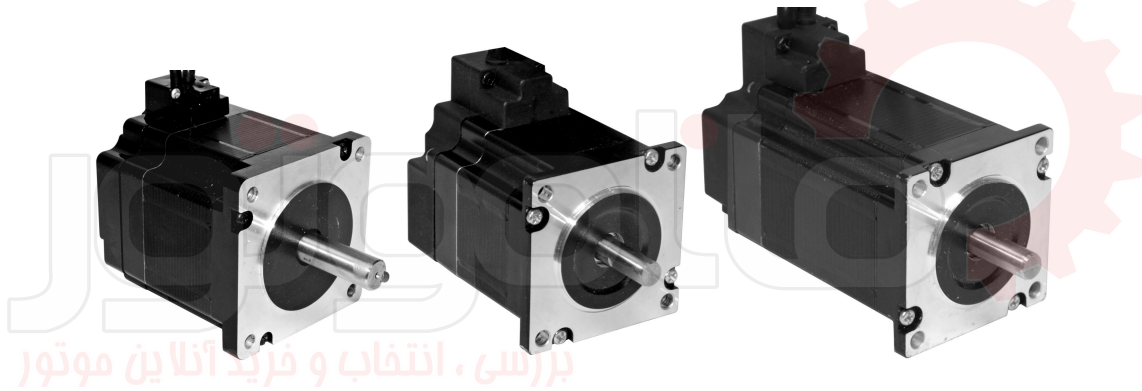




# Leadshine

*Datasheet of the Easy Servo Motor*

*ES-M Series*



Stepper Motor with Encoder, 0.9 - 8 Nm

Version 1.3

<http://www.Leadshine.com>

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

## Encoder Specifications

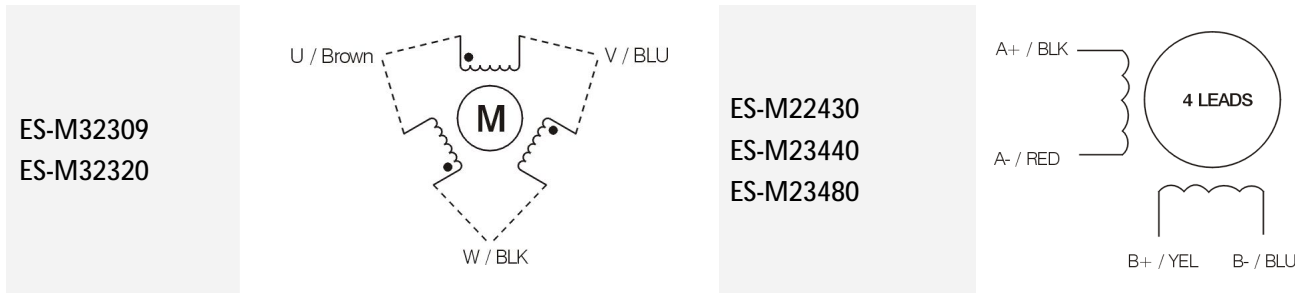
Parameter	Min	Typical	Max	Unit
Supply Voltage	4.5	5	5.5	VDC
Output Current per Channel	-1	-	5	mA
Low Level Output Voltage	-	-	0.4	VDC
High Level Output Voltage	2.4	-	-	VDC
Count Frequency	-	-	100	kHz

## Motor Specifications

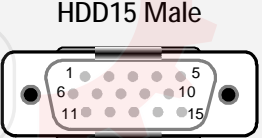
Part Number	Phase	Step Angle (°)	Leads	Holding Torque (N.m)	Phase Current (A)	Phase Resistance (Ohm)	Phase Inductance (mH)	Rotor Inertia (kg.cm <sup>2</sup> )	Weight (Kg)	Shaft Diameter (mm)
ES-M32309	3	1.2°	3	0.9	5.8	0.37	0.92	0.3	0.9	8
ES-M32320	3	1.2°	3	2.0	5.8	0.62	1.85	0.5	1.35	8
ES-M22430	2	1.8°	4	3.0	3	0.39	1.71	0.52	1.5	8
ES-M23440	2	1.8°	4	4.0	5.5	0.46	4.0	1.5	2.5	14
ES-M23480	2	1.8°	4	8.0	6.0	0.44	3.73	2.7	4.0	14

