Leadshine

Reliable Motion Control

Easy Servo Products

Closed–loop, No Tuning

- **Quick Response**
- **Extra-low Heating**
- **Highly Cost-effective**

(Holding Torque: 0.3 Nm to 20 Nm)

Leading Technology *Shining Value*

Note: Product appearance and technical parameters are subject to change without notice.

Headquarters

Company Overview

Founded in 1997 by Warren Li, a MIT PhD graduate and former USA professor, Leadshine Technology Co., Ltd. is a leading technology company dedicated to design, manufacture, market, and support reliable and affordable motion control products based on the latest control technologies. Leadshine offers a full complement of products including motion controllers, control systems, servo drives & motors, integrated servos, easy servo drives & motors (closed loop steppers), integrated easy servo motors, stepper drives & motors, and integrated steppers. Today, Leadshine is one of the largest motion control companies in the world to provide solutions and quality products to tens of industries, and thousands of OEM clients in Asia, Europe, North & South America, Australia, and Africa.

Leadshine is committed to providing its customers with world-class motion control products at highly competitive prices. "LEADING technology and SHINING value" is always what Leadshine dedicated to offer.

R&D

Led by Dr. Warren Li, a PhD majored in robotics & servo controls from MIT, Leadshine has one of the largest R&D teams in the motion control industry. The team consists of more than 100 R&D engineers. All of them are highly educated while most of them carry PhD & Master degrees in controls, electrical & electronics engineering, mechanical engineering, mechatronics, computer engineering, or computer science. Their strong background, experience & dedication make Leadshine capable of designing superior quality products of servos, steppers, controllers..., in the most efficient way based on the latest technologies. Many innovative designs and products from Leadshine have been awarded patents, and helped our customers to design & build high quality machines in cost effective ways.

Product Quality

All products offered by Leadshine are at industrial quality and have proven records of successfully implemented in tens of industries by thousands of OEM clients in the world.

Leadshine has been ISO9001 certified for quality management practices since 2004. Our products are made of high quality materials, and produced by following rigorus manufacturing and quality control procedures. From supplier selection to raw material inspection, to manufacturing, to in-producss quality control, and to final quality assurance, each process is strictly controlled to guarantee that every single Leadshine product will meet the pre-set tough quality standards. Most of our products are certified with CCC, CE, and UL/CUL.

Support and Service

Staffed with a highly professional and experienced application support team, Leadshine can help in the whole process of product development including initial application evaluation, product selection, design help & suggestion, and technical support. Our expertise and experience allow us to help OEM clients to produce competitive high quality machines in their industries. Leadshine can provide assistance and support services through email, telephone, and field support.

In addition, Leadshine also has a global distribution network consisting of local distributors that are highly experienced in the motion industry and understand their clients' application needs, to provide product selection support, system design assistance, sales & after-sales services, and technical support.

Easy Servo Products

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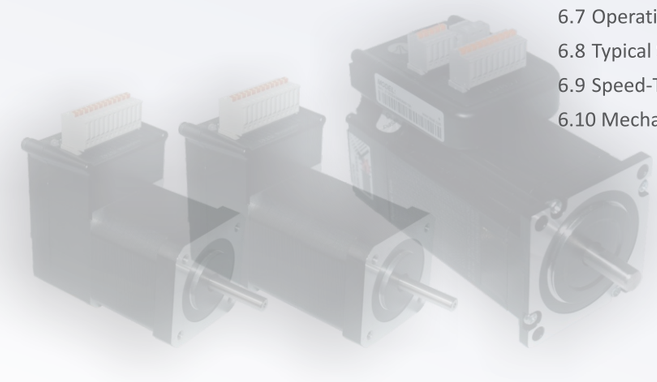


01 ES Series
Easy Servo Systems

1.1 Introduction

The ES series easy servos offer an alternative for applications requiring high performance and high reliability when the servo was the only choice, while it remains cost-effective. The system includes an easy servo motor combined with a high performance easy servo drive. The internal encoder is used to close the position, velocity and current loops in real time, just like servo systems. It combines the best of servo and stepper motor technologies, and delivers unique capabilities and enhancements over both, while at a fraction of the cost of a servo system !

Besides can be used to upgrade all stepper systems, its great features of quick response and no hunting make it ideal for applications such as bonding and vision systems in which rapid motions with a short distance are required and hunting would be a problem. It is also a great solution for applications where the equipment uses a belt-drive mechanism or has low rigidity and you don't want it to vibrate when stopping.

1.2 Advantages

Compared with a Conventional Stepper

- Closed loop for no loss of steps
- Broader operating range, higher torque and higher speed
- Extra low motor heating
- Smooth motion and extra-low motor noise
- Do not need a high torque margin

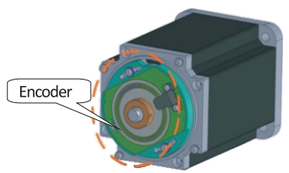
Compared with a Conventional Servo

- No tuning for most of applications and always stable
- Quick response, no delay and almost no settling time
- No hunting or no inherent dither
- High torque at starting and low speed, high stiffness at standstill
- Lower cost

1.3 Features

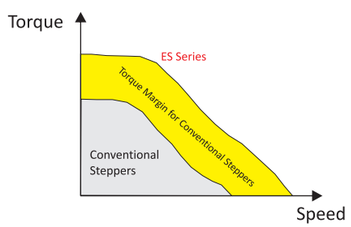
Closed loop for no loss of steps

In open-loop stepper systems, potential loss of motor movement synchronization limits their adoption for many applications. Engineers are usually forced to reserve up to 50% of available stepper motor torque to avoid possible loss of steps. With the adoption of high resolution encoders to feedback real time motor shaft positions, Leadshine ES series easy servo drives close the position loops between servo drives and driven motors, providing very reliable control like a servo.



Broader operating range

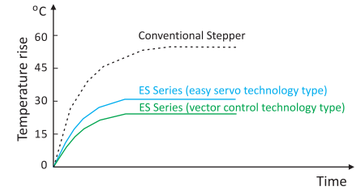
Due to closed loop control and adoption of advanced control algorithm, the ES series easy systems can always implement 100% torque of the motor, and do not need the huge 50% torque reservation in normal open-loop stepper systems. This feature significantly improves system high speed performance. While open-loop stepper systems are typically adopted in applications under 1,000 rpm, the ES series easy servo systems are ideal for many applications up to 2,000 RPM; sometimes even for 3,000 RPM!



