

Robots that are Custom for Your Site

Tips for Developing an Optimal Production Process for Your Site

As the demand for robots is increasing at many different kinds of production sites, many companies are seeking to install robots on existing production lines, which is difficult to do with commercial industrial robots. In response to these challenges, Oriental Motor proposes the development of production processes tailored to each individual company.

Here's a demonstration using five equipment modules that enhances a production line and provide tips for realizing cost reduction, reduction of programming load, and space saving in automation.

Configuration of Demo Unit

Load insertion + Arrangement

Module 1

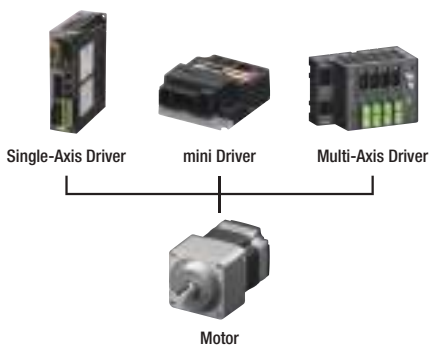
- Reduces Maintenance Expenses
- Shortens Time to Recovery
- Maintenance at the Part Level
- Maintenance-Free

Motors and Actuators that Help Achieve Your Vision

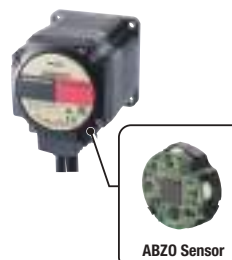
α STEP AZ Family

The AZ Family is a group of controlled motors and linear & rotary actuators equipped with ABZO sensors, all with the same driver interface. Unification of wiring, control and maintenance has been achieved, as well as workload reduction and time saving. This product group is recommended for future automation projects.

α STEP AZ Family



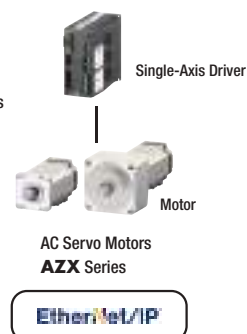
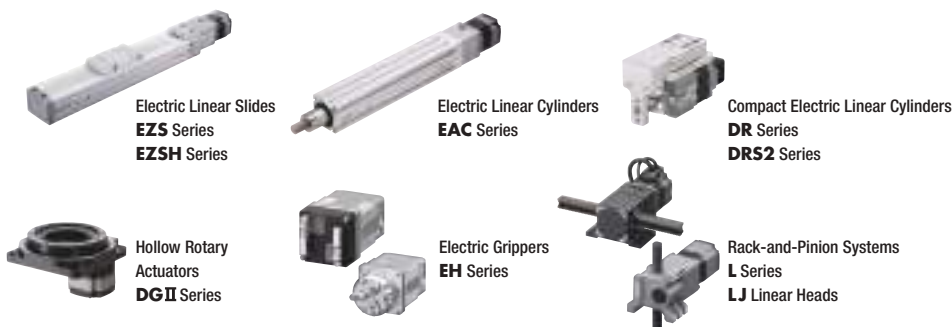
Built-in Battery-Free Multi-Turn Absolute Sensor



