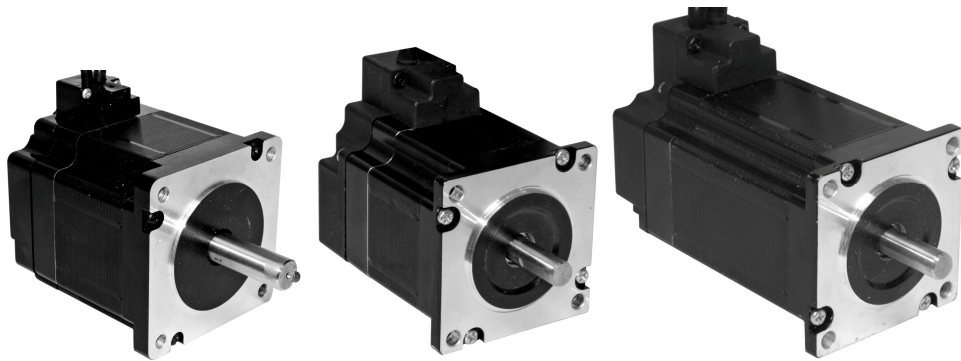




Leadshine

ES-M Series Easy Servo Motor

Datasheet



Low Voltage Stepper Motor with Encoder, 1 - 8 Nm

Version 0.0.1

<http://www.Leadshine.com>

Descriptions

Leadshine's ES-M series easy servo motors, or low voltage stepper motors with encoders, are designed to work with Leadshine easy servo drives including the ES-D508, ES-D808 and ES-D1008. They are currently available from NEMA23 to NEMA34 with holding torque from 1 Nm to 8 Nm. All those easy servo motors are integrated with 1,000-line) optical incremental encoders.

Part Number

ES	—	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		M: Motor	Motor Type	Motor Size	Holding Torque				
		MH: High Voltage Motor	2: 2-Phase 3: 3-Phase	23: N EMA23 (57mm) 24: NEMA24 (60mm) 34: NEMA34 (86mm) 42: NEMA42 (110mm)	09: 0.9 Nm 20: 2.0 Nm 40: 4.0 Nm				

Encoder Specifications

Parameter	Min	Typical	Max	Unit
Operating Temperature	-40	-	100	°C
Supply Voltage	4.5	5	5.5	VDC
Output Current per Channel	-1	-	5	mA
Low Level Output Voltage	-	-	0.4	VDC
High Level Output Voltage	2.4	-	-	VDC
Count Frequency	-	-	100	KHz

Motor Specifications

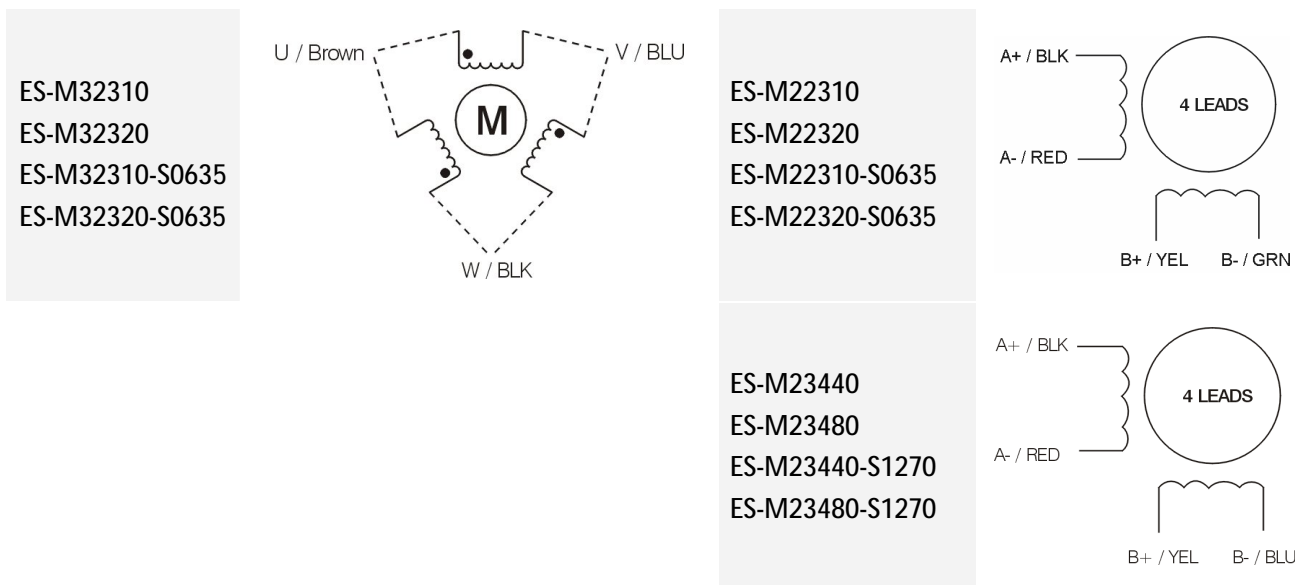
Model	Phase	Step Angle (°)	Leads	Holding Torque (N.m)	Phase Current (A)	Phase Resistance (Ohm)	Phase Inductance (mH)	Rotor Inertia (g.cm ²)	Weight (Kg)	Shaft Diameter (mm)
ES-M32310	3	1.2°	3	1.0	5.8	0.37	0.92	300	0.7	8
ES-M32310-S0635	3	1.2°	3	1.0	5.8	0.37	0.92	300	0.7	6.35
ES-M32320	3	1.2°	3	2.0	5.8	0.62	1.85	500	1.3	8
ES-M32320-S0635	3	1.2°	3	2.0	5.8	0.62	1.85	500	1.3	6.35
ES-M22310	2	1.8°	4	1.0	4.2	0.45	1.0	300	0.7	8
ES-M22310-S0635	2	1.8°	4	1.0	4.2	0.45	1.0	300	0.7	6.35
ES-M22320	2	1.8°	4	2.0	5.0	0.42	1.8	500	1	8
ES-M22320-S0635	2	1.8°	4	2.0	5.0	0.42	1.8	500	1	6.35

