Product Guide

**αSTEP** Hybrid Control System

- Linear & Rotary Actuators
- Network – Controllers
- Servo Motors
- Stepper Motors
- Brushless Motors
- Standard AC Motors
- Cooling Fans

2020

2021
Bringing Oriental Motor to the Global Market

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

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

**αStep® Hybrid Control System**
- Closed Loop
- Positioning, Speed, Torque Control
- Absolute Type
- Electromagnetic Brake Types
- Geared Types

**Linear & Rotary Actuators**
- Transport
- Push/Pull
- Lifting
- Gripping
- Rotating
- Electromagnetic Brake Types

**Network – Controllers**
- EtherNet/IP
- EtherCAT
- Modbus (RTU)
- CoLink
- Single Axis Controller

**Servo Motors**
- Standard
- Electromagnetic Brake Types
- Geared Types

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

**Brushless Motors**
- AC Input
- DC Input
- Electromagnetic Brake Types
- Geared Types
- RS-485 Communications

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

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

**Short Lead Times**

*Delivering What is Needed, When it is Needed.*
Our manufacturing system allows the manufacturing of an order with little notice, in any quantity requested. Additionally, our one-by-one process allows us to manufacture one product as easily as one hundred.
Oriental Motor Corporate Overview

Company ORIENTAL MOTOR CO., LTD.
Founded 1885
Established 1950
Representative President Eiji Kawahito
Capital 4.1 billion yen
Sales Consolidated 58.2 billion yen (At the end of March 2019)
Number of Employees Consolidated 3,200 (At the end of March 2019)

Company Activity Development, manufacture and sale of small precision motors and electronic circuits for motion control
Head Office 4-8-1, Higashiueno, Taito-ku, Tokyo, 110-8536, Japan

R&D Center Tsuruoka-Chuo Plant
Factories Tsuruoka-Chuo Plant
Soma Plant
Tsuruoka-Nishi Plant
Tsukiwa Plant
Soma Plant
Kashiwa Plant
Tsuchiura Plant
Kofu Plant
Takamatsu-Kozai Plant
Takamatsu-Kokubunji Plant

Manufacturing Technology R&D Center (Joso, Ibaraki)

Tsuruoka-Chuo Plant

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

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

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

Tsuchiura Plant
Development and manufacturing of gearheads and motorized actuators.

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

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

Takamatsu-Kozai Plant
Development and manufacturing of stepper motors.

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

Quality

In order to meet all motion control needs, we expanded our product line. Our accumulated technological excellence reflects our long years of dedication to quality. With our strengths, such as high torque, high precision, long life, low noise and ease of selection, our established systems aim to produce products that our customers can rely on.

Speed

You can order the products listed in our catalog or website anytime, anywhere and in any quantity you need. We deliver orders of any size, from one piece or more, with the shortest lead-times. With our stable production, quality control and logistics systems, we relentlessly pursue improvements and excellence in order to continue providing our products and services to our customers all over the world.

Product & Technology Training

On-Site Technical Seminars
Oriental Motor offers in-person training and product demonstrations at your location. Contact your local sales office or our Technical Support Team for more information or to schedule an on-site training seminar.

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

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

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

Interested in Learning How the Products Work? Contact Us to Find Out More.

By Phone
In a hurry or need to talk with a member of our full-time staff? Give us a call!

Customer Support Center

- Toll-free
  USA/Canada: TEL: 800-468-3982
  Mexico: TEL: 01-800-681-5309
- Hours: Monday to Friday 8:30am EST to 5:00pm PST

Website
For online inquiries, product name and technical information searches, please use our website.

www.orientalmotor.com
Find the Right Solution from Approximately 50,000 Products

White Papers
Learn more about the technology used in our products.

Engineering Resources
Refer to videos, blog, and forum for motion control tips.

Order Online
Convenient online ordering is available.

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

Motor Sizing
Easily calculate motor requirements for specific applications.

Search
Search by part number, keyword, or specification.

Live Chat
Live chat is available during regular office hours.

For technical information searches, please use our website.

Q & A Forum
Online Inquiries
On Demand Technical Videos

Contact Us

By Live Chat
www.orientalmotor.com
“Need Help?” popup
Available - Monday to Friday,
8:30am EST to 5:00pm PST

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

By Phone
Customer Support Center
USA/Canada: 800-468-3982
Mexico: 01-800-681-5309

Oriental Motor Offers:
Fast Delivery
No Minimum Order Quantity
Dedicated Support
**Hybrid Control System**

**αSTEP** is a “hybrid” stepper motor-based motor & driver that together, performs independent control which, combines the advantages of “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.

There are two base motor / driver types within the αSTEP family of products. The AZ Series features an absolute Sensor and the AR Series features a resolver based sensor.

### Performance

Highest starting and running torque allowing for quick motion. No tuning required. Continuous duty.

“Rated output” is not listed because the αSTEP has no “rated speed.” Refer to the graph to compare rated torque of AZ Series to watts of servo motor’s rated output torque.

![Graph showing torque vs. speed for AZM66 and AZM69 motors and Servo Motors 200 W and 400 W]  

- **Frame Size 60 mm (2.36 in)**
- **AZM66**
- **AZM69**
- **Servo Motor 200 W (Rated torque)**
- **Servo Motor 400 W (Rated 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.

### Ideal Applications for αSTEP

- Complete synchronization with commands
- Complete stop during standby and maintenance of position (No hunting)
- Frequent repetitive starting and stopping
**αSTEP Stopping Accuracy**

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

![Graph showing stopping accuracy comparison](image)

**Support Software MEXE02**

- **Operating Data & Parameter Settings**
  Setting of operation data and parameters easily via computer.