Load Environment

Linear & Rotary Actuators Equipped with AZ Series

Related Products

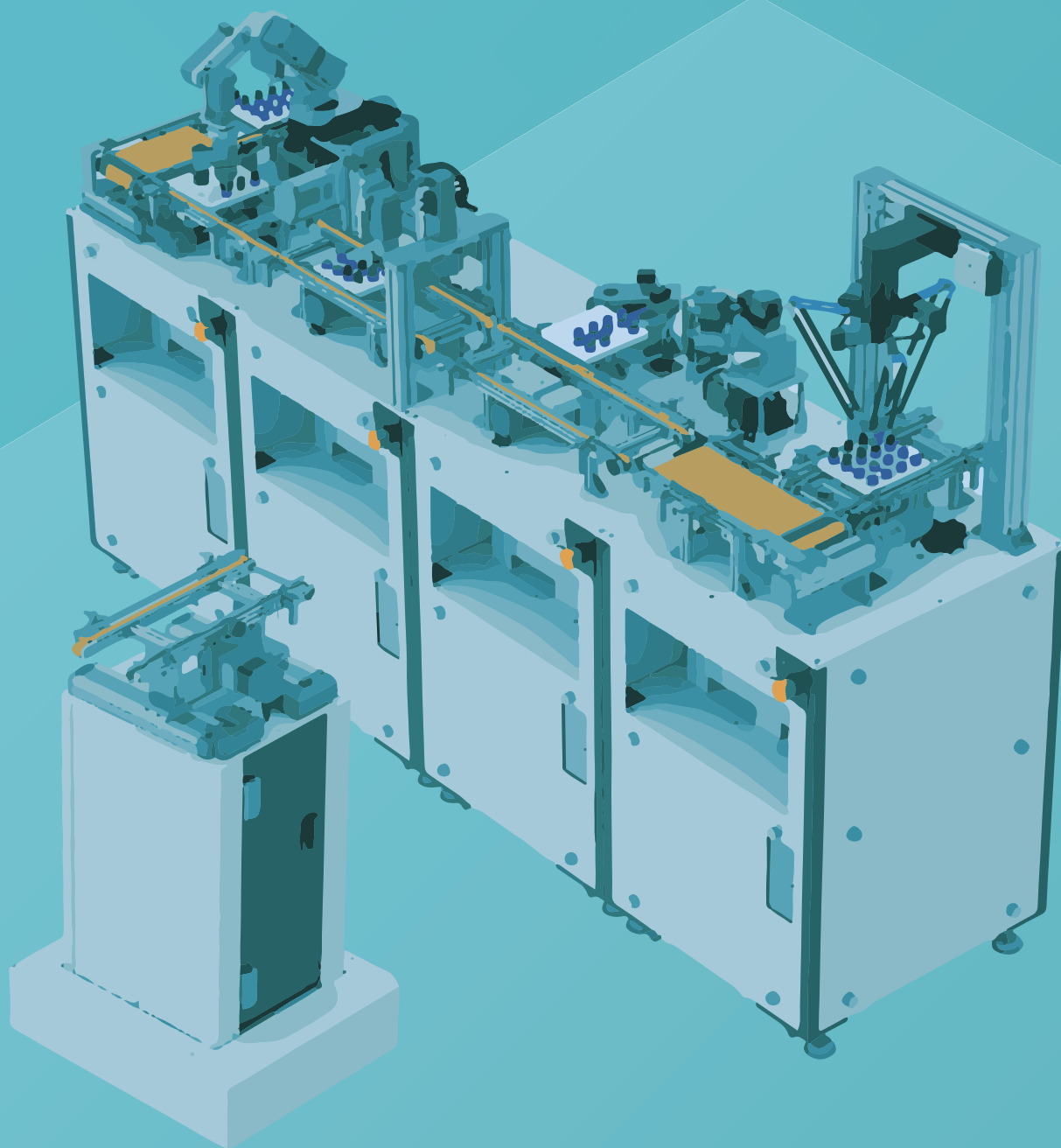


●The drivers that can be used vary depending on the product.

Orientalmotor

Custom Automation is Possible!

Tips for Developing an Optimal Production Process for Your Company



AGV/AMR

Compatible with battery power operation
Load changeover with high-accuracy stopping
Load held when stopped