Motor Specifications (Continued)

Model	Phase	Step Angle (°)	Leads	Holding Torque (N.m)	Phase Current (A)	Phase Resistance (Ohm)	Phase Inductance (mH)	Rotor Inertia (g.cm ²)	Weight (Kg)	Shaft Diameter (mm)
ES-M22415	2	1.8°	4	1.5	2.5	-	-	-	1.1	8
ES-M22430	2	1.8°	4	3.0	3	-	-	-	1.6	8
ES-M23440	2	1.8°	4	4.0	5.5	0.46	4.0	1500	2.5	14
ES-M23440-S1270	2	1.8°	4	4.0	5.5	0.46	4.0	1500	2.5	12.7
ES-M23480	2	1.8°	4	8.0	6.0	0.44	3.73	2580	4.0	14
ES-M23480-S1270	2	1.8°	4	8.0	6.0	0.44	3.73	2580	4.0	12.7

Motor Wiring Diagram

Note: Contact Leadshine for the wiring diagram of other motors.

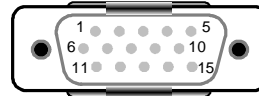


Cable Specifications

Model	Native Motor Cable	Encoder Cable	
		Native	Extension
ES-M32310 ES-M32310-S0635	500±20mm (Fly wires)	500±20mm (HDD15 Male)	3.0m / CABLE-ENCODER-03
ES-M32320 ES-M32320-S0635			5.0m / CABLE-ENCODER-05
ES-M22310 ES-M22310-S0635	800±20mm (Fly wires)	300±20mm (HDD15 Male)	3.0m / CABLEH-BM3M0
ES-M22320 ES-M22320-S0635			5.5m / CABLEH-BM5M5
ES-M23440 ES-M23440-S1270			8.0m / CABLEH-BM8M0
ES-M23480 ES-M23480-S1270	500±20mm (Fly wires)	300±20mm (HDD15 Male)	10.0m / CABLEH-BM10M0
ES-M23480 ES-M23480-S1270			13.0m / CABLEH-BM13M0

Encoder Cable Connector

Encoder Cable Connector – HDD15 Male



ES-M32310(-S0605), ES-M32320(-S0605)

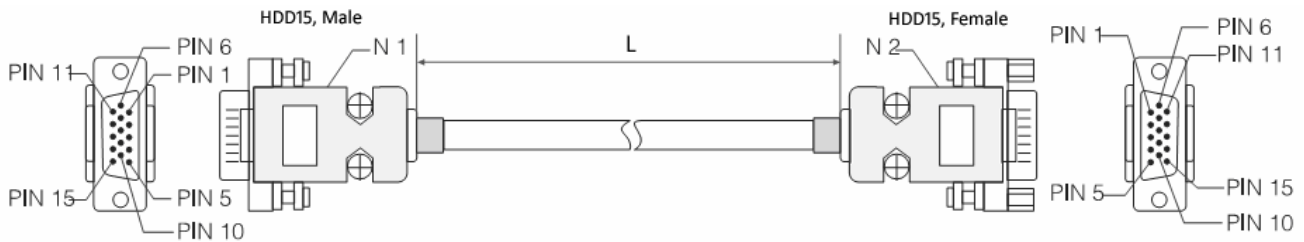
Pin	Name	Wire Color	I/O	Description
1	EA+	Black	O	Channel A+ output
2	EB+	Yellow	O	Channel B+ output
3	GND	White	GND	Ground
4	NC	-	-	Not Connected
5	NC	-	-	Not Connected
6	NC	-	-	Not Connected
7	NC	-	-	Not Connected
8	NC	-	-	Not Connected
9	NC	-	-	Not Connected
10	NC	-	-	Not Connected
11	EA-	Blue	O	Channel A- output
12	EB-	Green	O	Channel B- output
13	VCC	Red	I	+5V power input
14	NC	-	-	Not Connected
15	NC	-	-	Not Connected

