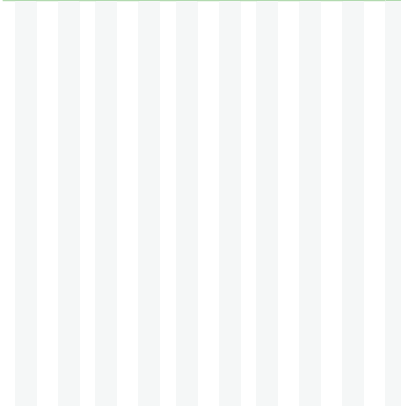
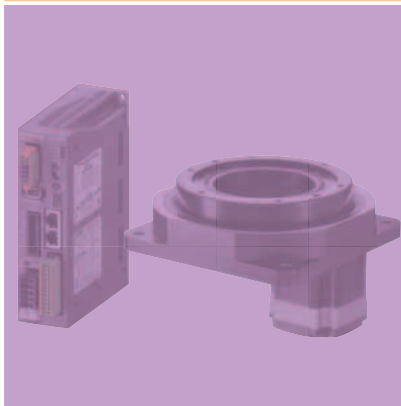
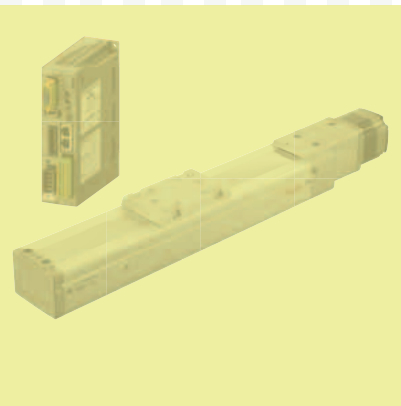
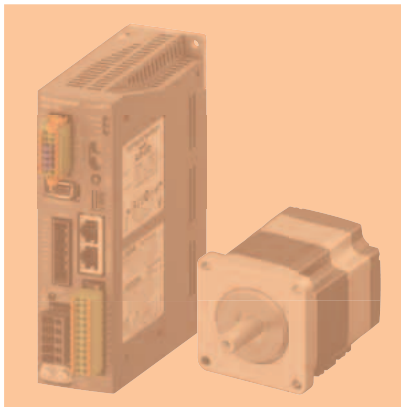


# 2026

## Product Guide



***Orientalmotor***

AVAILABLE WORLDWIDE,  
STARTING FROM A SINGLE UNIT.

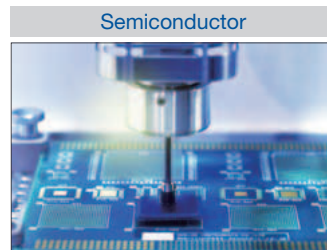


# GLOBAL SALES NETWORK

*14 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. Our corporate philosophy is built on over 100 years of history. We continually evolve to meet our customers' needs—whatever they are.



# Oriental Motor Products

## $\alpha$ STEP Hybrid Step-Servo System

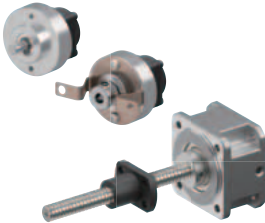


- Mechanical Absolute Encoder Stepper Motors
- Closed Loop
- Positioning, Speed, Torque Control
- Electromagnetic Brake Types
- Geared Types



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

## Linear Attachments / Encoders



- Compact, High-Resolution Incremental Encoders
- Mounting Adapter for Linear Actuators Compatible with **AZ** Series or **PKP** Series Motors

## Network – Drivers and Controllers



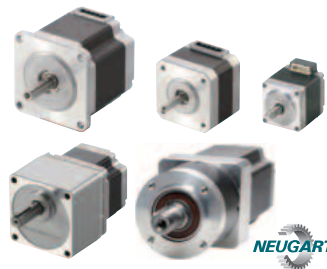
- EtherNet/IP
- EtherCAT
- PROFINET
- Modbus (RTU)
- Modbus (TCP, UDP)
- Single and Multi-Axis Controllers

## Industrial Robots and Controllers



- Easy Programming and Control of In-house Designed Robots
- Compatible with  $\alpha$ STEP **AZ** Series Family of Products
- EtherNet/IP
- SCARA/Articulated/Cartesian Robots

## Stepper Motors



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

## 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)~200 W (1/4 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

# Oriental Motor Corporate Overview

---



Company	ORIENTAL MOTOR CO., LTD.
Founded	1885
Incorporated	1950
Representative	President Eiji Kawahito
Capital	4.1 billion yen
Sales	Consolidated 64.3 billion yen (At the end of March 2025)
Number of Employees	Consolidated 3,021 (At the end of March 2025)
Business Activities	Development, manufacture and sale of small precision motors and electronic circuits for motion control
Headquarters	4-8-1, Higashiueno, Taito-ku, Tokyo, 110-8536, Japan
.....	
Plants	Tsuruoka-Chuo Plant 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)

## Oriental Motor Supports Global Manufacturing

---

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 lines. 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.



### Reliable Lead Times Through a Stable Global Supply Chain

---

Customers can place orders anytime, from anywhere, and in any quantity—from a single unit to large-volume needs. With stable production, dependable quality control, and a well-coordinated global logistics network, each order is prepared and shipped as scheduled. This strong foundation supports consistent lead times and a reliable supply chain, helping customers keep their operations moving smoothly and with confidence.

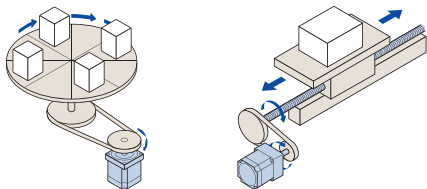


# Oriental Motor Service and Support

Products and technology are only valuable when coupled with skilled people and services to support them. ORIENTAL MOTOR U.S.A. CORP. has dedicated over 45 years to establishing a service and support system to better serve customers. It is our goal to provide the best product and service from the design phase, through the sale and beyond.

## Before and After Sales Service

### Motor Sizing & Selection



Utilize our [Free Online Sizing Tools](#) for help finding the proper specifications for your application. Application Engineers and Technical Support Staff are also available to assist you in properly sizing and selecting your motor based on your individual application. Simply call **1-800-468-3982**.

### Customer Service & Technical Support



Available from 8:30 EST to 5:00 PST, one phone call provides access to the experts on our products. Call toll free **1-800-468-3982** to speak with an Oriental Motor associate. Spanish support is available. For online inquiries, technical searches, and on demand technical videos use our website.

## Contact Us

● Estimates ● Product Inquiries ● Orders ● General Information

### By Live Chat



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

“Technical Support Assistance” pop up  
Available - Monday to Friday,  
8:30am EST to 5:00pm PST

### By Email



[sales@orientalmotor.com](mailto:sales@orientalmotor.com)

Technical Support  
Customer Service / Sales

### By Phone



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

**Toll-free** Customer Support Center  
**Technical Support: 1-800-468-3982**  
**Robot Support: 1-800-443-0775**  
**Sales Support: 1-800-448-6935**

### Oriental Motor Offers:

Fast Delivery

No Minimum Order  
Required

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**

# $\alpha$ STEP Hybrid Step-Servo System

Position, Speed and Torque Control

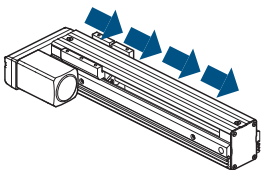
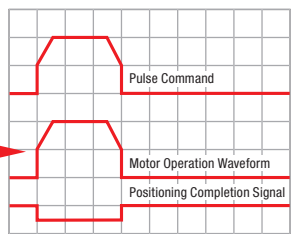
## What is $\alpha$ STEP Hybrid Step-Servo?

$\alpha$ STEP hybrid step-servo 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.

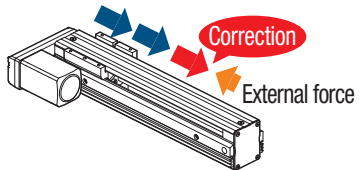
- The tuning-free feature allows for high accuracy and high responsiveness to commands
- Hunting-free (Complete stop)
- Constant monitoring of the motor’s status

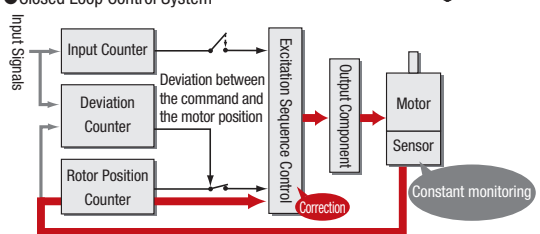
### Overload Condition (Positioning deviation is $\pm 1.8^\circ$ min.)

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

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



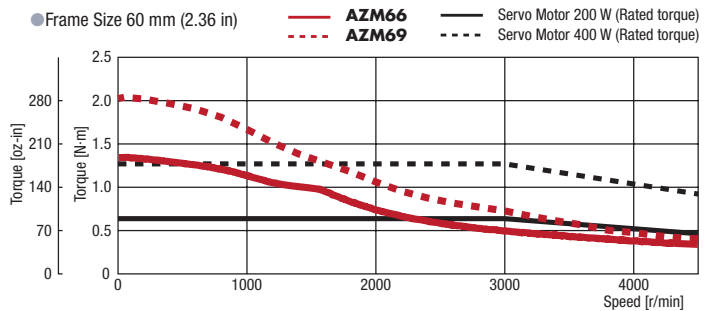
● Closed Loop Control System



## Performance

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

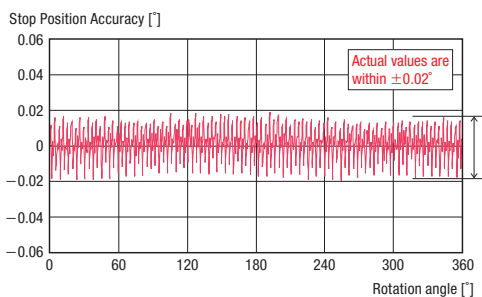


● Data for the speed–torque characteristics is based on Oriental Motor’s internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

## Stopping Accuracy

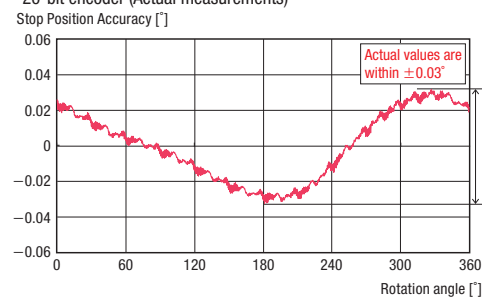
The stopping accuracy of a typical  $\alpha$ STEP hybrid step-servo is  $\pm 0.05^\circ$  (under no load), which is equivalent to that of servo motors. These graphs show the actual measured stopping accuracies when an  $\alpha$ STEP hybrid step-servo and an AC servo motor were rotated once.

● Stopping accuracy of  $\alpha$ STEP hybrid step-servo (Actual measurements)



[Example] When the ball screw lead is 10 mm, the  $\alpha$ STEP step-servo 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

# Advantages of the AZ Series

The AZ Series QSTEP hybrid step-servo system features absolute sensing using a multiple-rotation mechanical sensor. The system continuously 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 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.

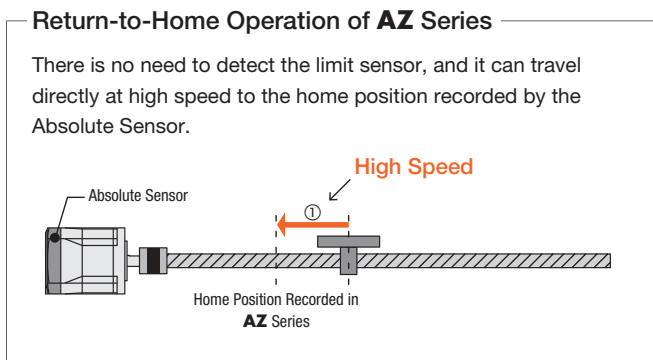
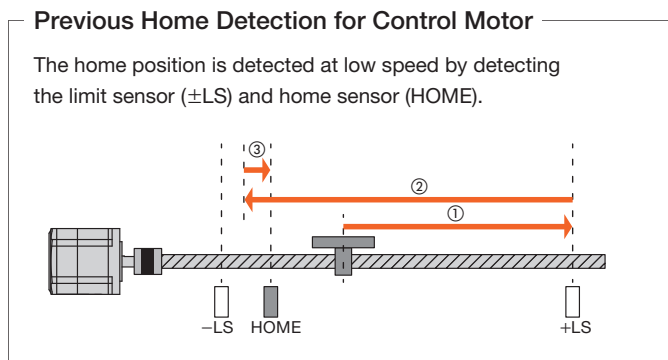


## No External Sensors Required

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.

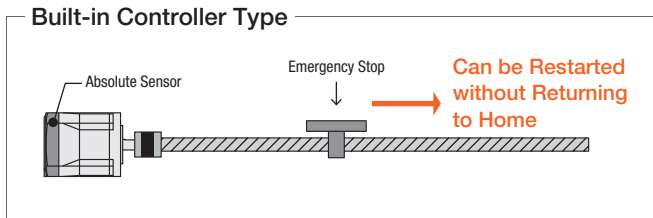
### Shortened Reset Time ① High Speed Return-to-Home

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.

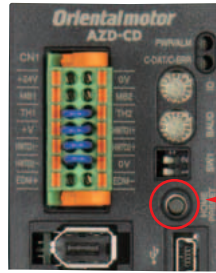


### Shortened Reset Time ② Return-to-Home is not Necessary

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.



