Nm	0.64	1.27
Peak Torque	Nm	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%	Nm / A (rms)	0.376	0.423
Winding Resistance (Line-Line)	Ohm ±10% @25°C		3.23
Winding Inductance (Line-Line)	mH (typ.)		8.9
Rotor Inertia	Kg·m ²	0.31×10 ⁻⁴	0.566×10 ⁻⁴
Rotor Inertia - With Brake	Kg·m ²	0.31×10 ⁻⁴	0.62×10 ⁻⁴
Thermal Resistance (mounted)	°C / W	70	70
Thermal Time Constant	Minutes	1.27	1.27
Heat Sink Size	mm	250 x 250 x 6 Aluminum	250 x 250 x 6 Aluminum
Shaft Load - Radial	N (max.)	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	200	240
Weight	kg	0.79	1.2
Weight - With Brake	kg	1.15	1.5

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

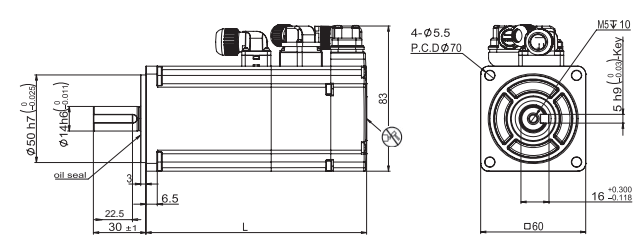
□ Dimensions (Unit: mm)

1) Without Brake



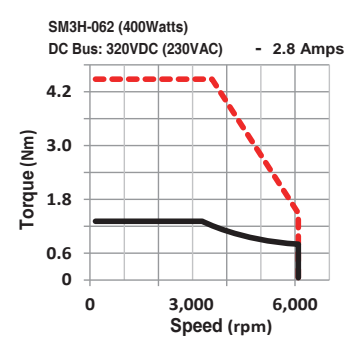
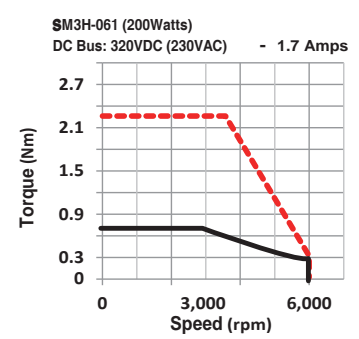
Without Brake	L
SM3H-061A ◇ NP △	77
SM3H-062A ◇ NP △	97

2) With Brake



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

□ Torque Curves



----- Max. Intermittent Torque
 _____ Max. Continuous Torque

Motor Specification **80mm Frame** **220VAC**
Low Inertia

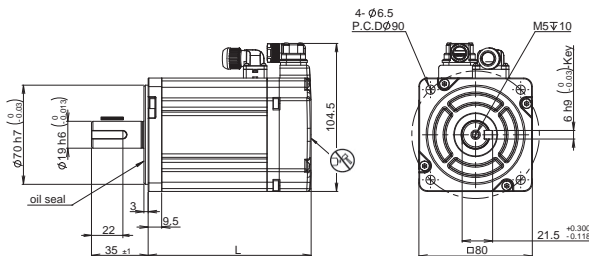
□ Specification

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	Nm	2.4	3.2
Peak Torque	Nm	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%	Nm / A (rms)	0.533	0.63
Winding Resistance (Line-Line)	Ohm ±10% @25°C	1.2	0.91
Winding Inductance (Line-Line)	mH (typ.)	7.38	6.04
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
Thermal Resistance (mounted)	°C / W	1.23	1.07
Thermal Time Constant	Minutes	7.38	19
Heat Sink Size	mm	250 x 250 x 6 Aluminum	300 x 300 x 12 Aluminum
Shaft Load - Axial	N (max.)	90	90
Shaft Load - Radial (End of Shaft)	N (max.)	270	270
Weight	kg	2.29	2.77
Weight - With Brake	kg	3.1	3.62

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

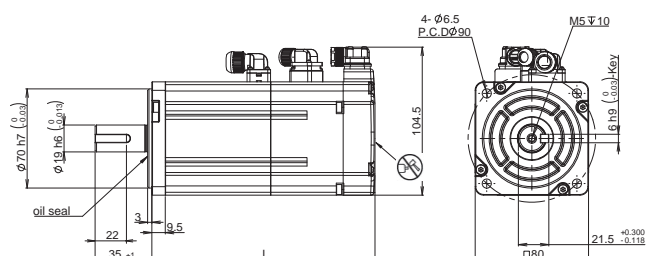
□ Dimensions (Unit: mm)

1) Without Brake



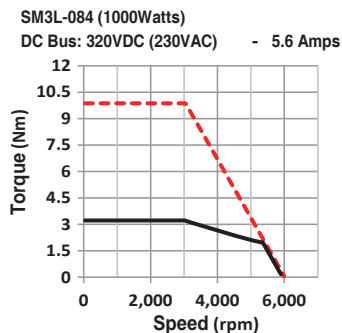
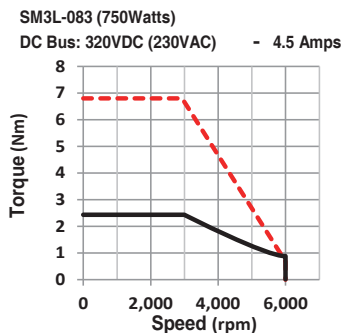
Without Brake	L
SM3L-083A ◇ NP △	115
SM3L-083ABND △	
SM3L-084A ◇ NP △	129
SM3L-084ABND △	

2) With Brake



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

□ Torque Curves



--- Max. Intermittent Torque
— Max. Continuous Torque

Motor Specification 80mm Frame High Inertia 220VAC

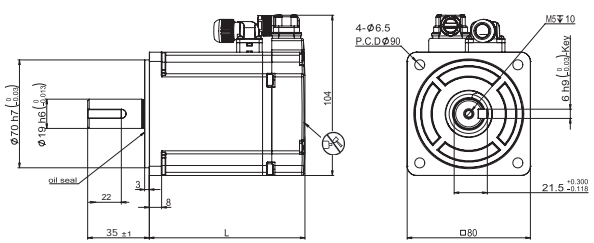
□ Specification

Type*		SM3H - 083A ◇ □ P △
Rated Output Power	watts	750
Rated Speed	rpm	3000
Max.Speed	rpm	6000
Rated Torque	Nm	2.4
Peak Torque	Nm	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%	Nm / A (rms)	0.53
Winding Resistance (Line-Line)	Ohm ±10% @25°C	1.3
Winding Inductance (Line-Line)	mH (typ.)	9.4
Rotor Inertia	Kg·m ²	1.46×10 ⁻⁴
Thermal Resistance (mounted)	°C / W	1.63×10 ⁻⁴
Thermal Time Constant	Minutes	1.3
Heat Sink Size	mm	250 x 250 x 6 Aluminum
Shaft Load - Radial	N (max.)	90
Shaft Load - Radial (End of Shaft)	N (max.)	270
Weight	kg	2.1
Weight - With Brake	kg	2.85

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

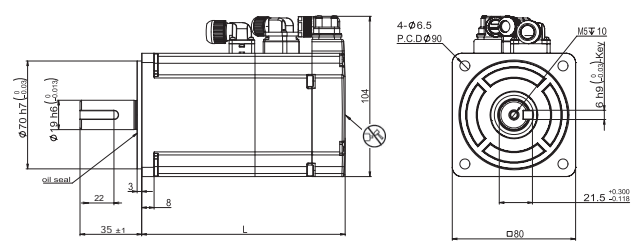
□ Dimensions (Unit: mm)