- **Teaching & Remote Operation**
  The operation command information can be input directly into the driver.

- **Various Monitoring Functions**
  - **I/O Monitoring**
    Used for post-wiring I/O checks or I/O checks during operation.
  - **Waveform Monitoring**
    Helpful at start-up or adjustments, the operational state can be checked by an oscilloscope-like image.
  - **Alarm Monitoring**
    When an abnormality occurs, the details of the abnormality and the solution can be checked.

Available for free download on the website.

**Examples**

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

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**Stopping accuracy of αSTEP**

<table>
<thead>
<tr>
<th>Rotation angle [˚]</th>
<th>Stop Position Accuracy [˚]</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>0.01</td>
</tr>
<tr>
<td>60</td>
<td>0.02</td>
</tr>
<tr>
<td>120</td>
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</tr>
<tr>
<td>180</td>
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</tr>
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</tr>
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</tr>
<tr>
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Actual values are within ±0.02°

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

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Actual values are within ±0.02°

The stopping accuracy of an AC servo motor is ±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

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Actual values are within ±0.02°

**Examples**

- **Transfer of large inertial load**
  - Low-speed operation even at a speed near 0 r/min
  - Transfer of large inertial load

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

Available for free download on the website.
Advantages of the AZ Series

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

- **Mechanical-Type Sensor / Multiple-Rotation Absolute System**
  1800 rotations the driver knows where the motor position is.
  No return to home is necessary.

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

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

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

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

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

No External Sensors Required with the AZ Series

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

Shortened Reset Time ① High Speed Return-to-Home

Because return-to-home is possible without using an external sensor, return-to-home can be performed at high speed without taking the sensor sensitivity into account, allowing for a shortened machine cycle.

Previous Home Detection for Control Motor

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

Return-to-Home Operation of AZ Series

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

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

If the power shuts down during a positioning operation, the positioning information is retained. For built-in controller types, positioning operations can restart without performing a return-to-home operation when recovering from an emergency stop of the production line or a blackout.

Built-in Controller Type

Can be Restarted without Returning to Home
AZ Series Driver Types

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

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

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

Actuator Types

- **Linear Slides**
- **Linear Cylinders**
- **Rotary Actuators**
- **Rack & Pinion**
- **Compact Electric Cylinder**
- **Gripper**
**AZ Series**

- High Response, operates without any delay.
- Frequent Starting and Stopping is Possible
  AZ Series operates synchronously with pulse commands. Excellent acceleration performance and response.
- No Tuning Required

**AC Input – Single Axis**

- Frame Sizes: 1.65 in (42 mm), 2.36 in (60 mm), 3.35 / 3.54 in (85 / 90 mm)
- Holding Torque: 43 oz-in – 974 lb-in (0.3 – 110 N·m)
- Resolution (P/R): 1000
- Options: Electromagnetic Brake
- Gear Types: Tapper Hob / Planetary / Right Angle / Harmonic
- Driver Types: Pulse / RS-485 / EtherNet/IP / EtherCAT
- Power Supply: VDC 24/48
- Starting From (Motor + Driver + Cable): $873.00

**DC Input – Single Axis**

- Frame Sizes: 0.79 in (20 mm), 1.10 in (28 mm), 1.65 in (42 mm), 2.36 in (60 mm)
- Holding Torque: 2.8 oz-in – 354 lb-in (0.3 – 40 N·m)
- Resolution (P/R): 1000
- Options: Electromagnetic Brake
- Gear Types: Tapper Hob / Planetary / Right Angle / Harmonic
- Driver Types: Pulse / RS-485 / EtherNet/IP / EtherCAT
- Power Supply: VDC
- Starting From (Motor + Driver + Cable): $702.00

**Multi-Axis (DC Input)**

- 2, 3 or 4 axis type

**Advantages for Uniting Four Drivers into One Package**

- Space saving, reduced wiring
- Reduced Cost

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

- **αSTEP Family**
- No Hunting, No Tuning
- Battery Back Up
- Stored Data, Pulse Input Type
- RS-485 / Monitoring
- Continuous Operation

Build an absolute system that detects absolute positions by connecting the accessory battery (sold separately).

*For use with Stored Data (Network) type

### AC Input

**AR Series**

<table>
<thead>
<tr>
<th>Frame Sizes</th>
<th>1.65 in (42 mm), 2.36 in (60 mm), 3.35 / 3.54 in (85 / 90 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding Torque</td>
<td>42 oz-in—327 lb-in (0.055—37 N·m)</td>
</tr>
<tr>
<td>Resolution (P/R)</td>
<td>1000</td>
</tr>
<tr>
<td>Options</td>
<td>Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Tapper Hob / Planetary / Right Angle / Harmonic</td>
</tr>
<tr>
<td>Driver Types</td>
<td>Pulse / RS-485</td>
</tr>
<tr>
<td>Power Supply</td>
<td>VDC</td>
</tr>
<tr>
<td></td>
<td>Single-Phase (VAC)</td>
</tr>
<tr>
<td></td>
<td>100-120 / 200-240</td>
</tr>
<tr>
<td></td>
<td>Three-Phase (VAC)</td>
</tr>
<tr>
<td></td>
<td>200-240</td>
</tr>
</tbody>
</table>
| Starting From (Motor + Driver + Cable) | $788.00

