



# Leadshine

*Datasheet of the Easy Servo Motor*

*ES-MH Series*



High Voltage Stepper Motor with Encoder, 8 - 20 Nm

Version 1.4

<http://www.Leadshine.com>

## Descriptions

Leadshine's ES-MH series easy servo motors, or stepping motors with encoders, are specially designed for 120VAC / 230VAC input with extra low motor heating. They can work with Leadshine easy servo drives including ES-DH1208 and ES-DH2306. They are currently available from NEMA 34 to NEMA 42 with holding torque from 8 Nm to 20 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	Motor Type	Motor Size	Holding Torque		
		MH: High Voltage Motor	2: 2-Phase	23: N EMA23 (57mm)	09: 0.9 Nm		
			3: 3-Phase	24: NEMA24 (60mm)	20: 2.0 Nm		
				34: NEMA34 (86mm)	40: 4.0 Nm		
				42: NEMA42 (110mm)			

## Encoder Specifications

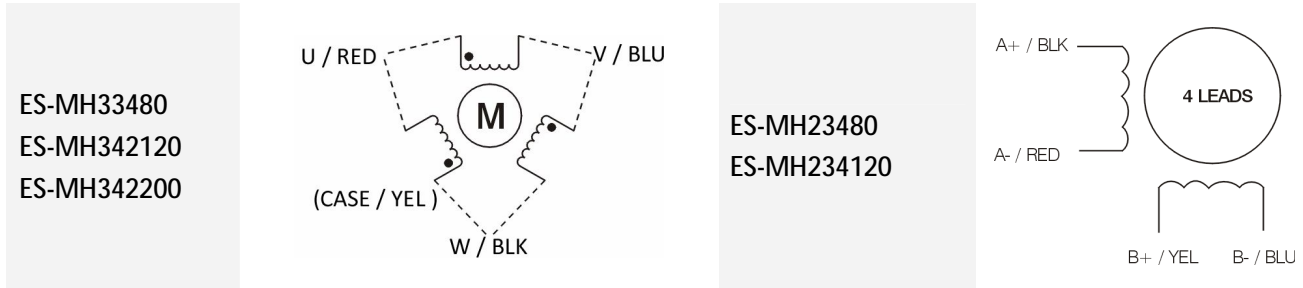
Parameter	Min	Typical	Max	Unit
Supply Voltage	4.5	5	5.5	VDC
Output Current per Channel	-1	-	5	mA
Low Level Output Voltage	-	-	0.4	VDC
High Level Output Voltage	2.4	-	-	VDC
Count Frequency	-	-	100	KHz

## Motor Specifications

Model	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-MH23480	2	1.8°	4	8.0	4.8	0.38	3.1	2.7	4.0	14
ES-MH234120	2	1.8°	4	12	5.5	-	-	-	5.6	14
ES-MH33480	3	1.2°	3	8.0	3.0	2.34	18.33	4	5.6	14
ES-MH342120	3	1.2°	3	12	4.2	1.2	13	11	8.6	19
ES-MH342200	3	1.2°	3	20	5.2	1.88	18	17	12.8	19

## Motor Wiring Diagram

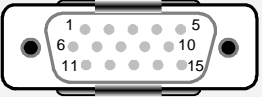
Note: Contact Leadshine for the wiring diagram of other motors.



## Cable Specifications

Part Number	Power Cable	Power Extension Cable	Encoder Cable	Encoder Extension Cable
ES-MH23480	270±15mm	3.0m / CABLEH-RZ3M0 5.0m / CABLEH-RZ5M0 10.0m / CABLEH-RZ10M0	270±15mm (HDD15 Male)	3.0m / CABLEG-BM3M0
ES-MH234120				8.0m / CABLEG-BM8M0
ES-MH33480				10.0m / CABLEG-BM10M0
ES-MH342120				12.0m / CABLEG-BM12M0
ES-MH342200				