Extra low motor heating

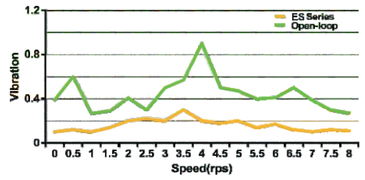
Usually in a open-loop stepper system, output current to the stepper motor from the step driver is constant. No matter what load condition is and how much current is needed. With the position loop closed in the ES series easy servo systems, output current from the servo drive to the driven motor is load based. The servo drive will only just-enough current into the motor as required to drive the motor to the target. This can significantly lower the drive and motor heating.

Compared with open loop systems, motor heating of in the ES series easy servo systems can be reduced for 20-40°C. Thus, life time in the ES series easy servo systems is much longer, power consumption is lower, and maintenance costs will also be reduced.



Smooth motion and Extra-low motor noise

Unlike conventional stepper systems, the ES series easy servo systems adopt vector control algorithm, same as brushless servo controls. Input commands are filtered for smooth motion with minimum torque ripples. Therefore, resonance in open-loop stepper systems is significantly minimized, and motor movement noise of can be significantly reduced, up to 70%.

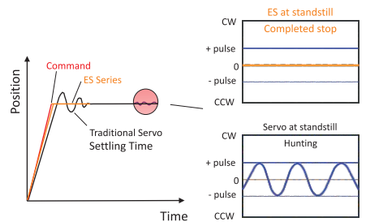


Quick response, no hunting

In a traditional brushless servo system ,there is a considerable delay for the servo motor to response ("move") to a command signal sent from a motion controller or PLC. This delay is caused by servo "settling time".

Leadshine ES series easy servo systems adopt servo control for stepper motors. Motor movement is always synchronized with input pulse commands. When receiving a pulse signal, an ES servo drive will response immediately and start motor movement. When it finishes execution of the input pulses, it stops immediately without any movement fluctuation. So, there is no hunting ("shaking") or overshooting, which is commonly seen in traditional brushless servo systems.

These features make the ES easy servo systems ideal for short-distance applications requiring rapid motion, such as bonding and vision type systems.

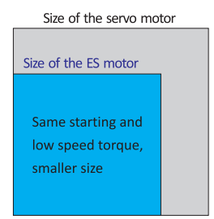


Plug and play, no tuning for most of applications

For traditional brushless servo systems, in order to get the preferred performance, an engineer usually has to spend hours even days, to tune servo gains which involves tens or even hundreds of servo parameter configurations. But there is no such much gain tuning for the ES series easy servo systems. They are designed for simple setup, "no tuning, plug and play", with all configurations are already optimized for most of applications. Save time and save cost.

High torque at starting & low speed, high inertial loads

Compared with traditional brushless servo systems, Leadshine ES series easy servo systems offer much higher start and low speed torque, due to the natural inheritance of high stiffness at standstill and high starting torque feature from stepper systems. This allows ES easy servo systems to perform direct drive of high inertia load, like flywheels and belt driving. But in traditional brushless servo systems, in order to get the preferred torque, expensive high power servo motors have to be chosen, or costly planetary gearboxes have to be added in many applications. While load inertia ratio normally can't exceed 10:1 in traditional brushless servo systems, that ratio can be as high as 100:1 in ES easy servo systems.



01 ES Series
Easy Servo Systems

1.4 Part Number

ES - D 808 V - C

① ② ③ ④ ⑤

① **ES**: Easy Servo

② **D**: Drive **DH**: High Voltage Drive

③ **508**: 50VDC, 8A Peak; ... **1008**: 100VDC, 8A Peak
1208: 120 VAC, 8A Peak; **2306**: 230 VAC, 6A Peak

④ **Blank**: Easy servo technology **V**: Vector control technology

⑤ **Blank**: Step&Direction **R**: RS485 **C**: CANopen

ES - M 3 23 20

① ② ③ ④ ⑤

① **ES**: Easy Servo

② **M**: Motor
MH: High Voltage Motor

③ **Motor Type:**
2: 2-phase;
3: 3-phase

④ **Motor Size:**
23: NEMA23 / ☐ 57 mm
34: NEMA34 / ☐ 86 mm

⑤ **Holding Torque:**
09: 0.9 N*m
20: 2.0 N*m
200: 20.0 N*m ...

Easy servo technology type, Low and medium voltage

NEMA23		NEMA24		NEMA34		
ES-D508	ES-M32309 (0.9 Nm) ES-M32320 (2.0 Nm)	ES-D808	ES-M22415 (1.5 Nm) ES-M22430 (3.0 Nm)	ES-D808	ES-D1008	ES-M23440 (4.0 Nm) ES-M23480 (8.0 Nm)
24 to 50 VDC, Typical: 36 VDC		24 to 80 VDC, Typical: 48 VDC		24 to 80/100 VDC, Typical: 60 VDC		

Easy servo technology type, High voltage

NEMA34		NEMA34		NEMA42	
ES-DH1208	ES-MH23480 (8.0 Nm) ES-MH234120 (12.0 Nm)	ES-DH2306	ES-MH33480 (8.0 Nm)	ES-DH2306	ES-MH342120 (12.0 Nm) ES-MH342200 (20.0 Nm)
90 to 130 VAC, Typical: 110 VAC		150 to 230 VDC, Typical: 220 VAC		150 to 230 VDC, Typical: 220 VAC	

Vector control technology type, Low and medium voltage

NEMA23		NEMA24		NEMA34		
ES-D508V	ES-M22309 (0.9 Nm) ES-M22320 (2.0 Nm)	ES-D808V	ES-M22415 (1.5 Nm) ES-M22430 (3.0 Nm)	ES-D808V	ES-D1008V	ES-M23440 (4.0 Nm) ES-M23480 (8.0 Nm)
24 to 50 VDC, Typical: 36 VDC		24 to 80 VDC, Typical: 48 VDC		24 to 80/100 VDC, Typical: 60 VDC		

Vector control technology type, High voltage

NEMA34		NEMA34		NEMA42	
ES-DH1208V	ES-MH23480 (8.0 Nm) ES-MH234120 (12.0 Nm)	ES-DH2306V	ES-MH33480 (8.0 Nm)	ES-DH2306V	ES-MH342120 (12.0 Nm) ES-MH342200 (20.0 Nm)
90 to 130 VAC, Typical: 110 VAC		150 to 230 VDC, Typical: 220 VAC		150 to 230 VDC, Typical: 220 VAC	

