

# Easy Servo Products

## Closed-loop, No Tuning

**Leadshine Technology Co., Ltd.** (Headquarters)

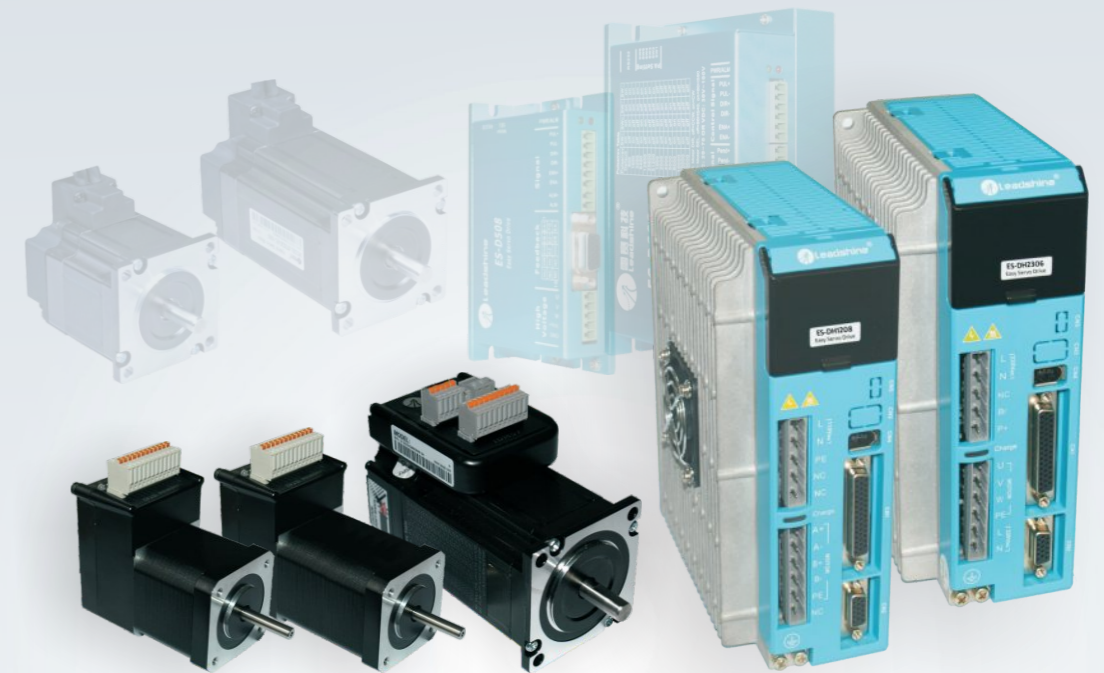
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Note: Product appearance and technical parameters are subject to change without notice.

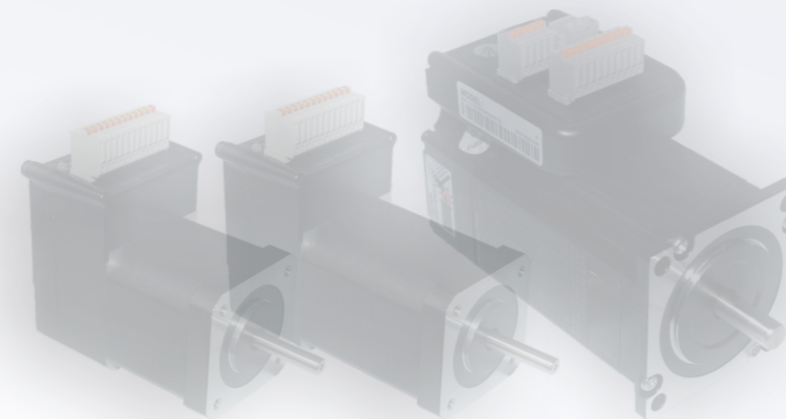
- Quick Response
  - Extra-low Heating
  - Highly Cost-effective
- (Holding Torque: 0.3 Nm to 20 Nm)

# Easy Servo Products

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- 1.2 Advantages
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- 6.1 Introductio



# 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.

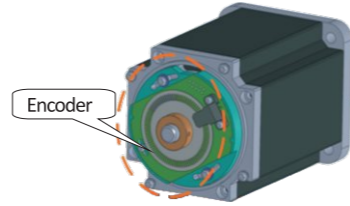
## 1.2 Advantages

- |  |  |
|--|--|
| <p><b>Compared with a Conventional Stepper</b></p> <ul style="list-style-type: none"> <li>• Closed loop for no loss of steps</li> <li>• Broader operating range, higher torque and higher speed</li> <li>• Extra low motor heating</li> <li>• Smooth motion and extra-low motor noise</li> <li>• Do not need a high torque margin</li> </ul> | <p><b>Compared with a Conventional Servo</b></p> <ul style="list-style-type: none"> <li>• No tuning for most of applications and always stable</li> <li>• Quick response, no delay and almost no settling time</li> <li>• No hunting or no inherent dither</li> <li>• High torque at starting and low speed, high stiffness at standstill</li> <li>• Lower cost</li> </ul> |
|--|--|

## 1.3 Features

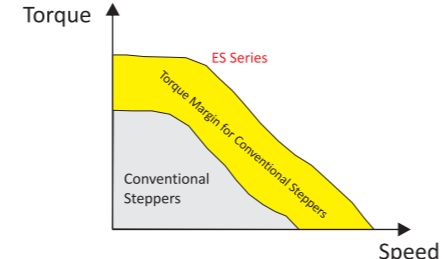
### Closed loop for no loss of steps

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.



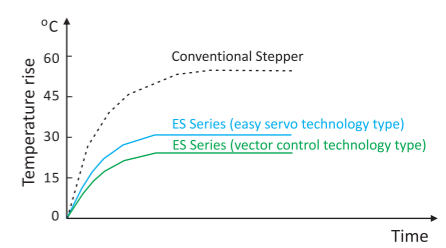
### Broader operating range

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

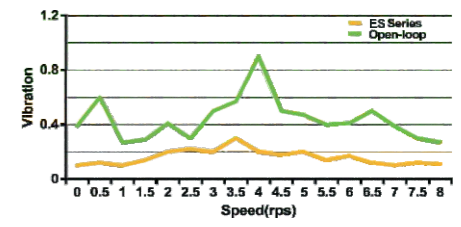
Usually in an open-loop stepper system, output current to the stepper motor from the step driver is constant. No matter what load condition is and how much current is needed. With the position loop closed in the ES series easy servo systems, output current from the servo drive to the driven motor is 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.

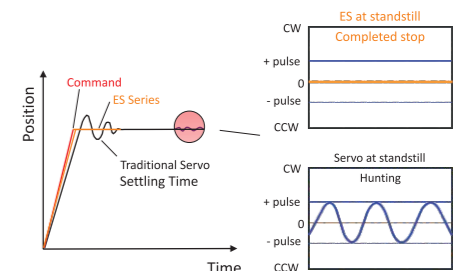
### Smooth motion and Extra-low motor noise

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.

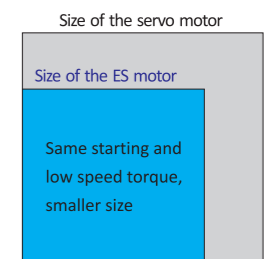
### Plug and play, no tuning for most of applications

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**      **ES - M 3 23 20**

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

① ES: Easy Servo      ④ Motor Size:  
 23: NEMA23 / □ 57 mm  
 34: NEMA34 / □ 86 mm

② M: Motor      ⑤ Holding Torque:  
 MH: High Voltage Motor      09: 0.9 N\*m  
 20: 2.0 N\*m  
 200: 20.0 N\*m ...

