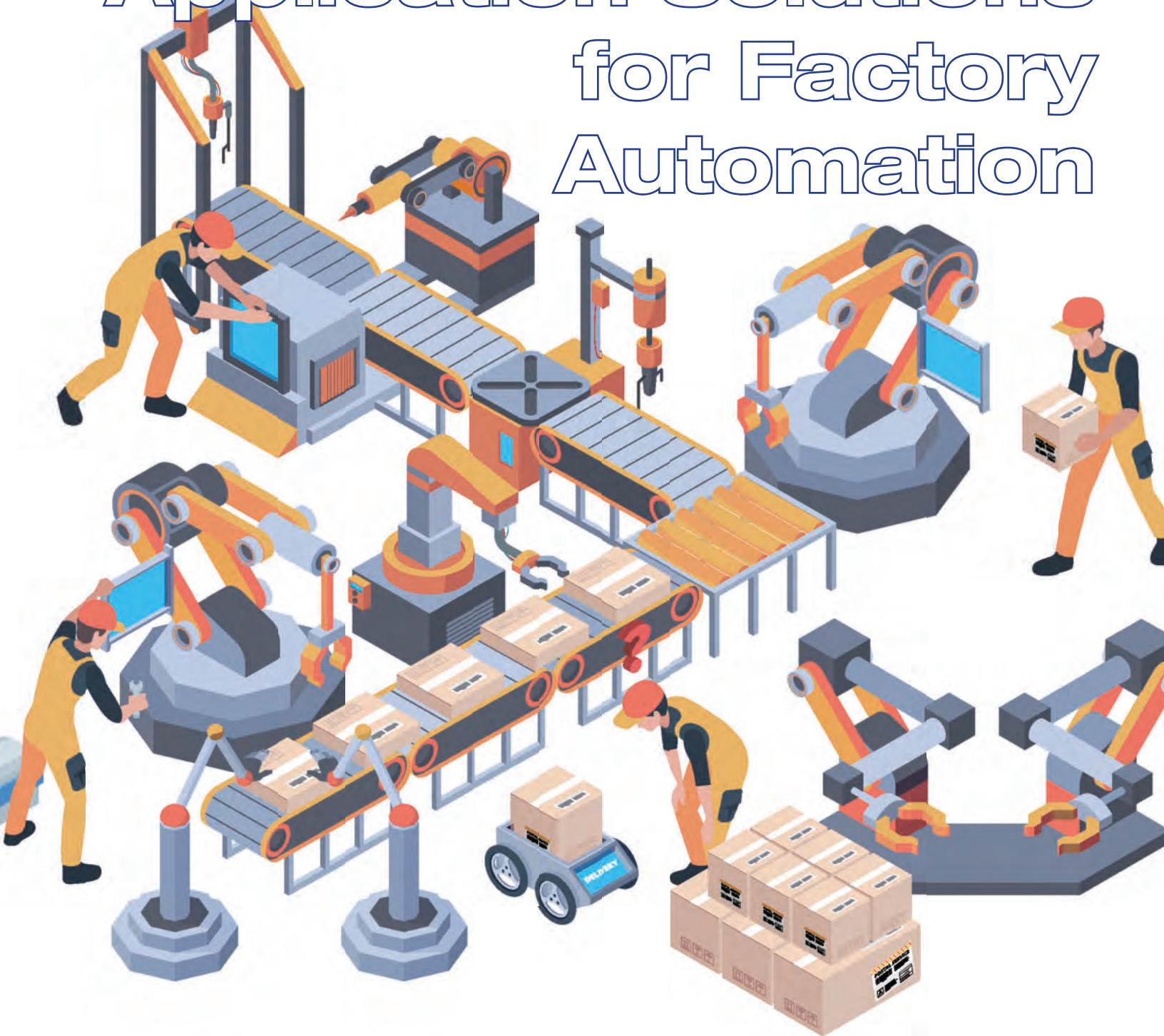


**Orientalmotor**

# Application Solutions for Factory Automation



## **2 Application Examples**

- 4 Motor and Communication Control Systems**
- 6 AZ Series Step-Servo Motor Hybrid Control**
- 8 Speed Control Motor Selection**
- 10 Select by Movement Type**

# Application

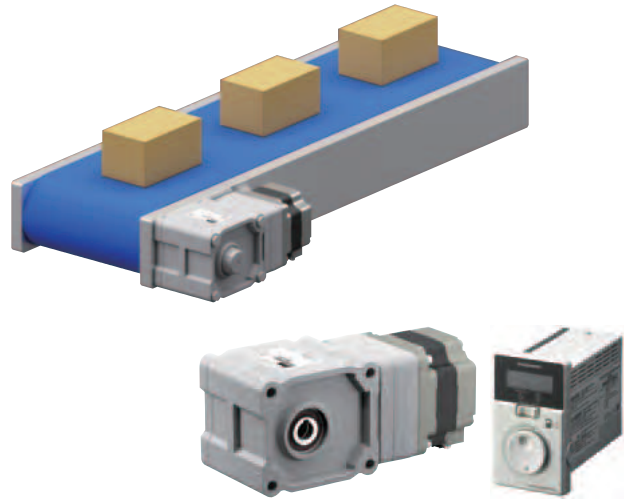
## Transport Robot

With the ability to run on battery power, **BLV** Series **R** Type brushless motors with hollow shaft flat gearheads can be used as the drive axle for transport robots with low floor designs.