## Motor Wiring Diagram

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



## Encoder Cable Connector

Pin	Name	Wire Color	I/O	Description	Connector
1	EA+	Black	O	Channel A+ output	
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	

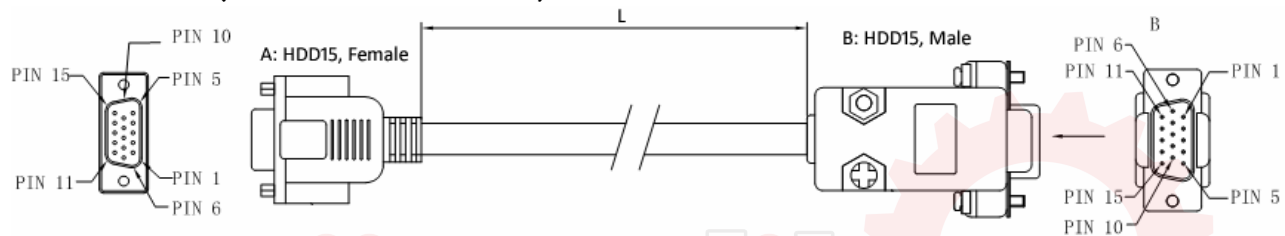
## Cable Specifications

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				

## 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	
CABLEH-BM5M5	5.5m	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-BM8M0	8.0m	
CABLEH-BM10M0	10.0m	
CABLEH-BM13M0	13.0m	

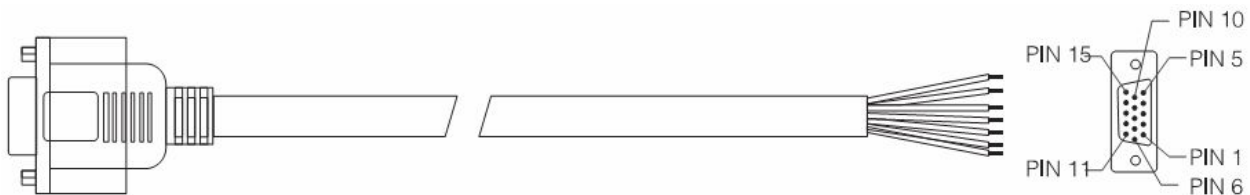
### CABLEG-BMXXMX (ES-M32309, ES-M32320)



### CABLEG-BMXXMX Pin Assignments

A: HDD15 Female		B: HDD15 Male		Name	Description
Pin	Wire Color	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)



