

**$\alpha$ STEP AZ** Series Equipped

# Motorized Linear Slides **EAS** Series Motorized Cylinders **EAC** Series

Standard Type/Side-Mounted Type



New Standards for  
Motorized Linear Slides and  
Motorized Cylinders

Oriental Motor presents a variety of lineups for linear motion, broadening the range of designs and performance.

Battery-Free, Built-In Absolute Sensor **AZ** Series Equipped

## Motorized Linear Slides **EAS** Series

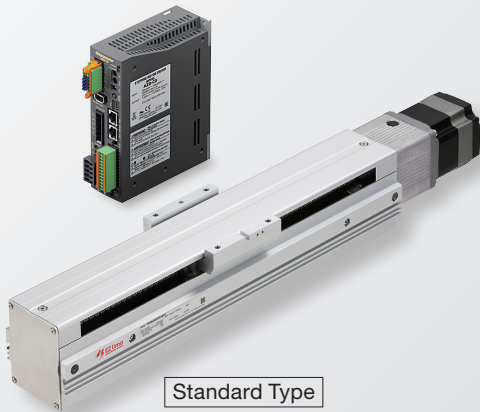


Built-In Controller Type **C-FLEX**

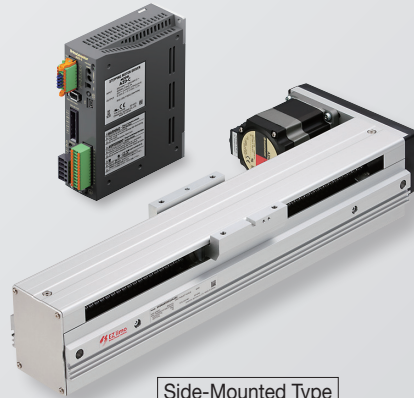
AC Power-Supply Input  
DC Power-Supply Input

Pulse Input Type

AC Power-Supply Input  
DC Power-Supply Input



Standard Type



Side-Mounted Type

\*Photo shows the Right-sided Type.

- Stroke: 50 to 850 mm
- Maximum speed: 800 mm/s
- Maximum transportable mass: 60 kg (horizontal), 30 kg (vertical)
- Repetitive positioning accuracy:  $\pm 0.02$  mm

Standard Type

- X Table
- Y Table

Side-Mounted Type  
(Right-sided/ Left-sided)

- X Table
- Y Table

All the linear slides and cylinders are equipped with a standard motor and driver package.

Adopting Oriental Motor's unique Closed Loop Control

With the ease of use of the Stepper motor retained, this package made continuous drive possible and improved the responsiveness and dependability.

Closed Loop Stepper Motor and Driver Package

**$\alpha$ STEP AZ Series**

- Standard
- With Electromagnetic Brake



Battery-Free, Built-In Absolute Sensor **AZ** Series Equipped

## Motorized Cylinders **EAC** Series



Built-In Controller Type **C-FLEX**

AC Power-Supply Input  
DC Power-Supply Input

Pulse Input Type

AC Power-Supply Input  
DC Power-Supply Input



Standard Type



Side-Mounted Type

- Stroke: 50 to 300mm
- Maximum speed: 600 mm/s
- Maximum transportable mass: 60 kg (horizontal), 30 kg (vertical)
- Repetitive positioning accuracy:  $\pm 0.02$  mm

Standard Type

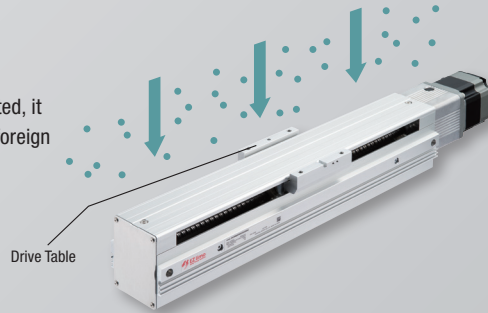
- Standard
- With Shaft Guide
- With Shaft Guide Cover

Side-Mounted Type

- Standard
- With Shaft Guide
- With Shaft Guide Cover

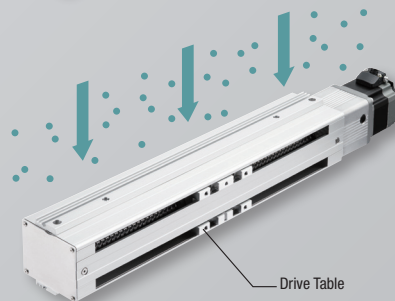
#### ■ X Table

When horizontally mounted, it lessens the intrusion of foreign objects.



#### ■ Y Table

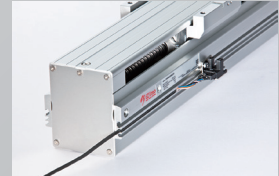
When attached to the wall, it lessens the intrusion of foreign objects.



#### ● With/Without Sensor Rail

##### ■ With Sensor Rail

Sensors (sold separately) can be fixed to the sensor rail on the lateral side of the slider.

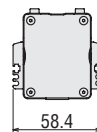


##### ■ Without Sensor Rail

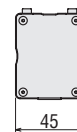
Without the sensor rail the actuator becomes more compact.



