

Orientalmotor

Easily Build What You Need

With the Built-in Battery-Free Absolute Encoder

AZ Family



Creating Time for Engineers,

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

The **AZ** Family is a group of closed-loop step-servo 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 (1/15 HP) to 750 W (1 HP).

Standard Type



Frame Size
20 mm (0.79 in.) -
85 mm (3.35 in.)

TS Geared (Spur gear mechanism)



Frame Size
42 mm (1.65 in.) -
90 mm (3.54 in.)

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



Frame Size
42 mm (1.65 in.) or
60 mm (2.36 in.)

PS Geared Type (Planetary gear mechanism)



Frame Size
28 mm (1.10 in.) -
90 mm (3.54 in.)

HPG Geared Type (Harmonic planetary[®]) Shaft Output Flange Output



Frame Size
40 mm (1.57 in.) -
90 mm (3.54 in.)

Harmonic Geared Type (Harmonic drive[®])



Frame Size
30 mm (1.18 in.) -
90 mm (3.54 in.)

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



Robot Joint Actuators



Drivers

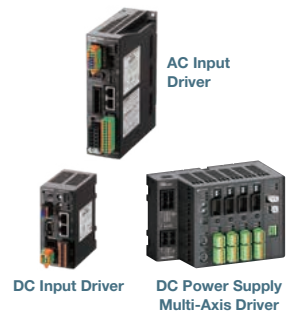
A wide variety of interface types and power supply input types are available. Drivers that are compatible I/O or pulse input pulse inputs, as well as the major industrial networks used around the globe, are available.



●Supported interfaces vary depending on the driver type

Pulse

I/O

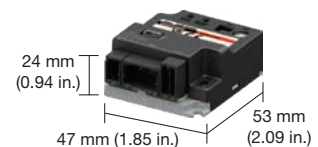


mini Driver (DC input only)

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 step-servo 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 encoder (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.

Inside

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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**

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For Maintenance Managers

Problem

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

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

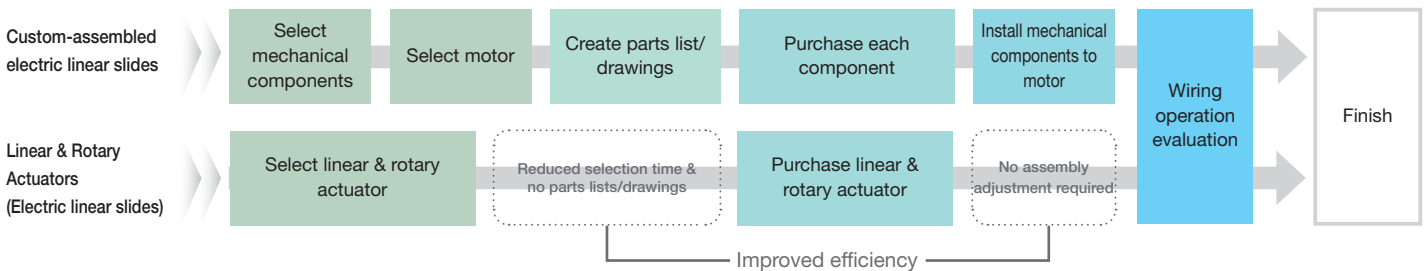
When Custom-Building by Installing Mechanical Components to a Motor

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

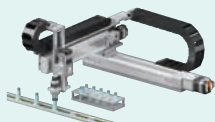
If necessary, the custom-built mechanism can also be installed and used on standard motors or geared motors in addition to linear & rotary actuators. This contributes to the optimal design of the components used in the equipment.

Motors



Select

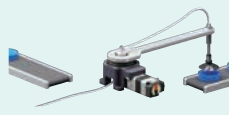
Linear & Rotary Actuators



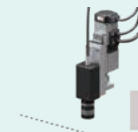
Select



Push/Pull



Rotate



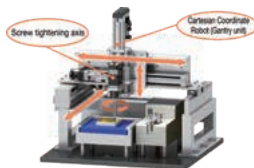
Fine adjustment & Feeding



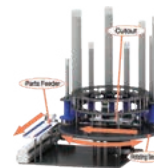
Grabbing

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.



Screw Tightening Equipment



Multi-Product Parts Feeder



SCARA Robot

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

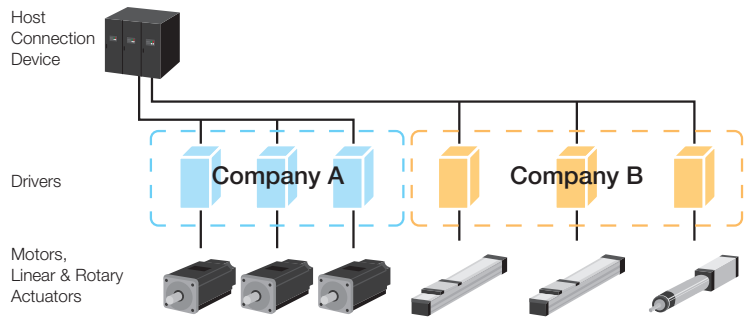
Even if there are different types of motors and linear & rotary actuators, the drivers are common products.