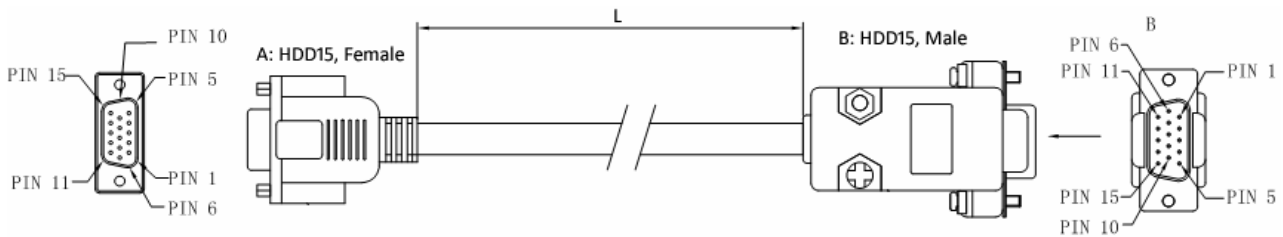
## Encoder Cable Connector

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	

## Encoder Extension Cable

Part Number	L	Matching Motor
CABLEG-BM3M0	3.0m	ES-MH23480, ES-MH234120, ES-MH33480, ES-MH342120, ES-MH342200
CABLEG-BM8M0	8.0m	(Note: The encoder extension cable must be connected between the ES-M3 motor and the ES-DH drive. You can not connect the motor's encoder cable to the ES-DH1208 / ES-DH2306 directly.)
CABLEG-BM10M0	10.0m	
CABLEG-BM12M0	12.0m	

### CABLEG-BMXXM (ES-MH23480, ES-MH234120, ES-MH33480, ES-MH342120, ES-MH342200)



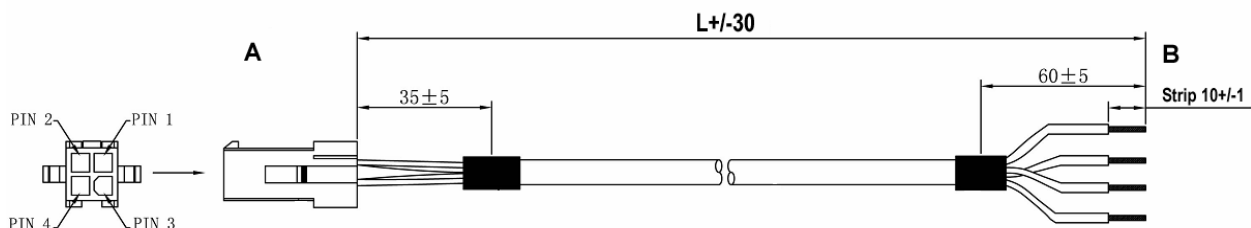
### CABLEG-BMXXM Pin Assignments

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-

## Power Extension Cable

Part Number	L	Matching Motor
CABLEH-RZ3M0	3.0m	ES-MH23480, ES-MH234120, ES-MH33480, ES-MH342120, ES-MH342200
CABLEH-RZ5M0	5.0m	
CABLEH-RZ10M0	10.0m	