1) Without Brake



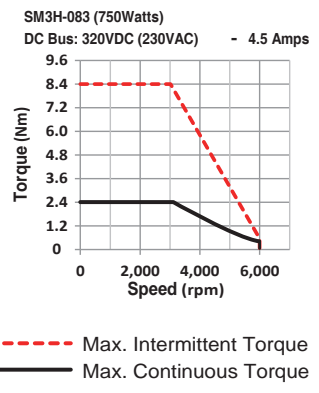
Without Brake	L
SM3H-083A ◇ NP △	101

2) With Brake



With Brake	L
SM3H-083A ◇ BP △	132

□ Torque Curves



Motor Specification

100mm Frame
Low Inertia

220VAC

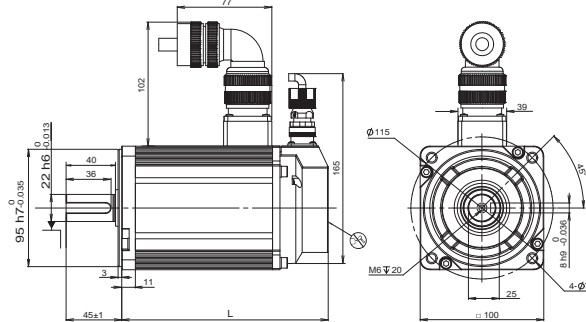
□ Specification

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	Nm	3.2	4.9	6.4	8
Peak Torque	Nm	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%	Nm / A (rms)	0.543	0.563	0.565	0.61
Winding Resistance (Line-Line)	Ohm ±10% @25°C	0.66	0.43	0.3	0.24
Winding Inductance (Line-Line)	mH (typ.)	6.6	4.6	3.45	3.16
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	4.39	5.2	6.3
Weight - With Brake	kg	5.2	5.64	6.12	7.6

* ◊ Encoder Options: □ Brake Options: △ Oil Seal Options

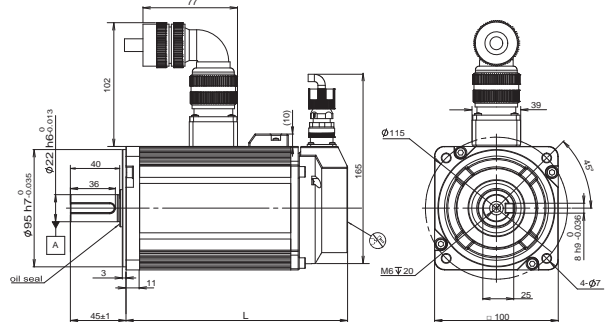
□ Dimensions (Unit: mm)

1) Without Brake



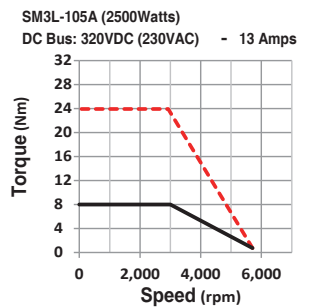
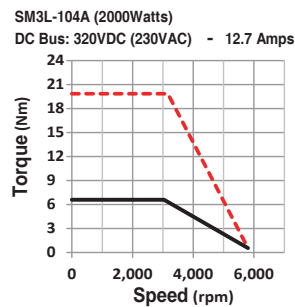
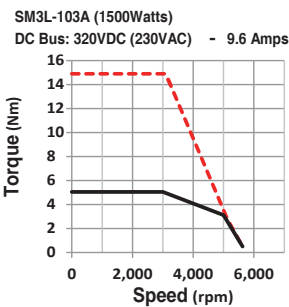
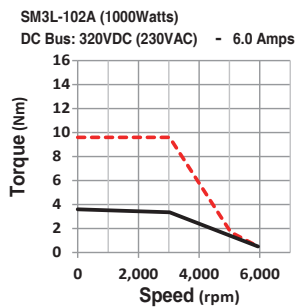
Without Brake	L
SM3L-102A ◊ NU △	137
SM3L-103A ◊ NU △	152
SM3L-104A ◊ NU △	168
SM3L-105A ◊ NU △	186

2) With Brake



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

□ Torque Curves



--- Max. Intermittent Torque
— Max. Continuous Torque

Motor Specification 100mm Frame 400VAC
 Low Inertia

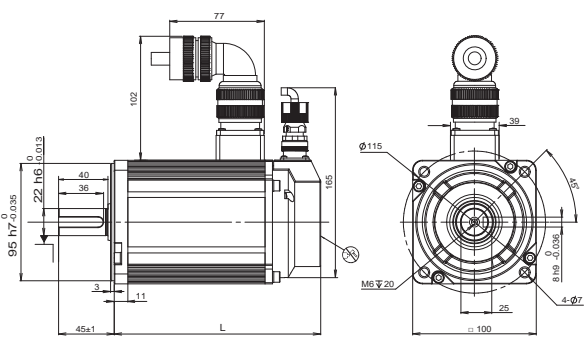
□ Specification

Type*		SM3L - 102Y ◊ □ U △	SM3L - 103Y ◊ □ U △	SM3L - 104Y ◊ □ U △	SM3L - 105Y ◊ □ U △
Rated Output Power	watts	1000	1500	2000	2500
Rated Speed	rpm	3000	3000	3000	3000
Max.Speed	rpm	6000	6000	6000	5600
Rated Torque	Nm	3.2	4.9	6.4	8
Peak Torque	Nm	9.6	14.7	19.2	24
Rated Current	A (rms)	3.8	5.7	7.4	13
Peak Current	A (rms)	14	21	25.5	45
Voltage Constant ±5%	V (rms) / K rpm	59	59.2	60.5	37.4
Torque Constant ±5%	Nm / A (rms)	0.842	0.86	0.86	0.61
Winding Resistance (Line-Line)	Ohm ±10% @25°C	2.16	1.36	0.86	0.24
Winding Inductance (Line-Line)	mH (typ.)	21	13.7	10.3	3.16
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	4.39	5.2	6.3
Weight - With Brake	kg	5.2	5.64	6.12	7.6

* ◊ Encoder Options: □ Brake Options: △ Oil Seal Options

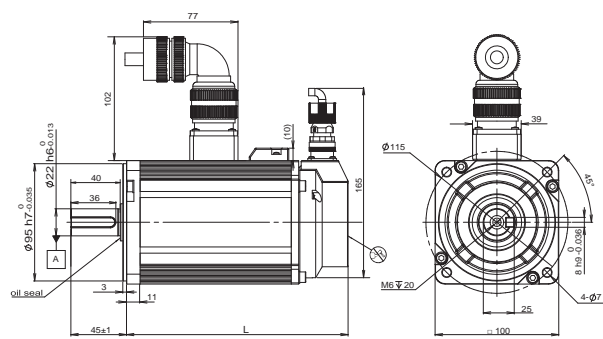
□ Dimensions (Unit: mm)

