Product Guide

αSTEP Hybrid Control System

Linear & Rotary Actuators
Network – Controllers
Stepper Motors
Brushless Motors
Standard AC Motors
Cooling Fans
Modular Automation

2023
2024
GLOBAL SALES NETWORK

15 countries

Bringing Oriental Motor to the Global Market

Industrial – Medical – Packaging – Material Handling – and so much more.

Worldwide, our refined product development enables daily operations across all fields of business. Honoring our corporate philosophy built on over 100 years of history. We continually evolve to meet our customers’ needs—wherever they are.
Oriental Motor offers approximately 50,000 items as standard products. Your optimal motion system can be found among our extensive product line-up. From our industry leading αSTEP Hybrid family of positioning products, high torque stepper motors to our speed control or constant speed motors designed for value and long life. For thermal management we offer a wide range of cooling fans, alarms and accessories.

### αSTEP Hybrid Control System

- Mechanical Absolute Encoder
- Stepper Motors
- Closed Loop
- Positioning, Speed, Torque Control
- Electromagnetic Brake Types
- Geared Types
- Linear & Rotary Actuators
- Transport
- Push/Pull
- Lifting
- Gripping
- Rotating

### Network – Controllers

- EtherCAT
- EtherNet/IP
- Modbus (RTU)
- CC-link
- Single Axis Controller

### Stepper Motors

- 2 Phase 1.8°, 0.9°
- 5 Phase 0.72°, 0.36°
- Drivers
- Encoder Motors
- Electromagnetic Brake Types
- Geared Types

### Brushless Motors

- Speed Control
- Compact Yet Powerful
- Excellent Speed & Torque Performance
- Space Saving
- Energy Saving
- No Brushes = No Maintenance

### Standard AC Motors

- 1 W (1/750 HP)~3 HP
- Single & 3 Phase
- Fixed Speed
- Speed Control
- Electromagnetic Brake Types
- Geared Types

### Cooling Fans

- AC or DC Input
- Alarms
- Axial Flow
- Blowers
- Cross Flow
- Thermostats
- Enclosure Types

### Modular Automation

- Flexibility in Production Layout
- High-Mix, Low-Volume Production
- Energy Saving
- Productivity Improvements
- Space Saving
- Resolve Labor Shortage

### Short Lead Times

Delivering What is Needed, When it is Needed.

Our manufacturing system allows the manufacturing of an order with little notice, in any quantity requested. Additionally, our one-by-one process allows us to manufacture one product as easily as one hundred.

Our main products are stocked and able to ship from the warehouse closest to your ship to location.
Oriental Motor Corporate Overview

Company ORIENTAL MOTOR CO., LTD.
Founded 1885
Established 1950
Representative President Eiji Kawahito
Capital 4.1 billion yen
Sales Consolidated 66.8 billion yen (At the end of March 2022)
Number of Employees Consolidated 3,079 (At the end of March 2022)
Company Activity Development, manufacture and sale of small precision motors and electronic circuits for motion control
Head Office 4-8-1, Higashiueno, Taito-ku, Tokyo, 110-8536, Japan

R&D Center Tsuruoka-Chuo Plant
Factories Tsuruoka-Nishi Plant
Soma Plant
Tsukuba Plant
Tsuchiura Plant
Kashiwa Plant
Kofu Plant
Takamatsu-Kozai Plant
Takamatsu-Kokubunji Plant
Manufacturing Technology R&D Center (Joso, Ibaraki)

Tsuruoka-Chuo Plant

Tsuruoka-Nishi Plant
Manufacturing of standard AC motors, brushless motors and gearheads.

Tsukuba Plant
Development of various motor and control circuits. Manufacturing of control motors. Evaluating, analyzing, and measuring various products.

Tsuchiura Plant
Development and manufacturing of gearheads and motorized actuators.

Kashiwa Plant
Research and development on the ideal accessories and peripheral equipment for every product.

Kofu Plant
Manufacturing and production technology development of control circuits. Evaluating, analyzing and measuring various products.

Takamatsu-Kozai Plant
Development and manufacturing of stepper motors.

Takamatsu-Kokubunji Plant
Manufacturing of stepper motors.
Since its founding in Japan in 1885, Oriental Motor globally has been providing the optimal motion systems as part of our total service, to meet the widest market demands. For over a century we have concentrated on technological advancement and product design improvement. This emphasis is evident in the sophisticated devices that we market today. Oriental Motor’s sales and service network is international, with offices throughout North America, Europe and Asia. Domestically, ORIENTAL MOTOR U.S.A. CORP. was established in 1978. We produce a wide variety of fractional horsepower products to meet all your motion control needs.

**Quality**

In order to meet all motion control needs, we expanded our product line. Our accumulated technological excellence reflects our long years of dedication to quality.

With our strengths, such as high torque, high precision, long life, low noise and ease of selection, our established systems aim to produce products that our customers can rely on.

**Speed**

You can order the products listed in our catalog or website anytime, anywhere and in any quantity you need. We deliver orders of any size, from one piece or more, with the shortest lead-times.

With our stable production, quality control and logistics systems, we relentlessly pursue improvements and excellence in order to continue providing our products and services to our customers all over the world.

**Product & Technology Training**

**Virtual or On-Site Technical Seminar**

Oriental Motor offers virtual or in-person training and product demonstrations at your location. Contact your local sales office or our Technical Support Team for more information or to schedule a training seminar.

**Lunch & Learn Seminars**

You can schedule an on-site lunch & learn seminar with our Sales and Application Engineer staff. For this one-hour session, Oriental Motor will discuss our latest technology for solving simple to challenging motion requirements.
At Oriental Motor, we carry nearly 50,000 standard products, including motors, actuators and fans.

With our solid production, quality control and logistics systems, Oriental Motor products can be delivered to customers when they need it, in as little as 1 day, starting from an order of just 1 piece.

Oriental Motor also offers an extensive support system to help customers select the optimal product. From selection, design and equipment setup, to after-sales services, Oriental Motor provides support for all of our customers' needs.

Contact Us

By Live Chat
www.orientalmotor.com
“Technical Support Assistance” pop up
Available - Monday to Friday,
8:30am EST to 5:00pm PST

By Email
www.orientalmotor.com/contact
Technical Support
Customer Service / Sales

By Phone
Customer Support Center
Support: 1-800-468-3982
Sales: 1-800-448-6935

Oriental Motor Offers:
Fast Delivery
No Minimum Order Quantity
Dedicated Support
See Full Product Details
Visit our website for expanded product information, specifications, CAD, accessories and more.

Find the Right Solution from Approximately 50,000 Products

Motor Sizing
Easily calculate motor requirements for specific applications.

Technical Information
Learn more about the technology used in our products.

Search
Search by part number, keyword, or specification.

Order Online
Convenient online ordering is available.

My Account
Register for My Account to view order history and receive special content.

Live Chat
Live chat is available during regular office hours.

For technical information searches, please use our website.