α STEP AZ Series DC Power Supply Input
AZM66AKH-TS7.2U
mini Driver
AZD-KR2D

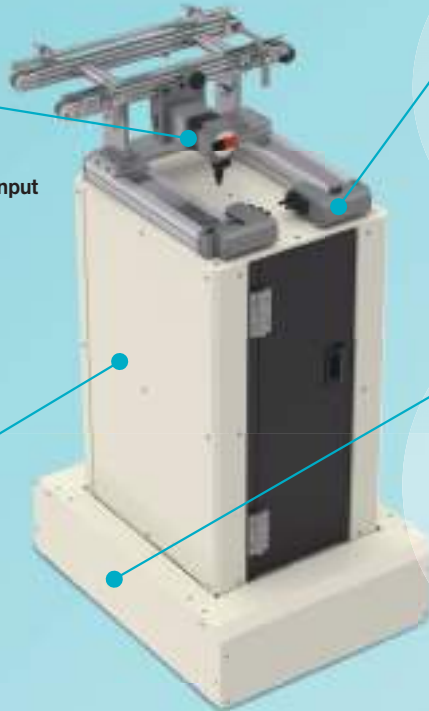


Compact driver reduces control panel space and makes equipment smaller

Brushless Motor
BLV Series R Type



α STEP AZ Series mini Driver



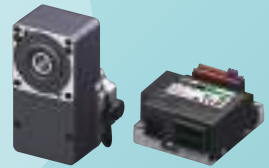
Supports battery power operation
Position adjustment via synchronous operation

Electric Linear Slide
EZS Series
EZSM4RD025AZAK
EZSM4LD025AZAK
mini Driver
AZD-KR2D



Supports battery power operation
Stable speed and smooth start/stop with wheel drive shaft controllable from 1 r/min

Brushless Motor
BLV Series R Type
BLMR5100K-30FR-B
BLVD-KRD



Modbus^(RTU)

CANopen[®]

Compatible with 24~48 VDC Batteries

A list of the components and the specifications of the demonstration equipment are available.



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Hint

Space Saving

Create Various Transportation Robots Tailored to the Environment

Automation of transportation robots require stable speeds, direction changes in narrow passageways, compactness and light weight. Automation on the cart, including bucket transfer and processing, can be realized with small, lightweight, battery-driven motors and drivers.

●Brushless motor BLV Series R Type

Compatible with battery power operation Compact installation, motors and gears can directly connect to wheels

Has a load-bearing capacity that allows for larger loads, as well as robot and conveyor mounting.

Top Mounting: Flange Output Head

Side Mounting: Hollow Shaft Flat Gear

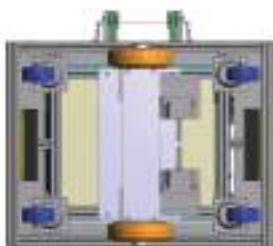


Permissible Radial Load
1500 N (153 kgf)



Permissible Radial Load
Max. 2040 N (208 kgf)

«Layout example»



●Stable driving, stopping and avoidance

Speed control from 1 r/min can be performed with the motor shaft, allowing operation with a large speed difference between the left and right drive wheels for small-radius turns. This also ensures smooth starting and stopping.



Improved resolution ensures more accurate positioning operations



Stopping accuracy during positioning operation
 $\pm 0.72^\circ$ on the motor shaft and around $1 \sim 2^\circ$ on the gearhead output shaft

■Range of operating voltage: 15~55 VDC*

Continued operation with limited speed and torque, even when battery voltage drops

■Different data can be sent/received for each axis together, resolving communication delays between axes

*400 W type is 48 VDC, range of operating voltage is 30~55 VDC.

Become a Robot Master in Just 3 Steps

Robot Controller MRC01

This is a robot controller that allows for a custom-built robot to be easily controlled with the 3 steps of "Initial setup", "Operation programming" and "Operation check". It can be connected to **AZ Series** motors and **AZ Series** equipped linear & rotary actuators.

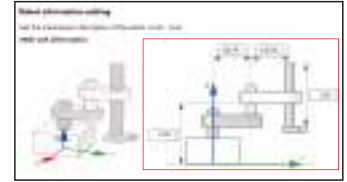
Step 1

Easy Setup with Step by Step Guidance.



- Follow the steps to set up
Proceed through initial setting of the robot by following the wizard menu.

