

# ***Oriental motor***

## **Product Guide**

***αSTEP*** Hybrid Control System

Linear & Rotary Actuators

Network – Controllers

Stepper Motors

Brushless Motors

Standard AC Motors

Cooling Fans

Modular Automation

2023  

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2024

AVAILABLE WORLDWIDE,  
STARTING FROM A SINGLE UNIT.



# 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.

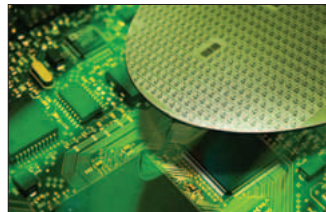
Medical



Packaging



Semiconductor



Factory Automation (FA)



Material Handling



Food Processing



Security



Environmental





# Products of Oriental Motor

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  $\alpha$ STEP 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.

## $\alpha$ STEP Hybrid Control System



- Mechanical Absolute Encoder Stepper Motors
- Closed Loop
- Positioning, Speed, Torque Control
- Electromagnetic Brake Types
- Geared Types



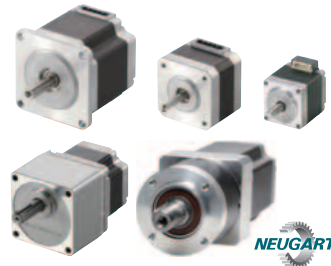
- Linear & Rotary Actuators
- Transport
- Push/Pull
- Lifting
- Gripping
- Rotating

## Network – Controllers



- EtherNet/IP
- EtherCAT
- PROFIBUS
- Modbus (RTU)
- CC-Link
- MECHATROLINK
- 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



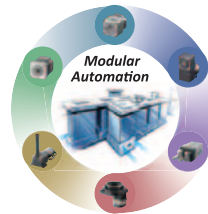
- 1 W (1/750 HP)~3 HP
- Single & 3 Phase
- Fixed Speed
- Speed Control
- Electromagnetic Brake Types
- Geared Types

## 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

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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**  
Development of standard AC motors and brushless motors. Development and manufacturing of control circuits and cooling fans.



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



**Soma Plant**  
Development and manufacturing of stepper motors and control circuits.

**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.



# Oriental Motor Supports Global Manufacturing

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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

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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

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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

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## 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

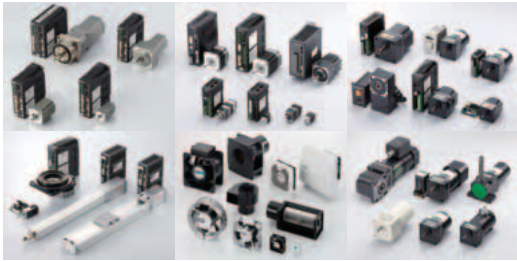
You can schedule an on-site lunch & learn seminar with our Sales and Application Engineer staff. For this one-hour session, Oriental Motor will discuss our latest technology for solving simple to challenging motion requirements.





# Oriental Motor Provides Customer Support for Products and Services

Find the Right Solution from  
Approximately 50,000  
**Standard Products**



Always Available,  
Before & After Sales Support  
**Services**



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

● Estimates ● Product Inquiries ● Orders ● General Information

By Live Chat



[www.orientalmotor.com](http://www.orientalmotor.com)

"Need Help?" popup  
Available - Monday to Friday,  
8:30am EST to 5:00pm PST

By Email



[www.orientalmotor.com/contact](http://www.orientalmotor.com/contact)

Technical Support  
Customer Service / Sales

By Phone



Hours - Monday to Friday,  
8:30am EST to 5:00pm PST

**Toll-free** 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.



oriental motor

search

## 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.

### Live Chat

Live chat is available during regular office hours.



### Order Online

Convenient online ordering is available.

### My Account

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

For technical information searches, please use our website.



## Stay in Touch

### Engineering Notes

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



### Social Media



# $\alpha$ STEP Hybrid Control System

Position, Speed and Torque Control

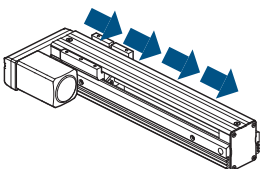
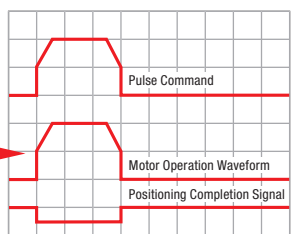
## What is $\alpha$ STEP?

$\alpha$ 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 $\pm 1.8^\circ$ )

Motor is controlled in open loop mode like a stepper motor.

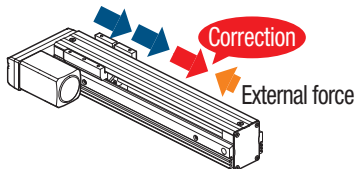
- The tuning-free feature allows for high accuracy and high responsiveness to commands
- Hunting-free (Complete stop)
- Constant monitoring of the motor's status

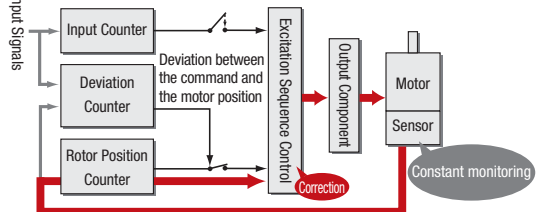
### Overload Condition (Positioning deviation is $\pm 1.8^\circ$ min.)

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

Reliability as a result of monitoring and correction of positions and speed



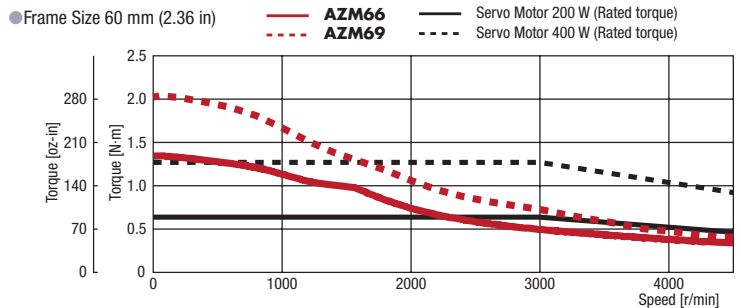
● Closed Loop Control System



## Performance

“Rated output” is not listed because  $\alpha$ STEP has no “rated speed.” Refer to the graph on the right to compare rated torque of  $\alpha$ 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

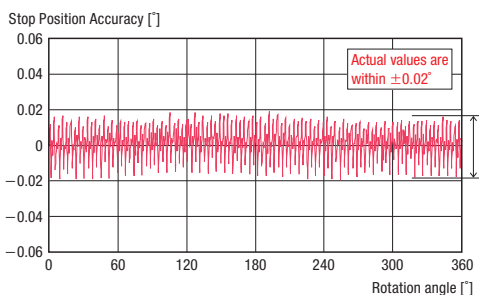


● Data for the speed-torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

## Stopping Accuracy

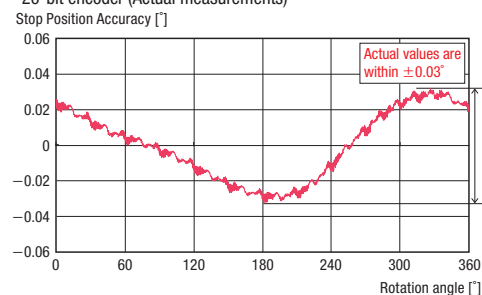
The stopping accuracy of a typical  $\alpha$ STEP is  $\pm 0.05^\circ$  (under no load), which is equivalent to that of servo motors. These graphs show the actual measured stopping accuracies when an  $\alpha$ STEP and an AC servo motor were rotated once.

● Stopping accuracy of  $\alpha$ STEP (Actual measurements)



[Example] When the ball screw lead is 10 mm, the  $\alpha$ STEP stopping accuracy is  $\pm 1.4\mu\text{m}$  and the repetitive positioning accuracy of a common ground ball screw is  $\pm 10\mu\text{m}$ .

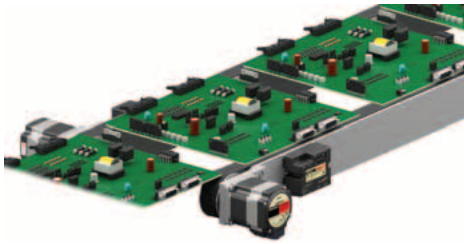
● Stopping accuracy of AC servo motor with a common 20-bit encoder (Actual measurements)



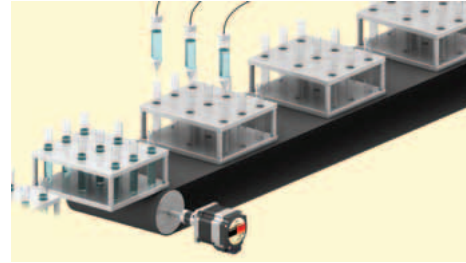
The stopping accuracy of an AC servo motor is the encoder resolution  $\pm 1$  pulse\*. The above shows the actual values that result from differences in the encoder's assembly.  
\*1,048,576 p/rev at 20 bits



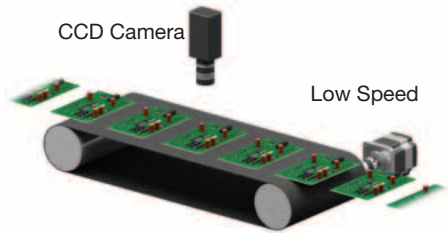
# Application Examples



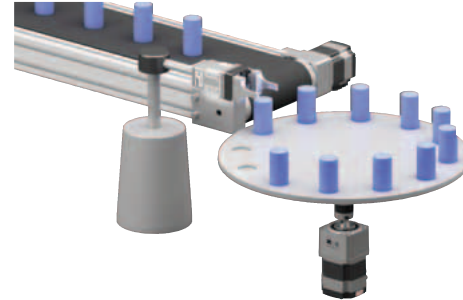
Complete synchronization with commands



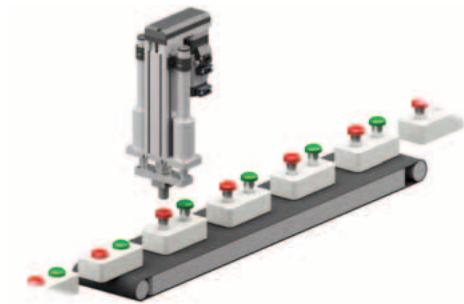
Frequent repetitive starting and stopping



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



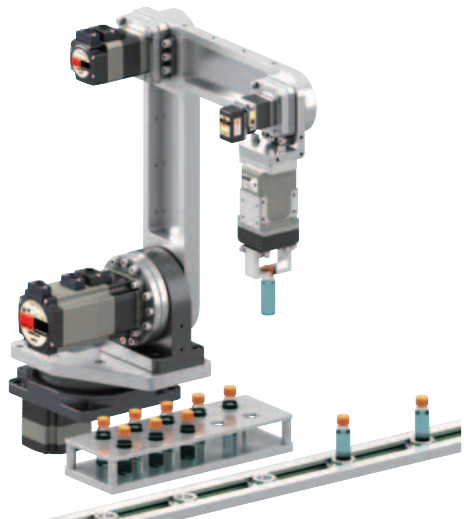
Transfer of large inertial load



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  $\alpha$ STEP 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**  
 $\pm 900$  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

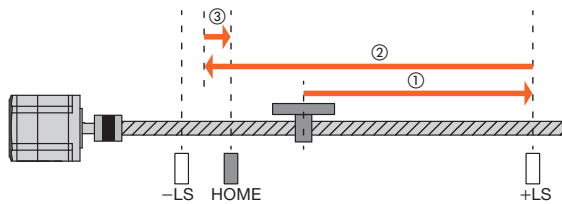
The AZ Series driver uses the positioning information managed by the mechanical absolute sensor. The position information can be preserved, even if the power turns off or if the cable between the motor and the drive is disconnected. No battery required.