● **AZ Series Driver Types**



HOME PRESET Switch

**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
- Certified STO function



EtherNet/IP

EtherCAT

PROFINET

Modbus (RTU)

SSCNET III/H  
SERVO SYSTEM CONTROLLER NETWORK

MECHATROLINK

Modbus (TCP, UDP)

● **Motor / Geared Types**



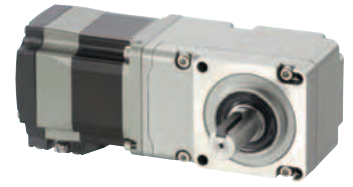
Standard



Spur



Harmonic (no backlash)



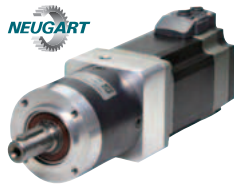
Right Angle (face gear)



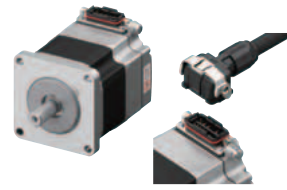
Planetary



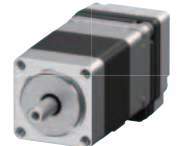
Harmonic Planetary (attach load)



Planetary (high torque)



Connector Type



Hollow Shaft Type

● **Actuator Types**



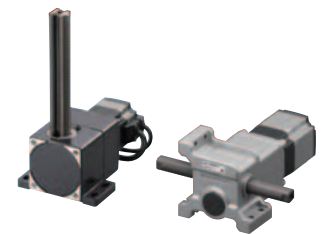
Linear Slides



Linear Cylinders



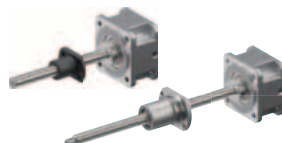
Hollow Rotary Actuators



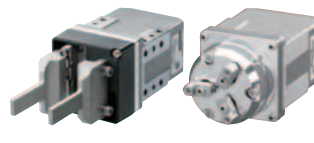
Rack & Pinion



Compact Electric Cylinder

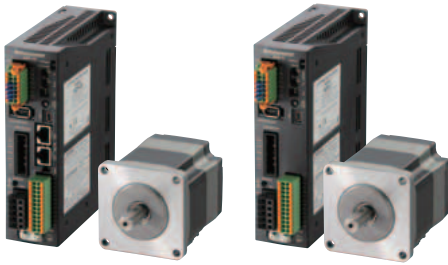


Linear Actuator Attachments for Stepper Motors



Gripper

● AC Input – Single Axis



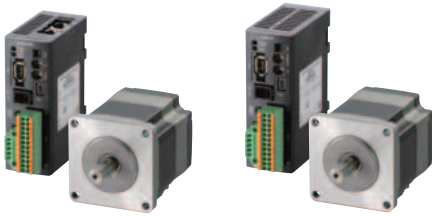
AC Input

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)	100~10,000	
Options	Electromagnetic Brake	
Gear Types	Spur / 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	
Safety Function	STO (Safe Torque Off)	

● DC Input – Single Axis



DC Input

AZ Series

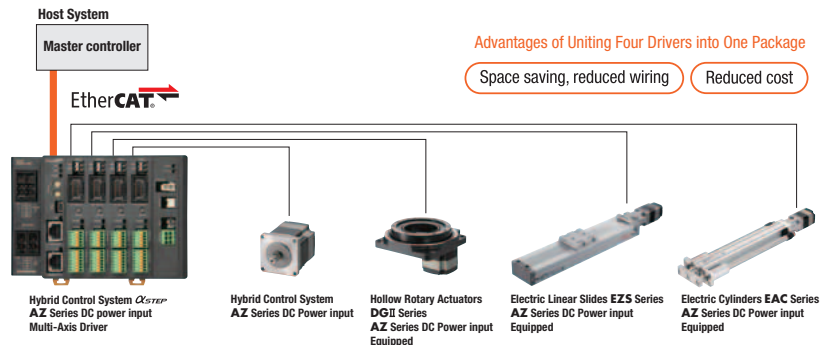
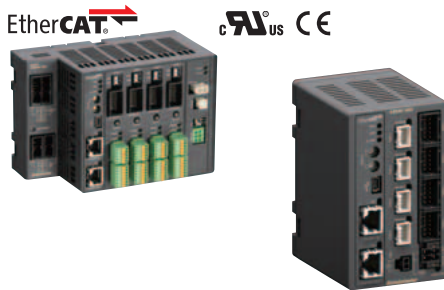


Frame Sizes	0.79 in (20 mm), 1.10 in (28 mm), 1.38 in. (35 mm), 1.65 in (42 mm), 2.36 in (60 mm)	
Holding Torque	2.8 oz-in~354 lb-in (0.02~40 N-m)	
Resolution (P/R)	100~10,000	
Options	Electromagnetic Brake	
Gear Types	Spur / Planetary / Right Angle / Harmonic	
Driver Types	Pulse / RS-485 / EtherNet/IP / EtherCAT / Profinet	
Power Supply	VDC	24/48
Safety Function	STO (Safe Torque Off)	

\*Does not apply to RS-485 and pulse input types

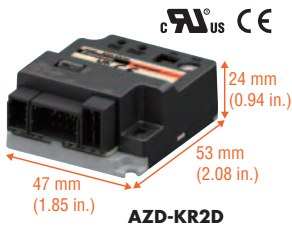
Multi - Axis (DC Input)

2, 3 or 4 axis type



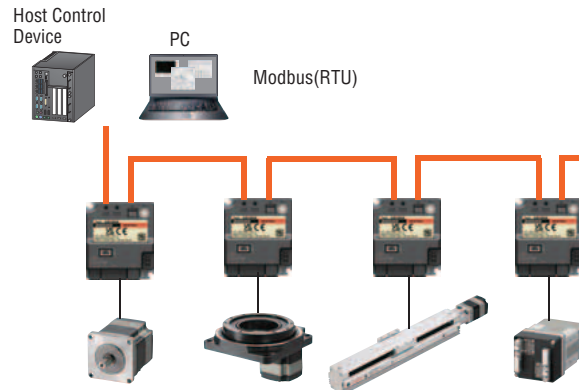
● The connected motors and linear & rotary actuators are representative examples.

mini Driver



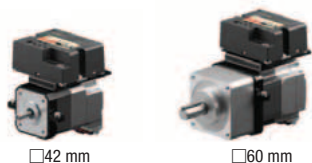
EtherCAT  
EtherNet/IP  
PROFINET  
Modbus (RTU)  
Modbus (TCP, UDP)

FA Network Compatible



Mounting Brackets

● This allows AZ mini drivers to be mounted on the side of an AZ motor connector type.

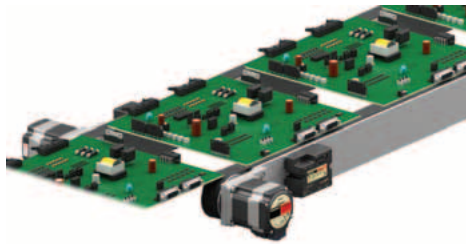


\*By using AZD-KR2D in combination with a network converter (gateway), control by CC-Link, MECHATROLINK or EtherCAT can be supported.

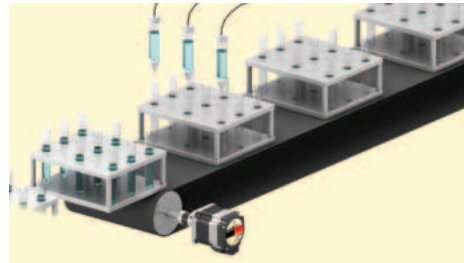
**QSTEP**  
 Hybrid Step-Servo  
**AZ Series**  
 Actuators  
 Linear Attachments / Encoders  
 Network  
 Industrial Robots & Controllers  
 Stepper Motors  
 Brushless Motors  
 Standard AC Motors  
 Cooling Fans  
 Before Selection / Warranty

# Application Examples

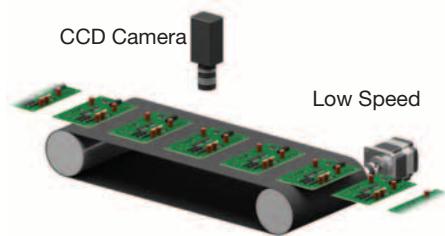
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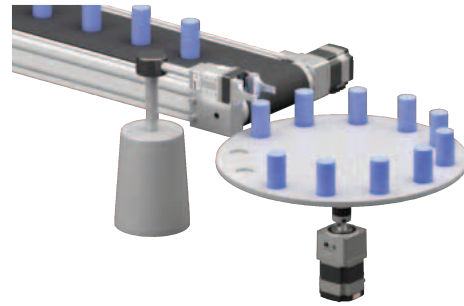
Complete synchronization with commands



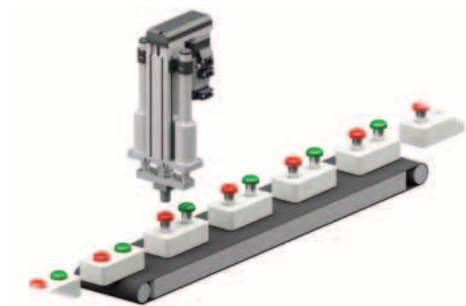
Frequent repetitive starting and stopping



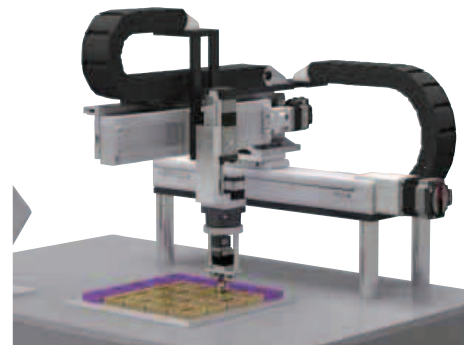
Low-vibration operation



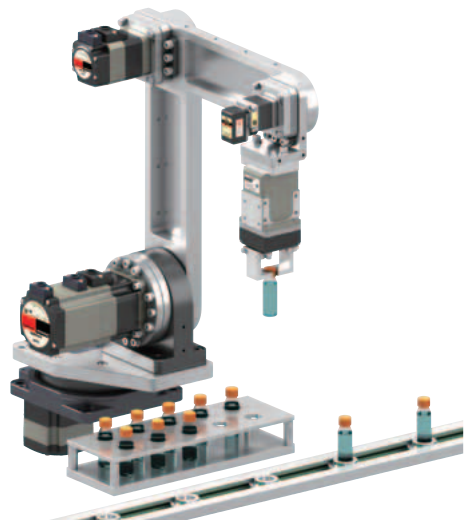
Transfer of large inertial load



Push-motion operation



X-Y-Z gantry system



Arm robot  
Refer to Robot Controller **MRC01** on Page 22.



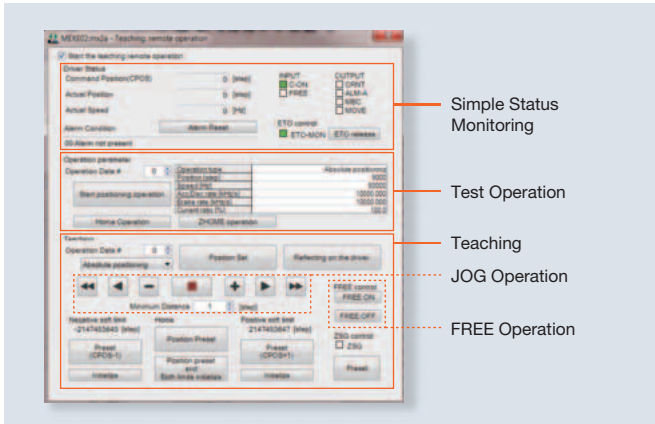
Parallel link robot

# 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 for the **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.

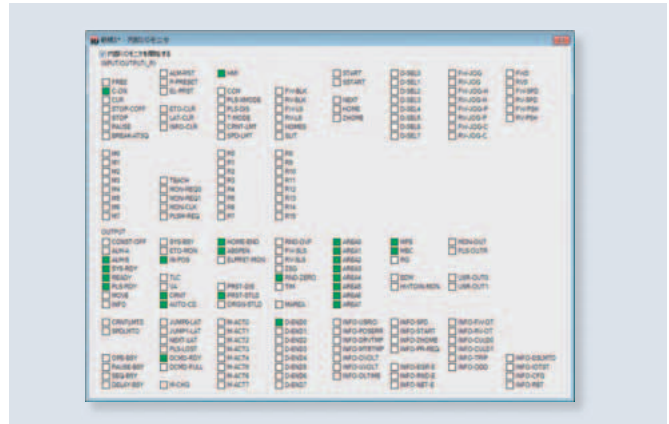
## Teaching and Remote Operations At startup

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.



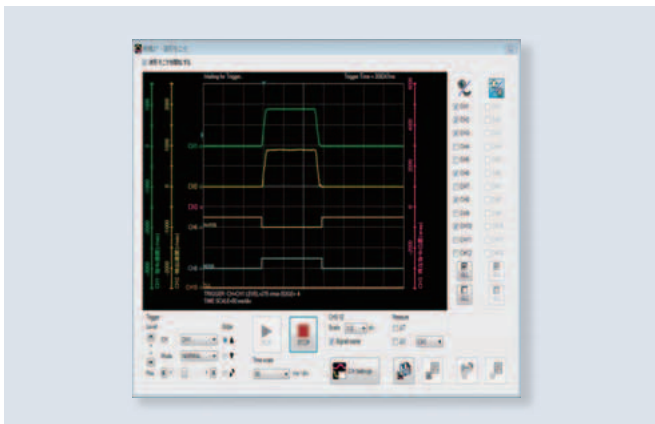
## I/O Testing At startup While running

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.