1) Without Brake



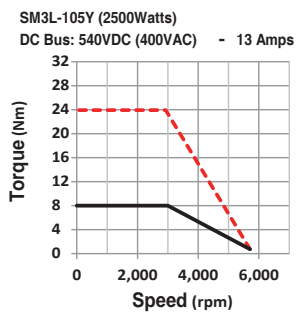
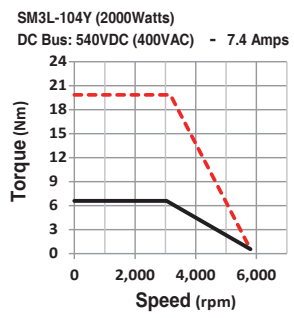
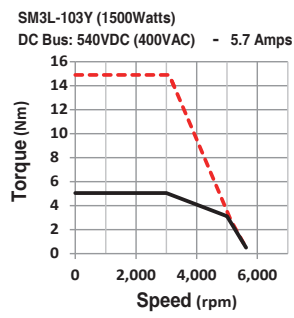
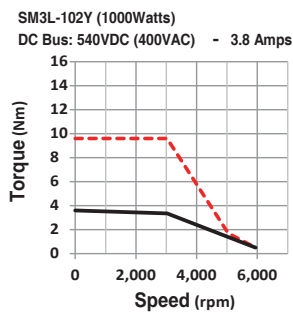
Without Brake	L
SM3L-102Y ◊ NU △	137
SM3L-103Y ◊ NU △	152
SM3L-104Y ◊ NU △	168
SM3L-105Y ◊ NU △	186

2) With Brake



With Brake	L
SM3L-102Y ◊ BU △	179
SM3L-103Y ◊ BU △	194
SM3L-104Y ◊ BU △	210
SM3L-105Y ◊ BU △	228

□ Torque Curves



----- Max. Intermittent Torque
 _____ Max. Continuous Torque

Motor Specification 130mm Frame Medium Inertia 220VAC

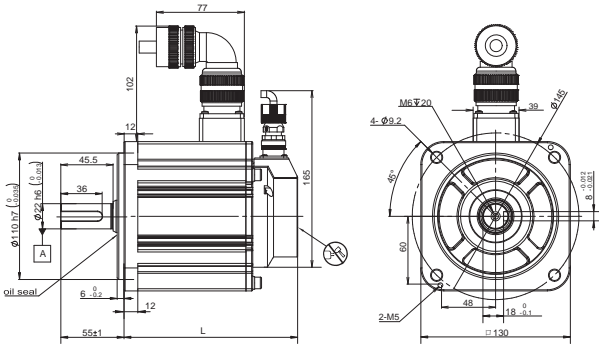
□ Specification

Type*		SM3M - 132A ◇ □ UV	SM3M - 133A ◇ □ UV	SM3M - 134A ◇ □ UV
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%	Nm / A (rms)	0.891	0.894	0.92
Winding Resistance (Line-Line)	Ohm ±10% @25°C	1.08	0.66	0.36
Winding Inductance (Line-Line)	mH (typ.)	9	5.4	3
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	5.33	6.67	9.1
Weight - With Brake	kg	7.25	8.47	10.75

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

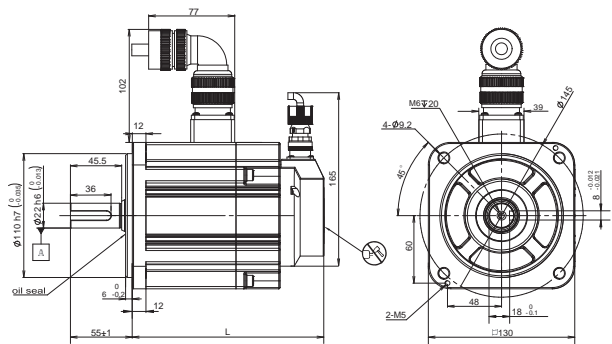
□ Dimensions (Unit: mm)

1) Without Brake



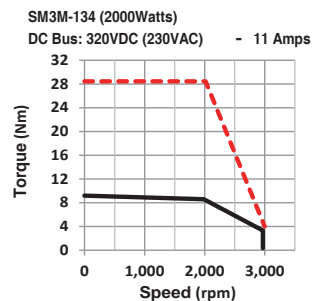
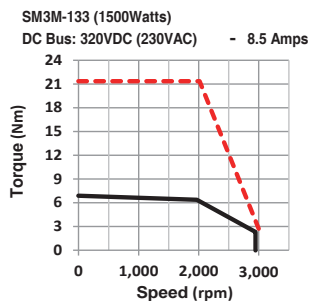
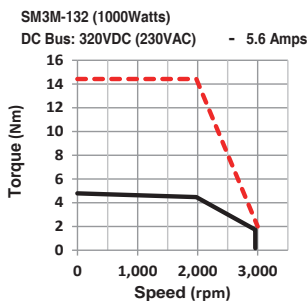
Without Brake	L
SM3M-132A ◇ NU △	138
SM3M-133A ◇ NU △	155
SM3M-134A ◇ NU △	169

2) With Brake



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

□ Torque Curves



--- Max. Intermittent Torque
— Max. Continuous Torque

Motor Specification 130mm Frame Medium Inertia 400VAC

□ Specification

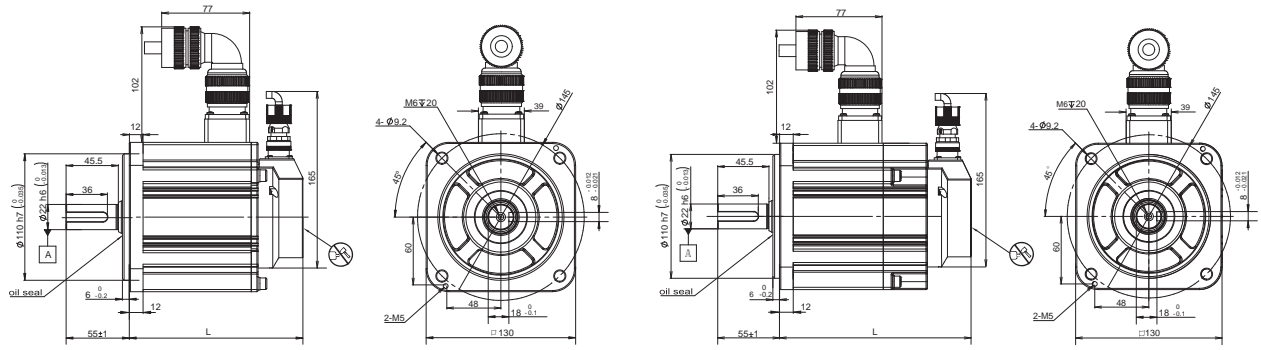
Type*		SM3M - 132Y ◇ □ UV	SM3M - 133Y ◇ □ UV	SM3M - 134Y ◇ □ UV
Rated Output Power	watts	1000	1500	2000
Rated Speed	rpm	2000	2000	2000
Max.Speed	rpm	3000	3000	3000
Rated Torque	N·m	4.77	7.16	9.55
Peak Torque	N·m	14.3	21.5	28.6
Rated Current	A (rms)	3.3	5.1	6.5
Peak Current	A (rms)	10	16	18.6
Voltage Constant ±5%	V (rms) / K rpm	101	97	101
Torque Constant ±5%	Nm / A (rms)	1.45	1.4	1.47
Winding Resistance (Line-Line)	Ohm ±10% @25°C	3.52	2.1	1.5
Winding Inductance (Line-Line)	mH (typ.)	28.5	18.6	12
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	5.33	6.67	9.1
Weight - With Brake	kg	7.25	8.47	10.75

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

□ Dimensions (Unit: mm)

