MOONS'

moving in better ways

M2 Series
AC Servo System

Reliable Easy to use Fast
Intelligent Safe Professional

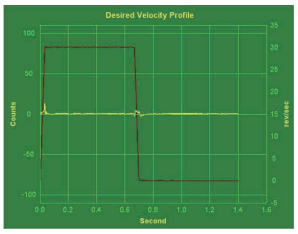
CE RoHS Compliant

The M2AC Series Servo System from MOONS' features drives that are high on functionality with a range of control options, programmable notch filters, an anti-vibration algorithm and auto-tuning. The drives are designed to be used with MOONS' servo motors in the 60W to 750W power range. The M2 drives can communicate over Modbus/RTU, CANopen, Ethernet, and Ethernet/IP. Using MOONS' Q Programmer software they can create complex motion programs that can be stored in the drive and then run in a stand-alone mode.

Easy to Use On-line Auto Tuning

The M2AC servo system can accomplish real time response to the dynamic feedback of the load and optimize gain tuning parameters on-line automatically. The auto tuning function can greatly save on debugging time and simplify the debugging procedure. This can all be done by the PC based software in only a few minutes.

Before auto-tuning

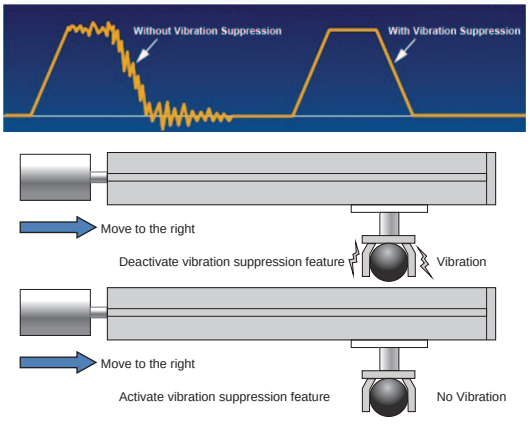


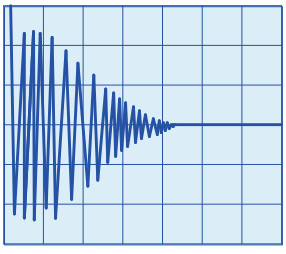
After auto-tuning

Advanced Anti-Vibration Function

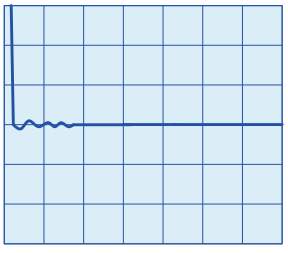
The M2AC servo system has an advanced antivibration function which includes anti-resonance and vibration damping. Anti-resonance uses two notch filters to overcome the resonance from the natural mechanical characteristic of the system.

Vibration damping uses an adjustable damping ratio in the controller to improve the damping characteristic of the system, which can reduce the vibration of the system.





Without Anti vibration



With Anti vibration

Safety Standards

Compatible functionality of IEC/EN 60204-1 - STO (Safe Torque Off)
Safe Torque Off (STO) is a hardware level safety protection function. When the STO function is activated, the drive's hardware circuitry automatically forces all power transistors OFF to cut off the motor current, immediately disable motor operation and prevent unexpected restarting. The operator isn't required to physically shut off the electromagnetic contactor to ensure personal and equipment safety in case of an emergency.

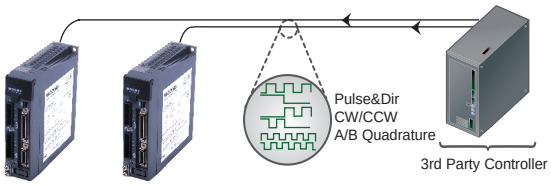
Note: UL 61800-5-1, UL 61800-5-2 certifications are pending.

Internal Regeneration Resistors

All M2AC Servo Series drives have an internal regeneration resistor, maximum of 40W.

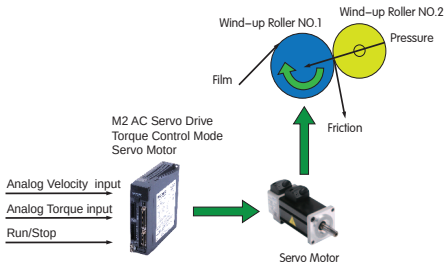
Digital Pulse Position Modes

- STEP/DIR, CW/CCW Pulse, A/B quadrature
- Open Collector Pulse Input: 500KHz, 5-24VDC
- Differential Line Input: 2MHz, 5VDC



Analog Input Control Modes

Two analog inputs support analog position, analog velocity and analog torque modes.



Built-In Q Programmer Software

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

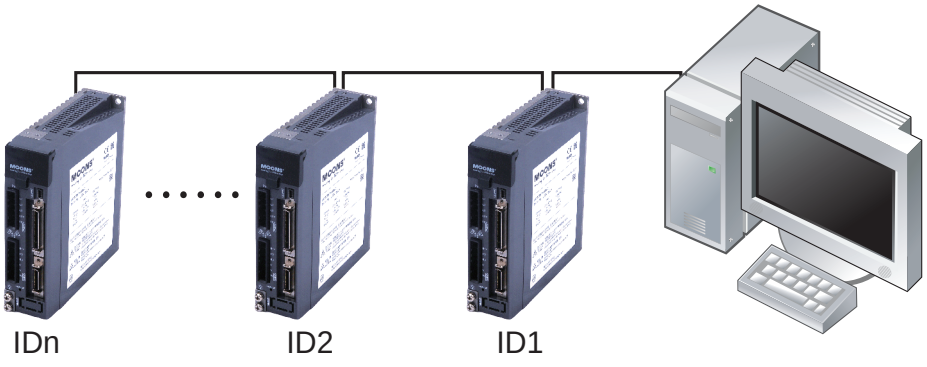
Features:

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

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

Field Bus Control

M2AC Servo Series drives support RS-485 Modbus/RTU protocol, CANopen protocal based on CANbus, as well as Ethernet and Ethernet/IP communication protocols.



☐ CANopen

Standard CAN bus interfaces are available in M2 series servo drives, which makes it easy to get integrated to a industrial field bus.

Items	Specification
Physical Layer Standard	CiA 303-1 Cabling and connector pin assignment
Communication Protocol	CiA 301 Application Layer and Communication Profile CiA 402 Device Profile Drives and Motion Control
Bus connector	RJ45
Baud Rate	12.5Kbps, 20Kbps, 50Kbps, 125Kbps, 250Kbps, 500Kbps, 800Kbps, 1Mbps
Communication Objects	SDO, PDO, SYNC, EMCY, NMT, Heartbeat
Control Mode	Profile Position, Profile Velocity, Profile Torque, Homing Mode
PDO data	4 RxPDOs, 4 TxPDOs

☐ Modbus

M2 series servo drives provide the Modbus/RTU communication function with RS-232/RS-485 interface, and the Modbus/TCP with Ethernet interface, which can be used to easily control the motor, set parameters or monitor the status of the drive.

Items	Specification
Physical Layer Standard	RS-232, RS-485, Ethernet
Communication Protocol	Modbus/RTU Modbus/TCP
Bus connector	RJ11(RS-232)
	RJ45(RS-485, Ethernet)
Baud Rate	RS-232/485: 9600bps, 19200bps, 38400bps, 57600bps, 115200bps
	Ethernet: 10/100Mbps
Control Mode	Position Mode, Velocity Mode, Torque Mode, Homing Mode

☐ SCL

SCL(Series command language), was developed by MOONS' to give users a simple way to control a motor drive via a series port. This eliminates the need for separate motion controllers or to supply control signals, like Pulse&Direction, to your servo drives. It also provides an easy way to interface to a variety of the industrial devices like PLC, industrial computers, and HMI, which most often have standard serial ports for communication.

eSCL is based on MOONS''s SCL for commanding and querying motion control products over Ethernet.

Items	Specification
Physical Layer Standard	RS-232, RS-485, Ethernet
Communication Protocol	SCL
	eSCL
Bus connector	RJ11(RS-232)
	RJ45(RS-485, Ethernet)
Baud Rate	RS-232/485: 9600bps, 19200bps, 38400bps, 57600bps, 115200bps
	Ethernet: 10/100Mbps
Control Mode	Position Mode, Velocity Mode, Torque Mode, Homing Mode

☐ EtherNet/IP

EtherNet/IP is an industrial network protocol that adapts the common industrial protocol to standard Ethernet. M2 series provide motion control solution with EtherNet/IP protocol.