### 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.

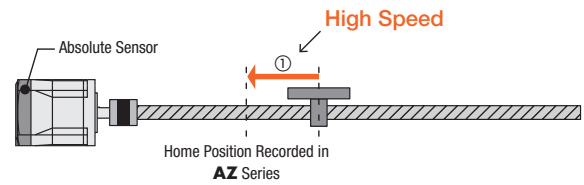
#### Previous Home Detection for Control Motor

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



#### Return-to-Home Operation of AZ Series

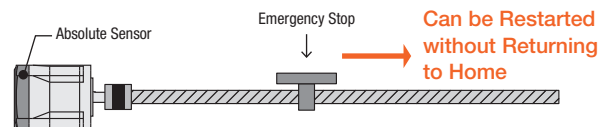
There is no need to detect the limit sensor, and it can travel directly at high speed to the home position recorded by the Absolute Sensor.



### 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



● **AZ Series Driver Types**



**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**



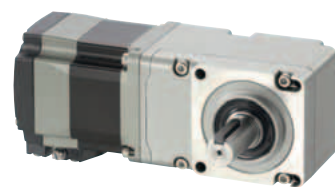
Standard



Tapered Hob



Harmonic (no backlash)



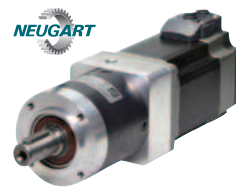
Right Angle (face gear)



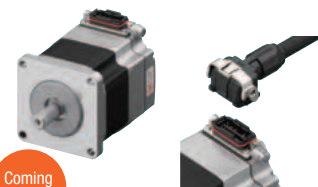
Planetary



Planetary (attach load)



Planetary (high torque)



Coming Soon

Connector Type

● **Actuator Types**



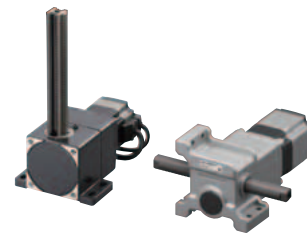
Linear Slides



Linear Cylinders



Rotary Actuators



Rack & Pinion



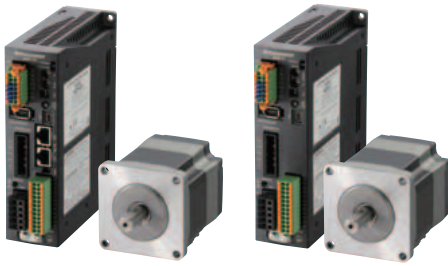
Compact Electric Cylinder



Gripper



● AC Input – Single Axis



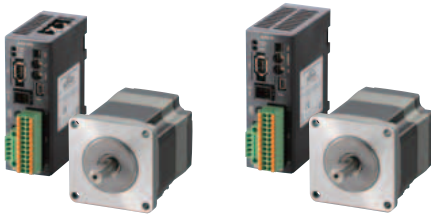
AC Input

**AZ Series**



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

● DC Input – Single Axis



DC Input

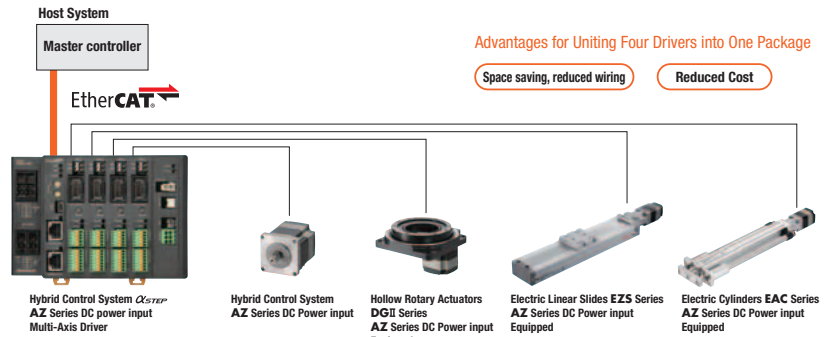
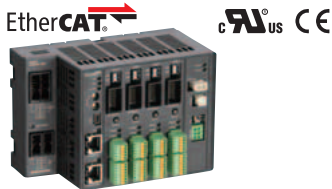
**AZ Series**



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

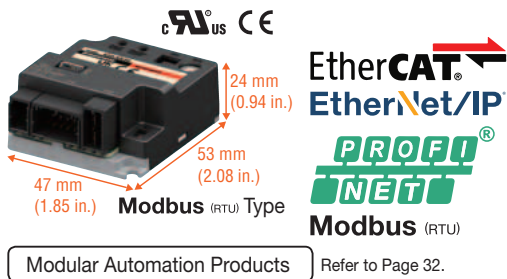
\*Profinet Only

Multi- Axis (DC Input)  
2, 3 or 4 axis type

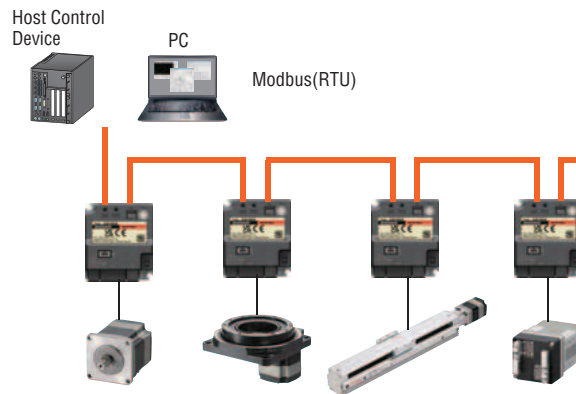


● The connected motors and linear & rotary actuators are representative examples.

mini Driver



FA Network Compatible



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

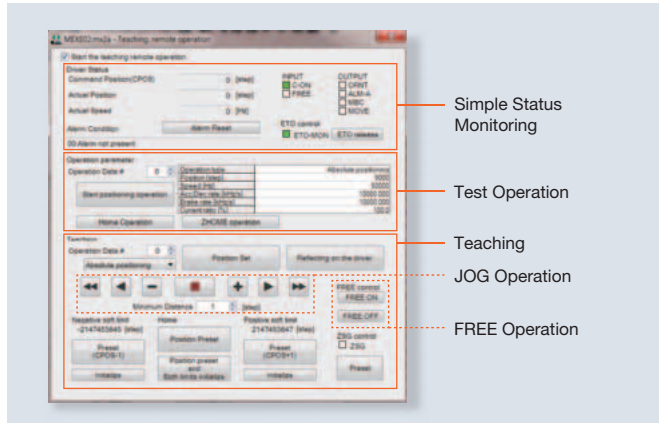
# Support Software MEXE02

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.

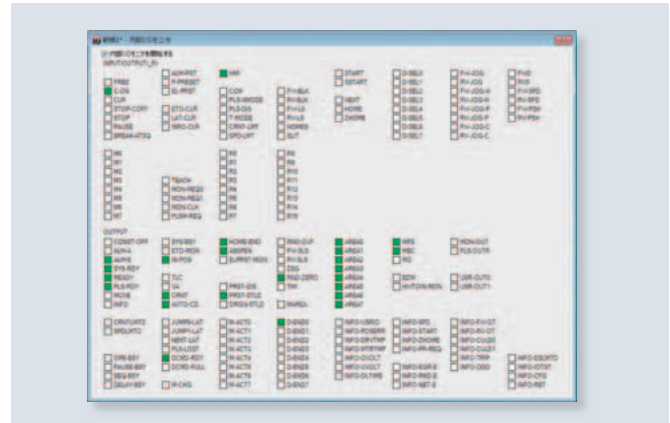
## Teaching and Remote Operations At startup

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.



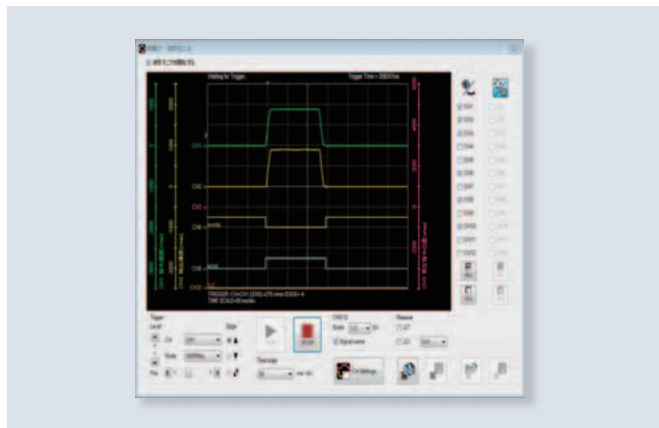
## I/O Testing At startup While running

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.



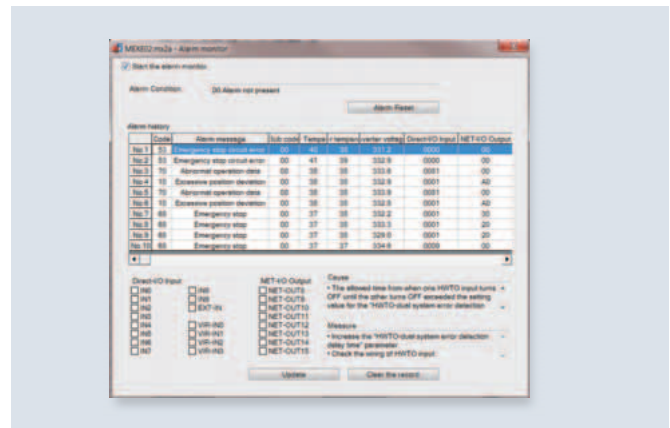
## Waveform Monitoring At startup

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



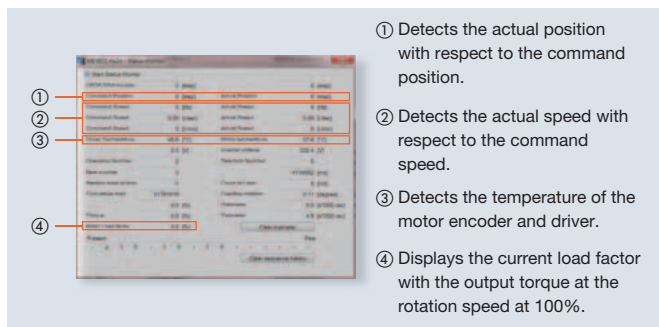
## Alarm Monitoring At startup

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



## Status Monitoring At startup

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.



## 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.

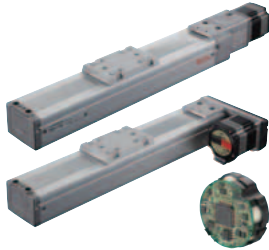


# Linear & Rotary Actuators

## $\alpha$ STEP Hybrid Control System

A broad selection of linear & rotary electric actuators using the **AZ Series  $\alpha$ STEP** hybrid control system as the driver source are available for a wide range of motion requirements.