Stay in Touch

Engineering Notes

Social Media

● Introduction to new products and technologies
● Motion control basics and application examples
● Tips for motor selection, programming, and troubleshooting

Q & A Forum
Online Inquiries
On Demand Technical Videos

Live Chat

Social Media

Engineering Notes

3-Axis Parallel Robot with AlphaStep Absolute Stepper Motors
What is \( \alpha \text{STEP} \)?

\( \alpha \text{STEP} \) is a “hybrid” stepper motor-based motor & driver that together, performs independent control which combines the advantages of “open loop” and “closed loop” performance. In addition to high-accuracy positioning and speed control, it can perform control that restricts the motor’s generated torque to a user set value (such as push-motion operation).

### Normal Condition (Positioning deviation is less than ±1.8°)

- Motor is controlled in open loop mode like a stepper motor.
- The tuning-free feature allows for high accuracy and high responsiveness to commands.
- Hunting-free (Complete stop)
- Constant monitoring of the motor’s status
- No time lag between command and actual operation

### Overload Condition (Positioning deviation is ±1.8° min.)

The closed loop mode is engaged to maintain the positioning operation.

#### Performance

“Rated output” is not listed because \( \alpha \text{STEP} \) has no “rated speed.” Refer to the graph on the right to compare rated torque of \( \alpha \text{STEP} \) to watts of servo motor’s rated output torque.

- Generates high torque in the mid-to-low speed range
- Excels at frequent starting and stopping operation that requires acceleration/deceleration torque

### Stopping Accuracy

The stopping accuracy of a typical \( \alpha \text{STEP} \) is ±0.05° (under no load), which is equivalent to that of servo motors. These graphs show the actual measured stopping accuracies when an \( \alpha \text{STEP} \) and an AC servo motor were rotated once.

- \( \alpha \text{STEP} \) Stopping accuracy (Actual measurements)
- AC servo motor Stopping accuracy (Actual measurements)

[Example] When the ball screw lead is 10 mm, the \( \alpha \text{STEP} \) stopping accuracy is ±1.4μm and the repetitive positioning accuracy of a common ground ball screw is ±10μm.
Application Examples

Complete synchronization with commands

Frequent repetitive starting and stopping

Low-vibration operation Push-Motion Operation even at a speed near 0 r/min

Transfer of large inertial load

Push-motion operation

X-Y-Z gantry system

Arm robot
Refer to Robot Controller MRC01 on Page 20.

Parallel link robot
Advantages of the AZ Series

The AZ Series QSTEP hybrid control system features absolute sensing using a multiple-rotation mechanical sensor. The system constantly monitors the motors position even during a sudden power off situation.

- **Mechanical-Type Sensor / Multiple-Rotation Absolute System**
  ±900 rotations the driver knows where the motor position is.
  No return to home is necessary.

- **Home Setting Method Improves Return-to-Home Accuracy**
  Home operation does not depend on a sensor sensitivity.

- **No External Sensors or Batteries Required**
  The driver uses the motor sensor to determine rotor position

- **No Hunting / No Gain Tuning**
  Utilizes the high response and mechanical advantage of a Stepper Motor

- **Continues Operation Even with Sudden Load Fluctuations and Sudden Acceleration**
  Runs in normally open loop control. If overloaded, switches to closed loop control.

- **Monitoring Functions**
  Speed, motor, driver temperature, load factor, odometer and much more can easily be monitored.

No External Sensors Required with the AZ Series

The AZ Series driver uses the positioning information managed by the mechanical absolute sensor. The position information can be preserved, even if the power turns off or if the cable between the motor and the drive is disconnected. No battery required.

**Shortened Reset Time ① High Speed Return-to-Home**
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.

Previous Home Detection for Control Motor
The home position is detected at low speed by detecting the limit sensor (±LS) and home sensor (HOME).

Return-to-Home Operation of AZ Series
There is no need to detect the limit sensor, and it can travel directly at high speed to the home position recorded by the Absolute Sensor.

Shortened Reset Time ② Return-to-Home is not Necessary
If the power shuts down during a positioning operation, the positioning information is retained. 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 blackout.

Built-in Controller Type
Emergency Stop
Can be Restarted without Returning to Home
Home Setting Method

The home position can be easily set by pressing a switch on the drivers surface, which is saved by the Mechanical Absolute Encoder. In addition, home setting is possible with the MEXE02 data setting software or external input signal.

Home position is easy to adjust by moving the motor to a desired position manually.

● AC or DC Input
● Stored Data, Pulse Input Type
● Network / RS-485 / Monitoring
● No Additional Sensors Required

Motor / Geared Types

- Standard
- Tapered Hob
- Harmonic (no backlash)
- Right Angle (face gear)
- Planetary
- Planetary (attach load)
- Planetary (high torque)
- Connector Type

Actuator Types

- Linear Slides
- Linear Cylinders
- Rotary Actuators
- Rack & Pinion
- Compact Electric Cylinder
- Gripper
**AC Input – Single Axis**

![AC Input - Single Axis](image1)

**AC Input**

**AZ Series**

<table>
<thead>
<tr>
<th>Frame Sizes</th>
<th>1.65 in (42 mm), 2.36 in (60 mm), 3.35 / 3.54 in (85 / 90 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding Torque</td>
<td>42 oz-in – 974 lb-in (0.3 – 110 N·m)</td>
</tr>
<tr>
<td>Resolution (P/R)</td>
<td>1000</td>
</tr>
<tr>
<td>Options</td>
<td>Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Tapper Hob / Planetary / Right Angle / Harmonic</td>
</tr>
<tr>
<td>Driver Types</td>
<td>Pulse / RS-485 / EtherNet/IP / EtherCAT / Profinet</td>
</tr>
<tr>
<td>Main Power Supply</td>
<td>Single-Phase (VAC) 100-120 / 200-240</td>
</tr>
<tr>
<td>Control Power Supply</td>
<td>(VDC) 24</td>
</tr>
<tr>
<td>Starting From (Motor + Driver + Cable)</td>
<td>$963.00</td>
</tr>
</tbody>
</table>

**DC Input – Single Axis**

![DC Input - Single Axis](image2)

**DC Input**

**AZ Series**

<table>
<thead>
<tr>
<th>Frame Sizes</th>
<th>0.79 in (20 mm), 1.10 in (28 mm), 1.65 in (42 mm), 2.36 in (60 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding Torque</td>
<td>2.8 oz-in – 354 lb-in (0.02 – 40 N·m)</td>
</tr>
<tr>
<td>Resolution (P/R)</td>
<td>1000</td>
</tr>
<tr>
<td>Options</td>
<td>Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Tapper Hob / Planetary / Right Angle / Harmonic</td>
</tr>
<tr>
<td>Driver Types</td>
<td>Pulse / RS-485 / EtherNet/IP / EtherCAT / Profinet</td>
</tr>
<tr>
<td>Power Supply</td>
<td>VDC 24/48</td>
</tr>
<tr>
<td>Starting From (Motor + Driver + Cable)</td>
<td>$773.00</td>
</tr>
</tbody>
</table>