### DC Input

**AR Series**

<table>
<thead>
<tr>
<th>Frame Sizes</th>
<th>1.10 in (28 mm), 1.65 in (42 mm), 2.36 in (60 mm), 3.35 / 3.54 in (85 / 90 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding Torque</td>
<td>7.8 oz-in—442 lb-in (0.055—50 N·m)</td>
</tr>
<tr>
<td>Resolution (P/R)</td>
<td>1000</td>
</tr>
<tr>
<td>Options</td>
<td>Electromagnetic Brake</td>
</tr>
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</tr>
<tr>
<td>Power Supply</td>
<td>VDC</td>
</tr>
<tr>
<td></td>
<td>24/48</td>
</tr>
</tbody>
</table>
| Starting From (Motor + Driver + Cable) | $546.00
Electric Actuators

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

- **Electric Cylinder**

- **Electric Cylinder**

- **Electric Cylinder**

- **Electric Cylinder**

- **Electric Cylinder**

- **Electric Linear Slides**

  - **EAS Series**

  - **Reversed Motor Type**

  - **Space saving due to the reversed motor.**

- **Electric Cylinders** **EAC Series**

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

  - **Space-saving due to the reversed motor.**

- **Electric Linear Slides** **EAS Series**

  - **X-Axis**

  - **Y-Axis**

  - **Z-Axis**

- **Compact Electric Cylinder**

- **Gripper**

  - **Gripper Arms not included**

- **Rack & Pinion**

- **Hollow Electric Rotary Actuator**

  - **Vertical Mount Type**

  - **Horizontal Mount Type**

  - **Large-Diameter Hollow Output Table**

  - **Makes Simple Wiring and Piping Possible**
Transportation

EZZS Series

EZZS Series: with AZ Series

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Speed (mm/s)</td>
<td>800</td>
</tr>
<tr>
<td>Max. Transportable Mass - Vertical (kg)</td>
<td>30</td>
</tr>
<tr>
<td>Max. Transportable Mass - Horizontal (kg)</td>
<td>60</td>
</tr>
<tr>
<td>Repetitive Positioning Accuracy (mm)</td>
<td>±0.02</td>
</tr>
<tr>
<td>Stroke Length (mm)</td>
<td>50 - 850</td>
</tr>
<tr>
<td>Power Supply</td>
<td>VDC 24/48</td>
</tr>
<tr>
<td>Single-Phase (VAC)</td>
<td>100-120 / 200-240</td>
</tr>
<tr>
<td>Three-Phase (VAC)</td>
<td>200-240</td>
</tr>
<tr>
<td>Starting From (Actuator + Driver + Cable)</td>
<td>$1,284.00</td>
</tr>
</tbody>
</table>

High Rigidity / High Accuracy Guide

LM Guide and Ball Retainer are registered trademarks of THK.

Traveling Parallelism of 0.03 mm or Less

High Strength, Space Savings

Straight Type

Reversed Motor Type

Shorter by more than 100 mm

When electromagnetic brake is installed

With or Without Guide Cover

Push / Pull

EZZS Series

EZZS Series: with AZ Series

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Max. Speed (mm/s)</td>
<td>600</td>
</tr>
<tr>
<td>Max. Transportable Mass - Vertical (kg)</td>
<td>30</td>
</tr>
<tr>
<td>Max. Transportable Mass - Horizontal (kg)</td>
<td>60</td>
</tr>
<tr>
<td>Repetitive Positioning Accuracy (mm)</td>
<td>±0.02</td>
</tr>
<tr>
<td>Stroke Length (mm)</td>
<td>50 - 300</td>
</tr>
<tr>
<td>Thrust Force (N)</td>
<td>400</td>
</tr>
<tr>
<td>Power Supply</td>
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<td>$1,058.00</td>
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Push / Pull / Transportation

DR Series
- Micromovement and High Positioning Accuracy
- 28 mm (PKP or AZ based motor)
- Compact, Space Saving

<table>
<thead>
<tr>
<th>28 mm: PKP or AZ Series - 42 / 60 mm: AZ Series</th>
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<tbody>
<tr>
<td>Frame Size (mm)</td>
</tr>
<tr>
<td>Max. Speed (mm/s)</td>
</tr>
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Gripping

EH Gripper: with AZ Series

| Maximum Grip Force (N) | 25 |
| Repetitive Positioning Accuracy (mm) | 0.02 |
| Backlash (mm) | 0.1 |
| Stroke (mm) | 25 (12.5 each side) |
| Maximum Speed (mm/s) | 156 (78 each side) |
| Push Speed (mm/s) | 20 (10 each side) |
| Minimum Travel Amount (mm) | 0.02 (0.01 each side) |
| Permissible Load (N) | 5 |
| Static Permissible Moment (N·m) | MP:1.2 MY:0.12 MR: 0.4 |
| Power Supply | VDC 24/48 |
| Starting From (Actuator + Driver + Cable) | $1,178.00 |

Up-Down / Side to Side

L Series: with AZ Series

| Frame Size (mm) | 60/80 |
| Max. Speed (mm/s) | 500 |
| Max. Transportable Mass (kg) | 100 (20 mm/s) |
| Max. Thrust Force (N) | 1008 (20 mm/s) |
| Max. Stroke Length (mm) | 1000 |
| Type | Horizontal / Vertical |
| Option | Brake |
| Power Supply | Single-Phase (VAC) 100-120, 200-240 Three-Phase (VAC) 200-240 |
| Starting From (Actuator + Driver + Cable) | $1,354.00 |
High Positioning Accuracy, Non-Backlash