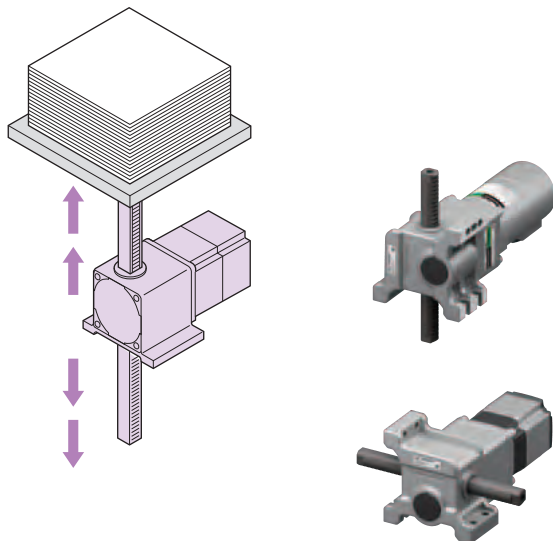
An optimized brushless design saves space with a right-angle hollow shaft gearhead. The **BMU** Series driver is easy to operate with a front mounted dial.

## Variable Speed Conveyor



## Load Unloader

The **LJ** Series rack and pinion linear heads are suitable for lifts, such as a loader & unloader. An electromagnetic brake type motor provides holding torque.



This 3-axis parallel link robot uses 3 **AZ** Series harmonic geared stepper motors and an EtherCAT compatible multiple-axis driver for pick and place operation.

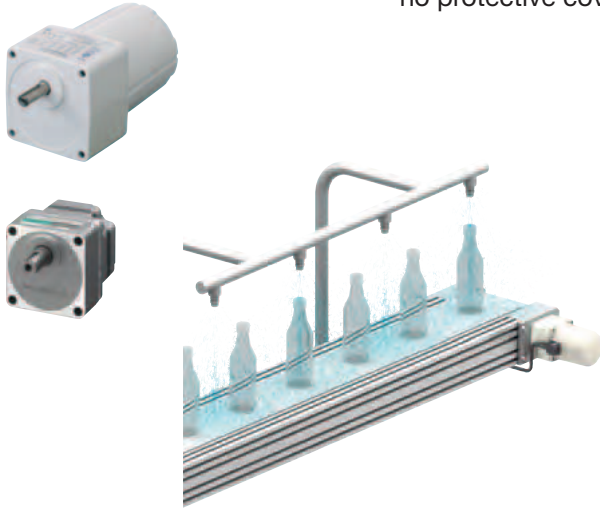
## Parallel Link Robot

\*Oriental Motor sells the motor and driver parts of this robot, we do not sell complete robotic systems



# Examples

## IP67 Rated Conveyor



Oriental Motor has IP67 rated AC gear motors and brushless motors that can be used in dusty and wet environments. They are designed to be mounted on equipment as-is with no protective cover.

## SCARA Robot

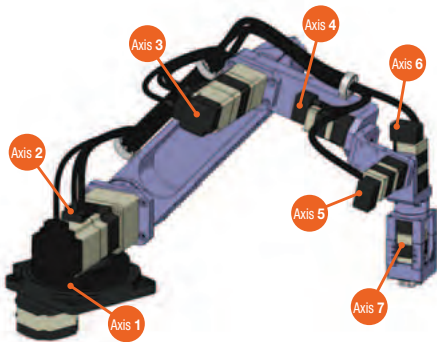
This 5-axis SCARA robot can be built in-house by using **AZ** Series geared motors, **DGII** Series hollow rotary actuators, **DR** Series compact cylinders, **EH** Series grippers, and the **MRC01** robot controller.



## Articulated Robot

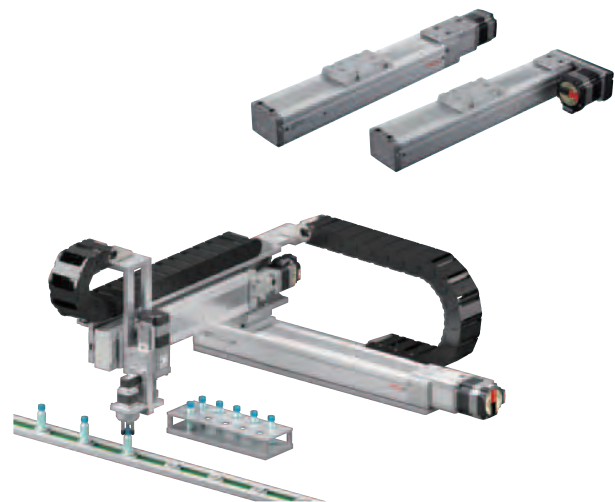


This 7-axis arm robot consists of 7 **AZ** Series based products. The built-in mechanical absolute encoder can recognize the motor's position, even with the power off.



## X-Y-Z Gantry System

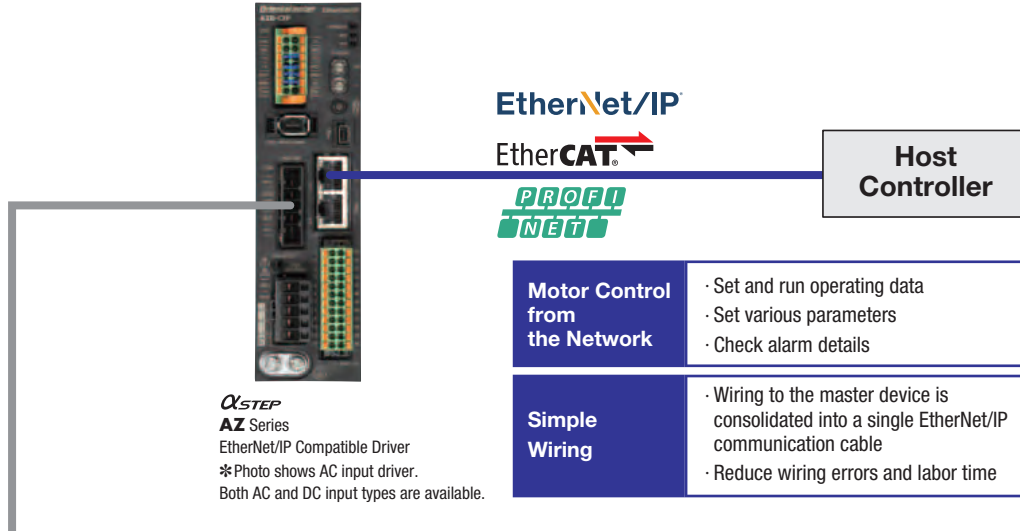
Oriental Motor offers several types of electric linear actuators, slides, cylinders, rotary actuators, and grippers for a wide range of high precision positioning requirements.