ES-M22310(-S0605), ES-M22320(-S0605)
ES-M23440(-S1270), ES-M23480(-S1270)

Pin	Name	Wire Color	I/O	Description
1	EA+	Black	O	Channel A+ output
2	VCC	Red	I	+5V power input
3	GND	White	GND	Ground
4	NC	-	-	Not Connected
5	NC	-	-	Not Connected
6	NC	-	-	Not Connected
7	NC	-	-	Not Connected
8	NC	-	-	Not Connected
9	NC	-	-	Not Connected
10	NC	-	-	Not Connected
11	EB+	Yellow	O	Channel B+ output
12	EB-	Green	O	Channel B- output
13	EA-	Blue	O	Channel A- output
14	NC	-	-	Not Connected
15	NC	-	-	Not Connected

Encoder Extension Cable

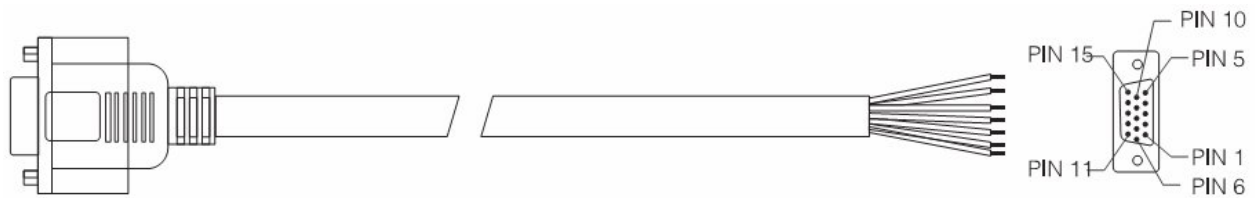
CABLE-ENCODER-XX



Part Number	L	Matching Motor
CABLE-ENCODER-03	3m	ES-M32310, ES-M22320, ES-M32309-S0635 and ES-M32320-S0635
CABLE-ENCODER-05	5m	

Note: Refer to the corresponding motor's encoder connector for the pin-out. The wire color may not be the same.

CABLEH-BMXMX



Pin	Wire Color	Name	Description	Pin	Wire Color	Name	Description
2	Red	VCC	+5V power input	12	Green	EB-	Channel B-
3	White	GND	+5V GND	1	Black	EA+	Channel A+
11	Yellow	EB+	Channel B+	13	Blue	EA-	Channel A-

Part Number	L	Matching Motor
CABLEH-BM3M0	3.0m	ES-M22310, ES-M22320, ES-M22310-S0635, ES-M22320-S0635, ES-M23440, ES-M23480, ES-M23440-S1270, ES-M23480-S1270
CABLEH-BM5M5	5.5m	
CABLEH-BM8M0	8.0m	
CABLEH-BM10M0	10.0m	
CABLEH-BM13M0	13.0m	