**Vertical Mount: with AZ Series**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame Size (mm)</td>
<td>60/85/110/200</td>
</tr>
<tr>
<td>Diameter of Hollow Section (mm)</td>
<td>28/33/62/100</td>
</tr>
<tr>
<td>Permissible Torque (N·m)</td>
<td>50</td>
</tr>
<tr>
<td>Permissible Axial Load (N)</td>
<td>4000</td>
</tr>
<tr>
<td>Lost Motion</td>
<td>2 arcmin</td>
</tr>
<tr>
<td>Power Supply</td>
<td>VDC 24/48</td>
</tr>
<tr>
<td>Repetitive Positioning Accuracy</td>
<td>±15 sec / ±0.004°</td>
</tr>
<tr>
<td>Option</td>
<td>Electromagnetic Brake</td>
</tr>
<tr>
<td>Starting From (Actuator + Driver + Cable)</td>
<td>$1,396</td>
</tr>
</tbody>
</table>

**Horizontal Mount: with AZ Series**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame Size (mm)</td>
<td>85/130</td>
</tr>
<tr>
<td>Diameter of Hollow Section (mm)</td>
<td>33/62</td>
</tr>
<tr>
<td>Permissible Torque (N·m)</td>
<td>50</td>
</tr>
<tr>
<td>Permissible Axial Load (N)</td>
<td>2000</td>
</tr>
<tr>
<td>Lost Motion</td>
<td>6 arcmin</td>
</tr>
<tr>
<td>Power Supply</td>
<td>VDC 24/48</td>
</tr>
<tr>
<td>Repetitive Positioning Accuracy</td>
<td>±30 sec / ±0.008°</td>
</tr>
<tr>
<td>Option</td>
<td>Electromagnetic Brake</td>
</tr>
<tr>
<td>Starting From (Actuator + Driver + Cable)</td>
<td>$2,374.00</td>
</tr>
</tbody>
</table>
Overview

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

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

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

Different part numbers required

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

- 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.
Modbus (RTU)

Oriental Motor offers single axis Modbus (RTU) communication in our AZ, AR, RK, BLE, BLV Series 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, AR, RK, BLE and BLV Series 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 MEXE02 Support Software

Single Axis Programmable Controller

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

- Stand Alone - Pulse Generator
- Stored Program Type
- Store up to 100 Sequence Programs
- External Encoder Input
- USB Port Standard
- Direct Command Operation via CANopen
- 24 VDC
- List Price: $349.00

Gateways

Oriental Motor offers additional Gateway Network Converters.

*EtherCAT is a registered trademark licensed by Beckhoff Automation GmbH, Germany
*MECHATROLINK is a registered trademark of MECHATROLINK Members Association
*SSCNETIII/H is a registered trademark of Mitsubishi Electric Corporation
Servo Motors

Servo motors are specialized for high response, high precision positioning. From these high level of features, Servo motors can be used in a variety of equipment.

A rotation detector (encoder) is mounted on the motor and feeds the rotation position/speed of the motor shaft back to the driver. The driver calculates the error of the pulse signal or analog voltage (position command/speed command) from the controller and the feedback signal (current position/speed) and controls the motor rotation so the error becomes zero. The closed loop control method is achieved with a driver, motor and encoder, so the motor can carry out highly accurate positioning operations.

Servo Motor Types

**Standard**
This is the basic round shaft type motor. Motors are available in a variety of Sizes.

**Electromagnetic Brake Type**
These motors incorporate a non-excitation type electromagnetic brake. When the power is accidentally cut off due to a power outage or another unexpected event, the electromagnetic brake holds the load in position to prevent it from dropping or moving. Electromagnetic brake motors are available in a round shaft type or geared type.

**Geared Type**
These motors incorporate a gearhead with reduced backlash to make the most of the high controllability of the motors. The gearhead ensures highly accurate, smooth operation even in applications where a large load torque is received. The inertia of the load converted to the motor shaft is reduced by the square of the gear ratio, improving the start and stop responsiveness.

**Regeneration Operation**
When suddenly starting or stopping a vertical drive (gravitational operation) or big inertia, the motor goes into regeneration operation, working as a generator. For regeneration operation with the NX Series, use the regeneration unit, sold separately.
NX Series (AC Input)

- Tuning Free
- Easy Operation / Easy Handling
- 4 Control Modes (Position, Speed, Torque, Tension)
- High Strength Planetary Gear Option

Max Speed 5500

Basic settings and adjustments are made with switches and potentiometers on the front panel. This design allows for easy control without a computer, and even saves the hassle of complicated UP and DOWN key operations.

By using the support software (MEXE02), parameters can be changed, functions set, and monitoring performed to better suit your system.

- Operating Status Waveform Monitoring

NX Series

Slight vibration

Stops immediately with no vibration

AC Input

<table>
<thead>
<tr>
<th>NX Series</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>50 W / 100 W / 200 W / 400 W / 750 W</td>
</tr>
<tr>
<td>Rated Torque</td>
<td>22 oz-in–220 lb-in (0.159–25.7 N·m)</td>
</tr>
<tr>
<td>Max. Instantaneous Torque</td>
<td>67 oz-in–680 lb-in (0.478–77.2 N·m)</td>
</tr>
<tr>
<td>Resolution (P/R)</td>
<td>100 to 100,000 (Factory 1000)</td>
</tr>
<tr>
<td>Options</td>
<td>Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Planetary</td>
</tr>
<tr>
<td>Driver Types</td>
<td>Pulse Input</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Single-Phase (VAC) 100-115 / 200-230</td>
</tr>
<tr>
<td></td>
<td>Three-Phase (VAC) 200-230</td>
</tr>
<tr>
<td>Starting From (Motor + Driver + Cable)</td>
<td>$1,493.00</td>
</tr>
</tbody>
</table>

*Monitoring the operating status waveform requires the support software (MEXE02).
The support software can be downloaded from the website. Please contact us for details.
Oriental Motor offers a wide range of high torque stepper motors in frame sizes from 0.79 in. (20 mm) up to 3.54 in. (90 mm). Geared types, encoders and brake options and various motor windings are offered.

