

M2DV Series—AC Input Servo System



Features

- 220VAC input drive
- Auto Tuning PID Gain Parameters
- Anti Resonance
- Internal Regeneration Resistors
- Build-In Soft PLC - Q Programmer
- Pulse Position Control Modes
- Analog Position, Speed, Torque Modes
- SCL/eSCL Language Communication
- Support Modbus, CANopen, EtherCAT, EtherNet/IP, Ethernet(eSCL) Communication Protocols
- Friendly Tuning Software

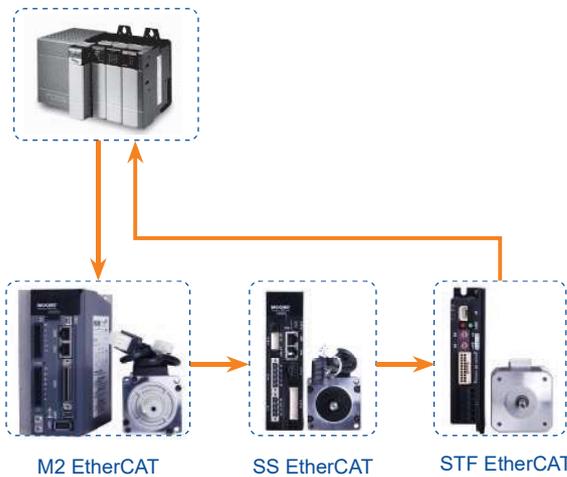
M2 Series EtherCAT Bus Type Drive



High Speed, High Efficiency

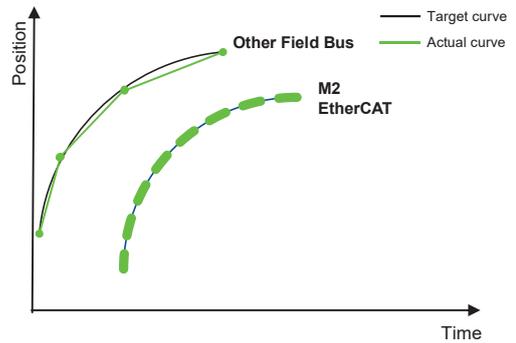
Higher communication field bus control could increase productivity.

- Full-Duplex, 100Mbps;
- Support CoE(CiA 402 protocol)
- Support CSP, CSV, PP, PV, TQ, HM
- Full Closed loop Control
- Various EtherCAT motion control products for your applications



High Performance

- Fastest Cycle time: 500µs
- Distributed clock to ensure high precision synchronisation



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
EC	RS-232	EtherCAT Type	EtherCAT

M2AC Drive Specification (-S/Q/R/C/D/IP Type)

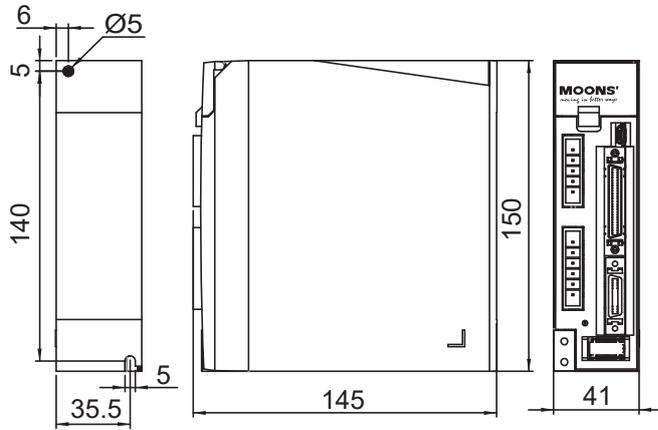
Basic Specifications	Input Power	M2DV-1D8	Main Circuit	Single / Three-phase, 200~240VAC ± 10%, 50/60Hz	
			Control Circuit	Single, 200~240VAC ± 10%, 50/60Hz	
		M2DV-3D0	Main Circuit	Single / Three-phase, 200~240VAC ± 10%, 50/60Hz	
			Control Circuit	Single, 200~240VAC ± 10%, 50/60Hz	
		M2DV-4D5	Main Circuit	Single / Three-phase, 200~240VAC ± 10%, 50/60Hz	
			Control Circuit	Single, 200~240VAC ± 10%, 50/60Hz	
	Withstand Voltage			Primary to earth: withstand 1500 VAC, 1 min, (Leakage current: 20 mA) [220V Input]	
	Environment	Temperature		Ambient temperature: 0°C to 50°C (If the ambient temperature of servo drive is higher than 45°C, please install the drive in a well-ventilated location) Storage temperature: -20°C 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 Signals	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, 30VDC, 20mA	
		Analog Signals	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
	RS-232		RS-232 Communication		
RS-485			RS-485 Communication & Modbus/RTU		
CAN bus			CANopen bus Communication		
Ethernet			EtherNET/IP, eSCL		
Front panel			4 keys (MODE, UP, DOWN, SET) , 5-digit LED Display		
Regeneration Resistor			Built-in regenerative resistor (external resistor can also be used.)		
Control Mode			(1) Position mode (2) Analog Velocity mode (3) Analog Position mode (4) Analog Position mode (5) Velocity Change mode (6) Command Torque mode (7) Command Velocity mode (4) Position Tables		
Control Input Signal			(1) Servo-ON input (2) Alarm clear input (3) CW/CCW Limit (4) Pulse & Direction or CW/CCW input (5) Gain Switch (6) Control mode Switch (7) Pulse Inhibition (8) Gear switch (9) Velocity Change mode (10) Analog input (11) General input		
Control Output Signal			(1) Alarm output (2) Servo-Ready output (3) External brake release (4) Speed reached output (5) Torque reached output (6) Position reached output (7) TachOut (8) Servo-on status output (9) General output		
Drive Mass	M2DV-1D8		0.89kg		
	M2DV-3D0		1.21kg		
	M2DV-4D5		1.63kg		

■ M2AC Drive Specification (EtherCAT Type)