Mechanical Specifications

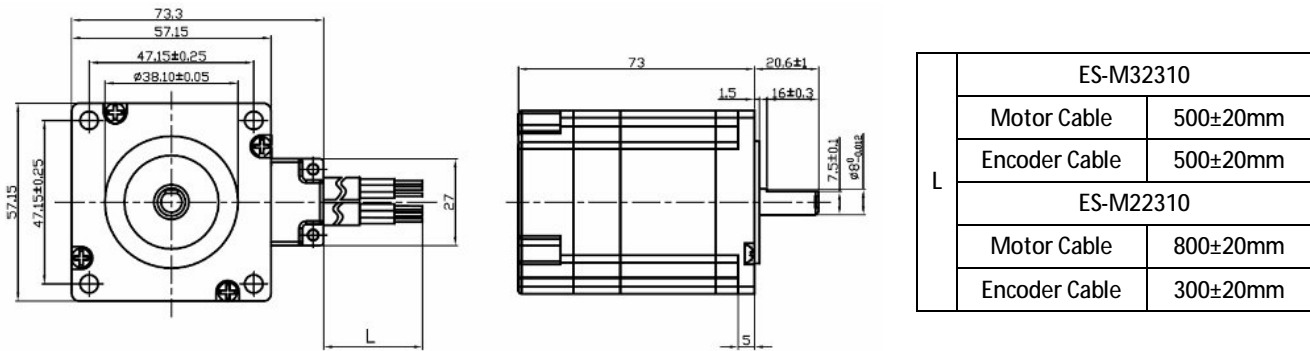


Figure 1: Mechanical Specification of ES-M32310 and ES-M22310

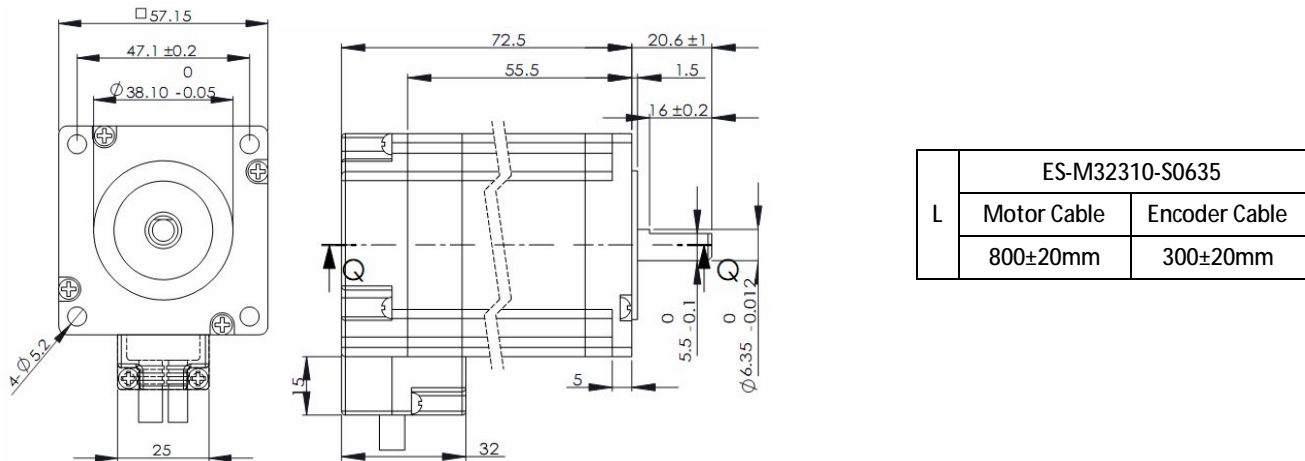


Figure 2: Mechanical Specification of ES-M32310-S0635

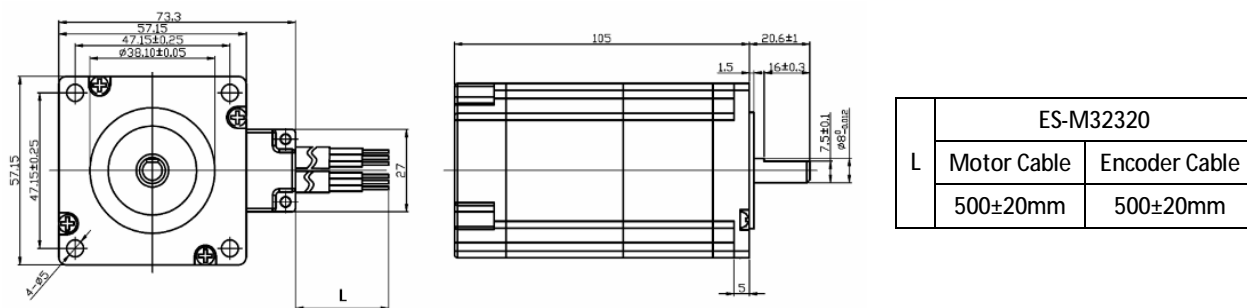


Figure 3: Mechanical Specification of ES-M32320

Mechanical Specifications (Continued)

