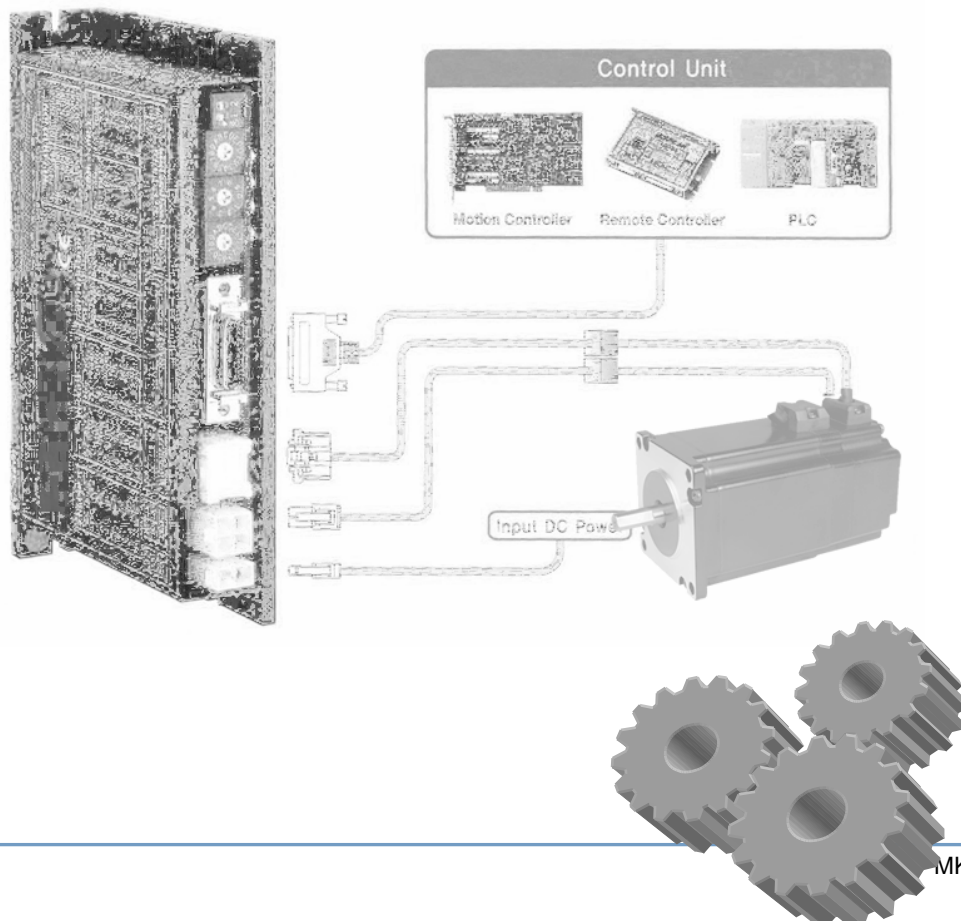




## CLOSED LOOP STEPPING SYSTEM

2  
Phase

# MEZ Series Stepper Servo System



### China Stepper Motor Inc.

By adopting high resolution encoders, MotionKing MEZ servo products apply servo controls on high torque stepper motors. Those products combine advantages of brushless servo systems and conventional stepper systems.

#### Compare to a Conventional Stepper

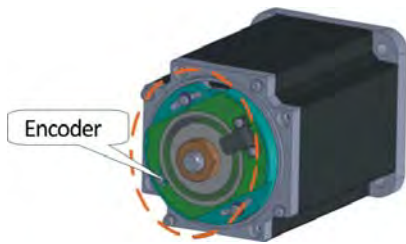
- Closed-loop, eliminates loss of synchronization
- Broader operating range, higher torque and higher speed
- Reduced motor heating and more efficient
- Smooth motion and extra-low motor noise
- Do not need a high torque margin

#### Compare to 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

### Compare to traditional Steppers

#### 1. Closed-loop, eliminates loss of synchronization



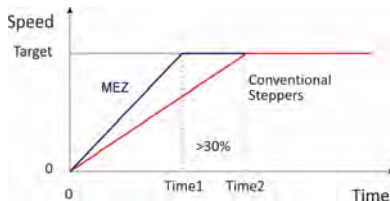
In open-loop stepper systems, potential loss of motor movement synchronization limits their adoption for many applications. Engineers are forced to reserve 50% of available stepper motor torque to avoid possible loss of steps or stall. With the adoption of high resolution encoders to feedback real time motor shaft positions, MotionKing MEZ series servo drives close the position loops between servo drives and driven motors. That will keep motor movement synchronized all the time, and allow 100% of available torque.

