

Orientalmotor

General Catalog 2012/2013

A Stepping Motors

Page A-1

Stepping motors are used to achieve precise positioning via digital control. The motor operates by accurately synchronizing with the pulse signal output from the controller to the driver. Stepping motors, with their ability to produce high torque at a low speed while minimizing vibration, are ideal for applications requiring quick positioning over a short distance.

- **AC Input Stepping Motor and Driver Package**
0.36° Closed Loop Stepping Motor and Driver Package *αSTEP*
0.36°/0.72°/0.9°/1.8° Stepping Motor and Driver Package
- **DC Input Stepping Motor and Driver Package**
0.36° Closed Loop Stepping Motor and Driver Package *αSTEP*
0.36°/0.72°/0.9°/1.8° Stepping Motor and Driver Package
- **Stepping Motors (Motor Only)**
0.36°/0.72°/0.9°/1.8° Stepping Motors
- **Controllers**
- **Accessories**



B Servo Motors

Page B-1

Servo motors can be used to achieve high-speed, highly accurate positioning operation via digital control. They are constructed of three elements: the motor for generating torque, the encoder for detecting position, and the driver for controlling the motor with respect to commands. Position and speed control are carried out with a closed loop. Because high torque is obtained in the high speed range, applications for traveling long distances at high speed are possible.

- **Servo Motor and Driver Package**
- **Accessories**



C Standard AC Motors

Page C-1

Standard AC motors operate by simply connecting a capacitor and supplying power from a commercial power supply. Standard AC motors include the basic induction motor and reversible motor. In addition, Oriental Motor offers electromagnetic brake motors, synchronous motors, torque motors and watertight, dust-resistant motors to meet specific application requirements.

- **Constant Speed Motors**
Induction Motors
Reversible Motors
Electromagnetic Brake Motors
Clutch and Brake Motors
Synchronous Motors
Low-Speed Synchronous Motors
- **Torque Motors**
- **Watertight, Dust-Resistant Motors**
- **Gearheads**
Parallel Shaft Gearheads
Right-Angle Gearheads
(Hollow shaft · Solid shaft)
- **Linear Heads**
- **Brake Pack**
- **Accessories**



D Brushless Motors/AC Speed Control Motors

Page D-1

Brushless Motors and AC Speed Control Motors are ideal for applications that require the precise control of speed. Motors for speed control systems can be either highly efficient brushless motors or simple-to-use AC motors.

- **Brushless Motors**

AC Input/DC Input

- **AC Speed Control Motors**

- **Accessories**



E Linear and Rotary Actuators

Page E-1

A linear-motion product incorporating a motor and a linear-motion mechanism. Drawing on our expertise as a motor manufacturer, Oriental Motor offers a wide range of linear-motion products in various shapes and sizes, featuring different motor types, drive methods and power inputs.

We assure the overall performance of each actuator and driver package.

- **Motorized Linear Slides**

- **Motorized Cylinders**

- **Compact Linear Actuators**

- **Hollow Rotary Actuators**

- **Accessories**



F Cooling Fans

Page F-1

Oriental Motor offers a wide range of cooling fans, including a cooling module suitable for enclosure cooling, axial flow fans ideal for ventilation cooling, centrifugal blowers and cross flow fans for local cooling, as well as fans with low-speed or stall alarms, or variable flow type.

- **Axial Flow Fans**

AC Input/DC Input

- **Centrifugal Blowers**

AC Input/DC Input

- **Cross Flow Fans**

AC Input/DC Input

- **Cooling Module**

- **Thermostats**

- **Accessories**



Contents

	Page
Contents	2
How to Use This Catalog	6
How Contents are Organized	6
How to Read Product Pages	7
How to Use the Website	8
Before Selecting a Product	9
Symbols	11

	Page
The Products and Services Delivered by Oriental Motor	12
Environmental Efforts	14
Oriental Motor U.S.A. Sales and Customer Service	15
Service and Support	16
Selection Guide	
Based on Operating Function	18
Based on Characteristics	22

A Stepping Motors

	Page
Overview of Stepping Motors	
Overview of Stepping Motors	A-2
Product Line-Up of Stepping Motors	A-8
Types of Stepping Motors	A-10
How to Read Specifications	A-12
How to Read Speed-Torque Characteristics	A-13
Common Specifications	A-14
AC Input Stepping Motor and Driver Packages	A-23
0.36° High-Efficiency <i>α</i> STEP AR Series	A-24
0.36° <i>α</i> STEP AS Series	A-68
0.72° RK Series	A-78
0.9° /1.8° UMK Series	A-114
DC Input Stepping Motor and Driver Packages	A-115
0.36° High-Efficiency <i>α</i> STEP AR Series	A-116
0.36° <i>α</i> STEP ASX Series	A-164
0.36° /0.72° CRK Series	A-168
0.9° /1.8° CMK Series	A-218
1.8° RBK Series	A-244
Stepping Motors (Motor Only)	A-269
0.36° PK Series	A-290
0.72° PK Series	A-291
0.9° PK Series	A-294
1.8° PK Series/PV Series	A-302
Geared Motor PK Series	A-334
Controllers	A-357
SCX10	A-364
EMP400	A-374
SG8030J	A-388
Accessories	A-393

B Servo Motors

	Page
Overview of Servo Motors	
Overview of Servo Motors	B-2
How to Read Specifications	B-6
How to Read Speed-Torque Characteristics	B-7
Servo Motor and Driver Package NX Series	B-9
Accessories	B-47