1) Without Brake

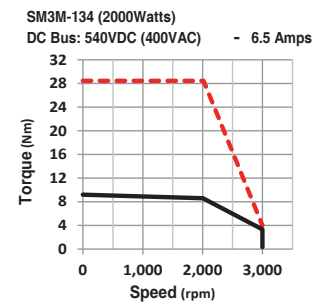
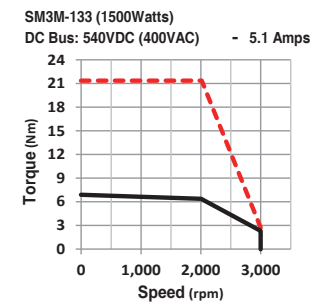
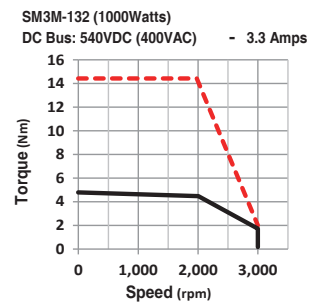
2) With Brake



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

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

□ Torque Curves



----- Max. Intermittent Torque
————— Max. Continuous Torque

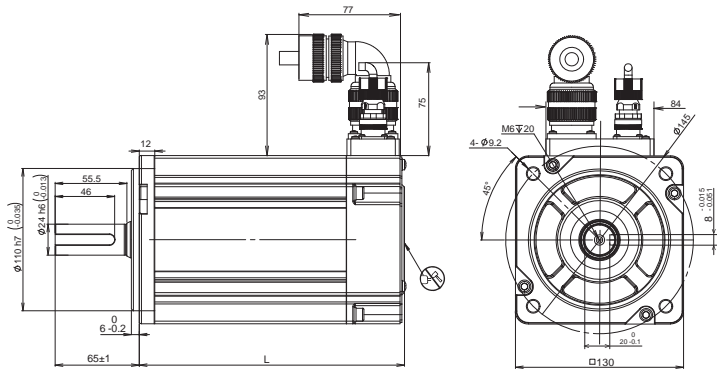
Motor Specification 130mm Frame Medium Inertia 400VAC

□ 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%	Nm / A (rms)	1.47
Winding Resistance (Line-Line)	Ohm ±10% @25°C	0.59
Winding Inductance (Line-Line)	mH (typ.)	5.6
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	12.05
Weight - With Brake	kg	13.95

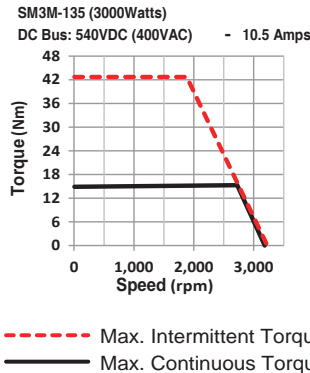
* ◇ Encoder Options: □ Brake Options: △ Oil Seal Options

□ Dimensions (Unit: mm)



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

□ Torque Curves



Motor Specification 130mm Frame High Inertia 220VAC

□ Specification

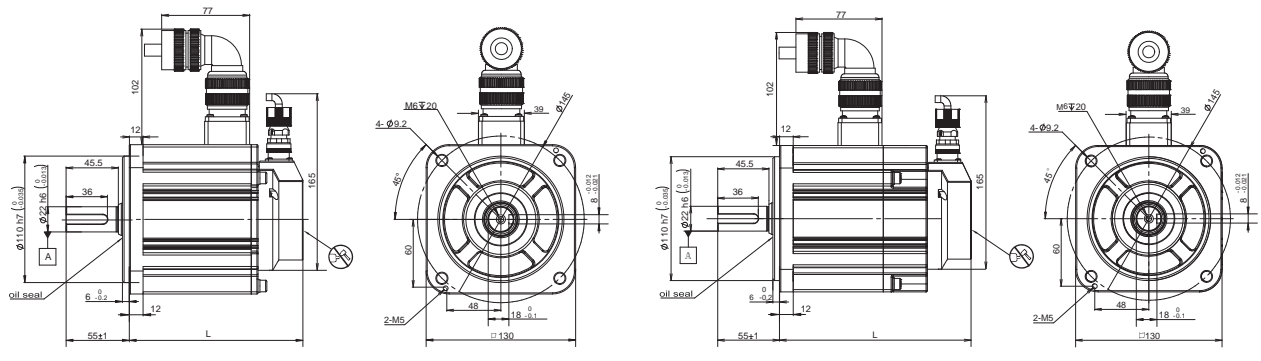
Type*		SM3H - 132A ◇ □ U △	SM3H - 133A ◇ □ U △	SM3H - 134A ◇ □ U △
Rated Output Power	watts	850	1300	1800
Rated Speed	rpm	1500	1500	1500
Max.Speed	rpm	3000	3000	3000
Rated Torque	Nm	5.39	8.34	11.5
Peak Torque	Nm	16.2	25	34.5
Rated Current	A (rms)	6	9.6	13
Peak Current	A (rms)	19	29.6	45
Voltage Constant ±5%	V (rms) / K rpm	55.3	54.2	51
Torque Constant ±5%	Nm / A (rms)	0.891	0.894	0.84
Winding Resistance (Line-Line)	Ohm ±10% @25°C	1.08	0.66	0.36
Winding Inductance (Line-Line)	mH (typ.)	9	5.4	3
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	5.92	7	8.5
Weight - With Brake	kg	7.84	8.8	10.15

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

□ Dimensions (Unit: mm)

1) Without Brake

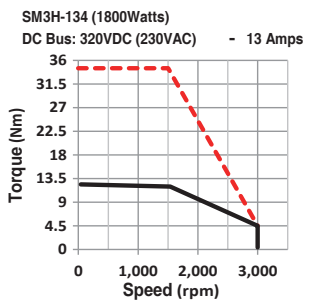
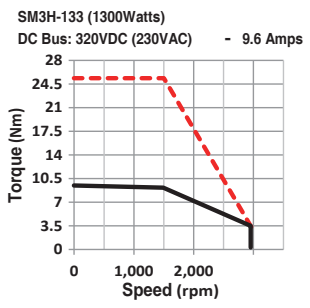
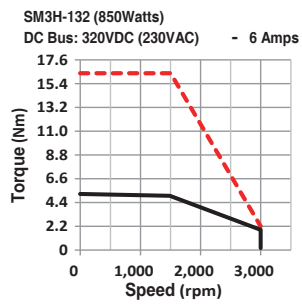
2) With Brake



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

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

□ Torque Curves



----- Max. Intermittent Torque
 _____ Max. Continuous Torque

Motor Specification 130mm Frame High Inertia 400VAC

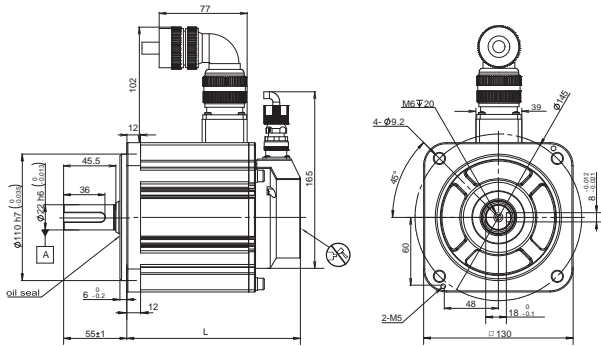
□ Specification

Type*		SM3H - 132Y ◇ □ U △	SM3H - 133Y ◇ □ U △	SM3H - 134Y ◇ □ U △
Rated Output Power	watts	850	1300	1800
Rated Speed	rpm	1500	1500	1500
Max.Speed	rpm	3000	3000	3000
Rated Torque	Nm	5.39	8.34	11.5
Peak Torque	Nm	16.2	25	34.5
Rated Current	A (rms)	3.6	5.8	8.1
Peak Current	A (rms)	11	17.5	23.2
Voltage Constant ±5%	V (rms) / K rpm	101	97	98
Torque Constant ±5%	Nm / A (rms)	1.5	1.44	1.42
Winding Resistance (Line-Line)	Ohm ±10% @25°C	3.52	2.1	1.25
Winding Inductance (Line-Line)	mH (typ.)	28.5	18.6	11.2
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	5.92	7	8.5
Weight - With Brake	kg	7.84	8.8	10.15