**EAS4**  
Y Table  
With Sensor Rail



**EAS4**  
Y Table  
Without Sensor Rail



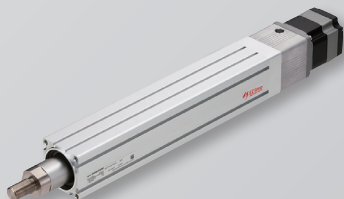
**13mm**  
Smaller

#### What is FLEX?

FLEX is the collective term for products compatible with I/O control, Modbus (RTU) control, and Industrial network control via network converters. These products enable simple connection and simple control, shortening the total lead time for system configuration.

#### ■ Standard

To be compatible with the device of the customer, an external guide is required.



#### ■ Equipped with shaft guide

The customer is not required to design or arrange for the parts, therefore reducing the time required to start up the equipment.



#### ■ Equipped with shaft guide cover

The movable parts of the cylinder body are protected, thereby improving the safety of the device. It also helps prevent the spattering of grease on the shaft guide and also prevent the intrusion of foreign matter into linear bushing.





# Amazing Design

Multi movement ability, performance regardless of operating conditions!

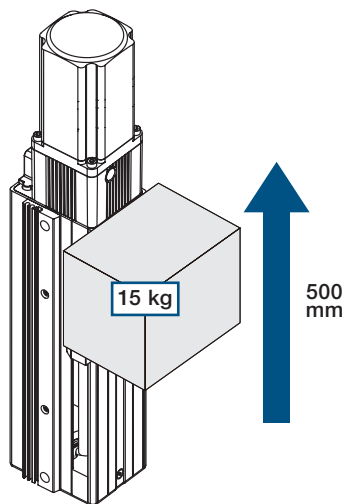
Supporting a wide range of speeds and loads: From low to high speed and from low to high load, these high-performance motorized linear slides and motorized cylinders have become easier to use.

## High-speed drive even with different weight.

High-speed drive is possible from light loads to heavy loads even during inching operation.

(Product used)  
Product name: **EAS6**  
Lead: 6 mm  
Power-Supply Input: 230 VAC

<Operation example>  
Transportable Mass: 15 kg  
Positioning Distance: 500 mm  
Drive Direction: Vertical



### <What Oriental Motor Can Provide>

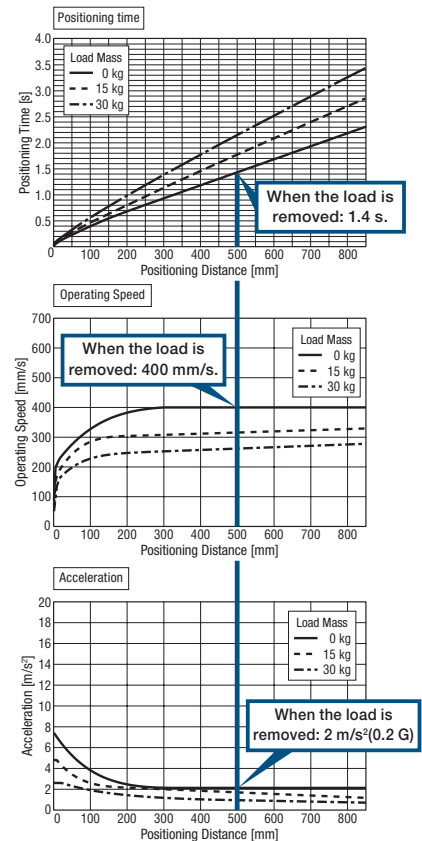
The positioning time, drive speed, and acceleration can be easily retrieved from the graph in this brochure.

From the graph, the movement can be estimated by selecting the model when the operating conditions change to no load or inching.

Capable of a higher-speed drive when load lessens during the return.

Transportable Mass: 0 kg  
Positioning Distance: 500 mm  
Positioning Time: 1.4 s  
Operating speed: 400 mm/s  
Acceleration: 2 m/s<sup>2</sup> (0.2 G)

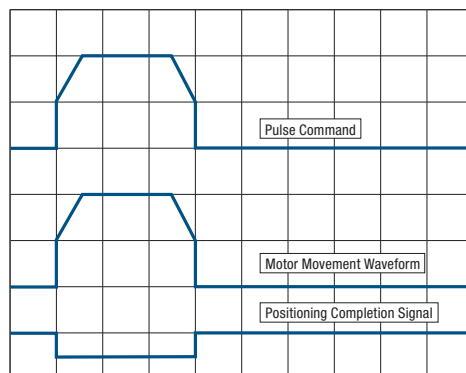
### High-speed drive with light load



## Quick responsiveness

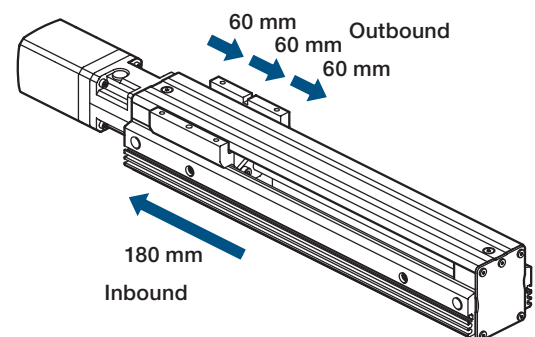
Using the high responsiveness of the closed loop stepper motor, short distance positioning is performed in a short time.