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

Easy servo technology type, Low and medium voltage					
NEMA23		NEMA24		NEMA34	
	ES-M32309 (0.9 Nm)		ES-M22415 (1.5 Nm)		ES-M23440 (4.0 Nm)
	ES-M32320 (2.0 Nm)		ES-M22430 (3.0 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-MH23480 (8.0 Nm)		ES-MH33480 (8.0 Nm)		ES-MH342120 (12.0 Nm)
	ES-MH234120 (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-M22309 (0.9 Nm)		ES-M22415 (1.5 Nm)		ES-M23440 (4.0 Nm)
	ES-M22320 (2.0 Nm)		ES-M22430 (3.0 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-MH23480 (8.0 Nm)		ES-MH33480 (8.0 Nm)		ES-MH342120 (12.0 Nm)
	ES-MH234120 (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

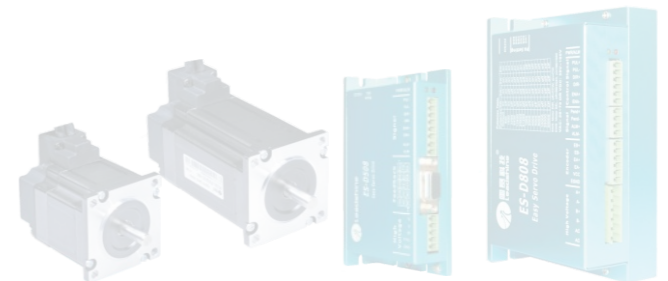
Operating Voltage up to

50VDC    80VDC    100VDC    150VAC    230VAC

## 2.1 Specifications

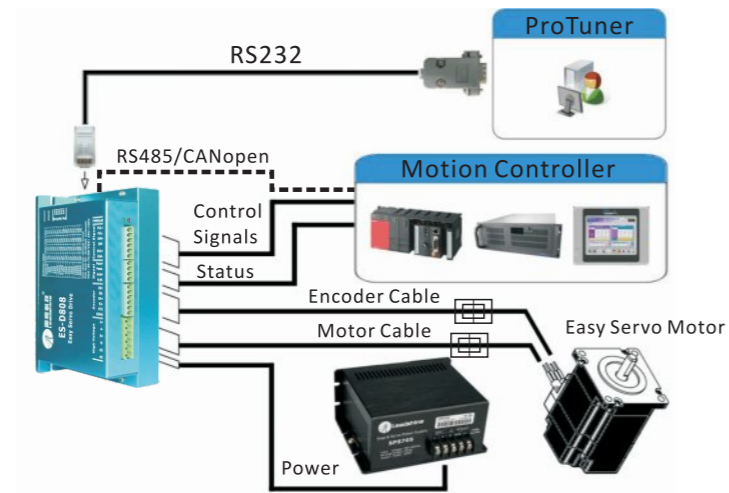
Model	ES-D508/ ES-D508V	ES-D808/ ES-D808V	ES-D1008/ ES-D1008V	ES-DH1208/ ES-DH1208V	ES-DH2306/ ES-DH2306V
Operating Voltage	18 to 48 VDC	24 to 75 VDC	24 to 70 VAC	90 to 130 VAC	150 to 240 VAC
Output (Peak)	8.0 A				
Control Algorithm	Easy servo technology for plug and play, or vector control technology 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.

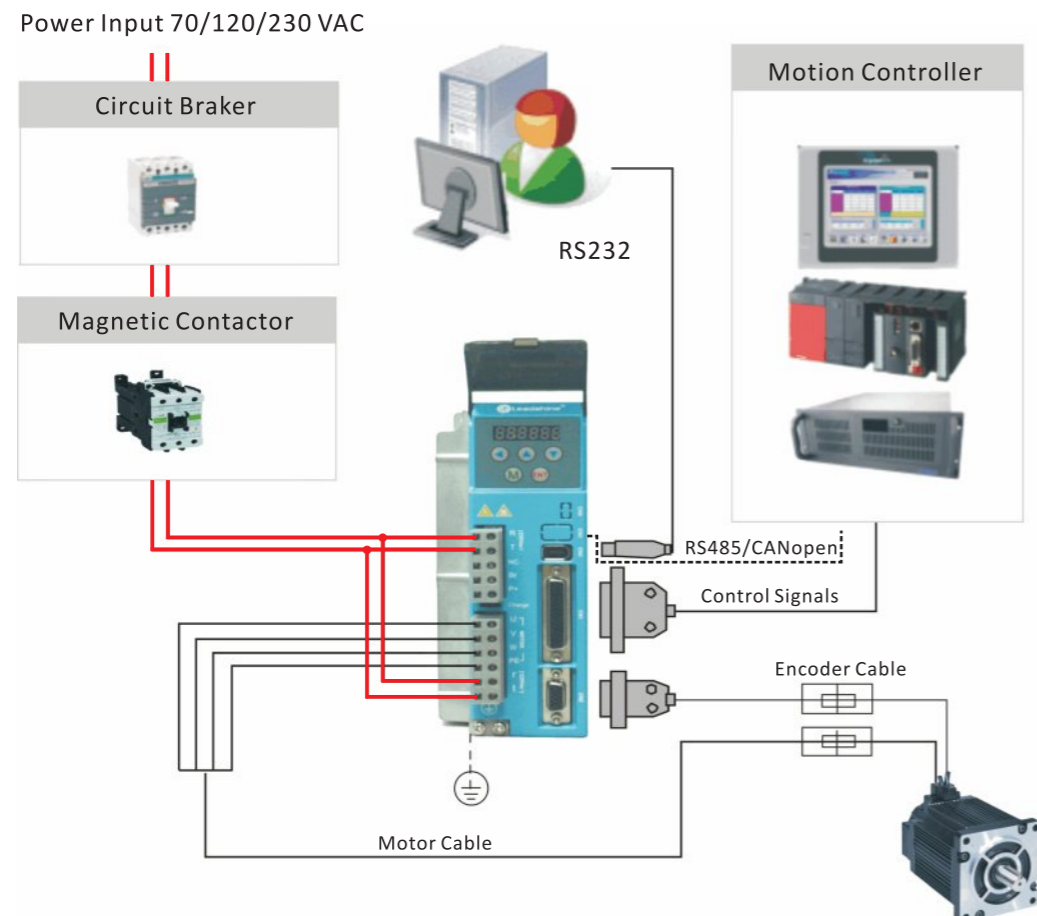


## 2.2 Typical System Configurations

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



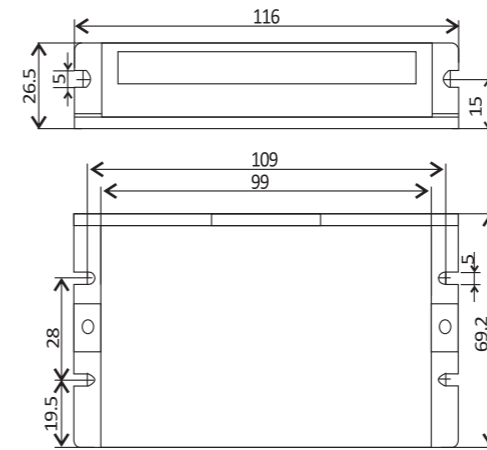
ES-D1008V  
 ES-DH1208/ES-DH1208V  
 ES-DH2306/ES-DH2306V