02 ES Series
Easy Servo Drives

Operating Voltage up to

50VDC	80VDC	100VDC	150VAC	230VAC
				

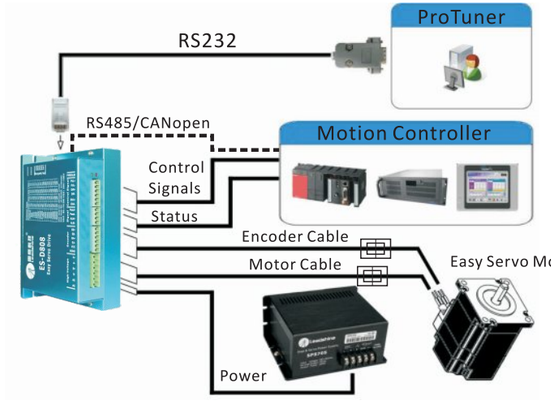
2.1 Specifications

Model	ES-D508/ ES-D508V	ES-D808/ ES-D808V	ES-D1008/ ES-D1008V	ES-DH1208/ ES-DH1208V	ES-DH2306/ ES-DH2306V
Operating Voltage	18 to 48 VDC	24 to 75 VDC	24 to 70 VAC	90 to 130 VAC	150 to 240 VAC
Output (Peak)	8.0 A				6.0 A
Control Algorithm	Easy servo technology for plug and play, or vector control technology for extra-low heating and smooth motion				
Maximum Input Frequency	200 kHz*				
Command Input	Step/Direction, Enable/Disable				
Status Output	In position, Fault status				
Encoder Feedback	A, B (differential)				
Protection Functions	Over-current, Over-voltage, Position following error				
Matching Motors	ES-M32309 ES-M32320	ES-M22309 ES-M22320 ES-M22415 ES-M22430	ES-M23440 ES-M23480	ES-MH23480 ES-MH234120	ES-MH33480 ES-MH342120 ES-MH342200
Encoder Resolution	1000/2500/5000 line optional				
Weight	280 g	570 g	600 g / 1200 g	1600 g	1800 g

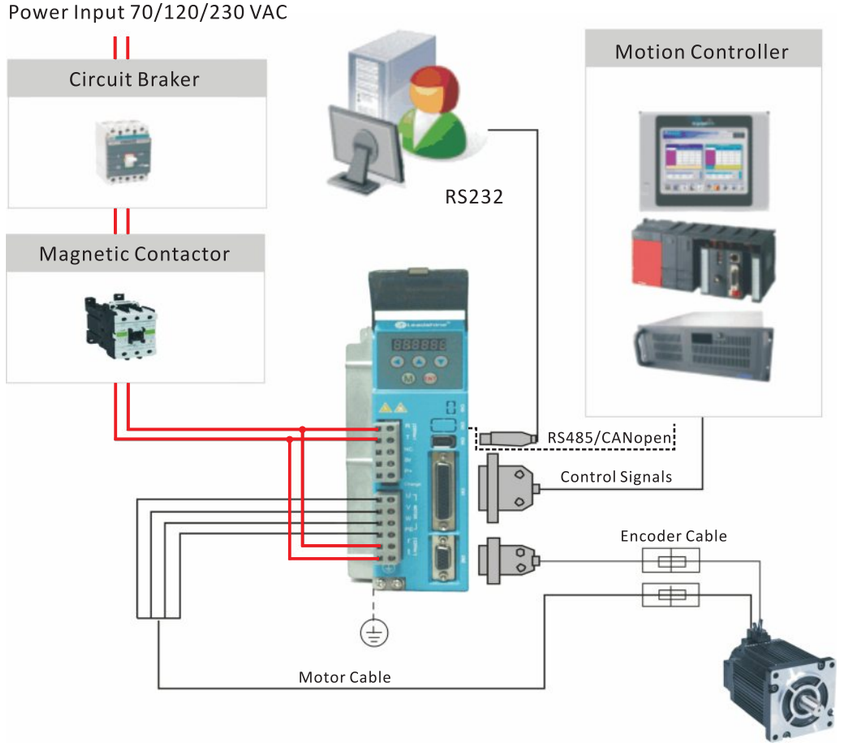
*Can be customized.

2.2 Typical System Configurations

ES-D508/ES-D508V
ES-D808/ES-D808V
ES-D1008



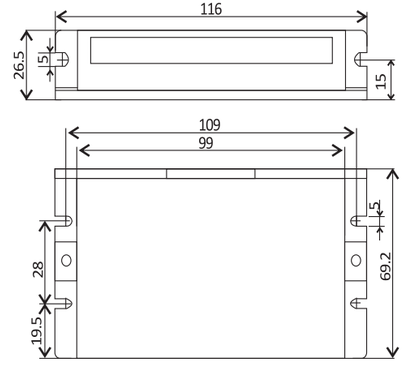
ES-D1008V
ES-DH1208/ES-DH1208V
ES-DH2306/ES-DH2306V



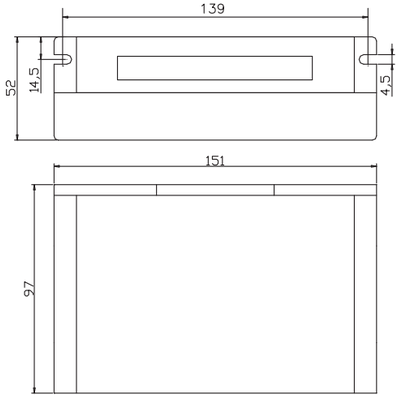
2.3 Mechanical Specifications

Units: mm 1 inch = 25.4mm

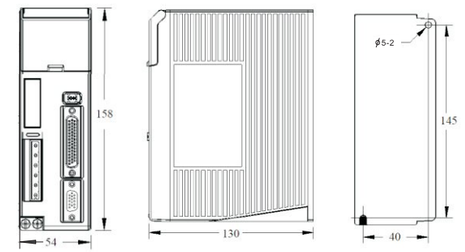
ES-D508 / ES-D508V



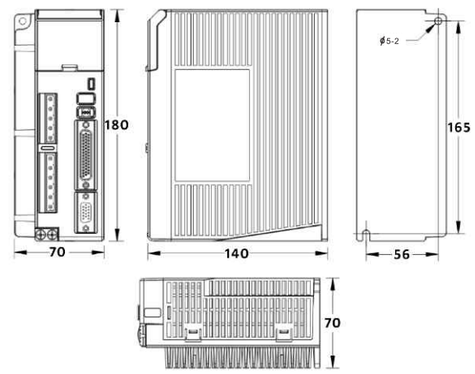
ES-D808 / ES-D808V / ES-D1008



ES-D1008V



ES-DH1208 / ES-DH1208V / ES-DH2306 / ES-DH2306V



03 ES Series
Easy Servo Motors

Frame Size	NEMA23 (57mm)	NEMA24 (60mm)	NEMA34 (86mm)	NEMA42 (110mm)
Holding Torque	0.9 Nm 2.0 Nm	1.5 Nm 3.0 Nm	4.0 Nm 8.0 Nm 12.0 Nm	12.0 Nm 20.0 Nm