Closed loop stepper motors operate synchronously with pulse commands and generate high torque with a compact body, and offer excellent acceleration performance and response.



(Product used)  
Product name: **EAS4**  
Lead: 12 mm  
Power-Supply Input: 230 VAC

<Operation example>  
Horizontal Transportable Mass: No load  
Inching Drive: 60 mm (Outbound 3 times)  
180 mm (Inbound once)  
Operating speed: 800 mm/s  
Acceleration: 20 m/s<sup>2</sup> (2 G)



## Low-speed stability

Closed loop stepper motor microstep drive method and smooth drive function.\* The resolution is improved without mechanical factors such as the reduction gear mechanism. This results in minimal variation in speed, and the speed is continuously kept constant.

### \* Smooth drive function

is a control method using the microstep drive to automatically keep the distance travelled and the travel speed the same as with the full step, without changing the pulse input setting.

(Product used)

Product Name: **EAS4**

Lead: 12 mm

Power-Supply Input: 230 VAC

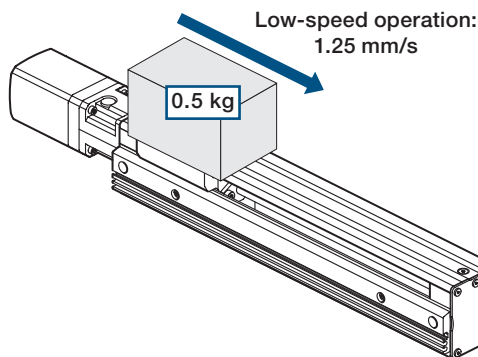
<Operation example>

Mass: 0.5 kg

Operating Current: 100%

Resolution: 0.01 mm/step

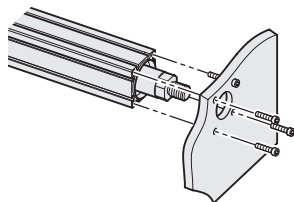
Operating Speed: 1.25 mm/s



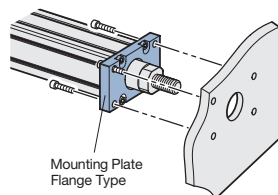
## Flexible Mounting of the Motorized Cylinder

The motorized cylinder EAC Series can be mounted as shown below.

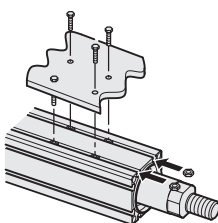
### ■ Front Mounting (Direct mounting)



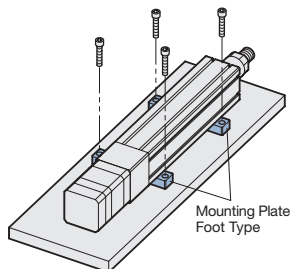
### ■ Front Mounting (Mounting plate flange type: sold separately)



### ■ Side Mounting (Direct mounting)

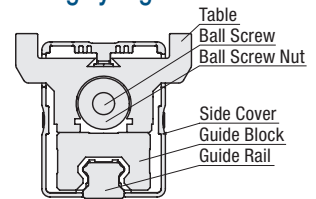


### ■ Side Mounting (Mounting plate foot type: sold separately)



## Compact, Highly Accurate and Highly Rigid Linear Slides

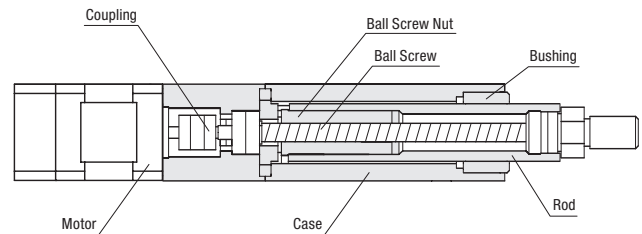
A motorized linear slide that uses ball screws and adopts a THK-made LM guide.\* The highly accurate LM Guide is installed directly to the enclosure base of your equipment making it ideal for applications that require parallelism. (Traveling parallelism of 0.03 mm) Besides being compact, it is highly rigid and has achieved a large portable mass.



\* "LM Guide" is a registered trademark of THK.

## Compact/High-Thrust Cylinder

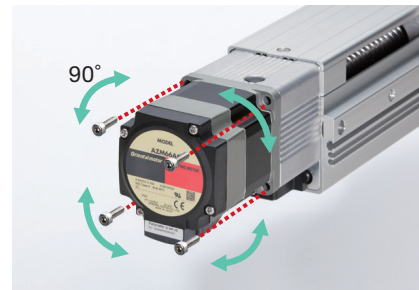
Aluminum is used for the rod, making the motorized cylinder compact, lightweight, and high-thrust. The unique structure suppresses vibration to achieve improved acceleration characteristics and high-speed positioning operation.