**Multi-Axis (DC Input)**

2, 3 or 4 axis type

**Mini Driver**

![Mini Driver](image3)

**Facilities Network Compatible**

![Facilities Network Compatible](image4)

- **Host System**
  - Master controller
  - EtherCAT

- **Advantages for Uniting Four Drivers into One Package**
  - Space saving, reduced wiring
  - Reduced Cost

- **The connected motors and linear & rotary actuators are representative examples.**

- **By using AZD-KR2D in combination with a network converter (gateway), control by CC-Link, MECHATROLINK or EtherCAT can be supported.**

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Refer to Page 32.
Support Software **MEXE02**

The **MEXE02** support software is a universal motion control and monitor software used with many products from Oriental Motor, such as the AZ Series, CVD Series or brushless DC drivers from BLE2 Series and BLV Series R Type. The **MEXE02** support software is ideal for designing and testing motion to production by copying the programs to the driver to monitoring the status of motion applications.

The programming method of the **MEXE02** software differs from traditional stored program type controllers. Instead of writing long programs and subroutines, data sets are written in the form of a table. Each data set contains parameters for a specific motion profile with its own starting speed, operating speed, acceleration/deceleration rates, and torque (current)...etc. This software is free and can be easily downloaded from our website.

**Teaching and Remote Operations**

It is possible to easily set the home position and drive the motor from the support software. Teaching and test operation are performed before connecting to the host system, which shortens the equipment’s startup time.

**Waveform Monitoring**

Monitors the motor’s operating status and output signal status with oscilloscope-like images. Use at equipment startup, adjustment, etc.

**Status Monitoring**

Besides operating speed, motor and driver temperature, load factor monitoring, and cumulative rotations, etc., can also be monitored since the start of use. The desired signals can be output for these items, allowing for efficient maintenance.

**I/O Testing**

Easily performs input signal monitoring and forced output of output signals. This is a convenient function for checking connection with the host system and network I/O operations.

**Alarm Monitoring**

When any abnormality occurs, the details of the abnormality, operating status and countermeasure can be verified.

**Multi-Monitoring Compatibility**

Several setting screens for data setting, test operation, monitoring, etc. can be opened and used on separate screens at the same time. This makes equipment startup, adjustment, etc. easier.
A broad selection of linear & rotary electric actuators using the AZ Series αSTEP hybrid control system as the driver source are available for a wide range of motion requirements.

- **Electric Slide**

- **Electric Cylinder**

- **Compact Electric Cylinder**

- **Gripper**

- **Rack & Pinion**

- **Hollow Electric Rotary Actuator**
Linear Motion / Transport

**EZS Series**

EZS Series: with AZ Series

<table>
<thead>
<tr>
<th>Max. Speed (mm/s)</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Transportable Mass - Vertical (kg)</td>
<td>30</td>
</tr>
<tr>
<td>Max. Transportable Mass - Horizontal (kg)</td>
<td>60</td>
</tr>
<tr>
<td>Repetitive Positioning Accuracy (mm)</td>
<td>± 0.02</td>
</tr>
<tr>
<td>Stroke Length (mm)</td>
<td>50 - 850</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>VDC 24/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Phase (VAC)</td>
<td>100-120 / 200-240</td>
</tr>
<tr>
<td>Three-Phase (VAC)</td>
<td>200-240</td>
</tr>
</tbody>
</table>

- High Rigidity / High Accuracy Guide
- LM Guide and Ball Retainer are registered trademarks of THK.
- Traveling Parallelism of 0.03 mm or Less

**Slim with High Transportable Mass**

- Height of table surface
  - 15 kg 50 mm
  - 30 kg 50 mm
  - 60 kg 66.5 mm

**Push / Pull**

**EAC Series**

EAC Series: with AZ Series

<table>
<thead>
<tr>
<th>Max. Speed (mm/s)</th>
<th>600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Transportable Mass - Vertical (kg)</td>
<td>28</td>
</tr>
<tr>
<td>Max. Transportable Mass - Horizontal (kg)</td>
<td>60</td>
</tr>
<tr>
<td>Repetitive Positioning Accuracy (mm)</td>
<td>± 0.02</td>
</tr>
<tr>
<td>Stroke Length (mm)</td>
<td>50 - 300</td>
</tr>
<tr>
<td>Thrust Force (N)</td>
<td>400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>VDC 24/48</th>
</tr>
</thead>
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<tr>
<td>Single-Phase (VAC)</td>
<td>100-120 / 200-240</td>
</tr>
<tr>
<td>Three-Phase (VAC)</td>
<td>200-240</td>
</tr>
</tbody>
</table>

- High Strength, Space Savings
- Straight Type
- Reversed Motor Type
- Shorter by more than 100 mm
- When electromagnetic brake is installed
- With or Without Guide Cover

- Reversed Motor Type with Shaft Guide Cover
- Shaft Guide Cover
- Shaft

- With or Without Guide Cover

- Reversed Motor Type
- Shaft Guide Cover
- Shaft

- With or Without Guide Cover
### DR/DRS Series: with AZ Series

<table>
<thead>
<tr>
<th>Frame Size (mm)</th>
<th>20 / 28 / 42 / 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Speed (mm/s)</td>
<td>200</td>
</tr>
<tr>
<td>Max. Transportable Mass - Vertical (kg)</td>
<td>50</td>
</tr>
<tr>
<td>Max. Transportable Mass - Horizontal (kg)</td>
<td>50</td>
</tr>
<tr>
<td>Max. Thrust Force (N)</td>
<td>500</td>
</tr>
<tr>
<td>Repetitive Positioning Accuracy (mm)</td>
<td>±0.003/±0.005/±0.01</td>
</tr>
<tr>
<td>Stroke Length (mm)</td>
<td>25–50</td>
</tr>
<tr>
<td>Options</td>
<td>Brake / Guide / Ball Screw Cover / Installation Plate</td>
</tr>
<tr>
<td>Power Supply</td>
<td>VDC 24/48</td>
</tr>
<tr>
<td>Starting From (Actuator + Driver + Cable)</td>
<td>$1,196.00</td>
</tr>
</tbody>
</table>

### EH Series

| Maximum Grip Force (N) | 27 |
| Repetitive Positioning Accuracy (mm) each side | ±0.02 |
| Backlash (mm) each side | 0.1 |
| Stroke (mm) | 25 (12.5 each side) |
| Maximum Speed (mm/s) | 156 (78 each side) |
| Push Speed (mm/s) | 20 (10 each side) |
| Minimum Travel Amount (mm) | 0.02 (0.01 each side) |
| Permissible Load (N) | 15 |
| Static Permissible Moment (N·m) | MP:1.2 MY:0.12 MR:0.4 |
| Power Supply | VDC 24/48 |
| Starting From (Actuator + Driver + Cable) | $1,251.00 |

