

Datasheet of the Easy Servo Motor

ES-M Series



Stepper Motor with Encoder, 0.9 - 8 N.m

Version 1.4

<http://www.Leadshine.com>



1 Descriptions

Leadshine's ES-M series easy servo motors, or stepper motors with encoders, are designed to work with Leadshine's 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 N.m to 8 N.m. All those easy servo motors are integrated with 1,000-line optical incremental encoders.

2 Part Number

ES-M 2 34 80 - S - -

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

- ① Easy Servo Motor Series
- ② Motor Voltage
Blank : low voltage motor H : high voltage motor
- ③ Motor Type
2 : 2-phase 3 : 3-phase
- ④ Motor Size
23 : NEMA23(57mm) 24 : NEMA24(60mm)
34 : NEMA34(86mm) 42 : NEMA42(110mm)
- ⑤ Holding Torque
09 : 0.9 N.m 80 : 8.0 N.m 120 : 12N.m
- ⑥ Speciality
Blank : standard B : brake P1/P2 : P1-IP54 P2- Ip67
- ⑦ Shaft diameter
Blank : standard S : inch size
- ⑧ Encoder Line
Blank : 1000 line E2 : 2500 line E5 : 5000 line
- ⑨ Customerized Code
Blank : standard

3 Electric Specification

3.1 Encoder Specifications

Parameter	Min	Typical	Max	Unit
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



3.2 Motor Specifications

Part Number	Step Angle (°)	Motor length (mm)	Holding Torque (N.m)	Phase Current (A)	Phase Resistance (Ohm)	Phase Inductance (mH)	Rotor Inertia (kg.cm ²)	Weight (Kg)	Shaft Diameter (mm)	Match Drive
ES-M32309	1.2	73	0.9	3.4	0.44	1.0	0.3	0.95	8	ES-D508
ES-M32320	1.2	93	2.0	3.4	0.70	1.9	0.55	1.35	8	ES-D508
ES-M22430	1.8	103	3.0	5.0	0.45	2.0	0.69	1.5	8	ES-D808
ES-M23440	1.8	101	4.0	5.5	0.46	4.0	1.95	2.7	14	ES-D808/E S-D1008
ES-M23480	1.8	119	8.0	6.0	0.53	3.9	2.8	4.0	14	ES-D808/E S-D1008
ES-M32309-S	1.2	73	0.9	3.4	0.44	1.0	0.3	0.95	6.35	ES-D508
ES-M32320-S	1.2	93	2.0	3.4	0.70	1.9	0.55	1.35	6.35	ES-D508
ES-M23440-S	1.8	101	4.0	5.5	0.46	4.0	1.95	2.7	12.7	ES-D808/E S-D1008
ES-M23480-S	1.8	119	8.0	6.0	0.53	3.9	2.8	4.0	12.7	ES-D808/E S-D1008
ES-M32320B	1.2	131	1.5	5.2	0.6	2.0	0.5	1.65	8	ES-D508

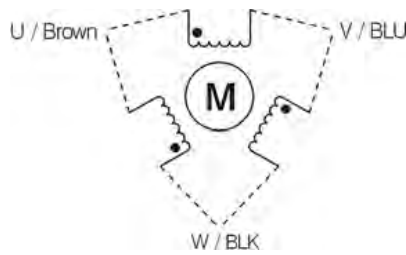
*Note: The length of the NEMA34 motor and the motor with protection IP can be chosen, please contact Leadshine for more details.

4 Motor Wiring Diagram and Mechanical Dimension

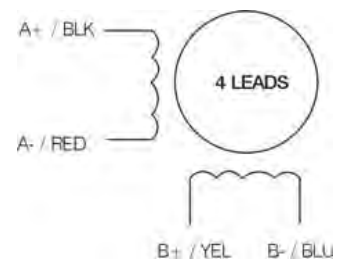
4.1 Wiring Diagram

Note: Please contact Leadshine for the wiring diagrams for other motors..