## Cable Drawing Direction

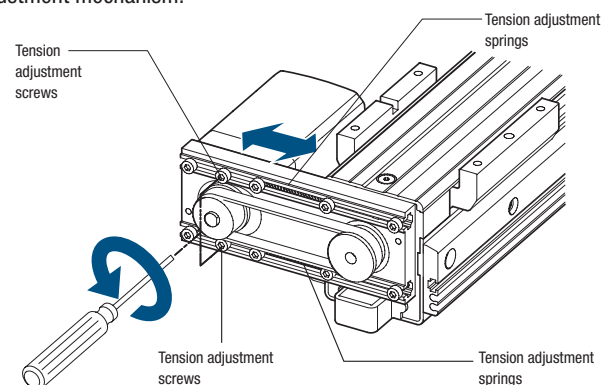
Changeable to 4 directions (3 directions for the Side-Mounted Type)

The direction of drawing the motor cable can be changed easily. The cable comes out from the side of the motor, therefore space is saved while no space is required at the back of the motor.





## Simple Belt Replacement (Side-Mounted Type)

The belt is easily replaced using Oriental Motor's unique belt tension adjustment mechanism.







When the screw is loosened, the belt tension is adjusted to the appropriate tension using the force from the spring. The above figure shows the side-mounted mechanism in the **EAS** Series, but it is also similar with the **EAC** Series.

# Lineup

Series Name Type	Product Width x Height Mass	Power Supply Input [V]	Lead [mm]	Stroke [mm]																Maximum Speed [mm/s]									
				100	200	300	400	500	600	700	800	900	100	200	300	400	500	600	700	800									
<b>EAS Series</b> Standard Type 	<b>EAS4</b> 58.4 × 60mm 1.8~4.0kg	Single-Phase 100-120 Single-Phase 200 - 240 Three-Phase 200 - 230	12	50~700																800									
			6	50~700																400									
		DC24/48	12	50~700																600									
			6	50~700																300									
		<b>EAS6</b> 75.4 × 83mm 3.9~8.8kg	Single-Phase 100-120 Single-Phase 200 - 240 Three-Phase 200 - 230	12	50~850																800								
				6	50~850																400								
			DC24/48	12	50~850																600								
				6	50~850																300								
	<b>EAS Series</b> Side-Mounted Type 	<b>EAS4R</b> <b>EAS4L</b> 58.4 × 60mm 1.8~4.0kg	Single-Phase 100-120 Single-Phase 200 - 240 Three-Phase 200 - 230	12	50~700																800								
				6	50~700																400								
DC24/48			12	50~700																600									
			6	50~700																300									
<b>EAS6R</b> <b>EAS6L</b> 75.4 × 83mm 3.9~8.8kg			Single-Phase 100-120 Single-Phase 200 - 240 Three-Phase 200 - 230	12	50~850																800								
				6	50~850																400								
			DC24/48	12	50~850																600								
				6	50~850																300								

\* Without sensor rail: **EAS4** 45×60mm, **EAS6** 62×83mm.

Series Name Type	Product Width x Height Mass	Power Supply Input [V]	Lead [mm]	Stroke [mm]										Maximum Speed [mm/s]								
				100	200	300	400	500	600	700	800	900	100	200	300	400	500	600	700	800		
<b>EAC Series</b> Standard Type Standard  	<b>EAC4</b> 42 × 42mm 1.0~2.1kg	Single-Phase 100-120	12	50~300										600								
		Single-Phase 200 - 240	6	50~300										300								
		Three-Phase 200 - 230																				
		DC24/48	12	50~300										600								
	<b>EAC6</b> 60 × 60mm 2.6~4.9kg	Single-Phase 100-120	12	50~300										600								
		Single-Phase 200 - 240	6	50~300										300								
		Three-Phase 200 - 230																				
		DC24/48	12	50~300										600								
<b>EAC Series</b> Standard Type  Shaft Guide With Cover   With Shaft Guide	<b>EAC4W</b> 42 × 114mm 1.7~3.5kg	Single-Phase 100-120	12	50~300										600								
		Single-Phase 200 - 240	6	50~300										300								
		Three-Phase 200 - 230																				
		DC24/48	12	50~300										600								
	<b>EAC6W</b> 60 × 156mm 4.1~7.6kg	Single-Phase 100-120	12	50~300										600								
		Single-Phase 200 - 240	6	50~300										300								
		Three-Phase 200 - 230																				
		DC24/48	12	50~300										600								
<b>EAC Series</b> Side-Mounted Type Standard  	<b>EAC4R</b> 42 × 42mm 1.0~2.1kg	Single-Phase 100-120	12	50~300										600								
		Single-Phase 200 - 240	6	50~300										300								
		Three-Phase 200 - 230																				
		DC24/48	12	50~300										600								
	<b>EAC6R</b> 60 × 60mm 2.6~4.9kg	Single-Phase 100-120	12	50~300										600								
		Single-Phase 200 - 240	6	50~300										300								
		Three-Phase 200 - 230																				
		DC24/48	12	50~300										600								
<b>EAC Series</b> Side-Mounted Type  Shaft Guide With Cover   With Shaft Guide	<b>EAC4RW</b> 42 × 114mm 1.7~3.5kg	Single-Phase 100-120	12	50~300										600								
		Single-Phase 200 - 240	6	50~300										300								
		Three-Phase 200 - 230																				
		DC24/48	12	50~300										600								
	<b>EAC6RW</b> 60 × 156mm 4.1~7.6kg	Single-Phase 100-120	12	50~300										600								
		Single-Phase 200 - 240	6	50~300										300								
		Three-Phase 200 - 230																				
		DC24/48	12	50~300										600								