● Electric Slide



● Electric Cylinder



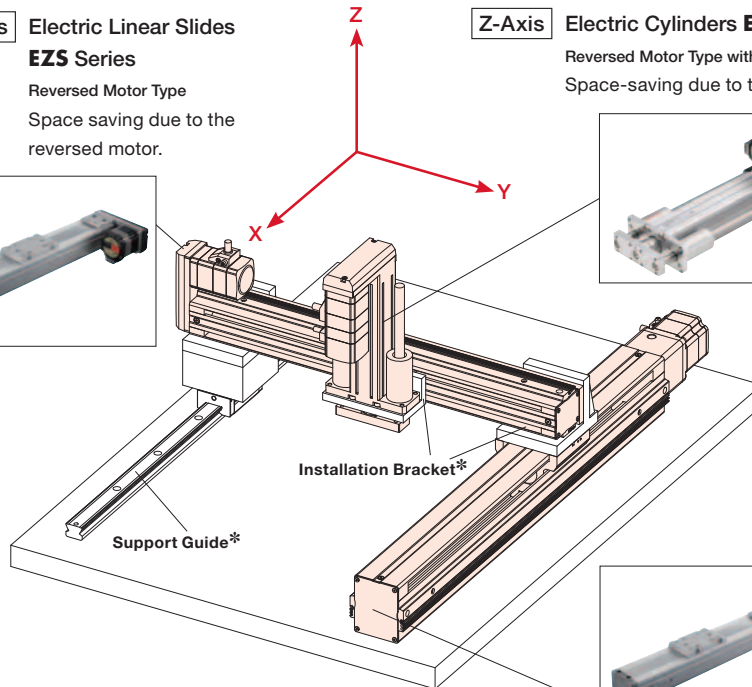
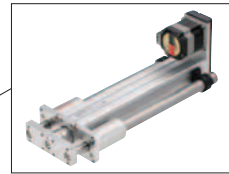
**Y-Axis** Electric Linear Slides **EZS Series**

Reversed Motor Type  
Space saving due to the reversed motor.



**Z-Axis** Electric Cylinders **EAC Series**

Reversed Motor Type with Shaft Guide Cover  
Space-saving due to the reversed motor.

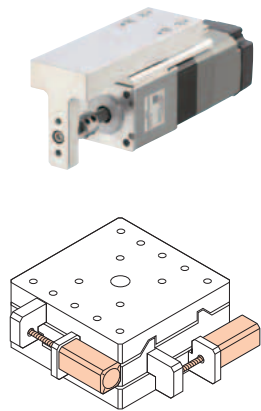


\*Support guide and installation brackets supplied by the customer.

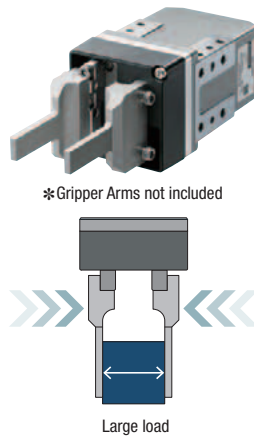
**X-Axis** Electric Linear Slides **EZS Series**  
Straight Type



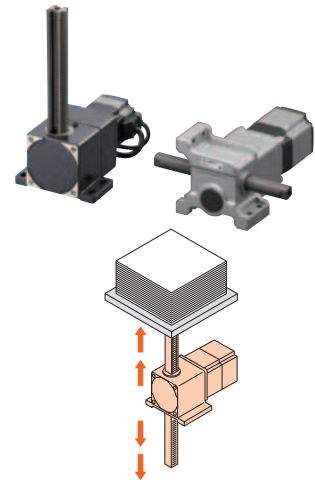
● Compact Electric Cylinder



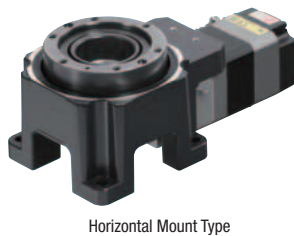
● Gripper



● Rack & Pinion



● Hollow Electric Rotary Actuator

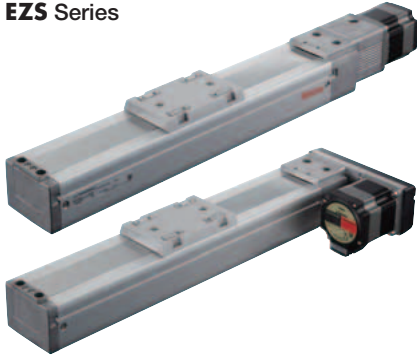


Large-Diameter Hollow Output Table  
Makes Simple Wiring and Piping Possible



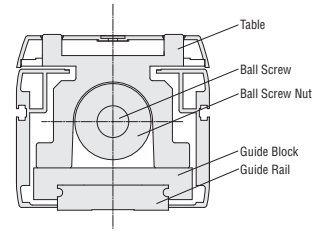
# Linear Motion / Transport

## EZS Series



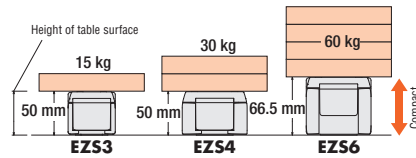
### ● High Rigidity / High Accuracy Guide

\*LM Guide and Ball Retainer are registered trademarks of THK.



Traveling Parallelism of 0.03 mm or Less

### ● Slim with High Transportable Mass



## EZS Series: with AZ Series



Max. Speed (mm/s)	800	
Max. Transportable Mass - Vertical (kg)	30	
Max. Transportable Mass - Horizontal (kg)	60	
Repetitive Positioning Accuracy (mm)	±0.02	
Stroke Length (mm)	50 - 850	
Power Supply	VDC	24/48
	Single-Phase (VAC)	100-120 / 200-240
	Three-Phase (VAC)	200-240
Starting From (Actuator + Driver + Cable)	\$1,412.00	

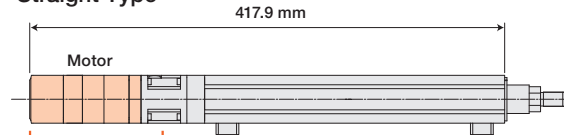
# Push / Pull

## EAC Series

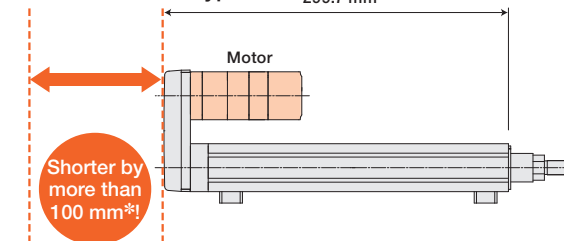


### ● High Strength, Space Savings

#### Straight Type

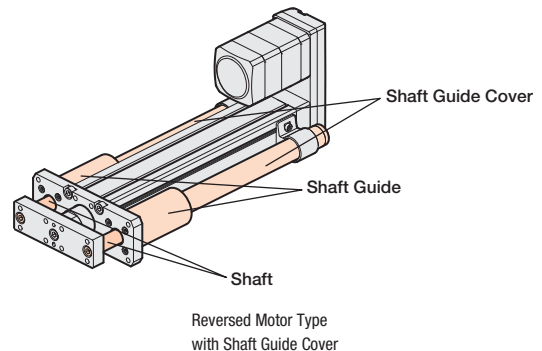


#### Reversed Motor Type



\*When electromagnetic brake is installed

### ● With or Without Guide Cover



## EAC Series: with AZ Series



Max. Speed (mm/s)	600	
Max. Transportable Mass - Vertical (kg)	28	
Max. Transportable Mass - Horizontal (kg)	60	
Repetitive Positioning Accuracy (mm)	±0.02	
Stroke Length (mm)	50 - 300	
Thrust Force (N)	400	
Push Force (N)	500	
Power Supply	VDC	24/48
	Single-Phase (VAC)	100-120 / 200-240
	Three-Phase (VAC)	200-240
Starting From (Actuator + Driver + Cable)	\$1,228.00	

# Push / Pull / Transport

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



**DR Series: with AZ Series**



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



Wide Table Type



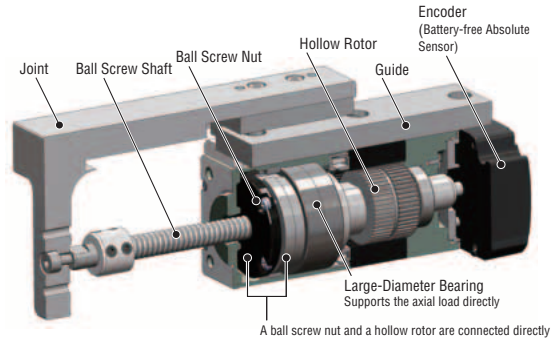
Table Type



Rod Type with Guide

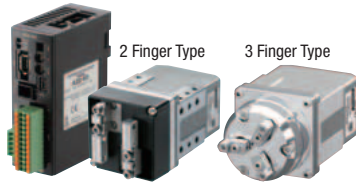


Rod Type



# Gripping

**EH Series**

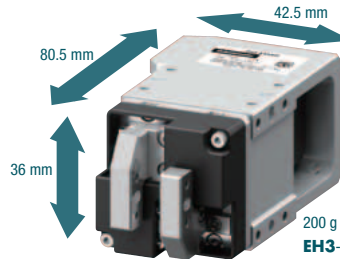


**EH Series: with AZ Series**

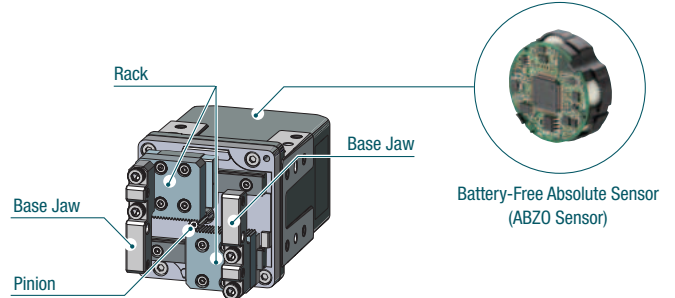


Maximum Grip Force (N)	27
Repetitive Positioning Accuracy (mm) each side	±0.02
Backlash (mm) each side	0.1
Stroke (mm)	25 (12.5 each side)
Maximum Speed (mm/s)	156 (78 each side)
Push Speed (mm/s)	20 (10 each side)
Minimum Travel Amount (mm)	0.02 (0.01 each side)
Permissible Load (N)	15
Static Permissible 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

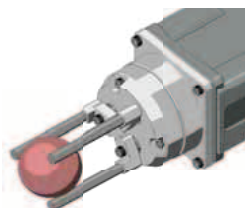
- Small and Light Weight



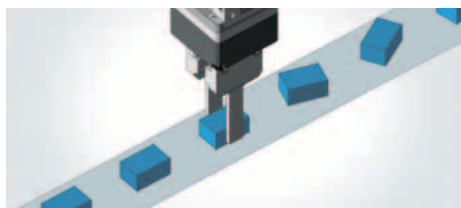
- High Reliability, Closed Loop Control



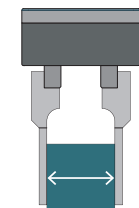
## Grip



## Adjust



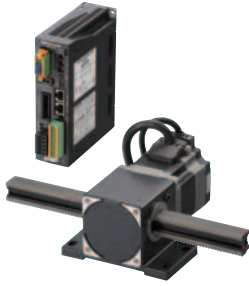
## Measure



Measure the load size

# Linear Motion / High Power

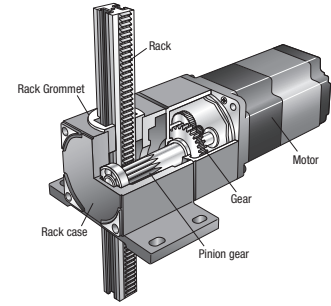
## L Series



### L Series: with AZ Series



### ● Compact and High Strength



Frame Size (mm)	60/80	
Max. Speed (mm/s)	High-Speed Type	500
	Large Transportable Mass Type	90
Max. Transportable Mass (kg)	High-Speed Type	20
	Large Transportable Mass Type	100
Max. Thrust Force (N)	High-Speed Type	220
	Large Transportable Mass Type	1008
Stroke Length (mm)	100~1000	
Type	Horizontal / Vertical	
Option	Electromagnetic Brake	
Power Supply	VDC	24/48
	Single-Phase (VAC)	100-120, 200-240
	Three-Phase (VAC)	200-240
Starting Price (Actuator + Driver + Cable)	\$1,328.00	