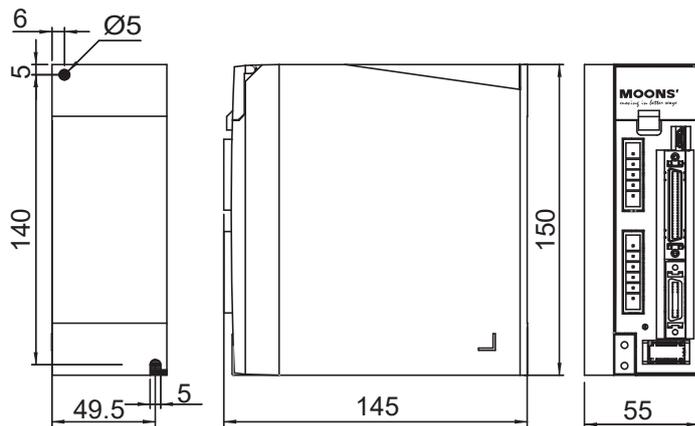
Basic Specifications	Input Power	M2DV-1D8	Main Circuit	Single / Three-phase, 200~240VAC ± 10%, 50/60Hz	
			Control Circuit	Single, 200~240VAC ± 10%, 50/60Hz	
		M2DV-3D0	Main Circuit	Single / Three-phase, 200~240VAC ± 10%, 50/60Hz	
			Control Circuit	Single, 200~240VAC ± 10%, 50/60Hz	
		M2DV-4D5	Main Circuit	Single / Three-phase, 200~240VAC ± 10%, 50/60Hz	
			Control Circuit	Single, 200~240VAC ± 10%, 50/60Hz	
	Withstand Voltage			Primary to earth: withstand 1500 VAC, 1 min, (Leakage current: 20 mA) [220V Input]	
	Environment	Temperature			Ambient temperature: 0°C to 50°C (If the ambient temperature of servo drive is higher than 45°C, please install the drive in a well-ventilated location) Storage temperature: -20°C 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	
	I/O	Digital Signals	Input	8 optical isolated multi function inputs, 5-24VDC, 20mA	
			Output	4 optical isolated multi function outputs, 5-24VDC, 20mA	
	Communication	RS-232			RS-232 Communication for configuration
		EtherCAT			EtherCAT
	Front panel			4 keys (MODE, UP, DOWN, SET) , 5-digit LED Display	
	Regeneration Resistor			Built-in regenerative resistor (external resistor is also enabled.)	
	Control Mode			CSP, CSV, PP, PV, TQ, HM	
	Control Input Signal			(1) Servo-ON input (2) Alarm clear input (3) CW/CCW Limit (4) Touch probe (5) General input	
Control Output Signal			(1) Alarm output (2) Servo-Ready output (3) External brake release (4) Speed reached output (5) Torque reached output (6) Position reached output (7) TachOut (8) Servo-on status output (9) General output		
Drive Mass	M2DV-1D82EC		0.89kg		
	M2DV-3D02EC		1.21kg		
	M2DV-4D52EC		1.63kg		

■ Drive Dimensions (Unit: mm)

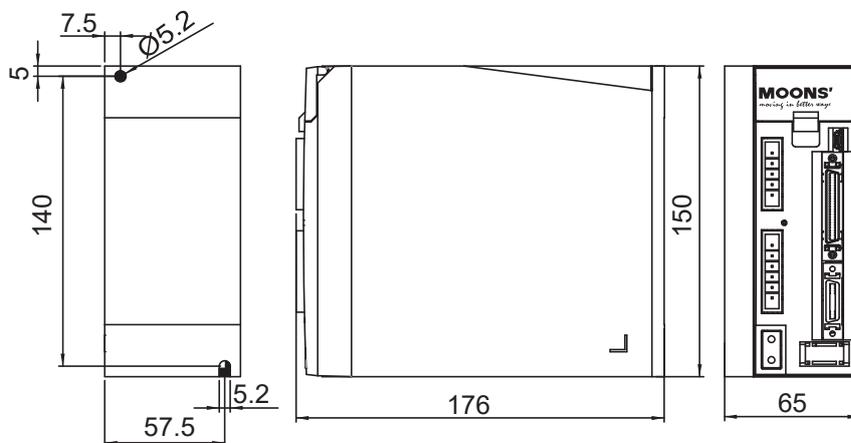
□ M2DV-1D8 □ □



□ M2DV-3D0 □ □

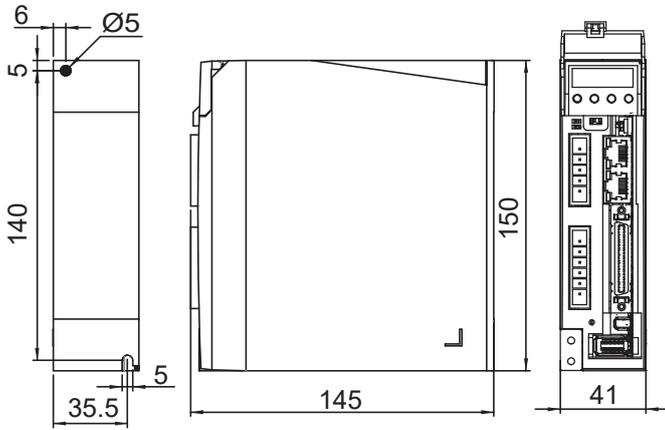


□ M2DV-4D5 □ □

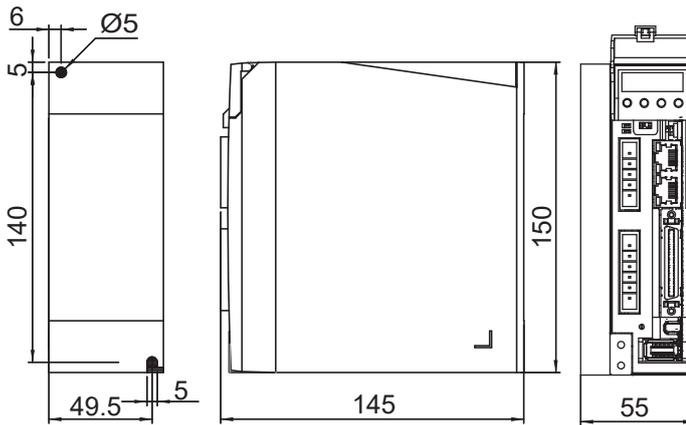


■ EtherCAT Type Dimensions (Unit: mm)

