

# Stepper Motors

## CM Series

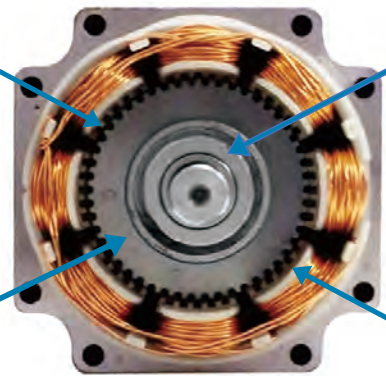
- Replace HS series stepper motors
- Frame size of NEMA8 to 42
- High reliability, Low motor heating, noise and vibration
- Multiple phase current optional for the same motor



### Introduction

Leadshine designs the new CM series stepper motors by using the latest technique and quality materials. It provides greater torque, lower heat, and better running stability compared with most of stepper motors on the market. As a result of large-scale automated production lines and strict quality management system, CM series stepper motors are more stable, reliable, superior, consistent and lower lost. Most of HS series stepper motors will be replaced by CM series motors till the end of 2019.

**Large Torque:**  
Uses the latest magnetic circuit optimization design solution to realize small volume and large torque.



**High Stability:**  
Core components are made of preferential imported materials to ensure the stable and reliable running of the motor.

**Low Heating:**  
Employs high grade and high performance punches to reduce the motor heating.

**High Consistency:**  
Large-scale automated production lines and strict quality management system ensure the batch consistency of products.

In addition to standard stepper motors, the CM series also includes the stepper motors with double shafts, brake, and waterproof to apply to various applications.

Compared with ordinary spring brakes, **permanent magnet brakes** produce less noise (no mechanical noise), respond fast (30 ms response time, only 1/10 of that of spring brakes), have a long service life, generate low heat, and consume low power. CM series stepper motor with a brake is configured with the cutting-edge permanent magnet brake that is more suitable for vertical motion and protects better against power failure.



Stepper Motor with brake



CM Series Stepper Motor



Permanent magnet brake

Low noise  
Quick response  
Low heat

Different from a standard stepper motor, CM series waterproof stepper motor is protected to **IP65** with its rear cover redesigned, its lead replaced with a waterproof connector, a new type of sealing material used between the front and rear end covers and the motor body, the motor body completely waterproofed, and the shaft end of the motor applied with high-quality oil seal. Therefore CM series **waterproof** stepper motor is suitable for application with damp, water spray, and oil spray.



Protection Rating **IP65**  
**Dustproof:**  
Prevents dust from entering  
**Waterproof:**  
Prevents water intrusion from different directions.

### General Specifications

Step Angle	1.8°
Position Accuracy	±0.09°
Temp Rise(Max.)	Max. 85K
Operation Environment	Temperature: -10°C+50°C ; Humidity: 85% Max
Insulation Class	B
Insulation Resistance	MIN 100 MΩ, 500 V DC
Dielectric Strength	500 VAC, 1 min
Radial Play	0.025 mm Max. (Load 5N)
Axial Play	0.075 mm Max. (Load 10N)

### Installation & Operation Conditions

Motor Size	NEMA17	NEMA23	NEMA24	NEMA34
Store Temperature	-10°C+50°C			
Store Humidity	85% Max.			
Operation Environment	Non-corrosive gas and dust; No direct contact with water, oil (except the waterproof type)			
Radial Load(N) (Distance to the flange 10mm)	30	75	90	300
Axial Load(N)	Less than motor weight			

# Stepper Motor Overview

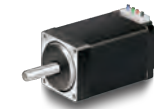
1. Below matched drive is default Step&Direction type, other control types of drive also can be matched;
2. 3-phase stepper motors still keep selling HS series, others recommend CM series;
3. Contact Leadshine for other customized model such as inch shaft diameters, modified cable, etc.