## LJ Series



LJ Linear Head

αSTEP AZ Series

\*Also available with Three-Phase Induction Motors **KIIS** Series electromagnetic type

### LJ Series: with AZ Series

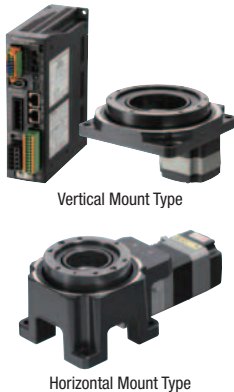


Frame Size (mm)	90	
Max. Speed (mm/s)	500	
Max. Transportable Mass (kg)	40 mm/s	200
	188 mm/s	55
Max. Thrust Force (N)	1961	
Stroke Length (mm)	100~700	
Type	Horizontal / Vertical	
Combination Motors*	AZ Series <b>TS</b> Geared Type	
Power Supply	Single-Phase (VAC)	100-120
	Three-Phase (VAC)	200-240
Starting Price (Actuator + Motor + Driver + Cable)	\$1,778.00	

# Rotate

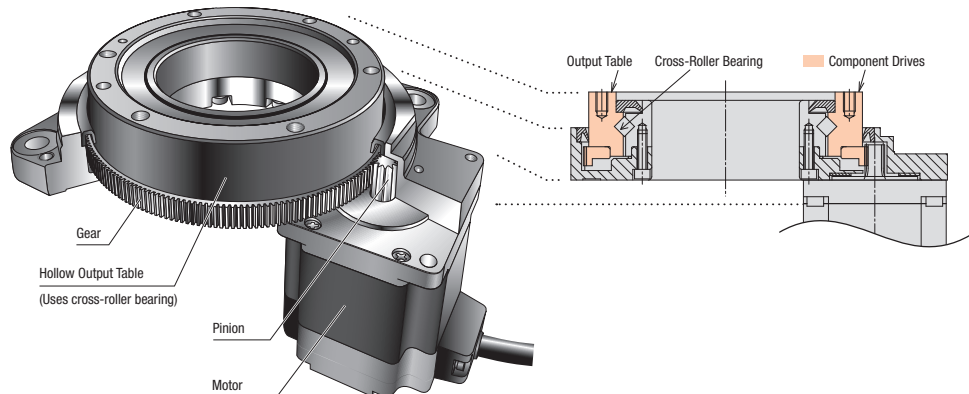
## DGII Series

### ● Large-Diameter, Hollow Output Table



Vertical Mount Type

Horizontal Mount Type

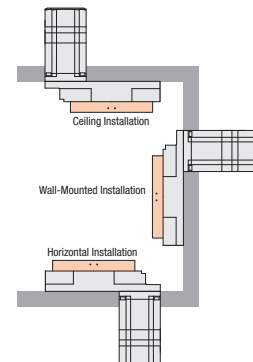
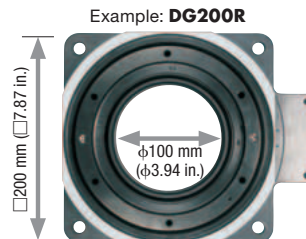


### ● High Positioning Accuracy, Non-Backlash

#### Vertical Mount: with AZ Series



Frame Size (mm)	60/85/130/200	
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	24/48
	Single-Phase (VAC)	100-120 / 200-240
	Three-Phase (VAC)	200-240
Starting From (Actuator + Driver + Cable)	\$1,537.00	





# Network / Controller Products

## Overview

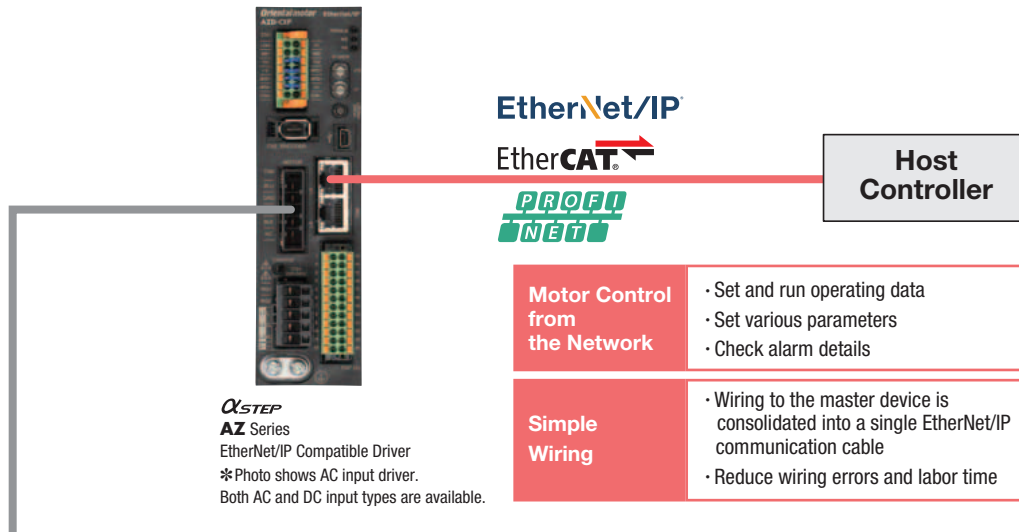
Motor control via network communication can detect the status of the motor directly by data. This results in a shorter development period, increased reliability and maintainability of the equipment.









By expanding the network supported product line, Oriental Motor meets diversifying network environments of factory automation (FA).



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

\*Different part numbers required



AZ Series Motors and Linear & Rotary Actuators			
● The Products shown below are representative examples.			
AC Input / DC Input			
 <b>AZ Series</b>	 Hollow Rotary Actuators <b>DGII Series</b>	 Electric Linear Slides <b>EZS Series</b>	 Electric Cylinders <b>EAC Series</b>
AC Input / DC Input		DC Input Only	
 Rack and Pinion Systems <b>L Series</b>	 Compact Electric Cylinders <b>DR Series</b>	 Compact Electric Cylinders <b>DRS2 Series</b>	 Electric Gripper <b>EH Series</b>

### • 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.

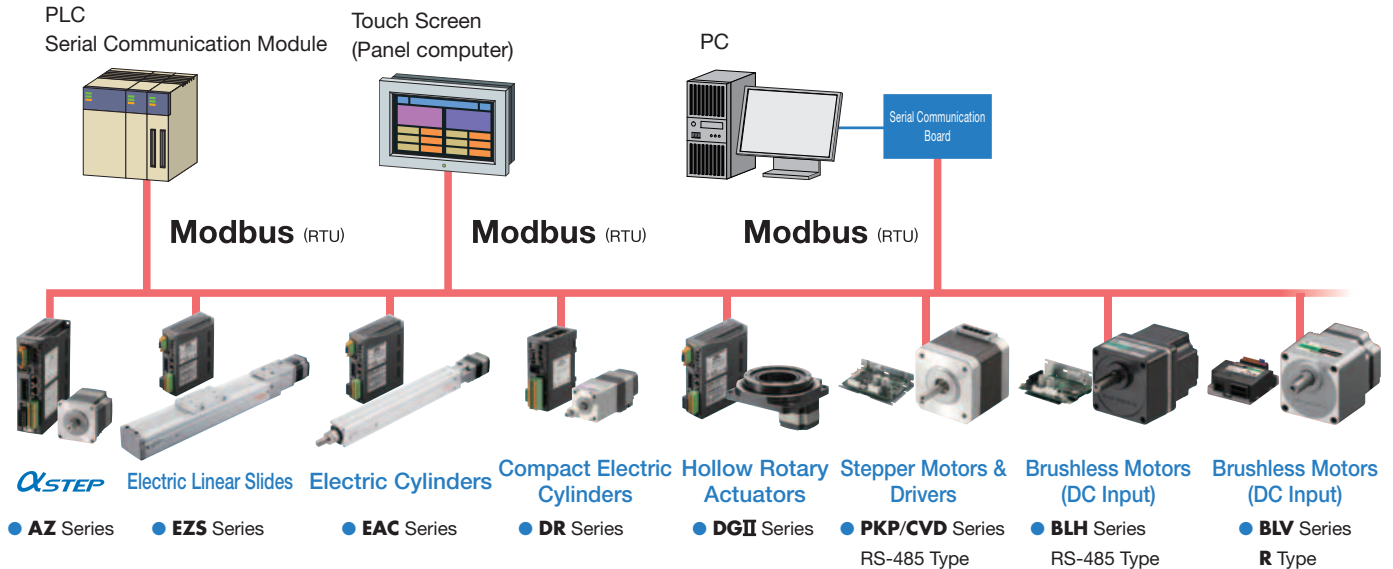
Ethernet/IP™ is a trademark of ODVA, Inc

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

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

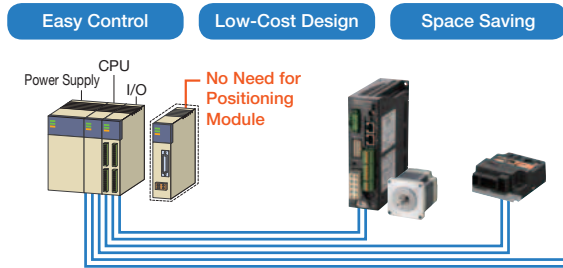
# Modbus (RTU)

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.



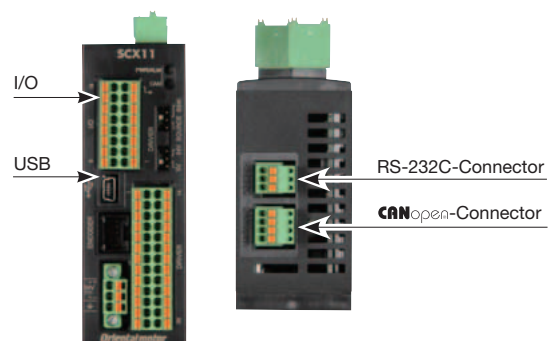
The operating data is set in the driver, and is then selected and executed from the host system.

- Simple Wiring
- No Additional Pulse Module Required
- I/O Control
- Driver / Motor Monitoring
- Daisy Chain up to 16 Drivers
- Use with **MEXE02** 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.

