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.

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**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).

<table>
<thead>
<tr>
<th>Type</th>
<th>Frame Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Type</td>
<td>20 mm (0.79 in.) -</td>
</tr>
<tr>
<td></td>
<td>85 mm (3.35 in.)</td>
</tr>
<tr>
<td>TS Geared</td>
<td>42 mm (1.65 in.) -</td>
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<tr>
<td>(Spur gear</td>
<td>90 mm (3.54 in.)</td>
</tr>
<tr>
<td>mechanism)</td>
<td></td>
</tr>
<tr>
<td>Right-Angle</td>
<td>28 mm (1.10 in.) -</td>
</tr>
<tr>
<td>Shaft FC</td>
<td>90 mm (3.54 in.)</td>
</tr>
<tr>
<td>Geared Type</td>
<td></td>
</tr>
<tr>
<td>(Face gear</td>
<td></td>
</tr>
<tr>
<td>mechanism)</td>
<td></td>
</tr>
<tr>
<td>PS Geared Type</td>
<td>42 mm (1.65 in.) -</td>
</tr>
<tr>
<td>(Planetary</td>
<td>60 mm (2.36 in.)</td>
</tr>
<tr>
<td>gear mechanism)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>HPG Geared Type</td>
<td></td>
</tr>
<tr>
<td>(Harmonic</td>
<td>40 mm (1.57 in.) -</td>
</tr>
<tr>
<td>planetary</td>
<td>90 mm (3.54 in.)</td>
</tr>
<tr>
<td>type)</td>
<td></td>
</tr>
<tr>
<td>Harmony Geared</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>30 mm (1.18 in.) -</td>
</tr>
<tr>
<td>(Harmonic drive</td>
<td>90 mm (3.54 in.)</td>
</tr>
<tr>
<td>®)</td>
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</tr>
</tbody>
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**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**

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**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.

- **EtherCAT**
- **EtherNet/IP**
- **ProfiNet**
- **Modbus RTU**
- **MECHATROLINK**
- **Pulse**
- **I/O**

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**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

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**Unification of Wiring, Control and Maintenance**

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

For Mechanical Designers
- 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.

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

For Maintenance Managers
- The combined use of motors and electric actuators from different manufacturers in the equipment creates inventory management costs
For Mechanical Designers

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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

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.

Select mechanical components → Select motor → Create parts list/drawings → Purchase each component → Install mechanical components to motor → Wiring operation evaluation → Finish

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.

Select linear & rotary actuator → Reduced selection time & no parts lists/drawings → Purchase linear & rotary actuator → No assembly adjustment required → Improved efficiency

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.
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
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.

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 ±0.05° (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.
AC Servo Motor

AZX Series

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.

- 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 (1/2 HP)

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.

Visit www.orientalmotor.com

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