Low and medium voltage

ES-M32309
ES-M32320

ES-M22309
ES-M22320

ES-M22415
ES-M22430

ES-M23440
ES-M23480

High voltage

ES-MH23480
ES-MH234120

ES-MH33480

ES-MH342120
ES-MH342200

Remark: NEMA17 easy servo motors and easy servo motors with brakes are also available. Contact Leadshine or visit our website for the latest information please.

3.1 Specifications

Low and medium voltage

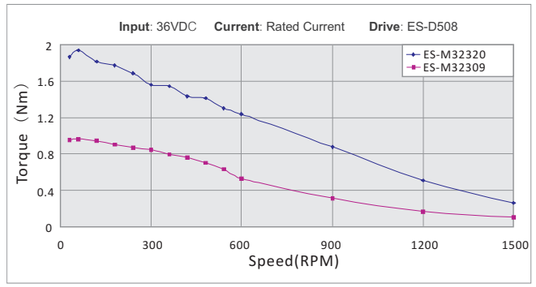
Model	Units	ES-M32309	ES-M32320	ES-M22415	ES-M22430	ES-M23440	ES-M23480
Current/Phase	A	5.8	5.8	2.5	3	5.5	6
Holding Torque	Nm	0.9	2	1.5	3	4	8
Speed Range	RPM	0 to 2000	0 to 2000	0 to 2000	0 to 2000	0 to 2000	0 to 2000
Weight	Kg	0.85	1.4	1.1	1.6	2.56	3.95

High voltage

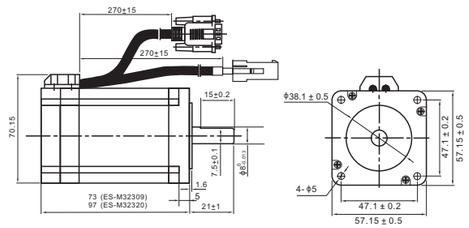
Model	Units	ES-MH23480	ES-MH234120	ES-MH33480	ES-MH342120	ES-MH342200
Current/Phase	A	5.0	5.5	3.5	4.0	4.5
Holding Torque	Nm	8	12	8	12	20
Speed Range	RPM	0 to 2000	0 to 2000	0 to 2000	0 to 2000	0 to 2000
Weight	Kg	4.0	5.6	5.6	8.6	10.5