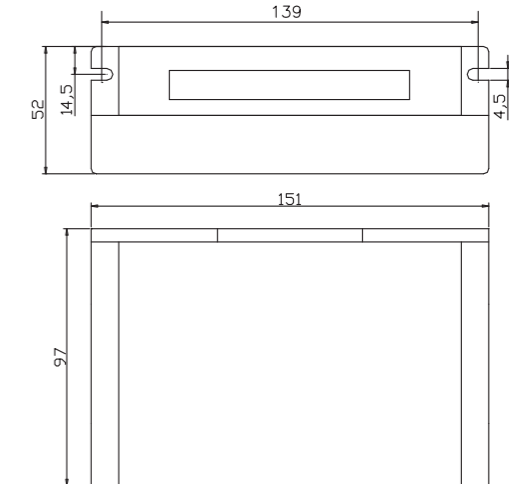
## 2.3 Mechanical Specifications

Units: mm 1 inch = 25.4mm

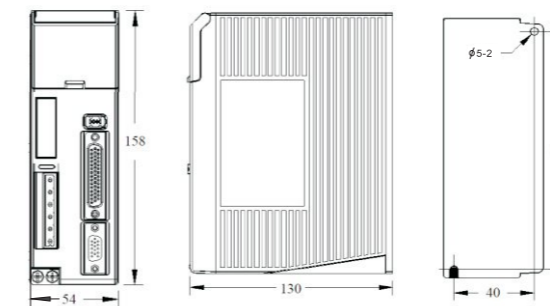
ES-D508 / ES-D508V



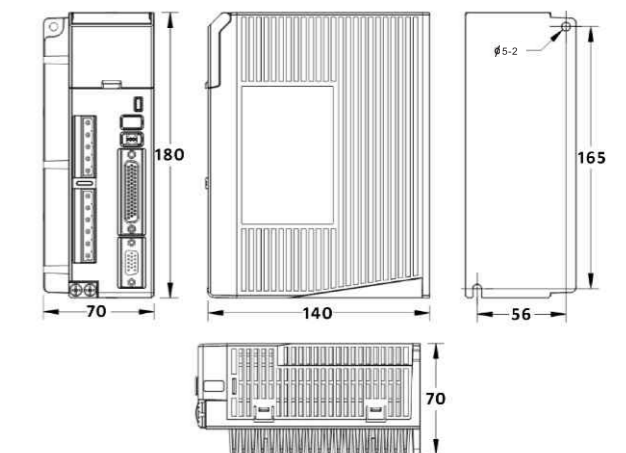
ES-D808 / ES-D808V / ES-D1008



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



## High voltage



**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

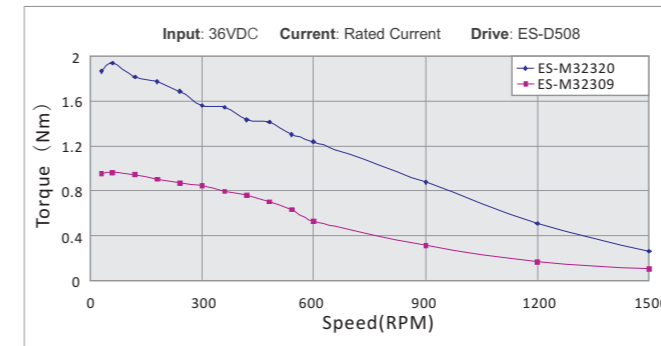
Model	Units	ES-M32309	ES-M32320	ES-M22415	ES-M22430	ES-M23440	ES-M23480
Current/Phase	A	5.8	5.8	2.5	3	5.5	6
Holding Torque	Nm	0.9	2	1.5	3	4	8
Speed Range	RPM	0 to 2000	0 to 2000	0 to 2000	0 to 2000	0 to 2000	0 to 2000
Weight	Kg	0.85	1.4	1.1	1.6	2.56	3.95

## High voltage

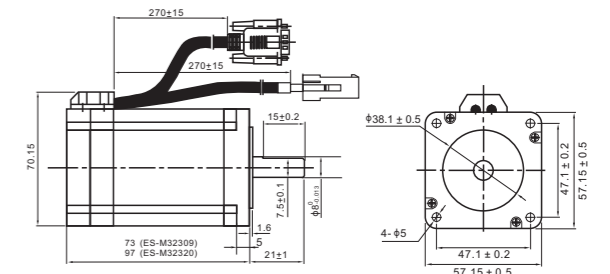
Model	Units	ES-MH23480	ES-MH234120	ES-MH33480	ES-MH342120	ES-MH342200
Current/Phase	A	5.0	5.5	3.5	4.0	4.5
Holding Torque	Nm	8	12	8	12	20
Speed Range	RPM	0 to 2000	0 to 2000	0 to 2000	0 to 2000	0 to 2000
Weight	Kg	4.0	5.6	5.6	8.6	10.5

# 3.2 Speed-Torque Curves and Mechanical Specifications

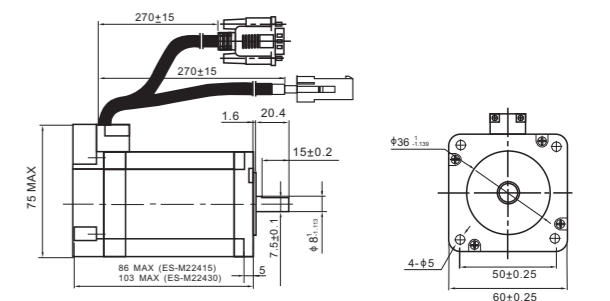
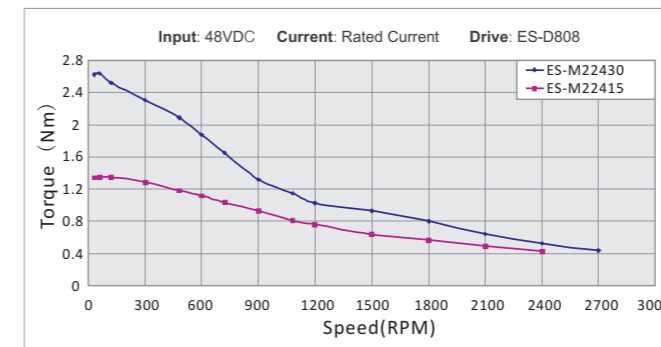
( a ) ES-M32309 and ES-M32320