Phase/ Series	Frame Size	Length(mm)	Model	Rate Current (A)	Holding Torque(N.m)	Matched Drives	Remark	
2-Phase/ CM	NEMA 8	33	20CM003	0.6	0.03	EM415S		
		45	20CM005	0.6	0.05	EM415S		
	NEMA 11	32	28CM006	1.2	0.06	EM415S		
		41	28CM010	1.2	0.1	EM415S		
		51	28CM013	1.2	0.13	EM415S		
	NEMA 14	31	35CM015	2.0	0.15	EM422S		
		47	35CM04	2.0	0.4	EM422S		
	NEMA 17	33	42CM02-1A	1.0	0.2	EM415S		
			42CM02	1.5	0.2	EM422S		
		40	42CM04-1A	1.0	0.4	EM415S		
			42CM04	1.5	0.4	EM422S		
		47	42CM06-1A	1.5	0.6	EM422S		
			42CM06	2.5	0.6	EM422S/EM542S	Performance in high-speed	
			42CM06-SZ	2.5	0.6	EM422S/EM542S	Motor with dual shaft	
		60	42CM08-1A	1.5	0.8	EM422S		
			42CM08	2.5	0.8	EM422S/EM542S	Performance in high-speed	
			42CM08-SZ	2.5	0.8	EM422S/EM542S	Motor with dual shaft	
		NEMA 23	41	57CM06	3.0	0.6	EM542S	
			56	57CM13-3A	3.0	1.3	EM542S	
				57CM13	4.0	1.3	EM556S	Performance in high-speed
				57CM13-SZ	4.0	1.3	EM556S	Motor with dual shaft
	96		57CM13-BZ	4.0	1.3	EM556S	Motor with brake	
	65		57CM13-FS	4.0	1.3	EM556S	IP65 waterproof	
	76		57CM23-3A	3.0	2.3	EM542S		
			57CM23-4A	4.0	2.3	EM556S		
			57CM23	5.0	2.3	EM556S/EM870S	Performance in high-speed	
			57CM23-SZ	5.0	2.3	EM556S/EM870S	Motor with dual shaft	
	116		57CM23-BZ	5.0	2.3	EM556S/EM870S	Motor with brake	
	90		57CM23-FS	5.0	2.3	EM556S/EM870S	Motor with waterproof	
	84		57CM26-4A	4.0	2.6	EM556S		
			57CM26	5.0	2.6	EM556S/EM870S	Performance in high-speed	
			57CM26-SZ	5.0	2.6	EM556S/EM870S	Motor with dual shaft	
	67		D57CM21-4A	4.0	2.1	EM556S		
			D57CM21	5.0	2.1	EM556S/EM870S	Performance in high-speed	
			D57CM21-SZ	5.0	2.1	EM556S/EM870S	Motor with dual shaft	
	88	D57CM31-4A	4.0	3.1	EM556S			
		D57CM31	5.0	3.1	EM556S/EM870S	Performance in high-speed		
		D57CM31-SZ	5.0	3.1	EM556S/EM870S	Motor with dual shaft		

Phase/Series	Frame Size	Length(mm)	Model	Rate Current (A)	Holding Torque(N.m)	Matched Drives	Remark
2-Phase/ CM	NEMA 34	68	60CM22X	5.0	2.2	EM556S/EM870S	Motor with dual shaft
			60CM22X-SZ	5.0	2.2	EM556S/EM870S	Motor with brake
			60CM22X-BZ	5.0	2.2	EM556S/EM870S	
		86	60CM30X	5.0	3.0	EM556S/EM870S	
			60CM30X-SZ	5.0	3.0	EM556S/EM870S	Motor with dual shaft
			60CM30X-BZ	5.0	3.0	EM556S/EM870S	Motor with brake
		66	86CM35	4.0	4.0	EM556S/EM870S	
		80	86CM45	6.0	4.5	EM882S	
			86CM45-SZ	6.0	4.5	EM882S	Motor with dual shaft
			86CM45-BZ	6.0	4.5	EM882S	Motor with brake
	86CM45-FS		6.0	4.5	EM882S	Motor with waterproof	
	98		86CM80	6.0	8.0	EM882S	
	118		86CM85	6.0	8.5	EM882S	
		86CM85-SZ	6.0	8.5	EM882S	Motor with dual shaft	
		86CM85-BZ	6.0	8.5	EM882S	Motor with brake	
		86CM85-FS	6.0	8.5	EM882S	Motor with waterproof	
	NEMA 42/ NEMA 51	129	86CM120	6.0	12	EM882S/DM1182	
		115	110CM12	6.0	12	DM2282	
		150	110CM20	6.5	20	DM2282	
		201	110CM28	6.0	28	DM2282	
283		130HS45	7.0	45	DM2282		
3-Phase/ HS		NEMA 23	50	573S09	3.5	0.9	3DM580S
	76		573S15	5.8	1.5	3DM580S	
	80		573S20-LS	5.8	1.5	3DM580S	
	NEMA 34	71	863S22	5.0	2.2	3ND883	
		103	863S42	5.0	4.2	3ND883	
		135	863S68H	2.3	6.8	3DM2283	