#### 2. No torque reservation for broader operating range



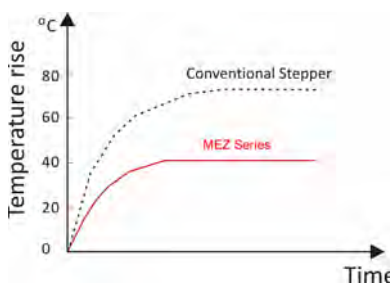
Due to closed loop control and adoption of advanced control algorithm, the MEZ series servo systems can always implement 100% torque of the motor, and do not need the huge 50% torque reservation in normal open-loop stepper systems. This feature significantly improves system high speed performance. While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

#### 3. Quicker Response, Higher Acceleration



Also due to closed loop control and adoption of advanced control algorithm, the MEZ series servo systems can always implement 100% torque of the motor. This feature significantly improves system response or acceleration performance, usually up to 30% quicker or higher acceleration than a same size and holding torque conventional steppers.

#### 4. Extra low motor heating

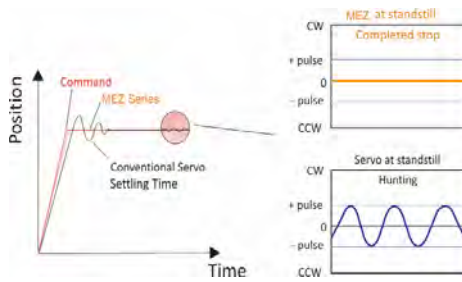


In open-loop stepper systems, output current to the stepper motor from the step driver is constant. No matter what load condition is and how much current is needed, the stepper drive will always output a constant current. Since the MEZ servo runs in closed-loop, the MEZ drives only put as much current into the motor as required to drive the motor to the target. Motor heat is 20 to 40 °C lower compare to a conventional stepper drive which runs at full current most of the time. Less power consumption and longer motor lifetime can be achieved, reducing using and maintenance cost.

### Compare to Servos

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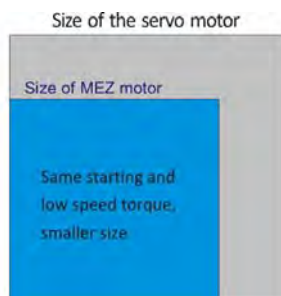
#### 1. Quick response, no hunting



For the case of conventional servo motor systems, there is a considerable delay between the commanding input signals and the resultant motion because of the constant monitor of the current position, necessitating a waiting time until it settles, called settle time.

Since the MEZ servo is a stepper motor based system, it operates in synchronism with command pulses and has no hunting problem. When it stops, its position is completely stable and does not fluctuate. It is a great feature of the MEZ when rapid motions with a short distance are required and it is ideal for applications such as bonding and vision systems in which hunting would be a problem.

#### 2. High torque at starting and low speed, high inertial loads



Since the MEZ servo system is a stepper motor based system, so it has the advantages of high stiffness at standstill, high torque at starting and low speed, eliminating gear box. The MEZ adopts sophisticated control algorithms to take advantage of high-torque capability, providing direct-drive of high inertia loads such as flywheels and belt drives. These load inertias may be as large as 100 times the motor inertia while still providing smooth positioning control. Conventional servo systems typically cannot exceed a 10:1 inertial mismatch.

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



Unlike a servo system which usually needs the engineer to spend a long time to learn how to use tuning tools and tune the gains for a satisfying performance, the MEZ series servo is ready for operation within a very short period of time. Set the microstep resolution and operating current, then the system is ready and offers high performance aCPRoaching to a fine tuned servo. Save time and save cost.

### Typical Applications

Due to combining the features of both brushless servo systems and stepper systems, MotionKing MEZ servo systems are ideal solutions for both upgrading conventional stepper systems, and replacing many brushless servo systems.

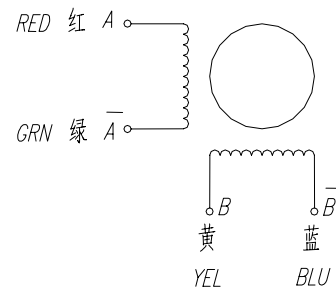
While conventional stepper systems are typically adopted for applications of 1,000 RPM or below, MotionKing MEZ servo systems can easily upgrade your motion control systems to the speed of 2,000 RPM (even higher) with much fast acceleration, much lower heating, higher torque, no loss of steps, smoother motor movement. In comparison to brushless servo systems, MotionKing MEZ servo systems can power control systems with much high starting & low-speed torque, no hunting, no overshooting, zero settling time, lower costs, and no tuning for most of applications.