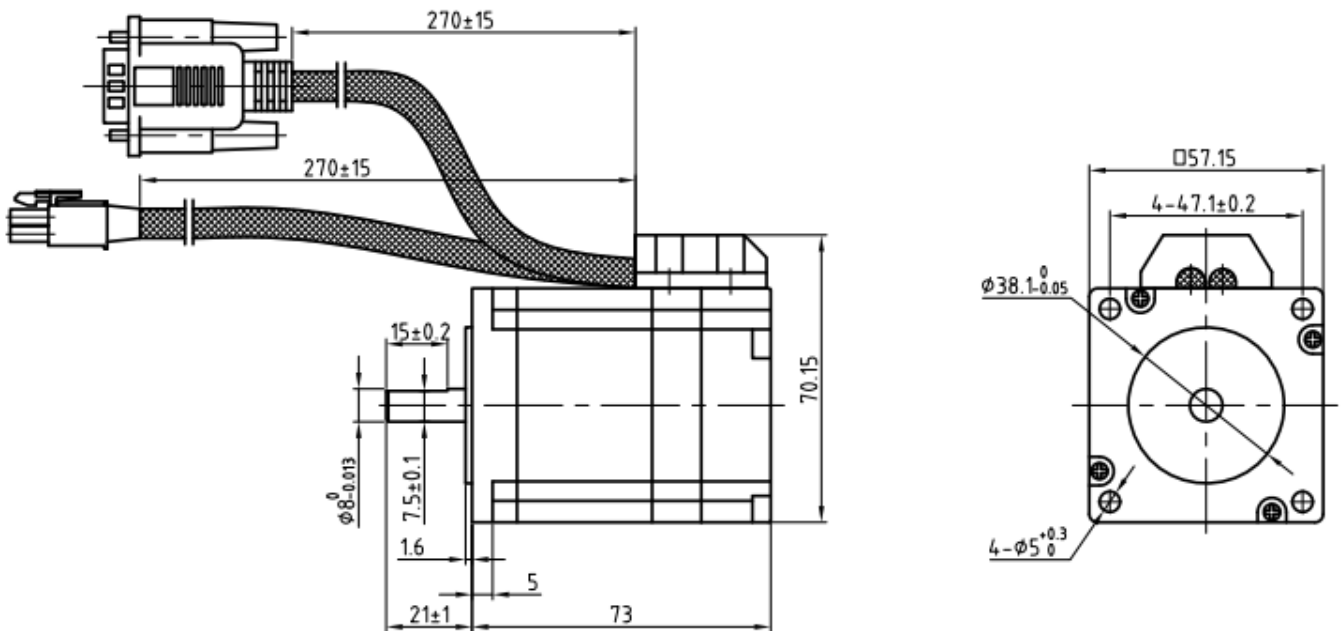
ES-M32309
ES-M32320



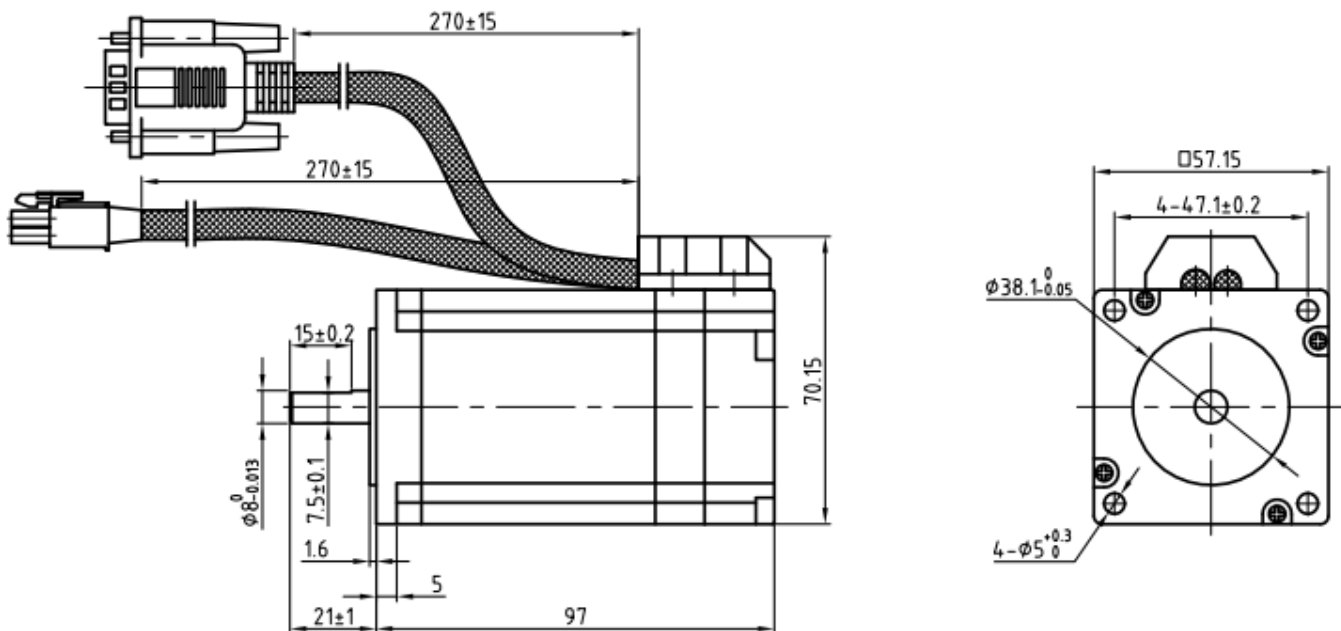
ES-M22430 (B-/GRN)
ES-M23440
ES-M23480



4.2 Mechanical Dimension



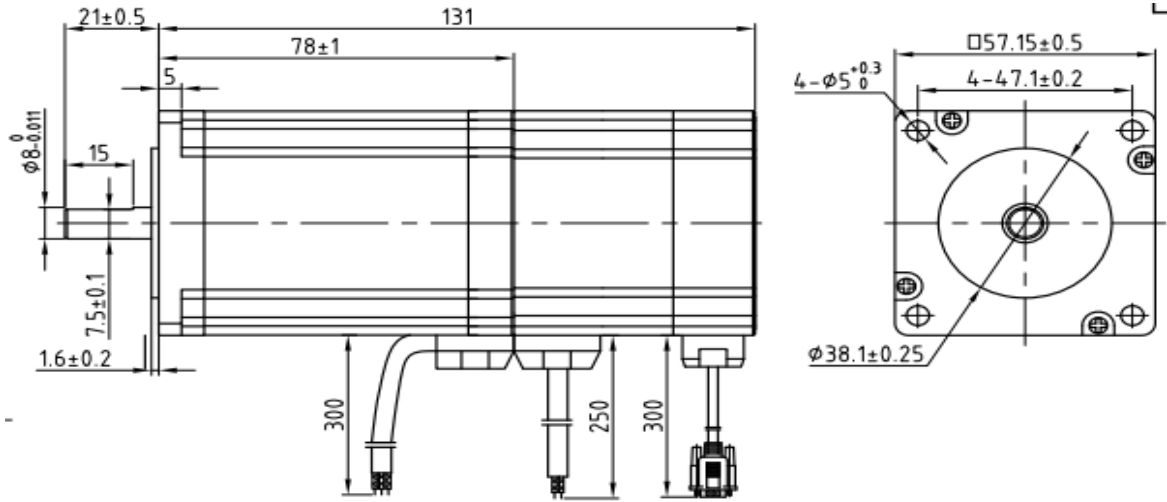
Mechanical Specification of ES-M32309



Mechanical Specification of ES-M32320

*Note: The Mechanical Specification of ES-M32309-S and ES-M32320-S are the same as ES-M32309 and ES-M32320 respectively, but the shaft diameter of ES-M32309-S and ES-M32320-S are all 6.25mm.