Items	Specification
Physical Layer Standard	Ethernet
Communication Protocol	EtherNet/IP
Bus connector	RJ45
Baud Rate	Ethernet: 10/100Mbps
Control Mode	Position Mode, Velocity Mode, Torque Mode, Homing Mode

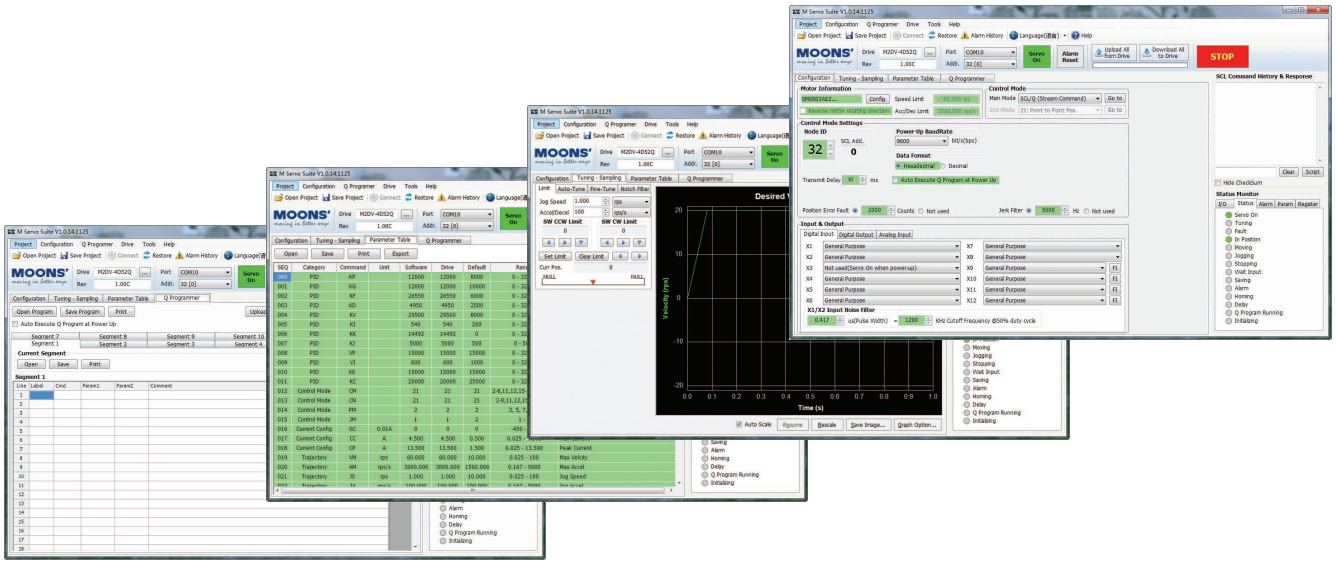
Easy to Use Control Panel, Friendly Tuning Software

On-board control panel

- Set and query basic parameters
- LED display of drive status

M Servo Suite tuning software

- Friendly interface
- Easy set-up
- Drive set-up and configuration
- Easy to use on-line auto-tuning
- Built in oscilloscope for motion testing and monitoring
- Write and save SCL scripts
- On-line help integrated



I/O

- Two standard EIA-422 high speed differential inputs
- Four 5-24VDC high speed inputs, maximum input frequency 500KHz, with digital input filter
- Eight optically isolated multi function inputs, 5-24VDC, 20mA
- Two analog inputs
- Six optically isolated multi function outputs, 5-24VDC, 20mA

Featured Function Application

Position Table

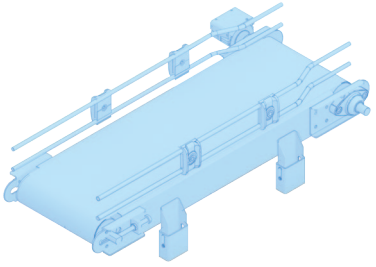
- Linear Motion, Rotary Motion
- Linear Motion: up to 63 position points controlled by different input signal combinations
- Rotary motion: up to 48 position points per revolution
- Customized acceleration/deceleration speed settings for each individual point for more control options
- Multi position control with no pulse input requirement

Applications: Linear Module, Rotary Table, Index Plate, Tool Changing System

Multi Velocity Control

- Set up to 8 different velocities via different I/O combinations
- Use digital input signal for settings, with no analog input requirement
- Velocity configuration via both M Servo Suite and control panel
- Programmable acceleration and deceleration settings for each individual velocity change

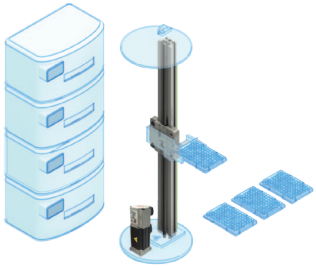
Applications: Polisher, Conveyor



Gain Selection

For applications with varying loads, gain selection allows the M2AC servo drive to optimize the motor's overall performance.

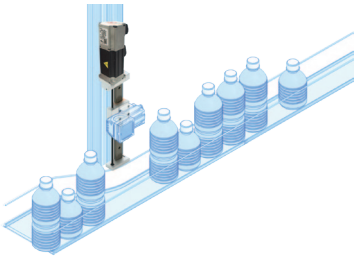
Applications: X-Y Robot Arm, Vertical Conveyor



Pulse Inhibit

When the pulse inhibit signal is triggered, the motor will stop moving regardless of pulse inputs.

Applications: Packaging Machinery



M2AC Servo Drive Numbering Information

M2DV - □ □ □ 2 □ *

M2 Series AC Servo Drive

Customized Specification(If Applicable)

Current Code	Continuous Current (RMS)	Boost Current(RMS)
1D8	1.80A	5.40A
3D0	3.00A	9.00A
4D5	4.50A	13.50A

Voltage Code	Input Voltage
2	Single/Three-Phases 200~240VAC ± 10%, 50/60Hz

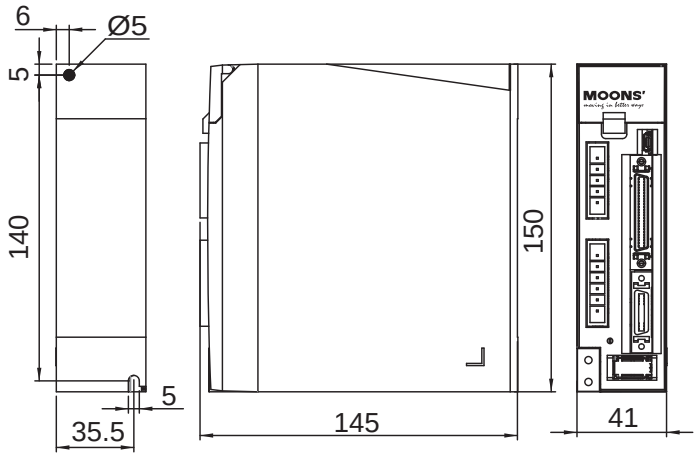
Communication Type	Configuration	Description	Communication
S	Mini USB	Basic Type	- - -
Q		Q Type	RS-232
R		Q Type(Modbus/RTU Type)	RS-485
C		CANopen Type	CANBus
D		eSCL Type	Ethernet
IP		EtherNet/IP Type	Ethernet