### CABLEH-RZXXM (ES-MH23480, ES-MH234120, ES-MH33480, ES-MH342120, ES-MH342200)

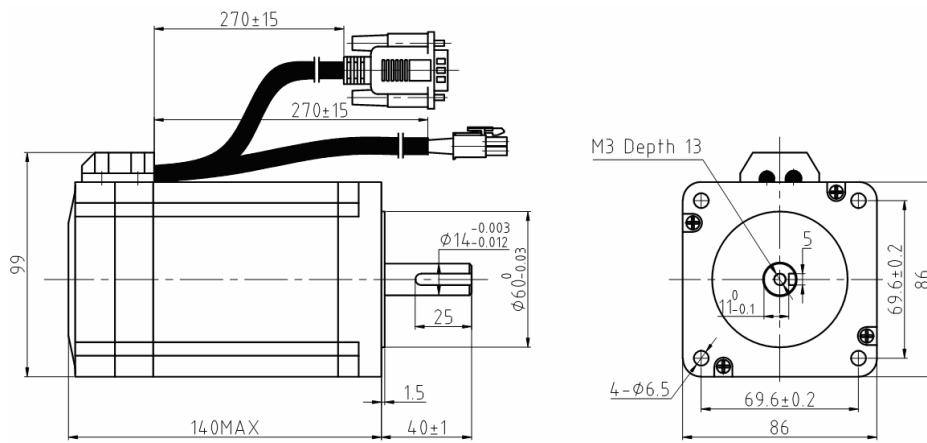


### Power Extension Cable (Continued)

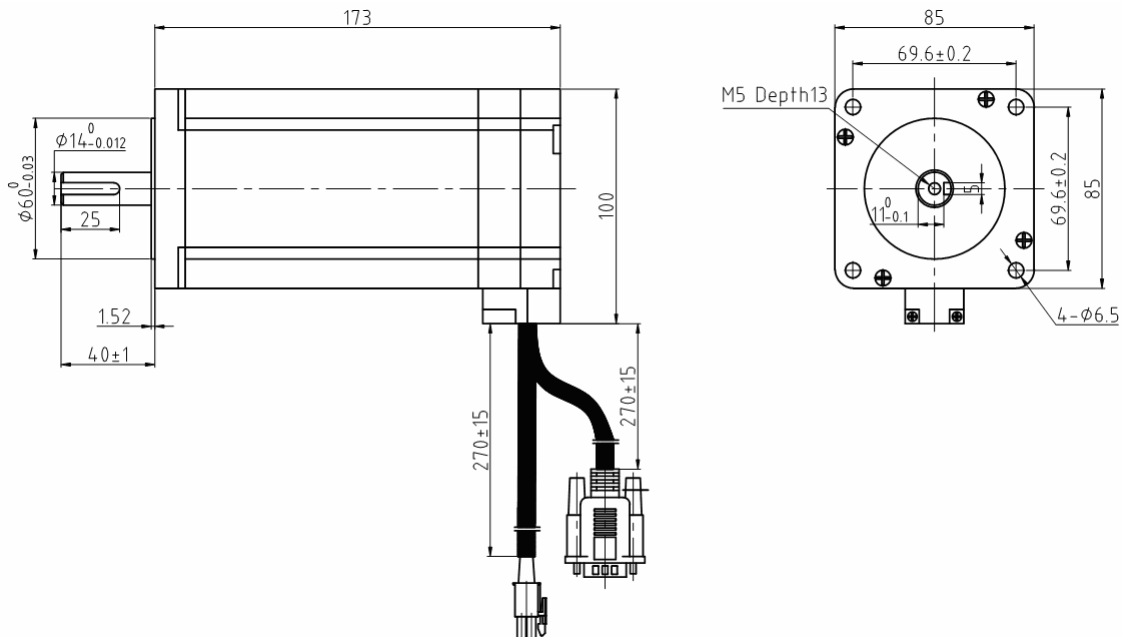
#### CABLEH-RZXXM Pin Assignments and Drive Connections

A	B	ES-DH2306	ES-D1208
Pin	Wire Color	Motor Connector	
1	Blue	V	B-
2	Red	U	A-
3	Black	W	A+
4	Yellow / Green	PE	B+