MotionKing MEZ servo systems have been successfully implemented by hundred of OEM clients in the world in tens of industries such as CNC machinery, electronics, CMM measuring / inspection, medical, lab automation, semiconductor, scientific instruments, textile, etc.

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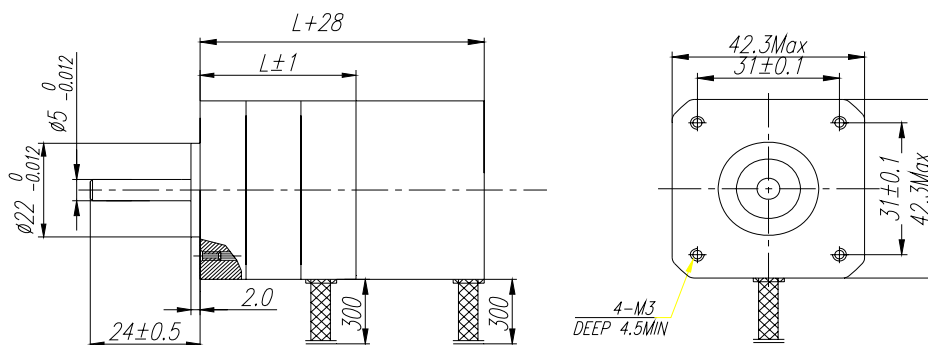


## ● 电气参数 Electrical Specifications ( MEZ-M2-17XX-E10 )

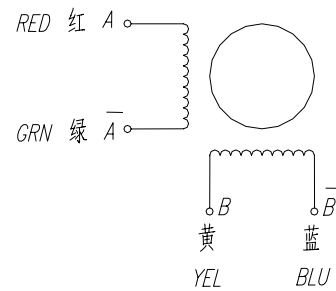
1.8 DEG/STEP	MEZ-M2-1705-E10	MEZ-M2-1707-E10				
Current (A)	1.7	2.5				
Resistance ( $\Omega$ )	1.8	1.7				
Inductance (mH)	3.2	2.7				
Holding Torque (N.m)	0.5	0.7				
Speed (RPM)	0 ~ 2000					
Weight (Kg)	0.5	0.7				
Length L (mm)	48+28=76	58+28=86				
Insulation Res. (M $\Omega$ )	100 MIN, 500Vdc					
Ambient Temp. ( $^{\circ}$ C)	0 ~ +55					
Encoder (CPR)	1000 (2500CPR optional)					
Matching Drive	MEZ-2D880 (24~80VDC, 8.2A)					

\* Note: The above are our typical models, we also manufacture products according to customer's requirements.

## ● 外形尺寸 Motor Dimensions (mm)



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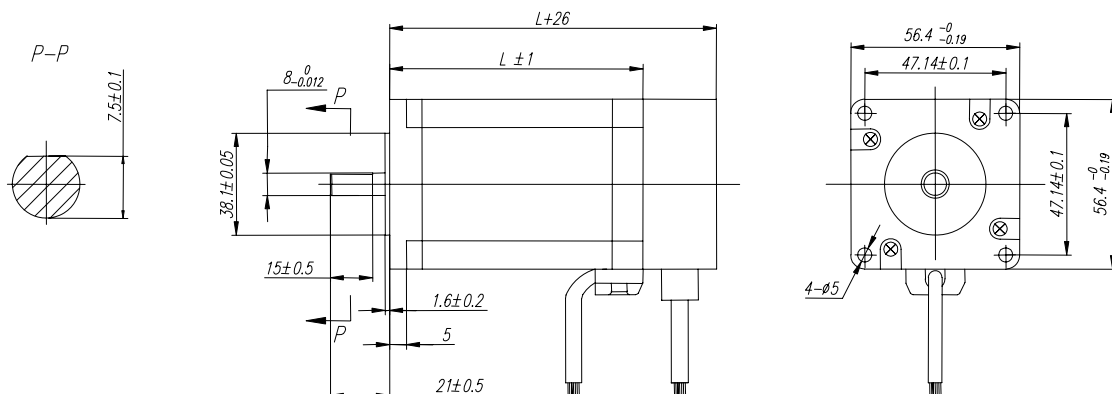