- 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...

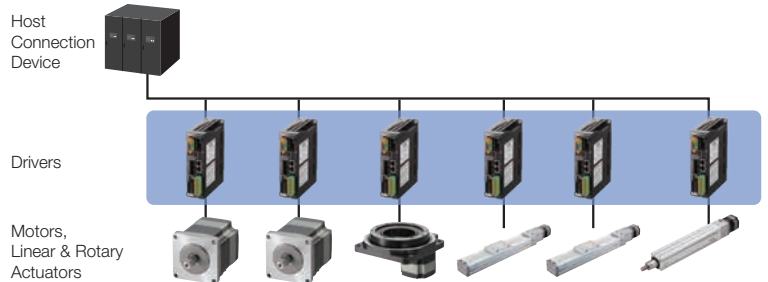
- Driver wiring is different
- Multiple types of setting software must be installed and the user must learn how they work...



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 encoder (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

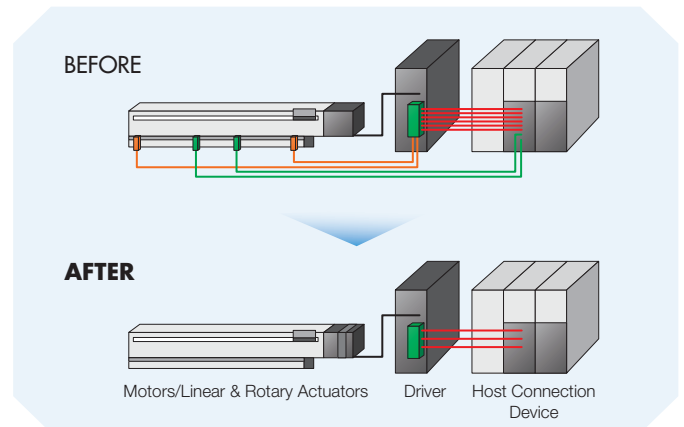
Sensor cables are not necessary, which reduces equipment assembly work time

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

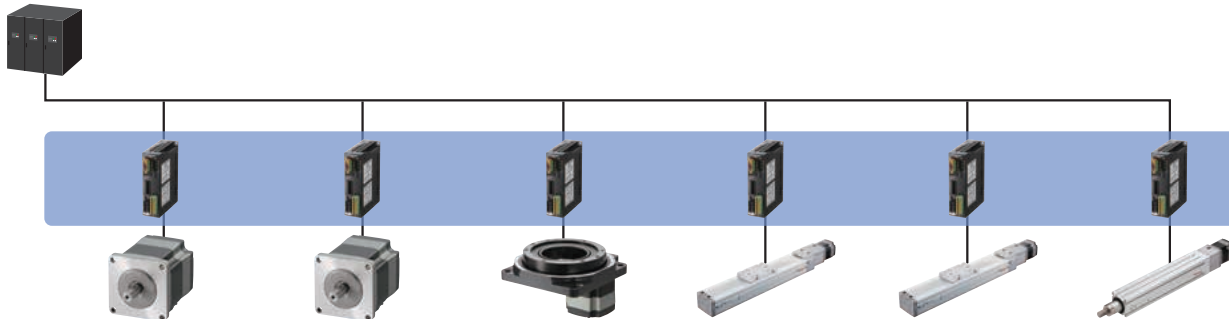
The product line includes standard type, geared type and linear & rotary actuators.

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

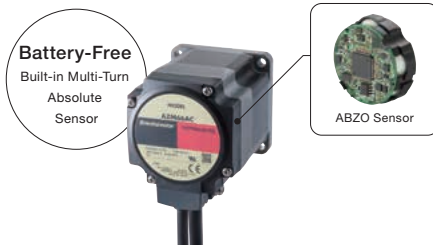


And!

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 encoder (ABZO sensor), enabling the construction of an absolute system without batteries.



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.

Achieves High Torque at Mid and Low Speeds

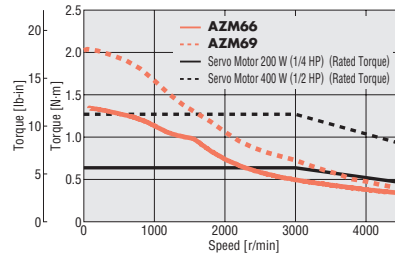
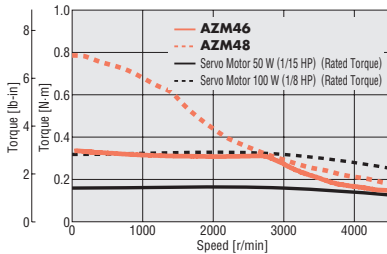
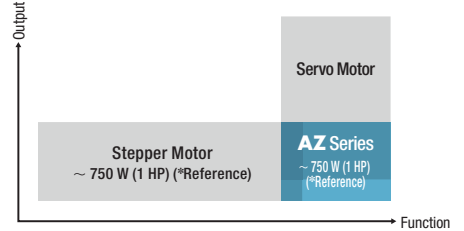


Illustration of AZ Series Position Map



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

A 42 mm (1.65 in.) frame size is equivalent to a 50 W (1/15 HP)/100 W (1/8 HP) servo motor, and a 60 mm (2.36 in.) frame size is equivalent to a 200 W (1/4 HP)/400 W (1/2 HP) servo motor.