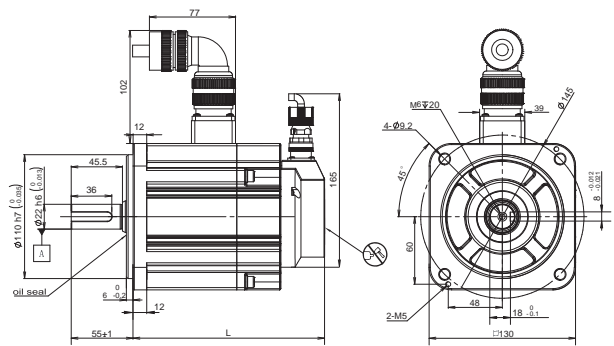
* ◇ Encoder Options: □ Brake Options: △ Oil Seal Options

□ Dimensions (Unit: mm)

1) Without Brake



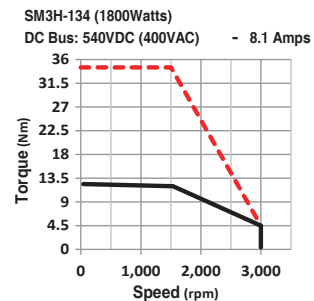
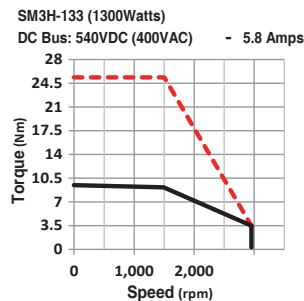
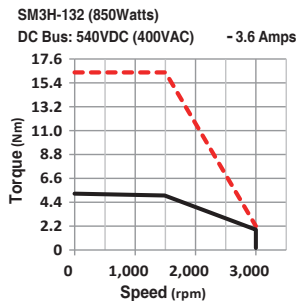
2) With Brake



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

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

□ Torque Curves



--- Max. Intermittent Torque
— Max. Continuous Torque

Motor Specification 180mm Frame High Inertia 400VAC

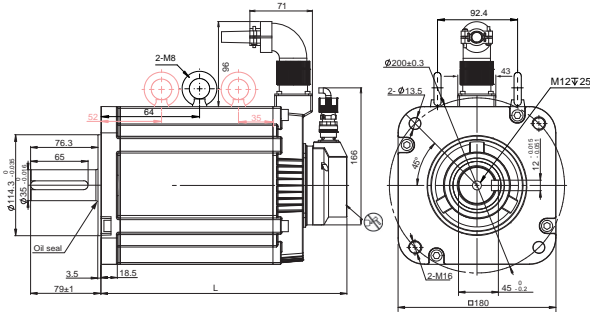
Specification

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%	Nm / A (rms)	1.76	1.68
Winding Resistance (Line-Line)	Ohm ±10% @25°C	0.55	0.35
Winding Inductance (Line-Line)	mH (typ.)	10.5	7.4
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
Thermal Resistance (mounted)	°C / W	0.455	0.369
Thermal Time Constant	Minutes	22	22
Heat Sink Size	mm	550 x 550 x 30 Aluminum	550 x 550 x 30 Aluminum
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 Option

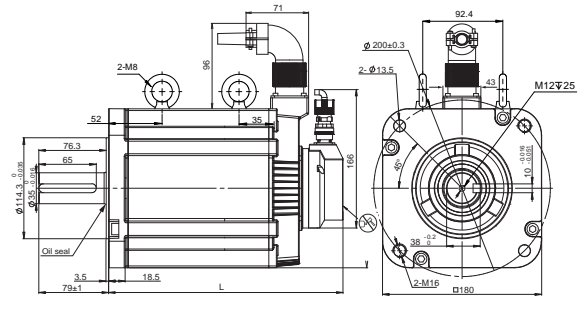
Dimensions (Unit: mm)

1) Without Brake



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

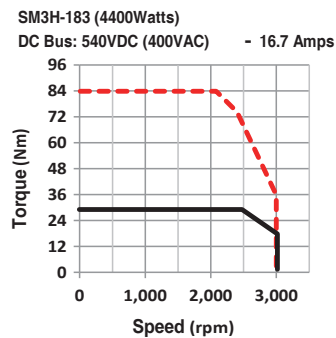
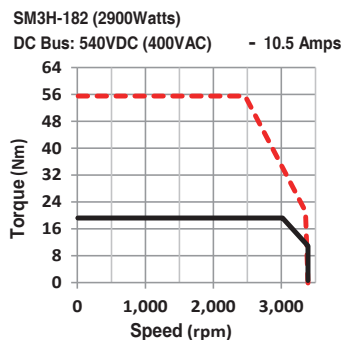
2) With Brake



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

Note : The red note indicates the mounting position of the ring for SM3H-183Y◊NU△

Torque Curves



----- Max. Intermittent Torque
 _____ Max. Continuous Torque

Motor Specification 180mm Frame 400VAC
High Inertia

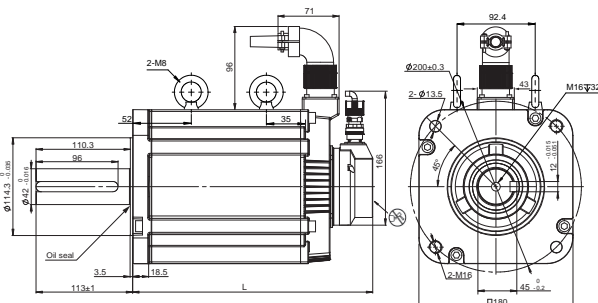
□ Specification

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)	69.9	73.4
Voltage Constant ±5%	V (rms) / K rpm	114	123
Torque Constant ±5%	Nm / A (rms)	1.67	2.0
Winding Resistance (Line-Line)	Ohm ±10% @25°C	0.27	0.185
Winding Inductance (Line-Line)	mH (typ.)	6.2	4.5
Rotor Inertia	Kg·m ²	89×10 ⁻⁴	125×10 ⁻⁴
Rotor Inertia - With Brake	Kg·m ²	92×10 ⁻⁴	145×10 ⁻⁴
Thermal Resistance (mounted)	°C / W	0.336	0.269
Thermal Time Constant	Minutes	26	34
Heat Sink Size	mm	550 x 550 x 30 Aluminum	550 x 550 x 30 Aluminum
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 Option