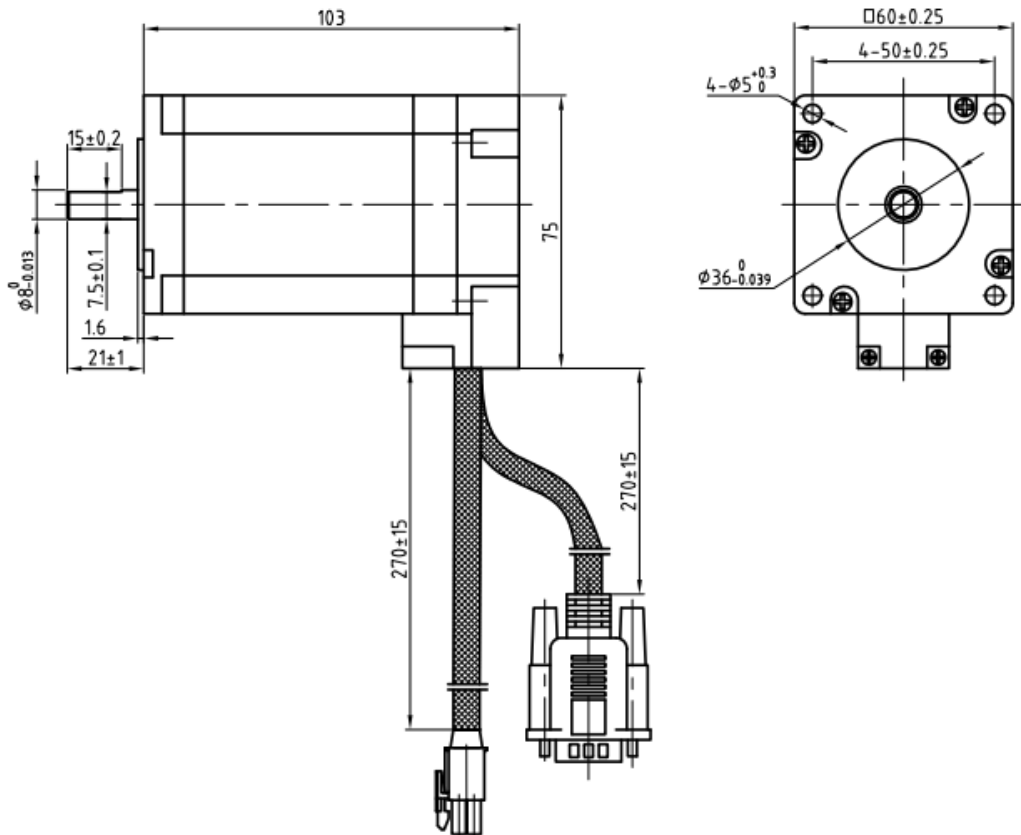




Brake Specification:

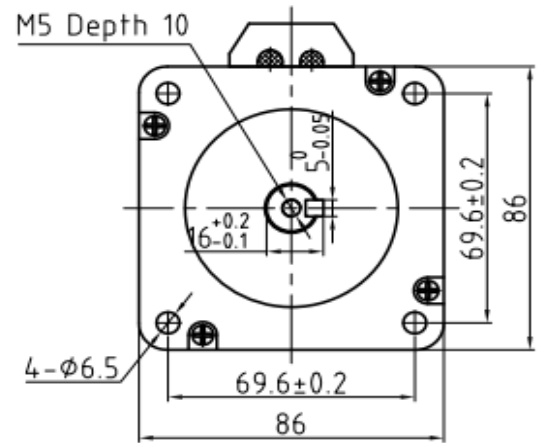
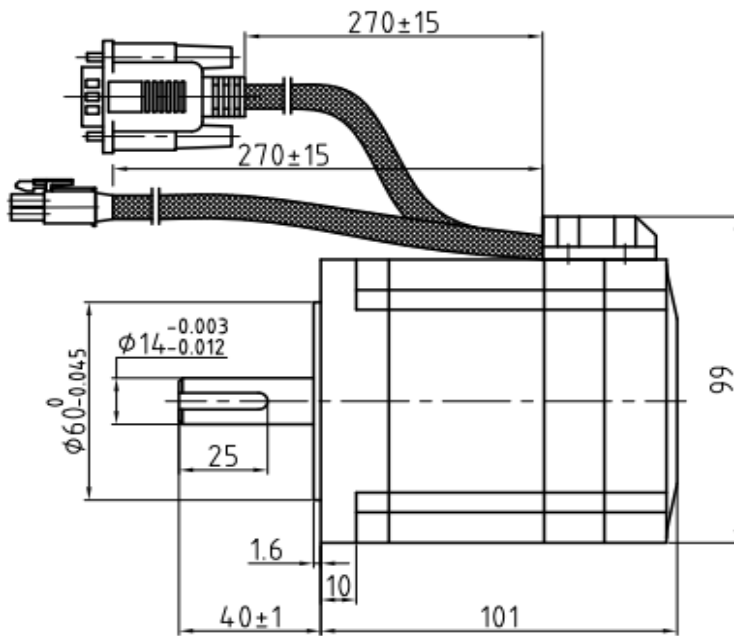
Voltage	24 Vdc
Friction torque	1N·M