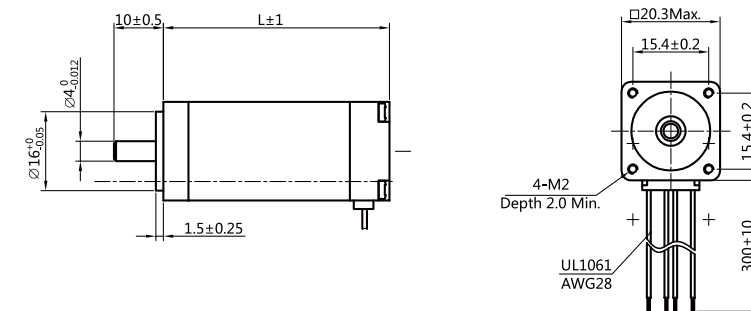
## Standard Stepper Motor Specifications

### NEMA 8 (20mm)



#### Standard Model:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Inertia (Kg.cm <sup>2</sup> )	Matched Drives
20CM003	33	0.03	0.6	5.7	2.6	0.003	EM415S
20CM005	45	0.05	0.6	7	3.4	0.004	EM415S



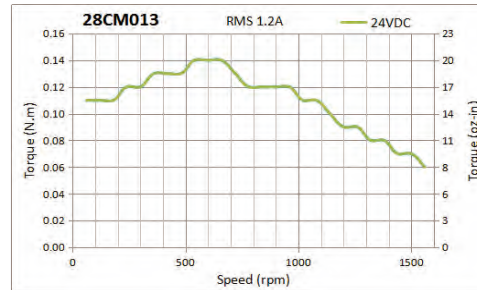
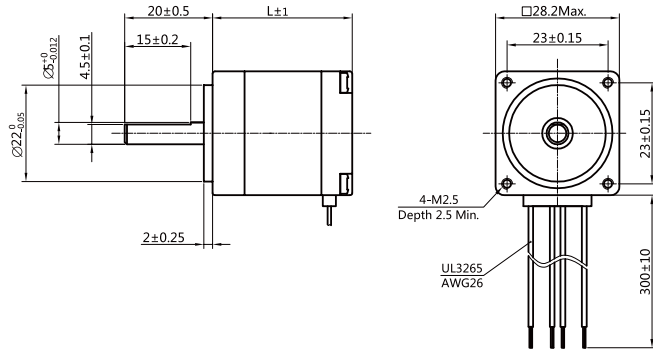
## NEMA 11 (28mm)



### Standard Models:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Inertia (Kg.cm <sup>2</sup> )	Matched Drives
28CM006	32	0.06	1.2	1.4	1.0	0.009	EM415S
28CM010	41	0.1	1.2	1.8	1.6	0.013	EM415S
28CM013	51	0.13	1.2	2.2	2.3	0.018	EM415S

Unit: mm 1inch=25.4mm



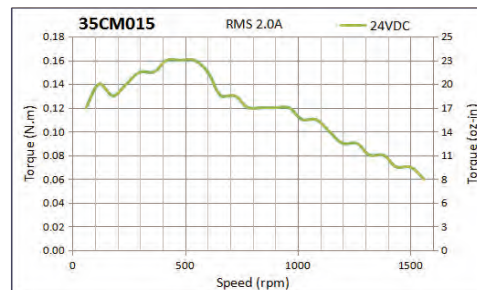
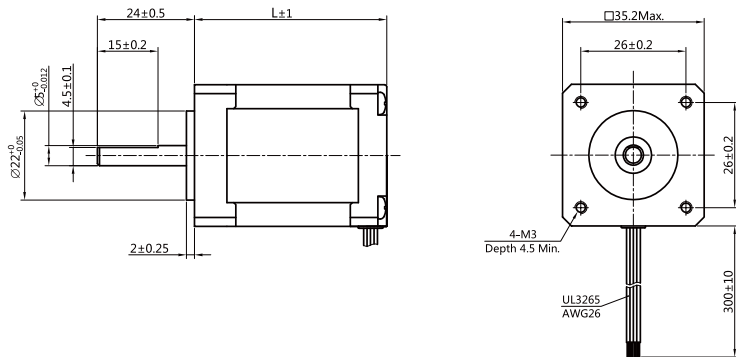
## NEMA 14 (35mm)



### Standard Models:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Inertia (Kg.cm <sup>2</sup> )	Matching Drives
35CM015	31	0.15	2	0.8	1.3	0.019	EM422S
35CM04	47	0.36	2	1.2	1.9	0.026	EM422S