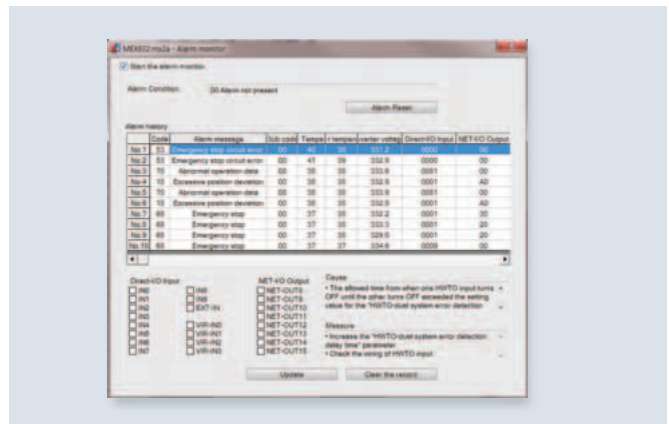
## Waveform Monitoring At startup

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



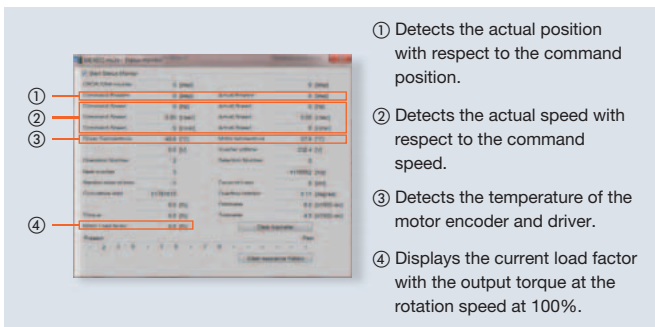
## Alarm Monitoring At startup

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.



- ① Detects the actual position with respect to the command position.
- ② Detects the actual speed with respect to the command speed.
- ③ Detects the temperature of the motor encoder and driver.
- ④ Displays the current load factor with the output torque at the rotation speed at 100%.

## 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.

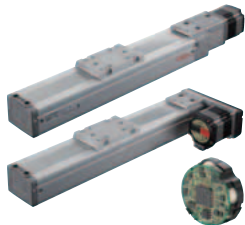


# Linear & Rotary Actuators

## $\alpha$ STEP Hybrid Step-Servo System

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

### ● Electric Slide



### ● Electric Cylinder



Robot controller available for gantry applications.



Refer to page 22.

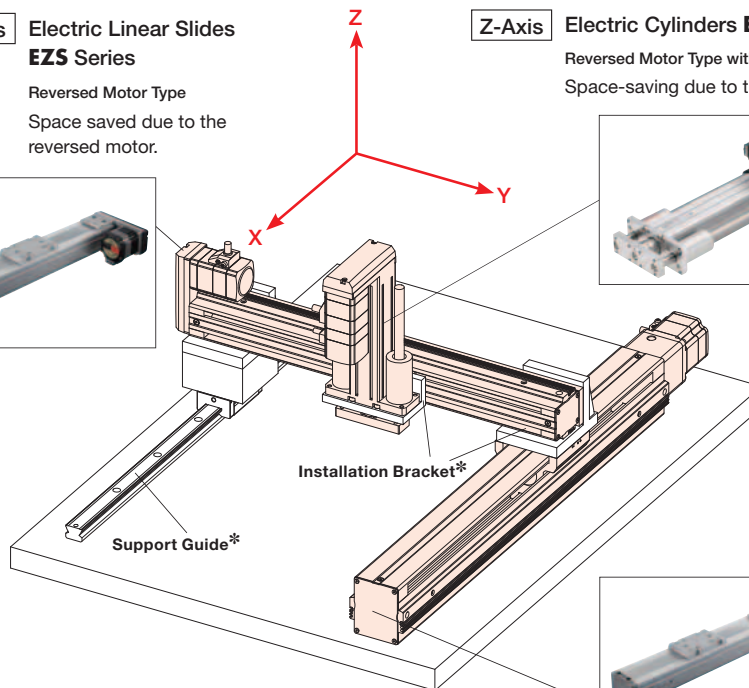
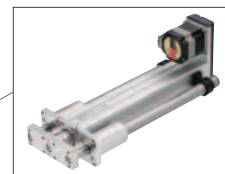
### Y-Axis Electric Linear Slides **EZS** Series

Reversed Motor Type  
Space saved due to the reversed motor.



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

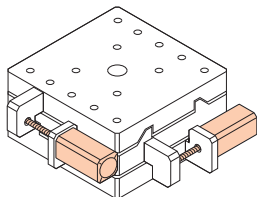
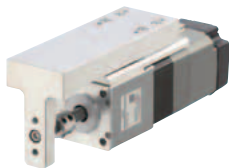
Reversed Motor Type with Shaft Guide Cover  
Space-saving due to the reversed motor.



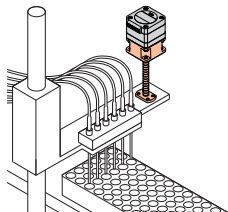
\*Support guide and installation brackets supplied by the customer.

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

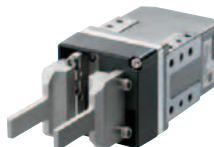
### ● Compact Electric Cylinder



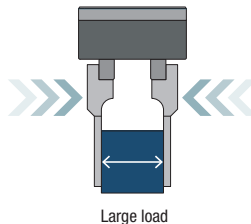
### ● Linear Attachment



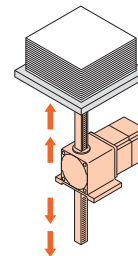
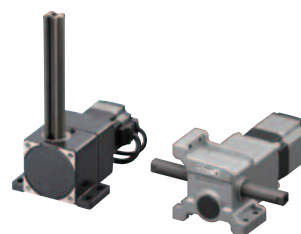
### ● Gripper



\*Gripper Arms not included



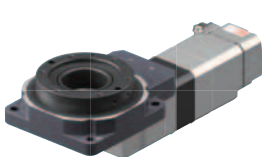
### ● Rack & Pinion



### ● Hollow Electric Rotary Actuator



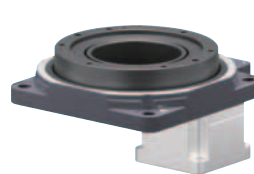
Vertical Motor Mount



Horizontal Motor Mount



Horizontal Motor Mount (Pedestal)



Motorless Type

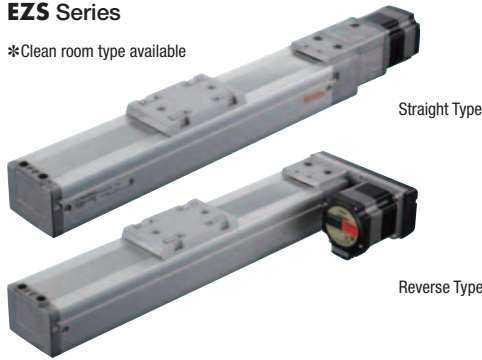


Large-Diameter Hollow Output Table  
Makes Simple Wiring and Piping Possible

# Linear Motion / Transport

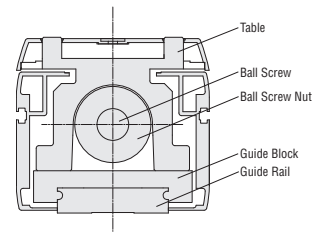
## EZS Series

\*Clean room type available



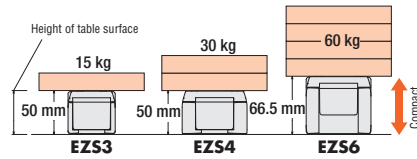
### High Rigidity / High Accuracy Guide

\*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	
VDC	24/48	
Power Supply	Single-Phase (VAC)	100-120 / 200-240
	Three-Phase (VAC)	200-240

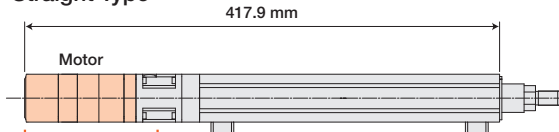
# Push / Pull

## EAC Series

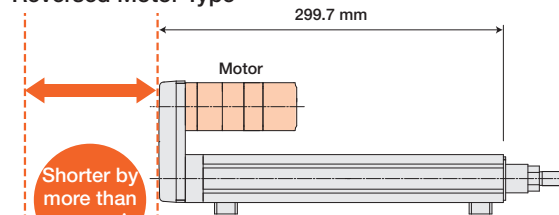


### High Strength, Space Savings

#### Straight Type

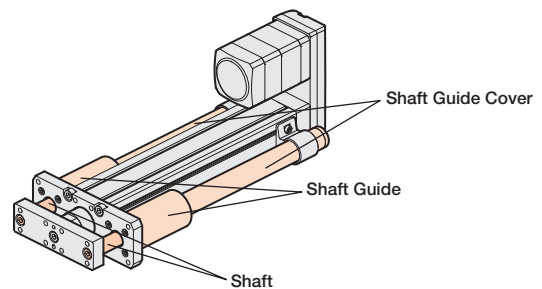


#### Reversed Motor Type



\*When electromagnetic brake is installed

### With or Without Guide Cover



Reversed Motor Type with Shaft Guide Cover

### EAC Series: with AZ Series



Max. Speed (mm/s)	600	
Max. Transportable Mass - Vertical (kg)	30	
Max. Transportable Mass - Horizontal (kg)	60	
Repetitive Positioning Accuracy (mm)	±0.02	
Stroke Length (mm)	50 - 300	
Max. Thrust Force (N)	400	
Max. Push Force (N)	500	
VDC	24/48	
Power Supply	Single-Phase (VAC)	100-120 / 200-240
	Three-Phase (VAC)	200-240

# Push / Pull / Transport

## DR/DRS Series



- Micromovement and High Positioning Accuracy
- Compact, Space Saving



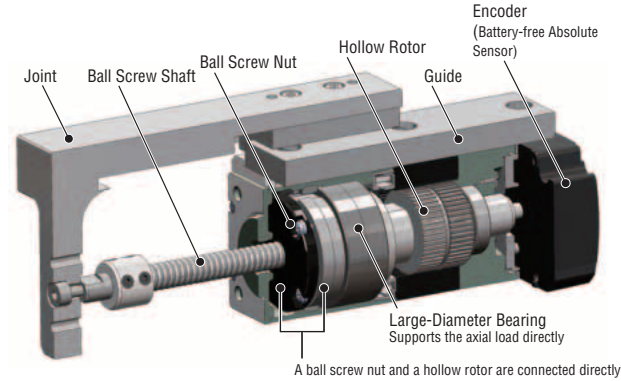
Table Type



Rod Type

### DR/DRS 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 / Ball Screw Cover / Installation Plate	
Power Supply	VDC	24/48

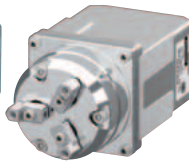


# Gripping

## EH Series

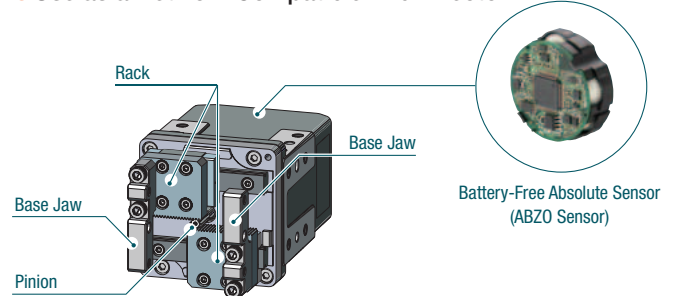


2 Finger Type



3 Finger Type

- Delicate, Human-Like Grip
- Use as a Network Compatible End Effector



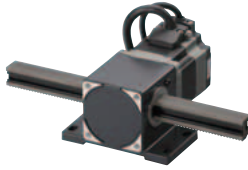
## EH Series

	2-Finger Electric Gripper	3-Finger Electric Gripper
Maximum Grip Force (N)	25	50
Repetitive Positioning Accuracy (mm) each side	±0.02	-
Backlash (mm)	0.1~0.2 (each side)	-
Stroke (mm)	15 (7.5 each side)~25 (12.5 each side)	-
Maximum Speed (mm/s)	156 (78 each side)	1200
Push Speed	20 (10 each side) mm/s	12 r/min
Minimum Travel Amount (mm)	0.02 (0.01 each side)	-
Permissible Load (N)	2~5	15 (Axial Load) 23 (Radial Load)
Static Permissible Moment (N-m)	<b>EH3-MP:0.7 MY:0.2 MR: 0.2</b> <b>EH4-MP:1.2 MY:0.12 MR: 0.4</b>	-
Power Supply	VDC	24/48

Type	2-Finger	3-Finger
Load Shape	Square 	Cylinders, Complex Shapes, Spheres 

# Linear Motion / High Power

## L Series

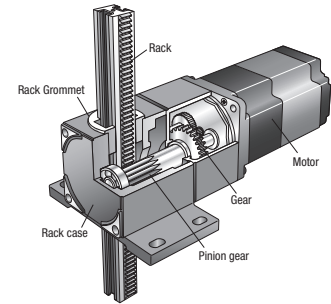


### L Series: with AZ Series

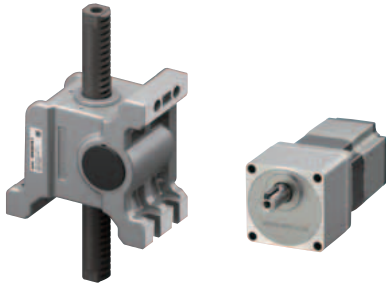
Frame Size (mm)	60/80	
Max. Speed (mm/s)	High-Speed Type	500
	Large Transportable Mass Type	90
Max. Transportable Mass (kg)	High-Speed Type	20
	Large Transportable Mass Type	100
Max. Thrust Force (N)	High-Speed Type	220
	Large Transportable Mass Type	1008
Stroke Length (mm)	100~1000	
Type	Horizontal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



