

***Orientalmotor***

Easily Build What You Need

With the Built-in Battery-Free Absolute Sensor

# **AZ Family**



# Creating Time for Engineers,

## Let the **AZ Family** Take Care of It.

The **AZ** Family is a group of closed-loop motors and linear or rotary actuators equipped with the ABZO sensor, all with the same interface (wiring). Common drivers allow for the unification of wiring, control and maintenance parts.

Because they reduce workload and shorten the time required, this product group can simplify future automation projects.

Unification of Wiring, Control and Maintenance

### Motors/Geared Motors

Based on torque, accuracy (backlash) and price, the optimal type can be selected.

The product line is equivalent to servo motors from 50 W to 750 W.

Standard Type



Frame Size  
20 mm - 85 mm

**TS** Geared  
(Spur gear mechanism)



Frame Size  
42 mm - 90 mm

**Right-Angle Shaft FC**  
Geared Type  
(Face gear mechanism)



Frame Size  
42 mm or 60 mm

**PS** Geared Type  
(Planetary gear mechanism)



Frame Size  
28 mm - 90 mm

**HPG** Geared Type  
(Harmonic planetary<sup>®</sup>)  
Shaft Output Flange Output



Frame Size  
40 mm - 90 mm

**Harmonic Geared Type**  
(Harmonic drive<sup>®</sup>)



Frame Size  
30 mm - 90 mm

### Linear & Rotary Actuators

Linear & rotary actuators, consisting of a motor assembled with the necessary mechanical components, are available to meet different needs of automated devices.

Electric Linear Slides



Electric Cylinders



Compact Electric Cylinders



Hollow Rotary Actuators



Rack-and-Pinion Systems



Electric Grippers



### Drivers

A wide variety of interface types and power supply input types are available.

Drivers that are compatible I/O or pulse input pulse inputs, as well as the major industrial networks used around the globe, are available.



Pulse



I/O



Modbus (RTU)

●Supported interfaces vary depending on the driver type



AC Input Driver



DC Input Driver



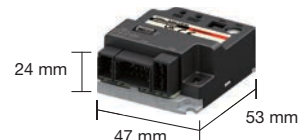
DC Power Supply Multi-Axis Driver

#### mini Driver (DC input only)

The mini driver has been designed to be smaller and lighter. It can be installed in small spaces and is suitable for integration into battery-powered equipment due to its wide voltage specifications.

Compatible interfaces: EtherCAT, EtherNet/IP, PROFINET, Modbus (RTU), Pulse, I/O

**AZD-KR2D**  
(Dimensions for RS-485 communication Modbus type)



# The New Standard for Automation

## What is the **AZ** Series?

The **AZ** Series is a stepper motor that is capable of high positioning accuracy, accurate speed control, and capable of limiting the torque generated by the motor. With a built-in mechanical absolute sensor (ABZO sensor) they make battery-free absolute systems a reality. They offer the same peace of mind as servo motors and contribute to improved productivity and cost reductions.



## These Types of Problems can be Solved

Inside

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# 01

### For Mechanical Designers

Problem

- When custom-building a mechanism to be attached to a motor, **selecting the mechanical components, creating the parts list and drawings, and evaluating after assembly are time consuming**
- **Unifying all the drive components in the equipment to linear & rotary actuators is difficult** due to installation space and cost.

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### For Electrical Designers

Problem

- When motors and linear & rotary actuators from different manufacturers are used together in equipment, **the drivers and setting software become disjointed**

Inside

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# 03

### For Maintenance Managers

Problem

- The combined use of motors and electric actuators from different manufacturers in the equipment **creates inventory management costs**

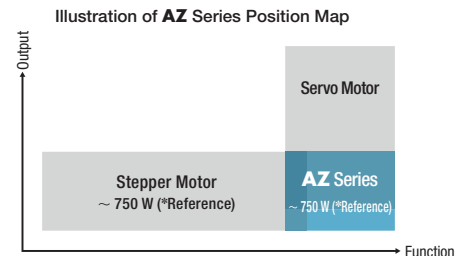
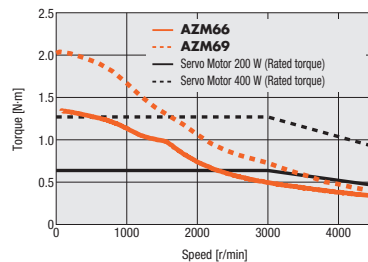
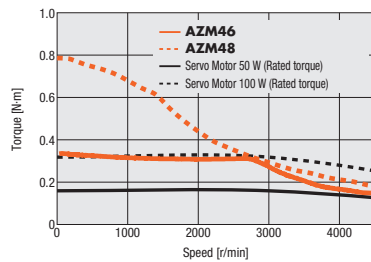
# Strengths of the AZ Series

The **AZ** Series can perform high positioning and speed control accuracy at the same level as servo motors, and can also be controlled to limit the motor's generated torque to any desired value.