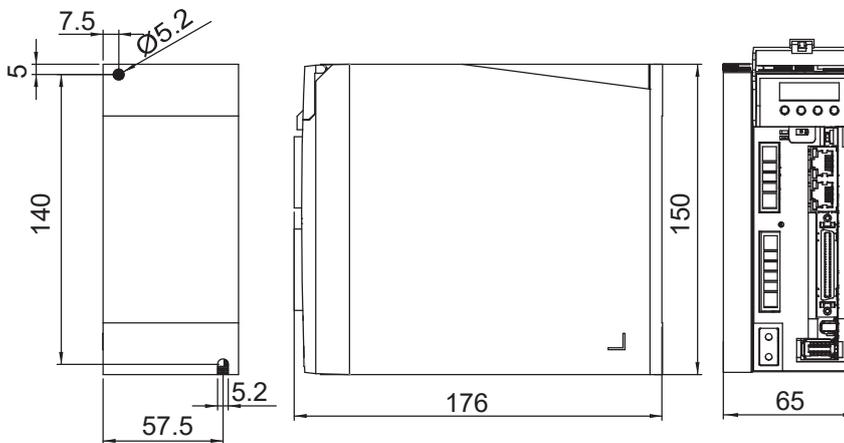
□ M2DV-1D82EC



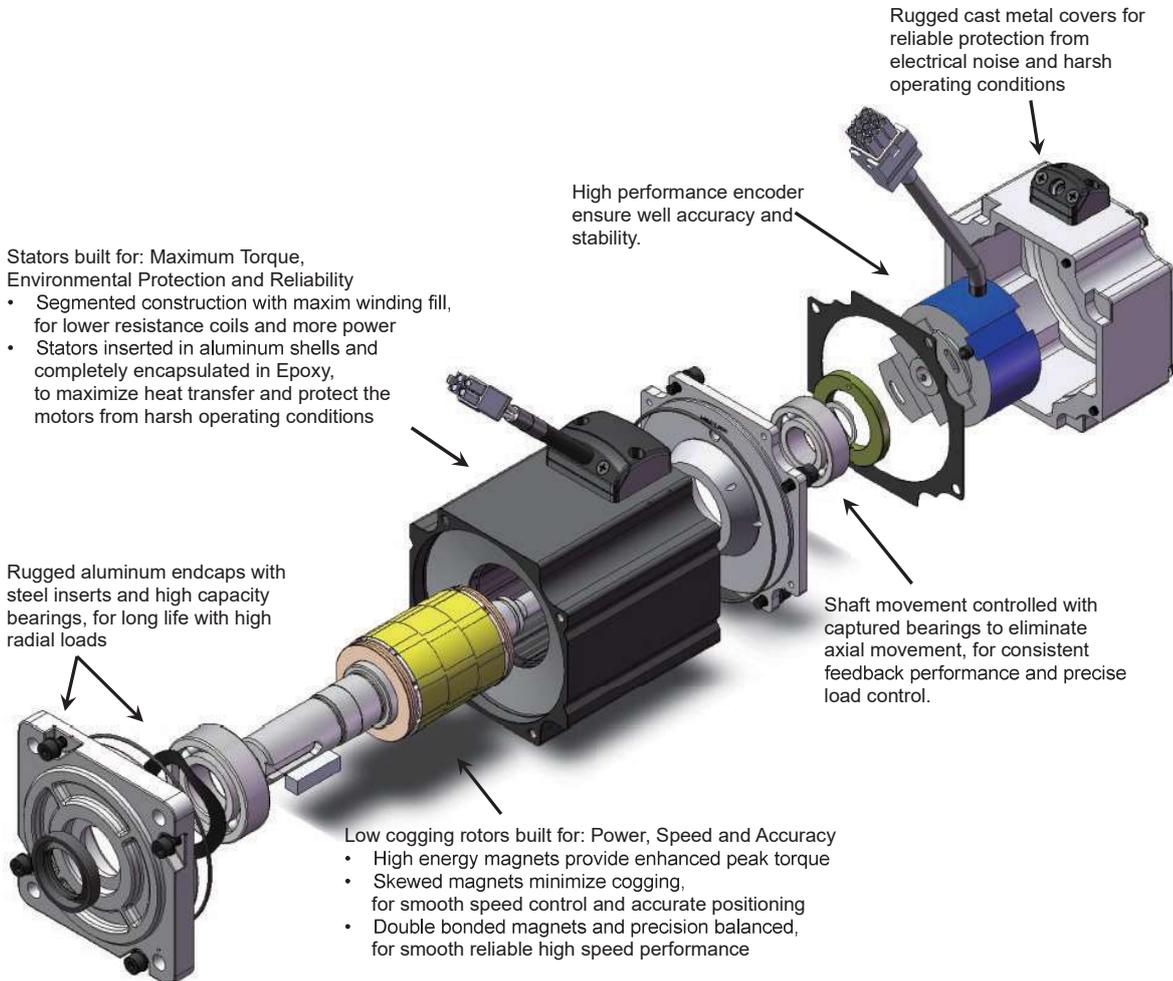
□ M2DV-3D02EC



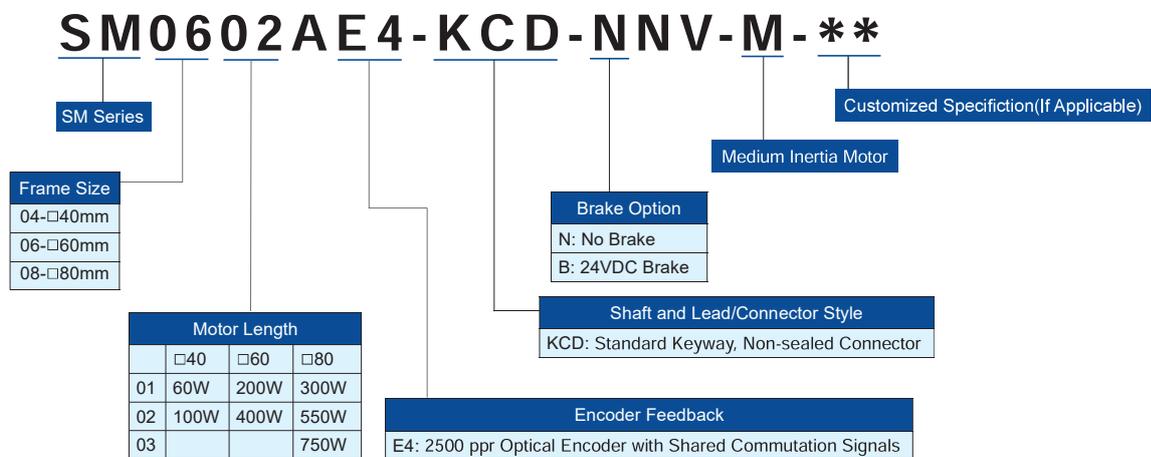
□ M2DV-4D52EC



■ AC Servo Motor—SM Series



■ M2AC Servo Motor Numbering Information



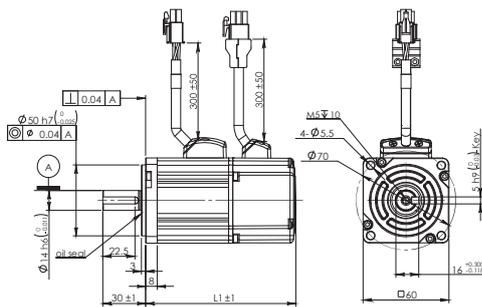
Low Inertia Motor—Frame 60mm

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·m ²	0.165×10^{-4}	0.272×10^{-4}
Rotor Inertia-With Brake Option	Kg·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