- Input dimensions (arm length, etc.) with the help of the illustration
Dimensions are entered directly into the input spaces on the illustrations.



Step 2

Say Goodbye to Ladder Logic! Operation Programming with Item Selection.

- Drag and drop the required commands
Select the necessary action from the "Command" column, drag and drop into the "Sequence" column, then the "Command Setting" column is displayed.



- Target position and speed setting
Specify the coordinates and traveling amount of the target position and enter the speed in the command setting field.

Step 3

Check Operation with an Online 3D Simulator.

- The robot's operation program can be checked using a 3D simulator.
The program can be checked easily before the actual robot is activated.



Load assembly + Pressing

Module 2

External Inspection of Load

Module 3


Load Disassembly (due to load environment)

Module 4

Load (tray) Transportation

Module 5

AGV/AMR

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Load Disassembly

Compatible with parallel link control
Achieve high throughput takt time with agile motion control

Robot Controller
MRC01
MRC Studio
(Programming Software)



A 30 mm frame size harmonic geared type motor is adopted for higher precision, smaller size, and lighter weight

α STEP AZ Series
AZM24AK-HS50



Compact, energy-saving, stable speed and easy operation with dial

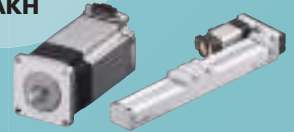
Brushless Motor
BMU Series
BLM230HP-10S
BMUD30-A2



Lifting and swiveling mechanism fits in conveyor gap for load grip adjustment

Lifting: Electric Linear Slide **EZS Series**
EZSM3RD005AZMK

Swiveling: α STEP AZ Series
AZM66AKH



A list of the components and the specifications of the demonstration equipment are available.



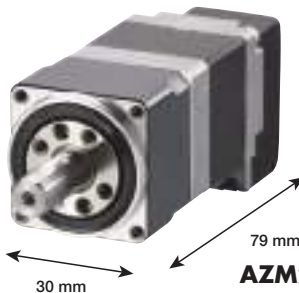
Hint Space Saving

Create a High-Throughput Operation, Tabletop-Size Parallel Link Robot

A compact parallel link robot is not commercially available. This can be achieved with the combination of small motors and the robot controller **MRC01**. Why not consider high-speed, high-accuracy positioning for handling small loads?

- Equipment miniaturization with the combination of three compact motors with a 30 mm frame size

Mass
0.24 kg

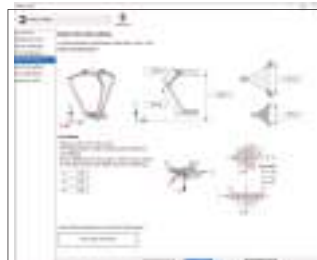


AZM24AK-HS50

- Self-maintains stop position
- High rigidity and torsion resistance
- When the inertial load is large or the acceleration/deceleration time is short, a geared motor is more stable than a standard motor

- The robot controller **MRC01** is compatible with parallel link robots
High-speed, high-accuracy positioning achieved

Parallel link operation can be configured simply by following the wizard.



External Inspection of Load

Three-link structure that does not interfere with other mechanisms
Low-floor design with cables running through the large hollow bore

Hollow Rotary Actuator
DG II Series
Axis 1: DGB85R36-AZAKR
Axis 2: DGM60-AZAK
Axis 3: DGM60-AZAK



Actuator integrating AZ Series and ball screw for space saving and lighter weight

Compact Electric Cylinder
DR Series
DR28T2.5BC03-AZAKL
DR28T2.5BC03-AZAKR



Non-backlash gears eliminate shaft misalignment

Reference: Harmonic Gear
AZM24AK-HS50 or Equivalent
AZM46AKH-HS50 or Equivalent

For gripping in tight spaces

Electric Gripper
EH Series
EH4-AZAKH



Z-axis placed at the base to reduce head weight

Rack-and-Pinion System
AZ Series Equipped L Series
LM2F200AZMK-1



A list of the components and the specifications of the demonstration equipment are available.