Units: mm 1 inch = 25.4mm

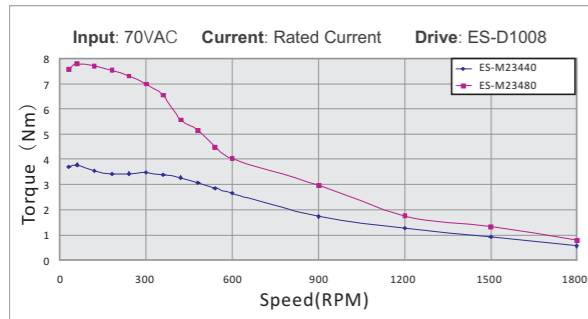


( b ) ES-M22415 and ES-M22430

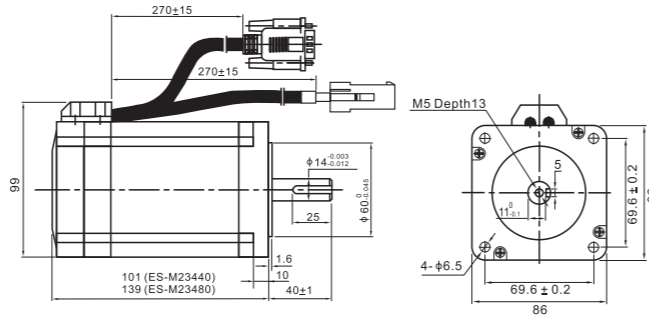


## 3.2 Speed-Torque Curves and Mechanical Specifications

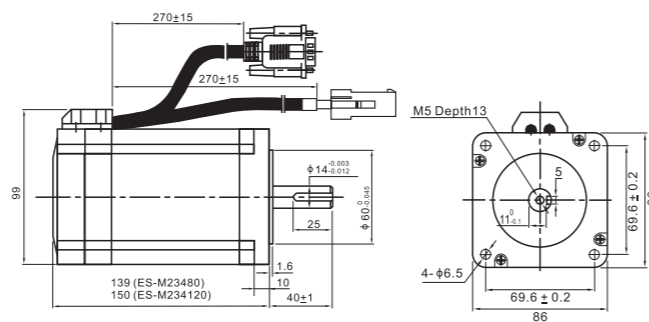
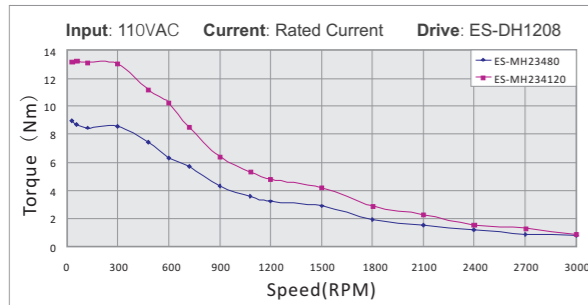
(c) ES-M23440 and ES-M23480



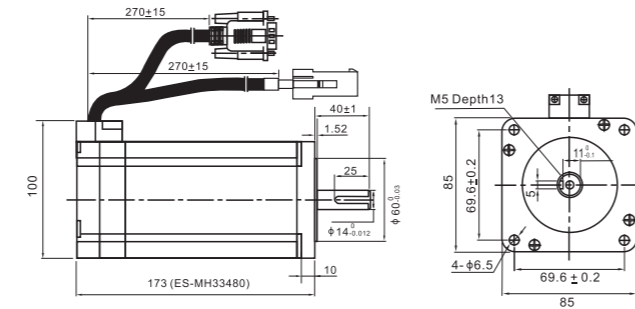
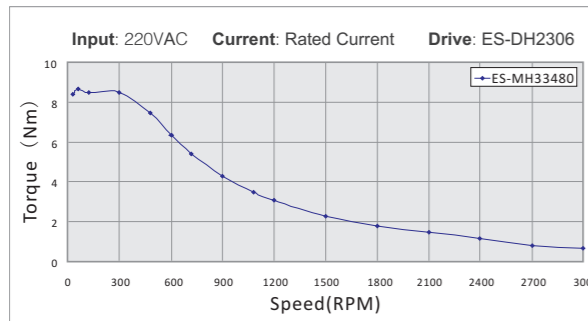
Units: mm 1 inch = 25.4mm



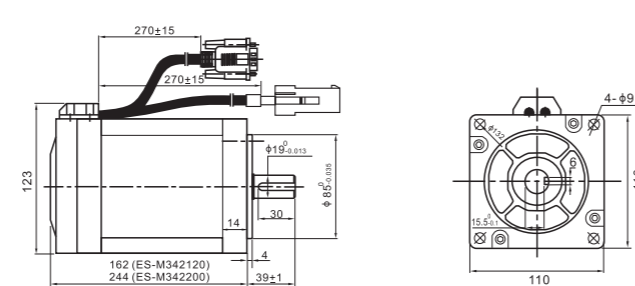
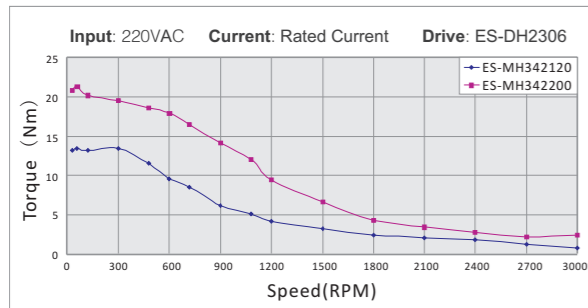
(d) ES-MH23480 and ES-MH234120



(e) ES-MH33480



(f) ES-MH342120 and ES-MH342200



Remark: Please contact Leadshine or visit [www.leadshine.com](http://www.leadshine.com) for more speed-torque curves of other models.

## 04 ES Series Accessories

Number	Picture	Name	Discreption
1		<b>Motor Cable:</b> CABLEH-RZ3M0 CABLEH-RZ5M0 CABLEH-RZ10M0	Length 3m (standard), 5m and 10m optional For all easy servo drives and motors.
2		<b>Encoder Cable:</b> 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		<b>Encoder Cable:</b> 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

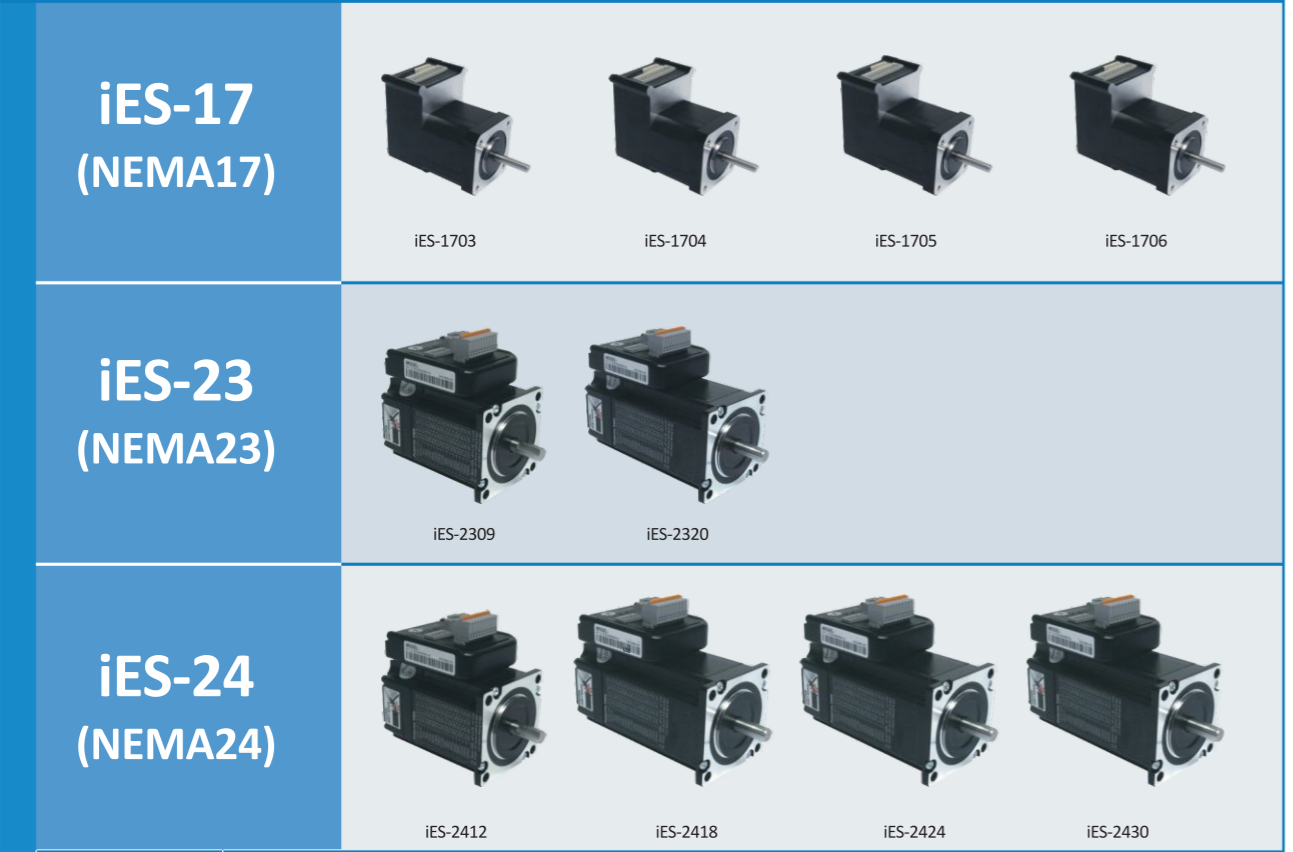
## 6.1 Introduction

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.