3.2 Speed-Torque Curves and Mechanical Specifications

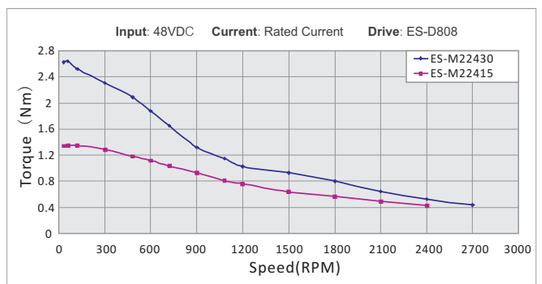
(a) ES-M32309 and ES-M32320

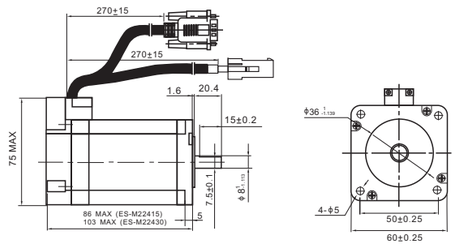


Units: mm 1 inch = 25.4mm



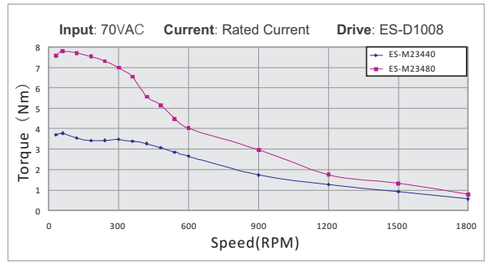
(b) ES-M22415 and ES-M22430



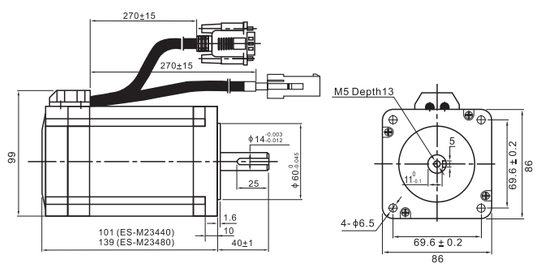


3.2 Speed-Torque Curves and Mechanical Specifications

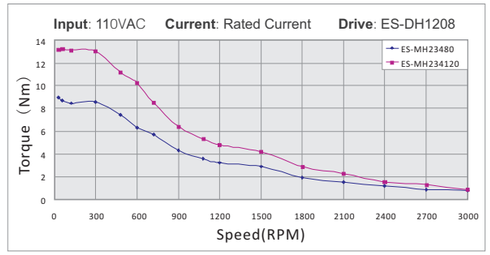
(c) ES-M23440 and ES-M23480

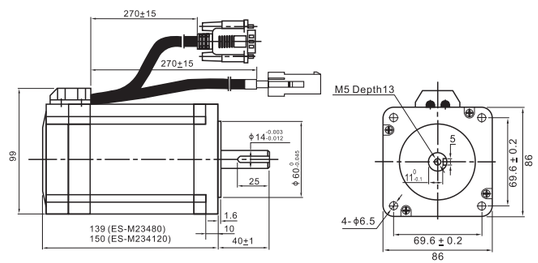


Units: mm 1 inch = 25.4mm

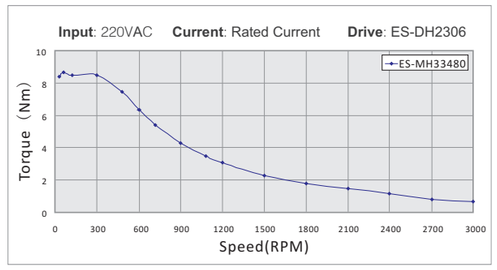


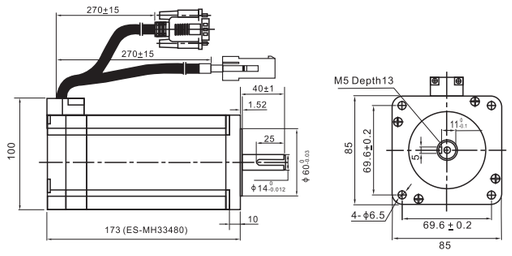
(d) ES-MH23480 and ES-MH234120



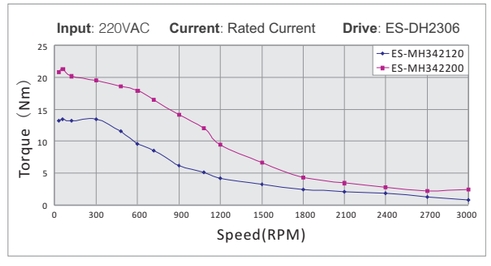


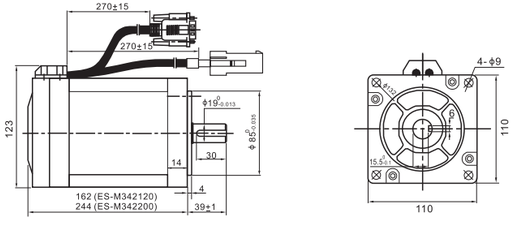
(e) ES-MH33480





(f) ES-MH342120 and ES-MH342200





Remark: Please contact Leadshine or visit www.leadshine.com for more speed-torque curves of other models.

04 ES Series Accessories

Number	Picture	Name	Discreption
1		**Motor Cable:** CABLEH-RZ3M0 CABLEH-RZ5M0 CABLEH-RZ10M0	Length 3m (standard), 5m and 10m optional For all easy servo drives and motors.
2		**Encoder Cable:** CABLEG-BM3M0 CABLEG-BM5M0 CABLEG-BM10M0	Length 3m (standard), 5m and 10m optional For the ES-D508, ES-D1008V, ES-DH1208, ES-DH1208V, ES-DH2306 and ES-DH2306V.
3		**Encoder Cable:** CABLEH－BM3M0 CABLEH－BM5M0 CABLEH－BM10M0	Length 3m (standard), 5m and 10m optional For the ES-D508V, ES-D808, ES-D808V and ES-DH1008.
4		RS232 Cable for ProTuner: CABLE－ACH1000	Length 1.2m For the ES-D1008V, ES-DH1208, ES-DH1208V, ES-DH2306 and ES-DH2306V.
5		RS232 Cable for ProTuner: CABLE－PC	Length 1.2m For the ES-D508, ES-D508V, ES-D808, ES-D808V, ES-D1008 and ES-D1008V.
6		Control Signal Connector: HDB-44P	Control signal connector for the ES-D1008V, ES-DH1208, ES-DH1208V, ES-DH2306 and ES-DH2306V..

05 ES Series Order Information

Motors	Drives	Accessories
ES-M32309	ES-D508	CABLEH-RZ3M0,CABLEG-BM3M0, CABLE-PC *
ES-M32320	ES-D508	CABLEH-RZ3M0,CABLEG-BM3M0, CABLE-PC *
ES-M22415	ES-D508V / ES-D808 / ES-D808V	CABLEH-RZ3M0,CABLEH-BM3M0, CABLE-PC *
ES-M22430	ES-D508V / ES-D808 / ES-D808V	CABLEH-RZ3M0,CABLEH-BM3M0, CABLE-PC *
ES-M23440	ES-D808 / ES-D808V	CABLEH-RZ3M0,CABLEH-BM3M0, CABLE-PC *
ES-M23480	ES-D1008	CABLEH-RZ3M0,CABLEH-BM3M0, CABLE-PC *
ES-M23480	ES-D1008V	CABLEH-RZ3M0,CABLEG-BM3M0, CABLE-ACH1000, HDB-44P *
ES-MH23480	ES-DH1208 / ES-DH1208V	CABLEH-RZ3M0,CABLEG-BM3M0, CABLE-ACH1000, HDB-44P *
ES-MH33480	ES-DH2306 / ES-DH2306V	CABLEH-RZ3M0,CABLEG-BM3M0, CABLE-ACH1000, HDB-44P *
ES-MH234120	ES-DH1208 / ES-DH1208V	CABLEH-RZ3M0,CABLEG-BM3M0, CABLE-ACH1000, HDB-44P *
ES-MH342120	ES-DH2306 / ES-DH2306V	CABLEH-RZ3M0,CABLEG-BM3M0, CABLE-ACH1000, HDB-44P *
ES-MH342200	ES-DH2306 / ES-DH2306V	CABLEH-RZ3M0,CABLEG-BM3M0, CABLE-ACH1000, HDB-44P *

*See the “Accessories” section for more information.

06 iES Series
Integrated Easy Servo Systems

6.1 Introduction

Leadshine's iES series easy servos are highly integrated easy servo systems. An iES integrated easy servo includes an easy servo motor and an easy servo drive. At very compact size and with all components integrated, the iES series easy servos can save mounting space, eliminate encoder connection and motor wiring time, increase reliability, and reduce cable and labor cost.

By adopting Leadshine's latest easy servo control technology, the iES series integrated easy servos offer high starting torque, high precision and smooth movement, and extra-low noise at low speed movement with no obvious resonance area. Different from a conventional constant-current drive in open-loop stepper controls, output current of the iES is dynamic and changes depending on load condition, the same as servo controls. Therefore, it can significantly reduce motor heating and increase motor lifetime. The drive takes step & direction commands, and is capable of outputting in-position and fault signals back to the master controller or external devices for complete system controls.

The integrated 1,000-line encoder offers the real-time motor shaft position to the drive. Based on that position, the drive can close the loop between the motor and drive, eliminating the possibility of stall or loss of movement synchronization which is often found in open-loop stepper systems. By getting rid of torque reservation in open-loop stepper systems, the iES series integrated easy servos can significantly improve high speed performance by as much as 30%. In addition, they perform much better in response time and acceleration over open-loop stepper systems.

