



Stepper Motor And Drive Guide

35HSxx/39HSxx Series



General Specifications	
Angle Accuracy	±5%(full step, no load)
Temperature Rise	80 °C Max
Ambient Temperature	-10 °C — +50 °C
Insulation Resistance	100M Ω min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.05 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table										
Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	14	35HS01	1.8	4	-	0.4	0.07	26	0.15	EM402 / DM422C
	16	39HS02	1.8	4	-	0.6	0.22	34	0.20	EM402 / DM422C

Mechanical Specifications
Unit: mm 1inch=25.4mm

Wiring Diagram

Mechanical Specifications
Unit: mm 1inch=25.4mm

Wiring Diagram

Match Drives	
Model	Match Drives
35HSxx / 39HSxx	EM402 / DM422C

42HSxx Series



General Specifications	
Angle Accuracy	±5%(full step, no load)
Temperature Rise	80 °C Max
Ambient Temperature	-10 °C — +50 °C
Insulation Resistance	100M Ω min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.05 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table										
Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	17	42HS02	1.8	4	-	0.4	0.22	40	0.24	EM402 / DM422C
					Parallel Series	1.4	0.47	48	0.34	EM402 / DM422C
					Unipolar	0.7	0.47			

Mechanical Specifications
Unit: mm 1inch=25.4mm

Wiring Diagram

Match Drives	
Model	Match Drives
42HSxx	EM402 / DM422C

57HSxx Series



General Specifications

Angle Accuracy	± 5%(full step, no load)
Temperature Rise	80 °C Max
Ambient Temperature	-10 °C — +50 °C
Insulation Resistance	100M Ω min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

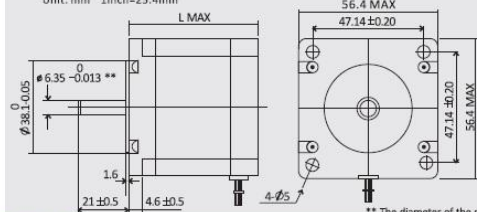
Selection Table

Phase	NEMA Size	Model	Step Angle (-)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives		
2	23	57HS04	1.8	6	Series	2.0	0.4	41	0.45	EM503 / DM556		
					Unipolar	2.8	0.28					
		57HS09	1.8	8	Parallel	4.2	1.3	54	0.6	EM503 / EM705 / DM556		
					Unipolar	2.1	1.3					
		57HS13	1.8	8	Parallel	2.8	0.9	76	1.0	EM503 / EM705 / DM556		
					Unipolar	4.0	1.8					
		57HS22*	1.8	8	Parallel	2.0	1.8	81	1.15	EM503 / EM705 / DM556		
					Unipolar	2.8	2.2					
							Series	5.6	2.2			
							Unipolar	2.8	2.2			
							Series	4.0	1.5			

* The diameter of the shaft of the 57HS22 is 8 mm, and those of the others are 6.35 mm.

Mechanical Specifications

Unit: mm 1inch=25.4mm



** The diameter of the shaft of the 57HS22 is 8 mm, and those of the others are 6.35 mm.

Wiring Diagram



Match Drives

Model	Match Drives	Model	Match Drives
57HS04		57HS13	
57HS09	EM503 / EM705 / DM556	57HS22	EM503 / EM705 / DM556

86HSxx Series



General Specifications

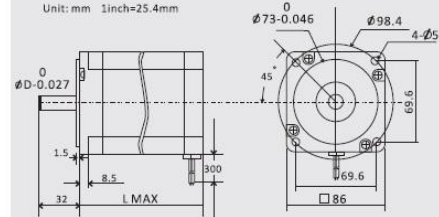
Angle Accuracy	± 5%(full step, no load)
Temperature Rise	80 °C Max
Ambient Temperature	-10 °C — +50 °C
Insulation Resistance	100M Ω min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table

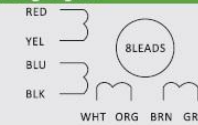
Phase	NEMA Size	Model	Step Angle (-)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives		
2	34	86HS35	1.8	8	Parallel	4.0	3.5	65	1.7	EM705 / EM806 / DM870		
					Series	2.0	3.5					
		86HS45	1.8	8	Unipolar	2.8	2.5	80	2.3	EM705 / EM806 / DM870 / DM1182		
					Parallel	6.0	4.5					
		86HS55	1.8	8	Series	3.0	4.5	96	2.3	EM806 / DM870 / DM1182 / DM2282		
					Unipolar	4.2	3.2					
		86HS85	1.8	8	Parallel	6.1	6.5	118	3.8	EM806 / DM870 / DM1182 / DM2282		
					Series	3.05	6.5					
		86HS120	1.8	8	Unipolar	4.3	4.6	156	5.3	EM806 / DM870 / DM1182 / DM2282		
					Parallel	6.8	8.5					
							Series	3.4	8.5			
							Unipolar	4.9	6.0			
					Parallel	6.0	12					
					Series	3.0	12					
					Unipolar	4.2	8.4					

Mechanical Specifications

Unit: mm 1inch=25.4mm

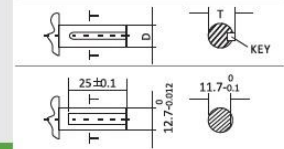


Wiring Diagram



Specifications of Motor Shafts

Model	T	KEY	D
86HS35	/	/	9.5
86HS45	/	/	12.7
86HS55, 86HS85	14.7	5*5*25	12.7
86HS120	17.875	5*5*25	15.875



The Shaft of the 86HS45

* The shaft of the 86HS35 is round, no flat.