Please visit Leadshine's website at [www.leadshine.com](http://www.leadshine.com) for the latest information about the iES series easy servos.

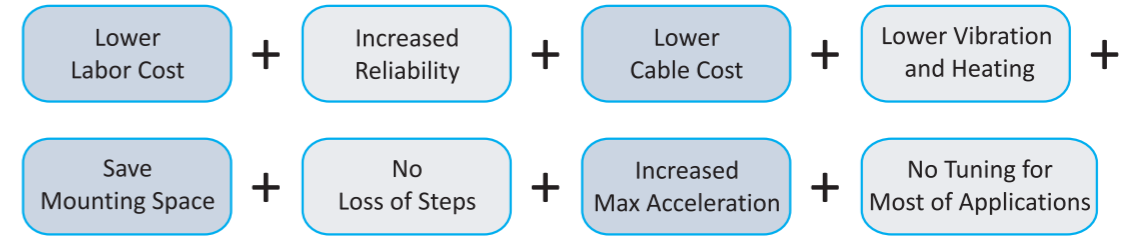
## 6.2 Advantages

### 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

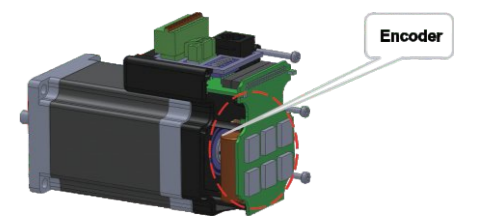
- No tuning for most of applications and always stable
- Quick response, no delay and almost no settling time
- No hunting or no inherent dither
- High torque at starting and low speed, high stiffness at standstill
- Lower cost



## 6.3 Features

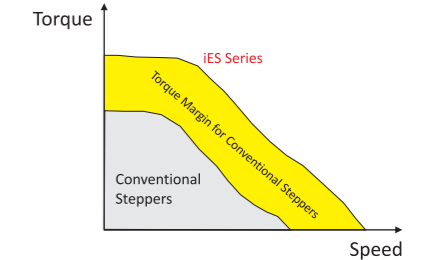
### Closed loop for no loss of steps

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.



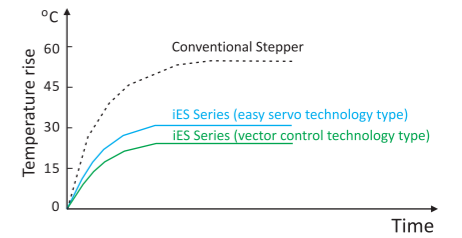
### Broader operating range

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 an 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.



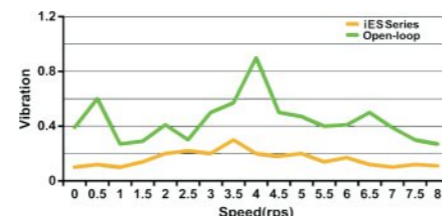
Compared with open loop systems, motor heating of in the iES series easy servo systems can be reduced for 20-40°C. Thus, life time in the iES series easy servo systems is much longer, power consumption is lower, and maintenance costs will also be reduced.



## 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%.

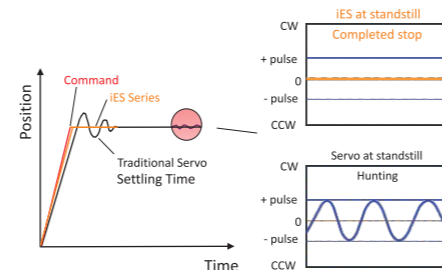


### Quick response, no hunting

In a traditional brushless servo system, there is a considerable delay for the servo motor to respond ("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 respond 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.



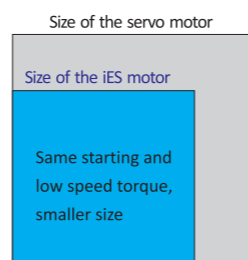
### Plug and play, no tuning for most of applications

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  
...



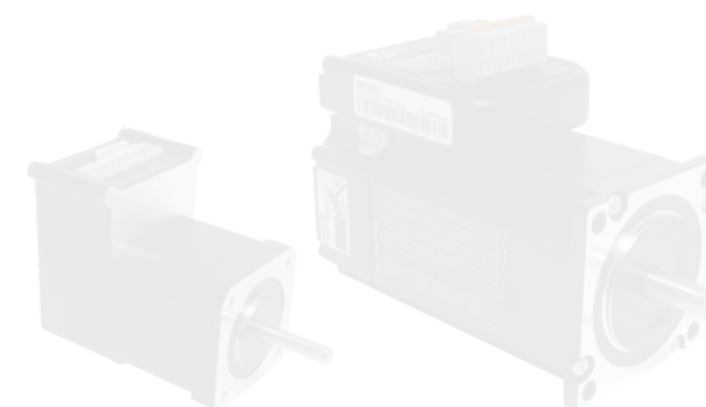
**Control Technology**  
Blank: Easy servo  
V: Vector control



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

## 6.5 Electrical Specifications

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 °C to 80 °C		
Ambient Temperature	0 °C to 50 °C (Heat sink)		
Humidity	40%RH to 90%RH		

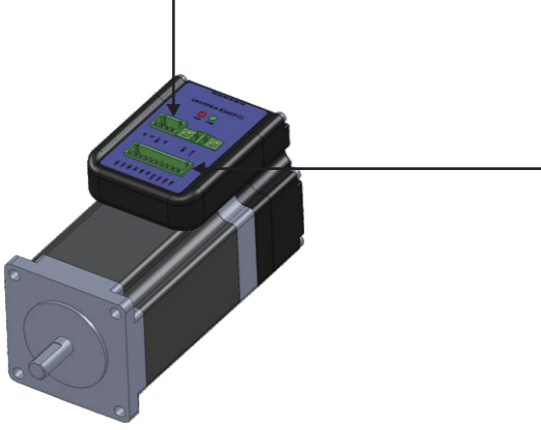


## 6.6 Pin Assignment

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

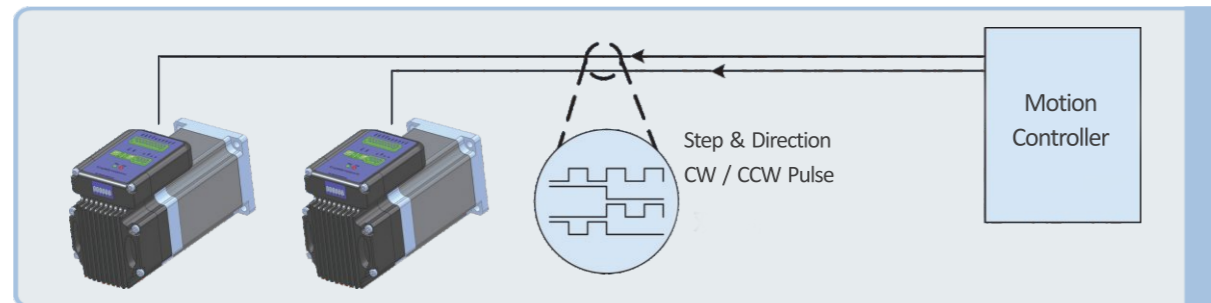
  

Model	Step&Direction	RS485/ CANopen
iES-17	PUL+ PUL- DIR+ DIR- ENA+ ENA- PEND+ PEND- ALM+ ALM- +VDC GND	IN1 IN2 IN3 IN4 OUT1 OUT2 VIN+ VIN- COM+ COM- +VDC GND
iES-23	PUL+ PUL- DIR+ DIR- ENA+ ENA- PEND+ PEND- ALM+ ALM- +VDC GND	IN1 IN2 IN3 IN4 OUT1 OUT2 VIN+ VIN- COM+ COM-
iES-24	PUL+ PUL- DIR+ DIR- ENA+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