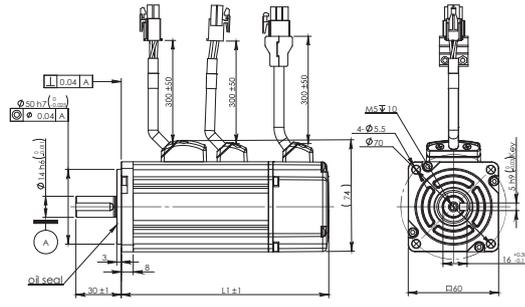
Dimensions (Unit:mm)

1) Without Brake



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

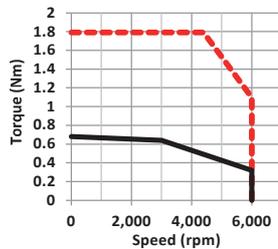
2) With Brake



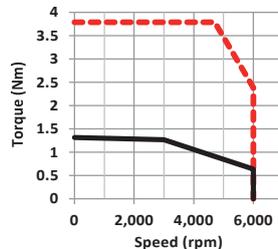
With Brake	L1
SM0601AE4-KCD-BNV	145
SM0602AE4-KCD-BNV	165

Torque Curves

SM0601 (200 Watts) - Winding A
320 VDC (230VAC) - 1.4 Amps



SM0602 (400 Watts) - Winding A
320 VDC (230VAC) - 2.7 Amps



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

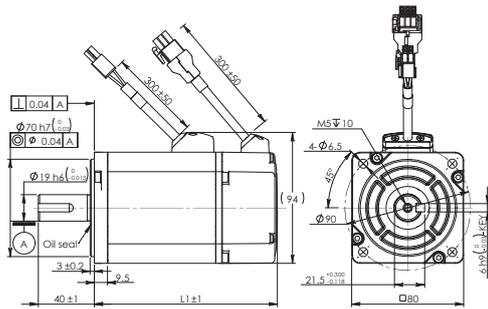
Low Inertia Motor—Frame 80mm

Specifications

Type		SM0801AE4-KCD-*NV	SM0802AE4-KCD-*NV	SM0803AE4-KCD-*NV
Rated Output Power	watts	300	550	750
Rated Speed	rpm	3000	3000	3000
Max Speed	rpm	6000	5500	6000
Rated Torque	Nm	0.95	1.8	2.4
Peak Torque	Nm	2.3	4.6	6.9
Rated Current	A (rms)	1.8	3.0	4.5
Peak Current	A (rms)	4.5	8.3	13.5
Voltage Constant±5%	V (rms) / K rpm	34.3	37.3	36.6
Torque Constant±5%	Nm / A (rms)	0.532	0.586	0.543
Winding Resistance(Line-Line)	Ohm ± 10%@25°C	5.9	2.7	1.47
Winding Inductance(Line-Line)	mH (typ.)	26	13.9	8.2
Rotor Inertia	Kg·m ²	0.45 × 10 ⁻⁴	0.63 × 10 ⁻⁴	0.89 × 10 ⁻⁴
Rotor Inertia-With Brake Option	Kg·m ²	0.53 × 10 ⁻⁴	0.71 × 10 ⁻⁴	0.97 × 10 ⁻⁴
Shaft Load - Axial	N (max.)	90	90	90
Shaft Load - Radial (End of Shaft)	N (max.)	200	240	270
Weight	kg	1.7	2.2	2.6
Weight-With Brake Option	kg	2.5	3.0	3.4

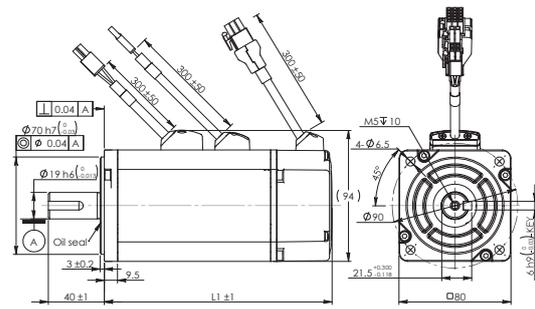
Dimensions (Unit:mm)

1) Without Brake



Without Brake	L1
SM0801AE4-KCD-NNV	101
SM0802AE4-KCD-NNV	116
SM0803AE4-KCD-NNV	131

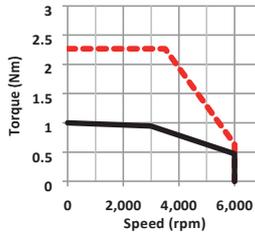
2) With Brake



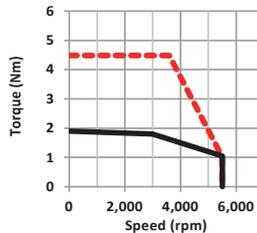
With Brake	L1
SM0801AE4-KCD-BNV	148
SM0802AE4-KCD-BNV	163
SM0803AE4-KCD-BNV	178

Torque Curves

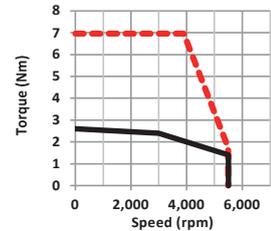
SM0801 (300 Watts) - Winding A
320 VDC (230VAC) - 1.8 Amps



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



SM0803 (750 Watts) - Winding A
320 VDC (230VAC) - 4.5 Amps



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

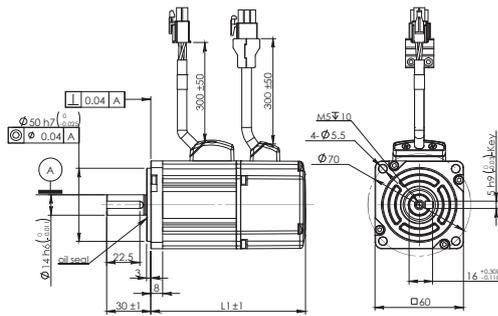
Medium Inertia Motor—Frame 60mm

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·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

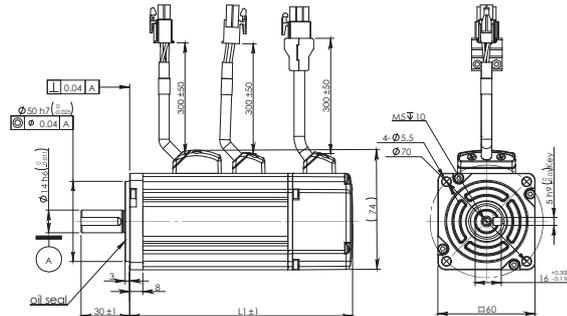
Dimensions (Unit:mm)