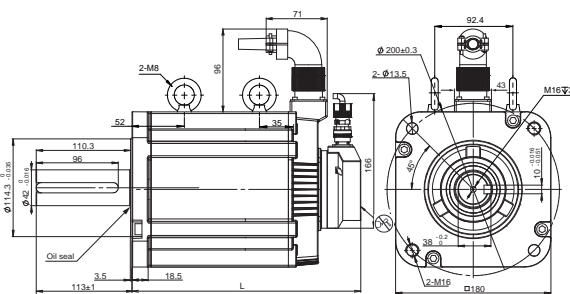
□ Dimensions (Unit: mm)

1) Without Brake



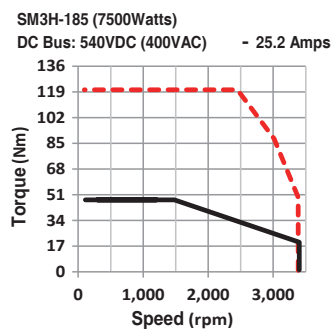
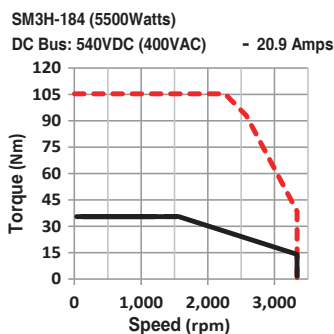
Without Brake	L
SM3H-184Y ◊ NU △	230
SM3H-185Y ◊ NU △	281

2) With Brake



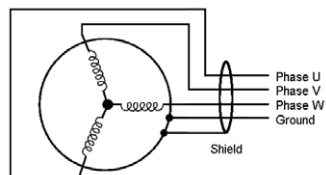
With Brake	L
SM3H-184Y ◊ BU △	280
SM3H-185Y ◊ BU △	316

□ Torque Curves



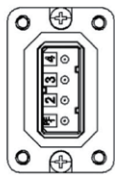
----- Max. Intermittent Torque
————— Max. Continuous Torque

Motor Power Connections



SM3□-04/06/08

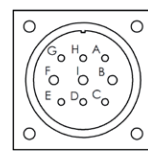
P/N: DGFA4S-A2-00A&Z(H)/DEGSON



Pin #	Signal	Function
1	Ground	Ground
2	Phase U	Motor Power
3	Phase V	
4	Phase W	

SM3□-10/13/18

P/N: XMS3102A20-18S(EUMACX)

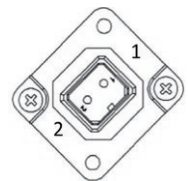


Pin #	Signal	Function
F	Phase U	Motor Power
I	Phase V	
B	Phase W	
A	Ground	Ground

Motor Brake Connections

SM3□-04/06/08

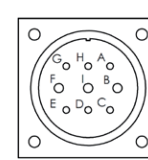
P/N: DGFA2S-A1-00A(H)/DEGSON



Pin #	Signal	Function
1	+24V	Motor Brake
2	0	

SM3□-10/13/18

P/N: XMS3102A20-18S(EUMACX)



Pin #	Signal	Function
C	+24V	Motor Brake
D	0	

Feedback Options

B Feedback Option

17bit multi-turn absolute encoder with BiSS-C Protocol

This is a 17-bit battery-less multi-turn absolute encoder which supports the BiSS-C protocol.

The multi-turn counting based on the Wiegand effect.

At any revolution, a voltage pulse is generated, which triggers the increment of an internal multiturn counter.

This Wiegand pulse counting requires no external energy source. Therefore, a backup battery or complex gear systems can be eliminated.

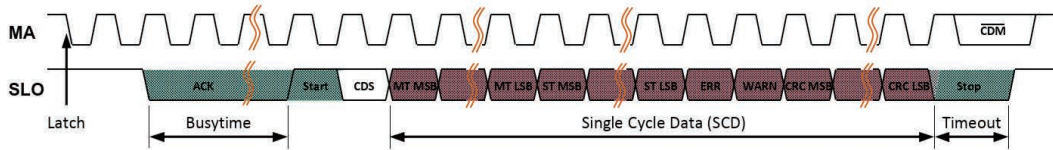
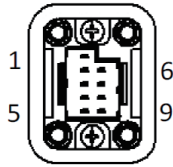


Figure 2: BiSS Transmission Frame Overview.

SM3□-04/06/08

P/N: DGFA9S-A1-02A(H) /DEGSON/28AWG/



Pin #	Signal
1	Shield
2	CLK+
3	CLK-
4	Data-
5	Data+
6	5V
8	GND

Feedback Options

X Feedback Option

21-bit Multiturn Absolute Magnetic Encoders

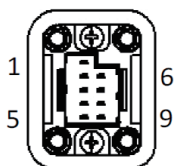
Tamagawa Protocol --SM3-40/60/80 Motors

Nikon Protocol--SM3-100/130/180 Motors

This is a 21-bit multi-turn absolute magnetic encoder which supports the Tamagawa protocol.

SM3□-04/06/08

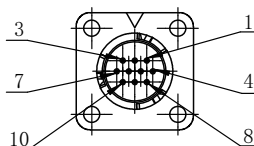
P/N: DGFA9S-A1-02A(H) /DEGSON/28AWG/



Pin #	Signal
1	Shield
3	5V
4	Battery+
5	SD+
7	GND
8	Battery-
9	SD-

SM3□-10/13/18

P/N: XM10-S10S-C(EUMACX)



Pin #	Signal
1	5V
2	GND
3	SD-
4	SD+
5	Battery+
6	Battery-
10	Shield

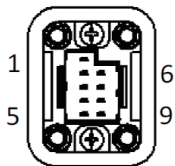
Optical Encoder Option—T Feedback Option

For the motor frame size of 80mm and below, this is a 26-bit multi-turn absolute optical encoder which supports the Tamagawa protocol.

For the motor frame size of 100mm and above, this is a 23-bit multi-turn absolute optical encoder which supports the Nikon protocol.

SM3□-04/06/08

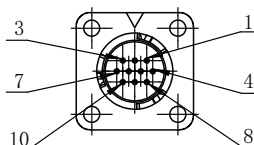
P/N: DGFA9S-A1-02A(H) /DEGSON/28AWG/



Pin #	Signal
1	Shield
3	5V
4	Battery+
5	SD+
7	GND
8	Battery-
9	SD-

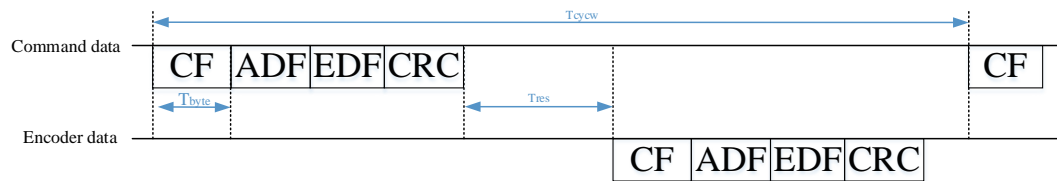
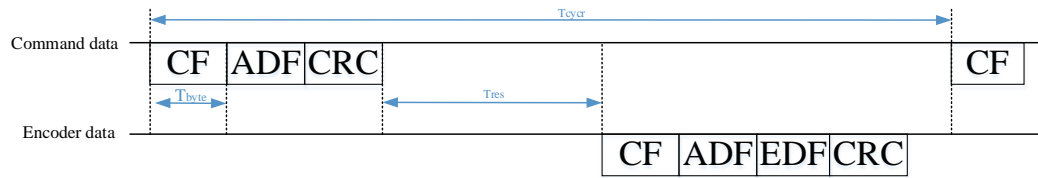
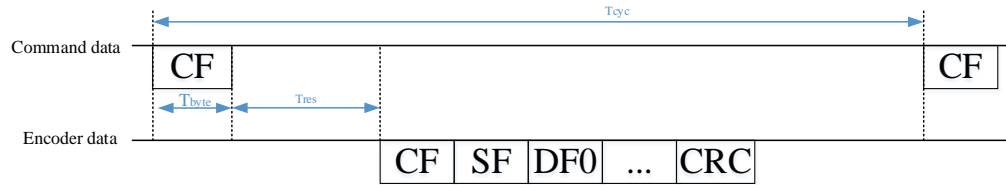
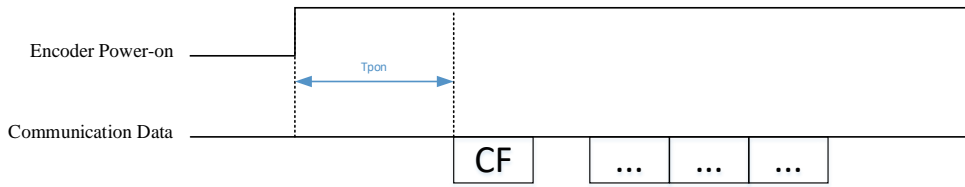
SM3□-10/13/18