Mechanical Specification of ES-M32320B

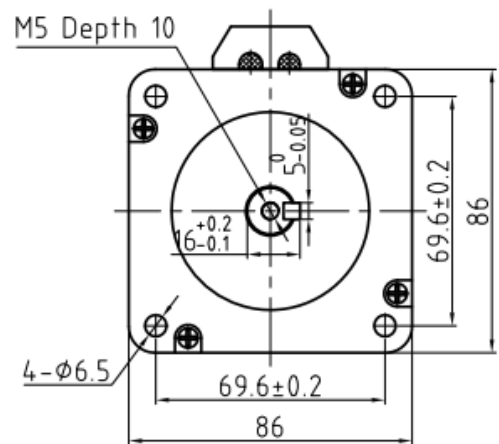
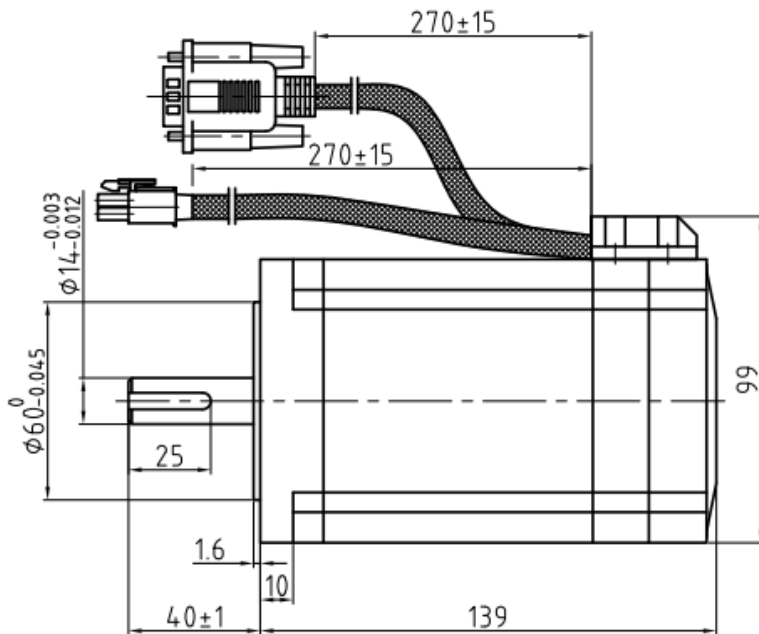


Mechanical Specification of ES-M22430





Mechanical Specification of ES-M23440



Mechanical Specification of ES-M23480

*Note: The Mechanical Specification of ES-M23440-S and ES-M23480-S are the same as ES-M23440 and ES-M23480 respectively, but the shaft diameter of ES-M23440-S and ES-M23480-S are all 12.7mm.