1) Without Brake



Without Brake	L1
SM0602AE4-KCD-NNV-M	135

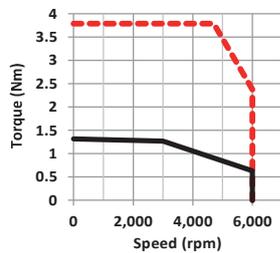
2) With Brake



With Brake	L1
SM0602AE4-KCD-BNV-M	175

Torque Curves

SM0602 (400 Watts) - Winding A
320 VDC (230VAC) - 2.7 Amps



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

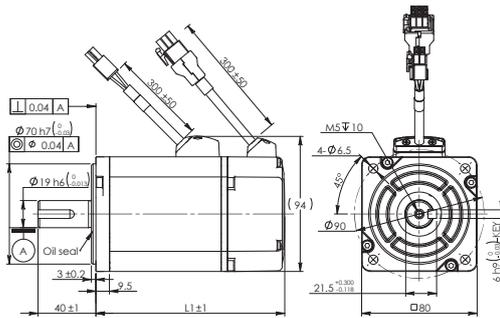
Medium Inertia Motor—Frame 80mm

Specifications

Type		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·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

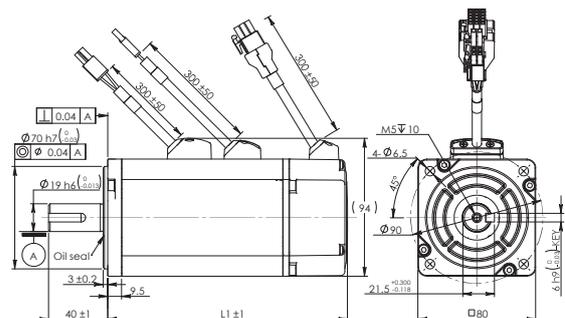
Dimensions (Unit:mm)

1) Without Brake



Without Brake	L1
SM0803AE4-KCD-NNV-M	140.8

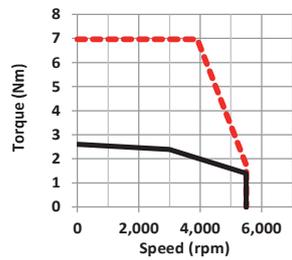
2) With Brake



With Brake	L1
SM0803AE4-KCD-BNV-M	188

Torque Curves

SM0803 (750 Watts) - Winding A
320 VDC (230VAC) - 4.5 Amps



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

■ Gearhead Servo Motors—Frame 40mm

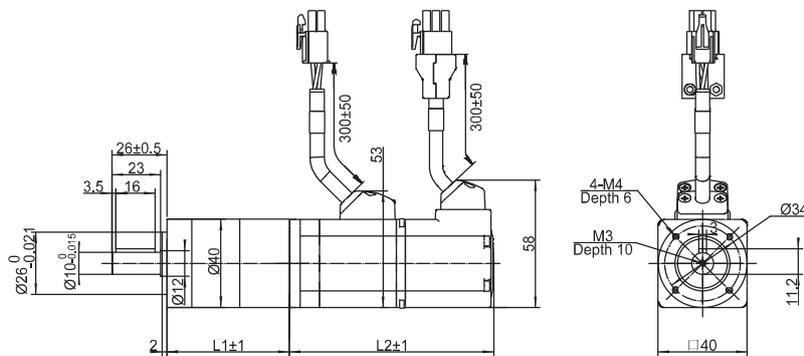
□ Specifications

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		
Gear Ratio		5	10	20	5	10	20
Max Output Torque	N·m	0.95	1.9	3.8	1.6	3.2	6.4
Peak Output Torque	N·m	2.4	4.8	11.4	4.65	9.3	18.6
Max Permissible Output Torque	N·m	6	8	12	6	8	40
Stage		1	1	2	1	1	2
Back lash	arcmin	≤12	≤12	≤15	≤12	≤12	≤15
Efficiency		96%	96%	94%	96%	96%	94%
Rated Output Speed	r/min	600	300	150	600	300	150
Max. Output Speed	r/min	1200	600	300	1200	600	300
Motor Rotor Inertia	Kg·m ²	0.0232x10 ⁻⁴ *(0.0298x10 ⁻⁴)			0.0428x10 ⁻⁴ *(0.0494x10 ⁻⁴)		
Gearhead Inertia	Kg·m ²	0.015x10 ⁻⁴	0.019x10 ⁻⁴	0.019x10 ⁻⁴	0.015x10 ⁻⁴	0.019x10 ⁻⁴	0.019x10 ⁻⁴
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 □					

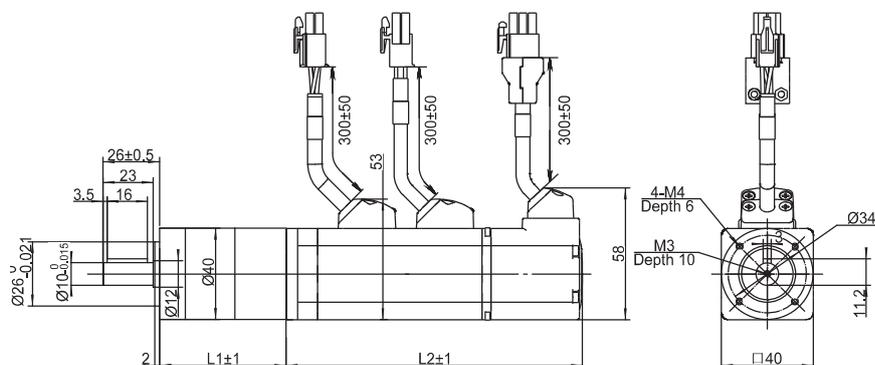
(*) With Brake

□ Dimensions (Unit:mm)