\*1

Upper value : Dynamic Permissible Moment [N•m] Lower value : Static Permissible Moment [N•m]			Mamimum Transportable Mass in Horizontal Direction [kg]										Mamimum Transportable Mass in Vertical Direction [kg]							Repetitive Positioning Accuracy [mm]
M <sub>P</sub>	M <sub>Y</sub>	M <sub>R</sub>	10	20	30	40	50	60	70	80	90	10	20	30	40	50	60			
16.3 58.3	4.8 16.0	15.0 53.3	~15									~7							±0.02	
			~30										~14							
			~15										~7							
			~30									~14								
31.8 86.0	10.3 34.0	40.6 110.0	~30									~15						±0.02		
			~60										~30							
			~30										~15							
			~60									~30								
16.3 58.3	4.8 16.0	15.0 53.3	~15									~7						±0.02		
			~30										~12.5							
			~15										~7							
			~30									~12.5								
31.8 86.0	10.3 34.0	40.6 110.0	~30									~15						±0.02		
			~60										~30							
			~30										~15							
			~60									~30								

Thrust [N]	Pushing Force [N]	Mamimum Transportable Mass in Horizontal Direction [kg]										Mamimum Transportable Mass in Vertical Direction [kg]										Repetitive Positioning Accuracy [mm]
		10	20	30	40	50	60	70	80	90	10	20	30	40	50	60						
~70	100	~15									~7						±0.02					
~140	200	~30									~14											
~70	100	~15									~7											
~140	200	~30									~14											
~200	400	~30									~15						±0.02					
~400	500	~60									~30											
~200	400	~30									~15											
~400	500	~60									~30											
~70	100	~15									~6						±0.02					
~140	200	~30									~13											
~70	100	~15									~6											
~140	200	~30									~13											
~200	400	~30									~13						±0.02					
~400	500	~60									~28											
~200	400	~30									~13											
~400	500	~60									~28											
~70	100	~15									~7						±0.02					
~125	200	~30									~12.5											
~70	100	~15									~7											
~125	200	~30									~12.5											
~200	400	~30									~15						±0.02					
~360	500	~60									~30											
~200	400	~30									~15											
~360	500	~60									~30											
~70	100	~15									~6						±0.02					
~125	200	~30									~11.5											
~70	100	~15									~6											
~125	200	~30									~11.5											
~200	400	~30									~13						±0.02					
~360	500	~60									~28											
~200	400	~30									~13											
~360	500	~60									~28											



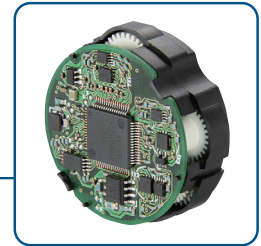
# AZ Series Features

Equipped with a newly developed ABZO sensor, this is advanced technology at an affordable price. As it is an absolute system, external sensors such as the point of origin sensor or limit sensor are not required.

## Newly developed ABZO Sensor

We have developed a compact, low cost, battery-free mechanical absolute sensor (patented). This affordable motor series allows for productivity improvements and cost reductions.

Battery-Free  
Equipped with multirotation  
absolute sensor



ABZO Sensor



## Cost Reductions

Sensor costs and cable costs can be reduced, leading to lower system costs.

## Mechanical Sensor

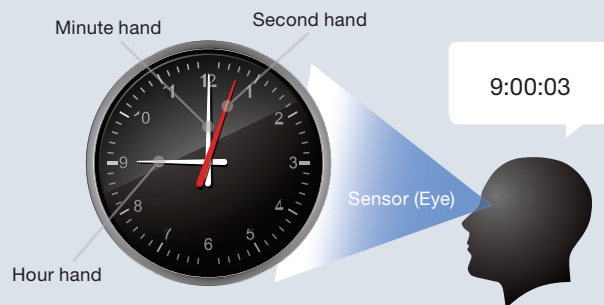
Analog clocks measure the current time based on the positions of the second hand, minute hand and hour hand. **ABZO** sensor is a mechanical sensor equipped with multiple gears equivalent to the hands on a clock. As it detects positioning information by detecting the angles of the respective gears, a battery is not required.

## Multirotation Absolute System

Absolute position detection is possible with  $\pm 900$  rotations (1800 rotations)\* of the motor shaft from the home position.

\* The frame sizes 20 and 28 mm are  $\pm 450$  rotations (900 rotations).

- Basic principles are like an analog clock



## Home Position Setting

By pressing the switch on the driver surface home position can be set simply, and the home position can be saved with the **ABZO** sensor. Furthermore, it is possible to set the home position using the data setting software (**MEXE02**) or the external input signal.

- Home Position Setting



Push switch

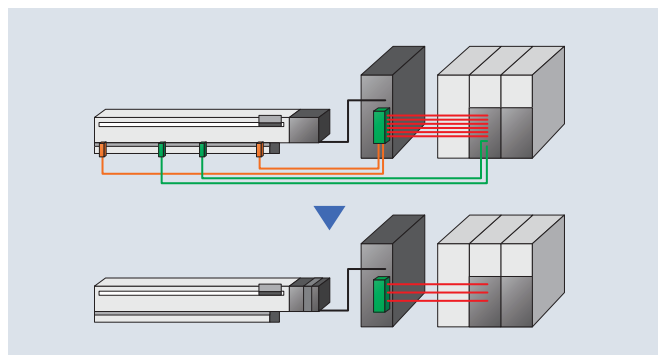
## Cable Savings

This reduces cabling, increasing device design degree of freedom.