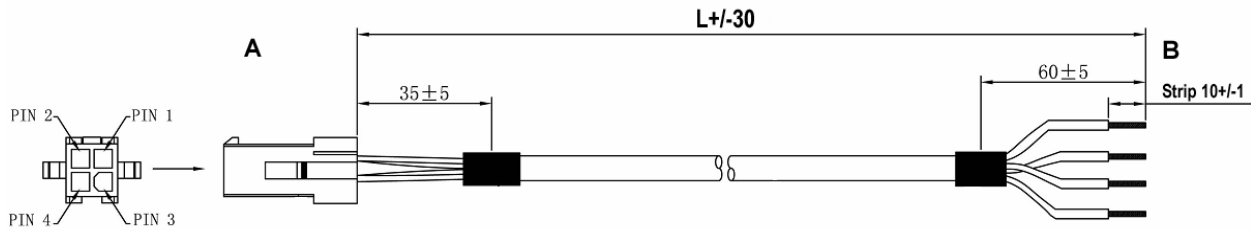
### CABLEH-BMXXMX Pin Assignments

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-

## 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	

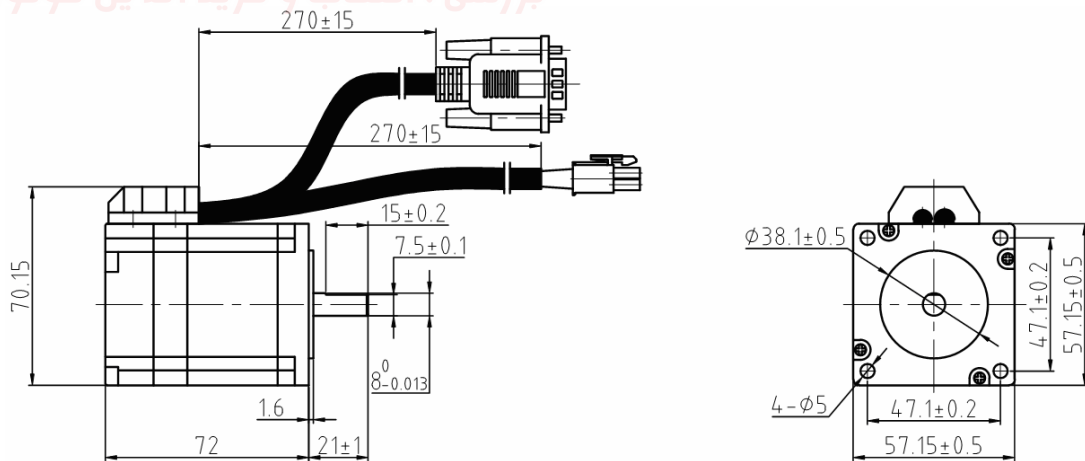
### CABLEH-RZXXMX (ES-M32309, ES-M32320, ES-M22430, ES-M23440, ES-M23480)



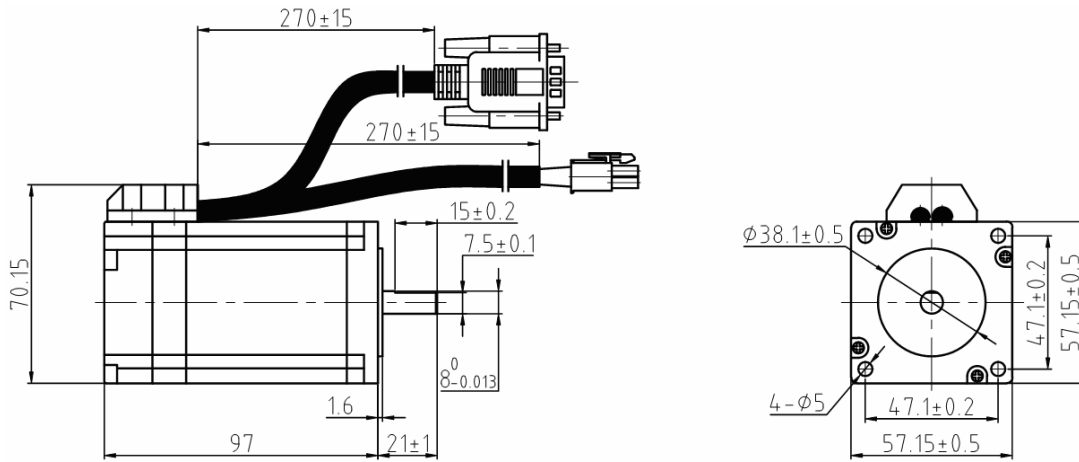
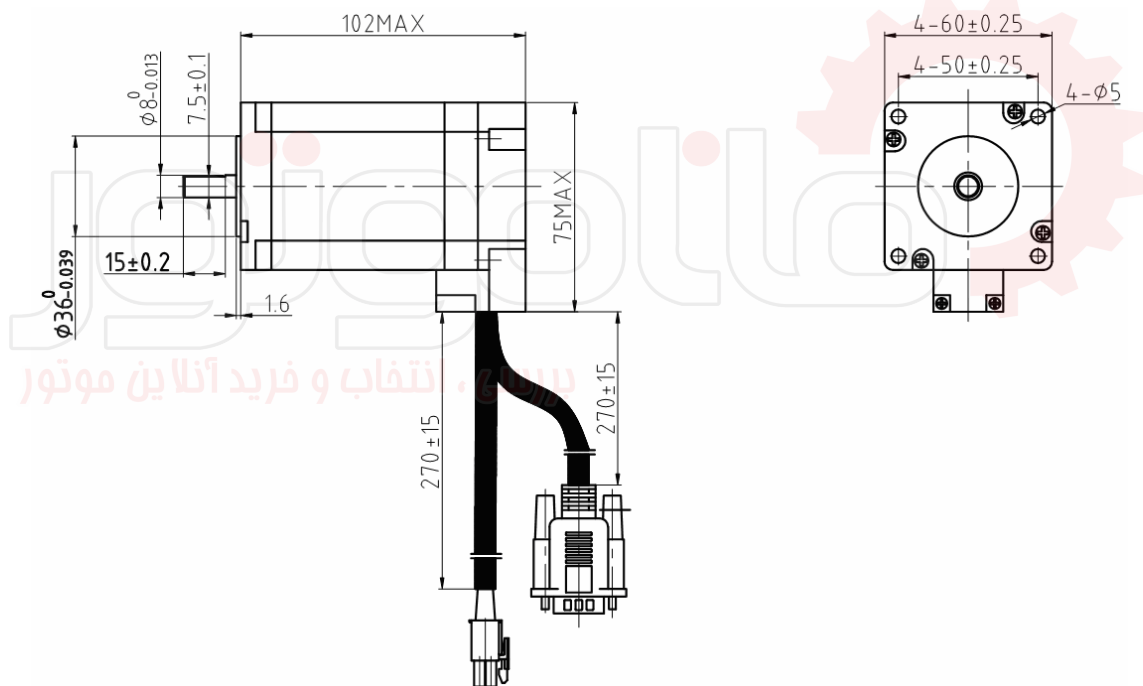
### CABLEH-RZXXMX Pin Assignments and Drive Connections