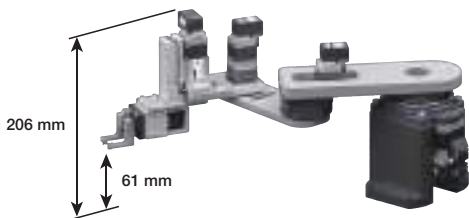


Hint Space Saving

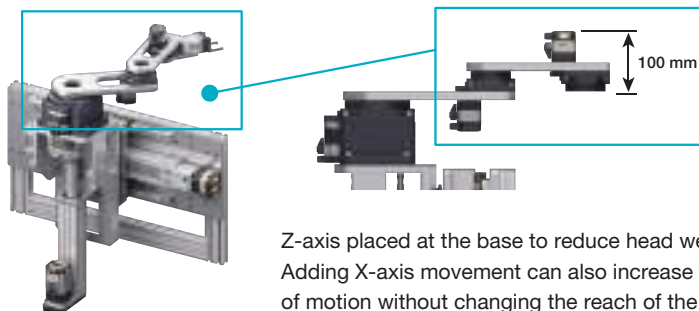
Consider Compact, Low-Floor, Automatic Devices that Match the Existing Equipment

If further automation and improved efficiency in a limited space is desired, such as next to industrial robots or in existing equipment, one idea is to design and install a compact robot that fits the equipment. Why not consider creating a robot that can scratch an itch that finished robot products can't?

Low floor design using linear & rotary actuators



Low-floor, horizontal articulated robots can be configured with compactly designed motors and actuators.



Z-axis placed at the base to reduce head weight. Adding X-axis movement can also increase the range of motion without changing the reach of the arm.

Compact driver and compact controller save space in the control panel

Compact drivers are available to save space, even in multi-axis configurations.



Load Assembly + Pressing

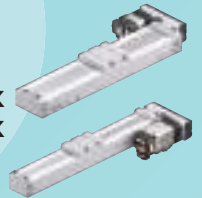
Palletizing function greatly reduces program lines

Robot Controller
MRC01
MRC Studio (Setting Software)



Highly rigid cantilever mechanism
Motor section reversed to save space

Electric Linear Slide
EZS Series
X-axis: **EZSM6D015AZAK**
Y-axis: **EZSM4RD015AZAK**
Z-axis: **EZSM3LD005AZMK**



For gripping in tight spaces

Electric Gripper
EH Series
EH4-AZAKH



For pressing with fine positioning and fine torque adjustment in 0.1% increments of operating current

Compact Electric Cylinder
DRS2 Series
DRSM42LG-04A2AZMK



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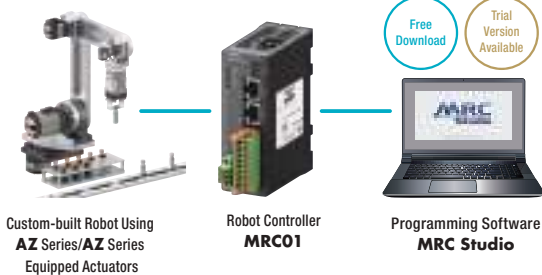


Hint Reduction of Program Lines

Reduced Programming Load with Ladder-less Controller

The difficulty of programming and controlling equipment with multiple interlocking axes is a hurdle to building a robot. Oriental Motor offers not only motors and actuators that reduce the design load but also controllers and programming software for easy control. This reduces the work and helps realize the vision.

- Even inexperienced robot users can program and control immediately
Mechanism equipped with robot controller **MRC01** and **AZ Series**



Just choose the necessary operation command for the robot with the corresponding icon



- Palletizing function greatly reduces program lines

With **MRC01**, the number of cells, pallet dimensions, and operation paths can be intuitively set while viewing illustrations. Dedicated palletizing commands significantly reduce the number of program lines, contributing to shorter coding and debugging times.