- \*Ether**CAT** 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

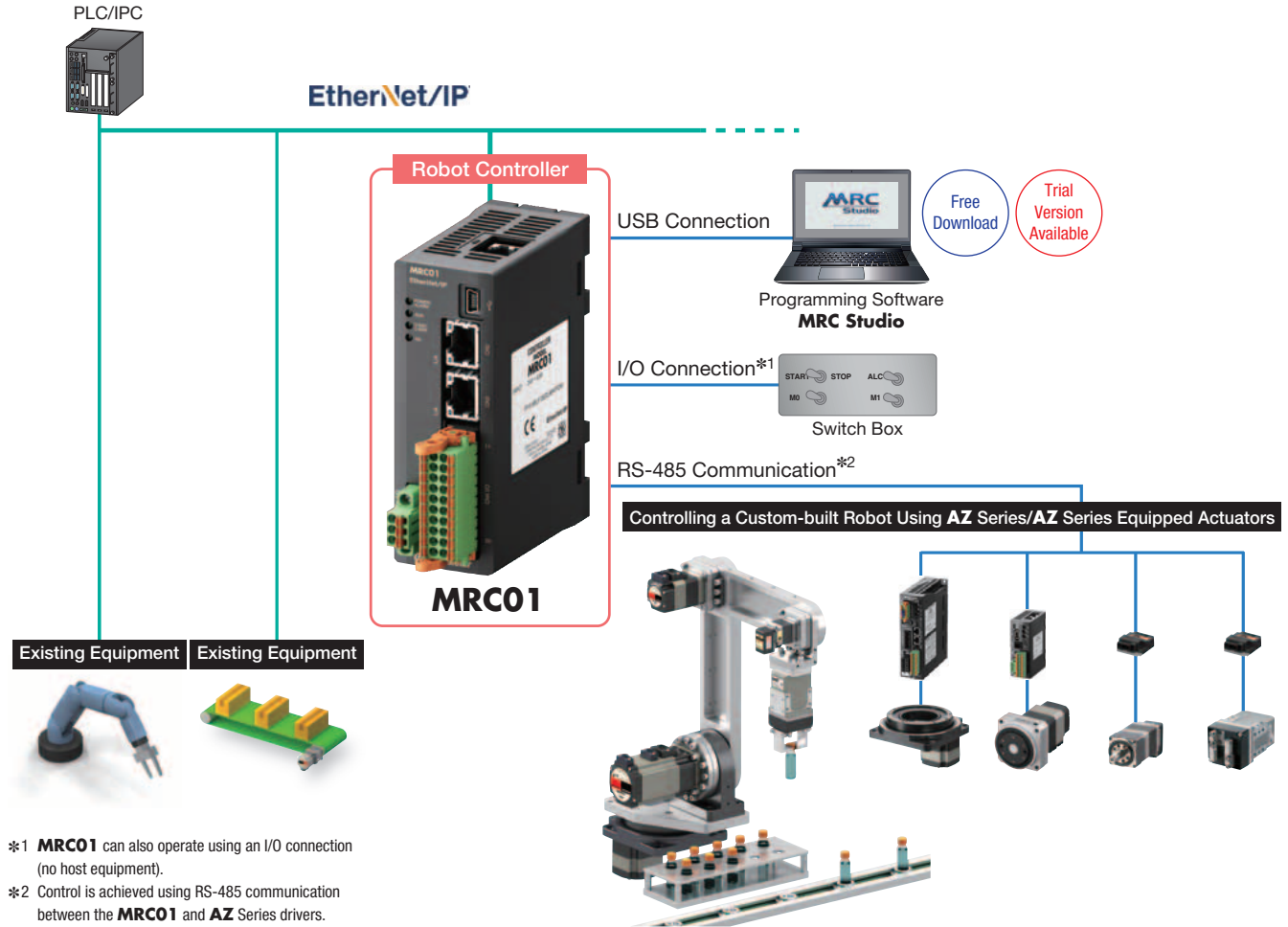


# Robot Controller **MRC01**

The **MRC01** robot controller supports easy programming and control of in-house designed custom built robots. Use the **αSTEP 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.



※1 **MRC01** can also operate using an I/O connection (no host equipment).  
 ※2 Control is achieved using RS-485 communication between the **MRC01** and **AZ** Series drivers.

## ● 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



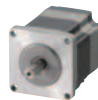
Single-Phase 100-120 VAC, 24/48 VDC  
 Single-Phase/Three-Phase  
 200-240 VAC

#### ● mini Driver RS-485 Communication Type



24/48 VDC

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



Motors



Hollow Rotary Actuators  
**DGII** Series



Compact Linear Actuators  
**DR** Series  
**DRS2** Series



Electric Linear Slides  
**EZS** Series



Electric Cylinders  
**EAC** Series



Lack and Pinion Systems  
**L** Series



Electric Gripper  
**EH** Series

### ● Application Example

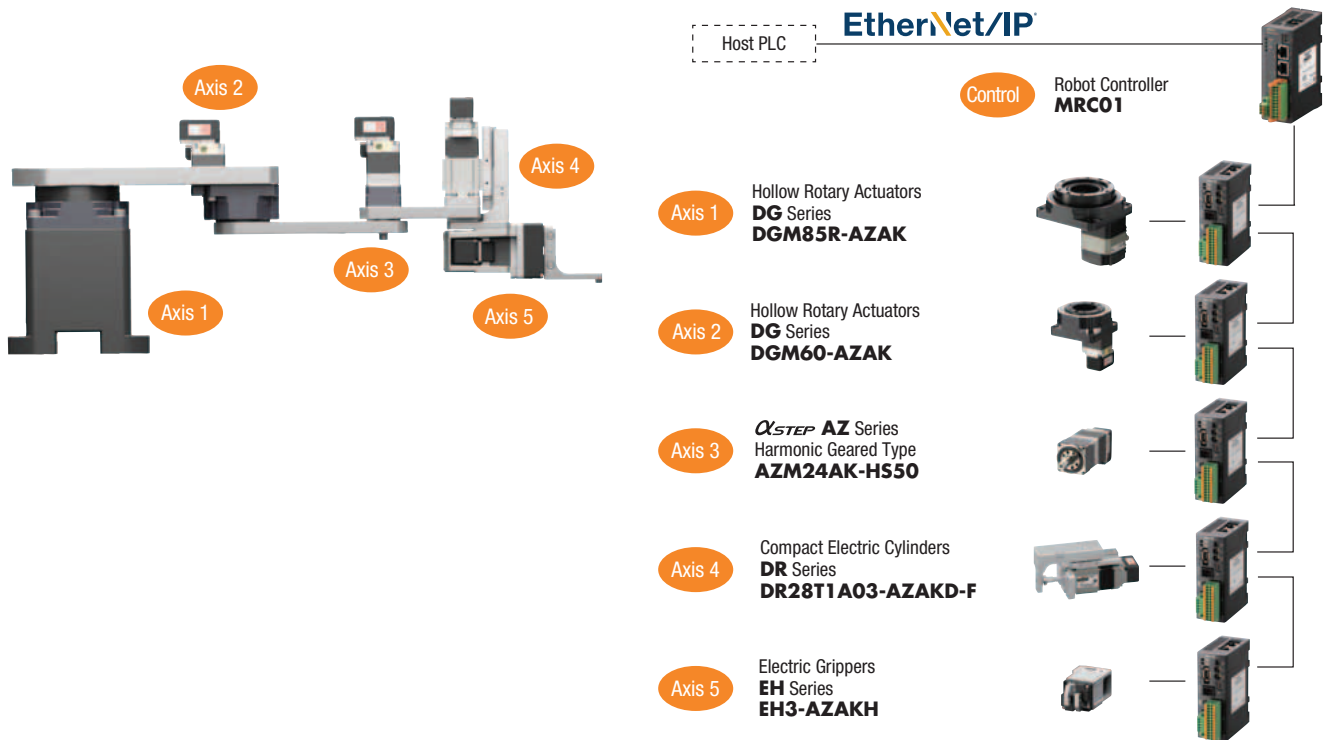
This is an in-house (original) SCARA robot that automates pick-and-place and transport between processes in a limited space. It is used in automated production lines for gluing, measuring, and assembly, which were conventionally done manually.



Number of Axes	5 Axes (3 Links + Lift + Electric Gripper)	
Robot Control	Robot Controller MRC01	
Transportable Mass	0.7 kg	
Maximum Speed	500 mm/s (Maximum Speed at Gripper Base Jaws)	
Maximum Speed of Each Axis	Axis 1	500 mm/s
	Axis 2	500 mm/s
	Axis 3	500 mm/s
	Axis 4	40 mm/s
	Axis 5	156 mm/s (Both Sides)
Device Main Power	100V AC	
Drive/Control Power supply	24V DC	
Mass (SCARA Robot Part)	4 kg	

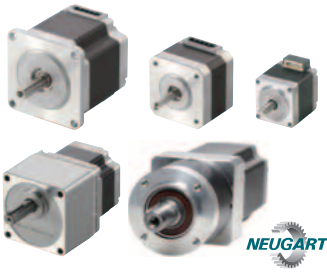
### ● System Configuration

It is controlled by Ethernet/IP. The **MRC01** and **AZ** series drivers are controlled via RS-485 communication.





# Stepper Motors

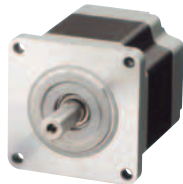
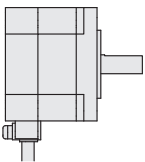


Oriental Motor offers a wide range of high torque stepper motors in frame sizes from 0.79 in. (20 mm) up to 3.54 in. (90 mm). Geared types, encoders, brake options and various motor windings are offered.

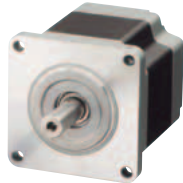
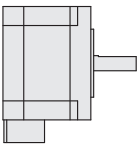
For improved performance, full time microstepping drivers with Smooth Drive are available, reducing noise and vibration and controlling heat output.

## Stepper Motor Types

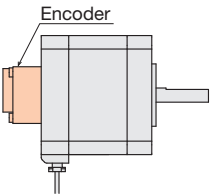
### Standard



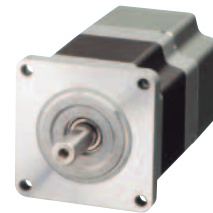
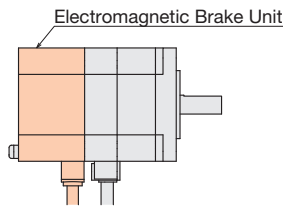
### High-Resolution Type



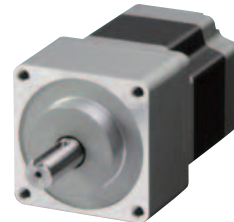
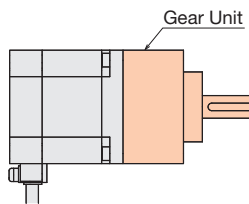
### Encoder Type



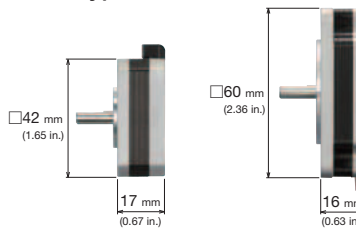
### Electromagnetic Brake Type



### Geared Type

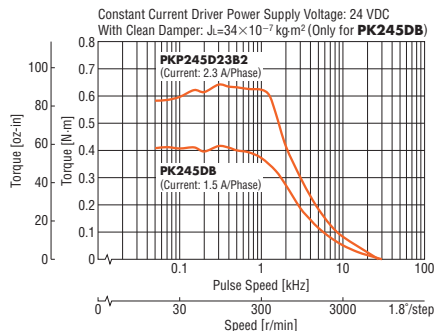


### Flat Type

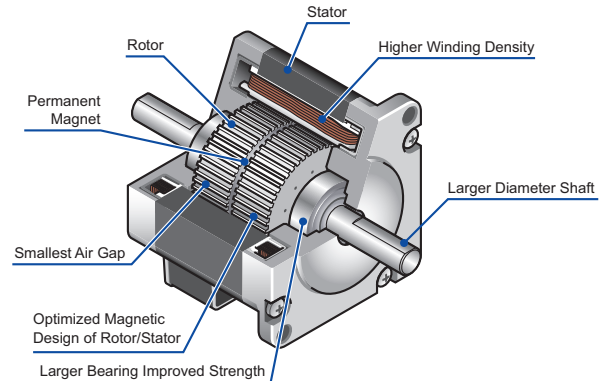


## PKP Stepper Motor Features

### Increased Torque: New PKP to PK



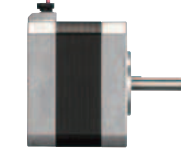
### New Design: Run Cooler or Downsize



# PKP Series



Flat Connector



Cable sold separately

● High Torque, Low Vibration, Ridged Construction, Downsizing

1.8°/0.9°/0.72°/0.36°

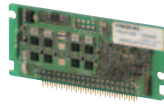
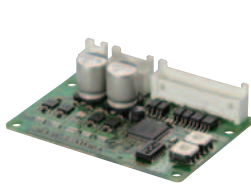
PKP Series