M2AC Drive Specifications

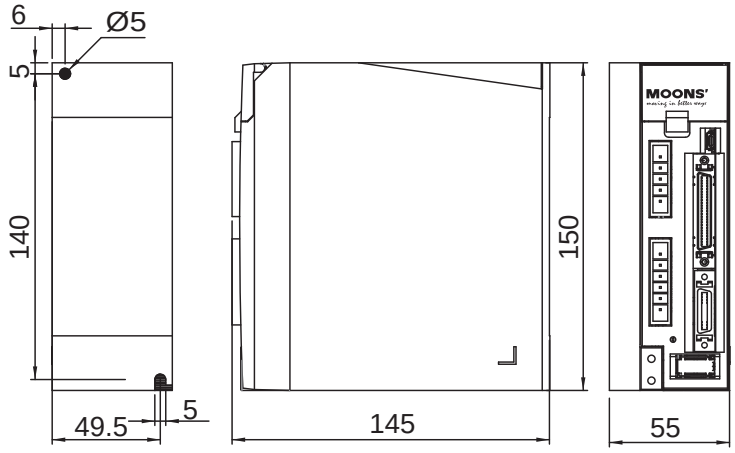
Basic Specifications	Input Power	M2DV-1D8	Main Circuit	Single / Three-phase, 200~240VAC ±10%, 50/60Hz
			Control Circuit	Single phase, 200~240VAC ±10%, 50/60Hz
		M2DV-3D0	Main Circuit	Single / Three-phase, 200~240VAC ±10%, 50/60Hz
			Control Circuit	Single phase, 200~240VAC ±10%, 50/60Hz
		M2DV-4D5	Main Circuit	Single / Three-phase, 200~240VAC ±10%,50/60Hz
			Control Circuit	Single phase, 200~240VAC ±10%, 50/60Hz
	Withstand Voltage			Primary to earth: withstand 1500 VAC, 1 min, (sensed current: 20 mA) [220V Input]
	Environment	Temperature		Ambient temperature:0°C to 50°C(If the ambient temperature of servo drive is greater than 45°C, please install the drive in a well-ventilated location) Storage temperature: -20°C to 65°C
		Humidity		Both operating and storage : 10 to 85%RH or less
		Altitude		Lower than 1000m
		Vibration		9.8m/s^2 or less, 10 - 60Hz (Do not use continuously at resonance frequency)
	Control Method			PWM Sinusoidal wave drive
	Encoder Feedback			2500 ppr Optical Encoder with Shared Commutation Signals
	I/O	Digital Signal	Input	8 optical isolated multi function inputs, 5-24VDC, 20mA 2 optical isolated multi function high speed inputs, 5-24VDC, 20mA
			Output	6 optical isolated multi function outputs, 5-24VDC, 20mA
		Analog Signal	Input	2 inputs (12Bit A/D : 2 input)
		Pulse Signal	Input	2 inputs (Photo-coupler input, Line receiver input) Photocoupler input is compatible with both line driver I/F and open collector I/F. Line receiver input is compatible with line driver I/F.
			Output	4 outputs (Line driver: 3 outputs, open collector: 1 outputs)
	Communication	USB Mini		Connection with PC or 1 : 1 communication to a host.
		RS232		RS-232 Communication
		RS485		RS-485 Communication & Modbus/RTU
		CAN bus		CANopen Communication
		Ethernet		EtherNET/IP, eSCL
	Front panel			(1) 4 keys (MODE, UP, DOWN, SET) (2) LED Display (5-digit)
	Regeneration Resistor			Built-in regenerative resistor (external resistor is also enabled.)
	Control Mode			(1) Position mode (2) Analog Velocity mode (3) Analog Position mode (4) Position mode (5) Velocity Change mode (6) Command Torque mode (7) Command Velocity mode
	Control Input Signal			(1) Servo-ON input (2) Alarm clear input (3) CW/CCW Limit (4) Pulse& Direction or CW/CCW input (5) Gain Switch (6) Control mode Switch (7) Pulse Inhibition (8) Gear switch (9) Velocity Change mode (10) Analog input (11) General input
	Control Output Signal			(1) Alarm output (2) Servo-Ready output (3) External brake release (4) Speed arrival output (5) Torque arrival output (6) Position arrival output (7) TachOut (8) Servo-on status output (9) General output
	Certification			RoHS, EN 61800-3: 2014, EN 61800-5-1: 2014

Drive Dimensions(Unit: mm)

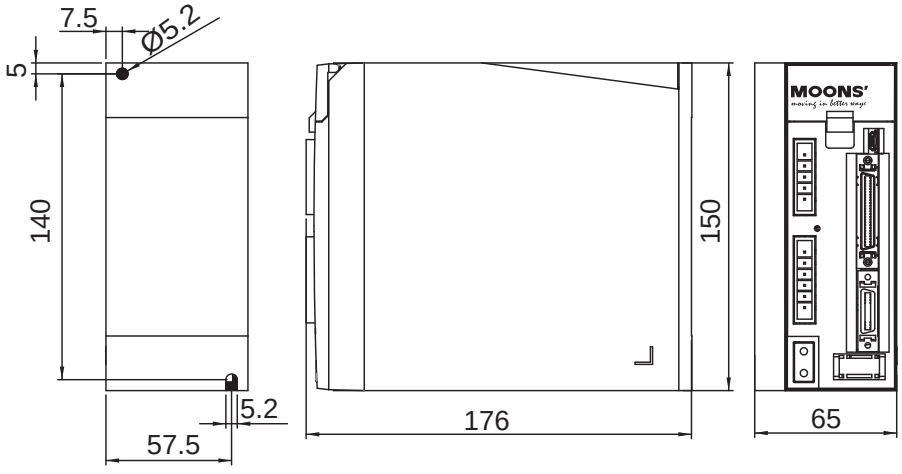
☐ M2DV-1D8 ☐☐



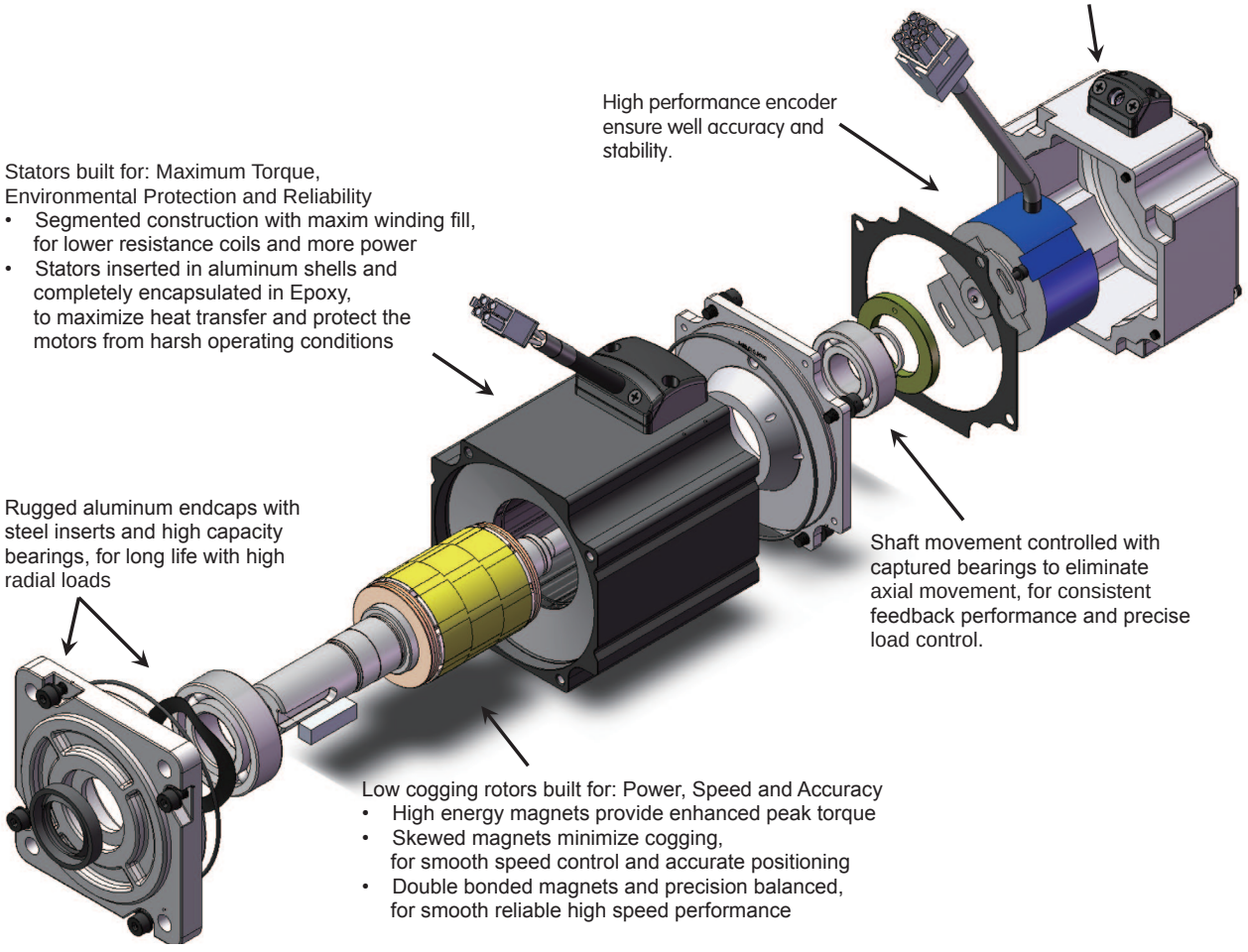
☐ M2DV-3D0 ☐☐



☐ M2DV-4D5 ☐☐



AC Servo Motor—SM Series



M2AC Servo Motor Numbering Information

SM0602AE4-KCD-NNV-M-**

SM Series

Frame Size
04-□40mm
06-□60mm
08-□80mm

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

Encoder Feedback
E4: 2500 ppr Optical Encoder and Shared Commutation Tracks

Shaft and Lead/Connector Style
KCD: Standard Keyway, Non-sealed Connector

Brake Option
N: No Brake
B: 24VDC Brake

Medium Inertia Motor

Customized Specifiction(If Applicable)