### Push / Pull / Transport

- **DR/DRS Series**
  - Micromovement and High Positioning Accuracy
  - Compact, Space Saving

### Gripping

- **EH Series**
  - 2 Finger Type
  - 3 Finger Type

- **EH Series: with AZ Series**

### Note

- Small and Light Weight
- High Reliability, Closed Loop Control

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**Grip**

**Adjust**

**Measure**

- Measure the load size
Linear Motion / High Power

L Series

L Series: with AZ Series

<table>
<thead>
<tr>
<th>Frame Size (mm)</th>
<th>High-Speed Type</th>
<th>Large Transportable Mass Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Speed (mm/s)</td>
<td>500</td>
<td>90</td>
</tr>
<tr>
<td>Max. Transportable Mass (kg)</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Max. Thrust Force (N)</td>
<td>220</td>
<td>1098</td>
</tr>
<tr>
<td>Stroke Length (mm)</td>
<td>100–1000</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Horizontal / Vertical</td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td>Electromagnetic Brake</td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td>VDC</td>
<td>24/48</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Single-Phase (VAC)</td>
<td>100-120, 200-240</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Three-Phase (VAC)</td>
<td>200-240</td>
</tr>
<tr>
<td>Starting Price (Actuator + Driver + Cable)</td>
<td>$1,328.00</td>
<td></td>
</tr>
</tbody>
</table>

U Series

U Series

U Series Linear Head

Also available with Three-Phase Induction Motors KIS Series electromagnetic type

A’STEP AZ Series

AZ Series

Also available with Three-Phase Induction Motors KIS Series electromagnetic type

Rotate

DGII Series

Large-Diameter, Hollow Output Table

High Positioning Accuracy, Non-Backlash

Vertical Mount: with AZ Series

| Frame Size (mm) | 60/80/120 |
| Diameter of Hollow Section (mm) | 28/33/62/100 |
| Permissible Torque (N·m) | 50 |
| Permissible Axial Load (N) | 4000 |
| Lost Motion | 2 arcmin |
| Option | Electromagnetic Brake |
| Repetitive Positioning Accuracy | ±15 sec / ±0.004° |
| Power Supply | VDC |
| Power Supply | Single-Phase (VAC) | 100-120, 200-240 |
| Power Supply | Three-Phase (VAC) | 200-240 |
| Starting Price (Actuator + Driver + Cable) | $1,537.00 |
Overview

Motor control via network communication can detect the status of the motor directly by data. This results in a shorter development period, increased reliability and maintainability of the equipment. By expanding the network supported product line, Oriental Motor meets diversifying network environments of factory automation (FA).

Oriental Motor offers single axis EtherNet/IP, EtherCAT, or Profinet communications in our AZ Series family of stored data drivers.

*Different part numbers required

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**AZ** Series Motors and Linear & Rotary Actuators

The Products shown below are representative examples.

<table>
<thead>
<tr>
<th>AC Input / DC Input</th>
<th>DC Input Only</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="AZ Series" /></td>
<td><img src="image" alt="Compact Electric Cylinders DR Series" /></td>
</tr>
<tr>
<td><img src="image" alt="Hollow Rotary Actuators DGI Series" /></td>
<td><img src="image" alt="Compact Electric Cylinders DRS2 Series" /></td>
</tr>
<tr>
<td><img src="image" alt="Electric Linear Slides EZS Series" /></td>
<td><img src="image" alt="Electric Cylinders EAC Series" /></td>
</tr>
<tr>
<td><img src="image" alt="Electric Cylinders EAC Series" /></td>
<td><img src="image" alt="Rack and Pinion Systems L Series" /></td>
</tr>
</tbody>
</table>

- **EDS File for EtherNet/IP**
  An EDS file has been prepared to allow EtherNet/IP-compatible products to be used more easily. The EDS file can be downloaded from the Oriental Motor website.

- **ESI File for EtherCAT**
  An ESI file has been prepared to allow EtherCAT compatible products to be used more easily. The ESI file can be downloaded from the Oriental Motor website.

- **GDS File for PROFINET**
  A GDS file has been prepared to allow PROFINET-compatible products to be used more easily. The GDS file can be downloaded from the Oriental Motor website.

Ethernet/IP™ is a trademark of ODVA, Inc.

EtherCAT™ is a registered trademark licensed by Beckhoff Automation GmbH, Germany.

PROFINET is a trademark or registered trademark of PROFIBUS Nutzerorganisation e.V. (PNO).
Modbus (RTU)

Oriental Motor offers single axis Modbus (RTU) communication in our AZ, PKP/CVD RS-485 Type, BLV R Type and linear based products. *Modbus is a registered trademark of Schneider Automation Inc.*

Built-In Controller (Stored Data Type)

For I/O or Network control, stored data drivers with built-in controller ability (stored data type) using our MEXE02 Support Software (Free Download) is available in our AZ Series and BLV Series R Type of products.

The operating data is set in the driver, and is then selected and executed from the host system.

- Simple Wiring
- No Additional Pulse Module Required
- I/O Control
- Driver / Motor Monitoring
- Daisy Chain up to 16 Drivers
- Use with MEX02 Support Software

Single Axis Programmable Controller (Stored Program Type)

The SCX11 universal controller is a highly functional and sophisticated controller, equipped with program editing and execution functions and able to control the motor via various serial ports such as USB, RS-232C and CANopen.

- Stand Alone - Pulse Generator
- Store up to 100 Sequence Programs
- External Encoder Input
- USB Port Standard
- Direct Command Operation via CANopen
- 24 VDC
- List Price: $383.00

Gateways

Oriental Motor offers additional Gateway Network Converters.

- EtherCAT® is a registered trademark licensed by Beckhoff Automation GmbH, Germany
- MECHATROLINK is a registered trademark of MECHATROLINK Members Association
- SSCNETIII/H is a registered trademark of Mitsubishi Electric Corporation
Robot Controller **MRC01**

The **MRC01** robot controller supports easy programming and control of in-house designed custom built robots. Use the **Adept AZ** Series family of products to support your in-house design for improved performance and ease of use.

● **Easily Introduce Custom-built Robots to Existing Systems**

The connection between the **MRC01** and host system is controlled directly via EtherNet/IP™. Custom-built robots can be added easily, without the need to make major changes to the control system from the existing equipment.

● **Applicable Products**

This controller can connect to the following **AZ** Series drivers. It can also be connected to an **AZ** Series-equipped Linear & Rotary Actuators.

**AZ Series Drivers**

- **Built-in Controller Type**
  - Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC
  - Mini Driver RS-485 Communication Type
    - 24/48 VDC

**AZ Series Motors, AZ Series-Equipped Linear & Rotary Actuators**

- Motors
- Hollow Rotary Actuators **DGI** Series
- Compact Linear Actuators **DR** Series, **DRS2** Series
- Electric Linear Slides **E5** Series
- Electric Cylinders **EAC** Series
- Lack and Pinion Systems **L** Series
- Electric Gripper **EH** Series
Application Example
This is an in-house (original) SCARA robot that automates pick-and-place and transport between processes in a limited space. It is used in automated production lines for gluing, measuring, and assembly, which were conventionally done manually.