● Compact and High Strength



## LJ Series



LJ Linear Head

αSTEP AZ Series

### 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 TS Geared Type	
Power Supply	Single-Phase (VAC)	100-120
	Three-Phase (VAC)	200-240



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

# Rotate

## DGII Series



Horizontal Mount Type



Vertical Mount Type



Motorless Type

### DGII Series 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°	
	VDC	24/48
Power Supply	Single-Phase (VAC)	100-120 / 200-240
	Three-Phase (VAC)	200-240

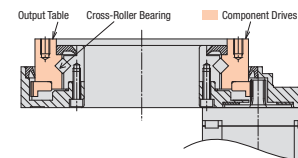
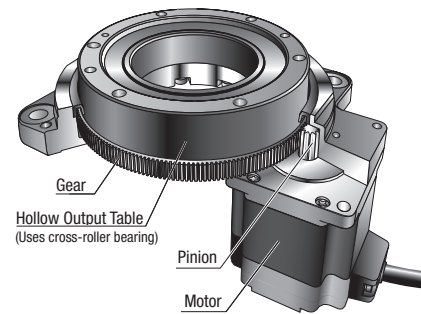


● High Positioning Accuracy, Non-Backlash

● Can be Linked to Cobots



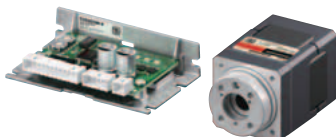
● Large-Diameter, Hollow Output Table



\*The motorless type gearhead structure remains the same as the **DGII** Series and is designed for use with servo motors from various manufacturers, connected via the actuator's coupling.

## DH Series

\*Requires a **CVD** 5-Phase Stepper Motor Driver



This actuator is a 5-phase stepper motor with a hollow flange. The hollow rotor simplifies piping and wiring at the end of equipment.

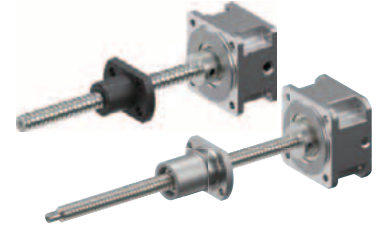
# Stepper Motor Linear Attachments

Stepper motor linear attachments achieve linear motion when assembled with a stepper motor.

- Available in lead screw type and rolled ball screw type (**AZ** Series only).
- Frame Size: 30/42mm, Stroke: 50-300mm\*1
- Compatible motors: **PKP** Series and **AZ** Series motors with 28/42mm frame size
- Maximum thrust: 160N\*2

\*1 For the sliding screw type. 100mm for the rolled ball screw type.

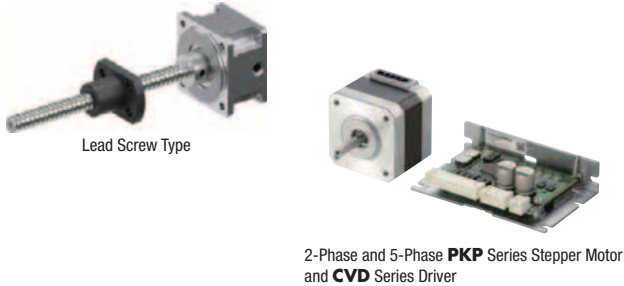
\*2 For the rolled ball screw type. 100N for the sliding screw type.



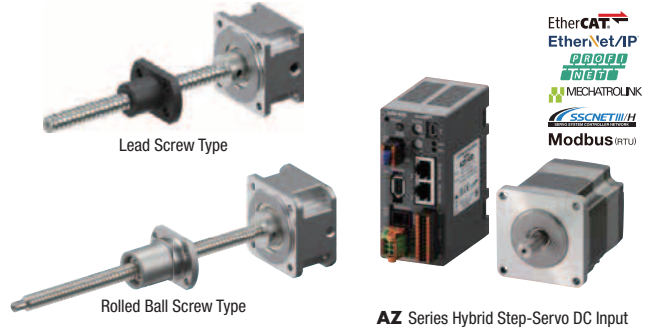
## Compatible Combinations

Motors equipped with additional functions such as an encoder or electromagnetic brake, or battery-less absolute sensors, can be combined with drivers that provide low vibration and noise drive and are compatible with FA networks.

### Combined Stepper Motor and Driver



### Combined with $\alpha$ STEP Hybrid Step-Servo



## Applications

Space is saved by reducing components, such as the coupling that connects the motor and screw.

When the lead screw type is used vertically, the self-locking function enables the load to be held without the need for an electromagnetic brake, even when the power is off.

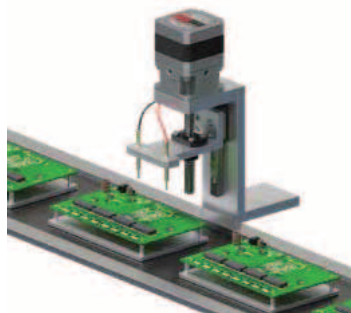
Lifting Axis for Component Supply



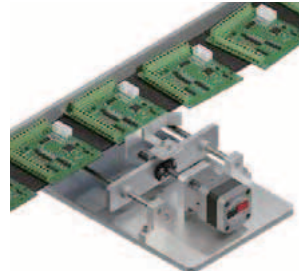
Test Tube Transport



Electrical Conduction Inspection of Boards



Centering of Board Transport








# Rotary Encoders

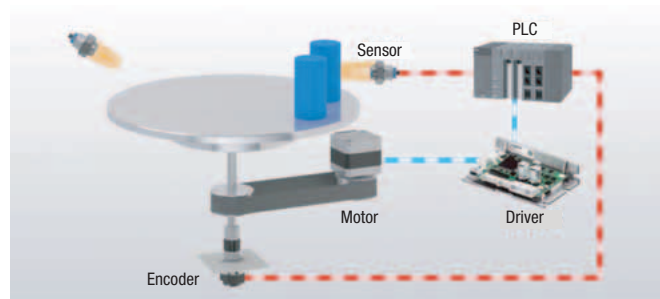
The Rotary Encoder is small, thin, and lightweight magnetic incremental encoder that can be installed in tight spaces.

- Outer diameter  $\phi 30$  mm or  $\phi 40$  mm
- Incremental type
- Hollow shaft or round shaft type
- 100~4000 P/R
- Voltage, line driver, or open collector output
- IP20 or IP65 types

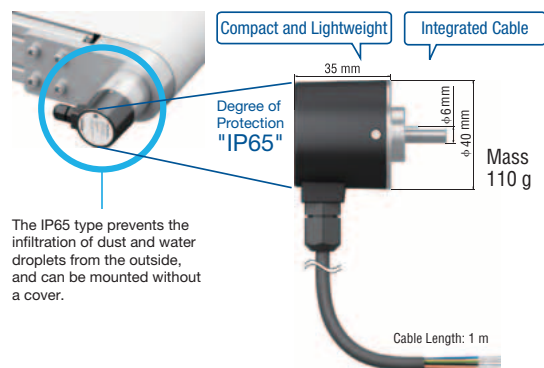


Installation Size (mm)	Degree of Protection	Shaft Shape	Output Circuit Type		
			Voltage Output (Power supply voltage 5 VDC)	Line Driver Output (Power supply voltage 5 VDC)	Open-collector Output (Power supply voltage 5 to 24 V DC)
$\phi 30$	IP20	Round Shaft 	●	●	●
		Hollow Shaft 	●	●	●
$\phi 40$	IP20	Round Shaft 	●	●	●
		Hollow Shaft 	●	●	●
	IP65	Round Shaft 	—	<b>NEW</b>	<b>NEW</b>

- The Actual Position, Speed, and Rotation Direction of the Mechanism Can Be Detected

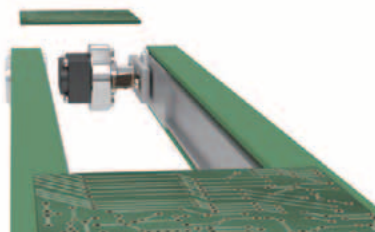


- Dustproof and Water-Resistant IP65 Type

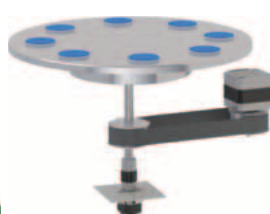


## Applications

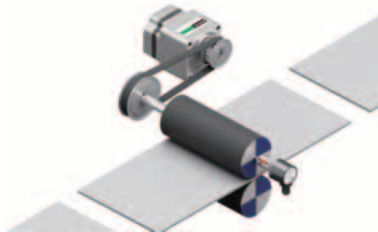
Conveyor



Index Table



Roll Feed



Winding



# Network - Drivers and Controllers

## Overview

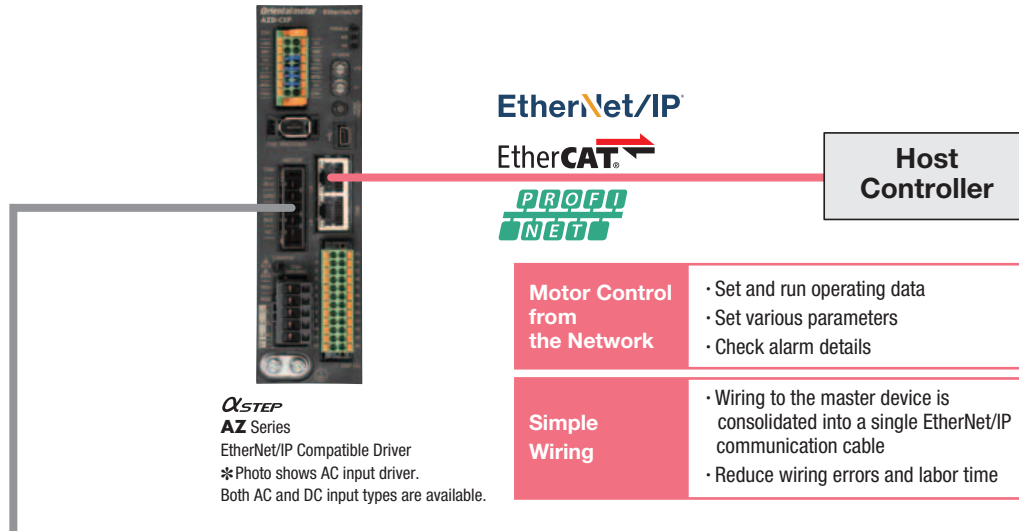
Motor control via network communication can detect the status of the motor directly by data. This results in a shorter development period, increased reliability and maintainability of the equipment.

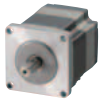







By expanding the network supported product line, Oriental Motor meets diversifying network environments of factory automation (FA).



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

\*Different part numbers required



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

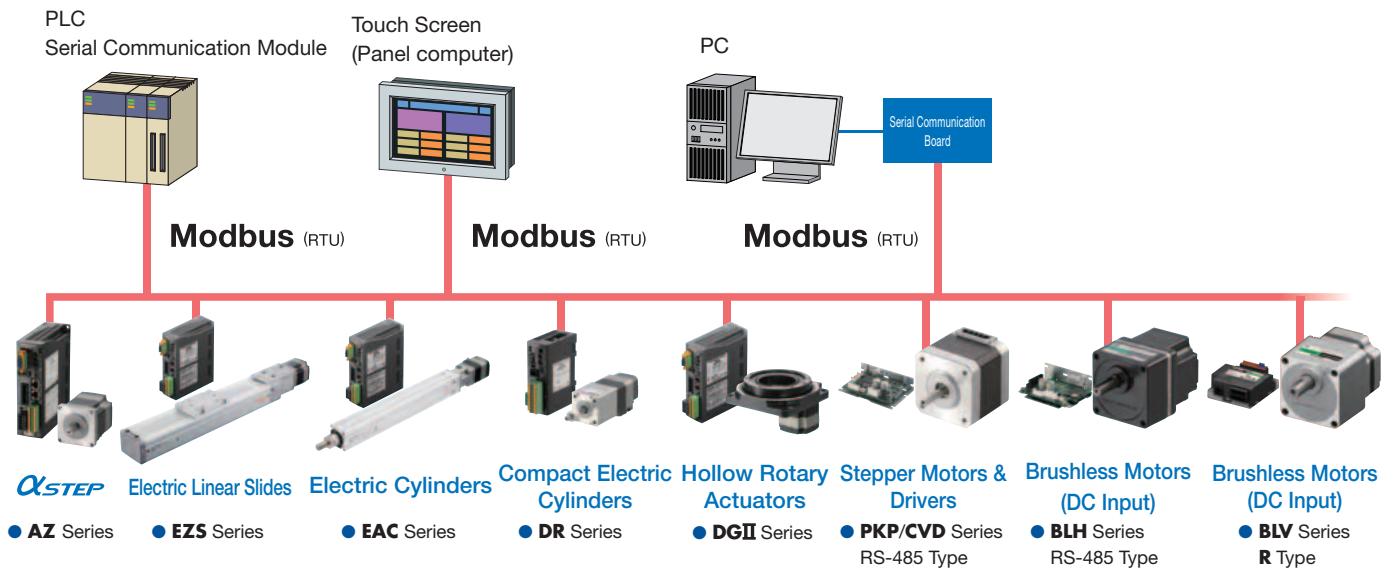
EtherNet/IP™ is a trademark of ODVA, Inc

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)

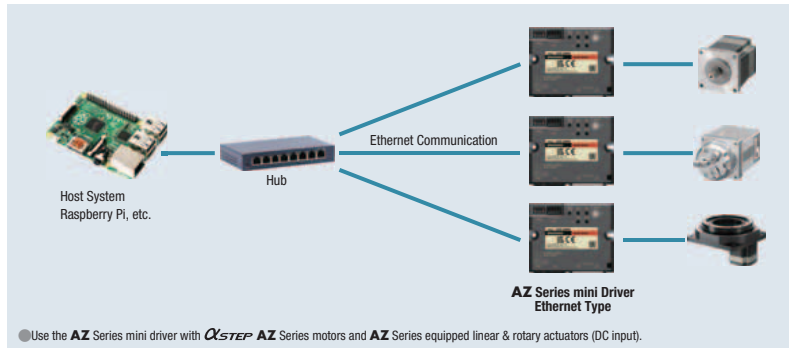
Oriental Motor offers Modbus (RTU) communication in our **AZ**, **PKP/CVD** RS-485 Type, **BLV R** Type and linear based products.  
 \*Modbus is a registered trademark of Schneider Automation Inc.