Frame Sizes	0.79 in (20 mm), 1.10 in (28 mm), 1.38 in (35 mm) 1.65 in (42 mm), 2.22/2.36 in (56.4/60 mm), 3.35 / 3.54 in (85 / 90 mm)
Holding Torque	2.8 oz-in~1062 lb-in (0.02~120 N-m)
Resolution (P/R)	2 Phase (1.8°/0.9°)
	5 Phase (0.72°/0.36°)
Options	Flat Motor / Electromagnetic Brake / Encoder (500P/R optical type. 1000P/R magnetic type is coming soon.)
Gear Types	Spur / Spur with Center Shaft / Tapper Hob / Planetary / Harmonic
Starting From (Motor)	\$46.00

\*Varies by items. See the website for the details.

# CVD Driver



Board Mounting Type  
CVD-S type

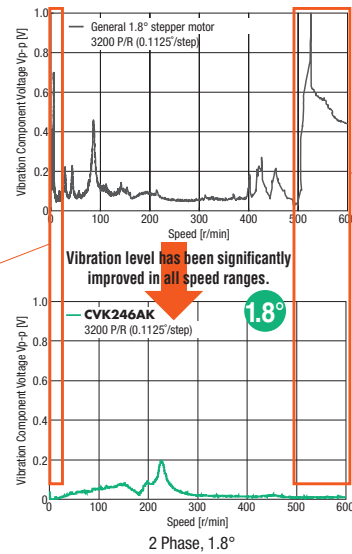
DC Input  
CVD Series



Motor Types (Bi-polar)	2 Phase (1.8°/0.9°) 5 Phase (0.72°/0.36°)
Output Current (Amps)	0.5~4.5*
Smooth Drive	2048 per step
Max Resolution	125,000 steps per rev.
Power Supply	VDC
Input Current (Amps)	24
Starting From (Driver)	0.5~4.8* \$143.00

\*See individual driver for ratings

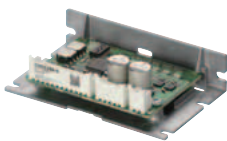
● Low Vibration with Full-Time Microstepping



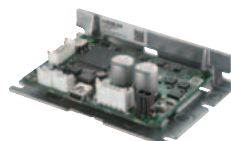
Smooth Drive Control Reduces Step Vibration

Vibration Suppression Control

● Industry's Top, Compact, High Performance Driver



Pulse Input Type



RS-485 Communication Type



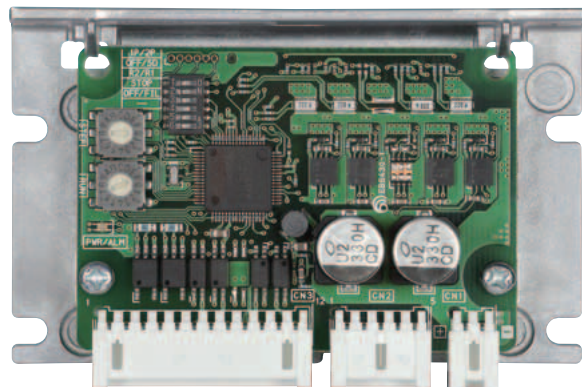
S Type

I/O or SPI Communication Setting

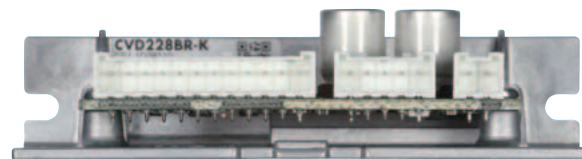


SC Type

Speed Control



52.5 mm  
(2.07 in.)



24.5 mm  
(0.96 in.)

85 mm (3.35 in.)

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

(Differs according to the driver type.)

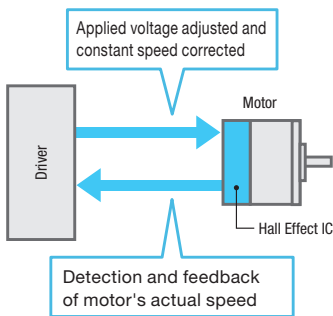
# Brushless Motors



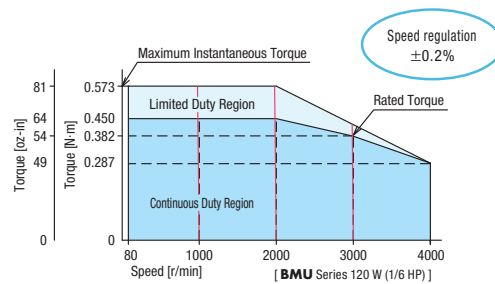
Brushless motors offer excellent energy efficiency and savings equivalent to IE4, excellent speed stability, as well as a wide speed control range. Brushless motors use permanent magnets in the rotor of three-phase motors. With Brushless motors there is no brush and commutator resulting in a maintenance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

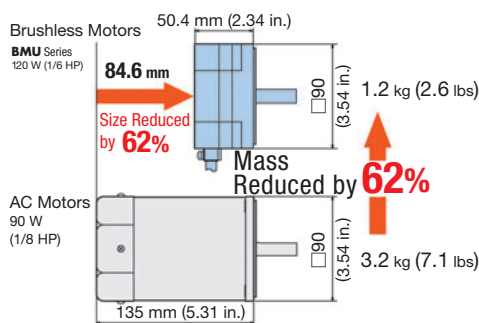
## Control Method



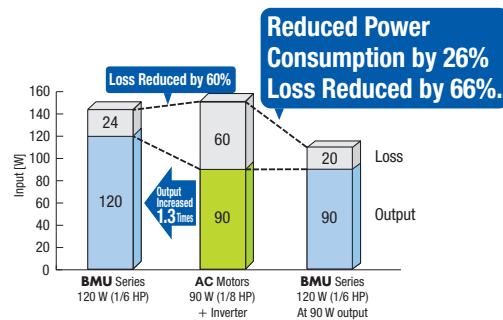
## Wide Speed Range: 80~4000 r/min



## Compact and Lightweight

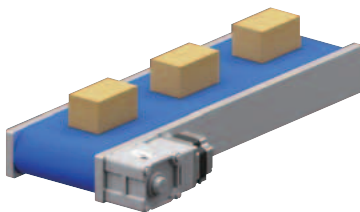


## Energy Savings

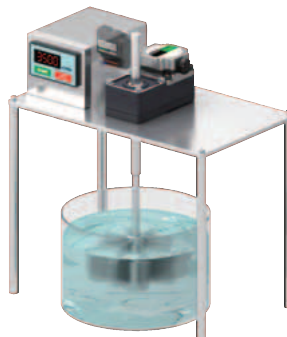


# Application Examples

## Conveyor / Transportation



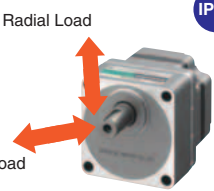
## Agitators/Pumps/Dispensers

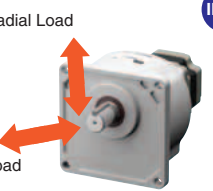


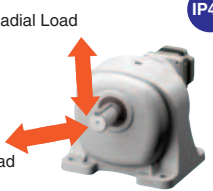
## Torque Limiting

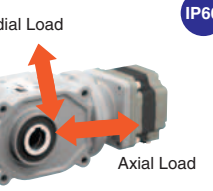


# Geared Options

Parallel Shaft GFV Gear	
	IP66
50:1 Gear Reduction; 3000 RPM at Motor	
Radial (Overhung) Load	<b>280 lb</b>
Axial (Thrust) Load	<b>67 lb</b>
Rated Torque	<b>483 lb-in</b>

Parallel Shaft JV Gear	
	IP66
450:1 Gear Reduction; 3000 RPM at Motor	
Radial (Overhung) Load	<b>1163 lb</b>
Axial (Thrust) Load	<b>154 lb</b>
Rated Torque	<b>3814 lb-in</b>

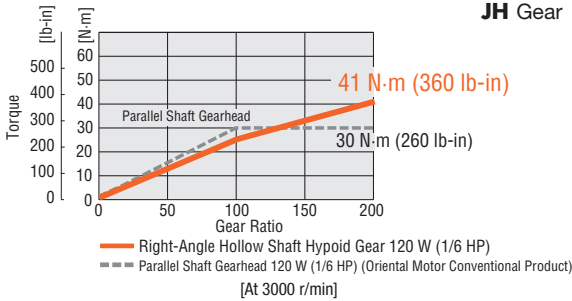
Foot Mounted Parallel Shaft JB Gear	
	IP44
600:1 Gear Reduction; 3000 RPM at Motor	
Radial (Overhung) Load	<b>1331 lb</b>
Axial (Thrust) Load	<b>185 lb</b>
Rated Torque	<b>5159 lb-in</b>

Right Angle Hollow Shaft JH Gear	
	IP66
200:1 Gear Reduction; 3000 RPM at Motor	
Radial (Overhung) Load	<b>772 lb</b>
Axial (Thrust) Load	<b>176 lb</b>
Rated Torque	<b>1575 lb-in</b>

## Hypoid Gear



JH Gear

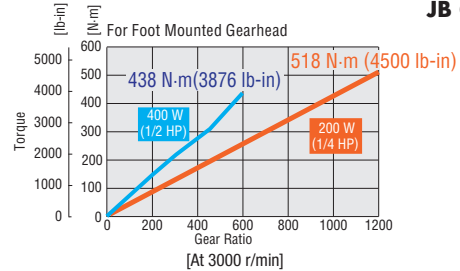


- Hypoid gears allow for high permissible torque without saturation even at higher gear ratios

## Helical Gear



JB Gear

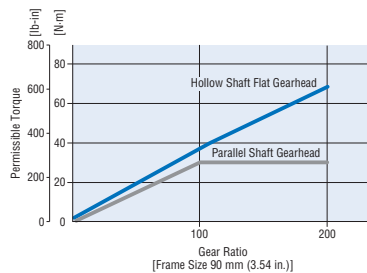


- Helical gears allow for the motor torque to be fully utilized even at the highest gear ratio.