System Configuration
It is controlled by Ethernet/IP. The **MRC01** and **AZ** series drivers are controlled via RS-485 communication.
Oriental Motor offers a wide range of high torque stepper motors in frame sizes from 0.79 in. (20 mm) up to 3.54 in. (90 mm). Geared types, encoders, brake options and various motor windings are offered.

For improved performance, full time microstepping drivers with Smooth Drive are available, reducing noise and vibration and controlling heat output.

**Stepper Motor Types**

- **Standard**
- **High-Resolution Type**
- **Encoder Type**
- **Electromagnetic Brake Type**
- **Geared Type**
- **Flat Type**

**PKP Stepper Motor Features**

- **Increased Torque: New PKP to PK**
- **New Design: Run Cooler or Downsize**
PKP Series

Hybrid Control
AZ Series
Actuators
Network
Stepper Motors
Brushless Motors
Standard AC Motors
Cooling Fans
Modular Automation
Before Selection / Warranty

PKP Series

Flat Connector

Cable sold separately

PKP Series

● High Torque, Low Vibration, Ridged Construction, Downsizing
1.8°/0.9°/0.72°/0.36°

Frame Sizes

<table>
<thead>
<tr>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding Torque</td>
</tr>
<tr>
<td>Resolution (P/R)</td>
</tr>
<tr>
<td>Options</td>
</tr>
<tr>
<td>Gear Types</td>
</tr>
</tbody>
</table>

● See individual driver for ratings

CVD Driver

Board Mounting Type

CVD-S type

DC Input

CVD Series

Motor Types (Bi-polar)
Output Current (Amps)
Smooth Drive
Max Resolution
Power Supply
Input Current (Amps)
Starting From (Driver)

● Low Vibration with Full-Time Microstepping

Smooth Drive Control Reduces Step Vibration

Vibration Suppression Control

Vibration level has been significantly improved in all speed ranges.

● Industry’s Top, Compact, High Performance Driver

Pulse Input Type
RS-485 Communication Type

5 Type
SC Type

I/O or SPI Communication Setting
Speed Control

CVK246AK Series

General 1.8° stepper motor
3200 P/R (0.1125°/step)

Vibration Component Voltage (V/step)

Vibration Component Voltage Vp-p [V]

Speed [r/min]

0.0 0.2 0.4 0.6 0.8 1.0

0 500 1000 1500 2000 2500 3000

Smooth Drive Control

Reduces Step Vibration

Vibration level has been significantly improved in all speed ranges.

● Industry’s Top, Compact, High Performance Driver

Mass 20 g (0.71 oz) to 70 g (2.47 oz)

(Differs according to the driver type.)
Brushless Motors

Brushless motors offer excellent energy efficiency and savings equivalent to IE4, excellent speed stability, as well as a wide speed control range. Brushless motors use permanent magnets in the rotor of three-phase motors. With Brushless motors there is no brush and commutator resulting in a maintenance free motor.

On the inside of the stator, there is a built-in hall effect IC (magnetic sensor) that detects magnetic field changes with the permanent magnets. The feedback signals from the hall effect IC of the motor are compared with the setting speed by the driver and the motor speed is adjusted continuously.

● Control Method
  - Applied voltage adjusted and constant speed corrected
  - Detection and feedback of motor’s actual speed

● Wide Speed Range: 80—4000 r/min

- Maximum Instantaneous Torque
- Limited Duty Region
- Continuous Duty Region
- Rated Torque
- Speed regulation ±0.2%

● Compact and Lightweight
- BMU Series 120 W (1/6 HP)
  - Size Reduced by 62%
  - Mass Reduced by 62%

- AC Motors 90 W (1/8 HP)
  - Size Reduced by 62%
  - Mass Reduced by 62%

● Energy Savings
- Reduced Power Consumption by 26%
- Loss Reduced by 66%

Application Examples

Conveyor / Transportation

Agitators/Pumps/Dispensers

Torque Limiting
**Geared Options**

<table>
<thead>
<tr>
<th>Parallel Shaft GFV Gear</th>
<th>Parallel Shaft JV Gear</th>
<th>Foot Mounted Parallel Shaft JB Gear</th>
<th>Right Angle Hollow Shaft JH Gear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radial Load</td>
<td>Radial Load</td>
<td>Radial Load</td>
<td>Radial Load</td>
</tr>
<tr>
<td>Axial Load</td>
<td>Axial Load</td>
<td>Axial Load</td>
<td>Axial Load</td>
</tr>
<tr>
<td>50:1 Gear Reduction; 3000 RPM at Motor</td>
<td>450:1 Gear Reduction; 3000 RPM at Motor</td>
<td>600:1 Gear Reduction; 3000 RPM at Motor</td>
<td>200:1 Gear Reduction; 3000 RPM at Motor</td>
</tr>
<tr>
<td>Radial (Overhung) Load</td>
<td>Radial (Overhung) Load</td>
<td>Radial (Overhung) Load</td>
<td>Radial (Overhung) Load</td>
</tr>
<tr>
<td>Axial (Thrust) Load</td>
<td>Axial (Thrust) Load</td>
<td>Axial (Thrust) Load</td>
<td>Axial (Thrust) Load</td>
</tr>
<tr>
<td>Rated Torque</td>
<td>Rated Torque</td>
<td>Rated Torque</td>
<td>Rated Torque</td>
</tr>
<tr>
<td>280 lb</td>
<td>1163 lb</td>
<td>1331 lb</td>
<td>772 lb</td>
</tr>
<tr>
<td>67 lb</td>
<td>154 lb</td>
<td>185 lb</td>
<td>176 lb</td>
</tr>
<tr>
<td>483 lb-in</td>
<td>3814 lb-in</td>
<td>5159 lb-in</td>
<td>1575 lb-in</td>
</tr>
</tbody>
</table>

**Hypoid Gear**
- Hypoid gears allow for high permissible torque without saturation even at higher gear ratios

**Helical Gear**
- Helical gears allow for the motor torque to be fully utilized even at the highest gear ratio.

**Hollow Shaft Flat Gear (FR Type)**
- High Permissible Torque
- Space Saving
- Long Life
- Suitable for AGV Designs

**H1 Food-Grade Grease (IP66)**
- Oil Seal Lubricant Uses H1 grease
- Gear Lubricant Uses H1 grease
- Bearing Lubricant Uses H1 grease
- Stainless Shaft
- Watertight, Dust-Resistant (IP66)
- H1 Food-Grade Grease is a grease registered by the NSF as part of a category where the "lubricants used in food-processing environments where there is the possibility of incidental food contact."