Compared with brushless servo systems, the iES series integrated easy servos offer much higher low-speed-torque, no overshooting and zero settling time, no hunting, and no tuning for most of applications. Significant cost cutting of the package (motor + encoder + drive) also makes the iES series integrated easy servos ideal for the motion control systems in many applications.

iES-17 (NEMA17)


iES-1703


iES-1704


iES-1705


iES-1706

iES-23 (NEMA23)


iES-2309


iES-2320

iES-24 (NEMA24)


iES-2412


iES-2418


iES-2424


iES-2430

Please visit Leadshine's website at www.leadshine.com for the latest information about the iES series easy servos.

6.2 Advantages

Compared with a Conventional Stepper

- Closed loop for no loss of steps
- Broader operating range, higher torque and higher speed
- Extra low motor heating
- Smooth motion and extra-low motor noise
- Do not need a high torque margin

Compared with a Conventional Servo

- No tuning for most of applications and always stable
- Quick response, no delay and almost no settling time
- No hunting or no inherent dither
- High torque at starting and low speed, high stiffness at standstill
- Lower cost

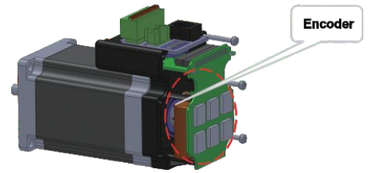
Lower Labor Cost + Increased Reliability + Lower Cable Cost + Lower Vibration and Heating +

Save Mounting Space + No Loss of Steps + Increased Max Acceleration + No Tuning for Most of Applications

6.3 Features

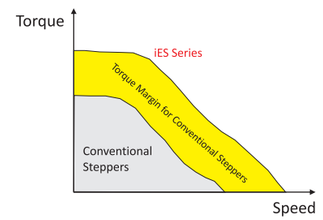
Closed loop for no loss of steps

In open-loop stepper systems, potential loss of motor movement synchronization limits their adoption for many applications. Engineers are usually forced to reserve up to 50% of available stepper motor torque to avoid possible loss of steps. With the adoption of high resolution encoders to feedback real time motor shaft positions, Leadshine iES series easy servo drives close the position loops between servo drives and driven motors, providing very reliable control like a servo.



Broader operating range

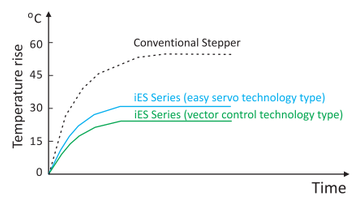
Due to closed loop control and adoption of advanced control algorithm, the iES series easy systems can always implement 100% torque of the motor, and do not need the huge 50% torque reservation in normal open-loop stepper systems. This feature significantly improves system high speed performance. While open-loop stepper systems are typically adopted in applications under 1,000 rpm, the iES series easy servo systems are ideal for many applications up to 2,000 RPM; sometimes even for 3,000 RPM!



Extra low motor heating

Usually in a open-loop stepper system, output current to the stepper motor from the step driver is constant. No matter what load condition is and how much current is needed. With the position loop closed in the iES series easy servo systems, output current from the servo drive to the driven motor is load based. The servo drive will only just-enough current into the motor as required to drive the motor to the target. This can significantly lower the drive and motor heating.

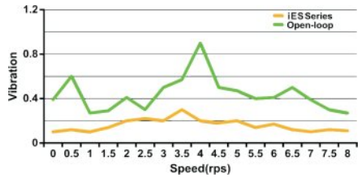
Compared with open loop systems, motor heating of in the iES series easy servo systems can be reduced for 20-40°C. Thus, life time in the iES series easy servo systems is much longer, power consumption is lower, and maintenance costs will also be reduced.



6.3 Features (Con't)

Smooth motion and Extra-low motor noise

Unlike conventional stepper systems, the iES series easy servo systems adopt vector control algorithm, same as brushless servo controls. Input commands are filtered for smooth motion with minimum torque ripples. Therefore, resonance in open-loop stepper systems is significantly minimized, and motor movement noise of can be significantly reduced, up to 70%.

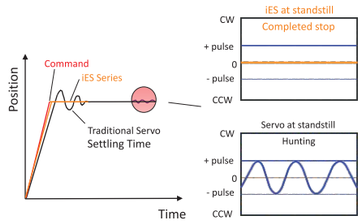


Quick response, no hunting

In a traditional brushless servo system ,there is a considerable delay for the servo motor to response ("move") to a command signal sent from a motion controller or PLC. This delay is caused by servo "settling time".

Leadshine iES series easy servo systems adopt servo control for stepper motors. Motor movement is always synchronized with input pulse commands. When receiving a pulse signal, an iES servo drive will response immediately and start motor movement. When it finishes execution of the input pulses, it stops immediately without any movement fluctuation. So, there is no hunting ("shaking") or overshooting, which is commonly seen in traditional brushless servo systems.

These features make the iES easy servo systems ideal for short-distance applications requiring rapid motion, such as bonding and vision type systems.

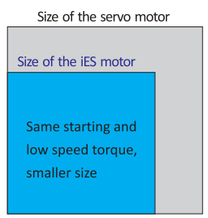


Plug and play, no tuning for most of applications

For traditional brushless servo systems, in order to get the preferred performance, an engineer usually has to spend hours even days, to tune servo gains which involves tens or even hundreds of servo parameter configurations. But there is no such much gain tuning for the iES series easy servo systems. They are designed for simple setup, "no tuning, plug and play", with all configurations are already optimized for most of applications. Save time and save cost.

High torque at starting & low speed, high inertial loads

Compared with traditional brushless servo systems, Leadshine iES series easy servo systems offer much higher start and low speed torque, due to the natural inheritance of high stiffness at standstill and high starting torque feature from stepper systems. This allows iES easy servo systems to perform direct drive of high inertia load, like flywheels and belt driving. But in traditional brushless servo systems, in order to get the preferred torque, expensive high power servo motors have to be chosen, or costly planetary gearboxes have to be added in many applications. While load inertia ratio normally can't exceed 10:1 in traditional brushless servo systems, that ratio can be as high as 100:1 in iES easy servo systems.



6.4 Part Number

iES – □□ □□ – □ – □□□

iES: Integrated Easy Servo

Motor Frame Size
17: NEMA17 (42mm)
23: NEMA23 (57mm)
24: NEMA24 (60mm)

Holding Torque
03: 0.3 Nm
10: 1.0 Nm
30: 3.0 Nm
...