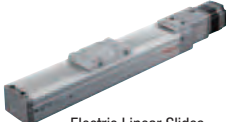
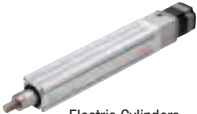




# Select Your Motor and Communication Control Systems

EtherNet/IP EtherCAT PROFIBUS

Oriental Motor offers single axis EtherNet/IP, EtherCAT, and 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			
 AZ Series	 Hollow Rotary Actuators DGII Series	 Electric Linear Slides EZS Series	 Electric Cylinders EAC Series
AC Input / DC Input	DC Input Only		
 Rack and Pinion Systems L Series	 Compact Electric Cylinders DR Series	 Compact Electric Cylinders DR52 Series	 Electric Gripper EH Series

• 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.

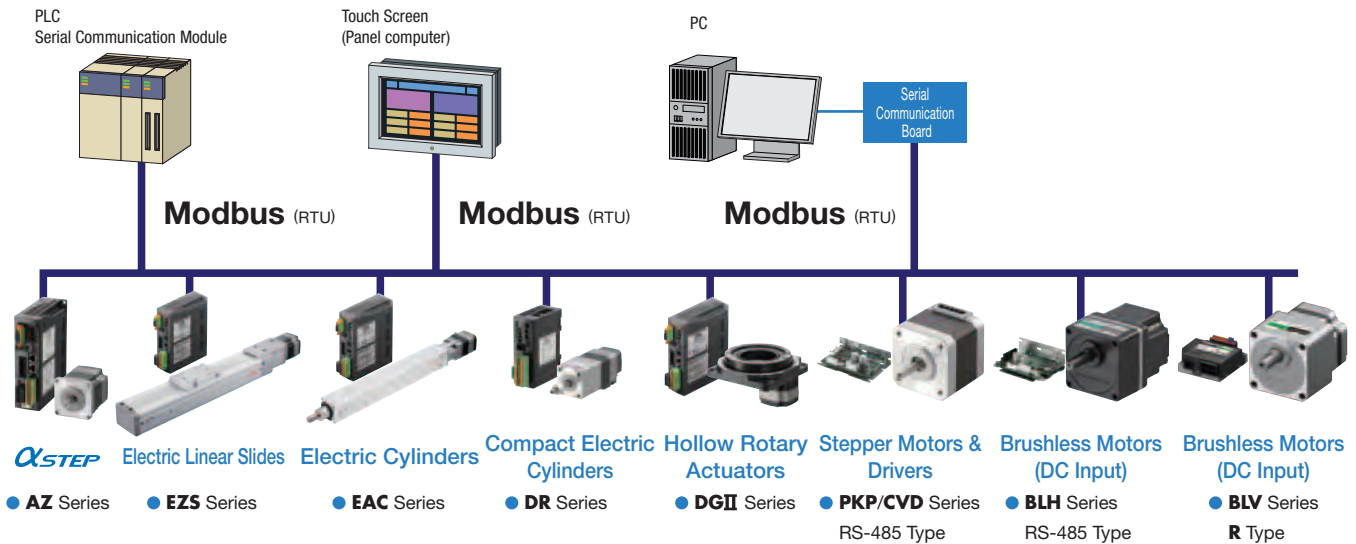
• ESI File for EtherCAT  
 An ESI file has been prepared to allow EtherCAT compatible products to be used more easily.  
 The ESI file can be downloaded from the Oriental Motor website.

• 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.

EtherCAT is a registered trademark licensed by Beckhoff Automation GmbH, Germany  
 PROFINET is a trademark or registered trademark of PROFIBUS Nutzerorganisation e.V. (PNO).

# Modbus (RTU)

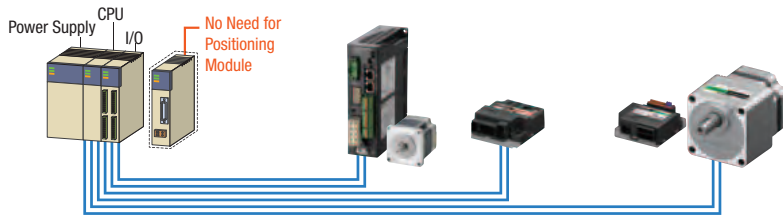
Oriental Motor offers single axis Modbus (RTU) communication in our **AZ**, **PKP/CVD** RS-485 Type, **BLV R** Type and linear based products.  
 \*Modbus is a registered trademark of Schneider Automation Inc.