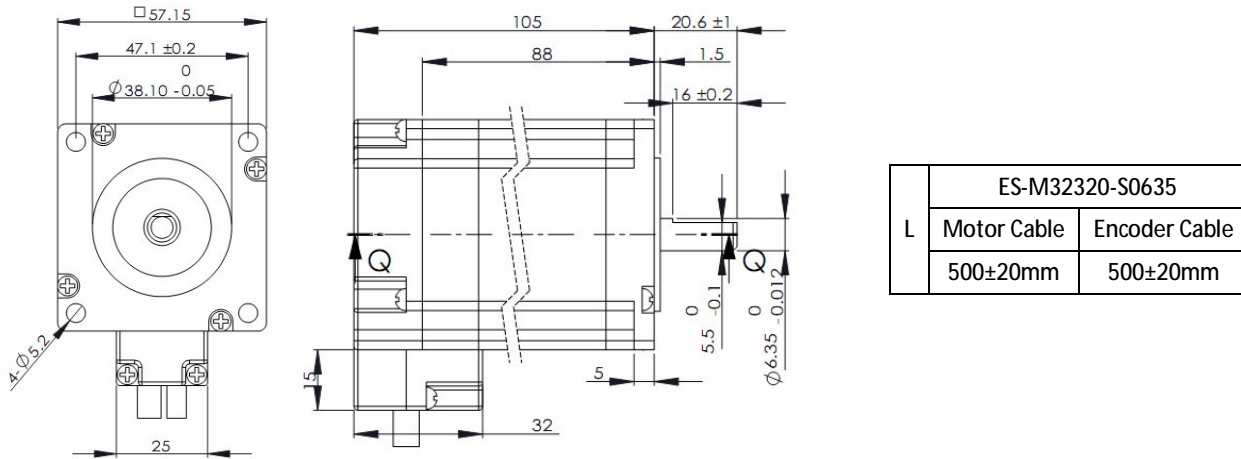


Figure 4: Mechanical Specification of ES-M32320-S0635

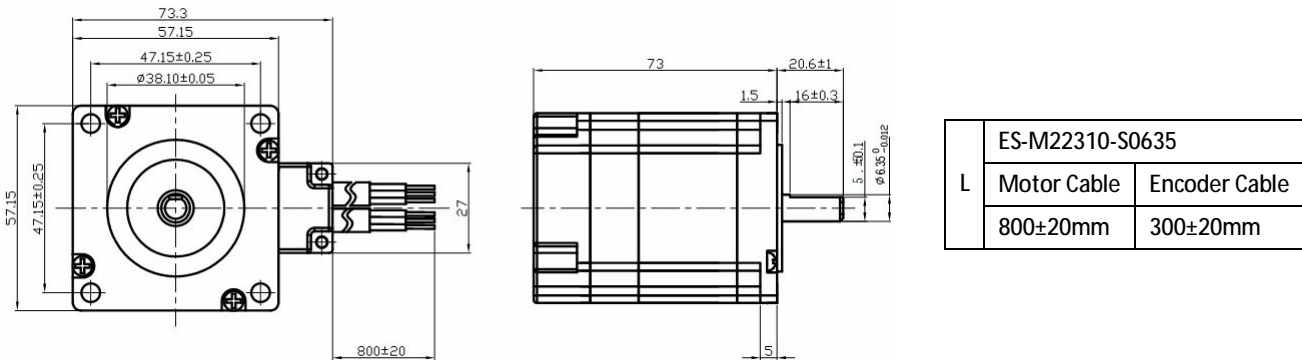


Figure 5: Mechanical Specification of ES-M22310-S0635

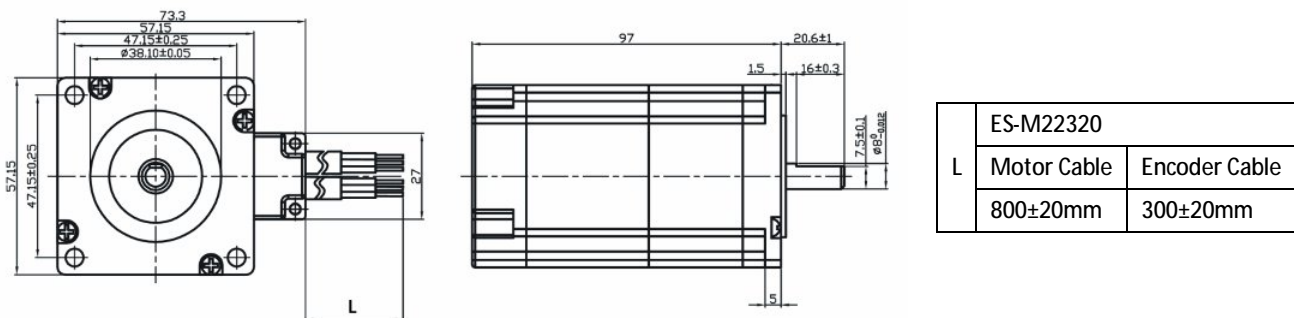


Figure 6: Mechanical Specification of ES-M22320

Mechanical Specifications (Continued)