P/N: XM10-S10S-C(EUMACX)



Pin #	Signal
1	5V
2	GND
3	SD-
4	SD+
5	Battery+
6	Battery-
10	Shield

X/T Timing Logic



Characteristic	Symbol	Minimum	Default	Maximum	Unit	Note
Power-On time	T_{pon}	450	550		ms	
Command cycle period	T_{cyc}	62.5			μs	
Encoder EPROM Write Command time	T_{cycw}	40			ms	
Encoder EPROM read Command time	T_{cycw}	62.5			μs	
Data byte time	T_{byte}	2.5			μs	
Encoder response time	T_{res}		10		μs	
Encoder disable delay time	T_{dis1}	0.6	1.2	μs		

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

Model*	Length	Description	For Servo Motor*	Outline
2641-0100	1m	Encoder Cables Battery - less Absolute Encoder Standard	SM3L-042AB□DV SM3L-061AB□DV SM3L-062AB□DV SM3L-083AB□DV SM3L-084AB□DV	
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 Battery - less 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			
2639-0100	1m	Encoder Cables With Battery Absolute Encoder Standard	SM3H-062AXBPV SM3H-083AXBPV	
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			

* □ Brake Options

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

Accessories

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

Model*	Length(L)	Description	For Servo Motor*	Outline
1672-0100	1m	Motor Cables Standard Unshielded	SM3L-042A ◇ □ D △	
1672-0200	2m		SM3L-061A ◇ □ P △	
1672-0300	3m		SM3L-062A ◇ □ P △	
1672-0400	4m		SM3L-083A ◇ □ P △	
1672-0500	5m		SM3L-084A ◇ □ P △	
1672-0800	8m			
1672-1000	10m		SM3H-041A ◇ □ P △	
1672-1500	15m		SM3H-042A ◇ □ P △	
1672-2000	20m		SM3H-061A ◇ □ P △	
1672-0100-C10	1m	Motor Cables Flexible Unshielded	SM3H-062A ◇ □ P △	
1672-0200-C10	2m		SM3H-083A ◇ □ P △	
1672-0300-C10	3m		SM3L-042AB □ D △	
1672-0400-C10	4m		SM3L-061AB □ D △	
1672-0500-C10	5m		SM3L-062AB □ D △	
1672-0800-C10	8m		SM3L-083AB □ D △	
1672-1000-C10	10m		SM3L-084AB □ D △	
1672-1500-C10	15m		SM3M-062AB □ D △	
1672-2000-C10	20m		SM3M-083AB □ D △	
1674-0100	1m	Brake Cables Standard Unshielded	SM3L-042A ◇ BD △	
1674-0200	2m		SM3L-061A ◇ BP △	
1674-0300	3m		SM3L-062A ◇ BP △	
1674-0400	4m		SM3L-083A ◇ BP △	
1674-0500	5m		SM3L-084A ◇ BP △	
1674-0800	8m			
1674-1000	10m		SM3H-041A ◇ BP △	
1674-1500	15m		SM3H-042A ◇ BP △	
1674-2000	20m		SM3H-061A ◇ BP △	
1674-0100-C10	1m	Brake Cables Flexible Unshielded	SM3H-062A ◇ BP △	
1674-0200-C10	2m		SM3H-083A ◇ BP △	
1674-0300-C10	3m		SM3L-042ABBD △	
1674-0400-C10	4m		SM3L-061ABBD △	
1674-0500-C10	5m		SM3L-062ABBD △	
1674-0800-C10	8m		SM3L-083ABBD △	
1674-1000-C10	10m		SM3L-084ABBD △	
1674-1500-C10	15m		SM3M-062ABBD △	
1674-2000-C10	20m		SM3M-083ABBD △	

* ◇ Encoder Options □ Brake Options △ Oil Seal Options

* Flexible -C10 10 million times

Test Conditions: Bend Radius 50mm, Frequency 40 times/min, Distance 1000mm

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

Model*	Length	Description	For Servo Motor*	Outline
2643-0100	1m	Encoder Cables Incremental Encoder Standard	SM3L-102A ◇ □UV SM3L-103A ◇ □UV SM3L-104A ◇ □UV SM3L-105A ◇ □UV	
2643-0300	3m			
2643-0500	5m			
2643-1000	10m			
2643-1500	15m			
2643-2000	20m			
2643-0100-C10	1m	Encoder Cables Incremental Encoder Flexible	SM3M-132A ◇ □UV SM3M-133A ◇ □UV SM3M-134A ◇ □UV SM3H-132A ◇ □UV SM3H-133A ◇ □UV SM3H-134A ◇ □UV SM3M-135Y ◇ □MV	
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	SM3L-102A ◇ □UV SM3L-103A ◇ □UV SM3L-104A ◇ □UV SM3L-105A ◇ □UV	
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	SM3M-132A ◇ □UV SM3M-133A ◇ □UV SM3M-134A ◇ □UV SM3H-132A ◇ □UV SM3H-133A ◇ □UV SM3H-134A ◇ □UV SM3M-135Y ◇ □MV	
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 100mm, Frequency 40 times/min, Distance 1000mm

Accessories

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

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

* ◇ Encoder Options △ Oil Seal Options

* Flexible -C10 10 million times

Test Conditions: Bend Radius 100mm, Frequency 40 times/min, Distance 1000mm

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

Model*	Length	Description	For Servo Motor*	Outline
1656-0100	1m	Motor Cables Standard	SM3L-103A ◇ NUV SM3M-133A ◇ NUV SM3H-133A ◇ NUV	
1656-0300	3m			
1656-0500	5m			
1656-1000	10m			
1656-1500	15m			
1656-2000	20m			
1656-0100-C10	1m	Motor Cables Flexible	SM3L-103A ◇ NUV SM3M-133A ◇ NUV SM3H-133A ◇ NUV	
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 ◇ BUV SM3M-133A ◇ BUV SM3H-133A ◇ BUV	
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	SM3L-103A ◇ BUV SM3M-133A ◇ BUV SM3H-133A ◇ BUV	
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

Accessories

Motor Power Cables (Angled Plug)