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+

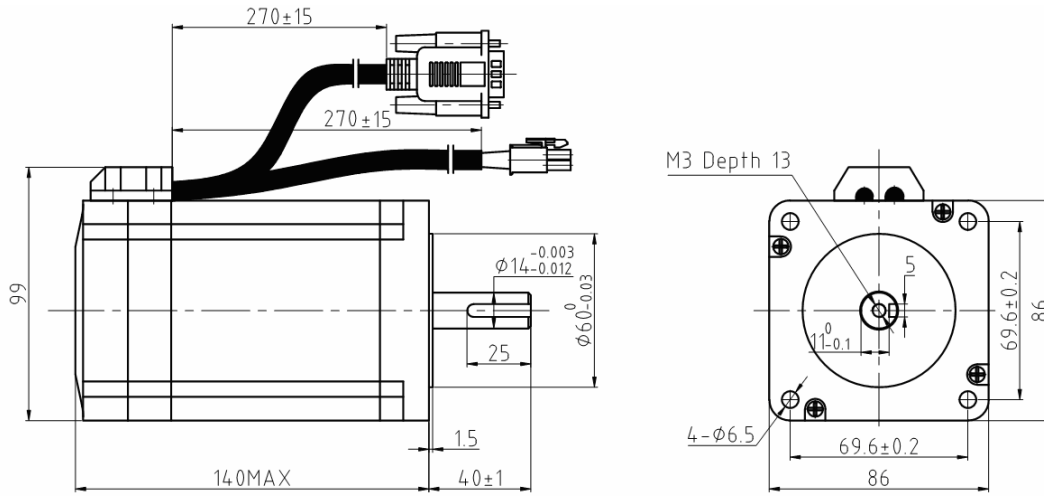
### Mechanical Specifications



Mechanical Specification of the ES-M32309

**Mechanical Specifications (Continued)**

**Mechanical Specification of the ES-M32320**

**Mechanical Specification of the ES-M22430**

### Mechanical Specifications (Continued)



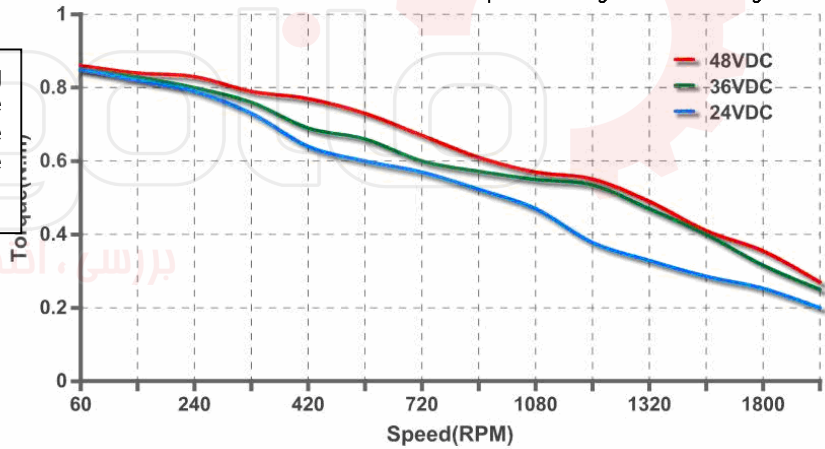
Mechanical Specification of the ES-M23480