1) Without Brake



2) With Brake



■ Gearhead Servo Motors—Frame 60mm

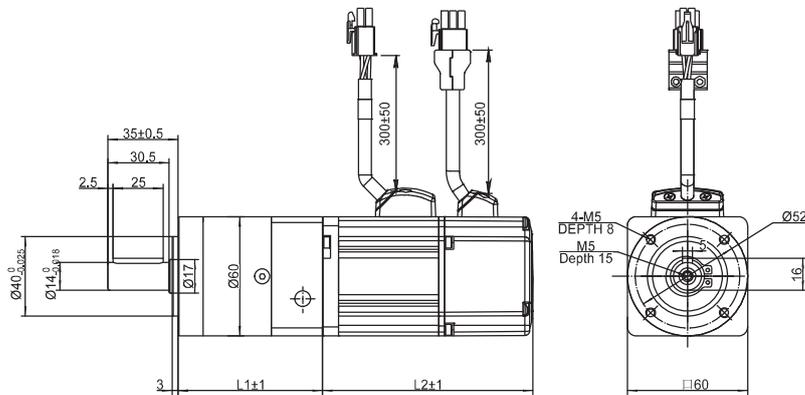
□ Specifications

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
Motor Power	W	200			400		
Gear Ratio		5	10	20	5	10	20
Max Output Torque	N·m	3.2	6.4	12.8	6.35	12.7	25.4
Peak Output Torque	N·m	9.5	19	38	19	38	76
Max Permissible Output Torque	N·m	32	24	88	32	24	88
Stage		1	1	2	1	1	2
Back lash	arcmin	≤10	≤10	≤15	≤10	≤10	≤15
Efficiency		96%	96%	94%	96%	96%	94%
Rated Output Speed	r/min	600	300	150	600	300	150
Max. Output Speed	r/min	1200	600	300	1200	600	300
Motor Rotor Inertia	Kg·m ²	0.165x10 ⁻⁴ *(0.22x10 ⁻⁴)			0.272x10 ⁻⁴ *(0.326x10 ⁻⁴)		
Gearhead Inertia	Kg·m ²	0.078x10 ⁻⁴	0.054x10 ⁻⁴	0.075x10 ⁻⁴	0.078x10 ⁻⁴	0.054x10 ⁻⁴	0.075x10 ⁻⁴
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 □					

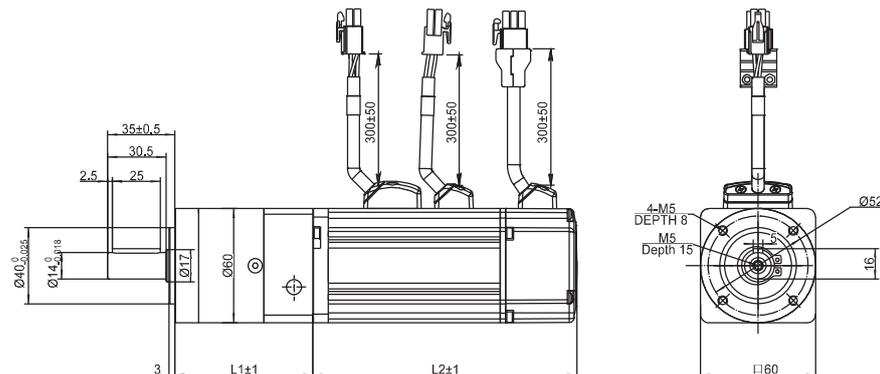
(*) With Brake

□ Dimensions (Unit:mm)

1) Without Brake



2) With Brake



■ Gearhead Servo Motors—Frame 80mm

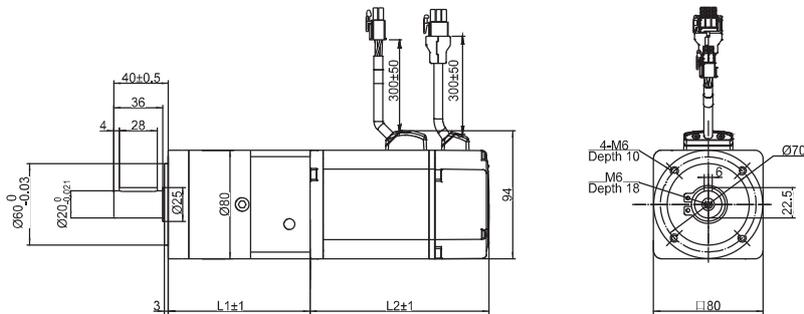
□ Specifications

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
Motor Power	W	750		
Gear Ratio		5	10	20
Max Output Torque	N·m	12	24	48
Peak 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)		
Gearhead 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 □		

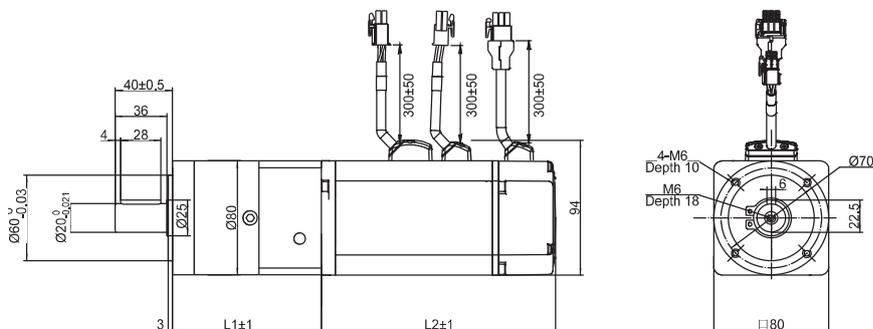
(*) With Brake

□ Dimensions (Unit:mm)