# Modbus (TCP, UDP)



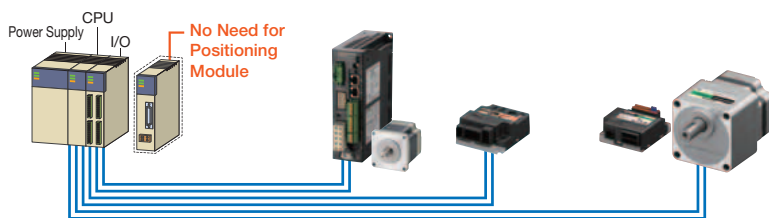
**Modbus (TCP, UDP)**  
**AZ Series mini Driver**  
 Ethernet Type



# 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.

- Easy Control
- Low-Cost Design
- Space Saving



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

# Gateways

Oriental Motor offers additional Gateway Network Converters.  
 \*EtherCAT is a registered trademark licensed by Beckhoff Automation GmbH, Germany



# Industrial Robots



The **OVR** Series is a small robot with a simple mechanism that can be easily controlled and constructed cost-effectively. We offer a range of compact shapes and operating mechanisms for modifying existing lines.

The **OVR** Series offers SCARA, Articulated, and Cartesian / Gantry robots that are equipped with our  **$\alpha$ STEP** hybrid step-servo motors. Motors and arms can be replaced, reducing maintenance costs.

Robot controllers can easily control the **OVR** small robots and multi-axis equipment configured with the  **$\alpha$ STEP AZ** Series. Complex motion sequences for a variety of robots can be programmed with the complimentary **MRC Studio** software.

## OVR Small Robots

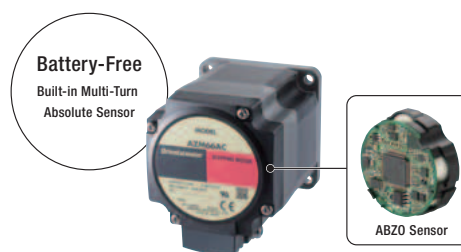
### ● Compact and Lightweight Design

The installation area is 130 mm × 130 mm. The arm material is also made of aluminum alloy for weight reduction. Due to its compact size and light weight, it can be combined with an electric linear slide to expand the horizontal operating range.



### ● Built-in Battery-Free Absolute Encoder

The  **$\alpha$ STEP AZ** Series (DC input) is used for all axes. No external sensors are required, simplifying the wiring. No battery is needed, so maintenance can be reduced.



### ● Self-Maintainable

Some motors can be replaced by the customer. This reduces the maintenance burden (both cost and time) after adoption.

\*Oriental Motor also replaces motors during maintenance and servicing. Please contact your nearest Oriental Motor sales office.



### ● Customizable

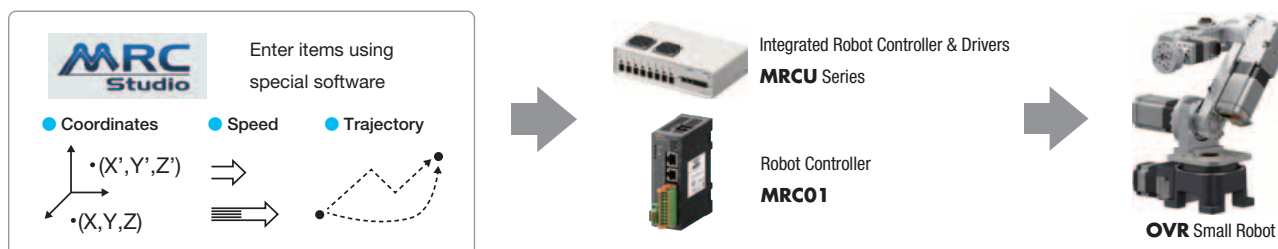
When purchasing a 4-axis articulated robot, the length of the arm can be customized to suit the application. (Reach length variations: 580 mm, 780 mm)



### ● Simple Control with a Robot Controller

Programs can be created intuitively, without requiring specialized knowledge, such as ladder diagrams.

**OVR** utilizes a robot controller, making it easy to start up and control the robot, even without robot control experience.



**SCARA**

**3-Axis**



**Lightweight and Flat**

- Compact and lightweight, with mass from 7.6 kg, height from 137 mm.
- Approach narrow spaces (compared to general SCARA robots).
- Max. reach length of 410 mm/460 mm/700 mm, transportable mass of 3 to 10 kg and repetitive positioning accuracy from ± 0.03 mm.
- The **EL** Series Lift Equipment with Electric Motor expands the range of motion in the vertical direction.

**Articulated**

**4-Axis**



**Parallel Link Mechanism**

- Installed below the arm's drive motor to reduce weight.
- Transportable mass 5 kg.
- The end of the arm is always mechanically level with the installation surface. This ensures stable horizontal transport.
- Three types with different maximum reach lengths: 480/680/880 mm.
- Also compatible with variable reach length (580 mm, 780 mm).

**5-Axis**



**Compact and Lightweight**

- Chassis mass 12.5 kg, installation area 130 mm × 130 mm.
- Max. reach length (horizontal) 350 mm, transportable mass 1 kg.
- Because it is small and lightweight, it can be combined with an electric linear slide for horizontal travel.

**6-Axis**

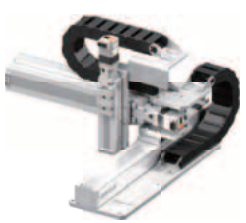


**Approach the Load from Various Angles**

- Add a motor for wrist axis rotation to achieve rotation and bending.
- Chassis mass 12.5 kg, installation area 130 mm × 130 mm.
- Max. reach length (horizontal) 480 mm, transportable mass 1 kg.
- Because it is compact and lightweight, it can be combined with an electric linear slide for horizontal travel.

**Cartesian**

**3-Axis**



**Cartesian Robots Delivered Assembled**

- Combined with electric linear slides on three axes.
- Contributes to reduced equipment startup time and labor saving.
- Moving range 300 mm × 300 mm × 100 mm (X-Y-Z), transportable mass 2.5 kg.

**Electric Lifting**

**EL Series**



**Lifting Equipment to Expand a Robot's Operating Range**

- Transportable mass (Vertical)  
30 kg (Lead: 6 mm) / 15 kg (Lead: 12 mm)
- Stroke 50/100/200/300 mm
- High rigidity and high accuracy

# Robot Controllers

The **MRC** robot controllers make operating **OVR** small robots and **AZ** Series equipped products easy. With intuitive functions such as drag and drop commands, software training, automatic operation time calculation, and live robot motion verification, the **MRC Studio** software can have your robot moving in minutes.

## Controllers

### ● MRCU Series Integrated Robot Controller & Drivers



- **MRC01** and **AZ** Series mini Driver (up to 8) in a single package
- Equivalent to A4 size (300 mm × 180 mm × 80 mm) for space saving
- Controlled via EtherNet/IP or I/O
- Easy wiring reduces the risk of mis-wiring
- Fewer parts to be purchased

EtherNet/IP

### ● MRC01 Robot Controller

#### MRC01-C Cartesian Robot Controller



- Requires one **AZ** Series driver per axis (sold separately)
- Easily introduce custom-built robots to existing systems
- Controlled via EtherNet/IP or I/O
- Number of Control Axes: 8 axes max\* (\*Only one robot can be controlled by **MRC01**)

EtherNet/IP

## Programming Software MRC Studio

The Programming Software "**MRC Studio**" simplifies the robot setup process, guiding users from the initial configuration to the final programming stages. The **OVR** Series small robots' dimensional data has already been registered, so setup time can be shortened.

\*The **MRC Studio** software and EDS files can be downloaded for free from the Oriental Motor website.

\***MRC Studio Simulator** (free) is also available for robot operation checks before purchase.

### Live Motion Simulator

The **Graphic Monitor** simulates the operation program live in a 3D environment, so you can visualize and verify the robot motion before implementation.



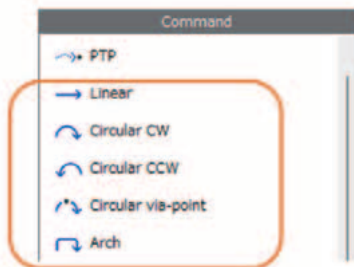
### Easy GUI Programming

Simply **select, drag, and drop commands** from the Commands list to the Sequence window. No ladder logic knowledge is necessary.



### Multiple Interpolation Commands

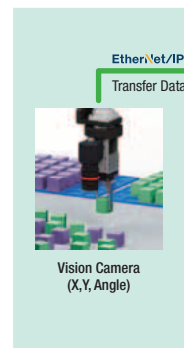
Multiple **interpolation commands** make complicated motion programming simple by making sure all axes arrive at the final target position at the same time.



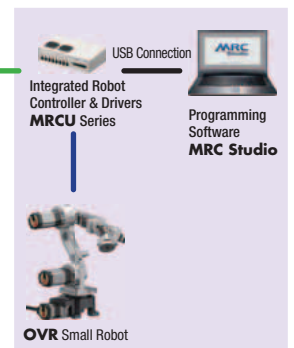
### Configuration of a Robot Visions System Using Cameras

The built-in robot **vision calibration function** simplifies robot operation and reduces costs since it can use a vision system without a robot/vision coordinate calibration function.

#### ● Acquire Load Position and Angle Information Using the Camera



#### ● Convert to Robot Coordinates and Operate



# OVR Series Robot Support Lab

At the Robot Lab, you can experience hands-on testing using your own workpieces and go through the entire planning process from robot controller setup to programming. You can also see demonstrations of articulated and SCARA robots. Online consultations are available via PC or smartphone.

Book your free consultation today.



**Chicago Lab Contact Information**  
 Address: 2320 Touhy Ave, Elk Grove Village, IL 60007  
 Phone: 1-800-443-0775  
 Email: robotsupport@orientalmotor.com  
 Hour: 8:30 am – 5:00 pm CST



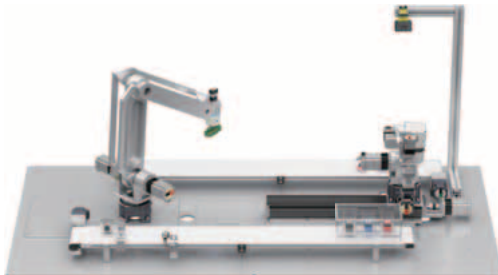
## ● What You Can Do at Robot Lab



**Proof of Concept**  
 We can conduct transport tests using your workpiece and end effector to verify if operation is possible. We can perform detailed verification, including checking if the desired operating speed and trajectory are achieved, providing consultations on gripper design, and robot sizing. In addition, we can help address any other concerns you may have about introducing robots into your operations.

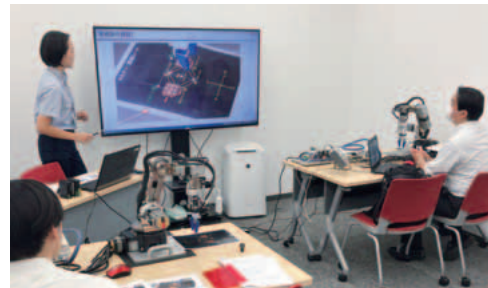
### Demonstration (On-site/ Remote)

We are exhibiting typical industrial robots, including "articulated robots" and "SCARA robots," as well as composite demonstration units combining these types.



### Training Support

We offer training for **OVR** small robot operation, the **MRC01** robot controller that allows for easy robot control, and the **MRC Studio** programming software. We offer product and programming consultations.



# MRC Reality

This simulator allows users to virtually place an **OVR** small robot in an actual space to check the size and mechanism movements. The app can be downloaded at no cost.

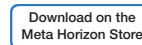


► <https://www.orientalmotor.com/video/introducing-mrc-reality.html>

For smartphone/tablet

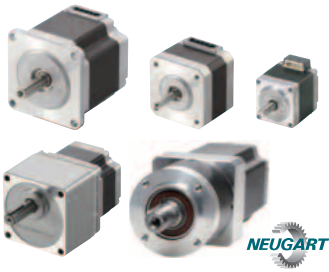


For headmount display (Meta Quest 3)



- QSTEP Hybrid Step-Servo
- AZ Series
- Actuators
- Linear Attachments / Encoders
- Network
- Industrial Robots & Controllers
- Stepper Motors
- Brushless Motors
- Standard AC Motors
- Cooling Fans
- Before Selection / Warranty

# Stepper Motors

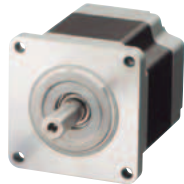
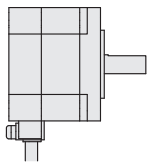


Oriental Motor offers a wide range of high torque stepper motors in frame sizes from 0.51 in. (13 mm) up to 3.54 in. (90 mm). Geared types, encoders, brake options and various motor types are offered.