**Special Coating**
- Stainless Steel Output Shaft & Parallel Key
- Corrosion Prevention (Electrical corrosion)
- Plating (Metal connector)
AC Input Motor / Driver

BMU Series

- Simple Driver Controls
- Easy Wiring & Set Up
- 4 Speeds - Data Setting
- Digital Display Built into the Driver
- IP66/67 Motors

Max. of 10 m (32.8 ft.) without an Extension Cable

BMU Series

Output Power - Watts (HP) 30 W (1/25 HP) – 400 W (1/2 HP)
Frame Size - mm (in.) 60 mm (2.36 in.) – 110 mm (4.33 in.)
Speed Range (r/min) 80 – 4000
Option Electromagnetic Brake / IP67 Type
Gear Types Parallel, Foot, Right Angle
H1 Food Grade Grease (Parallel Shaft type), FR Hollow Shaft
Power Supply Single-Phase (VAC) 100-120 / 200-240
Three-Phase (VAC) 200-240
Starting From (Motor + Driver + Cable) $361.00

BLE2 Series

- Easy Set up via Front Control Panel
- Side By Side Mounting
- Up to 16 Preset Speeds
- External DC Voltage Control
- MEXE02 Support Software
- IP66/67 Motors

Max. of 20 m (65.6 ft.) without an Extension Cable

BLE2 Series

Output Power - Watts (HP) 30 W (1/25 HP) – 400 W (1/2 HP)
Frame Size - mm (in.) 60 mm (2.36 in.) – 110 mm (4.33 in.)
Speed Range (r/min) 80 – 4000
Option Electromagnetic Brake / IP67 Type
Gear Types Parallel, Foot, Right Angle
H1 Food Grade Grease (Parallel Shaft type), FR Hollow Shaft
Power Supply Single-Phase (VAC) 100-120 / 200-240
Three-Phase (VAC) 200-240
Starting From (Motor + Driver + Cable) $458.00

DC Input Motor and Driver

BLH Series

- 2 Motor types (Connector or Cable)
- 3 Driver types (Analog, Digital or RS-485 Communications)
- 80 to 3000 r/min
- Torque Limiting & Deceleration Stop
- MEXE02 Support Software

BLH Series

Output Power - Watts (HP) 15 W (1/50 HP) – 100 W (1/8 HP)
Frame Size - mm (in.) 42 mm (1.65 in.) – 90 mm (3.54 in.)
Speed Range (r/min) 80 – 3000
Option Electromagnetic Brake
Gear Types Parallel, FR Hollow Shaft, Center Shaft
Power Supply VDC 24
Starting From (Motor + Driver + Cable) $286.00

BLV Series R Type

- Communications Control Through Modbus (RTU) and CANopen
- 1 to 4000 r/min
- Battery-Operated
- MEXE02 Support Software

BLV Series R Type

Output Power - Watts (HP) 60 W (1/12 HP) – 400 W (1/2 HP)
Frame Size - mm (in.) 60 mm (2.36 in.) – 110 mm (4.33 in.)
Speed Range (r/min) 1 – 4000
Option Electromagnetic Brake
Gear Types Parallel, FR Hollow Shaft, Center Shaft
Power Supply VDC 24 / 48 (400 W (1/2 HP) type is 48 VDC only)
Starting From (Motor + Driver + Cable) $775.00

Modular Automation Products Refer to Page 32.
Transport Robot Solutions

With the ability to run on battery power, our BLV Series R Type and BLH Series brushless motors can be used as the drive axle for modular robots (AGV/AMR/GTP*) or embedded in other similar Modular devices. These motors contribute to the handling of a wide variety of operating patterns and modular modes in various workplace environments.

✽ AGV: Automatic Guided Vehicle. AMR: Autonomous Mobile Robot. GTP: Goods To Person

● Low-Platform and Thin Design

Face surface mounting with the Flange Drive Adapter

Flange Drive Adapter Sold Separately

● Compact and Lightweight Driver

BLV Series R Type

60 W (1/12 HP), 100 W (1/8 HP), 200 W (1/4 HP), 400 W (1/2 HP)

BLH Series

15 W (1/50 HP), 30 W (1/25 HP), 50 W (1/15 HP)

The BLH Series can be controlled by software created in ROS. Visit our website for free software download, www.orientalmotor.com

● Setting via Networks

CANopen Modbus(RTU)

The BLH Series can be controlled by software created in ROS. Visit our website for free software download, www.orientalmotor.com

● For Larger Loads Used in Robots and Conveyors

A transport robot’s load capacity is affected by its permissible radial load. Using a Flange Drive Adapter or a hollow shaft flat gearhead supports requirements of increasing load size and installation in robots and conveyors.

Permissible Radial Load

<table>
<thead>
<tr>
<th>Gear Ratio</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>50</th>
<th>100</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>When Using a Flange Drive Adapter</td>
<td>1230 (276)</td>
<td>1680 (377)</td>
<td>2040 (458)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hollow Shaft Flat Gearhead</td>
<td>900 (202)</td>
<td>1300 (291)</td>
<td>1500 (337)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#1: The motor shaft speed is at or below 300 r/min
#2: The motor shaft speed is 100-3000 r/min
Standard AC Motors

Standard AC motors are used generally as a power source for automated equipment because they can be operated easily by connecting directly to an AC power supply. A standard AC motor supports various applications including high torque output, stopping or variable speeds. By using with a gear head, brake pack or speed controller, Standard AC Motors offer simple to use convenience and flexibility.

The Power Supply Frequency Determines the Speed

The basic speed (synchronous speed) of a standard AC motor is determined by the power supply frequency and the number of poles. Many of our standard AC motors have four poles, so their synchronous speed is as follows:

- 50 Hz: 1500 r/min
- 60 Hz: 1800 r/min

The actual speed varies according to the load torque. With our motors, the speed roughly falls within the following ranges at a load torque equivalent to the rated torque:

- 50 Hz: 1200 to 1300 r/min
- 60 Hz: 1450 to 1600 r/min

Constant Speed AC Motors

Induction / Reversible Motors

World K Series

- Standard AC Motors
- Overheat Protection Built-in
- Long Life – 10,000 hrs
- Right Angle Gearheads Available

KIS Series

- For use with 1/8 HP up to 3 HP Three-Phase Motors
- Single-Phase 115 VAC or 230 VAC input, Three-Phase 230 VAC or Three-Phase 460 VAC input

World K Series

<table>
<thead>
<tr>
<th>Type</th>
<th>Induction, Reversible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>1 W (1/750 HP) – 90 W (1/8 HP)</td>
</tr>
<tr>
<td>Frame Size</td>
<td>42 mm (1.65 in.) – 90 mm (3.54 in.)</td>
</tr>
<tr>
<td>Options</td>
<td>Terminal Box / Conduit Box / Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Parallel, Right Angle Hollow or Solid</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Single-Phase (VAC) 100-120 / 220-230</td>
</tr>
<tr>
<td>Three-Phase (VAC) 220-230</td>
<td></td>
</tr>
<tr>
<td>Starting Pricing (Motor + Gear)</td>
<td>$151.00</td>
</tr>
</tbody>
</table>