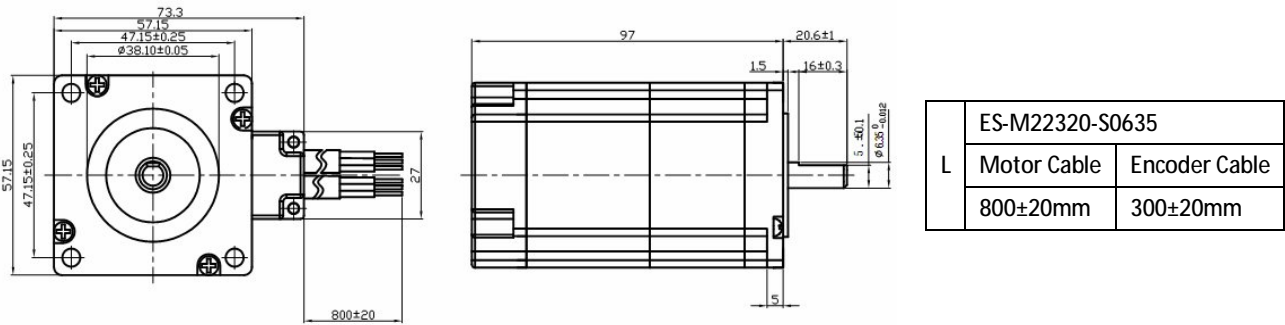


Figure 7: Mechanical Specification of ES-M22320-S0635

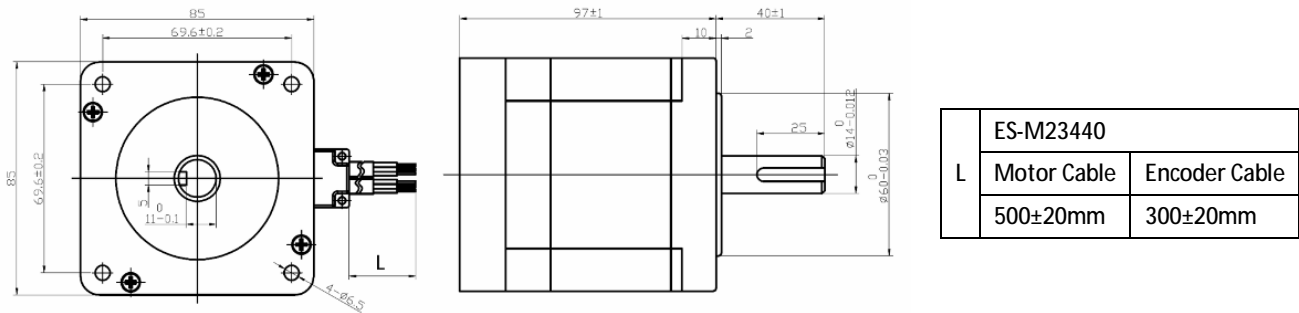


Figure 8: Mechanical Specification of ES-M23440

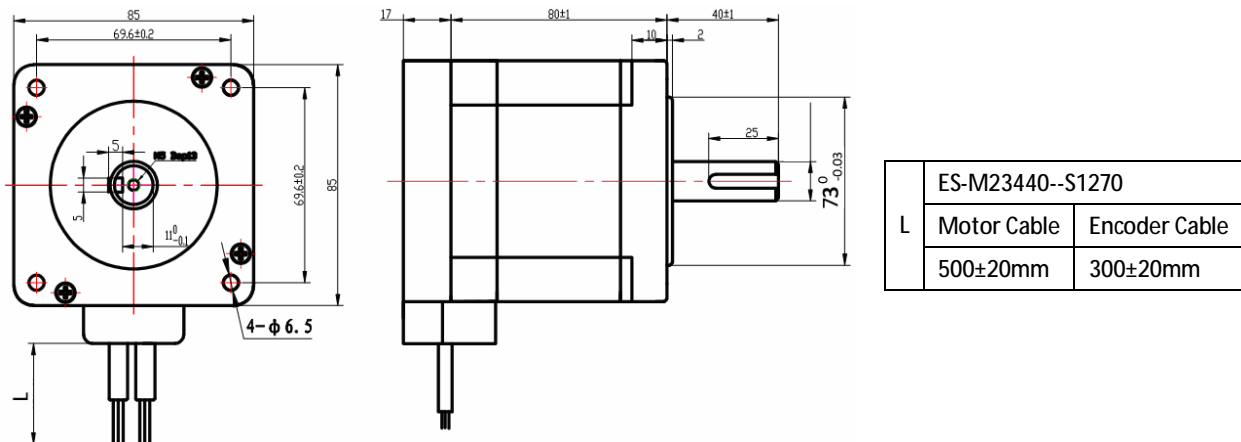


Figure 9: Mechanical Specification of ES-M23440-S1270

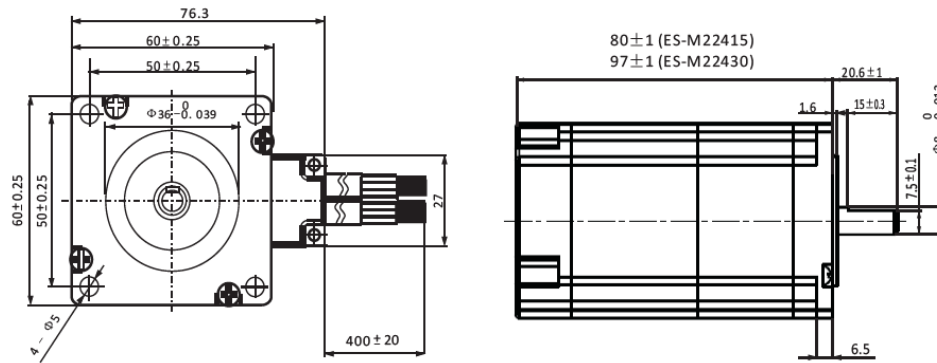
Mechanical Specifications (Continued)