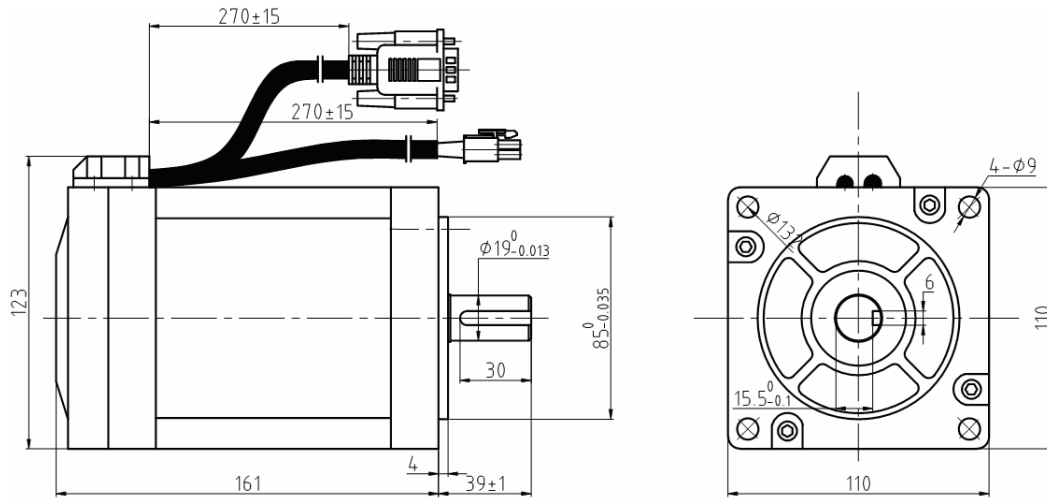
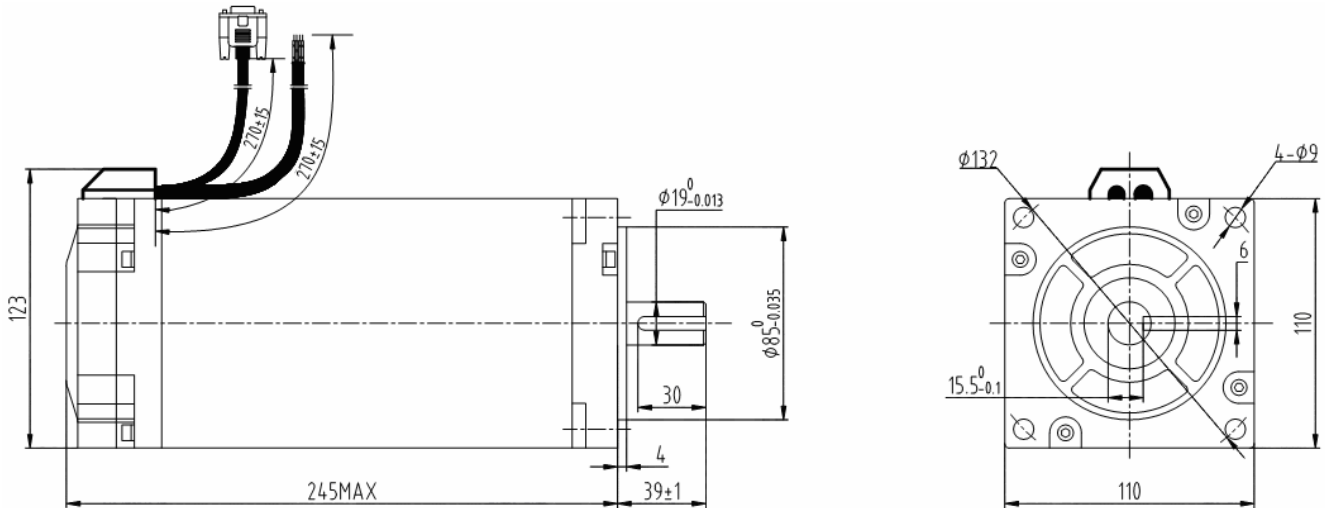
### Mechanical Specifications