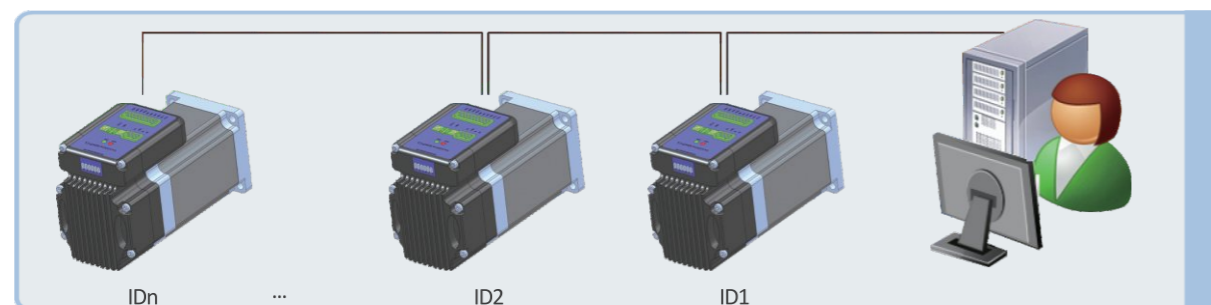
## 6.7 Operation Modes

### 1. Step & Direction



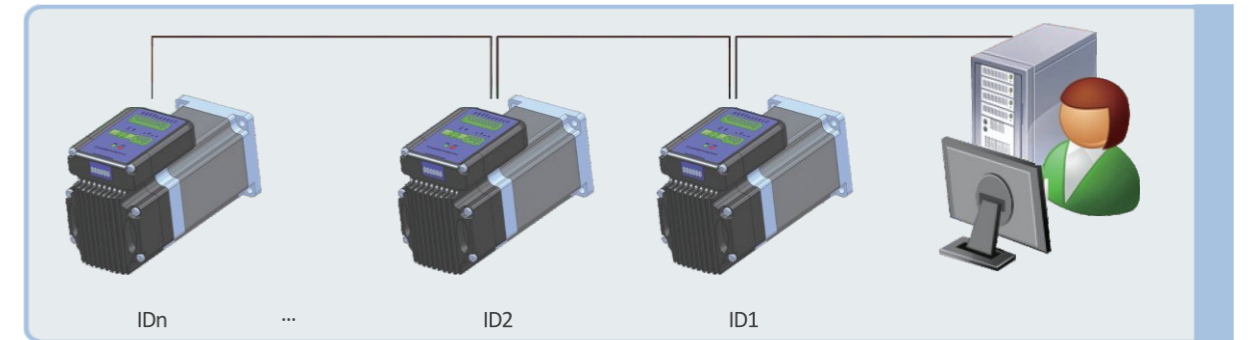
- Support step & direction and CW/CCW pulse commands
- Compatible with 5 to 24 V command signals