Unit: mm 1inch=25.4mm



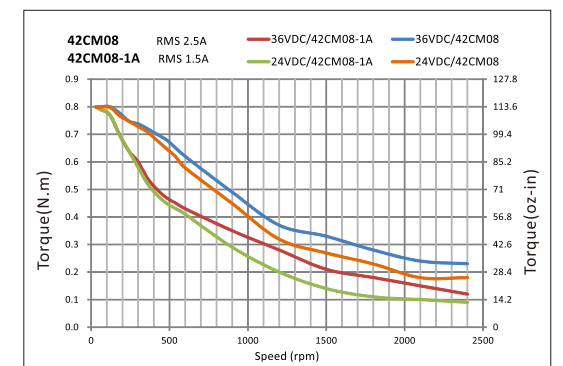
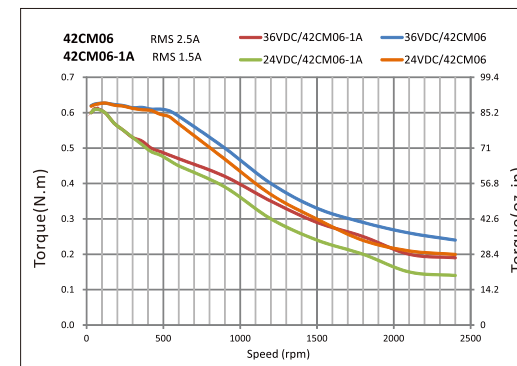
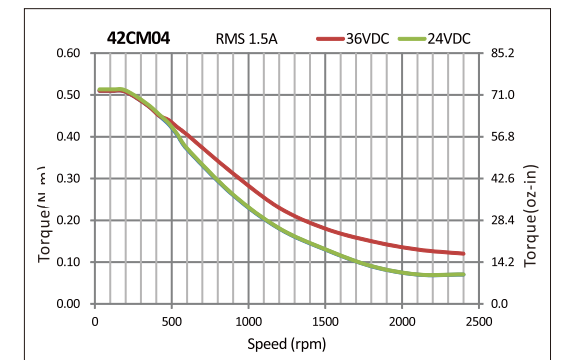
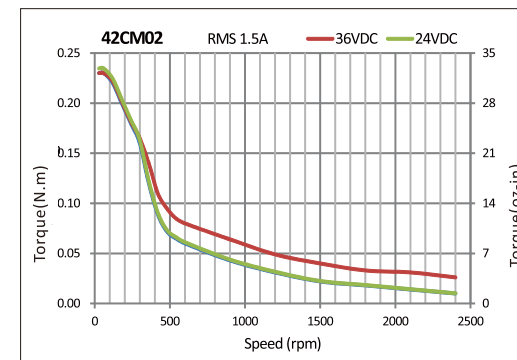
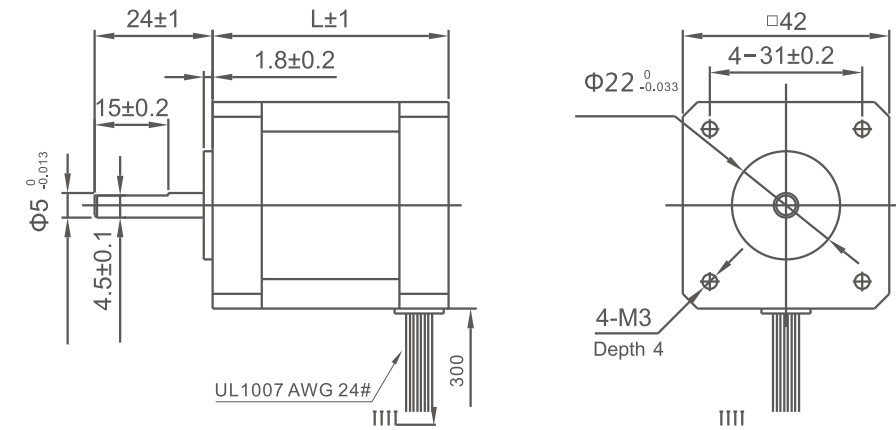
## NEMA 17 (42mm)



### Standard Models:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Inertia (Kg.cm <sup>2</sup> )	Matching Drives
42CM02-1A	33	0.21	1	4.5	6.5	0.035	EM415S
42CM02		0.21	1.5	1.4	1.4	0.035	EM422S
42CM04-1A	40	0.4	1	4.0	7.9	0.054	EM415S
42CM04		0.4	1.5	2.3	4.3	0.054	EM422S
42CM06-1A	47	0.6	1.5	2.2	4.5	0.072	EM422S
42CM06		0.6	2.5	0.9	1.6	0.072	EM432S
42CM08-1A	60	0.8	1.5	3.0	6.9	0.110	EM422S
42CM08		0.8	2.5	1.0	2.4	0.110	EM542S