### Speed-Torque Curves

#### ES-M32309

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

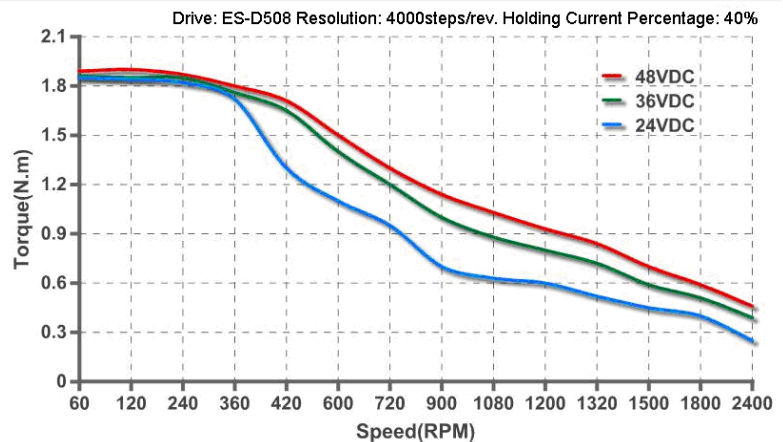
Note: These curves are based on 40% holding torque percentage of ES-D508. If higher torque at high speed is required, you can change the holding torque percentage to 100%. See software manual.



Speed Torque Curve of the ES-M32309

**Speed-Torque Curves (Continued)**
**ES-M32320**

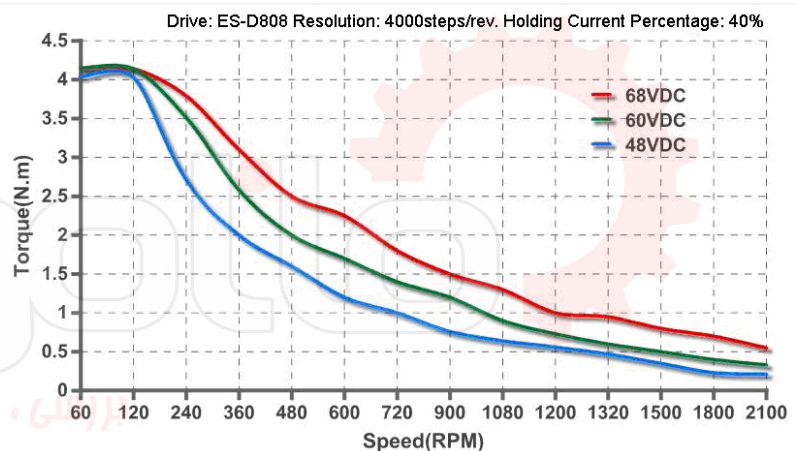
Note: These curves are based on 40% holding torque percentage of ES-D508. If higher torque at high speed is required, you can change the holding torque percentage to 100%. See software manual.



Speed Torque Curve of the ES-M32320

**ES-M23440**

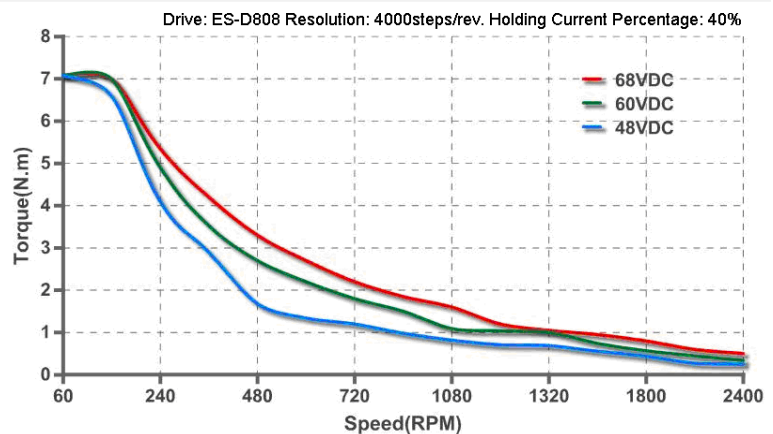
Note: These curves are based on 40% holding torque percentage of ES-D808. If higher torque at high speed is required, you can change the holding torque percentage to 100%. See software manual.



Speed Torque Curve of the ES-M23440

**ES-M23480**

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.



Speed Torque Curve of the ES-M23480