For increased 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**

---

Constant Current Driver Power Supply Voltage: 24 VDC With Clean Damper: \( J_{n} = 34 \times 10^{-7} \text{kg·m}^2 \) (Only for PK245DB)

PKP245D23B2 (Current: 2.3 A/Phase)

PK245DB (Current: 1.5 A/Phase)

---

Smallest Air Gap

Optimized Magnetic Design of Rotor/Stator

Larger Bearing Improved Strength

Larger Diameter Shaft

Higher Winding Density
PKP Series

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

PKP Series

| Frame Sizes               | 0.79 in (20 mm), 1.10 in (28 mm), 1.38 in (35 mm)  
|                          | 1.65 in (42 mm), 2.22/2.36 in (56/60 mm),  
|                          | 3.35 / 3.54 in (85 / 90 mm)                     |
| Holding Torque           | 2.8 oz-in—1062 lbf-in (0.02—120 N·m)            |
| Resolution (P/R)         | 2 Phase (1.8°/0.9°)                             |
|                          | 5 Phase (0.72°/0.36°)                           |
| Options                  | Flat Motor / Electromagnetic Brake / Encoder    |
| Gear Types               | Spur / Tapper Hob / Planetary / Harmonic        |
| Starting From (Motor)    | $45.00                                         |

CVD Driver

- Low Vibration with Full-Time Microstepping

CVD Series

| DC Input | 2 Phase (1.8°/0.9°)  
|          | 5 Phase (0.72°/0.36°) |
| Current (Amps) | 0.5—4.5°      |
| Smooth Drive    | 2048 per step |
| Power Supply    | VDC           |
| Input Current (Amps) | 0.5—4.8°   |
| Starting From (Driver) | $130.00 |

RKII Series

- High-Efficiency at a Low Price

RKII Series

| AC Input | 1.65 in (42 mm), 2.36 in (60 mm),  
|          | 3.35 / 3.54 in (85 / 90 mm)       |
| Holding Torque | 19.8 oz-in—460 lbf-in (0.14—52 N·m) |
| Resolution (P/R) | 500 (0.72°)          |
| Options         | Electromagnetic Brake / Encoder |
| Gear Types      | Tapper Hob / Planetary / Right Angle / Harmonic |
| Driver Types    | Pulse / Stored Data—RS-485 |
| Power Supply    | Single-Phase (VAC): 100-120, 200-240  
|          | Three-Phase (VAC): 200-240          |
| Starting From (Motor + Driver + Cable) | $473.00 |
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.

Constant Torque:
Speed is maintained even with changing loads

● Wide Speed Range: 80～4000 r/min

● Smaller than AC Motors

● ±0.2% Speed Stability

● Energy Savings

● Degree of Protection – IP66

● Connector Structure

● Selectable Cable Direction

Quick lock connector style is now available on our AC Input Brushless Motor Series (BMU/BLE2)

● Installation Method

Insert the connector
Turn down the lock lever
Connection complete
Hybrid Control
AZ Series / AR Series
Actuators
Network
Stepper Motors
Brushless Motors
Standard AC Motors
Before Selection / Warranty

Geared Options

<table>
<thead>
<tr>
<th>Parallel Shaft GFV Gear</th>
<th>Parallel Shaft JV Gear</th>
<th>Foot Mounted Parallel Shaft JB Gear</th>
<th>Right Angle Hollow Shaft JH Gear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radial Load</td>
<td>Radial Load</td>
<td>Radial Load</td>
<td>Radial Load</td>
</tr>
<tr>
<td>Axial Load</td>
<td>Axial Load</td>
<td>Axial Load</td>
<td>Axial Load</td>
</tr>
<tr>
<td>50:1 Gear Reduction; 3000 RPM at Motor</td>
<td>450:1 Gear Reduction; 3000 RPM at Motor</td>
<td>600:1 Gear Reduction; 3000 RPM at Motor</td>
<td>200:1 Gear Reduction; 3000 RPM at Motor</td>
</tr>
<tr>
<td>Radial (Overhung) Load</td>
<td>Radial (Overhung) Load</td>
<td>Radial (Overhung) Load</td>
<td>Radial (Overhung) Load</td>
</tr>
<tr>
<td>Axial (Thrust) Load</td>
<td>Axial (Thrust) Load</td>
<td>Axial (Thrust) Load</td>
<td>Axial (Thrust) Load</td>
</tr>
<tr>
<td>Rated Torque</td>
<td>Rated Torque</td>
<td>Rated Torque</td>
<td>Rated Torque</td>
</tr>
<tr>
<td>280 lb</td>
<td>1163 lb</td>
<td>1331 lb</td>
<td>772 lb</td>
</tr>
<tr>
<td>67 lb</td>
<td>154 lb</td>
<td>185 lb</td>
<td>176 lb</td>
</tr>
<tr>
<td>483 lb-in</td>
<td>3814 lb-in</td>
<td>5195 lb-in</td>
<td>1575 lb-in</td>
</tr>
</tbody>
</table>

Hypoid Gear

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

Helical Gear

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

Hollow Shaft Flat Gear (FR Type)

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

H1 Food-Grade Grease (IP66)

- Also available with KIS Series AC Motors.