### 2. RS485



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

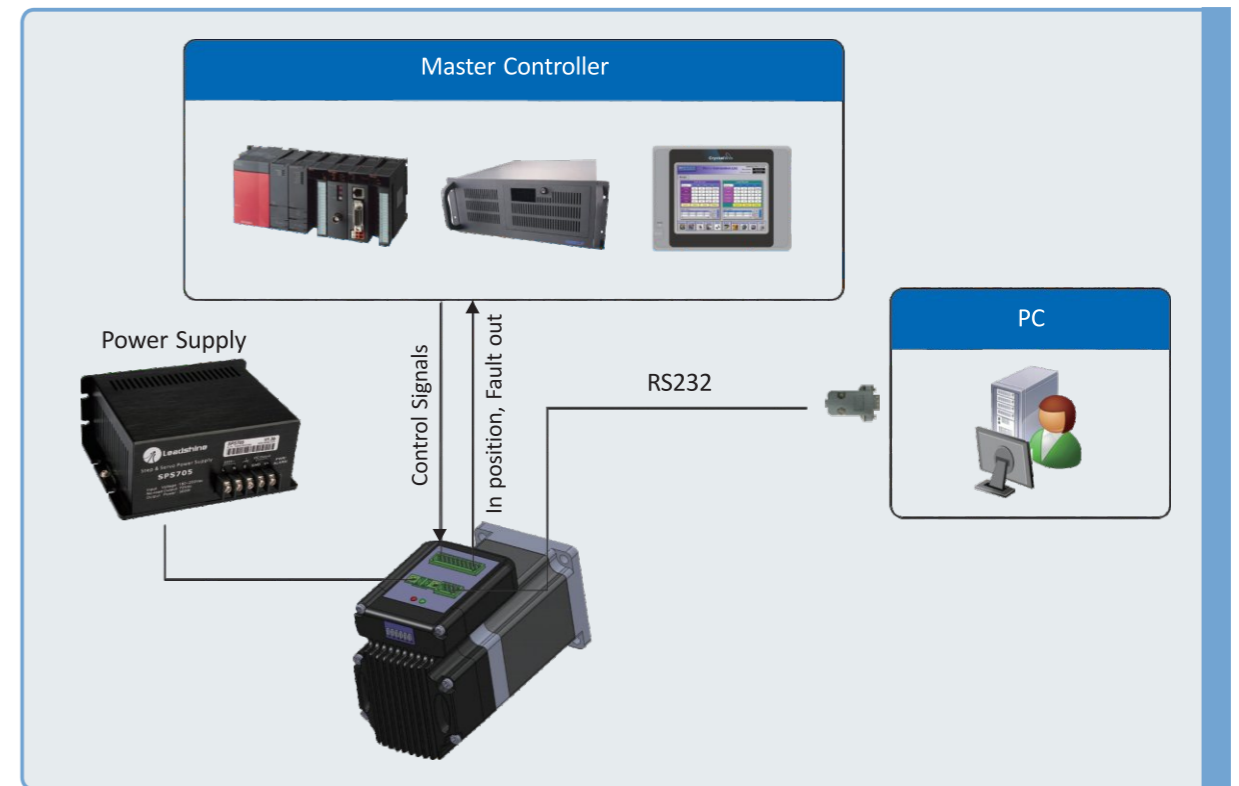
### 3. CANopen



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

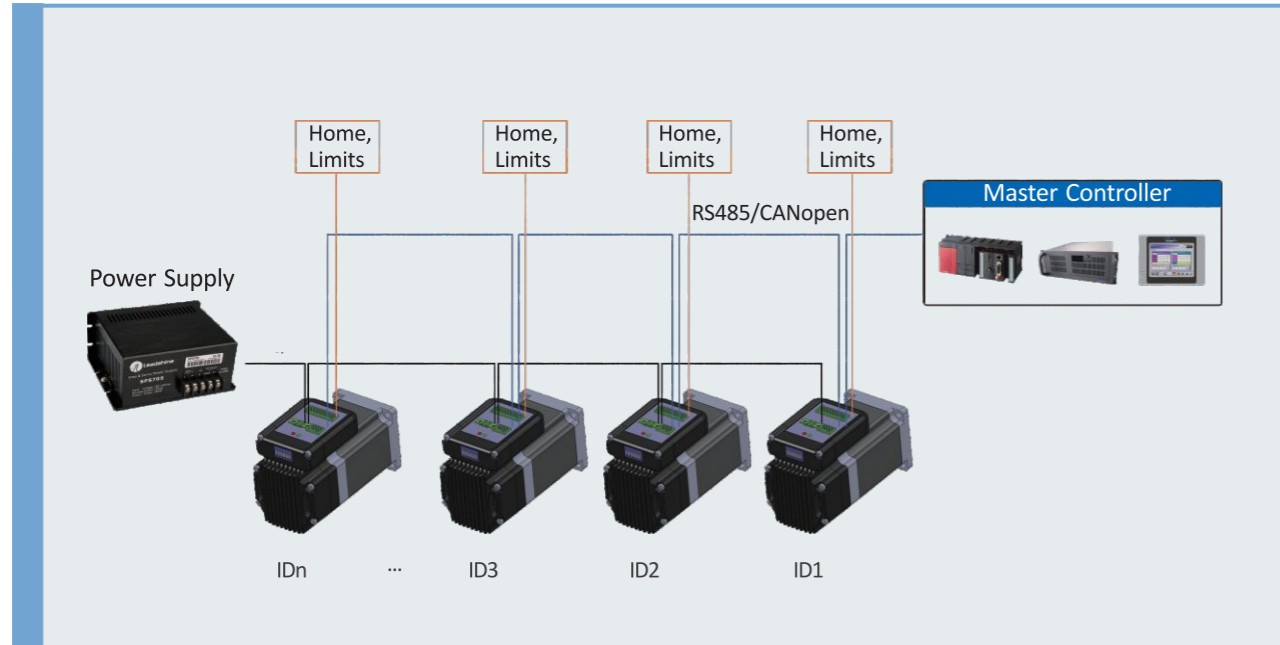
## 6.8 Typical System Configurations

### 1. Step & Direction

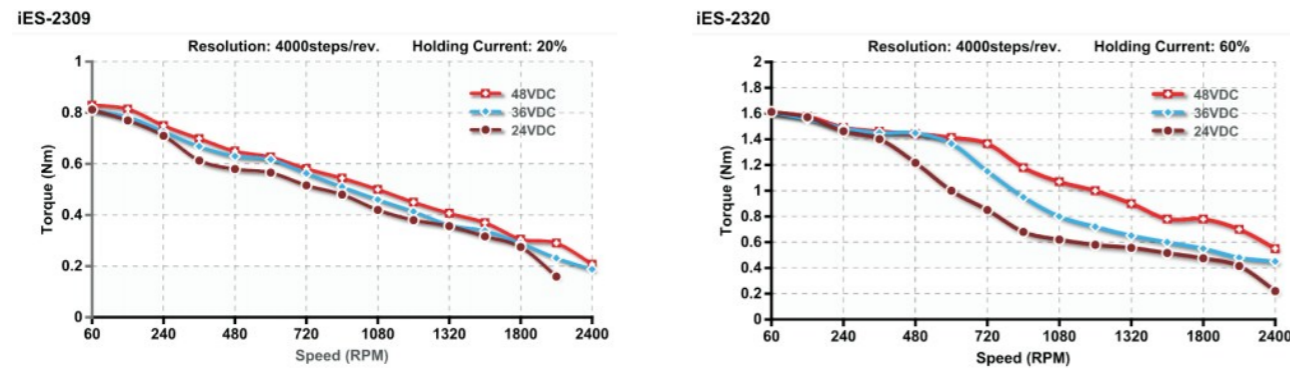


## 6.8 Typical System Configurations (Con't)

### 2. RS485 and CANopen



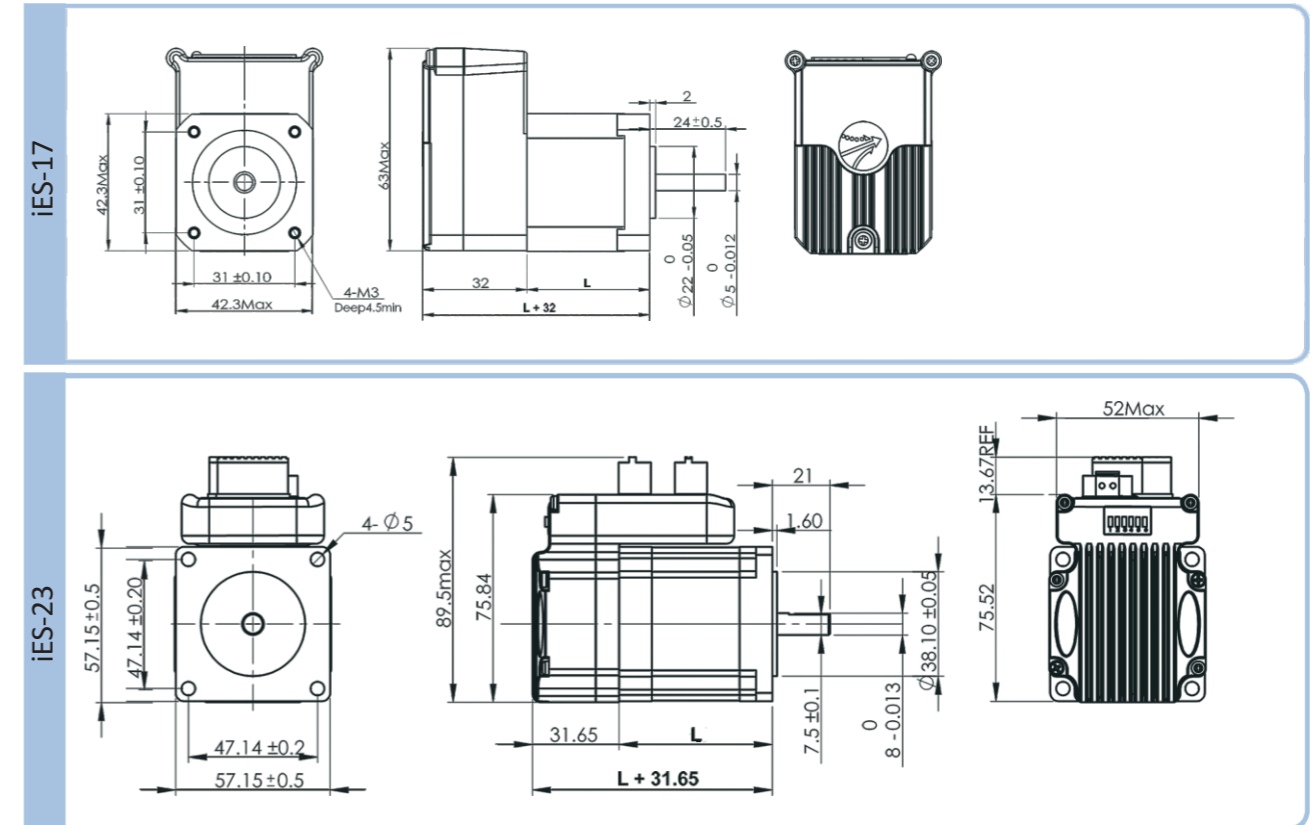
## 6.9 Speed-Torque Curves\*



\* Please contact Leadshine or visit [www.leadshine.com](http://www.leadshine.com) for more speed-torque curves of other models.