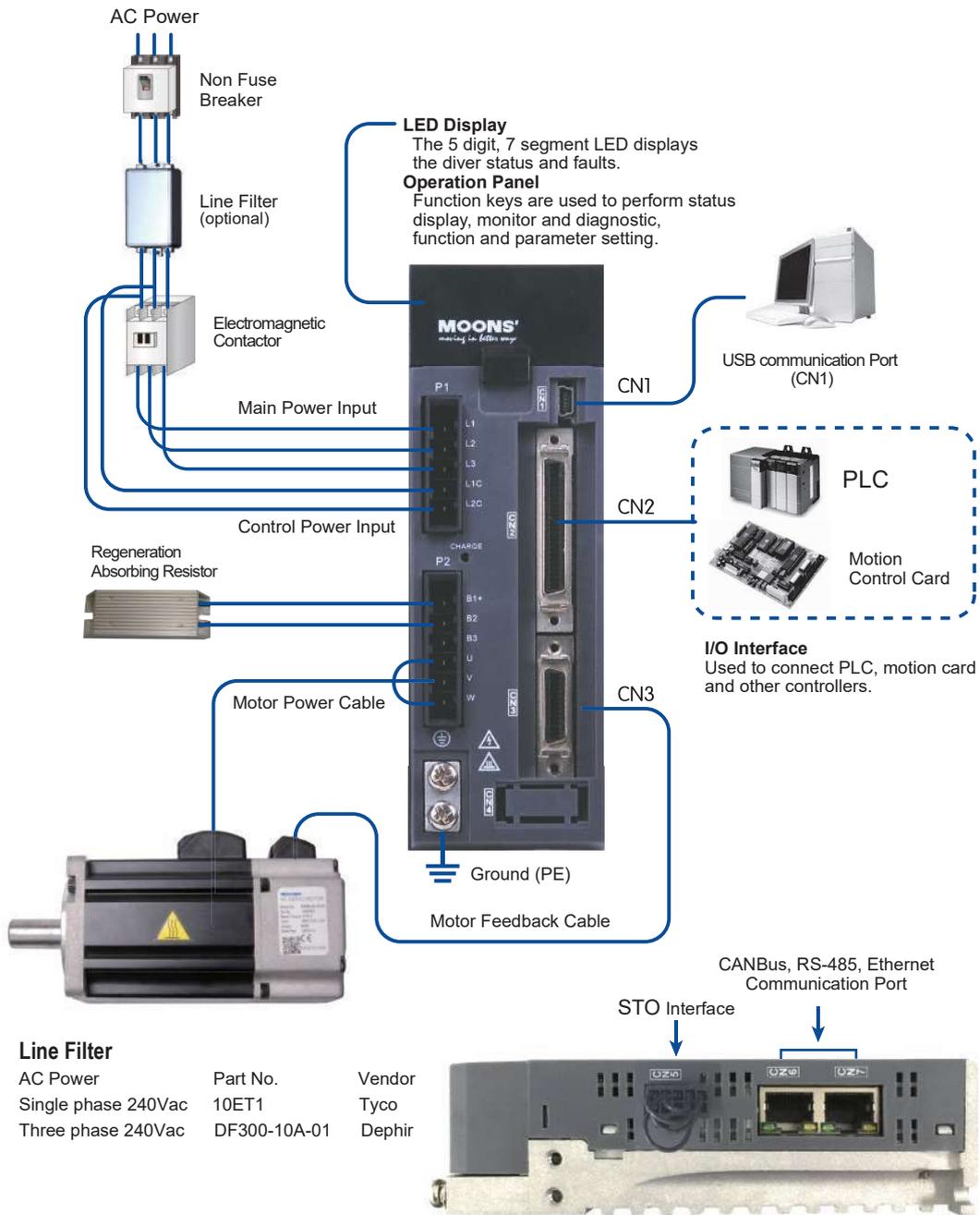
1) Without Brake



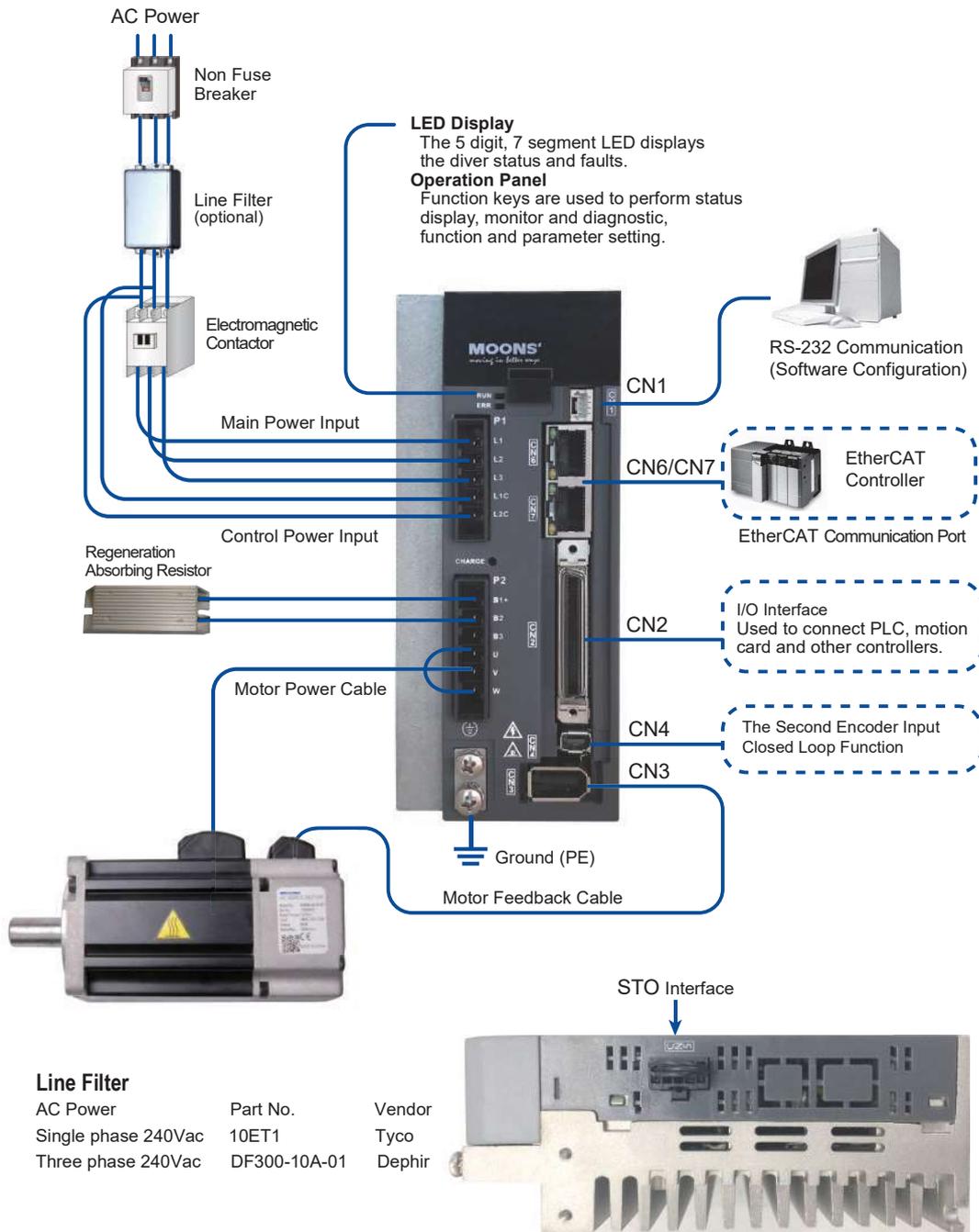
2) With Brake



M2AC System Configuration



M2 EtherCAT System Configuration



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			
			
	Frame 40: 60W, 100W	-	-
	Frame 60: 200W	Frame 60: 400W	-
	Frame 80: 300W	Frame 80: 550W	Frame 80: 750W
Low Inertia	Without Brake	SM0401AE4-KCD-NNV SM0402AE4-KCD-NNV SM0601AE4-KCD-NNV SM0801AE4-KCD-NNV	SM0602AE4-KCD-NNV SM0802AE4-KCD-NNV
	With Brake	SM0401AE4-KCD-BNV SM0402AE4-KCD-BNV SM0601AE4-KCD-BNV SM0801AE4-KCD-BNV	SM0602AE4-KCD-BNV SM0802AE4-KCD-BNV
Medium Inertia	Without Brake	-	SM0602AE4-KCD-NNV-M SM0803AE4-KCD-NNV-M
	With Brake	-	SM0602AE4-KCD-BNV-M SM0803AE4-KCD-BNV-M

Gearhead 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

** Standard gear ratios are 5:1; 10:1 and 20:1.

Accessories	
IO Connector	M2-50P
USB mini-B Configuration	2620-150
Standard* Cable	Motor power
	Encoder
	Brake
Flexible** Cable	Motor power
	Encoder
	Brake

* Standard: Can not be used in a drag chain.