Unit: mm 1inch=25.4mm



## NEMA 23 (57mm)

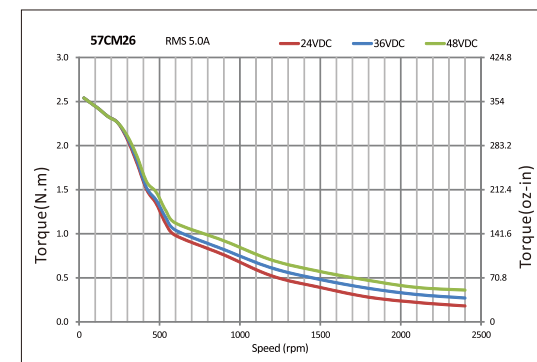
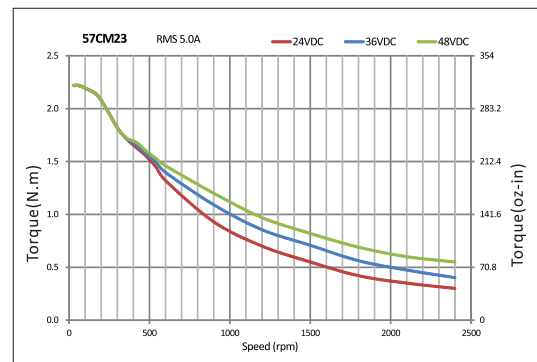
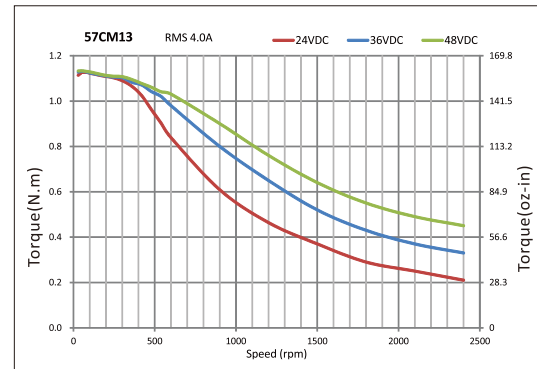
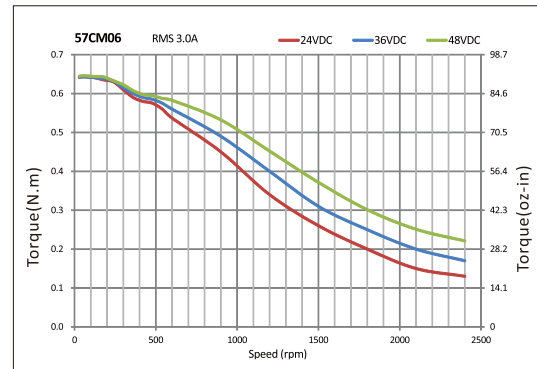
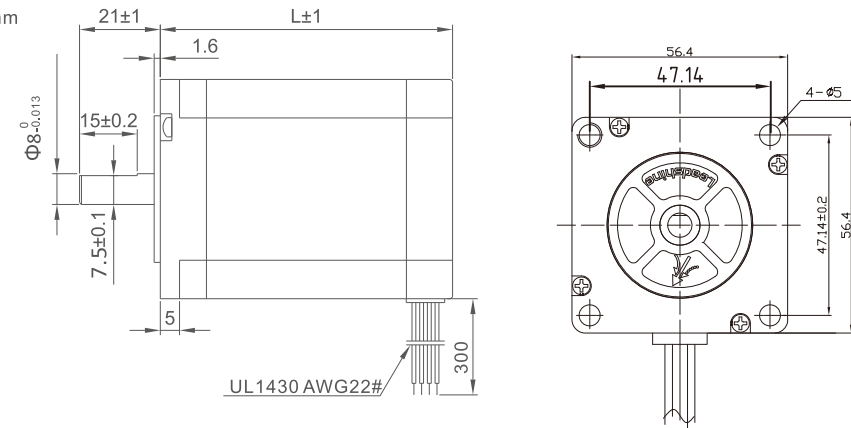


### Standard Models:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Detent Torque	Inertia (Kg.cm <sup>2</sup> )	Matching Drives
57CM06	41	0.6	3	0.7	1.4	0.02	0.12	EM542S
57CM13-3A	55	1.3	3	0.8	2.8	0.04	0.3	EM542S
57CM13		1.3	4	0.42	1.6			EM542S/EM556S
57CM12X		1.2	4	0.6	1.4			EM542S/EM556S
57CM21X	76	2.1	4	0.6	2.4	0.07	0.48	EM542S/EM556S
57CM23-3A	76	2.1	3	1.1	4.2			EM542S
57CM23-4A		2.3	4	0.5	2			EM542S/EM556S
57CM23		2.3	5	0.38	1.75	EM556S		
57CM22X	80	2.2	5	0.34	1.74	0.07	0.5	EM556S/EM870S
57CM26-4A	85	2.6	4	0.8	3.2	0.08	0.52	EM542S/EM556S
57CM26		2.6	5	0.44	2			EM556S/EM870S

Note: Motors with 1/4 in(6.35mm) shaft diameter are available.