The high torque at mid to low speeds provides excellent positioning performance for short distances.

The series also features DC input power and wide product line of compact size.

## Achieves High Torque at Mid and Low Speeds



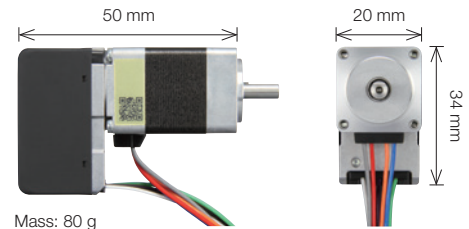
\*The **AZ** Series does not have a "rated speed," so there is no rated output power shown.

A 42 mm frame size is equivalent to a 50 W/100 W servo motor, and a 60 mm frame size is equivalent to a 200 W/400 W servo motor.

## The Smallest Motors in the Industry are Also Available

As equipment becomes smaller, there is an increasing demand for smaller position control motors as well.

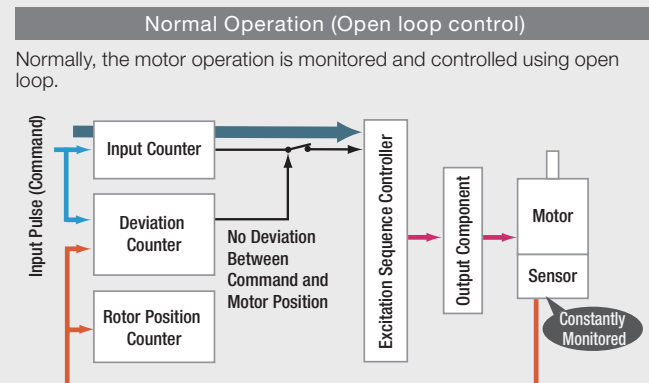
The **AZ** Series offers one of the industry's smallest motors, with a frame size of just 20 mm.



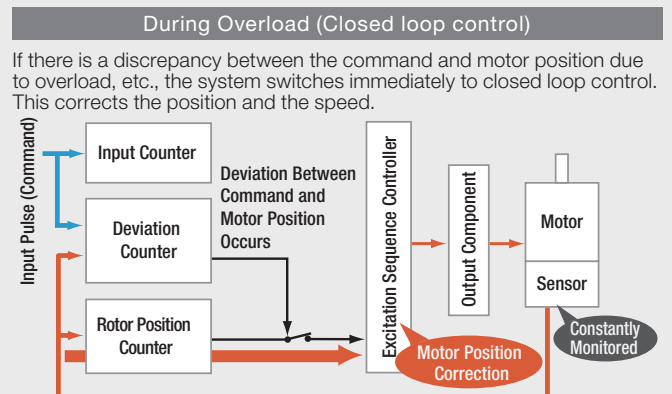
## POINT

## Providing More Accurate Control and Positioning

**Normal Operation** Open loop control provides ease of use at the same level as stepper motors



**During Overload** Switches to closed loop control to correct the position and speed

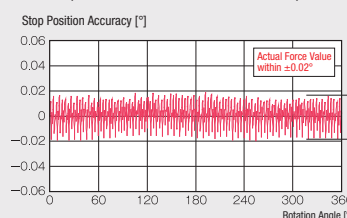


## Accurate Positioning

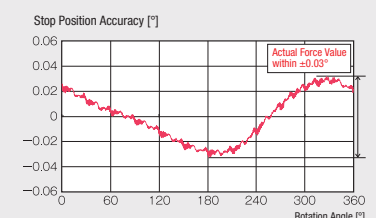
The typical stopping accuracy is within  $\pm 0.05^\circ$  (no load), which is the same as servo motors.