## 6.10 Mechanical Specifications

Units: mm 1 inch = 25.4mm



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

# 07 Companion Products Stepper and Servo Power Supplies

## SPS Series Unregulated Switching Mode Power Supplies

- Specifically designed to power stepper and servo drives
- High efficiency, compact size, light weight
- Input voltage 220VAC±10% or 110VAC±10% 50/60 Hz
- Short circuit, over-current, over-voltage and short-voltage protections



### Electrical Specifications

Model	Output Voltage (V)	Output Current (A)	Input Voltage	Size (mm)	Weight (kg)
SPS407	42	7 (RMS)	220VAC ± 10%	132*104*60	0.638
SPS487	48	7 (RMS)			
SPS705	68	5 (RMS)			
SPS407-L	42	4.7 (RMS)			
SPS487-L	48	4.0 (RMS)	110VAC ± 10%	132*104*60	0.638
SPS705-L	68	3.0 (RMS)			

## RPS Series Regulated Switching Mode Power Supplies

- Specifically designed to power stepper and servo drives
- High efficiency, compact size, light weight
- Input voltage 220VAC±10% or 110VAC±10% 50/60 Hz
- Short circuit, over-current, over-voltage and short-voltage protections



### Electrical Specifications

Model	Output Voltage (V)	Output Current (A)	Input Voltage	Size (mm)	Weight (kg)
RPS2410	24	10 (RMS)	220VAC±10% or 110VAC±10%	199*110*50	0.8
RPS369	36	9.7 (RMS)		215*113.6*50	0.88
RPS488	48	8.3 (RMS)		215*113.6*50	0.88
RPS608	60	8.5 (RMS)		261*102.4*65	1.13

## PS Series Linear Power Supplies

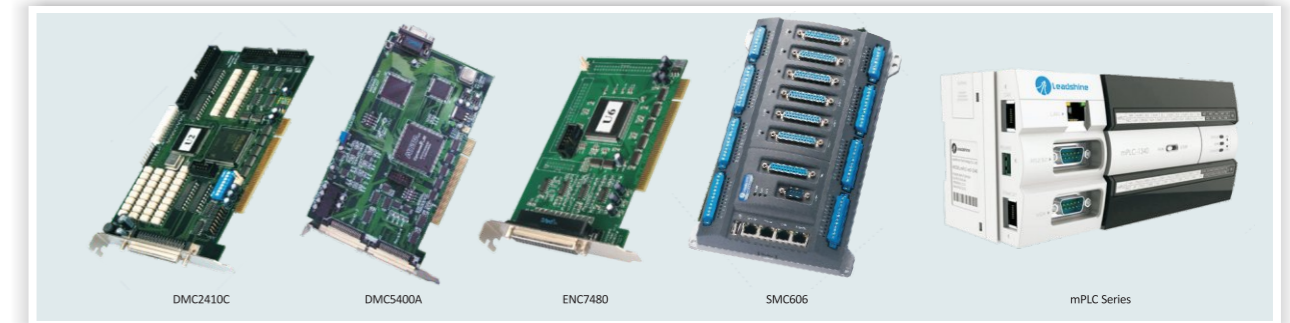
- Simple structure, high reliability
- 3 main outputs plus 1 auxiliary output
- Short circuit and over-voltage protections
- Input voltage 220VAC±10%



### Electrical Specifications

Model	Main DC Output	Auxiliary DC Output	Rated Power	Size (mm)	Weight (kg)
PS405-5	DC36V/5A	DC5V/1A	200	175*110*70	1.6
PS405-12	DC36V/5A	DC12V/1A	200		
PS408-5	DC36V/8A	DC5V/1A	300		
PS408-12	DC36V/8A	DC12V/1A	300		
PS804-5	DC68V/4A	DC5V/1A	300	175*110*70	2.0
PS804-12	DC68V/4A	DC12V/1A	300		
PS806-5	DC68V/6A	DC5V/1A	500	215*130*70	3.5
PS806-12	DC68V/6A	DC12V/1A	500		

# 07 Companion Products Motion Controllers



## Leadshine's Motion Controllers

Since releasing its first motion controller in 1997, Leadshine has been developing new products to meet the needs of its customers in a wide range of industries. Today, thousands of Leadshine motion controllers are deployed around the world in hundreds of industries. These applications include PCB drilling and milling machines, coordinate measuring machines (CMM), laser welding machines, vision and photo composition automation, electronic manufacturing and assembly, measurement device, biotech sampling and handling, LCD manufacturing, robotics, electronic assembly and measurement equipment, AOI machines, screen printing machines, and so on.

Leadshine is distinguished from others by providing motion controllers that are highly reliable, cost-effective, and easy-to-use. Leadshine's full line of motion controllers includes single and multi-axis, bus-based and stand-alone controllers. Available interface options for international markets include PCI bus, Ethernet, CANopen, EtherCAT, USB and RS232/RS485, etc. By using advanced microcomputer, Leadshine's controllers provide high speed performance and can handle many modes of motion such as point-to-point positioning, jogging, linear and circular interpolation, continuous interpolation and helix interpolation.

All of them are SMT processed with high reliability. They are suitable for stepping and digital servo control systems. Leadshine offers drivers, demo software, and documents to help the users to develop their own application software with G code, IEC-61131-3, or VB/VC/C++ Builder/LabVIEW in Window95/98/2000/NT/XP/7.

### Selection Table (Visit [www.leadshine.com](http://www.leadshine.com) for information about other motion controllers.)

Model	DMC1000B	DMC2410C	DMC5400A	SMC606	mPLC Series	ENC7480
<b>Number of Controllable Axes</b>	4	4	4	6	up to 32	4
<b>Interfaces</b>	PCI	PCI	PCI	Stand-alone, USB, EtherCAT, CANopen, RS232	Stand-alone CANopen, EtherCAT	PCI
<b>Pulse Output Frequency (Max)</b>	1.2 MPPS	4 MPPS	4.0 MPPS	2.0 MPPS	500 KPPS	-
<b>Encoder Input Frequency (Max)</b>	-	4 MHz	4 MHz	2 MHz	-	6.5 MHz
<b>Position Ranges</b>	24-bit ± (8,388,608 pulses)	28-bit ± (134,217,728 pulses)	32-bit ± (2,147,483,647 pulses)	32-bit ± (2,147,483,648 pulses)	32-bit ± (2,147,483,648 pulses)	-
<b>General purpose I/O</b>	32 Inputs / 27 Outputs	20 Inputs / 20 Outputs	16 Inputs / 14 Outputs	24 Inputs / 18 Outputs	optional and expandable	32 Inputs / 32 Outputs
<b>Linear Interpolation</b>	2~4 axes	2~4 axes	2~4 axes	2~4 axes	2~4 axes	-
<b>Circular Interpolation</b>	Any 2 axes Software Interpolation	Any 2 axes High Speed Hardware Interpolation	Any 2 axes High Speed Hardware Interpolation	Any 2 axes High Speed Hardware Interpolation	Any 2 axes Software Interpolation	-
<b>Continuous Interpolation</b>	-	Yes	Yes	Yes	Yes	-
<b>Acceleration and Deceleration</b>	Equal	Equal or Unequal	Equal or Unequal	Equal or Unequal	Equal or Unequal	-
<b>Encoder Counter</b>	-	28-bit ± (134,217,728 pulses)	32-bit ± (2,147,483,647 pulses)	32-bit ± (2,147,483,647 pulses)	-	28-bit ± (134,217,728 pulses)
<b>Manual Pulser Input</b>	-	500 KHz (Max)	500 KHz (Max)	500 KHz (Max)	-	-
<b>Index Signal Input</b>	-	Yes	Yes	Yes	-	Yes