# Built-In Controller (Stored Data Type)

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

- Easy Control
- Low-Cost Design
- Space Saving

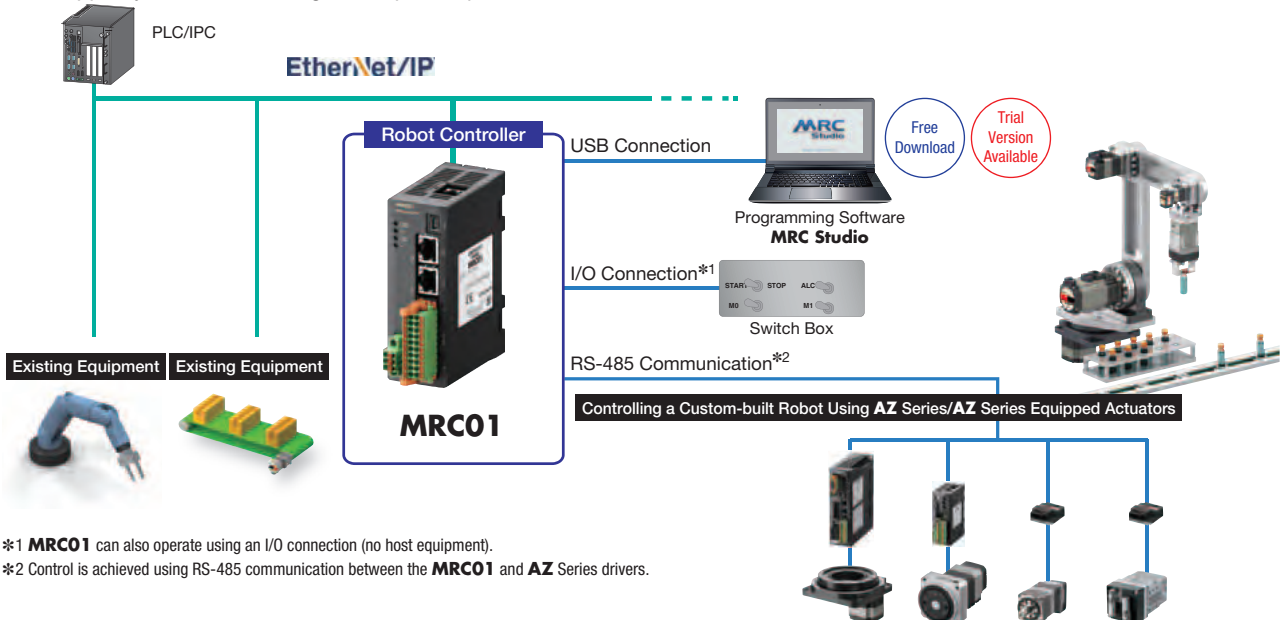


The operating data is set in the driver, and is then selected and executed from the host system.

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

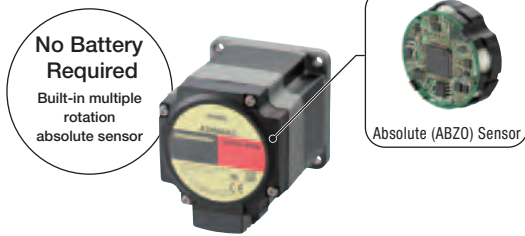
# Robot Controller MRC01

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



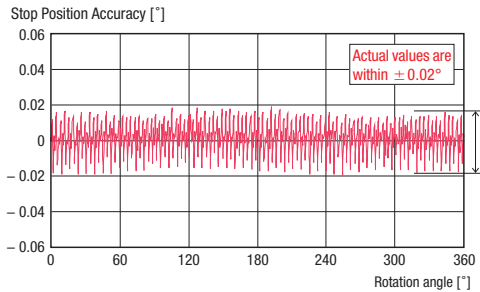
\*1 **MRC01** can also operate using an I/O connection (no host equipment).  
 \*2 Control is achieved using RS-485 communication between the **MRC01** and **AZ** Series drivers.

# AZ Series $\alpha$ STEP Hybrid Control

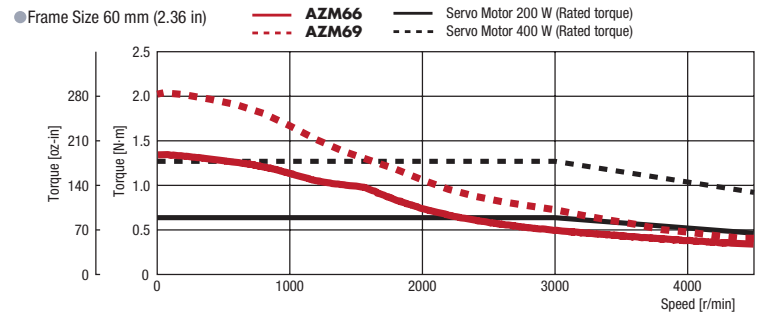


The **AZ Series** is a “hybrid” step-servo based motor & driver system that combines the advantages of the “open loop” set up programming with “closed loop” performance. In addition to high-accuracy positioning and speed control, it can perform control that restricts the motor’s generated torque to a set value for push-motion operation.