The table on the right shows the actual stopping accuracy measurements when an **AZ** Series or a servo motor is rotated 1 revolution.

**αSTEP** Stopping Accuracy (Actual measurement value)



AC Servo Motor with Standard 20-bit Encoder Stopping Accuracy (Actual measurement value)



# 01 For Mechanical Designers



## Problem

- When custom-building a mechanism to be attached to a motor, selecting the mechanical components, creating the parts list and drawings, and evaluating after assembly are time consuming
- Unifying all the drive components in the equipment to linear & rotary actuators is difficult due to installation space and cost.

## Solution

### Reduce Design Time with Linear & Rotary Actuators

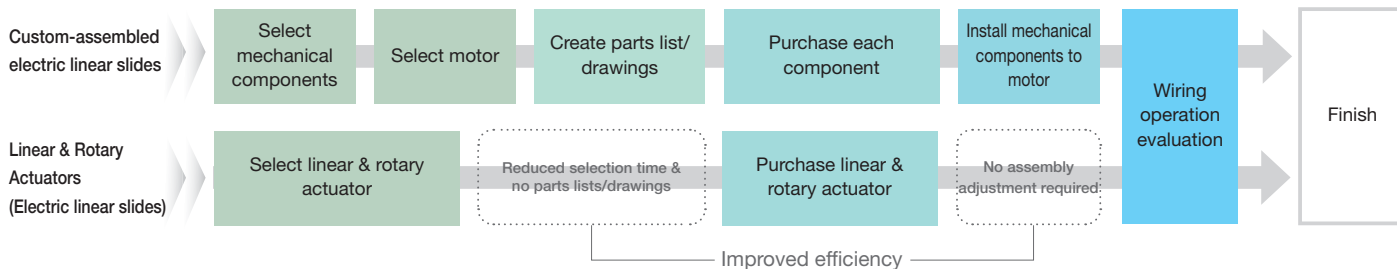
When Custom-Building by Installing Mechanical Components to a Motor

#### Increase Design Work Efficiency

A lot of time is spent selecting the motor and mechanical components, and creating the parts lists and drawings. The **AZ** Series offers a variety of linear & rotary actuators to minimize the design work for our customers.

#### Reduce Build Time and Improve Quality

Adjustments are necessary because assembly conditions impact running resistance and positioning accuracy. Operating performance of the linear & rotary actuators is guaranteed to match the product specifications, which allows for a reduction in adjustment work.

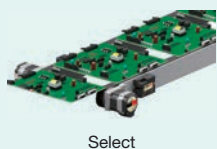


## Solution

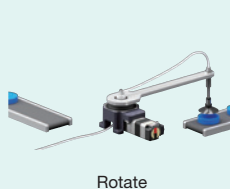
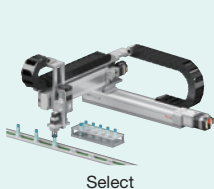
### The Wide Range of Products Allow for the Selection of the Right Component for the Right Application

If necessary, the custom-built mechanism can also be installed and used on standard motors or geared motors in addition to linear & rotary actuators. This contributes to the optimal design of the components used in the equipment.

#### Motors

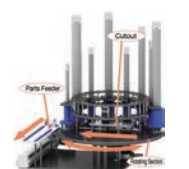


#### Linear & Rotary Actuators



#### Examples of In-House Equipment

Various types of the **AZ** family are used in Oriental Motor's own manufacturing sites. In addition to the structure and system configuration of the equipment, the key points for the selection of the products selected for each axis are explained.



# 02 For Electrical Designers



## Problem

- When motors and linear & rotary actuators from different manufacturers are used together in equipment, the drivers and setting software become disjointed

## Solution

### Unified Wiring/Control Shortens Equipment Start-Up Time

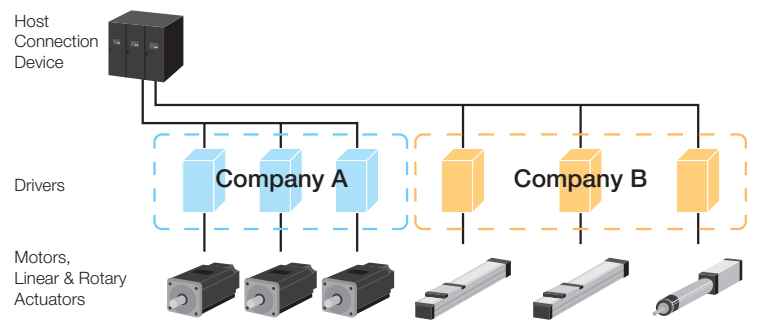
Even if there are different types of motors and linear & rotary actuators, the drivers are common products.