## Not Affected by Sensor Malfunctions

The **AZ** Series eliminates concerns such as sensor malfunctions, sensor faults or disconnection of the sensor lines. For example, sensor malfunctions due to metal flakes or oil mist floating about in the environment will be prevented.

● In systems where limit switches are not possible, software limits can be used to prevent the limit values being exceeded.



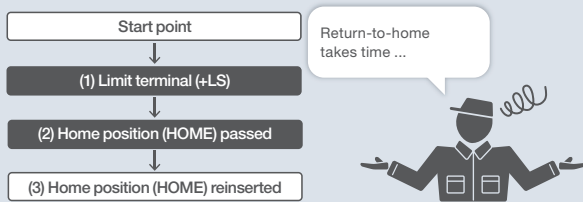
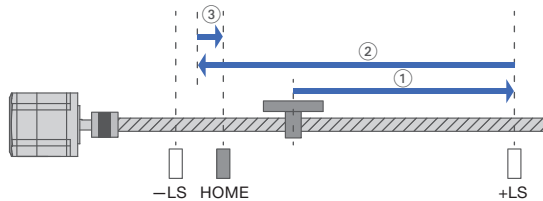


## High Speed Return-to-Home + Improved Return-to-Home Accuracy

Because return-to-home is possible without using an external sensor, return-to-home can be performed at high speed without taking the sensor sensitivity into account, allowing for a shortened machine cycle. Further, as return-to-home can be performed without concern for differences in the home sensor, it is possible to improve home position accuracy.

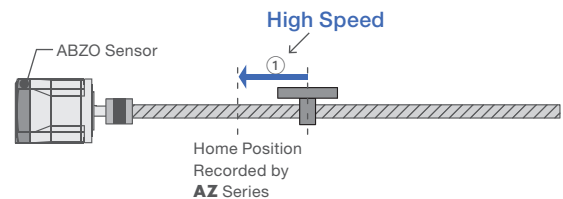
### Pre-ABZO homing method example

The home position is detected at low speed by detecting the limit sensor ( $\pm$ LS) and home sensor (HOME).



### AZ Series utilising ABZO sensor homing method

There is no need to detect the limit sensor, and it moves directly at high speed to the home position recorded by the ABZO sensor.



## Battery-Free

As this is a mechanical sensor, a battery is not necessary. The positioning information is managed mechanically by the **ABZO** sensor.

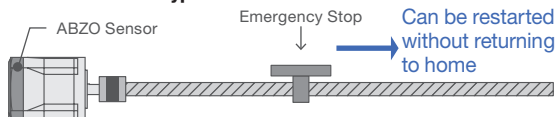


## Maintaining Positioning Information

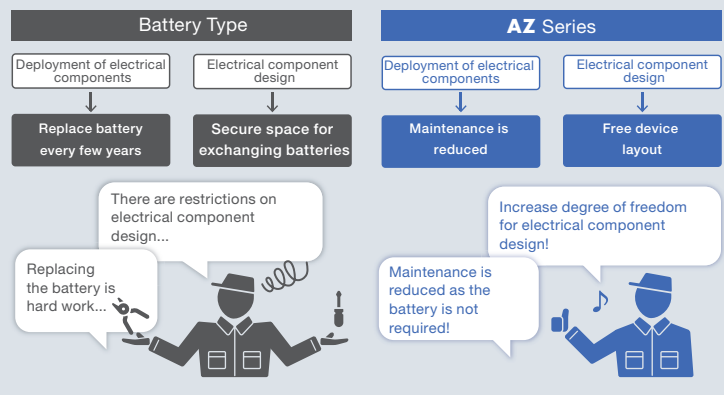
Even if the power shuts down during a positioning operation, the positioning information is retained. Furthermore, for built-in controller types, positioning operations can restart without performing a return-to-home operation when recovering from an emergency stop of the production line or a power cut.

● If the motor is temporarily replaced it is necessary to reset the home position as the positioning information is stored in the **ABZO** sensor.

### Built-in Controller Type



### • Maintenance



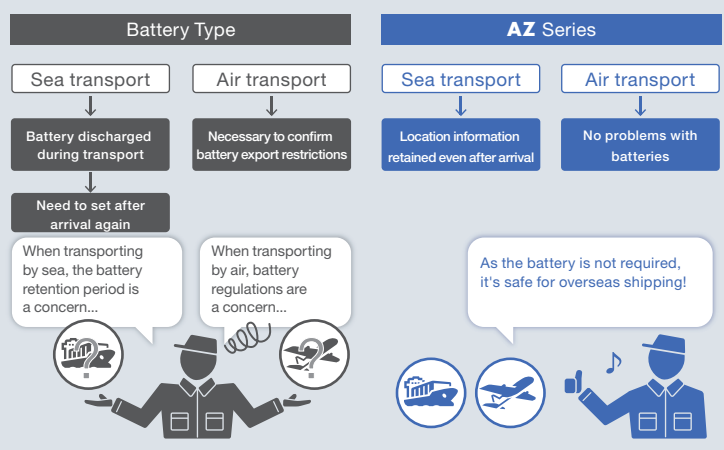
## Drivers take up less Space

As space is not required for the battery, this free up space within the panel for other purposes.