Figure 10: Mechanical Specification of ES-M22415 and ES-M22430

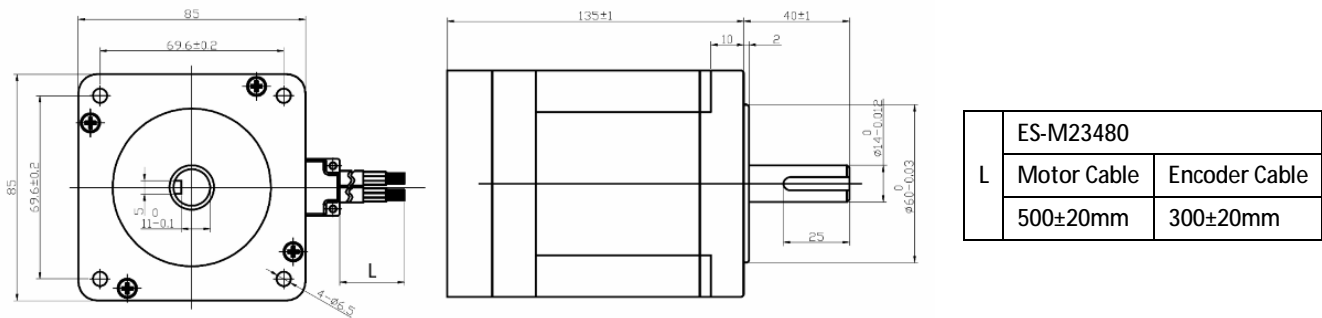


Figure 11: Mechanical Specification of ES-M23480

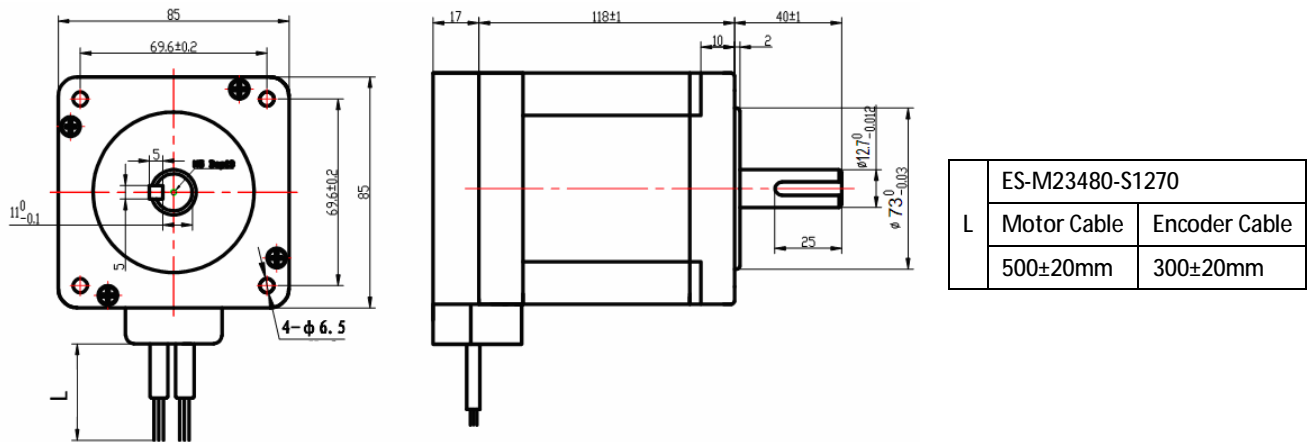


Figure 12: Mechanical Specification of ES-M23480-S1270

Speed-Torque Curves

ES-M32310

Drive: ES-D508 Resolution: 4000steps/rev. Holding Current Percentage: 40%

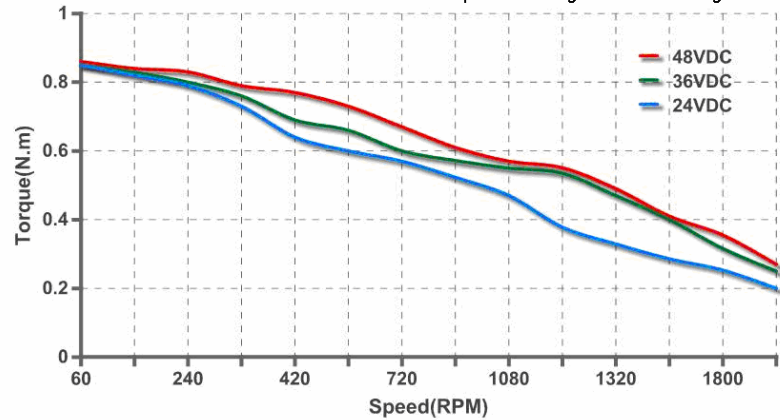


Figure 16: Speed Torque Curve of ES-M32310

ES-M32320

Drive: ES-D508 Resolution: 4000steps/rev. Holding Current Percentage: 40%

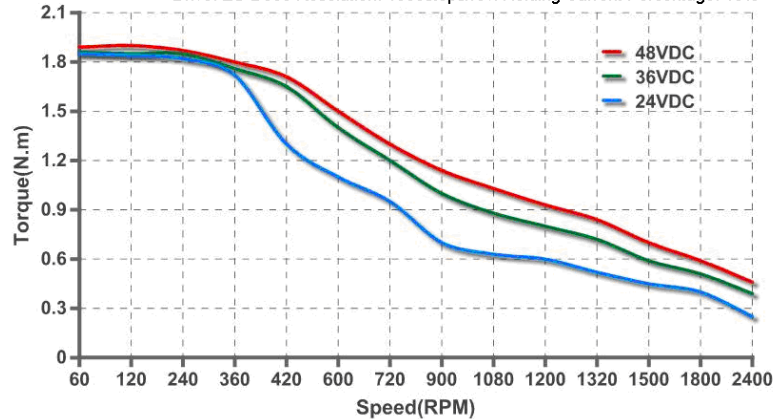


Figure 17: Speed Torque Curve of ES-M32320

Note: These curves are based on 40% holding torque percentage of ES-D508. If higher torque at high speed is required, you can change the holding torque percentage to 100%. See software manual.