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

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

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

**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 Option** | Parallel, Foot, Right Angle
**Power Supply** | Single-Phase (VAC)
---|---
**Output** | 100–120 / 200–240
**Three-Phase (VAC)** | 200–240
**Starting From (Motor + Driver + Cable)** | $335.00

**BLE2 Series**
- Easy Set up via Front Control Panel
- Side By Side Mounting
- Up to 16 Preset Speeds
- External DC Voltage Control
- MEXE02 Support Software
- IP66 Motors

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

**Output Power - Watts (HP)** | 30 W (1/25 HP) – 400 W (1/2 HP)
---|---
**Frame Size - mm (in.)** | 60 mm (2.36 in.) – 110 mm (4.33 in.)
**Speed Range (r/min)** | 80 – 4000
**Option** | Electromagnetic Brake / IP67 Type
**Gear Option** | Parallel, Foot, Right Angle
**Power Supply** | Single-Phase (VAC)
---|---
**Output** | 100–120 / 200–240
**Three-Phase (VAC)** | 200–240
**Starting From (Motor + Driver + Cable)** | $428.00

**The control panel cannot be removed from the driver.**

**BLE Series**
- Internal or External Potentiometer
- External DC Voltage
- RS-485 / Modbus (RTU)
- MEXE02 Support Software

**Output Power - Watts (HP)** | 30 W (1/25 HP) – 120 W (1/6 HP)
---|---
**Frame Size - mm (in.)** | 42 mm (1.65 in.) – 90 mm (3.54 in.)
**Speed Range (r/min)** | 80 – 4000
**Option** | Electromagnetic Brake
**Gear Option** | Parallel / FR Hollow Shaft
**Power Supply** | Single-Phase (VAC)
---|---
**Output** | 100–120 / 200–240
**Three-Phase (VAC)** | 200–240
**Starting From (Motor + Driver + Cable)** | $458.00

**BXII Series**
- Speed Control
- Position Control
- Torque Limiting
- MEXE02 Support Software

**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
**Gear Option** | Parallel / FR Hollow Shaft
**Power Supply** | Single-Phase (VAC)
---|---
**Output** | 100–120 / 200–240
**Three-Phase (VAC)** | 200–240
**Starting From (Motor + Driver + Cable)** | $760.00

The Display when the Load Factor is 50%
DC Input Motor and Driver

**BLH Series**

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

**BLH Series**

<table>
<thead>
<tr>
<th>Feature</th>
<th>BLH Series</th>
<th>BLV Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power - Watts (HP)</td>
<td>15 W (1/50 HP) – 100 W (1/8 HP)</td>
<td>200 W (1/4 HP) – 400 W (1/2 HP)</td>
</tr>
<tr>
<td>Frame Size - mm (in.)</td>
<td>42 mm (1.65 in.) – 80 mm (3.54 in.)</td>
<td>90 mm (3.54 in.)</td>
</tr>
<tr>
<td>Speed Range (r/min)</td>
<td>80 – 3000</td>
<td>80 – 4000</td>
</tr>
<tr>
<td>Option</td>
<td>Electromagnetic Brake</td>
<td>Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Parallel / FR Hollow Shaft</td>
<td>Parallel / FR Hollow Shaft</td>
</tr>
<tr>
<td>Power Supply</td>
<td>VDC</td>
<td>VDC</td>
</tr>
<tr>
<td>Starting From (Motor + Driver + Cable)</td>
<td>$264.00</td>
<td>$632.00</td>
</tr>
</tbody>
</table>

**BLV Series**

- Communications Control Through I/O or RS-485
- 80 to 4000 r/min
- Torque Limiting & Deceleration Stop
- **MEXE02** Support Software

**Hollow Shaft Flat Gear (FR Type) for AGV / AMR**

When considering AGV/AMR’s drivetrain design, Brushless DC motors offer a compact size and a wide speed range. Flat torque performance can be matched with the FR gearhead.

DC Brushless motors offer constant torque, accurate stopping (load holding with brake) and are highly efficient for longer battery life.

**Stop and Hold Using Electromagnetic Brake**

The stop position can be maintained when stopping the equipment to load and unlock or process work pieces or hold the loads during unexpected occurrences such as power outages.

- Cannot be used for vertical drive applications such as gravitational operation.
- Customer must provide the electromagnetic brake control.
Standard AC Motors

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

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

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

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

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

Constant Speed AC Motors

Induction / Reversible Motors

World K Series

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

<table>
<thead>
<tr>
<th>World K Series</th>
<th>Induction, Reversible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>1 W (1/750 HP) – 90 W (1/8 HP)</td>
</tr>
<tr>
<td>Frame Size</td>
<td>42 mm (1.65 in.) – 90 mm (3.54 in.)</td>
</tr>
<tr>
<td>Options</td>
<td>Terminal Box / Conduit Box / Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>150 W (1/5 HP) 2-Pole (no Gear type)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Single-Phase (VAC) 100-120 / 220-230</td>
</tr>
<tr>
<td></td>
<td>Three-Phase (VAC) 220-230</td>
</tr>
<tr>
<td>Pricing</td>
<td>$143.00</td>
</tr>
</tbody>
</table>