## Safe for Overseas Shipping

As normal batteries are self discharging, care is required when transporting the device over long periods, such as in the case of overseas shipments. **ABZO** sensors do not require batteries, so there is no deadline for the storage of positioning information. Further, there is no need to consider the respective regulations etc. when exporting overseas.

### • Overseas Shipping



# Motor Features

Save Energy with High Reliability and High Efficiency of **αSTEP**

## High Reliability

We have adopted a proprietary control system. We have achieved high reliability by linking the benefits of open loop control and closed loop control.

### ■ Keeps driving even in the case of sudden load changes or sudden acceleration

Normally it drives with open loop control in sync with the pulse commands. At times of overload, control instantly switches to control using a closed loop, and perform positioning correction.

### ■ Outputs an alarm signal in case an abnormality occurs

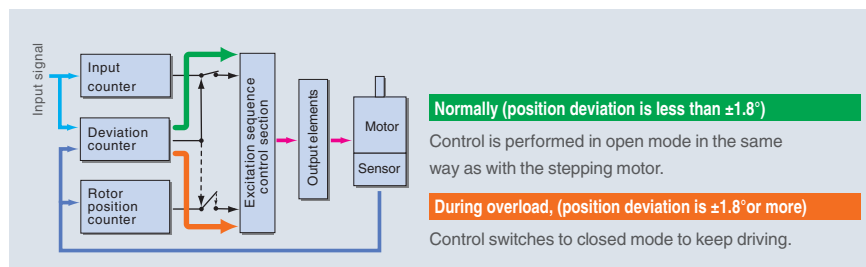
When overload continuously occurs, an alarm signal is output and when positioning determination is complete, a signal is output. This supports high reliability.

### ■ Tuning not required

As normally it drives with open loop control, when there is a change in load, such as in the belt mechanism, cam and chain drive, the positioning can be determined without gain adjustment.

### ■ Storing of stop position

When determining positioning, it stops using the motor's own holding torque without hunting. Therefore it is suitable for use in a situation where vibration could cause a problem when stopping due to a low-rigidity mechanism.



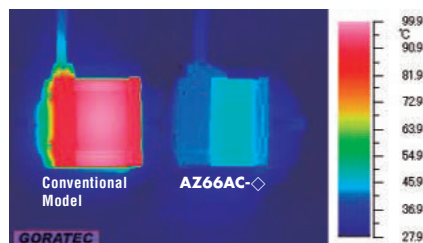
## Energy Saving

Energy saving is also achieved by reducing motor heat generation through high efficiency.

### ■ Reduced heat generation

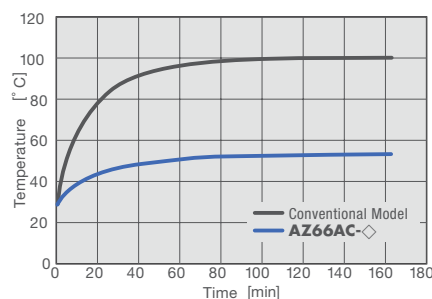
We have achieved a significant decrease in heat generation through high efficiency.

#### ● Temperature Distribution by Thermography



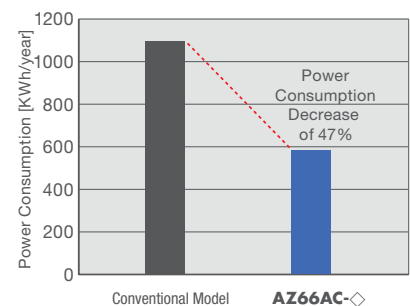
This is an image when driving under the same conditions.

#### ● Motor Surface Temperature during Same Operation Conditions



### ■ The amount of power consumption has been reduced to 47% of its previous levels through energy saving

#### ● Power Consumption



CO2 emissions have reduced by 47% compared to the previous levels

#### Drive conditions

Rotation speed 1000 r/min, load factor 50%  
Usage time: 24 hour operation (drive 70%, standby 25%, stop 5%), 365 days/year