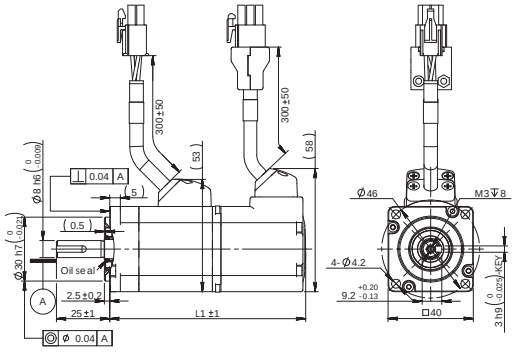
Low Inertia Motor

☐ 40mm Specifications

Type		SM0401AE4-KCD-*NV	SM0402AE4-KCD-*NV
Rated Output Power	watts	60	100
Rated Speed	rpm	3000	3000
Max Speed	rpm	6000	6000
Rated Torque	Nm	0.19	0.32
Peak Torque	Nm	0.48	0.93
Rated Current	A (rms)	0.7	1.2
Peak Current	A (rms)	1.75	3.6
Voltage Constant±5%	V (rms) / K rpm	17	16.6
Torque Constant±5%	Nm / A (rms)	0.283	0.271
Winding Resistance(Line-Line)	Ohm ±10%@25°C	27	9.7
Winding Inductance(Line-Line)	mH (typ.)	26	11.5
Rotor Inertia	$Kg{\cdot}m^2$	0.0232×10^{-4}	0.0428×10^{-4}
Rotor Inertia-With Brake Option	$Kg{\cdot}m^2$	0.0298×10^{-4}	0.0494×10^{-4}
Shaft Load - Axial	N (max.)	50	50
Shaft Load - Radial (End of Shaft)	N (max.)	50	60
Weight	kg	0.4	0.55
Weight-With Brake Option	kg	0.65	0.8

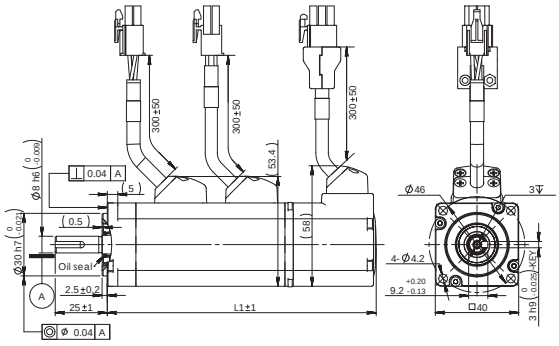
☐ 40mm Outline Dimensions

1) Without Brake



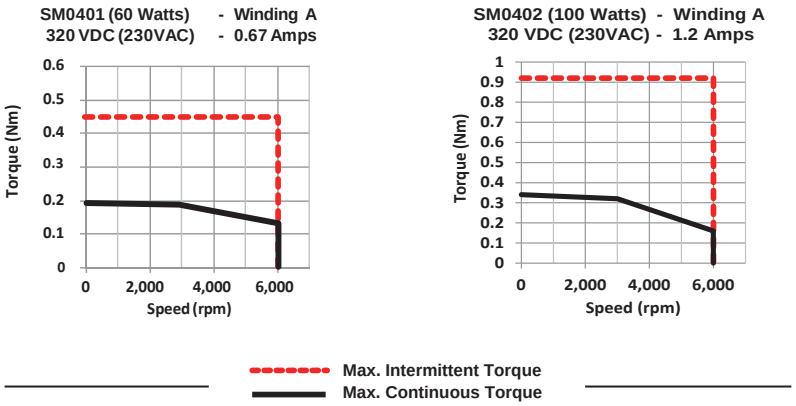
Without Brake	L1
SM0401AE4-KCD-NNV	92
SM0402AE4-KCD-NNV	109

2) With Brake



With Brake	L1
SM0401AE4-KCD-BNV	129
SM0402AE4-KCD-BNV	147

☐ 40mm Torque Curves



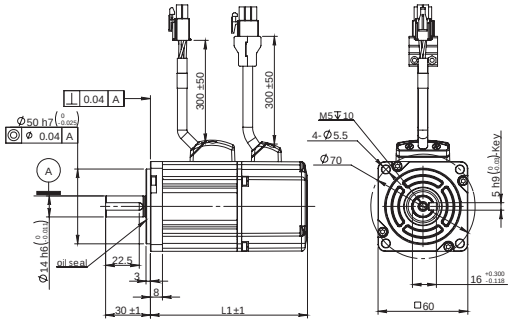
Low Inertia Motor

☐ 60mm Specifications

Type		SM0601AE4-KCD-*NV	SM0602AE4-KCD-*NV
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	2.75
Peak Current	A (rms)	4.5	8.3
Voltage Constant±5%	V (rms) / K rpm	27.2	29
Torque Constant±5%	Nm / A (rms)	0.432	0.484
Winding Resistance(Line-Line)	Ohm ±10%@25°C	8.6	3.7
Winding Inductance(Line-Line)	mH (typ.)	25	12.9
Rotor Inertia	$Kg{\cdot}m^2$	0.165×10^{-4}	0.272×10^{-4}
Rotor Inertia-With Brake Option	$Kg{\cdot}m^2$	0.22×10^{-4}	0.326×10^{-4}
Shaft Load - Axial	N (max.)	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	200	240
Weight	kg	1.1	1.4
Weight-With Brake Option	kg	1.6	1.9

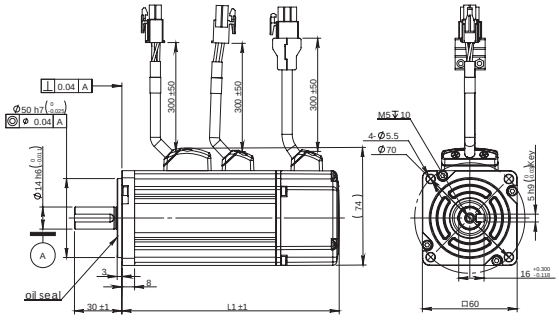
☐ 60mm Outline Dimensions

1) Without Brake



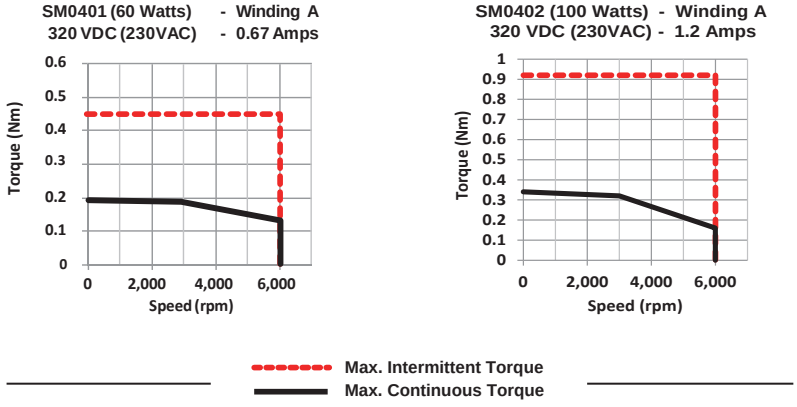
Without Brake	L1
SM0601AE4-KCD-NNV	105
SM0602AE4-KCD-NNV	125