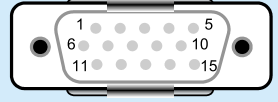


5 Motor Cable

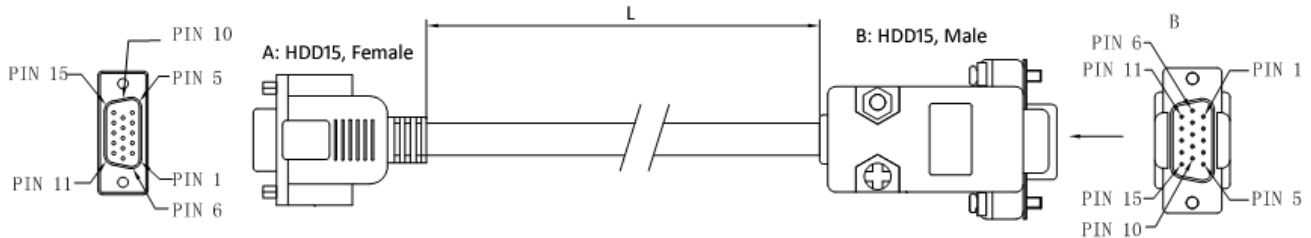
Part Number	Power Cable	Power Extension Cable	Encoder Cable	Encoder Extension Cable
ES-M32309	270±15mm	3.0m / CABLEH-RZ3M0 5.0m / CABLEH-RZ5M0 10.0m / CABLEH-RZ10M0	270±15mm (HDD15 Male)	3.0m / CABLEG-BM3M0
ES-M32320				8.0m / CABLEG-BM8M0
ES-M22430				10.0m / CABLEG-BM10M0
ES-M23440				12.0m / CABLEG-BM12M0
ES-M23480				

5.1 Encoder Cable

5.1.1 Encoder Cable Connector

Pin	Name	Wire Color	I/O	Description	Connector
1	EA+	Black	O	Channel A+ Output	 <p>HDD15 Male</p>
2	VCC	Red	I	+5V Power Input	
3	GND	White	GND	Ground	
4	NC	-	-	No Connection	
5	NC	-	-	No Connection	
6	NC	-	-	No Connection	
7	NC	-	-	No Connection	
8	NC	-	-	No Connection	
9	NC	-	-	No Connection	
10	NC	-	-	No Connection	
11	EB+	Yellow	O	Channel B+ Output	
12	EB-	Green	O	Channel B- Output	
13	EA-	Blue	O	Channel A- Output	
14	NC	-	-	No Connection	
15	NC	-	-	No Connection	

➤ CABLEG-BMXMX (ES-M32309, ES-M32320)



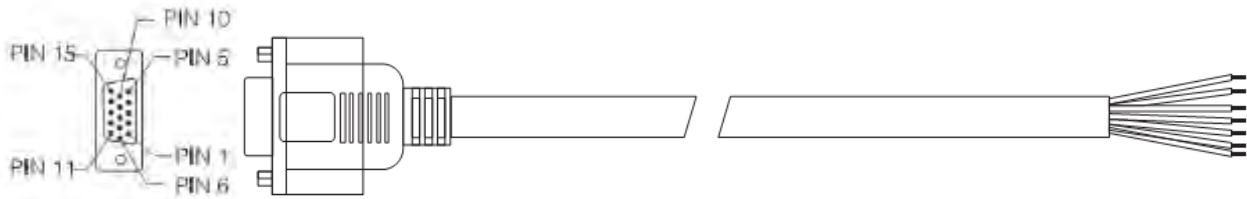
➤ CABLEG-BMXMX Pin Assignments

A: HDD15 Female	Wire Color	B: HDD15 Male	Name	Description
Pin		Pin		
1	Black	1	EA+	Channel A+



2	Red	13	VCC	+5V power input
3	White	3	GND	+5V GND
11	Yellow	2	EB+	Channel B+
12	Green	12	EB-	Channel B-
13	Blue	11	EA-	Channel A-