Match Drives

Model	Match Drives
86HS35	
86HS45 / 86HS55	EM705 / EM806 / DM1182
86HS85 / 86HS120	EM705 / EM806 / DM1182

110HSxx Series



General Specifications

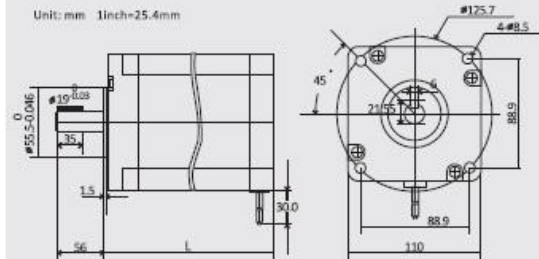
Angle Accuracy	± 5%/full step, no load
Temperature Rise	80 °C Max
Ambient Temperature	-10 °C — +50 °C
Insulation Resistance	100M Ω min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table

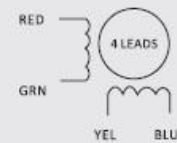
Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	42	110HS12	1.8	4	-	6.0	12	115	6.0	DM2282 / DM1182
		110HS20	1.8	4	-	6.0	20	150	8.4	DM2282 / DM1182
		110HS28	1.8	4	-	6.5	28	201	11.7	DM2282 / DM1182

Mechanical Specifications

Unit: mm 1inch=25.4mm



Wiring Diagram

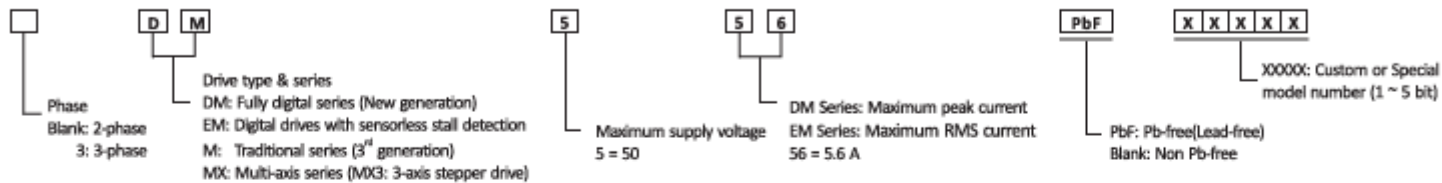


Match Drives

Model	Match Drives
110HS12	DM2282 / DM1182
110HS20	
110HS28	

Selection Guide For Stepper Drives

Part Number



Selection Table

Phase	Series	Model	Output Current (A)	Operating Voltage (V)	Microstep Resolution	Driving Motors (NEMA Size)	Weight (kg)	Size (mm)	Control Signals	
									PUL/DIR; CW/CCW	Single-ended; Differential
2	EM	EM402	0.3 - 2.2	DC(20-40)	1-512	14, 17, 23	0.12	86*55*20	PUL/DIR;	Single-ended; Differential
		EM503	0.5 - 4.5	DC(20-50)	1-512	14, 17, 23	0.2	116*69*26.5	PUL/DIR; CW/CCW	Single-ended; Differential
		EM705	0.5 - 7.8	DC(20-75)	1-512	17, 23, 34	0.29	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
		EM806	0.5 - 8.4	DC(24-80)	1-512	17, 23, 34	0.58	151*97*48	PUL/DIR;	Single-ended; Differential
	DM	DM422C	0.3 - 2.2	DC(18-40)	1-512	14, 17, 23	0.115	86*55*20	PUL/DIR; CW/CCW	Single-ended;
		DM556	0.5 - 5.6	DC(18-50)	1-512	14, 17, 23	0.28	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
		DM870	0.5 - 7.0	DC(18-80)	1-512	17, 23, 34	0.28	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
		DM1182	0.5-8.2	AC(80-150)	1-512	34, 42	1.3	202*167*63	PUL/DIR; CW/CCW	Single-ended; Differential
		DM2282	0.5-8.2	AC(80-220)	1-512	34, 42	1.3	202*167*63	PUL/DIR; CW/CCW	Single-ended; Differential
		DM805-AI	0.5-7.0	DC(18-80)	1-512	17, 23, 34	0.28	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
		M	M542	1.0-4.2	DC(20-50)	2-128, 5-125	14, 17, 23	0.28	118*75.5*34	PUL/DIR; CW/CCW
	M550		1.2 - 5.0	DC(20-50)	2-256, 5-200	14, 17, 23	0.28	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
	M760		1.45 - 6.0	DC(20-75)	2-256, 5-200	17, 23, 34	0.57	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
	M860		2.4 - 7.2	DC(24-80)	2-256, 5-200	17, 23, 34	0.57	151*97*48	PUL/DIR; CW/CCW	Single-ended; Differential
M880A	2.8 - 7.8		DC(24-80)	2-256, 5-200	17, 23, 34	0.57	151*97*48	PUL/DIR; CW/CCW	Single-ended; Differential	
MA860	2.4 - 7.2		AC(18-58)	2-256, 5-200	17, 23, 34	0.58	151*97*48	PUL/DIR; CW/CCW	Single-ended; Differential	
	MA860H	2.4 - 7.2	AC(24-80)	2-256, 5-200	34, 42	0.65	151*97*52	PUL/DIR; CW/CCW	Single-ended; Differential	
3	DM	3DM683	0.5 - 8.3	DC(18-60)	200-51200s/r	17, 23, 34	0.30	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
2	DM	MX3660	1.4 - 6.0	DC(20-60)	2-64	17, 23, 34	0.68	168*77.5*37	PUL/DIR;	Single-ended;