## ● 电气参数 Electrical Specifications ( MEZ-M2-23XX-E10 )

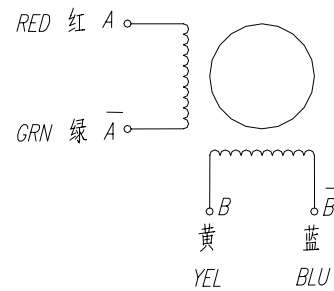
1.8 DEG/STEP	MEZ-M2-2311 -E10	MEZ-M2-2318 -E10	MEZ-M2-2325- E10			
Current (A)	3.0	4.2	4.2			
Resistance (Ω)	0.8	0.7	0.7			
Inductance (mH)	2.4	2.0	2.5			
Holding Torque (N.m)	1.1	1.8	2.5			
Speed (RPM)	0 ~ 2000					
Weight (Kg)	1.0	1.4	1.8			
Length L (mm)	56+26=82	80+26=106	100+26=126			
Insulation Res. (MΩ)	100 MIN, 500Vdc					
Ambient Temp. (°C)	0 ~ +55					
Encoder (CPR)	1000 (2500CPR optional)					
Matching Drive	MEZ-2D880 (24~80VDC, 8.2A)					

\* Note: The above are our typical models, we also manufacture products according to customer's requirements.

## ● 外形尺寸 Motor Dimensions (mm)



China Stepper Motor Inc.

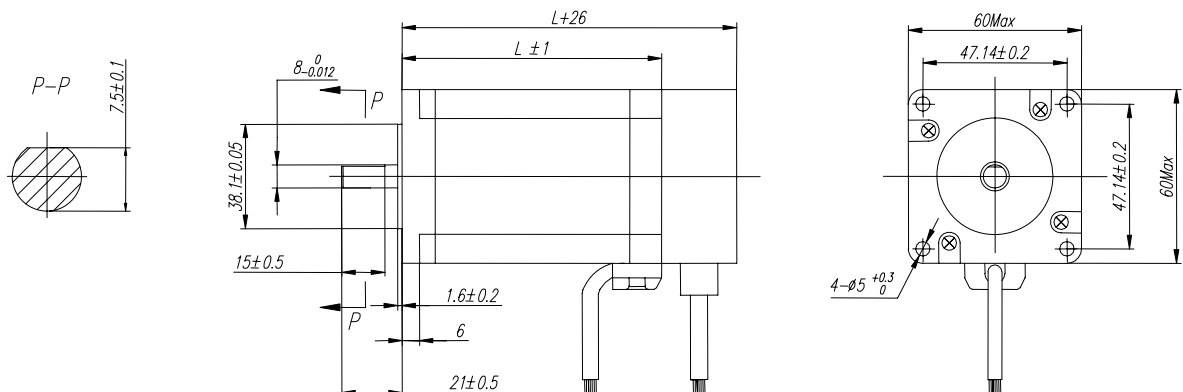


## ● 电气参数 Electrical Specifications ( MEZ-M2-24XX-E10 )

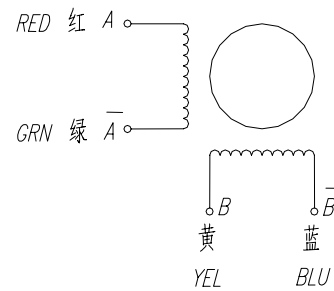
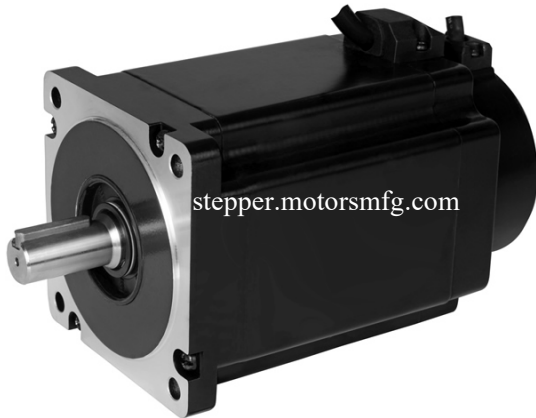
1.8 DEG/STEP	MEZ-M2-2416-E10	MEZ-M22430-E10				
Current (A)	4.2	4.8				
Resistance (Ω)	0.45	0.6				
Inductance (mH)	1.2	2.5				
Holding Torque (N.m)	1.6	2.6				
Speed (RPM)	0 ~ 2000					
Weight (Kg)	1.0	1.6				
Length L (mm)	56+26=82	90+26=116				
Insulation Res. (MΩ)	100 MIN, 500Vdc					
Ambient Temp. (°C)	0 ~ +55					
Encoder (CPR)	1000 (2500CPR optional)					
Matching Drive	MEZ-2D880 (24~80VDC, 8.2A)					

\* Note: The above are our typical models, we also manufacture products according to customer's requirements.