For 100mm Frame Size 2.0/2.5kW Motor, 130mm Frame Size 1.8/2.0/3.0kW Motor

Model*	Length	Description	For Servo Motor*	Outline
1650-0100	1m	Motor Cables Standard Unshielded	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 Unshielded		
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 Unshielded	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 Unshielded		
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 Cables (Angled Plug)
For 180mm Frame Size, 2.9/4.4kW Motor

Model*	Length	Description	For Servo Motor*	Outline
1666-0100	1m	Motor Cables Standard Unshielded	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 Unshielded	SM3H-182Y ◇ NU △ SM3H-183Y ◇ NU △	
1666-0300-C10	3m			
1666-0500-C10	5m			
1666-1000-C10	10m			
1666-1500-C10	15m			
1666-2000-C10	20m			
1681-0100	1m	Motor Cables With Built-in Brake Cable Standard Unshielded	SM3H-182Y ◇ BU △ SM3H-183Y ◇ BU △	
1681-0300	3m			
1681-0500	5m			
1681-1000	10m			
1681-1500	15m			
1681-2000	20m			
1681-0100-C10	1m	Motor Cables With Built-in Brake Cable Flexible Unshielded	SM3H-182Y ◇ BU △ SM3H-183Y ◇ BU △	
1681-0300-C10	3m			
1681-0500-C10	5m			
1681-1000-C10	10m			
1681-1500-C10	15m			
1681-2000-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 Cables (Angled Plug)
For 180mm Frame Size, 5.5/7.5kW Motor

Model*	Length	Description	For Servo Motor*	Outline
1667-0100	1m	Motor Cables Standard Unshielded	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 Unshielded	SM3H-184Y ◇ NU △ SM3H-185Y ◇ NU △	
1667-0300-C10	3m			
1667-0500-C10	5m			
1667-1000-C10	10m			
1667-1500-C10	15m			
1667-2000-C10	20m			
1680-0100	1m	Motor Cables With Built-in Brake Cable Standard Unshielded	SM3H-184Y ◇ BU △ SM3H-185Y ◇ BU △	
1680-0300	3m			
1680-0500	5m			
1680-1000	10m			
1680-1500	15m			
1680-2000	20m			
1680-0100-C10	1m	Motor Cables With Built-in Brake Cable Flexible Unshielded	SM3H-184Y ◇ BU △ SM3H-185Y ◇ BU △	
1680-0300-C10	3m			
1680-0500-C10	5m			
1680-1000-C10	10m			
1680-1500-C10	15m			
1680-2000-C10	20m			

* ◇ Encoder Options △ Oil Seal Options

* Flexible -C10 10 million times

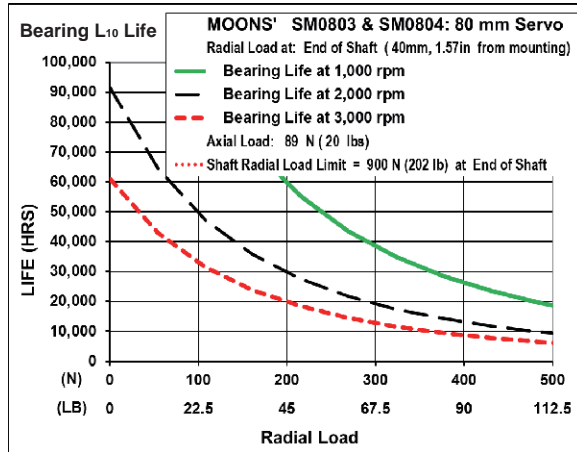
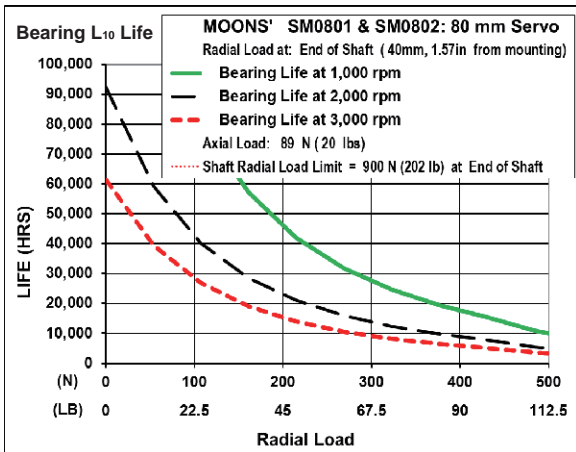
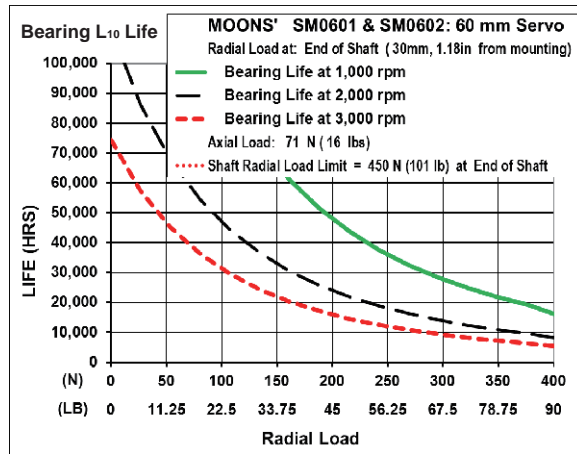
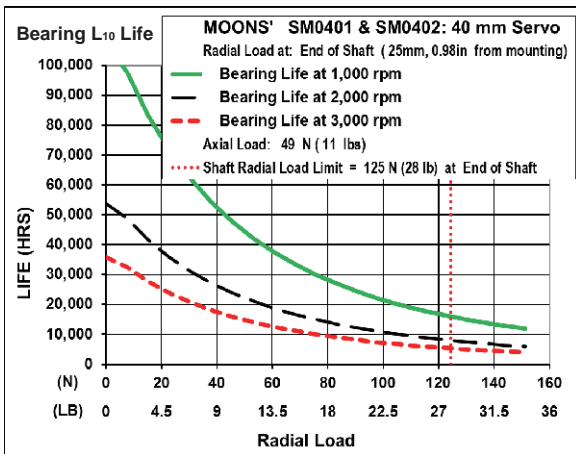
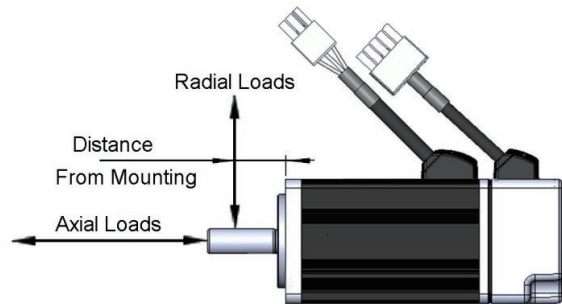
Test Conditions: Bend Radius 100mm, Frequency 40 times/min, Distance 1000mm

Allowable load of shaft—Bearing Life

Motor bearing life depends on several factors including: axial and radial loads, motor speed, temperature, and the bearing ratings. Because the front bearing is positioned closest to the motor shaft, it usually carries a higher radial load and has the shortest life.

A common cause for shaft and bearing failure is high radial loads that are created when a pulley is attached to the motor shaft at a large distance from the motor mounting face, and the belt has high tension. To avoid this condition mount pulleys and gears as close to the face of the motor as possible, and avoid over tightening belts.

These curves show bearing life, at various speeds and radial loads. The curves were calculated with the radial load applied at the end of the shaft.





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Vietnam

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