➤ **CABLEH-BMXXMX (ES-M22430, ES-M23440, ES-M23480)**



➤ **CABLEH-BMXXMX Pin Assignments**

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

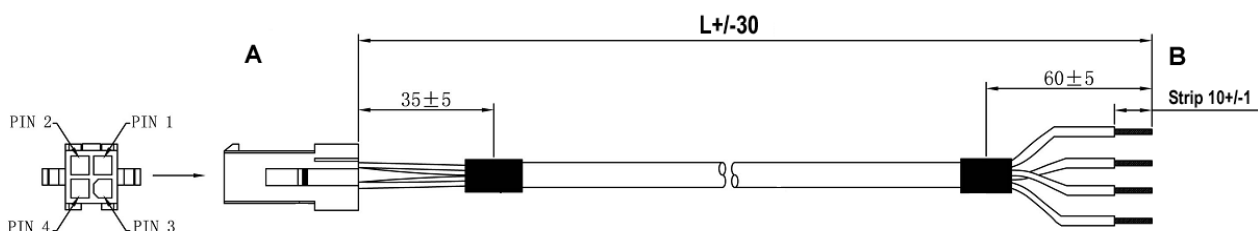
5.1.2 Encoder Extension Cable

Part Number	L	Matching Motor
CABLEG-BM3M0	3.0m	ES-M32309, ES-M32320
CABLEG-BM8M0	8.0m	(Note: The encoder extension cable must be connected between the ES-M3 motor and the ES-D508. You can not connect the motor's encoder cable to the ES-D508 directly.)
CABLEG-BM10M0	10.0m	
CABLEG-BM12M0	12.0m	
CABLEH-BM3M0	3.0m	ES-M22430, ES-M23440, ES-M23480 (Note: The encoder extension cable must be connected between the ES-M2 motor and the ES-D drive. You can not connect the motor's encoder cable to the ES-D808 / ES-D1008 directly.)
CABLEH-BM5M5	5.5m	
CABLEH-BM8M0	8.0m	
CABLEH-BM10M0	10.0m	
CABLEH-BM13M0	13.0m	

5.2 Power Cable

5.2.1 Power Cable Connector

➤ **CABLEH-RZXMX (ES-M32309, ES-M32320, ES-M22430, ES-M23440, ES-M23480)**



➤ CABLEH-RZXMX Pin Assignments and Drive Connections

A	B	ES-D508	ES-D808, ES-D1008
Pin	Wire Color	Motor Connector	
1	Blue	V	B-
2	Red	U	A-
3	Black	W	A+
4	Yellow / Green	NC	B+

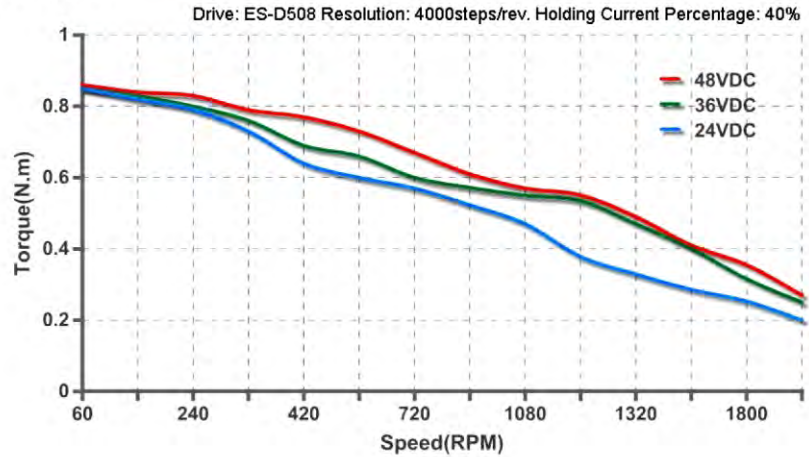
5.2.2 Power Extension Cable

Part Number	L	Matching Motor
CABLEH-RZ3M0	3.0m	ES-M32309, ES-M32320, ES-M22430, ES-M23440, ES-M23480
CABLEH-RZ5M0	5.0m	
CABLEH-RZ10M0	10.0m	

6 Speed-Torque Curves

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%. For more details, please refer to the software user manual.