BH Series

- High Power 200 W
- Right Angle Hypoid Gears
- Pre-assembled

<table>
<thead>
<tr>
<th>BH Series</th>
<th>Induction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>200 W (1/4 HP)</td>
</tr>
<tr>
<td>Frame Size</td>
<td>104 mm (4.09 in.)</td>
</tr>
<tr>
<td>Options</td>
<td>Terminal Box / Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Parallel, Right Angle Hollow or Solid</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Single-Phase (VAC) 110-115 / 220-230</td>
</tr>
<tr>
<td></td>
<td>Three-Phase (VAC) 220-230</td>
</tr>
<tr>
<td>Pricing</td>
<td>$334.00</td>
</tr>
</tbody>
</table>
**KII / KII-S Series**

- 25 W (1/30 HP) Gearhead Output Torque (Permissible)
- Permissible Torque Doubled

**Brother ie3 Mid Series**

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

**FPW Series**

- IP67 Rated
- Helical (parallel) and Hypoid (right angle) gear type motors
- Pre-assembled, motor & gear
- Slip fit “O” ring design for mounting in any direction

**SMK Series**

- Low Speed Synchronous
- Excellent Starting / Stopping
- Quick, Bi-directional Operation
- Holding Torque
- 60 Hz: 72 r/min

**SB50W**

- List Price: $121.00

**Torque Motors**

- Torque Control
- Set/Adjust Motor Torque
- TMP-1 Power Controller (sold separately)
- List Price: $123.00

**Brake Packs**

- Instantaneous stop, Bi-directional Motor Control.
- Ideal to Control Electromagnetic Brakes
- Supports 1 W up to 90 W
- Single-Phase 100-230 VAC
Oriental Motor offers 4 types of Speed Control Solutions. AC Motors with closed loop feedback, Three-Phase AC Motors using an Inverter, Stepper Motors with Controller and our Brushless line of Closed Loop DC Motors.

**Closed Loop Type (DSC or US2 Series)**

- Speed Regulation ±1%
- Digital Circuits
- Lower Electrical Noise (Phase Control)

**SCM Speed Control Motors**

<table>
<thead>
<tr>
<th>Functions: Speed Controllers</th>
<th>DSC Series</th>
<th>US2 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed Setting Method</td>
<td>- External Potentiometer</td>
<td>- Dial Setting</td>
</tr>
<tr>
<td></td>
<td>- Digital Setting</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>- External DC Voltage</td>
<td>-</td>
</tr>
<tr>
<td>Function</td>
<td>Speed Display</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Instantaneous Stop</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Acceleration/Deceleration Operation</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Multiple-Speed Operation</td>
<td>4 Speed</td>
</tr>
<tr>
<td></td>
<td>Load Holding</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Gravitational Operation</td>
<td>Electromagnetic Brake</td>
</tr>
<tr>
<td></td>
<td>Parallel Motor Operation</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Protection Function</td>
<td>-</td>
</tr>
<tr>
<td>Starting Pricing (Controller)</td>
<td>$125.00</td>
<td>$125.00</td>
</tr>
</tbody>
</table>

**DSC Series**

Simple User Interface

- Monitoring Mode
  - Real-time monitor for speed (Motor, gear shaft, conveyor speed), alarms, warnings, I/O status monitor
- Data Mode
  - Speed setting
- Parameter Mode
  - Set I/O assignments and parameters
- Test Mode
  - Test operation without data setting is possible.
  - An operation lock can prevent accidental operation.

**US2 Series**

Easy Operation

- Spin and Push
- Start / Stop
  - FWD / Reverse

**Output Power**

- 6 W (1/125 HP) — 90 W (1/8 HP)

**Speed Range (r/min)**

- 90 — 1600 (60 Hz)

**Options**

- Terminal Box / Electromagnetic Brake
- External Speed Control
- Parallel (inch / metric), Right Angle Hollow or Solid

**Starting Pricing (Motor)**

- $81.00
Three-Phase AC Motors with Inverter

**KIIS Series**

Three-Phase **KIIS / BH Series**

<table>
<thead>
<tr>
<th>Type</th>
<th>Induction, Reversible, Electromagnetic Brake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>30 W (1/25 HP) – 200 W (1/4 HP)</td>
</tr>
<tr>
<td>Speed Range (r/min)</td>
<td>90 – 3600 (3 – 120 Hz)</td>
</tr>
<tr>
<td>Options</td>
<td>Terminal Box / Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Parallel (inch / metric), Right Angle Hollow or Solid</td>
</tr>
<tr>
<td>H1 Grease (metric only)</td>
<td></td>
</tr>
<tr>
<td>Starting Pricing (Motor + Gear)</td>
<td>$228.00</td>
</tr>
</tbody>
</table>

Three-Phase **FPW Series**

<table>
<thead>
<tr>
<th>Type</th>
<th>Induction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>25 W (1/30 HP) – 20 W (1/8 HP)</td>
</tr>
<tr>
<td>Speed Range (r/min)</td>
<td>90 – 2400 (3 – 80 Hz)</td>
</tr>
<tr>
<td>Features</td>
<td>Watertight / Stainless Steel Shaft</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Parallel, Right Angle Hollow or Solid</td>
</tr>
<tr>
<td>Starting Pricing (Motor + Gear)</td>
<td>$295.00</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Induction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power</td>
<td>400 W (1/2 HP) – 3 HP</td>
</tr>
<tr>
<td>Speed Range (r/min)</td>
<td>90 – 3600 (3 – 120 Hz)</td>
</tr>
<tr>
<td>Options</td>
<td>Terminal Box / Electromagnetic Brake</td>
</tr>
<tr>
<td>Gear Types</td>
<td>Parallel, Right Angle Hollow or Solid</td>
</tr>
<tr>
<td>Starting Pricing (Motor + Gear)</td>
<td>$565.00</td>
</tr>
</tbody>
</table>