Control Technology
Blank: Easy servo
V: Vector control

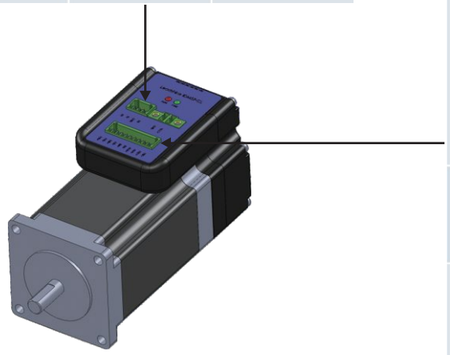
Communication Type
Blank: Step & Direction
485: RS485
CAN: CANopen

6.5 ElectricalSpecifications

Model		iES-17	iES-23	iES-24
Operating Voltage (VDC)		24	18 to 48	18 to 70
Holding Torque (Nm)		0.3, 0.4, 0.5 and 0.6	0.9 and 2.0	1.2, 1.8, 2.4 and 3.0
Operation Modes		Step & Direction, RS485 and CANopen		
Maximum Input Frequency (kHz)		500		
Protection Functions		Over-current, Over-voltage, Position following error		
Inputs	Step & Direction	Step & Direction, Enable (differential)		
	RS485 / CANopen	4 digital inputs, 1 analog input (single-end)		
Outputs	Step & Direction	In position and fault out (differential)		
	RS485 / CANopen	2 digital outputs (open collector)		
Encoder Resolution		1000-line (4000 ppr)		
Storage Temperature		-20 ℃ to 80 ℃		
Ambient Temperature		0 ℃ to 50 ℃ (Heat sink)		
Humidity		40%RH to 90%RH		

6.6 Pin Assignment

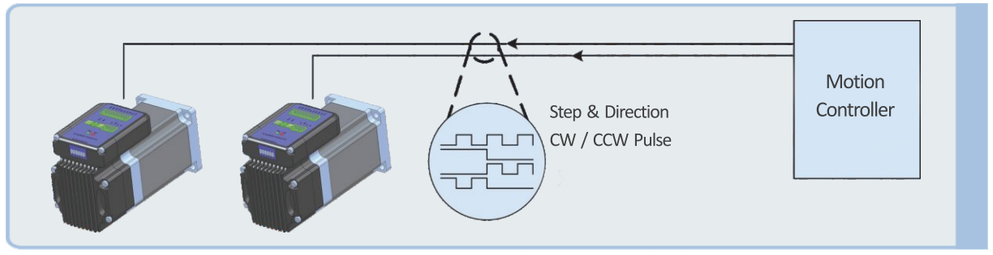
Model	Step&Direction	RS485	CANopen
iES-17	+5V TX GND RX GND	T+ T- R+ R- GND	CANH CANL CANH CANL GND
iES-23			
iES-24			



Model	Step&Direction	RS485/ CANopen
iES-17	PUL+ PUL- DIR+ DIR- ENA+ ENA- PEND+ PEND- ALM+ ALM- +VDC GND	IN1 IN2 IN3 IN4 OUT1 OUT2 VIN+ VIN- COM+ COM- +VDC GND
iES-23	PUL+ PUL- DIR+ DIR- ENA+ ENA- PEND+ PEND- ALM+ ALM-	IN1 IN2 IN3 IN4 OUT1 OUT2 VIN+ VIN- COM+ COM-
iES-24		

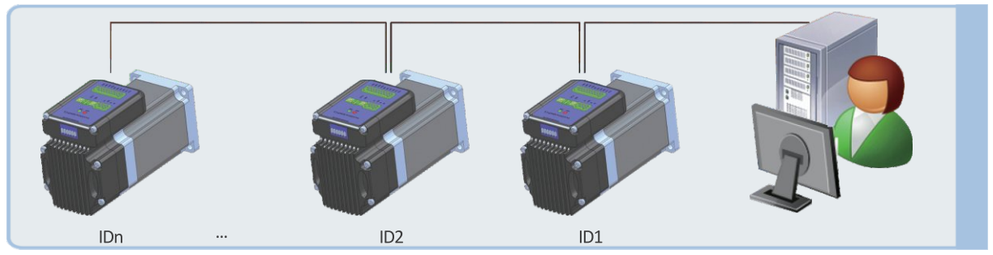
6.7 Operation Modes

1. Step & Direction



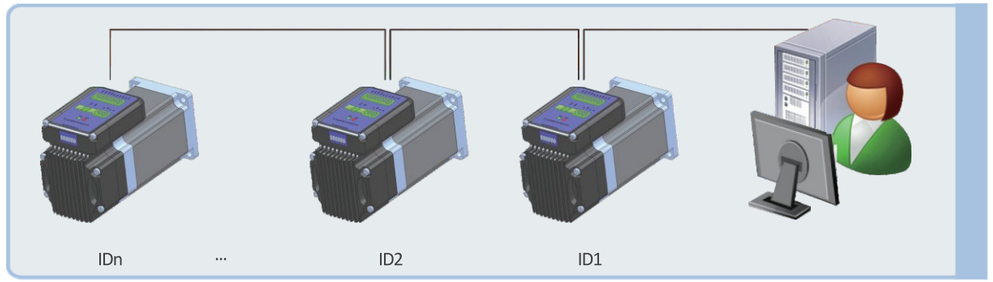
- Support step & direction and CW/CCW pulse commands
- Compatible with 5 to 24 V command signals

2. RS485



- One host up to 32 drives
- Can be used with either 2-wire (half-duplex) or 4-wire RS485 (full-duplex) implementation
- DLL is available for API function calling
- Easy to wire and build multi-axis systems