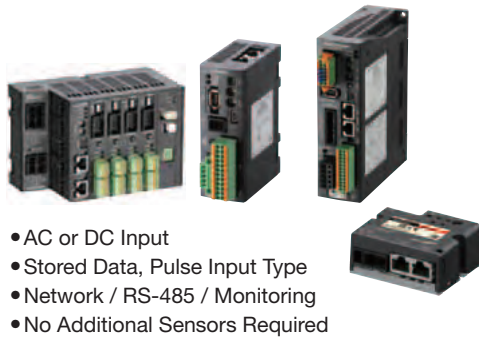
## ● Stopping Accuracy



## ● High Performance



## Drivers

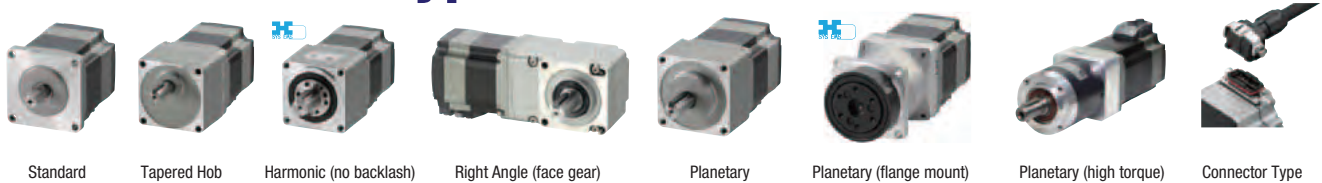


### Home Setting Method

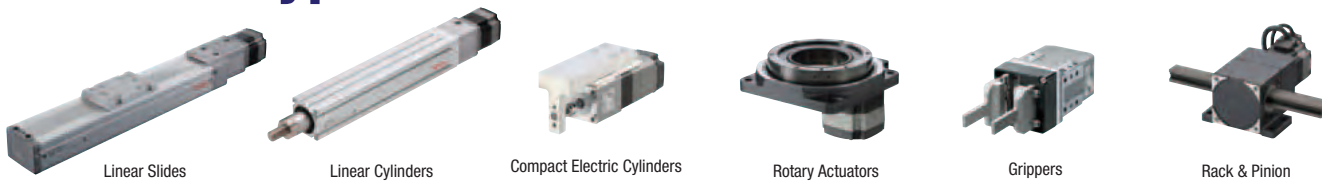
The home position can be easily set by pressing a switch on the drivers surface, which is saved by the Mechanical Absolute Encoder. In addition, home setting is possible with the **MEXE02** data setting software or external input signal. Home position is easy to adjust by moving the motor to a desired position manually.



## Motor/Geared Types



## Actuator Types



# MEXE02: A Tool to Make All Data Setting Easy

## ● Support Software **MEXE02** (Free Download)

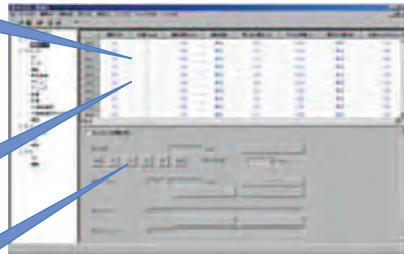
Fundamental settings, such as editing operation data and parameter settings, can be performed easily from a computer.

Sequence control is possible, which allows for easy system configuration without a host sequence.

This is a function that allows the traveling amount, speed, etc. to be displayed and input in the designated units

Simplified program with simple sequence function

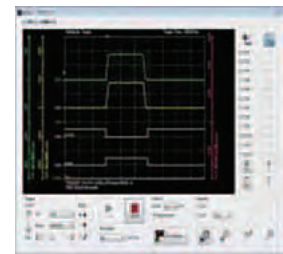
Settings can be copied and backed up



Easy to understand and easy to use  
Intuitive usability



Teaching can be performed from a PC



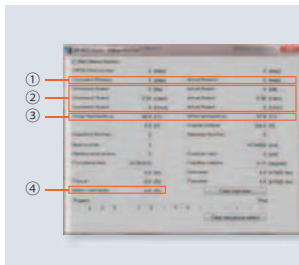
Built-in waveform monitor that can check signal input status

Easy to use, even for people with no electrical design experience



## ● Status Monitoring/Preventative Maintenance

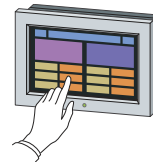
Besides operating speed, motor and driver temperature, load factor, and cumulative rotations, etc., status can also be monitored from the start of use. The desired signals can be output for these items, allowing for efficient maintenance.



- 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 with the output torque at the rotation speed at 100%.
- ④ Displays the current load factor rotation speed at 100%.

## ● Touch Screen (Commercially Available)

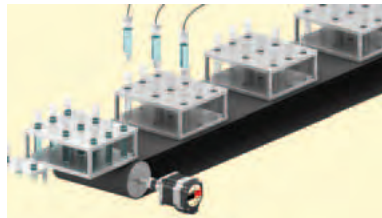
Used with stored data drivers, operating data can be directly overwritten from the touch screen, normally used for monitoring. This is useful for monitoring operation status and when settings must be changed due to set-up changes.