ES-M32309

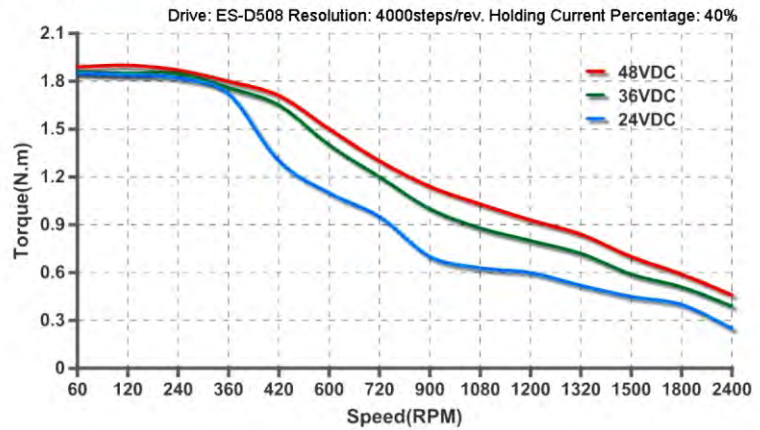


Speed Torque Curve of ES-M32309



ES-M32320

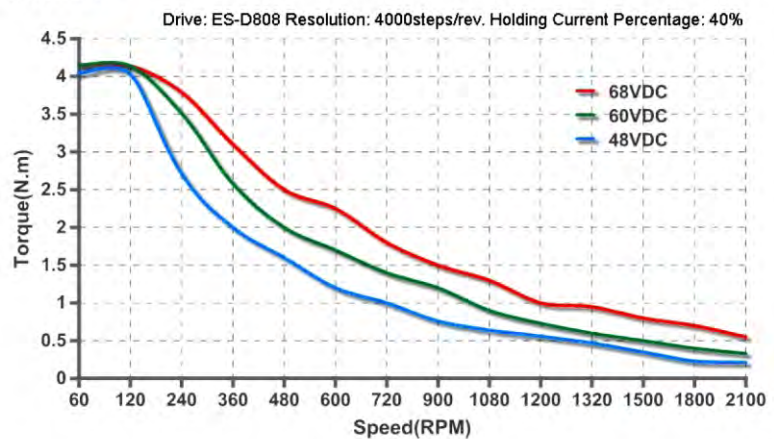
Note: These curves are based on 40% holding torque percentage of ES-D508. If higher torque at high speed is required, you can change the holding torque percentage to 100%. For more details, please refer to the software user manual.



Speed Torque Curve of ES-M32320

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%. For more details, please refer to the software user manual.

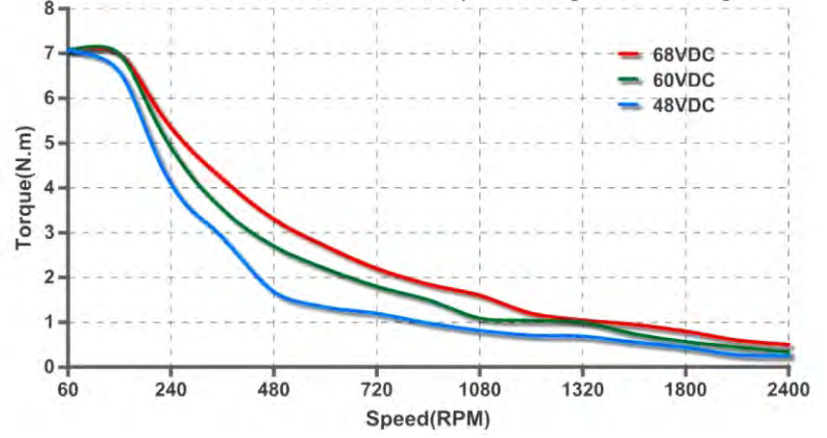


Speed Torque Curve of ES-M23440



ES-M23480

Drive: ES-D808 Resolution: 4000steps/rev. Holding Current Percentage: 40%



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%. For more details, please refer to the software user manual.

Speed Torque Curve of ES-M23480