## ● 外形尺寸 Motor Dimensions (mm)



China Stepper Motor Inc.

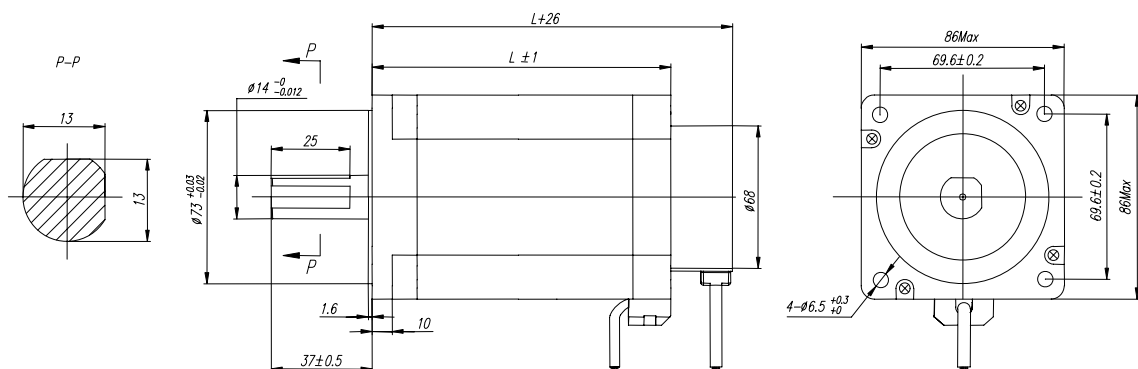


## ● 电气参数 Electrical Specifications ( MEZ-M2-34XX-E10 )

1.8 DEG/STEP	MEZ-M2-3442-E10	MEZ-M2-3480-E10	MEZ-M2-3412-E10			
Current (A)	5.6	7.0	7.0			
Resistance ( $\Omega$ )	0.3	0.38	0.45			
Inductance (mH)	3.0	3.2	5.2			
Holding Torque (N.m)	4.2	8	12			
Speed (RPM)	0 ~ 2000					
Weight (Kg)	2.8	4.0	5.5			
Length L (mm)	80+26=106	114+26=140	150+26=176			
Insulation Res. (M $\Omega$ )	100 MIN, 500Vdc					
Ambient Temp. ( $^{\circ}$ C)	0 ~ +55					
Encoder (CPR)	1000 (2500CPR optional)					
Matching Drive	<b>MEZ-2D880</b> (24~80VDC, 8.2A)	<b>MEZ-2D1080</b> (24~75VAC/DC, 8.2A)	<b>MEZ-2DH1280</b> (70~130VAC 8A)			

\* Note: The above are our typical models, we also manufacture products according to customer's requirements.

## ● 外形尺寸 Motor Dimensions (mm)





## MEZ Stepper Servo Drives – Closed-Loop Drives



### Highlights

- Stepper based servo control
- Closed position loop to eliminate loss of synchronization
- No torque reservation
- Load based output current for extra low motor heating
- Smooth motor movement and low motor noise
- Quick response and no hunting
- No overshooting and almost zero settling time
- High starting torque, high inertial loads
- Capable of driving NEMA 17, 23, 24 & 34 MEZ servo motors (stepper motors with encoders)
- Plug-and-play, no tuning for most of applications

### Available Products

Model	Control Tye	Power			Matching Easy Servo Motors (NEMA)	Configuration	Encoder Feedback
		Voltage(V)		Current(A)			
		AC	DC	Peak			
<a href="#">MEZ-2D880</a>	Step & Dir		24 - 80	0.5 - 8.2	MEZ-M2-1705-E10 MEZ-M2-1707-E10 MEZ-M2-2311-E10 MEZ-M2-2318-E10 MEZ-M2-2325-E10 MEZ-M2-2416-E10 MEZ-M2-2430-E10 MEZ-M2-3442-E10	DIP Switch / RS232	√
<a href="#">MEZ-2D1080</a>	Step & Dir	20 - 70	30 - 100	0.5 - 8.0	MEZ-M2-3442-E10 MEZ-M2-3480-E10	DIP Switch / RS232	√
<a href="#">MEZ-2DH1280</a>	Step & Dir	90 - 130	127 - 184	0.5 - 8.0	MEZ-M2-3480-E10 MEZ-M2-3412-E10	HMI / RS232	√