● Product lines are available for each interface and power supply voltage

Not only can the drivers be common, but the cables and setting software, wiring/control can also be unified, reducing start-up time and labor.

**When motors and linear & rotary actuators from multiple manufacturers are used together within the equipment...**

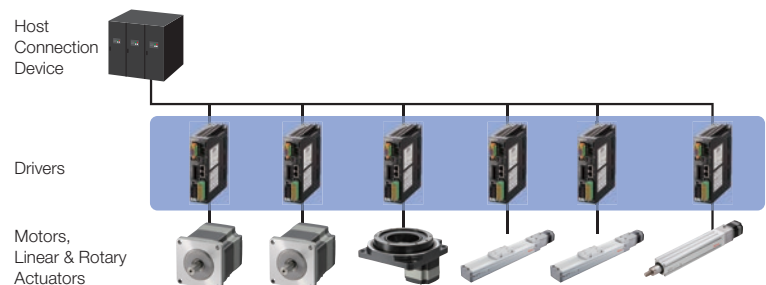
- Driver wiring is different
- Multiple types of setting software must be installed and the user must learn how they work...



**When control is unified using AZ family products in the equipment...**

### Can control using common drivers

The product name is identical, regardless of motor frame size (output).



## Unified Wiring

Because the I/O pin assignments are identical, the time needed for electrical design and wiring can be reduced.

## Unified Control

Because the control methods are identical, they can be operated in the same way. For network control, because the remote I/O and command codes are the same, programming time can be reduced.

## And!

### Reduction of Sensor Wiring

The **AZ** Series is equipped with a battery-free mechanical absolute sensor (ABZO sensor), which allows for the creation of an absolute system without using a battery. Thanks to the absolute system, home sensors and limit sensors can be eliminated.

### Reduced Wiring Work Time

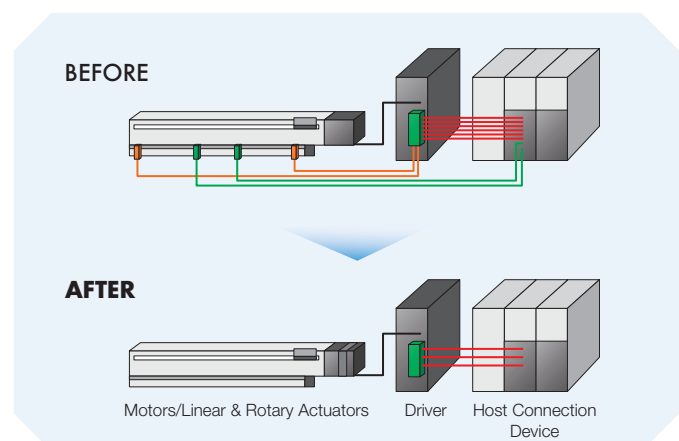
Sensor cables are not necessary, which reduces equipment assembly work time

### Reduced Costs

Sensor costs and wiring costs are reduced

### Not Affected by External Sensor Malfunctions

Reduces concerns about malfunction, failure or disconnection of external sensors





# 03 For Maintenance Managers



## Problem

- The combined use of motors and electric actuators from different manufacturers in the equipment creates inventory management costs