Unit: mm 1inch=25.4mm



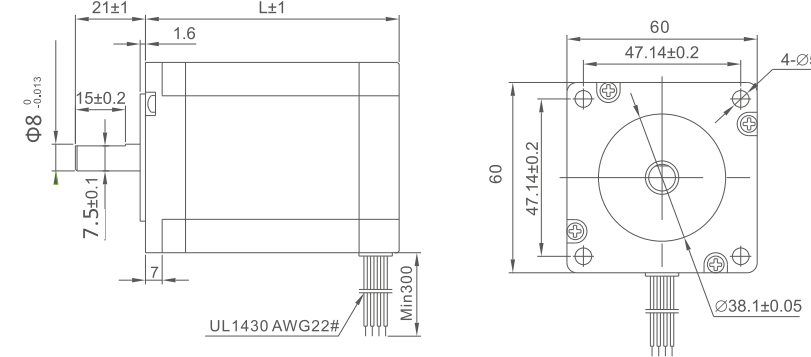
## NEMA 23 (57mm)



### Standard Models:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Detent Torque(N.m)	Inertia (Kg.cm <sup>2</sup> )	Matching Drives
D57CM21-4A	67	2.1	4	0.5	1.77	0.09	0.57	EM556S
D57CM21		2.1	5	0.21	0.75			EM556S/EM870S
D57CM31-4A	88	3.1	4	0.62	2.8	0.10	0.84	EM556S
D57CM31		3.1	5	0.26	1.18			EM556S/EM870S

Unit: mm 1inch=25.4mm



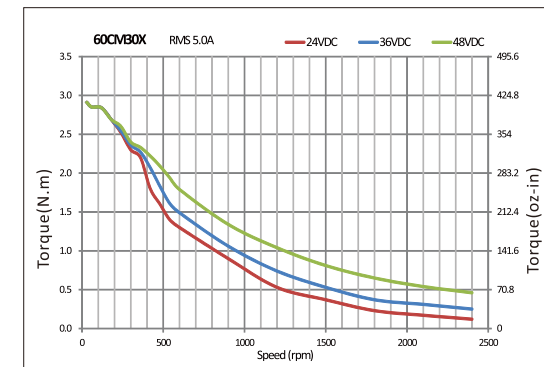
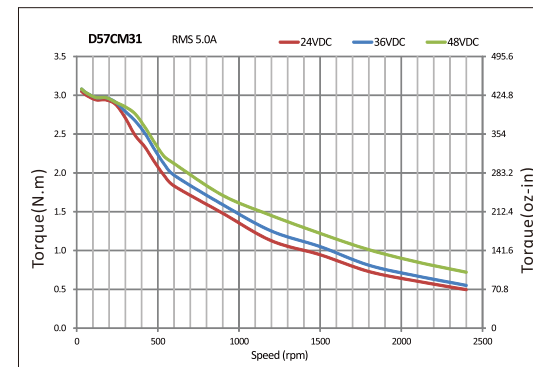
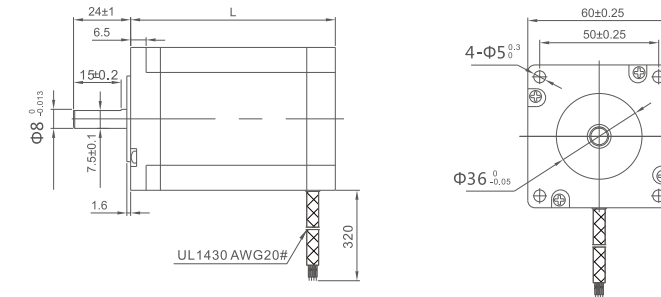
## NEMA 24 (60mm)



### Standard Models:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Detent Torque(N.m)	Inertia (Kg.cm <sup>2</sup> )	Matching Drives
60CM22X	67	2.2	5	0.33	1.05	0.07	0.49	EM556S/EM870S
60CM30X	85	3.0	5	0.46	2.0	0.08	0.69	EM556S/EM870S