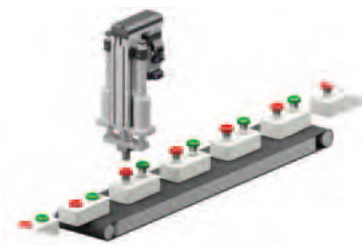
# Ideal Applications for $\alpha$ STEP



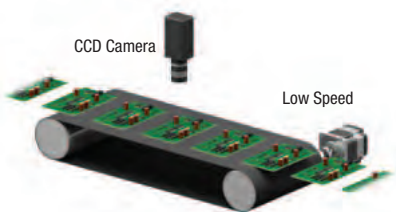
Complete synchronization with command



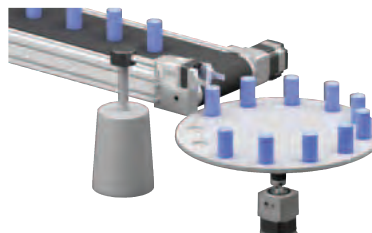
Frequent repetitive stop and start



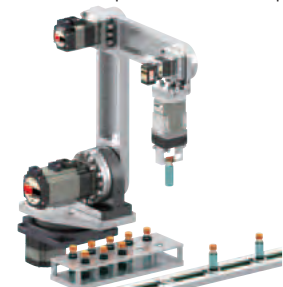
Push-motion operation with set torque



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



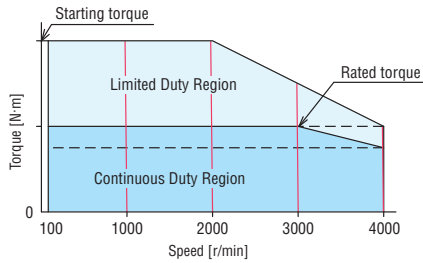
Large inertial load



Arm robot

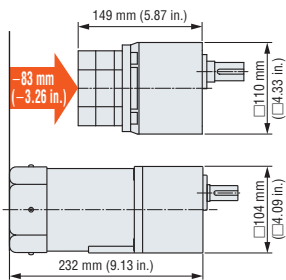
# Speed Control Motor Selection

## Brushless DC Motors

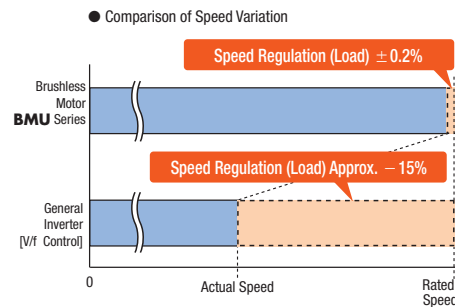


Brushless motors maximize system efficiency and can move heavy loads with a compact drive system. They provide high torque with a wide speed range. Compared to AC motors, Brushless motors save space, offer more speed stability, and reduce power consumption.

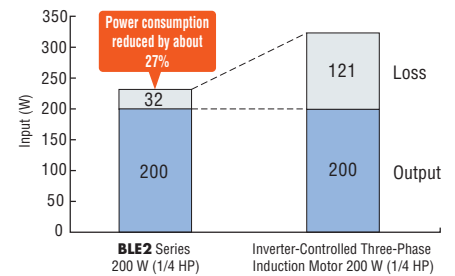
### More Compact



### Speed Stability



### Save Energy



## AC Input Motor and Drivers

- Power supply: Single-phase 100-120 or Single-phase/Three-phase 200-240 VAC
- Output power: **BLE2 Series** 30 W (1/25 HP) ~ 400 W (1/2 HP)  
**BMU Series** 30 W (1/25 HP) ~ 400 W (1/2 HP)
- Parallel shaft/ Right-angle hollow shaft gear/ Hollow shaft flat gear/ Round shaft (no gear)
- IP66 & IP67 types available
- Digital display built into driver
- Speed control range: 80 ~ 4000 r/min

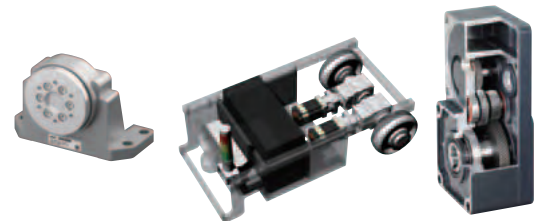


## DC Input Motor and Drivers



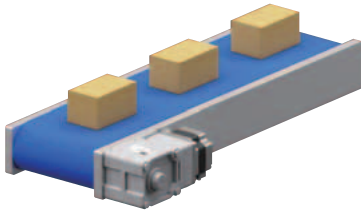
- Power supply: 24/48VDC
- Output power: **BLH Series** 15 W (1/50 HP) ~ 100 W (1/8 HP)  
**BLV Series R Type** 60 W (1/12 HP) ~ 400 W (1/2 HP)
- Parallel shaft gearhead / Parallel hollow shaft flat gearhead
- Compact and lightweight drivers
- Electromagnetic brake is available
- RS-485 communication is available

- Face surface mounting with the Flange Drive Adapter or side mounting with the Hollow Shaft Flat Gearhead

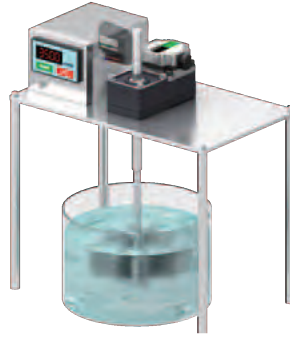




# Ideal Applications for Brushless Motors



Conveyor/ Transportation



Agitators/ Pumps/ Dispensers



Torque Limiting

---

# Standard AC Motors

## Simple Constant Speed Applications



**WK2 Series**

- Induction/ Reversible/ Torque Motors
- Overheat Protection Built-in
- Long Life - 10,000 hrs
- Right Angle Gearheads Available

## VFD/ Inverter Driver Speed Control Applications



**KIIS Series**

- Continuous Operation
- High Strength Gears, High Permissible Torque
- Long Life - 10,000 hrs
- Low Noise
- Improved Performance with VFDs

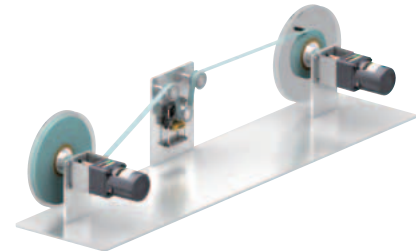
# Ideal Applications for AC Motors



Belt Conveyor



Pinch Conveyor



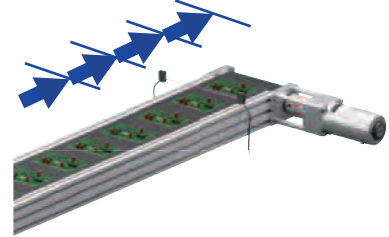
Tension Control

# Select by Movement

## Positioning

This provides a guide to the optimal products for applications that stop the load at the target position, or that decelerate before stopping the load at the target position.