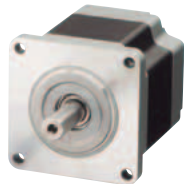
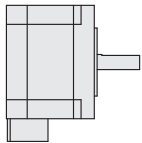
For improved performance, full time microstepping drivers with Smooth Drive are available, reducing noise and vibration and controlling heat output.

## Stepper Motor Types

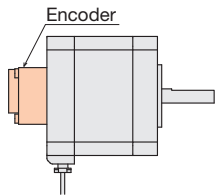
### ● Standard



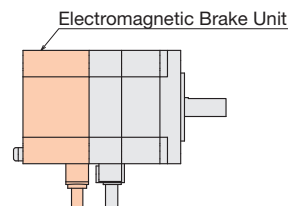
### ● High-Resolution Type



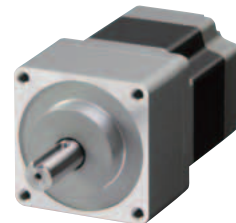
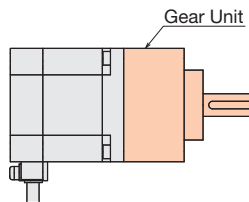
### ● Encoder Type



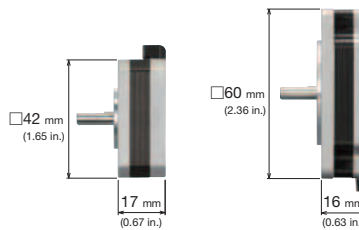
### ● Electromagnetic Brake Type



### ● Geared Type

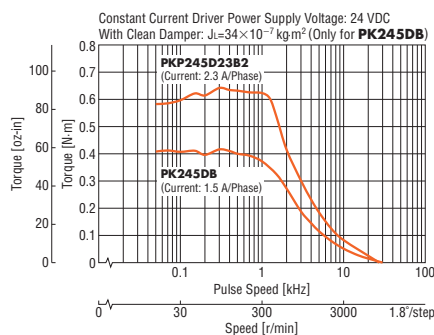


### ● Flat Type

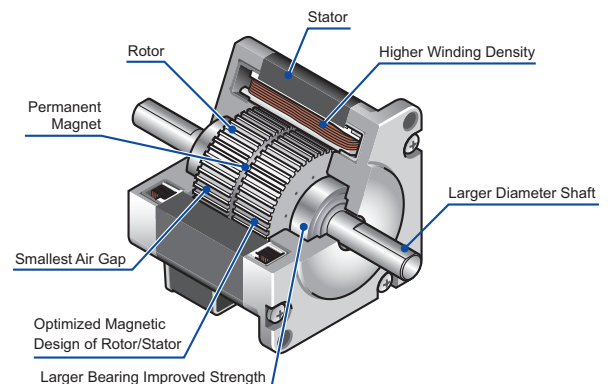


## PKP Stepper Motor Features

### ● Increased Torque: New PKP to PK

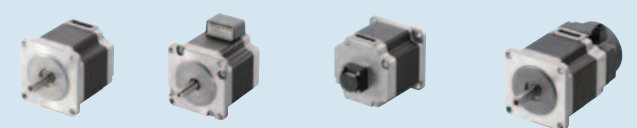
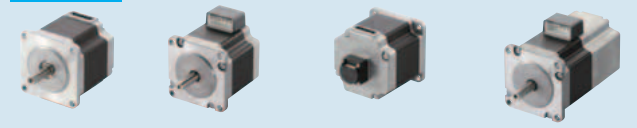

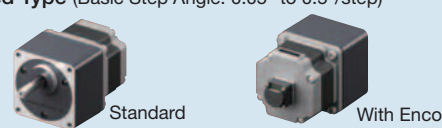


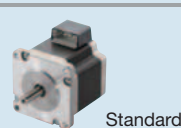
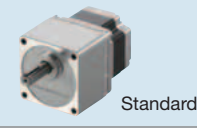


### ● New Design: Run Cooler or Downsize



# PKP Series

● Bipolar (4 lead wires) and unipolar (5 or 6 lead wires) wiring types are available.

2-Phase	Motor Type	Motor Frame Size	Additional Function		
			Standard	With Encoder	With Electromagnetic Brake
<b>Standard Type</b> (Basic Step Angle: 1.8°/step) High Strength  Flat-Connector Type    Connector Type    With Encoder    With Electromagnetic Brake Standard	□ 13 mm	NEW	—	—	
	□ 20 mm	●	●	—	
	□ 28 mm	●	●	●	
	□ 35 mm	●	●	●	
	□ 42 mm	●	●	●	
	□ 56.4 mm	●	●	●	
	□ 60 mm*1	●	—	—	
	□ 85 mm	●	—	—	
<b>High-Resolution Type</b> (Basic Step Angle: 0.9°/step) High Strength  Flat-Connector Type    Connector Type    With Encoder    With Electromagnetic Brake Standard	□ 28 mm	●	●	—	
	□ 42 mm	●	●	●	
	□ 56.4 mm	●	●	●	
<b>Flat Type</b> (Basic Step Angle: 0.018° to 1.8°/step)  Standard    With Encoder    Harmonic Gear	□ 42 mm	●	●	—	
	□ 60 mm	●	●	—	
	□ 51 mm*2	●	●	—	
	□ 61 mm*2	●	●	—	
<b>SH Geared Type</b> (Basic Step Angle: 0.05° to 0.5°/step)  Standard    With Encoder	□ 28 mm	●	●	—	
	□ 42 mm	●	●	—	
	□ 60 mm	●	●	—	
	□ 90 mm*1	●	●	—	
<b>CS Geared Type</b> (Basic Step Angle: 0.09 to 0.36°/step)  Standard	□ 28 mm	●	—	—	
	□ 42 mm	●	—	—	
	□ 60 mm	●	—	—	
5-Phase	Motor Type	Motor Frame Size	Additional Function		
			Standard	With Encoder	With Electromagnetic Brake
<b>Standard Type</b> (Basic Step Angle: 0.72°/step) High Strength  Flat-Connector Type    Connector Type    With Encoder Standard	□ 20 mm*1	●	●	—	
	□ 28 mm	●	●	—	
	□ 42 mm	●	●	—	
	□ 56.4 mm	●	●	—	
	□ 60 mm	●	●	—	
	□ 85 mm*1	●	—	—	
<b>High-Resolution Type</b> (Basic Step Angle: 0.36°/step)  Standard	□ 28 mm	●	●	—	
	□ 42 mm	●	●	—	
	□ 60 mm	●	●	—	
<b>TS Geared Type</b> (Basic Step Angle: 0.024 to 0.2°/step)  Standard	□ 42 mm	●	—	—	
	□ 60 mm	●	—	—	

●: 2 types are available—the "Flat Connector Type" and the "Connector Type".

\*1 This is the conventional PK Series.

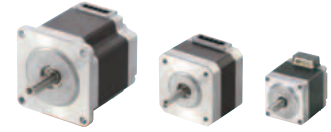
\*2 With harmonic gears

# PKP Series Product Customization

Oriental Motor can design a custom motor tailored to your application requirements. We offer customization for shafts, windings, cables, and more. Here are some examples of our customization options. Please contact us if you have other customization requests.

## PKP Series 2-Phase Bipolar Stepper Motors

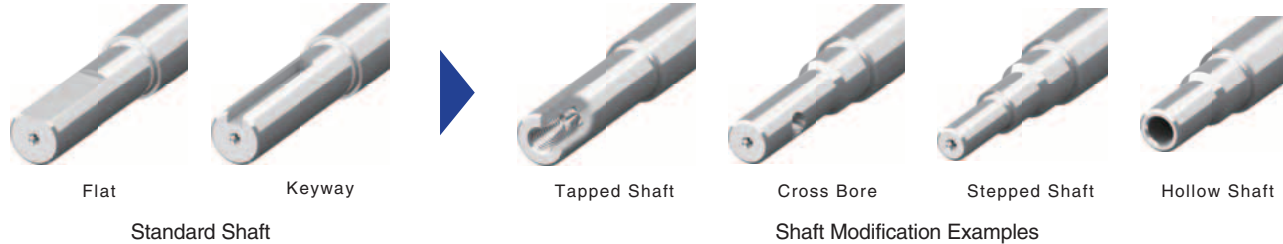
High-torque, 2-phase bipolar stepper motors and geared type stepper motors offer the optimum performance and value. In addition to offering high torque, the **PKP** series stepper motors offer more variety of electrical specifications, more frame sizes, encoder options and electromagnetic brake options for the right solution in stepper motors.



## Customization Examples

### Shaft Modification

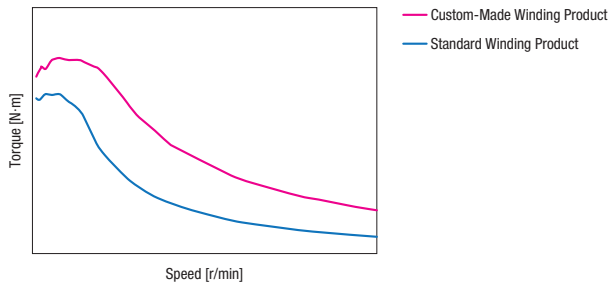
It is possible to change the shaft shape to suit what is attached to the tip of the shaft.



### Motor Winding

With stepper motors, the number of windings and wire diameter specifications can be changed to match the torque-speed characteristics to the required specifications.

· Example: Changes to winding specifications to ensure torque at high speeds



### Cable Assembly

We can process motor lead wires and cables to suit the design and manufacturing circumstances of your equipment.

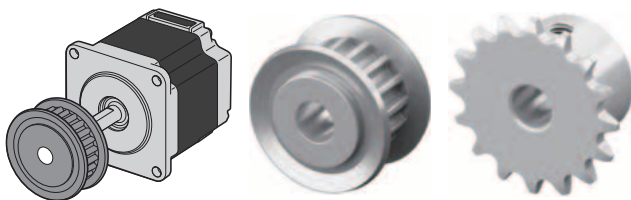
· Example: Length / Twisted Pairs / Connectors / Label / Marking Tie  
· Example of connectors: Molex / Hirose / JST / TE



### Pulley / Gears / Sprocket Installation

We can install pulley, gears, or sprocket to our stepper motor shaft.

· Example: SDP / Gates Unitta / Inhouse



### Encoder Assembly

We can assemble Oriental Motor encoders or third party encoders to our stepper motors.

· Example: Oriental Motor magnetic Encoders MR Type or 3rd party encoders such as Same Sky



Oriental Motor Magnetic Encoders MR Type



Same Sky Encoder

### Encoder Resolution



Our standard type encoder resolution is available in 200, 400, and 1,000. With this semi-custom order, we have the resolutions ranging from 100 to 4,000 P/R.

· Output Type: Incremental  
· Resolution (P/R):  
100/200/360/400/500/600/720/800/1000/1800/2000/2500/  
3600/4000

# CVD Driver

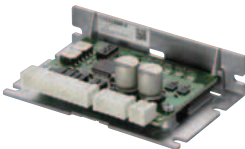

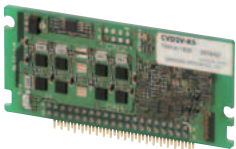
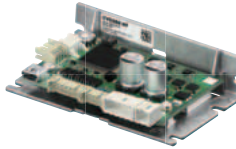
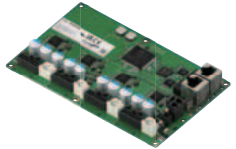
2-Phase 5-Phase

## Stepper Motor Driver - CVD Series

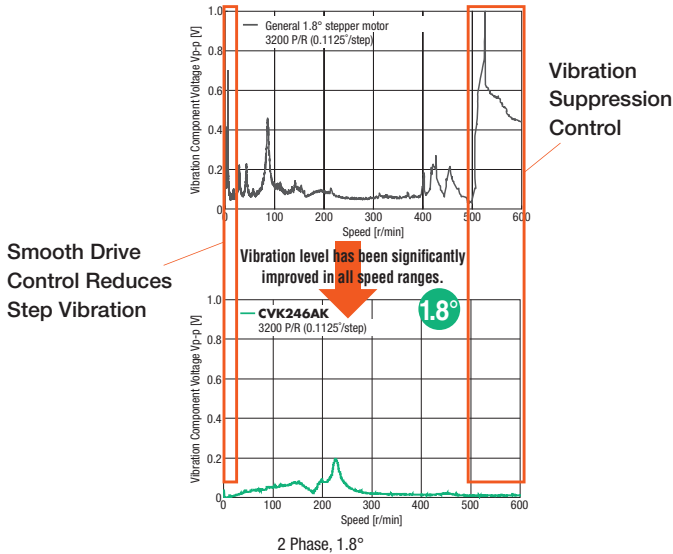
Compact

Low Vibration

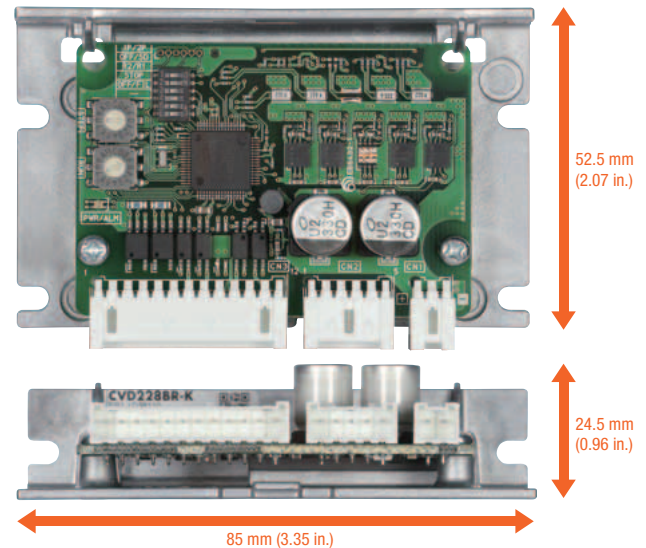
The 2-Phase stepper motors are only bipolar (4 lead wires)