Note: These curves are based on 40% holding torque percentage of ES-D508. If higher torque at high speed is required, you can change the holding torque percentage to 100%. See software manual.

Speed-Torque Curves (Continued)

Note: These curves are based on 40% holding torque percentage of ES-D808. If higher torque at high speed is required, you can change the holding torque percentage to 100%. See software manual.

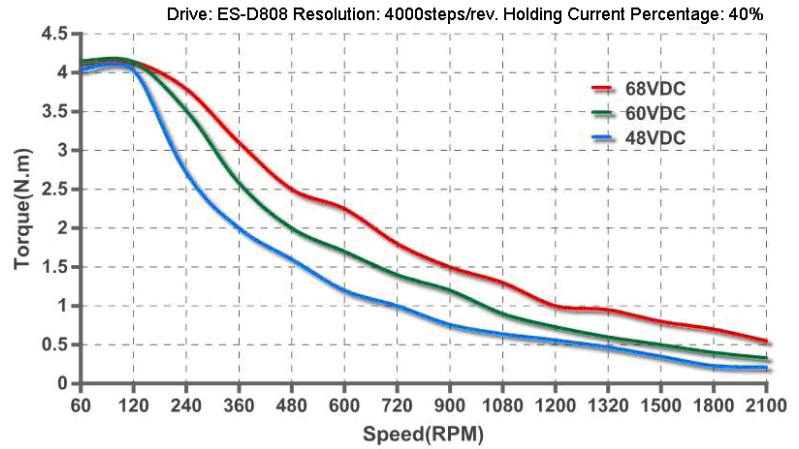
ES-M23440


Figure 18: Speed Torque Curve of ES-M23440

Note: These curves are based on 40% holding torque percentage of ES-D808. If higher torque at high speed is required, you can change the holding torque percentage to 100%. See software manual.

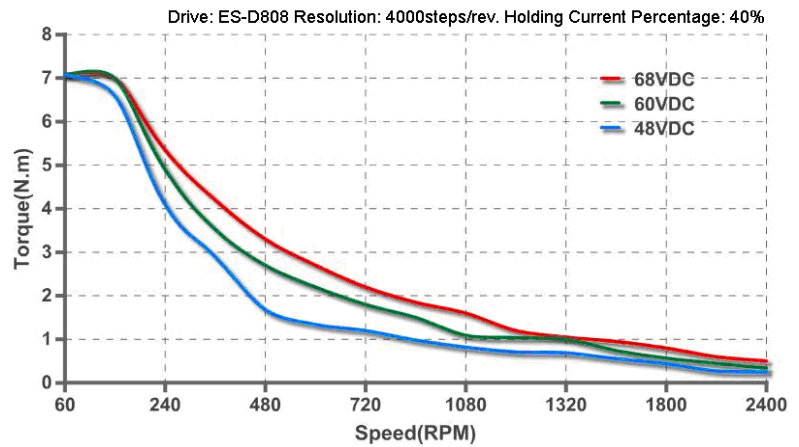
ES-M23480


Figure 19: Speed Torque Curve of ES-M23480