KIS Series

- Uni-Direction, Continuous Operation
- High Strength Gears, High Permissible Torque
- Long Life – 10,000 hrs
- Low Noise

<table>
<thead>
<tr>
<th>Type</th>
<th>Induction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>30 W (1/25 HP) – 200 W (1/4 HP)</td>
</tr>
<tr>
<td>Frame Size</td>
<td>80 mm (3.15 in.) – 110 mm (4.33 in.)</td>
</tr>
<tr>
<td>Options</td>
<td>Terminal Box / Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Parallel, Right Angle Hollow or Solid</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Three-Phase (VAC) 220-415</td>
</tr>
<tr>
<td>Starting Pricing (Motor + Gear)</td>
<td>$214.00</td>
</tr>
</tbody>
</table>
Brother ie3 MMD Series

- Helical (parallel) and Hypoid (right angle) gear type motors
- Pre-assembled, motor & gear
- Slip fit “O” ring design for mounting in any direction

Single or Three-Phase
Brother ie3 Mid Series Helical / Hypoid Gear Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Output Power</th>
<th>Speed Range (r/min)</th>
<th>Options</th>
<th>Gear Types</th>
<th>Starting Pricing (Motor + Gear)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induction</td>
<td>400 W (1/2 HP)–3 HP</td>
<td>90–3600 (3–120 Hz)</td>
<td>Terminal Box / Electromagnetic Brake</td>
<td>Parallel, Right Angle Hollow or Solid</td>
<td>$626.00</td>
</tr>
</tbody>
</table>

FPW Series
IP67 Rated

- Conforms to IEC Standard IP67
- Pre-assembled, Motor & Gear
- Water Tight and Dust Resistant

Single-Phase / Three-Phase

<table>
<thead>
<tr>
<th>FPW Series</th>
<th>Type</th>
<th>Output Power</th>
<th>Frame Size</th>
<th>Gear Types</th>
<th>Single-Phase (VAC)</th>
<th>Three-Phase (VAC)</th>
<th>Starting Pricing (Motor + Gear)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Induction</td>
<td>25 W (1/30 HP)–90 W (1/8 HP)</td>
<td>80 mm (3.15 in.)–104 mm (4.09 in.)</td>
<td>Parallel</td>
<td>110–115 / 220–230</td>
<td>220–230</td>
<td>$320.00</td>
</tr>
</tbody>
</table>

Torque Motors

Torque Control

- TMP-1 Power Controller (sold separately)
- List Price: $135.00

WK Series

<table>
<thead>
<tr>
<th>Type</th>
<th>Output Power</th>
<th>Frame Size</th>
<th>Gear Types</th>
<th>Single-Phase</th>
<th>Starting Pricing (Motor + Gear)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque Motor</td>
<td>3 W (1/250 HP)–23 W (1/38 HP)</td>
<td>60 mm (2.36 in.)–90 mm (3.54 in.)</td>
<td>Parallel</td>
<td>110–115 / 220–230</td>
<td>$200.00</td>
</tr>
</tbody>
</table>

Applications

Belt Conveyor

Pinch Conveyor

Tension Control

Packing System

- Conforms to IEC Standard IP67
- Pre-assembled, Motor & Gear
- Water Tight and Dust Resistant
Fans and Thermal Management
Today’s fans are designed to move air allowing for cooling, controlling an area of space or for protecting electronics. Many of our fans come with alarm features designed for warning or for preventative maintenance. Oriental Motor helps make selecting the appropriate type of fan for today’s applications simple.

**Axial Flow Fans**
- AC or DC Input

**Centrifugal Blowers**
- AC or DC Input

**Cross Flow Fans**
- AC or DC Input

**Thermostat**
- Centigrade (°C)

---

**Device Ventilation and Cooling**

**Cooling Densely Mounted Devices**

**Air-Blow Cooling or Drying**

**Cooling with High Static Pressure**

**Uniform Cooling or Drying**

**Cooling for Long or Thin Spaces**

**Automatically turning it ON/Off with a Set Timer**
Alarm Types

Cooling fans with alarms allow for prevention of unexpected problems or malfunctions.

● Locked Rotor Alarm
The fan will emit an alarm when the fan rotation has stopped. This will alert you to interruptions immediately, so that action / replacement can be made.

● Low-Speed Alarm
The fan will emit an alarm when the fan slows down possibly due to the introduction of foreign particles or other problems. This helps with predictive maintenance.

If multiple fans are running, it will also allow for replacement of only the fans experiencing a reduced cooling capacity.

Enclosure Types

- AC or DC Input
- Complete Assembly
- IP2X, IP4X or IP55 Models
- Suction or Exhaust Type

Accessories

- Finger Guards
- Filters
- Screens
- Plug Cords
Modular Automation

Solutions to Accelerate Automation

Modular Automation-Compatible Products

- Layout-Free Equipment
- Improved Efficiency
- High-Mix Low-Volume Production
- Reduce Labor Shortages
- Space Saving
- Energy Saving

The Implementation of Layout-Free Automation Equipment and Lines is the Key to Flexibility

Modular Automation-Compatible Products Support the Creation of Next Generation Automation

Companies need the flexibility to respond to changes in the external environment such as labor shortages, natural disasters and the constantly changing global situation. Production sites are increasingly adopting automation measures to replace humans for work such as transporting loads, working on production lines or doing work in difficult to access locations. In addition, the number of companies that are working to modularize equipment to allow line configurations to be reconfigured according to the situation is also increasing. The key to solving these issues is the creation of layout-free automation equipment and lines. Modular automation compatible products are a group of products that support the achievement of these goals.

"Modular Automation Compatible Products" are a group of products based on the shared concept of battery operation, compact size and lightweight.

- Use automated transportation instead of fixed conveyors
- The production line can be configured using modularized lightweight and compact equipment
- Eliminates the need to run AC power lines and extends range of movement

The concept of flexible automation equipment and lines

- "Battery drive & DC input" and "Light & compact"

Elements necessary to achieve

Consider modular automation-compatible products

Modular Automation-Compatible Product Line

"Modular Automation Compatible Products" are a group of products based on the shared concept of battery operation, compact size and lightweight. Ideal for installation in self-propelled equipment and mobile facilities, they contribute to the creation of flexible automation lines and modular automation, which will see increasing demand in the future.

Brushless DC Motors
BLV Series R Type

- Low-speed operation from 1 r/min can be performed.
- Provides smooth drive performance.
- Both the motor and driver are significantly smaller and lighter.
- Contributes to development of compact, battery driven devices.