2) With Brake



With Brake	L1
SM0601AE4-KCD-BNV	145
SM0602AE4-KCD-BNV	165

☐ 60mm Torque Curves



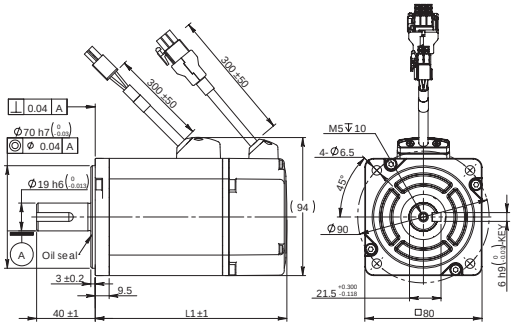
Low Inertia Motor

☐ 80mm Specifications

Type		SM0803AE4-KCD-*NV
Rated Output Power	watts	750
Rated Speed	rpm	3000
Max Speed	rpm	6000
Rated Torque	Nm	2.4
Peak Torque	Nm	6.9
Rated Current	A (rms)	4.5
Peak Current	A (rms)	13.5
Voltage Constant±5%	V (rms) / K rpm	36.6
Torque Constant±5%	Nm / A (rms)	0.543
Winding Resistance(Line-Line)	Ohm ±10%@25°C	1.47
Winding Inductance(Line-Line)	mH (typ.)	8.2
Rotor Inertia	$Kg{\cdot}m^2$	0.89×10^{-4}
Rotor Inertia-With Brake Option	$Kg{\cdot}m^2$	0.97×10^{-4}
Shaft Load - Axial	N (max.)	90
Shaft Load - Radial (End of Shaft)	N (max.)	270
Weight	kg	2.6
Weight-With Brake Option	kg	3.4

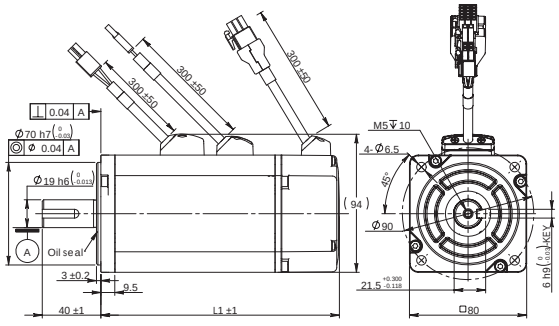
☐ 80mm Outline Dimensions

1) Without Brake



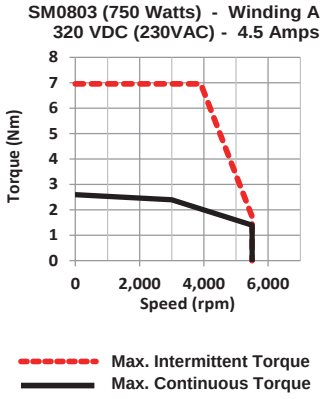
Without Brake	L1
SM0803AE4-KCD-NNV	131

2) With Brake



With Brake	L1
SM0803AE4-KCD-BNV	178

☐ 80mm Torque Curves



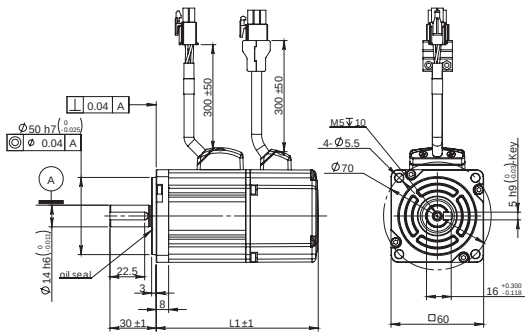
Medium Inertia Motor

☐ 60mm Specifications

Type		SM0602AE4-KCD-NNV-M	SM0602AE4-KCD-BNV-M
Rated Output Power	watts	400	400
Rated Speed	rpm	3000	3000
Max Speed	rpm	6000	6000
Rated Torque	Nm	1.27	1.27
Peak Torque	Nm	3.8	3.8
Rated Current	A (rms)	2.75	2.75
Peak Current	A (rms)	8.3	8.3
Voltage Constant±5%	V (rms) / K rpm	29	29
Torque Constant±5%	Nm / A (rms)	0.484	0.484
Winding Resistance(Line-Line)	Ohm ±10%@25°C	3.7	3.7
Winding Inductance(Line-Line)	mH (typ.)	12.9	12.9
Rotor Inertia	$Kg \cdot m^2$	0.682×10^{-4}	0.72×10^{-4}
Shaft Load - Axial	N (max.)	70	70
Shaft Load - Radial (End of Shaft)	N (max.)	240	240
Weight	kg	1.6	2.1

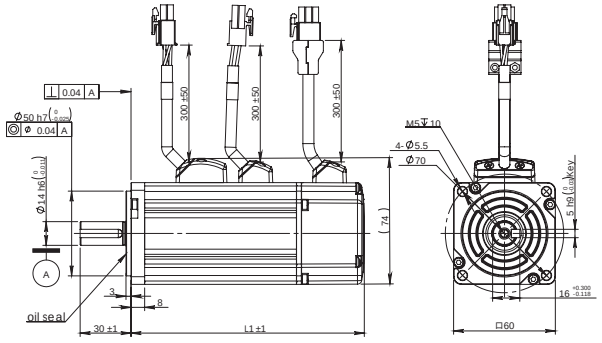
☐ 60mm Outline Dimensions

1) Without Brake



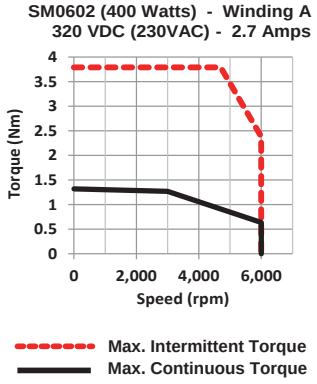
Without Brake	L1
SM0602AE4-KCD-NNV-M	135

2) With Brake



With Brake	L1
SM0602AE4-KCD-BNV-M	175

☐ 60mm Torque Curves



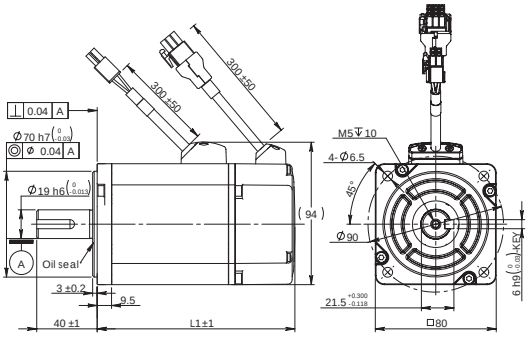
Medium Inertia Motor

☐ 80mm Specifications

Model		SM0803AE4-KCD-NNV-M	SM0803AE4-KCD-BNV-M
Rated Output Power	watts	750	750
Rated Speed	rpm	3000	3000
Max Speed	rpm	5500	5500
Rated Torque	Nm	2.4	2.4
Peak Torque	Nm	6.9	6.9
Rated Current	A (rms)	4.5	4.5
Peak Current	A (rms)	13.5	13.5
Voltage Constant±5%	V (rms) / K rpm	36.6	36.6
Torque Constant±5%	Nm / A (rms)	0.543	0.543
Winding Resistance(Line-Line)	Ohm ±10%@25°C	1.47	1.47
Winding Inductance(Line-Line)	mH (typ.)	8.2	8.2
Rotor Inertia	$Kg \cdot m^2$	1.52×10^{-4}	1.56×10^{-4}
Shaft Load - Axial	N (max.)	90	90
Shaft Load - Radial (End of Shaft)	N (max.)	270	270
Weight	kg	2.8	3.6

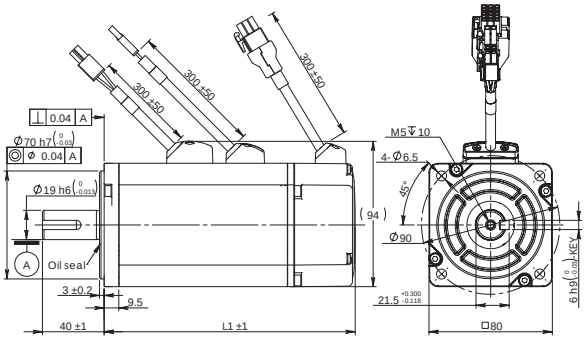
☐ 80mm Outline Dimensions

1) Without Brake



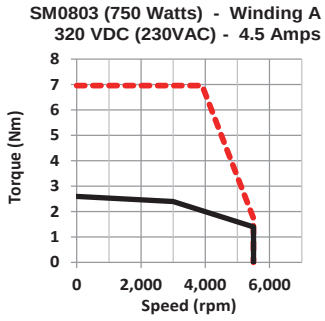
Without Brake	L1
SM0803AE4-KCD-NNV-M	140.8