Unit: mm 1inch=25.4mm





## NEMA 34 (86mm)

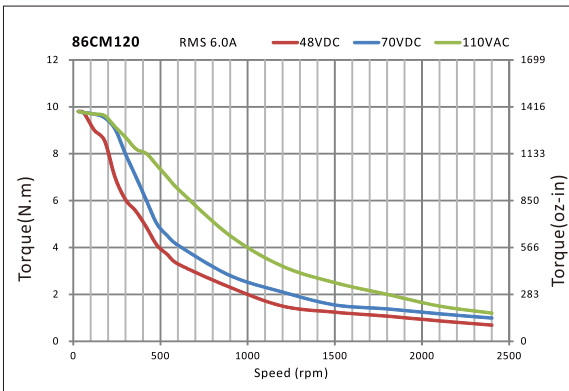
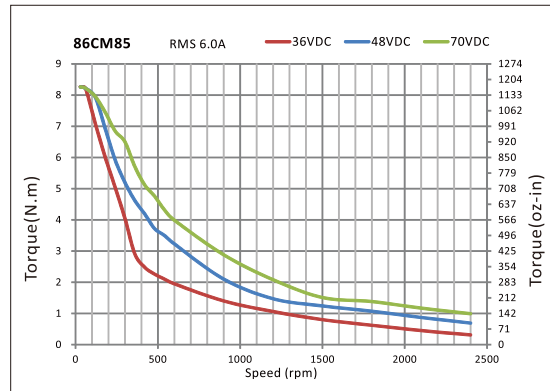
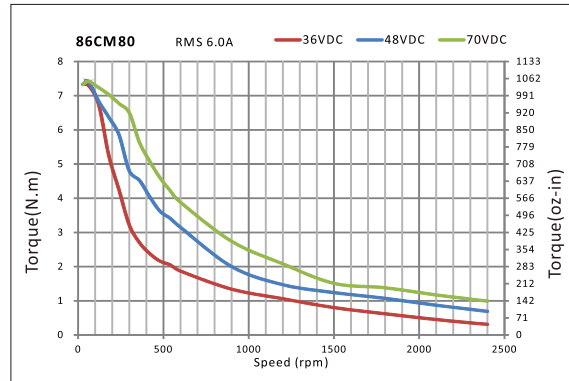
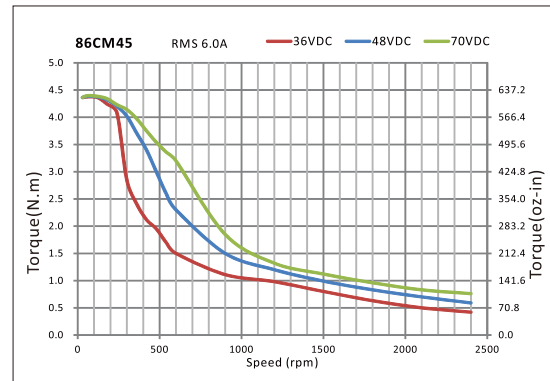
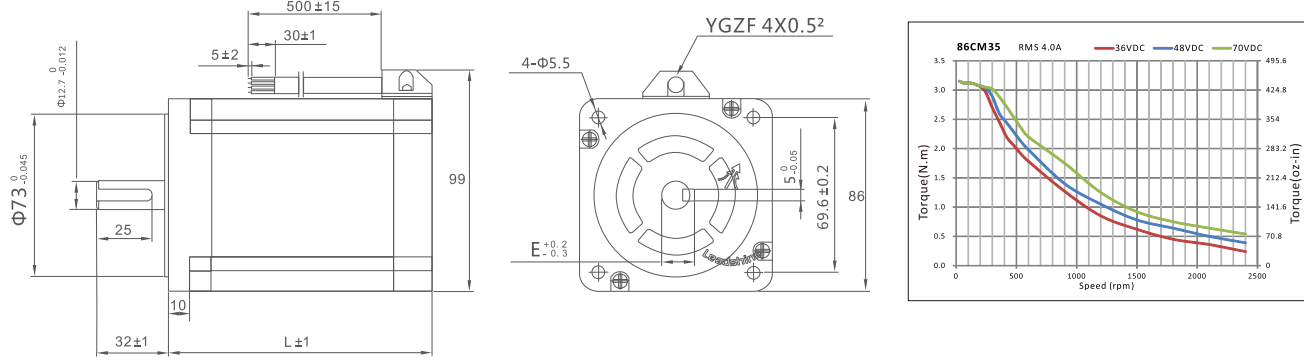


### Standard Models:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Inertia (Kg.cm <sup>2</sup> )	Matching Drives
86CM35	65	3.5	4	0.42	2.67	1.00	EM556S/EM870S
86CM45	80	4.5	6	0.43	2.95	1.40	EM882S
86CM80	98	8.0	6	0.63	4.0	2.50	EM882S
86CM85	118	8.5	6	0.53	4.25	2.70	EM882S
86CM120	129	12.0	6	0.75	5.30	2.94	EM882S/DMA882S

Note: Motors with 14mm shaft diameter are available.