Compatible Robots

| Vertical Articulation | Horizontal Articulation (SCARA) | | Cartesian | ORIM VEXTA Robot | End Effector | |
|---|---|--|--------------------------------------|----------------------|-----------------------------|-----------------------|
| | | | | | | |
| 3 link base axis swivels + Rz axis | 3 link linear motion of base axis + Rz axis | 2 link elevating end axis + Rz axis | 2 link elevating base axis + Rz axis | X-Y-Z | Please see the OVR pamphlet | Linear motion gripper |
| Other: 3 link no base axis, 3 link base axis swivels, 3 link linear motion of base axis | | Other: 2 link no elevating axis, 2 link elevating end axis, 2 link elevating base axis, 2 link no elevating axis + Rz axis | | | | Rotation |
| | | | | Other: X-Y, X-Z, Y-Z | - | - |

Load Insertion + Arrangement

Self-maintaining robot using **AZ Series motor**

Vertical Articulated Robot Arm
ORIMVEXTA CO., LTD. **OVR5035K1-V**

αSTEP AZ Series
AZM66MKH, etc.



Verify and align workpiece by capturing image sensor information

Robot Controller
MRC01
MRC Studio
(Programming Software)



Large hollow bore diameter can be used for robot cable wiring
High strength and rigidity to withstand large moment loads

Hollow Rotary Actuator
DGII Series
DGB130R36-AZAKL



For lifting in tight spaces

Electric Linear Slide
EZS Series
EZSM3RD005AZMK



Triple-jaw/finger mechanism for gripping round loads

Electric Gripper
EH Series
EH4T-AZAKH



A list of the components and the specifications of the demonstration equipment are available.



Hint Cost Reduction

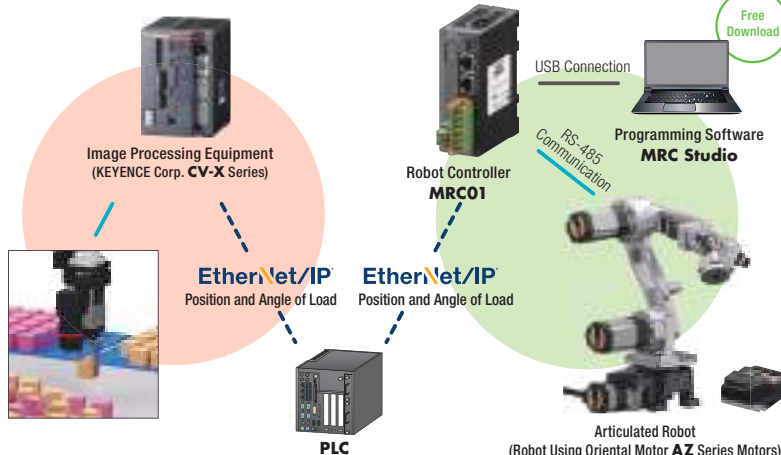
Consider Self-maintaining Robots

When a robot malfunctions, it is typical for the manufacturer or supplier to provide maintenance support, which is both time-consuming and costly. Ideas for reducing costs include the introduction of self-maintaining robots and in-house production of the robots themselves.

- Control robots easily with the **MRC01** controller
Calibration function facilitates vision sensor linking

■ Load position and angle information acquired with camera

■ Converted to robot coordinates for operation



Robot Vision Sensors, etc. Reduce System Configuration Costs

For robots using **AZ Series motors**, the robot controller **MRC01** enables the construction of a robot vision system in a relatively inexpensive configuration.

- Design-free, self-maintaining robots

Vertical Articulated Robot Arm OVR
Max. horizontal reach length: 480, 680, 880 mm

ORIM VEXTA
ORIMVEXTA CO., LTD.



Part of Oriental Motor Co., Ltd. /
Trading company that handles drive parts for FA equipment.

- Robot arm with parallel link mechanism
- Stable transport of parts in a constantly horizontal position
- Motor and arms can be easily replaced
- Compatible with ISO9409-compliant end effectors