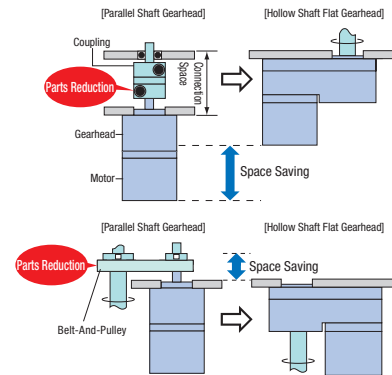
## Hollow Shaft Flat Gear (FR Type)



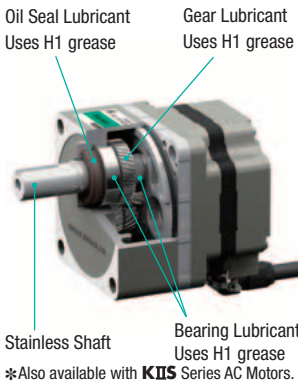
- High Permissible Torque
- Space Saving
- Long Life
- Suitable for AGV Designs



- Space Saving

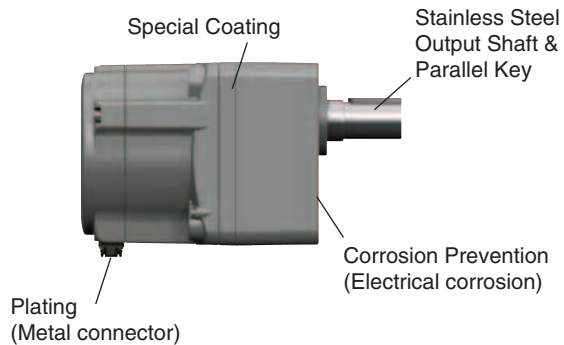


## H1 Food-Grade Grease (IP66)



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."

## Watertight, Dust-Resistant (IP67)





# AC Input Motor / Driver

## BMU Series



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



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



Turn the dial and set to the desired speed.



### 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	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



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



- 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



● The control panel cannot be removed from the driver.

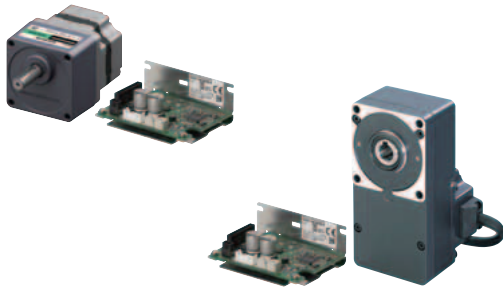


### BLE2 Series

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



**QSTEP**  
Hybrid Control

AZ Series

Actuators

Network

Stepper Motors

Brushless Motors

Standard AC Motors

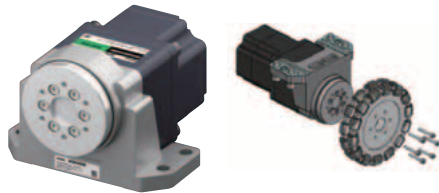
Cooling Fans

Modular Automation

Before Selection / Warranty

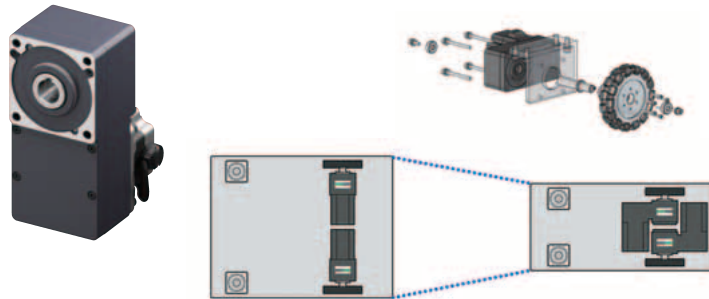
## ● Low-Platform and Thin Design

Face surface mounting with the Flange Drive Adapter



Flange Drive Adapter Sold Separately

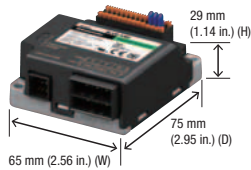
Side-mounting with the Hollow Shaft Flat Gearhead



## ● Compact and Lightweight Driver

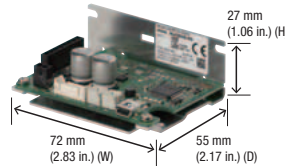
### BLV Series R Type

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)



## ● Setting via Networks

### BLV Series R Type

**CANopen** Modbus(RTU)

### BLH Series

Modbus(RTU)

The **BLH Series** can be controlled by software created in ROS. Visit our website for free software download, [www.orientalmotor.com](http://www.orientalmotor.com)

## ● For Larger Loads Used in Robots and Conveyors

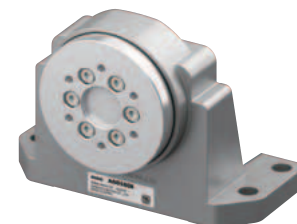
A transport robot's load capacity is affected by its permissible radial load. Using a Flange Drive Adapter or a hollow shaft flat gearhead supports requirements of increasing load size and installation in robots and conveyors.

### Permissible Radial Load

Gear Ratio		[N (lbs)]							
		5	10	15	20	30	50	100	200
When Using a Flange Drive Adapter	100 W (1/8 HP)*1	1500 (337)							
	200 W (1/4 HP), 400 W (1/2 HP)*2	1230 (276)	1680 (377)	2040 (458)					
Hollow Shaft Flat Gearhead	100 W (1/8 HP)	900 (202)	1300 (291)	1500 (337)					
	50 W (1/15 HP), 60 W (1/12 HP)	800 (179)	1200 (269)						
	30 W (1/25 HP)	450 (101)	500 (112)						

\*1: The motor shaft speed is at or below 300 r/min

\*2: The motor shaft speed is 100-3000 r/min



Flange Drive Adapter  
**AGD580B**

# 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

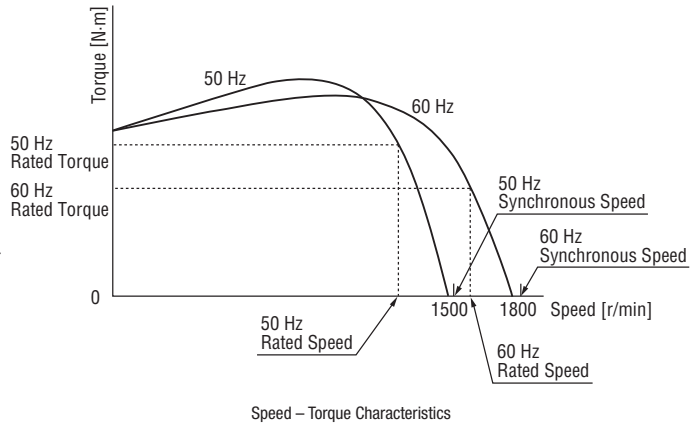
The basic speed (synchronous speed) of a standard AC motor is determined by the power supply frequency and the number of poles. Many of our standard AC motors have four poles, so their synchronous speed is as follows:

- 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



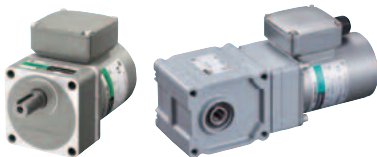
- Standard AC Motors
- Overheat Protection Built-in
- Long Life – 10,000 hrs
- Right Angle Gearheads Available

#### World K Series



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

### KIIS Series



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

#### KIIS Series



Type	Induction	
Output Power	30 W (1/25 HP) ~ 200 W (1/4 HP)	
Frame Size	80 mm (3.15 in.) ~ 110 mm (4.33 in.)	
Options	Terminal Box / Electromagnetic Brake	
Gear Types	Stainless Steel Shafts	
Power Supply	Parallel, Right Angle Hollow or Solid, H1 Food Grade Grease (Parallel Shaft type)	
Power Supply	Three-Phase (VAC)	220-415
	Starting Pricing (Motor + Gear)	\$214.00

Use with Fuji Electric Inverter



- 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

## Brother ie3 MMD Series



Features Electrocoat Paint

- 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



Type	Induction
Output Power	400 W (1/2 HP)~3 HP
Speed Range (r/min)	90~3600 (3~120 Hz)
Options	Terminal Box / Electromagnetic Brake Stainless Steel Shafts
Gear Types	Parallel, Right Angle Hollow or Solid
Starting Pricing (Motor+Gear)	\$626.00

## FPW Series IP67 Rated



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

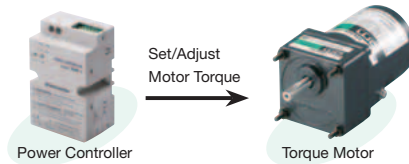
Single-Phase / Three-Phase

### FPW Series



Type	Induction
Output Power	25 W (1/30 HP)~90 W (1/8 HP)
Frame Size	80 mm (3.15 in.)~104 mm (4.09 in.)
Gear Types	Parallel
Single-Phase (VAC)	110-115 / 220-230
Three-Phase (VAC)	220-230
Starting Pricing (Motor+Gear)	\$320.00

## Torque Motors Torque Control



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

Single-Phase

### WK Series



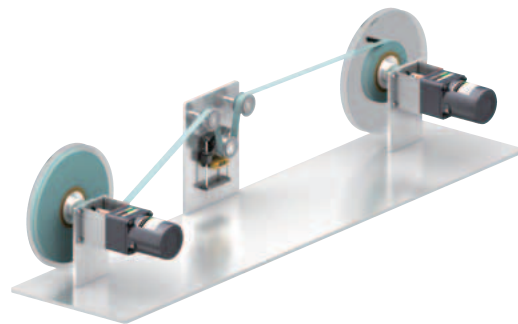
Type	Torque Motor
Output Power	3 W (1/250 HP)~23 W (1/38 HP)
Frame Size	60 mm (2.36 in.)~90 mm (3.54 in.)
Gear Types	Parallel
Single-Phase	110-115 / 220-230
Starting Pricing (Motor+Gear)	\$200.00

# Applications

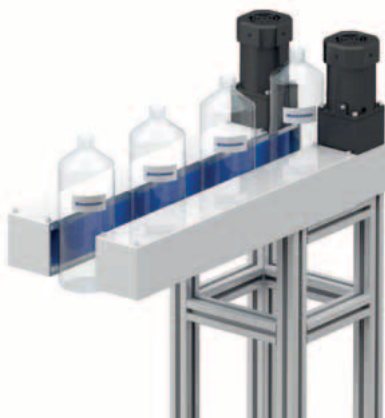
Belt Conveyor



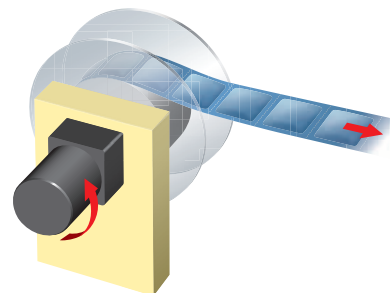
Tension Control



Pinch Conveyor



Packing System





# Cooling Fans

## Fans and Thermal Management

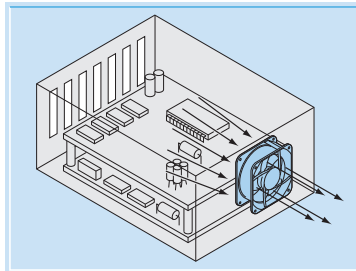
Today's fans are designed to move air allowing for cooling, controlling an area of space or for protecting electronics. Many of our fans come with alarm features designed for warning or for preventative maintenance. Oriental Motor helps make selecting the appropriate type of fan for today's applications simple.