Unit: mm 1inch=25.4mm



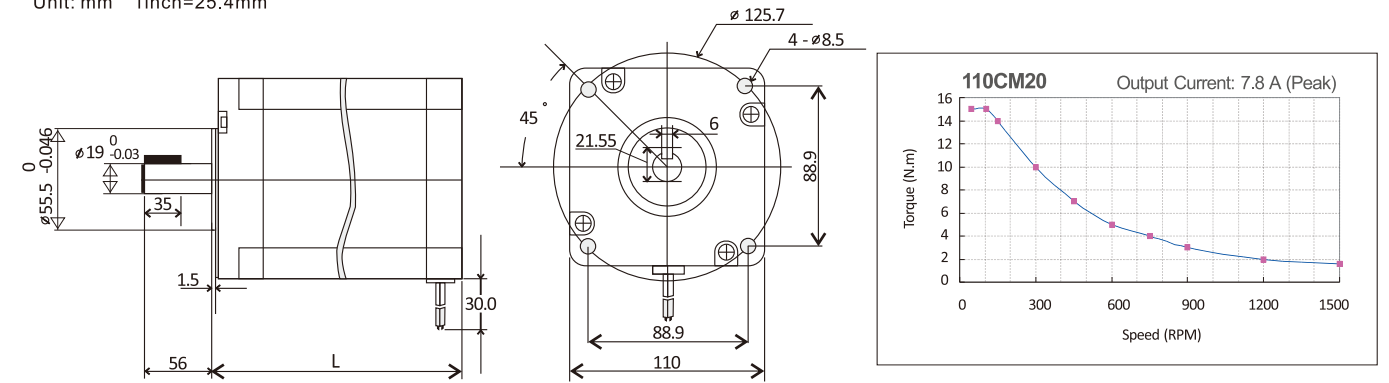
## NEMA 42 & 51 (110mm & 130mm)



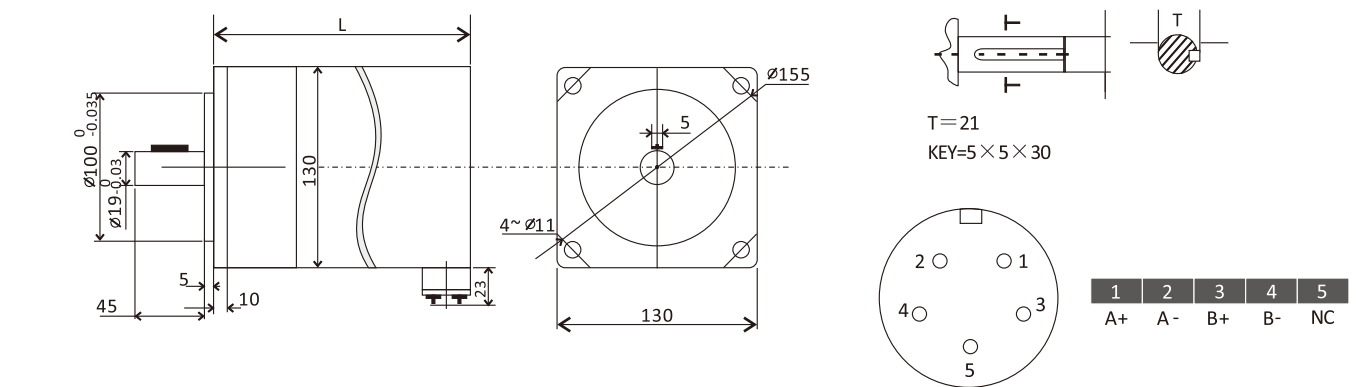
### Standard Models:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Inertia (Kg.cm <sup>2</sup> )	Matching Drives
110CM12	115	12	6	0.53	6.5	7.2	DM2282
110CM20	150	20	6	0.8	15	10.9	DM2282
110CM28	201	28	6.5	1.2	22	16.2	DM2282
130HS27	227	27	6	0.86	12.5	15.7	DM2282
130HS45	283	45	7	0.66	9.0	22.9	DM2282

Unit: mm 1inch=25.4mm



Unit: mm 1inch=25.4mm



## 3-phase:NEMA 23, 34, 42

### Standard Models:

Model	Length (mm)	Holding Torque(N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Inertia (Kg.cm <sup>2</sup> )	Matching Drives
573S09	50	0.9	3.5	0.77	1.8	1.00	3DM580S
573S15	76	1.3	5.8	0.86	2.0	1.40	3DM580S
863S22	71	2.3	5	0.9	2.8	2.50	3ND883
863S42	103	4.3	5	1.35	4.5	2.70	3ND883
863S68H	135	6.8	2.3	4.5	20	2.94	3DM2283

Unit: mm 1inch=25.4mm