2) With Brake



With Brake	L1
SM0803AE4-KCD-BNV-M	188

☐ 80mm Torque Curves



Reducer Servo Motor Specifications and Dimensions

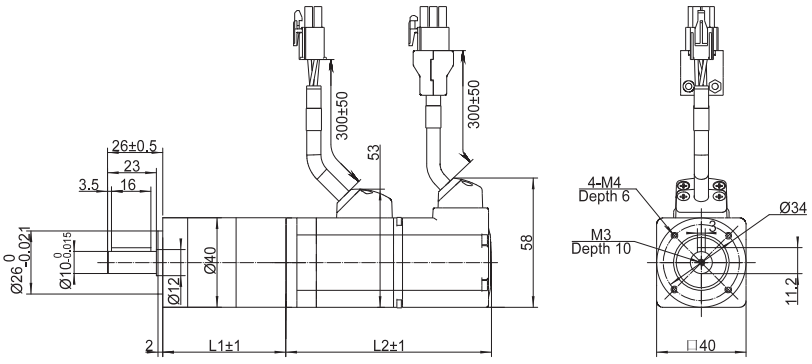
☐ 40mm Specifications

Without Brake Type		SM0401AE4-KCD-NNV-PG05A	SM0401AE4-KCD-NNV-PG10A	SM0401AE4-KCD-NNV-PG20A	SM0402AE4-KCD-NNV-PG05A	SM0402AE4-KCD-NNV-PG10A	SM0402AE4-KCD-NNV-PG20A
With Brake Type		**SM0401AE4-KCD-BNV-PG05A**	**SM0401AE4-KCD-BNV-PG10A**	**SM0401AE4-KCD-BNV-PG20A**	**SM0402AE4-KCD-BNV-PG05A**	**SM0402AE4-KCD-BNV-PG10A**	**SM0402AE4-KCD-BNV-PG20A**
Motor Power	W	60			100		
Reduction Ratio		5	10	20	5	10	20
Max Output Torque	N·m	0.95	1.9	3.8	1.6	3.2	6.4
Instantaneous Output Torque	N·m	2.4	4.8	11.4	4.65	9.3	18.6
Max Permissible Output Torque	N·m	6	8	12	6	8	40
Stage		1	1	2	1	1	2
Back lash	arcmin	≤12	≤12	≤15	≤12	≤12	≤15
Efficiency		96%	96%	94%	96%	96%	94%
Rated Output Speed	r/min	600	300	150	600	300	150
Max. Output Speed	r/min	1200	600	300	1200	600	300
Motor Rotor Inertia	$Kg·m^2$	$0.0232x10^{-4}$ *($0.0298x10^{-4}$)			$0.0428x10^{-4}$ *($0.0494x10^{-4}$)		
Reducer Rotor Inertia	$Kg·m^2$	$0.015x10^{-4}$	$0.019x10^{-4}$	$0.019x10^{-4}$	$0.015x10^{-4}$	$0.019x10^{-4}$	$0.019x10^{-4}$
L1 Without Brake	mm	67.5	67.5	80.5	67.5	67.5	80.5
L2 Without Brake	mm	92	92	92	109	109	109
L1 With Brake	mm	67.5	67.5	80.5	67.5	67.5	80.5
L2 With Brake	mm	129	129	129	147	147	147
Matching Drive		M2DV-1D82 ☐					

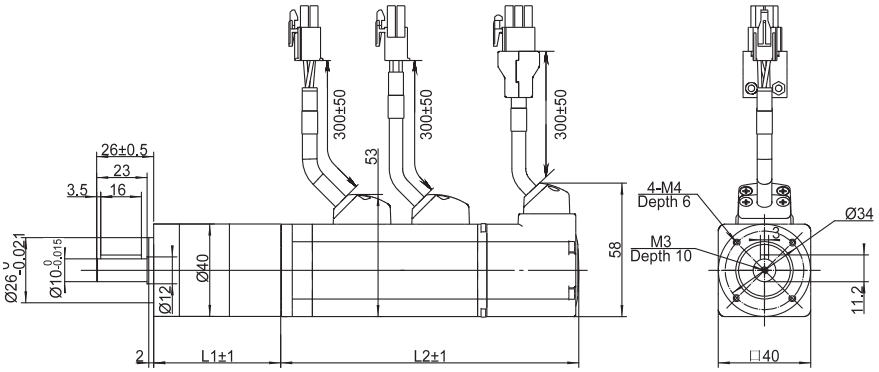
(*) With Brake

☐ 40mm Outline Dimensions

1) Without Brake



2) With Brake



Reducer Servo Motor Specifications and Dimensions

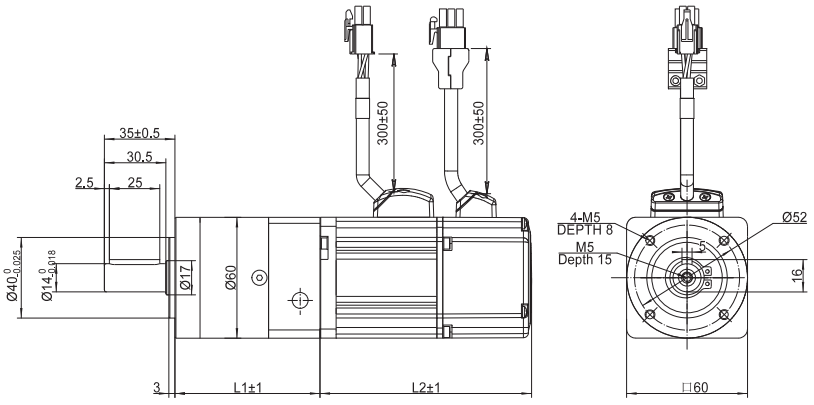
☐ 60mm Specifications

Without Brake Type		SM0601AE4-KCD-NNV-PG05A	SM0601AE4-KCD-NNV-PG10A	SM0601AE4-KCD-NNV-PG20A	SM0602AE4-KCD-NNV-PG05A	SM0602AE4-KCD-NNV-PG10A	SM0602AE4-KCD-NNV-PG20A
With Brake Type		**SM0601AE4-KCD-BNV-PG05A**	**SM0601AE4-KCD-BNV-PG10A**	**SM0601AE4-KCD-BNV-PG20A**	**SM0602AE4-KCD-BNV-PG05A**	**SM0602AE4-KCD-BNV-PG10A**	**SM0602AE4-KCD-BNV-PG20A**
Output Power	W	200			400		
Reduction Ratio		5	10	20	5	10	20
Max.Output Torque	N·m	3.2	6.4	12.8	6.35	12.7	25.4
Instantaneous Output Torque	N·m	9.5	19	38	19	38	76
Max Permissible Output Torque	N·m	32	24	88	32	24	88
Stage		1	1	2	1	1	2
Back lash	arcmin	≤10	≤10	≤15	≤10	≤10	≤15
Efficiency		96%	96%	94%	96%	96%	94%
Rated Output Speed	r/min	600	300	150	600	300	150
Max. Output Speed	r/min	1200	600	300	1200	600	300
Motor Rotor Inertia	$Kg·m^2$	$0.165x10^{-4}$ *($0.22x10^{-4}$)			$0.272x10^{-4}$ *($0.326x10^{-4}$)		
Reducer Rotor Inertia	$Kg·m^2$	$0.078x10^{-4}$	$0.054x10^{-4}$	$0.075x10^{-4}$	$0.078x10^{-4}$	$0.054x10^{-4}$	$0.075x10^{-4}$
L1 Without Brake	mm	78.5	78.5	91.5	78.5	78.5	91.5
L2 Without Brake	mm	105	105	105	125	125	125
L1 With Brake	mm	78.5	78.5	91.5	78.5	78.5	91.5
L2 With Brake	mm	145	145	145	165	165	165
Matching Drive		M2DV-3D02 ☐					