### Axial Flow Fans

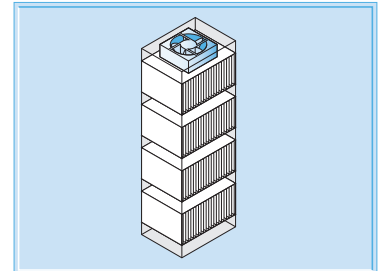
●AC or DC Input



Device Ventilation and Cooling



Cooling Densely Mounted Devices

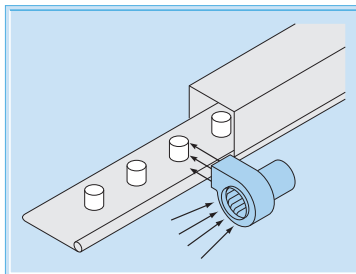


### Centrifugal Blowers

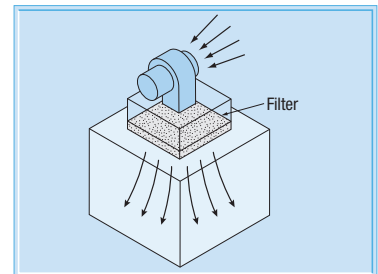
●AC or DC Input



Air-Blow Cooling or Drying



Cooling with High Static Pressure

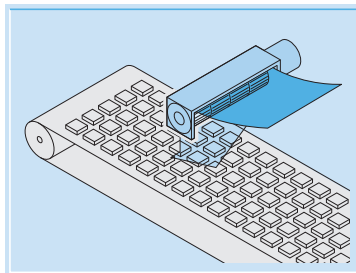


### Cross Flow Fans

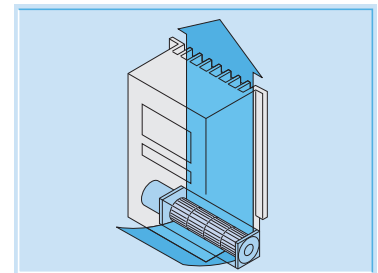
●AC or DC Input



Uniform Cooling or Drying



Cooling for Long or Thin Spaces



### Thermostat

●Centigrade (°C)



Automatically turning it ON/Off with a Set Timer

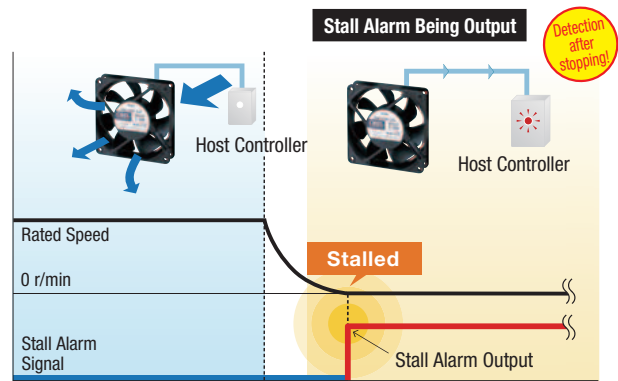


# Alarm Types

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

## ● Locked Rotor Alarm

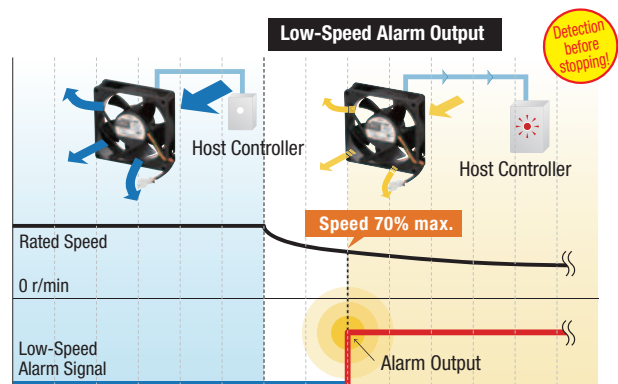
The fan will emit an alarm when the fan rotation has stopped. This will alert you to interruptions immediately, so that action / replacement can be made.



## ● 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.

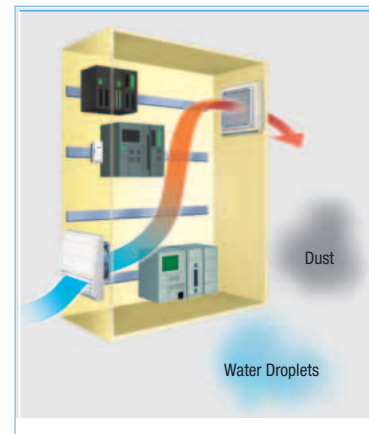
If multiple fans are running, it will also allow for replacement of only the fans experiencing a reduced cooling capacity.



# Enclosure Types



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



# Accessories



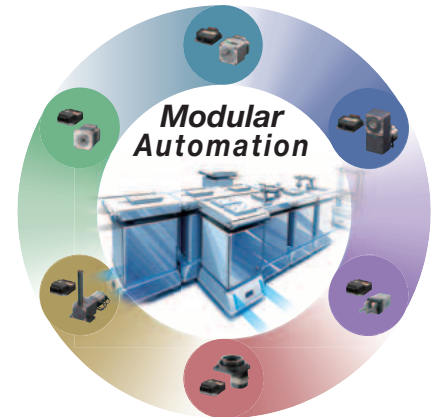
- Finger Guards
- Filters
- Screens
- Plug Cords

# 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.



The concept of flexible automation equipment and lines



- 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

Elements necessary to achieve



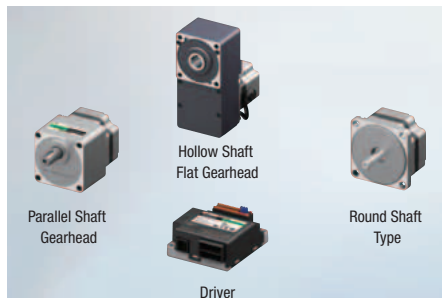
"Battery drive & DC input" and "Light & compact"

### Consider modular automation-compatible products

## Modular Automation-Compatible Product Line

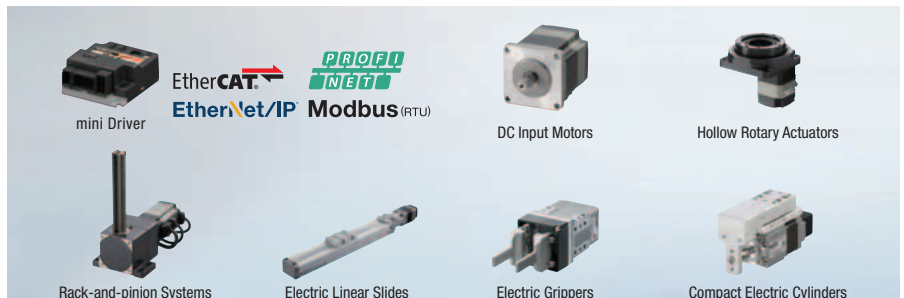
["Modular Automation Compatible Products"](#) are a group of products based on the shared concept of battery operation, compact size and lightweight. Ideal for installation in self-propelled equipment and mobile facilities, they contribute to the creation of flexible automation lines and modular automation, 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.

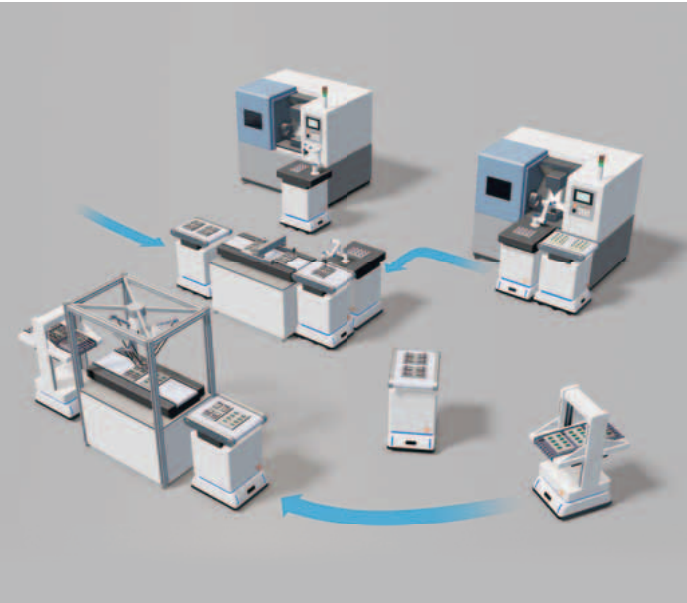
### αSTEP AZ Series mini Driver & Motors/Actuators



- 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



**Articulated Arm Type Transportation Robot**

Vertical Articulated Robot **A B**

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**

Lifting Equipment **C**


Rack-and-Pinion System **L** Series

Conveyor **D**

Transportation Robot (Wheel-Driven) **E**

**BLV** Series **R** Type

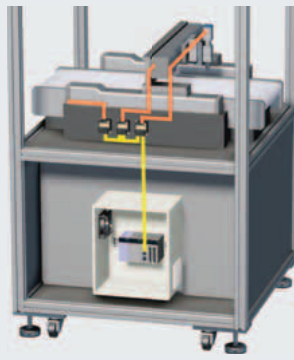
### Flexible Modular Line That Can Be Reconfigured to Match the Product



**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



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 ●**αSTEP** and **ABZO Sensor** are registered trademarks or trademarks of Oriental Motor Co. in Japan and other countries.



# Environmental Efforts

## Oriental Motor's Carbon Neutral Initiative

Oriental Motor supports our customers' MOTION with consideration for the environment.

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.

- Reduced waste through products with longer lives
- Reduced waste by making the products more compact
- Easy-to-recycle products

- 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

- Decreased energy consumption during product use (development of energy-efficient 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

### 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

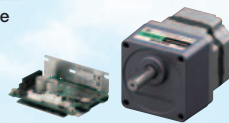
Oriental Motor uses green procurement standards that take into consideration the global electrical and electronic industry standard IEC 62474 and customer requirements to curb the chemical substances in products.  
\*IEC 62474: Material declaration for products of and for the electrotechnical industry

#### Brushless Motors

Simple operation  
**BMU Series**  
AC Input

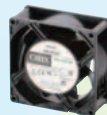


Small board type  
**BLH Series**  
DC Input



#### Brushless Motors Fans

**EMU Series**  
AC Input



#### High Torque Stepper Motors

**PKP Series**  
DC Input



#### (a) Green Procurement

Products, parts, materials, packaging, etc. with a low environmental impact are given priority in procurement. The basic requirements are established as "Green Procurement Standards", which are promoted during business transactions.  
● For details, refer to "Green Procurement" on the Oriental Motor website.

#### (b) Measures and Responses to Chemical Substances in Products

- RoHS Directive Compliance Initiatives for the EU
- REACH Regulation Compliance
- Initiatives Concerning the Measures for Administration of the Pollution Control of Electronic Information Products Act (People's Republic of China)
- Other Regulations Concerning Handling of Chemical Substances in Products
- Global Regulations & Standards/Management of Chemical Substances in Products

[WEB](#)

### Environmental Policy

Oriental Motor's Basic Environmental Philosophy and Environmental Policy

● ISO 9001 and ISO 14001 [WEB](#)

# 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.

## Lead Time

Oriental Motor's lead time is characterized by best in class, with many of our catalog products available to ship in 3 to 9 business days (for orders placed before 12pm PST). Your order is shipped using only reputable carriers or any carrier of your choice to ensure on-time and damage free-delivery. Our manufacturing processes support our fast delivery and short lead time to allow us to support your needs. Our Just-In-Time production 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 thousand.

In addition, Oriental Motor will quote “Available to Ship” shipping dates for guaranteed quantities on our website for most products. For larger quantities please contact your local sales office.

### 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.

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