** Bending test: Min. bend radius: 100mm, Travel distance: 60mm, Lifetime: 5,000,000c.

EtherCAT Type—Ordering Information

Servo Drive			
			
EtherCAT	M2DV-1D82EC	M2DV-3D02EC	M2DV-4D52EC

Matching motor				
				
	Frame 40: 60W, 100W	-	-	
	Frame 60: 200W	Frame 60: 400W	-	
	Frame 80: 300W	Frame 80: 550W	Frame 80: 750W	
Low Inertia	Without Brake	SM0401AE4-KCD-NNV SM0402AE4-KCD-NNV SM0601AE4-KCD-NNV SM0801AE4-KCD-NNV	SM0602AE4-KCD-NNV SM0802AE4-KCD-NNV	SM0803AE4-KCD-NNV
	With Brake	SM0401AE4-KCD-BNV SM0402AE4-KCD-BNV SM0601AE4-KCD-BNV SM0801AE4-KCD-BNV	SM0602AE4-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

Gearhead 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

** Standard gear ratios are 5:1; 10:1 and 20:1.

Accessories		
IO Connector		M2-50P
USB mini-B Configuration		2620-150
Standard* Cable	Motor power	1626-X00
	Encoder	2636-X00
	Brake ***	1602-X00
Flexible** Cable	Motor power	1620-X00
	Encoder	2636-X00-C05
	Brake ***	1602-X00-C05

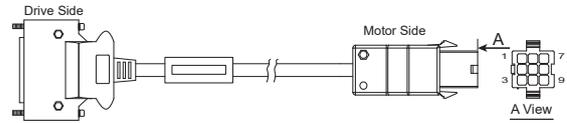
* Standard: Can not be used in a drag chain.

** Bending test: Min. bend radius: 100mm, Travel distance: 60mm, Lifetime: 5,000,000c.

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



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

Flexible Encoder Cable - Extra Type

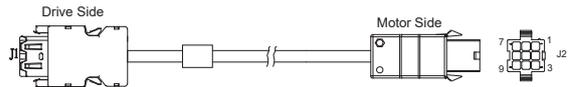
P/N	Description
2621-100	M2 Flexible Encoder Cable, 1m
2621-300	M2 Flexible Encoder Cable, 3m
2621-500	M2 Flexible Encoder Cable, 5m
2621-1000	M2 Flexible Encoder Cable, 10m

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

Encoder Cables—For EtherCAT Drive

Standard Encoder Cable

P/N	Description
2636-100	M2 EtherCAT Standard Encoder Cable, 1m
2636-300	M2 EtherCAT Standard Encoder Cable, 3m
2636-500	M2 EtherCAT Standard Encoder Cable, 5m
2636-1000	M2 EtherCAT Standard Encoder Cable, 10m



Flexible Encoder Cable - Extra Type

P/N	Description
2636-100-C05	M2 EtherCAT Flexible Encoder Cable, 1m
2636-300-C05	M2 EtherCAT Flexible Encoder Cable, 3m
2636-500-C05	M2 EtherCAT Flexible Encoder Cable, 5m
2636-1000-C05	M2 EtherCAT Flexible Encoder Cable, 10m

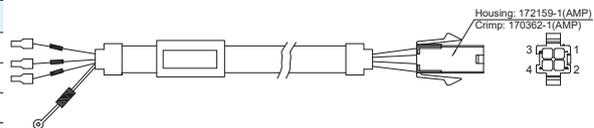
*: Min. band radius: 100mm; Travel distance: 600mm; Lifetime: 5,000,000c

Connection Definition			
Connect to drive	Signal	Colour	Connect to motor
10	A+	Blue	1
9	A-	Blue/Black	4
8	B+	Green	2
7	B-	Green/Black	5
6	Z+	Yellow	3
5	Z-	Yellow/Black	6
1	5V	Red	7
2	GND	Black	8
0	Shield		9

Motor Power Cables

Standard Cables

P/N	Description
1626-100	M2 Standard Motor Cable, unshielded, 1m
1626-300	M2 Standard Motor Cable, unshielded, 3m
1626-500	M2 Standard Motor Cable, unshielded, 5m
1626-1000	M2 Standard Motor Cable, unshielded, 10m



Flexible Motor Cable - Extra Type

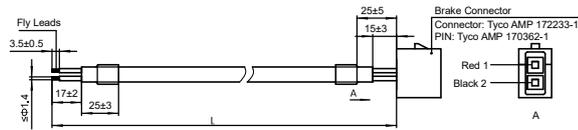
P/N	Description
1620-100	M2 Flexible Motor Cable, shielded, 1m
1620-300	M2 Flexible Motor Cable, shielded, 3m
1620-500	M2 Flexible Motor Cable, shielded, 5m
1620-1000	M2 Flexible Motor Cable, shielded, 10m

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

Connect to drive (JST) S06B-F32SK-GGXR	Signal	Colour	Connect to motor 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



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

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

Drive Connector Kit

P/N	M2 Drive Connector Kit
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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 Connector Kit
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◇ 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		

◆ Servo Motor Connector Kit

P/N	M2 Motor Connector Kit
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◇ 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	120 Ω
REG200W120R	200W	120 Ω
REG300W120R	300W	120 Ω

Certification specification



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

Motor Specification

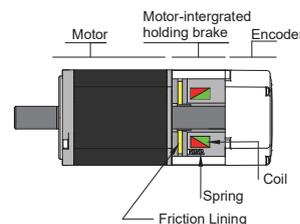
Encoder Type	2500ppr Incremental encoders
Insulation Class	Class B(130°C)
IP65 Rating	IP65 (except shaft through hole and cable end connector)
Installation location	Indoors, away from direct sunlight, corrosive gas, flammable gas
Ambient Temperature	Operating 0 to 40°C, Storage -20 to 80°C
Ambient Humidity	Operate where the relative humidity range is 20% to 85% and non-condensing
Elevation	Operating 1,000m
Vibration	49m/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, which produces holding torque. When power is applied to the brake coil, the brake solenoid pulls the friction plate away from the stationary plate, which 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 of 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.