ΩSTEP AZ Series mini Driver & Motors/Actuators

- Uses Oriental Motor’s unique closed loop control.
- Equipped with the newly developed ABZO Sensor This makes an absolute system possible without a battery.
- The mini driver has been designed to be compact and lightweight to save control cabinet space in embedded applications. They can be connected to DC input motors and their on-board linear & rotary actuators. Contributes to the development of battery driven devices.
For Example, They Contribute to Following Layout-Free Projects:

**Inter-Process Load Transporting Robots**

![Image of Inter-Process Load Transporting Robots]

- **Articulated Arm Type Transportation Robot**
  - Drive for each joint: AZ Series motor, mini Driver
  - Hand component: Electric Gripper EH Series, mini Driver
  - Robot Controller MRC01

- **Lifting Equipment Type Transportation Robot**
  - Rack-and-Pinion System L Series
  - Conveyor BLV Series R Type

**Flexible Modular Line That Can Be Reconfigured to Match the Product**

![Image of Flexible Modular Line]

**X-Y-Z Type Modularized Equipment**

- Distributed Driver Equipment
  - Distributed driver placement is possible thanks to the small size and light weight of the mini Driver.
  - This allows for reduced wiring and smaller power distribution panels. Smaller, lighted equipment designs are possible.

---

**Modular Automation-Compatible Products**

- **Robot Controller MRC01**
  - A robot controller that allows for easy setting, programming and operation of custom-built robots using the AZ Series.
  - Compatible protocol: EtherNet/IP

- **DC Axial Flow Fans MD Series**
  - 24 VDC input axial flow fans adapted to ventilation and cooling
  - Types: No alarm, with alarm, long life, speed control, waterproof

---

EtherCAT® is a patented technology licensed from Beckhoff Automation GmbH (Germany) and is a registered trademark of that company.

PROFINET is a trademark or registered trademark of PROFIBUS Nutzerorganisation e.V. (PNO).

Modbus (RTU) is a registered trademark of Schneider Automation Inc.

EtherNet/IP™ is a trademark of ODVA.

ABZO Sensor are registered trademarks or trademarks of Oriental Motor Co. in Japan and other countries.
Environmental Efforts

Oriental Motor has proactively supported activities that give consideration to global environmental conservation. Energy savings, conservation of natural resources and reduction of waste and carbon dioxide are implemented at various stages of the product lifecycle. By providing beneficial products that feature high efficiency, compact size, high power and long life, Oriental Motor hopes to be involved with various “motion” that our customers require, while contributing to environmental conservation activities.

① Energy Savings (High Efficiency)
A motor converts electric energy into mechanical energy. Energy savings require higher efficiency by reducing the energy loss from the motor. Going forward, Oriental Motor will surpass the international standards with compact, precision motors aimed at higher efficiency.

② Conservation of Natural Resources and Longer Life
We have saved on natural resources by producing compact, more efficient products, thereby making more effective use of the natural resources in the product lifecycle. In the future we will promote longer product life and less wiring to match product features.

③ Controlling Chemical Substances in Products
Oriental Motor uses green procurement standards that take into consideration the global electrical and electronic industry standard IEC 62474 and customer requirements to curb the chemical substances in products.

Environmental Policy
Oriental Motor’s Basic Environmental Philosophy and Environmental Policy
- ISO 9001 and ISO 14001

Our Efforts in the Product Lifecycle

- Reduction and lightening of parts and materials
- Use of materials and parts with low environmental impact (green procurement measures)
- Reduction of paper use by converting operating manuals to digital versions
- Use of recycled materials
- Reduced energy use during manufacturing
- Reduced consumption of resources during manufacturing
- Control of chemical substances used in manufacturing processes
- Reduction of waste and appropriate processing
- Control of chemical substances used in products
- Improved transportation efficiency through optimal packaging design
- Packaging that is easy to recycle
- Communication about the chemical substances contained in products
- Reduced waste through optimally-designed packaging
- Reduced wiring with network-compatible products
- Reduced waste through products with longer lives
- Decreased energy consumption during product use (development of energy-efficient products)
- Reduced waste through products with longer lives
- Decreased energy consumption during product use (development of energy-efficient products)

Brushless Motors
Simple operation
BMU Series
AC Input

Small board type
BLH Series
DC Input

Brushless Motors Fans
EMU Series
AC Input

High Torque Stepper Motors
PKP Series
DC Input

Environmental Policy
Oriental Motor’s Basic Environmental Philosophy and Environmental Policy
- ISO 9001 and ISO 14001
Before Selecting a Product

■ Scope of Intended Applications
Our products are designed and manufactured for use in general industrial applications. They are not intended for use in nuclear power generation, aerospace, railway, vehicle, entertainment machinery, safety equipment, medical equipment or any other application having a significant effect on human life or property.

■ Safety Precautions
Before using any product, carefully read the “operating manual” to ensure correct operation.

■ Return, Replacement and Repair After Delivery
ORIENTAL MOTOR U.S.A. CORP. is confident that you will be completely satisfied with your purchase. In the unlikely event that a delivered product has been damaged during shipping or if you receive an incorrect order, ORIENTAL MOTOR U.S.A. CORP. will correct the problem. Please contact your local sales office or distributor where the product was purchased.

If you need to return a product because of a technical issue, please contact ORIENTAL MOTOR U.S.A. CORP. technical support at 1-800-468-3982 (847-871-5931 or 310-715-3303 if outside the USA & Canada) to try to determine the cause of the problem. If your problem cannot be resolved, you will receive instructions on how to obtain an RMA number and how to return the product.

■ Warranty and Limitation of Liability
● Warranty
Oriental Motor U.S.A. Corporation (the “Company”) warrants to the first end user Buyer that the products and parts thereof, when shipped will be free from defects in materials comprising the same and in the Company’s workmanship. If any such defects exist or later appear, the Company shall undertake, at its sole expense, prompt remedial action as stated herein to correct the same; provided however, that the Company shall have no obligation or liability under this warranty unless it shall have received written notice specifying such defects no later than two (2) years from the date of shipment.

● LIMITATION OF LIABILITY
THE COMPANY SHALL HAVE NO LIABILITY WHATSOEVER IN ANY EVENT FOR PAYMENT OF ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, DAMAGES FOR INJURY TO ANY PERSON OR PROPERTY. BY ACCEPTING THE PRODUCTS AND/OR PARTS THEREOF, THE FIRST END USER BUYER OR SUBSEQUENT USER AGREES THAT THE COMPANY SHALL NOT BE LIABLE FOR INDEMNIFICATION OR CONTRIBUTION (IN WHOLE OR IN PART) EITHER EXPRESSLY OR BY IMPLICATION. IF FOR ANY REASON OF THE FOREGOING PROVISIONS SHALL BE INEFFECTIVE, THE COMPANY’S LIABILITY FOR DAMAGES ARISING OUT OF ITS MANUFACTURE OR SALE OF ITS PRODUCTS OR PARTS, OR USE THEREOF; WHETHER SUCH LIABILITY IS BASED ON WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE, SHALL NOT IN ANY EVENT EXCEED THE FULL PURCHASE PRICE OF SUCH PRODUCTS AND PARTS THEREOF.

Any action against the Company based upon any liability or obligation arising hereunder any law applicable to the sale or its products or parts thereof, or the use thereof, must be commenced within two (2) years after the cause of such actions arises.