NEW One Cable Type: Frame Size 42 mm (1.65 in.) and 60 mm (2.36 in.)

One cable, IP66 rated locking connector enables a simple direct connection between the motor and the driver.



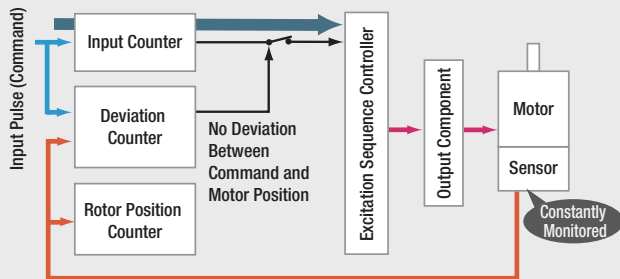
POINT

Providing More Accurate Control and Positioning

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

Normal Operation (Open loop control)

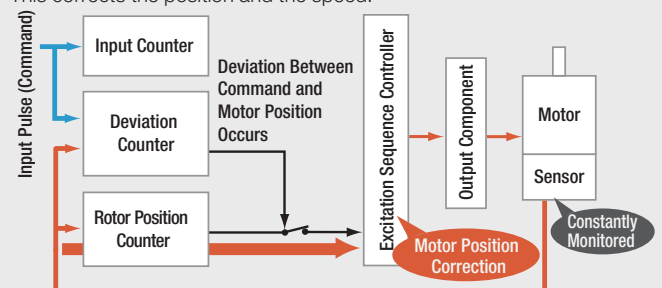
Normally, the motor operation is monitored and controlled using open loop.



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

During Overload (Closed loop control)

If there is a discrepancy between the command and motor position due to overload, etc., the system switches immediately to closed loop control. This corrects the position and the speed.

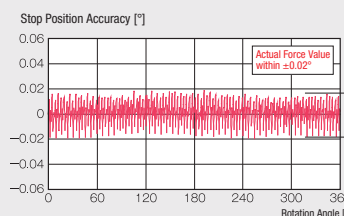


Accurate Positioning

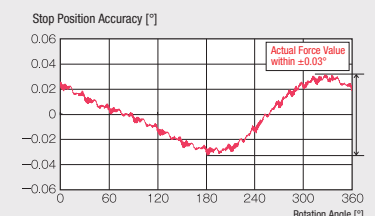
The typical stopping accuracy is within $\pm 0.05^\circ$ (no load), which is the same as servo motors.

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)



Related Products

AC Servo Motor

AZX Series

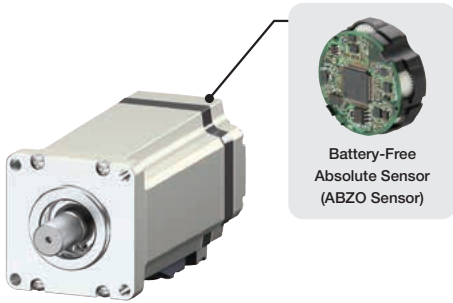
NEW

Built-in Battery-Free Absolute Encoder

Standard Type / PS Geared Type 400 W (1/2 HP) / 600 W (4/5 HP)

■ AC Servo Motor with Built-In Battery-Free Absolute Encoder

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

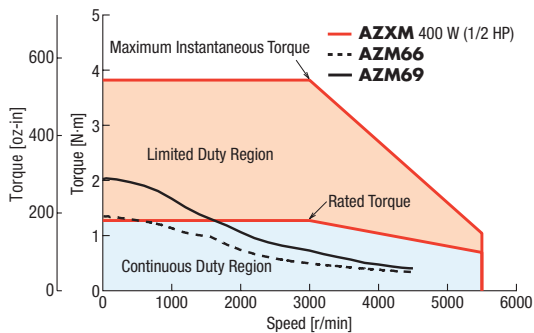


- **Mechanical-Type Encoder**
Holds positioning information even when powered off
- **Multi-Turn Absolute Sensor**
Absolute position detection is possible with ± 900 rotations (1800 rotations) of the motor shaft from the reference home position

■ 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 (1/2 HP)



EtherNet/IP

● 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

■ 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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Visit www.orientalmotor.com

For further information (specifications, dimensions, speed-torque characteristics)