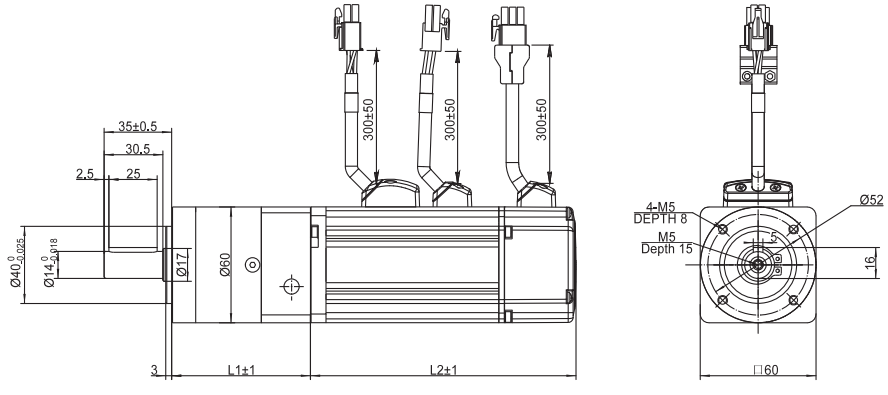
(*) With Brake

☐ 60mm Outline Dimensions

1) Without Brake



2) With Brake



Reducer Servo Motor Specifications and Dimensions

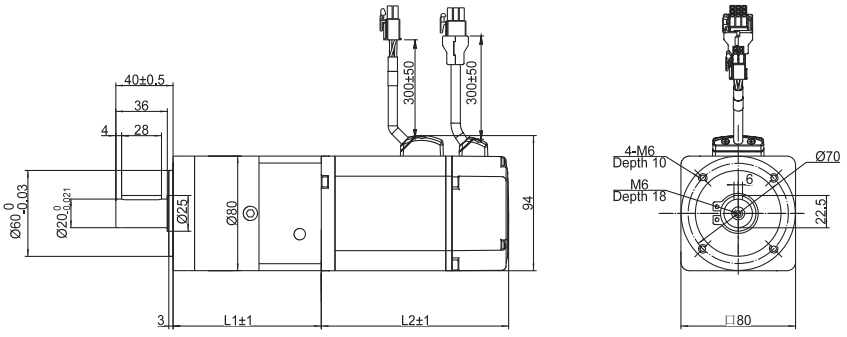
☐ 80mm Specifications

Without Brake Type		SM0803AE4-KCD-NNV-PG05A	SM0803AE4-KCD-NNV-PG10A	SM0803AE4-KCD-NNV-PG20A
With Brake Type		**SM0803AE4-KCD-BNV-PG05A**	**SM0803AE4-KCD-BNV-PG10A**	**SM0803AE4-KCD-BNV-PG20A**
Output Power	W	750		
Reduction Ratio		5	10	20
Max.Output Torque	N·m	12	24	48
Instantaneous Output Torque	N·m	34.5	69	138
Max Permissible Output Torque	N·m	100	80	240
Stage		1	1	2
Back lash	arcmin	≤10	≤10	≤15
Efficiency		96%	96%	94%
Rated Output Speed	r/min	600	300	150
Max.Output Speed	r/min	1200	600	300
Motor Rotor Inertia	$Kg·m^2$	$0.89x10^{-4}$ *($0.97x10^{-4}$)		
Reducer Rotor Inertia	$Kg·m^2$	$0.45x10^{-4}$	$0.39x10^{-4}$	$0.44x10^{-4}$
L1 Without Brake	mm	104	104	122
L2 Without Brake	mm	131	131	131
L1 With Brake	mm	104	104	122
L2 With Brake	mm	178	178	178
Matching Drive		M2DV-4D52 ☐		

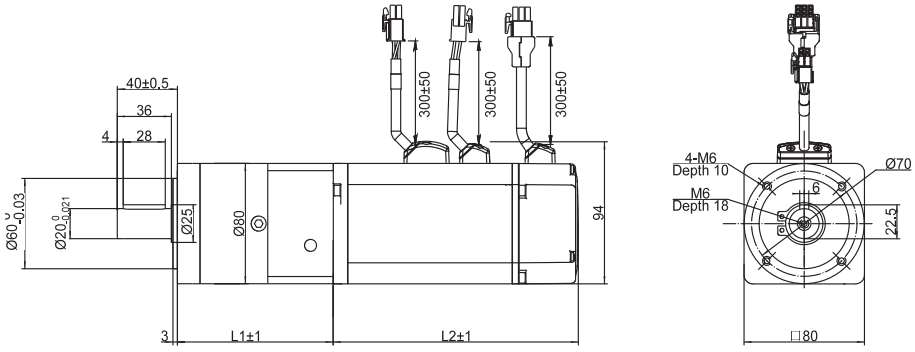
(*) With Brake

☐ 80mm Outline Dimensions

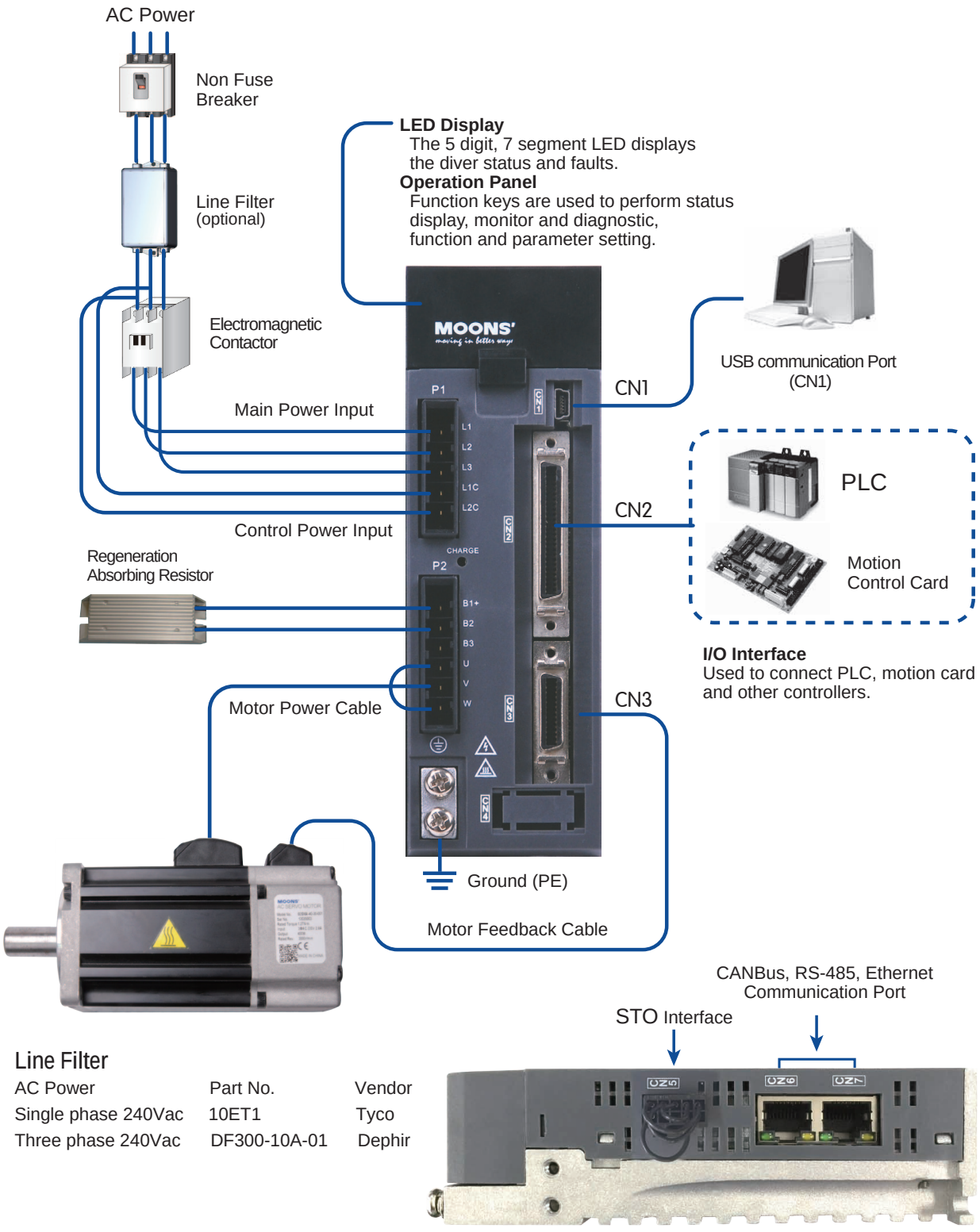
1) Without Brake



2) With Brake



M2AC System Configuration



Line Filter

AC Power	Part No.	Vendor
Single phase 240Vac	10ET1	Tyco
Three phase 240Vac	DF300-10A-01	Dephir

Ordering Information

Servo Drive				
				
Basic Type		M2DV-1D82S	M2DV-3D02S	M2DV-4D52S
Q Program Type (RS-232 Communication)		M2DV-1D82Q	M2DV-3D02Q	M2DV-4D52Q
Q Program Type (RS-485 Communication)		M2DV-1D82R	M2DV-3D02R	M2DV-4D52R
CANopen		M2DV-1D82C	M2DV-3D02C	M2DV-4D52C
eSCL		M2DV-1D82D	M2DV-3D02D	M2DV-4D52D
EtherNet/IP		M2DV-1D82IP	M2DV-3D02IP	M2DV-4D52IP
Matching motor				
		 40 Frame, 60W, 100W	 60 Frame, 200W, 400W	 80 Frame, 300W, 550W, 750W
Low Inertia	Without Brake	SM0401AE4-KCD-NNV SM0402AE4-KCD-NNV	SM0601AE4-KCD-NNV SM0602AE4-KCD-NNV	SM0801AE4-KCD-NNV SM0802AE4-KCD-NNV SM0803AE4-KCD-NNV
	With Brake	SM0401AE4-KCD-BNV SM0402AE4-KCD-BNV	SM0601AE4-KCD-BNV SM0602AE4-KCD-BNV	SM0801AE4-KCD-BNV SM0802AE4-KCD-BNV SM0803AE4-KCD-BNV
Medium Inertia	Without Brake		SM0602AE4-KCD-NNV-M	SM0803AE4-KCD-NNV-M
	With Brake		SM0602AE4-KCD-BNV-M	SM0803AE4-KCD-BNV-M