## Solution

### Unify Maintenance Parts for Drivers and Reduce Management Time

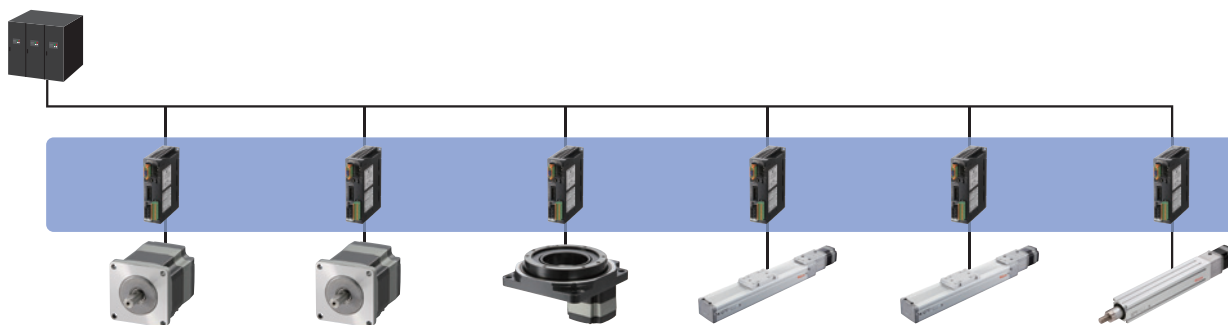
The product line includes standard type, geared type and linear & rotary actuators.

Even when the motor and linear & rotary actuator types are different, because the drivers will all be the same product name, the maintenance parts can be minimized.

When control is unified  
using the **AZ** family  
within the equipment...

#### Identical Driver Product Name

If the cable length between motors and drivers is the same, maintenance components for the cables can also be unified



## And!

### Reduce Maintenance. No Battery Replacement Required

When building an absolute system, a battery is used to store the position information. Normally, batteries must be replaced every few years due to battery life, but the **AZ** family is equipped with a battery-free mechanical absolute sensor (ABZO sensor), enabling the construction of an absolute system without batteries.

Battery-Free  
Built-in Multi-Turn  
Absolute  
Sensor



ABZO Sensor

## Related Products

### AC Servo Motor

# AZX Series

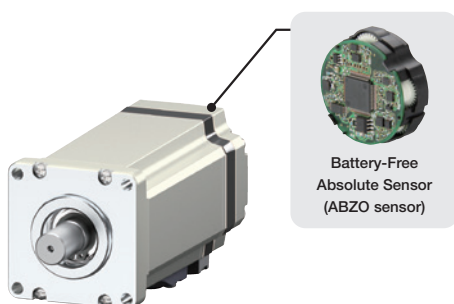
NEW

Built-in Battery-Free Absolute Sensor

Standard Type / PS Geared Type 400 W / 600 W

## ■ AC Servo Motor with Built-In Battery-Free Absolute Sensor

The **AZX** Series features the same battery-free mechanical absolute sensor (ABZO sensor) as the **AZ** Series. This is a servo motor specialized for both positioning operation and continuous operation.



- **Mechanical-Type Sensor**

Holds positioning information even when powered off

- **Multi-Turn Absolute Sensor**

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



EtherNet/IP EtherCAT

- **No External Sensor Required**

Thanks to the absolute system, home sensors and limit sensors are unnecessary.

**MERIT**

- High-speed return-to-home and improved return-to-home accuracy
- Lowered costs
- Reduced wiring
- No impact from external sensor malfunctions

- **Battery-free**

Mechanical sensors do not require batteries because the position information is mechanically managed by the ABZO sensor

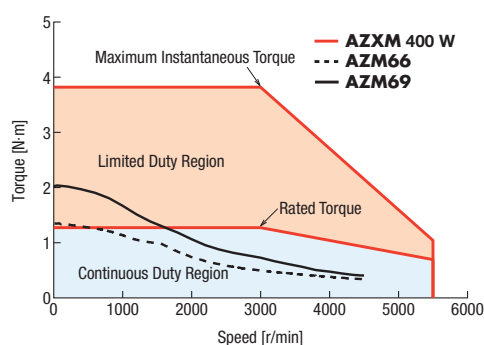
**MERIT**

- No battery replacement required
- No battery installation space required (unlimited driver installation possibilities)
- In addition, there is no need to worry about various safety regulations, which must be taken into consideration when shipping a battery overseas

## ■ Achieves High Torque in the High Speed Range

The **AZX** Series achieves high torque in the high speed range. It is suitable for positioning applications with a lot of travel (e.g.: ball screw driving).

For a Standard Type 400 W



## ■ The Basic Operations are the Same as the AZ Series

The basic operations of the **AZX** Series are the same as the **AZ** Series.

As a result, using the **AZX** Series and **AZ** Series together in the same equipment can eliminate the work of operational changes.

### AZX Series



**Wiring**

Signal system wiring

**Setting**

Switch, parameter, setting method

**Control**

Parameter ID number

**Operation Functions**

Positioning operation, etc.

### AZ Series



Same Operating Method

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