Mechanical Specification of ES-MH23480

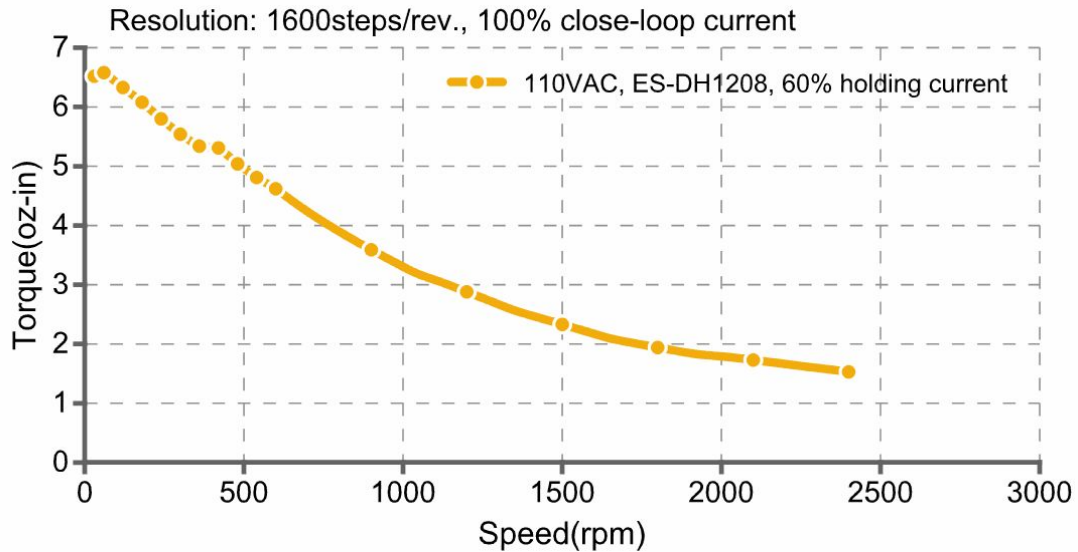


Mechanical Specification of ES-MH33480

**Mechanical Specifications (Continued)**

**Mechanical Specification of ES-MH342120**

**Mechanical Specification of ES-MH342200**

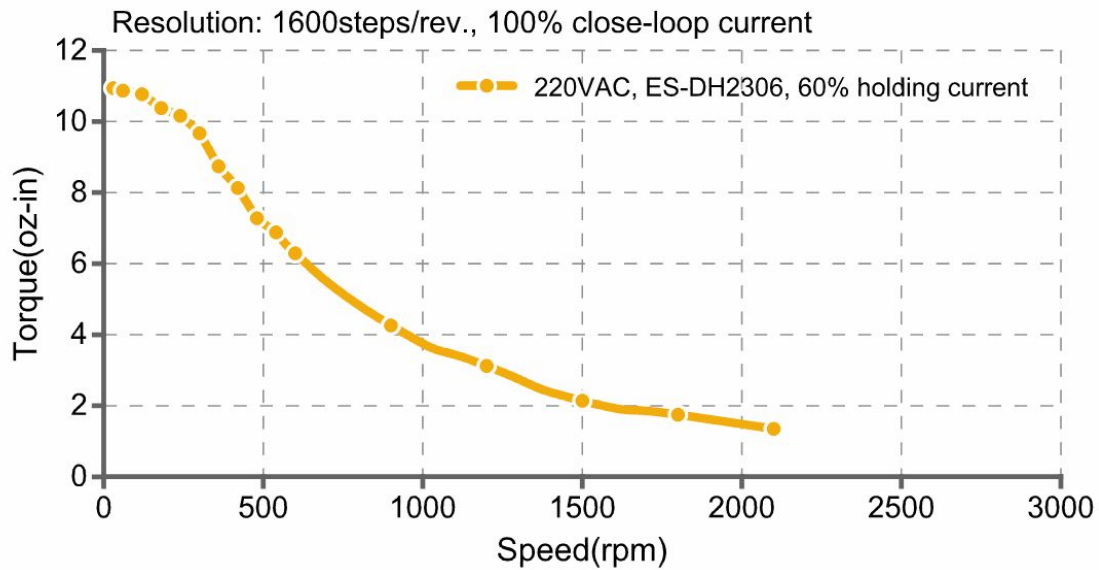
## Speed-Torque Curves

### ES-MH23480



Speed Torque Curve of ES-MH23480

### ES-MH33480



Speed Torque Curve of ES-MH33480