 <p>Pulse Input Type</p>		 <p>RS-485 Communication Type</p>	
 <p><b>S Type: Board-Mounted Type</b></p> <ul style="list-style-type: none"> <li>I/O Setting or SPI Communication types available</li> <li>Detection of wire breakage possible</li> </ul>		 <p><b>Fully Closed Loop Control Type</b></p> <ul style="list-style-type: none"> <li>Full closed control of 5-phase stepping motors</li> <li>Sub-micron high-precision positioning</li> <li>Can be operated via Modbus RTU (RS-485 communication)</li> </ul>	
		 <p><b>Multi-Axis Type - EtherCAT Compatible</b></p> <ul style="list-style-type: none"> <li>Control up to 4-axis</li> <li>Compatible with 2-phase and 5-phase motors with the same driver</li> <li>Detection of loss of synchronisation by capturing encoder information</li> <li>Automatic electromagnetic brake control</li> </ul>	

### Low Vibration with Full-Time Microstepping



### Industry's Top, Compact, High Performance Driver

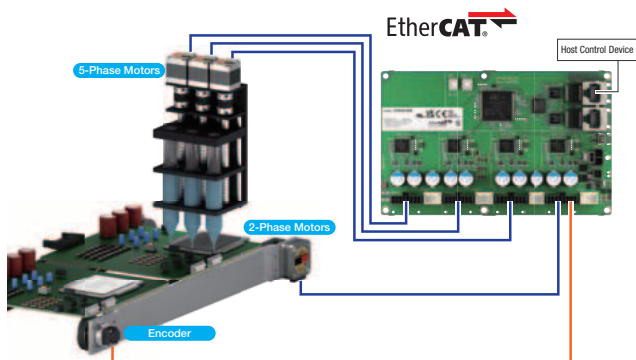


**Mass 20 g (0.71 oz) to 70 g (2.47 oz)**

(Differs according to the driver type.)

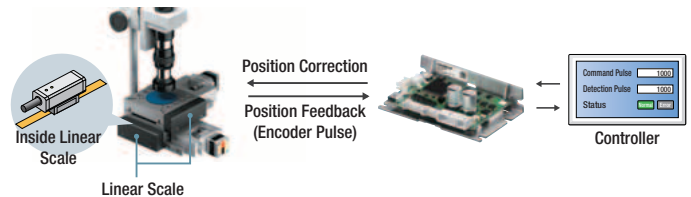
### CVD Series Multi-Axis Type EtherCAT Compatible

This compact, lightweight 4-axis control driver reduces wiring and saves valuable space.



### CVD Series Fully Closed-Loop Control Type

This driver enables precise positioning when combined with high resolution rotary and linear encoders.



RSTEP Hybrid Step-Servo

AZ Series

Actuators

Linear Attachments / Encoders

Network

Industrial Robots & Controllers

Stepper Motors

Brushless Motors

Standard AC Motors

Cooling Fans

Before Selection / Warranty

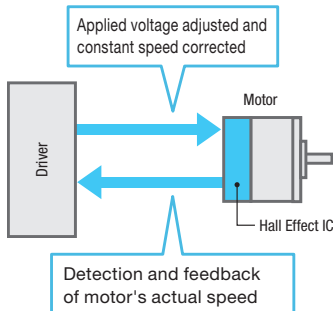
# Brushless Motors



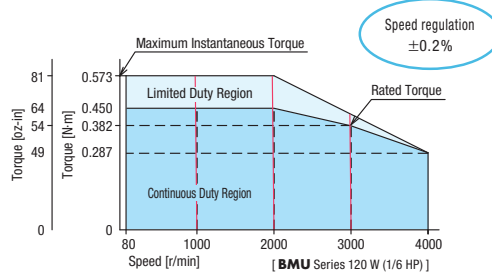
Brushless motors offer excellent energy efficiency and savings equivalent to IE4, excellent speed stability, as well as a wide speed control range. Brushless motors use permanent magnets in the rotor of three-phase motors. With Brushless motors there is no brush and commutator resulting in a maintenance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

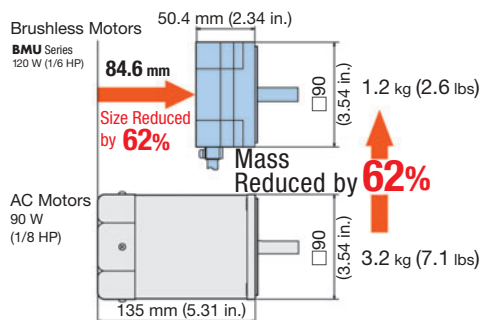
## Control Method



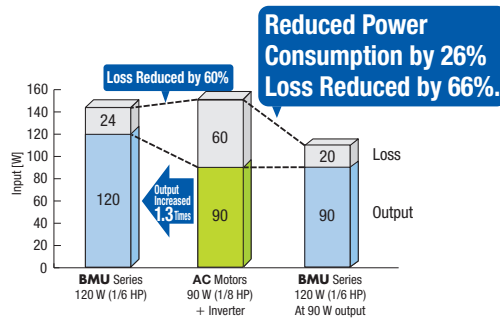
## Wide Speed Range: 80~4000 r/min



## Compact and Lightweight

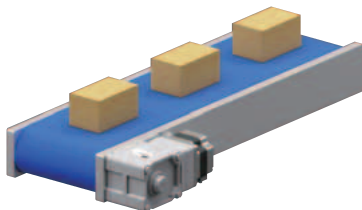


## Energy Savings



## Application Examples

Conveyor / Transportation



Agitators/Pumps/Dispensers



Torque Limiting



# Brushless DC Motor Gear Options

These gearheads can be combined with brushless DC motors and offer a wide variety of gear ratio variations and high strength types, expanding the available options.

Gearhead Type	Parallel Shaft Gearhead				Right-Angle Gearhead	Hollow Shaft Flat Gear	
	<b>GFV</b> Gears <b>GFS</b> Gears	<b>JV</b> Gears	<b>JB</b> Gears	<b>CS</b> Geared Motor	<b>JH</b> Gears	<b>FR</b> Gears	
External View							
Features	<ul style="list-style-type: none"> <li>Long Life, High Strength</li> <li>Output Shaft: Iron, Stainless Steel</li> </ul>	<ul style="list-style-type: none"> <li>High Gear Ratio up to 1/450</li> <li>Flange Installation</li> <li>Output Shaft: Stainless Steel</li> </ul>	<ul style="list-style-type: none"> <li>High Gear Ratio up to 1/1200</li> <li>Does not Saturate</li> <li>High Permissible Torque</li> <li>Leg Installation</li> </ul>	<ul style="list-style-type: none"> <li>Increased Load-bearing Capacity (Compared to a parallel shaft gearhead)</li> <li>Center Shaft</li> </ul>	<ul style="list-style-type: none"> <li>Space Saving, Low Cost</li> <li>High Strength</li> <li>Output Shaft: Stainless Steel</li> </ul>	<ul style="list-style-type: none"> <li>Space Saving, Low Cost</li> <li>Does not Saturate</li> <li>High Permissible Torque</li> </ul>	
Advantages of Installation	<ul style="list-style-type: none"> <li>Install on Flange Face</li> </ul>		<ul style="list-style-type: none"> <li>No Mounting Brackets Required</li> </ul>	<ul style="list-style-type: none"> <li>The Output Shaft Protrudes from the Center, so Design is Easy</li> </ul>	<ul style="list-style-type: none"> <li>Space Saving</li> <li>Can be Connected Directly to the Drive Shaft</li> </ul>		
Output Power of Combinable Motors	AC Input	30 W, 60 W, 120 W, 200 W, 300 W, 400 W	200 W, 300 W, 400 W	200 W, 300 W, 400 W	—	60 W, 120 W, 200 W, 300 W, 400 W	30 W, 60 W, 120 W, 200 W, 300 W, 400 W
	DC Input	15 W, 30 W, 50 W, 60 W, 100 W, 200 W, 400 W	—	—	30 W, 50 W, 60 W	—	30 W, 50 W, 60 W, 100 W, 200 W, 400 W
Gear Ratio	<b>5 to 200</b>	<b>100 to 450</b>	<b>5 to 1200</b>	<b>5 to 20</b>	<b>5 to 200</b>	<b>5 to 200</b>	
Rated Life	10000 hours*	5000 hours	5000 hours	10000 hours	5000 hours	10000 hours	
Permissible Radial Load/ Permissible Axial Load	1400 N/400 N	3123 N/480 N	3672 N/577 N	200 N/70 N	2405 N/550 N	2040 N/800 N	
Permissible Torque	70 N-m	198 N-m	518 N-m	3.4 N-m	82.8 N-m	54 N-m	

\*The rated life for 15 W is 5,000 hours.

The values for permissible radial load, permissible axial load, and permissible torque are for the following operating conditions. They will vary based on the combined motor output power and gearhead gear ratio.

- Output Power: 200 W (For **CS** geared motors, values are for 50 W models.)
- Motor Shaft Speed: 3000 r/min
- Gear Ratio : Maximum gear ratio for each gearhead (Example: For **GFV** gear, the gear ratio is 200)

**Hollow Shaft Flat Gearhead**

**[Internal Gearhead Structure]**

Improved gear case rigidity and larger diameters for gears and bearings lead to high permissible torque and long life.

**[Characteristic Configuration]**

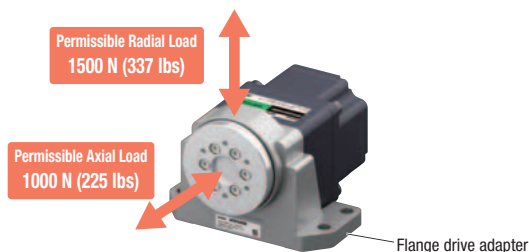
Wheel drive units, etc. can be arranged in a compact configuration with alternating directions.

\*Now available in smaller sizes.

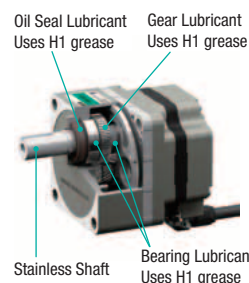
**[Frame Size 90 mm]**

Gear Ratio	Hollow Shaft Flat Gearhead (N-m)	Parallel Shaft Gearhead (N-m)
100	~40	~20
200	~80	~40

## ● Significantly Increased Permissible Load with Flange Drive Adapter



## ● H1 Food-Grade Grease (IP66)



H1 Food-Grade Grease is a grease registered by the NSF as part of a category of "lubricants used in food-processing environments where there is the possibility of incidental food contact."

# 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



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

## 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

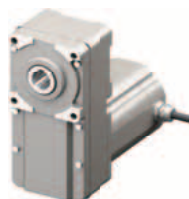


The control panel cannot be removed from the driver.



### 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 / IP69K 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



- 200 W (1/4 HP) Stainless Steel Type**
- IP67/69K Motors
  - Corrosion resistant stainless steel equivalent to SUS304

## BLS Series



- Easy Wiring, Easy Drive with Power ON/OFF (Simple Type Driver)
- IE5 Class High Efficiency Motor
- High Power, Compact Size
- **MEXE02** Support Software
- IP66 Motors

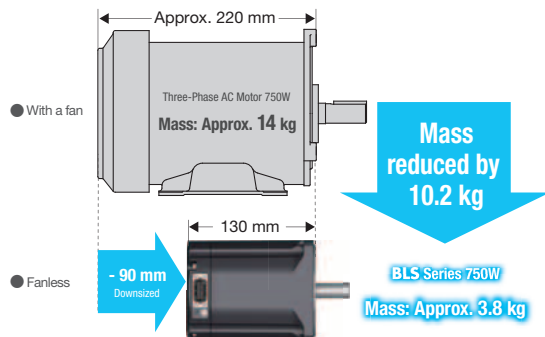


The operation method, operating speed, and rotation direction can be easily set using switches.