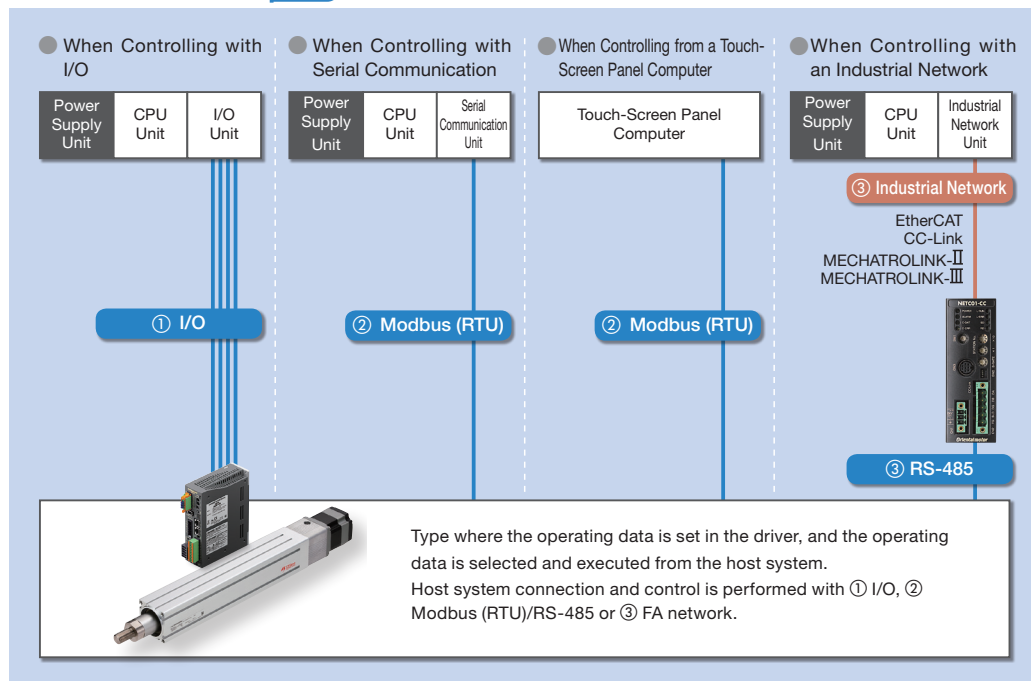
# Driver Features

Connectable with Various Host Systems.

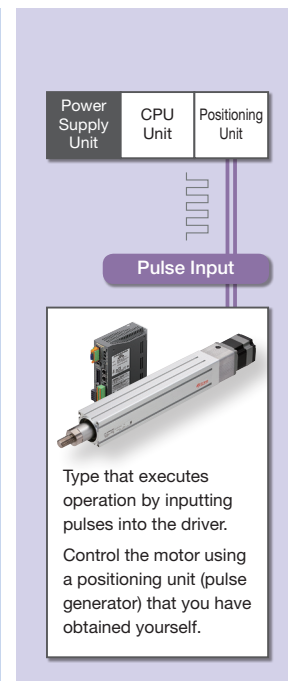
## 2 Driver Types Selectable by System Configuration

You can select from 2 driver types for the **EAS/EAC** Series, depending on your host system.

### Built-in Controller Type **C-FLEX**



### Pulse Input Type

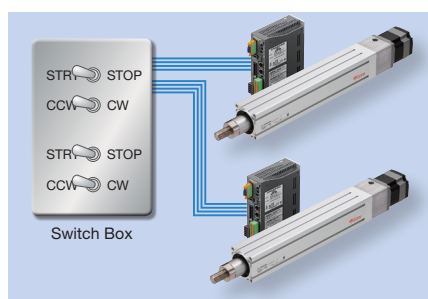


## How to Connect a Built-In Controller Type

### ① I/O

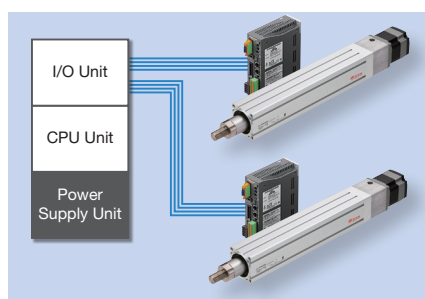
Because the positioning unit (pulse generator) function is built in to the driver, you can build an operation system using I/O by directly connecting to a switch box or PLC. Because a positioning unit is not necessary on the PLC side, space is saved and the system is simplified.

#### ● Example of Using a Switch Box



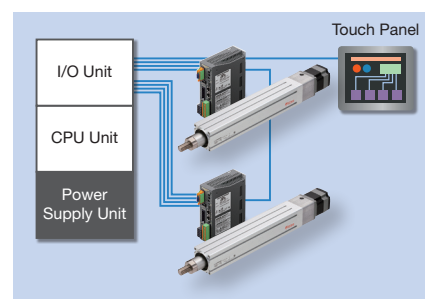
Because operating data is set in the driver, the actuator can be started and stopped simply by connecting a switch you have on hand. Control can be performed easily without using PLC.

#### ● Example of Using PLC



When using PLC, you can build an operation system by connecting directly to an I/O unit. Because a positioning unit is not necessary on the PLC side, space is saved and the system is simplified.

#### ● Example of Using PLC and a Touch Panel



Normally, the actuator is started and stopped with I/O. Changing the operating data settings and displaying the monitors and alarms is performed with the touch panel using Modbus (RTU) communication. When there is a lot of setup work, changes can be easily performed on the touch panel, and the burden of creating ladders is reduced.

### ② Modbus (RTU)/RS-485

Operating data and parameters can be set and operation commands can be input using RS-485 communication. Up to 31 drivers can be connected to each serial communication unit. Also, there is a function that enables the simultaneous start of multiple axes. The protocol supports Modbus (RTU), enabling connection with devices such as touch-screen panel computers and PCs.



# ***Orientalmotor***

These products are manufactured at plants certified with the international standards **ISO 9001** (for quality assurance) and **ISO 14001** (for systems of environmental management).

Specifications are subject to change without notice.  
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