Reducer Motor			
Without Brake	SM0401AE4-KCD-NNV-PG**A SM0402AE4-KCD-NNV-PG**A	SM0601AE4-KCD-NNV-PG**A SM0602AE4-KCD-NNV-PG**A SM0602AE4-KCD-NNV-M-PG**A	SM0803AE4-KCD-NNV-PG**A SM0803AE4-KCD-NNV-M-PG**A
With Brake	SM0401AE4-KCD-BNV-PG**A SM0402AE4-KCD-BNV-PG**A	SM0601AE4-KCD-BNV-PG**A SM0602AE4-KCD-BNV-PG**A SM0602AE4-KCD-BNV-M-PG**A	SM0803AE4-KCD-BNV-PG**A SM0803AE4-KCD-BNV-M-PG**A

** Stands for reduction ratio, reduction ratio, is 5:1; 10:1; 20:1

Encoder Cables

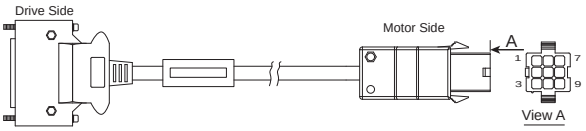
☐ Standard Encoder Cable

P/N	Description
2627-100	M2 Standard encoder cable, 1m
2627-300	M2 Standard encoder cable, 3m
2627-500	M2 Standard encoder cable, 5m
2627-1000	M2 Standard encoder cable, 10m

☐ Flexible Encoder Cable—Extra Type

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

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



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

Motor Power Cables

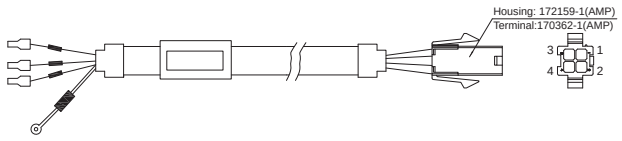
☐ Standard Cables

P/N	Description
1621-100	M2 Standard Motor Cable, 1m
1621-300	M2 Standard Motor Cable, 3m
1621-500	M2 Standard Motor Cable, 5m
1621-1000	M2 Standard Motor Cable, 10m

☐ Flexible Motor Cable - Extra Type

P/N	Description
1620-100	M2 Flexible motor cable, 1m
1620-300	M2 Flexible motor cable, 3m
1620-500	M2 Flexible motor cable, 5m
1620-1000	M2 Flexible motor cable, 10m

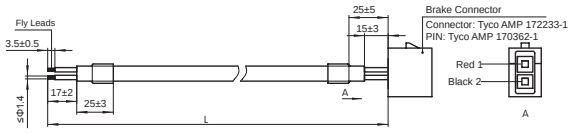
*: Min. band radius: 100mm; Travel distance: 600mm; Lifetime: 5,000,000c



Connect to drive	Signal	Colour	Connect to motor
(JST) S06B-F32SK-GGXR			AMP 172159-1
4	U	Red	1
5	V	Yellow	2
6	W	Blue	3
Ground	PE	Yellow/Green	4

Motor Brake Extension Cable

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

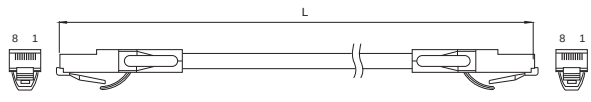


USB mini-B Configuration Cable

Description	P/N	Numbers	Manufacturer	Details
USB mini-B configuration cable	2620-150	1	MOONS'	For connector CN1

CN6\CN7 RS-485/CANopen Daisy Chain Cable

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



Connector Accessories

☐ I/O Connector-CN2

P/N	M2-50P

◇ Includes

Item	P/N	Numbers	Manufacturer	Description
Connector(Drive side)	5-2232346-1	1	TYCO	For connector CN2

☐ Encoder Connector-CN3

P/N	M2-26P

◇ Includes

Item	P/N	Numbers	Manufacturer	Description
Connector(Drive side)	3-2232346-1	1	TYCO	For connector CN3

☐ Power Connector Kit(Drive side)

P/N	M2 Drive Connector Kit

◇ Includes

Item	P/N	Numbers	Manufacturer	Description
Power input connector (drive side)	05JFAT-SBXGF-I	1	JST	For connector P1
Power output connector (drive side)	06JFAT-SBXGF-I	1		For connector P2
JST Handle lever	J-FAT-OT	2		

☐ STO Connector Kit

P/N	STO Connecter Kit

◇ Includes

Item	P/N	Numbers	Manufacturer	Description
STO connector	STO connector	1	Molex	For connector CN5
Connector	43025-1000	1		
Connector PIN	43030-0005	10		

☐ Motor Connector Kit

P/N	M2 Motor Connector Kit

◇ Includes

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

External Regeneration Resistors

P/N		Power	Resistance
REG100W120R	100W	100W	120Ω
REG200W120R	200W	200W	120Ω
REG300W120R	300W	300W	120Ω

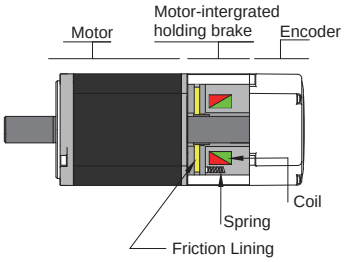
Motor Specifiction

Encoder Type	2500ppr Incremental encoders
Insulation Class	Class B(130℃)
IP65 Rating	IP65 (except shaft through hole and cable end connector)
Installation location	Indoors, away from direct sunlight, corrosive gas, flammable gas
Ambient Temperature	Operating 0 to 40°C, Storage -20 to 80°C
Ambient Humidity	Operate where the relative humidity range is 10% to 85% and non-condensing
Elevation	Operating 1,000m
Vibration	5.88m/s^2, 10Hz-60Hz (DO NOT use the drive for extended periods of time at the resonance point.)

Holding Brake Option

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

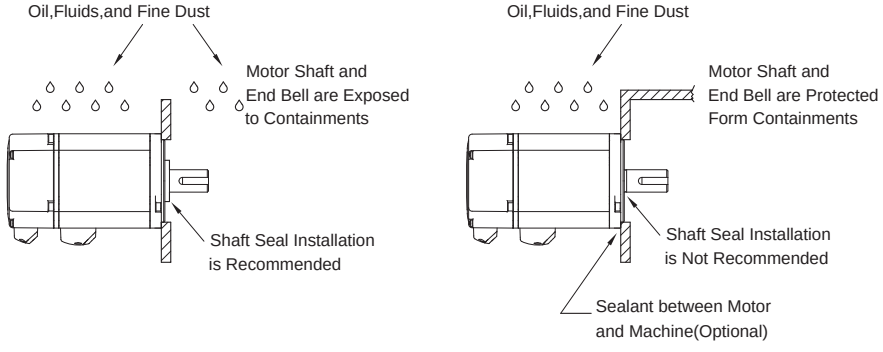
With no power, a spring presses a friction plate into a stationary plate, whitch produces holding torque. When power is applied to the brake coil, the brake solenoid pulls the friction plate away from the stationary plate, whitch allows the motor to turn.



Model	SM04 Series	SM06 Series	SM08 Series
Static friction torque	0.35Nm	2.0Nm	4.5Nm
Rated Voltage	24VDC		
Rated Current	0.25A	0.38A	0.61A
Brake Time	Standard air gap, 20°C below<25ms		
Release Time	<25ms		
Release Voltage	18.5VDC max.(at 20°C)		

Shaft Seal

A shaft seal can extend the life or a motor by keeping contaminants out of the motor. MOONS' servo motors typically include a shaft seal shipped with the motor, but not installed in the motor. These are high quality seals. Installing a shaft seal is recommended if the front of the motor will be exposed to significant amounts of oil, dirt or liquids.



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