### BLS Series

Output Power	750 W (1 HP)	
Frame Size - mm (in.)	104 mm (4.09 in.)~110 mm (4.33 in.)	
Speed Range (r/min)	100~4000	
Option	IP66	
Gear Types	Parallel, FR Hollow Shaft	
Power Supply	Single-Phase (VAC)	200-240
	Three-Phase (VAC)	200-240



## DC Input Motor / Driver

### BLS Series



- Constant Speed Operation
- AC Gearheads Can Be Used
- 100 to 4000 r/min
- **MEXE02** Support Software

**BLS Series**

Output Power	25 W (1/30 HP)~120 W (1/6 HP)	
Frame Size - mm (in.)	60 mm (2.36 in.)~90 mm (3.54 in.)	
Speed Range (r/min)	100~2000 (standard) or 100~4000 (high strength)	
Option	IP65 or IP40	
Gear Types	Parallel, FR Hollow Shaft	
Power Supply	VDC	24

### 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)	80/100~3000	
Option	Electromagnetic Brake	
Gear Types	Parallel, FR Hollow Shaft, Center Shaft	
Power Supply	VDC	24

### 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
Safety Function	STO (Safe Torque Off)	

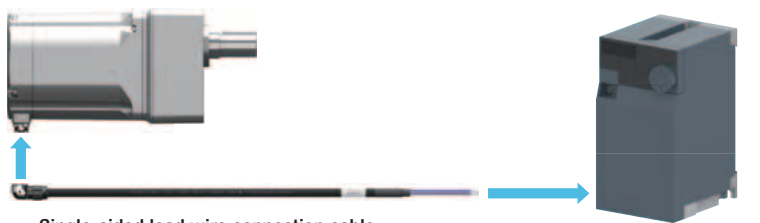
## Brushless Motor for Inverter / VFD



- Lightweight and Compact Compared to AC Motors with the Same Output Power
- Fanless and Low-Noise
- Operates in Combination with an Inverter
- IP66 Motors

**750 W Brushless Motor**

Output Power	750 W (1 HP)	
Frame Size - mm (in.)	104 mm (4.09 in.)~110 mm (4.33 in.)	
Speed Range (r/min)	300~4000	
Option	IP66	
Gear Types	Parallel, FR Hollow Shaft	



Single-sided lead wire connection cable that can be connected to an inverter is available.

Inverter From Other Manufacturers

# 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

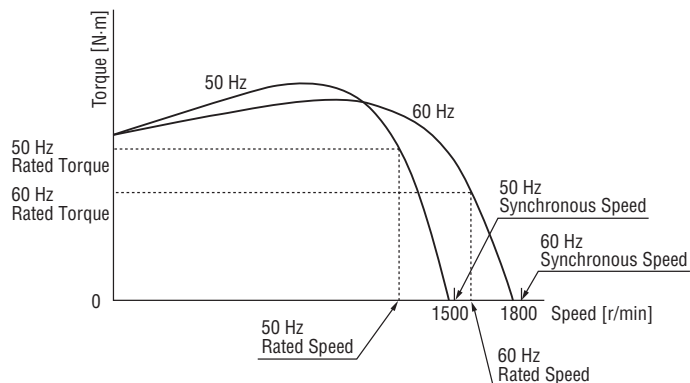
60 Hz: 1800 r/min

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



Speed – Torque Characteristics

## 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	
	150 W (1/5 HP) 2-Pole (No Gear type)	
Gear Types	Parallel, Right Angle Hollow or Solid	
Power Supply	Single-Phase (VAC)	100-115 / 220-230
	Three-Phase (VAC)	220-230

### KIIS Series



- High-Efficiency, 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	
	Stainless Steel Shafts	
Gear Types	Parallel, Right Angle Hollow or Solid	
Power Supply	Three-Phase (VAC)	220-415



#### 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 480 VAC input

## IP67 Rated FPW Series



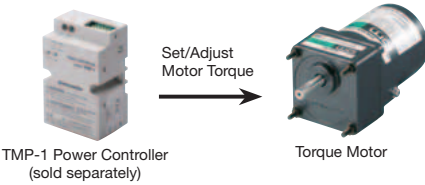
- Conforms to IEC Standard IP67
- Pre-assembled, Motor & Gear
- Water Tight and Dust Resistant



### 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)	200-230

## Torque Control Torque Motors



TMP-1 Power Controller  
(sold separately)

Torque Motor

### World K Series



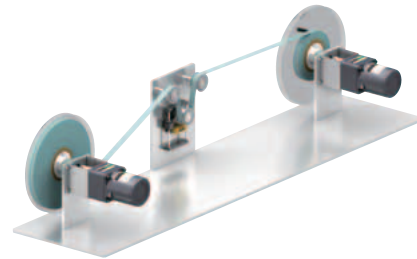
Type	Torque Motor
Output Power	3 W (1/250 HP)~20 W (1/38 HP)
Frame Size	60 mm (2.36 in.)~90 mm (3.54 in.)
Gear Types	Parallel
Single-Phase (VAC)	110-115 / 220-230

## Applications

Belt Conveyor



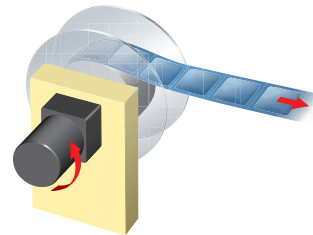
Tension Control



Pinch Conveyor



Labeling System



# Cooling Fans

## Fans and Thermal Management

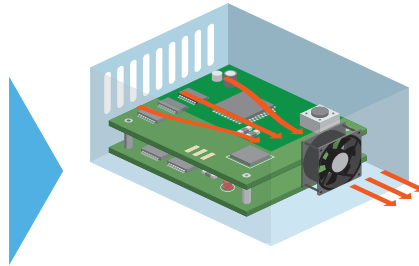
Today's fans are designed to move air allowing for cooling, controlling an area of space or for protecting electronics. Many of our fans come with alarm features designed for warning or for preventative maintenance. Oriental Motor helps make selecting the appropriate type of fan for today's applications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

### Axial Flow Fans

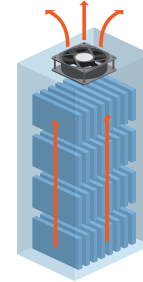
- AC or DC Input



Device Ventilation and Cooling



Cooling Densely Mounted Devices

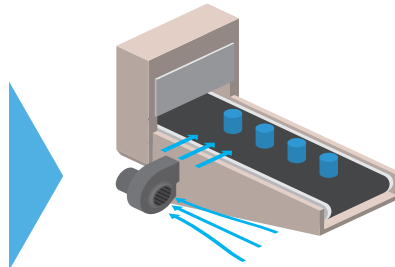


### Centrifugal Blowers

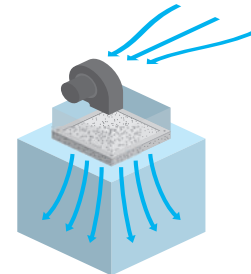
- AC or DC Input



Air-Blow Cooling or Drying



Cooling with High Static Pressure

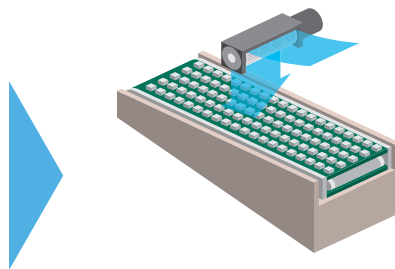


### Cross Flow Fans

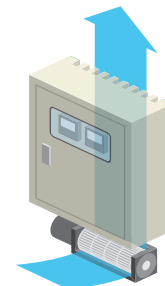
- AC or DC Input



Uniform Cooling or Drying



Cooling for Long or Thin Spaces



### Thermostat

- Centigrade (°C)



Automatic ON/OFF with Set Temperature

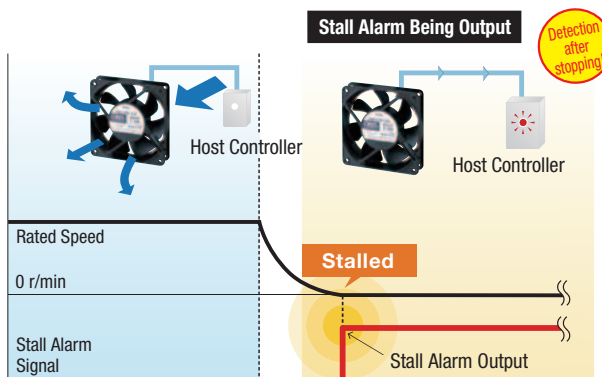


# Alarm Types

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

## ● Stall Alarm

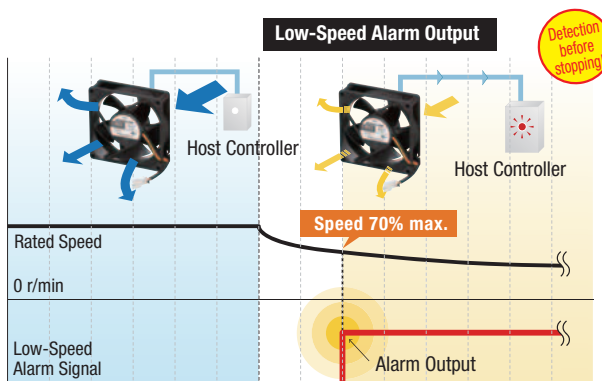
The fan will emit an alarm when the fan rotation has stopped. This will alert you to interruptions immediately, so that action / replacement can be made.



## ● 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.

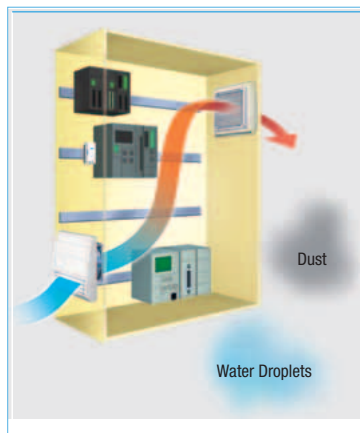
If multiple fans are running, it will also allow for replacement of only the fans experiencing a reduced cooling capacity.



# Enclosure Types



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



# Accessories



- Finger Guards
- Filters
- Screens
- Plug Cords

# 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 achieve the various needs that our customers require, while contributing to environmental conservation activities. The below products are just a few examples of how Oriental Motor is reducing their impact on the environment.

## 750 W Brushless Motor (PM Motor)

The 750 W (1HP) brushless motor is a PM motor that uses a permanent magnet in its rotor, making it highly efficient, compact, and lightweight. The motor's efficiency has reached IE5, contributing to reduced electricity costs and CO<sub>2</sub> emissions.

Compared to a three-phase alternating current motor, this motor is compact and lightweight, reducing the burden on assemblers. Its high efficiency and low heat generation enable a fanless design.

### ● Energy saved (reference value per motor)

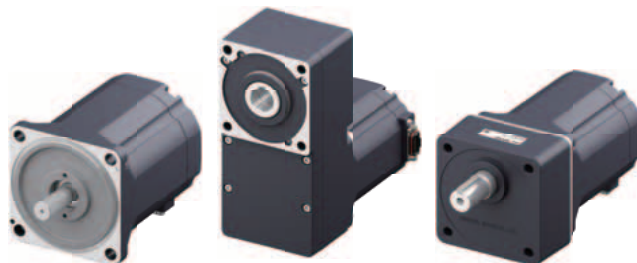
Compared to a 750 W induction motor (IE3), the 750 W brushless motor reduces electricity costs and CO<sub>2</sub> emissions.




	Electricity used (kWh/year)	CO <sub>2</sub> emissions (kg-CO <sub>2</sub> /year)	Electricity Costs (dollars/year)
IE3 defined value (82.5%)* 750 W induction motor	7,960	3,640	\$1182.19
750 W brushless motor + inverter	7,400	3,380	\$1090.40

\*Specified efficiency value (%) for induction motors (4 poles, 50 Hz) based on IEC TS 60034-30-1 Operation Conditions:

Calculated under the following conditions: 24 hours of operation per day, 365 days per year, an electricity-to-CO<sub>2</sub> emissions conversion factor of 0.457 kg-CO<sub>2</sub>/kWh, and electricity costs of \$0.15/kWh.

Electricity used	Reduced by 560 kWh/year	CO <sub>2</sub> emissions	Reduced by 260 kg-CO <sub>2</sub> /year
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Compact & lightweight	Energy saving	Low noise
 <b>COMPACT</b>	 <b>IE5 ECO</b>	 <b>FANLESS</b>
Greatly reduced motor size Contributes to compactness of equipment	IE5 efficiency Reduced electricity costs	Reduced noise with no fan No scattering of dust, etc.

### ● Achieved IE5 efficiency, saved energy, and reduced electricity costs

This motor meets the requirements for IE5\* efficiency class for variable speed motors, contributing to reduced electricity costs and CO<sub>2</sub> emissions.

\*Specified efficiency value (%) for variable speed motors (rated speed of 1801–6000 rotations per minute), based on IEC TS 60034-30-2

## EMR Series EC Fan

The **EMR Series EC** Fans feature brushless motors and offers energy efficiency, long service life, low noise, and a light weight design.

The built-in low-speed alarm enhances reliability, while the variable speed feature enables further energy savings and quieter operation. These fans also help address challenges, such as maximizing cooling efficiency with a single lightweight unit and reducing electricity costs.

### ● Result of adopting EMR Series EC Fans

Adopting brushless motors significantly reduced power consumption compared to conventional products with the same characteristics. The motors also contribute to reducing CO<sub>2</sub> emissions.

	Electricity used (kWh/year)	CO <sub>2</sub> emissions (kg-CO <sub>2</sub> /year)	Electricity Costs (dollars/year)
Conventional product	438	200	\$43.96
EMR Series	306	140	\$62.82

\*When comparing EMR2090-A and MRS20-BUL

Operation Conditions:

Calculated under the following conditions: 24 hours of operation per day, 365 days per year, an electricity-to-CO<sub>2</sub> emissions conversion factor of 0.457 kg-CO<sub>2</sub>/kWh, and electricity costs of \$0.15/kWh.

Electricity used	Reduced by 132 kWh/year	CO <sub>2</sub> emissions	Reduced by 60 kg-CO <sub>2</sub> /year
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# 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 offers best-in-class lead times, with in-stock items shipping in 2 business days from your order date (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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