**FRENIC-Mini (C2) Inverter**

UL508C, EN 61800-5-1:2007

<table>
<thead>
<tr>
<th>Capacity</th>
<th>115 VAC Single-Phase: 1/8 HP – 1 HP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>230 VAC Single-Phase: 1/8 HP – 3 HP</td>
</tr>
<tr>
<td></td>
<td>230 VAC Three-Phase: 1/8 HP – 3 HP</td>
</tr>
<tr>
<td>Overload Capability</td>
<td>150% 1 min; 200% 0.05 sec</td>
</tr>
<tr>
<td>Input Power</td>
<td>115 VAC / 230 VAC Single / Three-Phase</td>
</tr>
<tr>
<td>Voltage</td>
<td>+10% to −15% (unbalance 2% or less)</td>
</tr>
<tr>
<td>Control</td>
<td>V/F control (Induction Motor)</td>
</tr>
<tr>
<td></td>
<td>Dynamic Torque Vector control (Induction Motor)</td>
</tr>
<tr>
<td></td>
<td>Permanent Magnet/Synchronous motor V/F control</td>
</tr>
<tr>
<td>Output Frequency</td>
<td>Analog Setting: ±2% of max. frequency</td>
</tr>
<tr>
<td></td>
<td>Digital Setting: ±0.01% of max. frequency (keypad)</td>
</tr>
<tr>
<td>Starting Torque</td>
<td>150% running at 1 Hz with Slip compensation &amp; Auto Boost</td>
</tr>
<tr>
<td>Braking Transistor</td>
<td>Built-in except 1/4 HP and less</td>
</tr>
<tr>
<td>Starting Pricing</td>
<td>$172.00</td>
</tr>
</tbody>
</table>

**Stepper Motor**

**CVK-SC Speed Control**

DC Input - 5 phase

<table>
<thead>
<tr>
<th>CVK-SC</th>
<th>5 Phase (0.72°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Types (Bi-polar)</td>
<td>2 Phase</td>
</tr>
<tr>
<td>Speed Settings</td>
<td>2</td>
</tr>
<tr>
<td>Hold Load at Standstill</td>
<td>Yes</td>
</tr>
<tr>
<td>Power Supply</td>
<td>VDC</td>
</tr>
<tr>
<td>Starting From (Motor + Driver + Cable)</td>
<td>24 VDC $263.00</td>
</tr>
</tbody>
</table>
Fans and Thermal Management
Today’s fans are designed to move air allowing for cooling, controlling an area of space or for protecting electronics. Many of our fans come with alarm features designed for warning or for preventative maintenance. Oriental Motor helps make selecting the appropriate type of fan for today’s applications simple.

Axial Flow Fans
- AC or DC Input

Centrifugal Blowers
- AC or DC Input

Cross Flow Fans
- AC or DC Input

Thermostat
- Fahrenheit (°F) or Centigrade (°C)
**Alarm Types**

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

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

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

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

---

**Enclosure Types**

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

**Accessories**

- Finger Guards
- Filters
- Screens
- Plug Cords
Environmental Efforts

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

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

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

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

- IEC 62474: Material declaration for products of and for the electrotechnical industry

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

ECO MOTION

Oriental Motor’s Basic Environmental Philosophy and Environmental Policy

ISO 9001 and ISO 14001

<table>
<thead>
<tr>
<th>Procurement</th>
<th>Manufacturing</th>
<th>Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduced waste through products with longer lives</td>
<td>• Reduced energy use during manufacturing</td>
<td>• Improved transportation efficiency through optimal packaging design</td>
</tr>
<tr>
<td>• Reduced waste by making the products more compact</td>
<td>• Reduced consumption of resources during manufacturing</td>
<td>• Packaging that is easy to recycle</td>
</tr>
<tr>
<td>• Easy-to-recycle products</td>
<td>• Control of chemical substances used in manufacturing processes</td>
<td>• Communication about the chemical substances contained in products</td>
</tr>
</tbody>
</table>

Use

• Reduced waste through optimally-designed packaging
• Reduced wiring with network-compatible products
• Reduced waste through products with longer lives

Installation

• Reduced waste through optimally-designed packaging
• Reduced wiring with network-compatible products
• Reduced waste through products with longer lives

Distribution

• Improved transportation efficiency through optimal packaging design
• Packaging that is easy to recycle
• Communication about the chemical substances contained in products

Hybrid Control System

STEP AZ Series
Energy savings of 47% compared to the conventional Oriental Motor product have been achieved, contributing to reduced CO2 emissions.

High-Efficiency Three-Phase Induction Motors

K2S Series
A high-efficiency three-phase induction motor with a maximum efficiency of 73% and an optimized magnet design that minimizes loss.

Brushless Motor and Driver

BMU Series
Compact size, high power and high efficiency contribute to a reduction in raw materials and energy conservation.

Low-Power Consumption Axial Flow Fans

EMU Series
By using a brushless motor, energy savings of approximately 68% (compared to other Oriental Motors products) have been achieved.

B. Measures and Responses to Chemical Substances in Products

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

Global Regulations & Standards/Management of Chemical Substances in Products
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
ORIENTAL MOTOR U.S.A. Corporation (the “Company”) warrants 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.

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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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