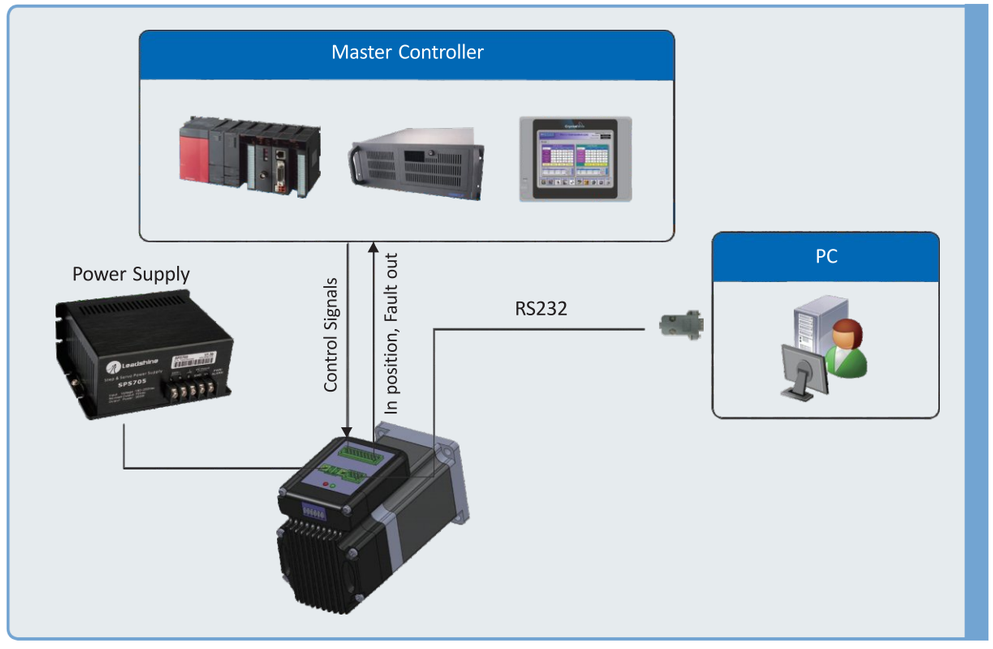
3. CANopen



- One host up to 127 drives
- CANopen standards: CiA Standard 301 (DS301), CiA Standard 402 (DSP402)
- Up to 1 Mbit/sec speeds possible
- Easy to wire and build multi-axis systems

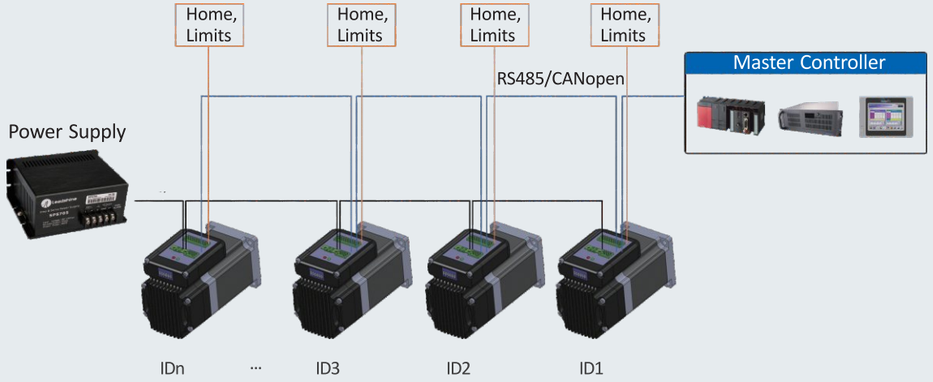
6.8 Typical System Configurations

1. Step & Direction



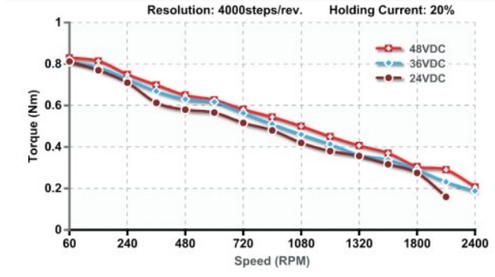
6.8 Typical System Configurations (Con't)

2. RS485 and CANopen

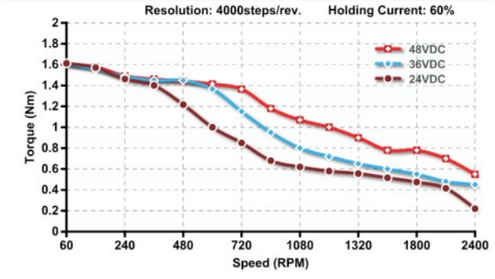


6.9 Speed-Torque Curves*

iES-2309



iES-2320

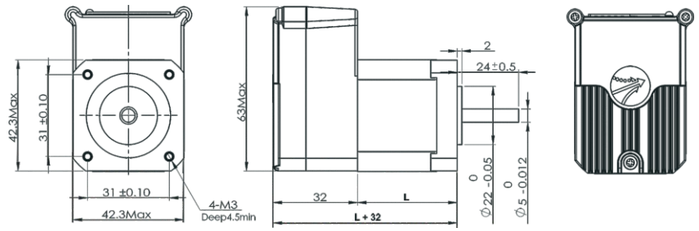


* Please contact Leadshine or visit www.leadshine.com for more speed-torque curves of other models.

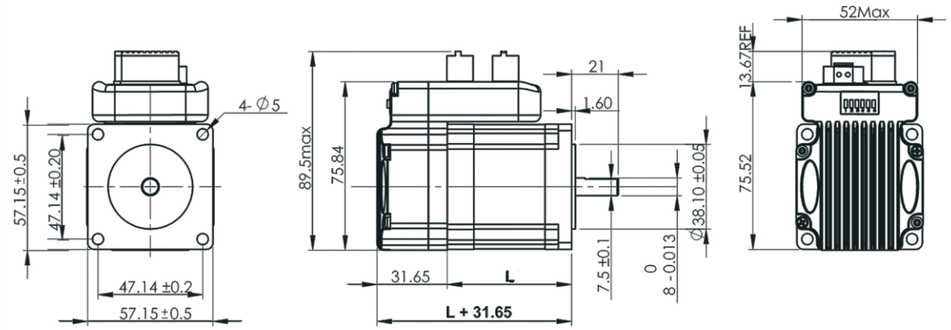
6.10 Mechanical Specifications

Units: mm 1 inch = 25.4mm

iES-17



iES-23



Frame Size	Motor Body Length (mm)	Holding Torque (Nm)	Model
iES-17 (NEMA17)	L = 33	0.3	iES-1703
	L = 39	0.4	iES-1704
	L = 47	0.5	iES-1705
	L = 58	0.6	iES-1706
iES-23 (NEMA23)	L = 56	0.9	iES-2309
	L = 80	2.0	iES-2320
iES-24 (NEMA24)	L = 47	1.2	iES-2412
	L = 55	1.8	iES-2418
	L = 68	2.4	iES-2424
	L = 85	3.0	iES-2430