\*To detect the load, it is necessary to install a sensor at each stop position and control it by a host device, etc.

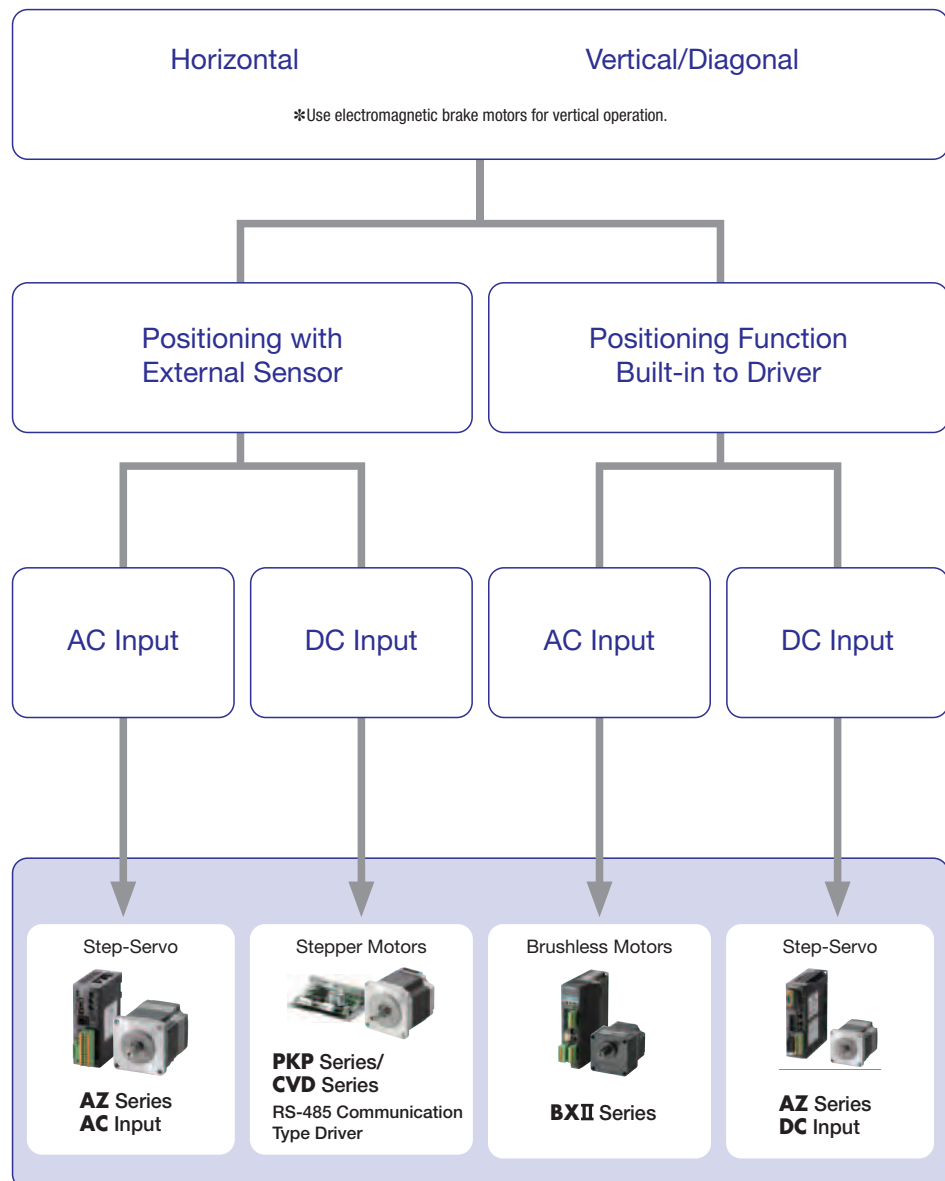


**STEP 1** Select Movement Direction

**STEP 2** Select Positioning Method

**STEP 3** Select Power Supply Input

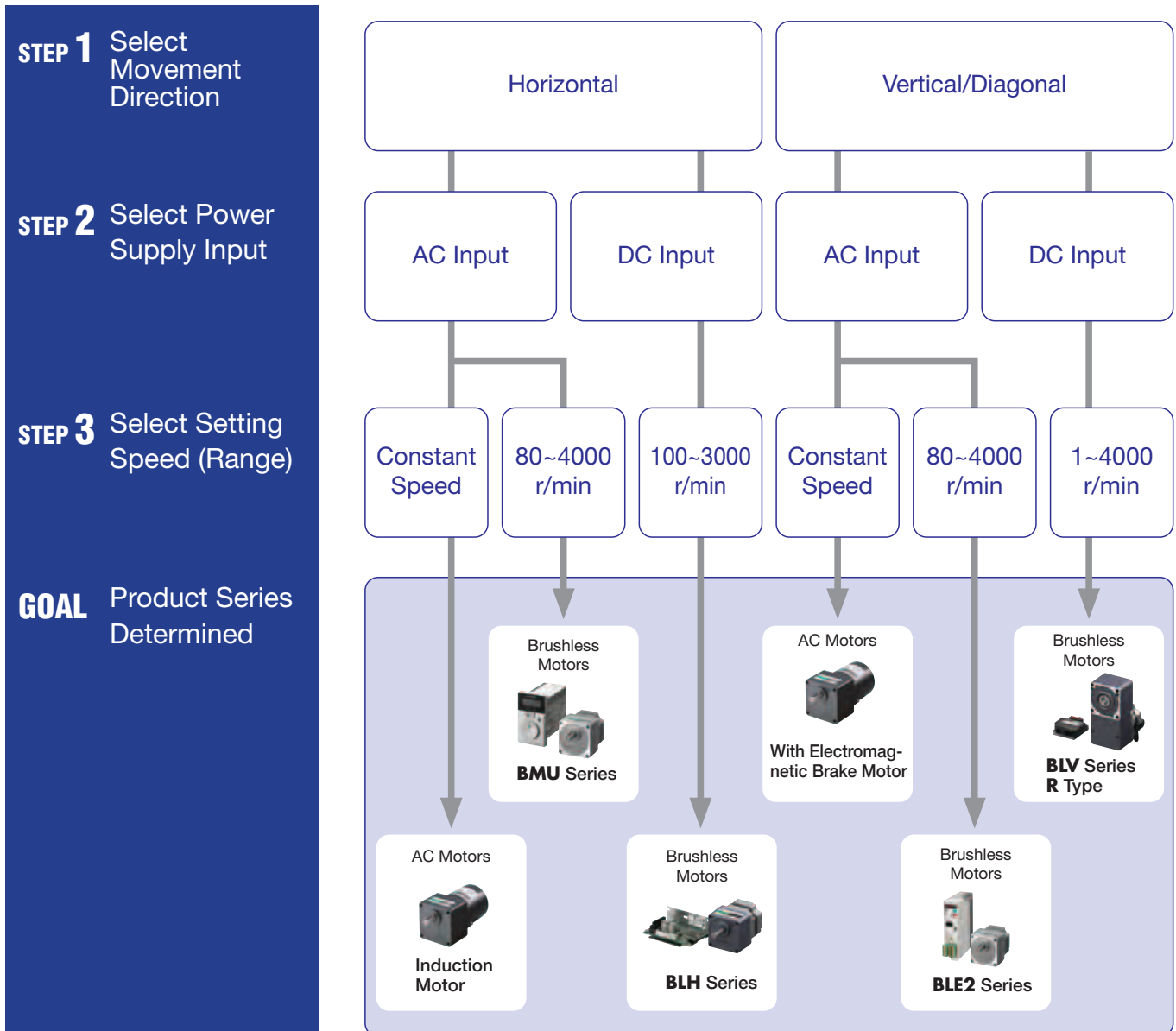
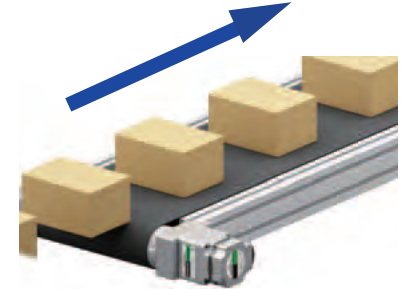
**GOAL** Product Series Determined



# Type and Application

## Continuous Operation

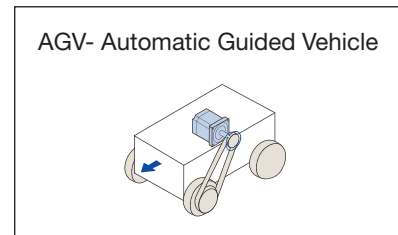
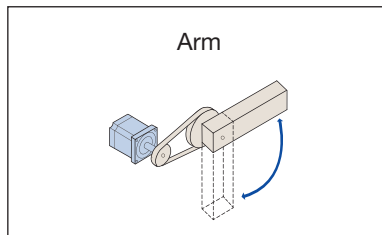
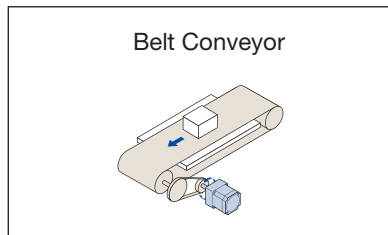
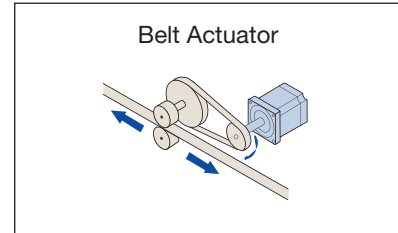
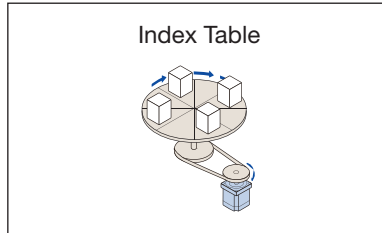
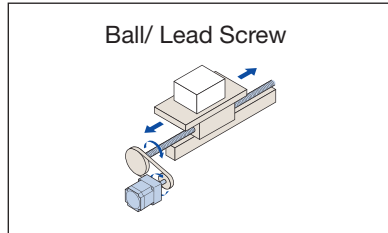
This provides a guide to the optimal products for applications that operate continuously at a constant speed, or switch to a previously set speed, such as automatic devices.



# Selecting a Product by Specification or Calculating Torque Values

## Online Motor Sizing Tool

Designed to make sizing a motor for your application faster and easier, use our online sizing tool to calculate the necessary torque, speed, stopping accuracy and system inertia when selecting a proper motor for the application.



## Sizing and Selection Service

Contact our Technical Support team and we will size the appropriate motor for your application based on your specifications and requirements at [techsupport@orientalmotor.com](mailto:techsupport@orientalmotor.com).

Specifications are subject change without notice. This catalog was published in November 2023.

# ORIENTAL MOTOR U.S.A. CORP.

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