C Standard AC Motors

	Page
Overview of Standard AC Motors	
Overview of Standard AC Motors	C-2
Product Line-Up of Standard AC Motors	C-8
Constant Speed Motors	
Constant Speed Motors	C-9
Features and Types of Constant Speed Motors	C-10
How to Read Specifications	C-12
Common Specifications	C-17
Induction Motors	
Features and Types of Induction Motors	C-20
General Specifications	C-25
World K Series (1 W~90 W)	C-28
BH Series (200 W)	C-58
World K Series (2-Pole, High-Speed Type)	C-70
Reversible Motors	
Features and Types of Reversible Motors	C-76
General Specifications	C-80
World K Series (1 W~90 W)	C-82
Electromagnetic Brake Motors	
Features and Types of Electromagnetic Brake Motors	C-108
General Specifications	C-113
World K Series (6 W~90 W)	C-116
BH Series (200 W)	C-140
High Strength, Long Life, Low Noise V Series (Induction Motors, Reversible Motors, Electromagnetic Brake Motors)	C-149
Clutch and Brake Motors C • B Motors	C-179
Synchronous Motors	C-189
Low-Speed Synchronous Motors SMK Series	C-191
Watertight, Dust-Resistant Motors FPW Series	
Watertight, Dust-Resistant Motors FPW Series	C-203
Torque Motors	C-213
Right-Angle Gearheads	C-227
Linear Heads	C-247
Brake Pack SB50W	C-253
Accessories	C-263
Installation	C-277

D Brushless Motors/AC Speed Control Motors

	Page
Overview of Brushless Motors and AC Speed Control Motors	
Overview of Brushless Motors and AC Speed Control Motors	D-2
Product Line-Up of Brushless Motors and AC Speed Control Motors	D-3
Brushless Motors and AC Speed Control Motors Selection Guide	D-9
Brushless Motors	
Brushless Motors	D-11
Product Line of Brushless Motors	D-12
How to Read Specifications	D-15
AC Input	
BX Series	D-18
BLF Series	D-60
BLE Series	D-84
BLU Series	D-114
DC Input	
BLH Series	D-132
BLV Series	D-148
AC Speed Control Motors	
AC Speed Control Motors	D-153
Product Line of AC Speed Control Motors	D-154
How to Read Specifications	D-157
BHF Series	D-160
FE100/FE200	D-178
ES01/ES02	D-192
US Series	D-222
Accessories	
Accessories	D-225
Installation	
Installation	D-239

E Linear and Rotary Actuators

	Page
Overview of Linear and Rotary Actuators	
Overview of Linear and Rotary Actuators	E-2
Product Line-Up of Linear and Rotary Actuators	E-6
Motorized Linear Slides EZ limo	
Motorized Linear Slides EZ limo	E-7
Features of Motorized Linear Slides	E-8
Features and Types of Motorized Linear Slides	E-10
Selection of Motorized Linear Slides	E-12
How to Read Specifications	E-14
EZSII Series	E-16
SPV Series	E-36
Motorized Cylinders EZ limo	
Motorized Cylinders EZ limo	E-47
Features of Motorized Cylinders	E-48
Features and Types of Motorized Cylinders	E-50
Selection of Motorized Cylinders	E-52
How to Read Specifications	E-54
EZCII Series	E-56
EZA Series	E-70
PWAII Series	E-80
Motorized Linear Slides/Motorized Cylinders	
Motorized Linear Slides/Motorized Cylinders	E-85
Common Controller	E-86
Accessories	E-99
Compact Linear Actuators	
Compact Linear Actuators	E-119
DRL Series	E-120
Hollow Rotary Actuators	
Hollow Rotary Actuators	E-129
DG Series	E-130
Accessories	E-146

F Cooling Fans

	Page
Overview of Cooling Fans	
Overview of Cooling Fans	F-2
Product Line-Up of Cooling Fans	F-6
Cooling Fans Selection Guide	F-10
How to Read Specifications	F-19
Specifications for Fans with Alarms	F-21
Axial Flow Fans	
Axial Flow Fans	F-25
AC Input	
MRS Series	F-32
Variable Flow MRS Series	F-46
MU Series	F-48
DC Input	
MDS Series, MD Series	F-56
MDE Series	F-74
Centrifugal Blowers	
Centrifugal Blowers	F-79
AC Input MB Series	F-82
DC Input MBD Series	F-94
Cross Flow Fans	
Cross Flow Fans	F-101
AC Input MF Series	F-104
DC Input MFD Series	F-104
Cooling Modules FM Series IP55/IP43	
Cooling Modules FM Series IP55/IP43	F-105
Thermostats	
Thermostats	F-113
Accessories	
Accessories	F-117
Installation	
Installation	F-127

G Technical Reference

	Page
Selection Calculations	
Motors	G-2
Linear and Rotary Actuators	G-18
Cooling Fans	G-34
Service Life	G-36
Stepping Motors	G-40
Servo Motors	G-51
Standard AC Motors	G-54
Brushless Motors/AC Speed Control Motors	G-60
Gearheads	G-66
Linear and Rotary Actuators	G-74
Cooling Fans	G-82

H General Information

	Page
Safety Standards	H-2
Management of Chemical Substances in Products	H-12
ISO 9001, ISO 14001	H-13
Global Power Supply Voltages	H-14
Oriental Motor Corporate Overview	H-15
Oriental Motor Global Sales Network	H-16
Product Recommendation Information Sheets	H-20
Conversion Charts	H-27
Product Line Updates	H-28
Product Index	H-30

How to Use This Catalog

About the ORIENTAL MOTOR General Catalog

In addition to the 2012/2013 general catalog (this catalog), we have a web catalog for your convenience. The 2012/2013 catalog primarily has our recommended products and product information. If you do not see a product listed here, check the web catalog.

[How to Use the Website ▶ Page 8](#)

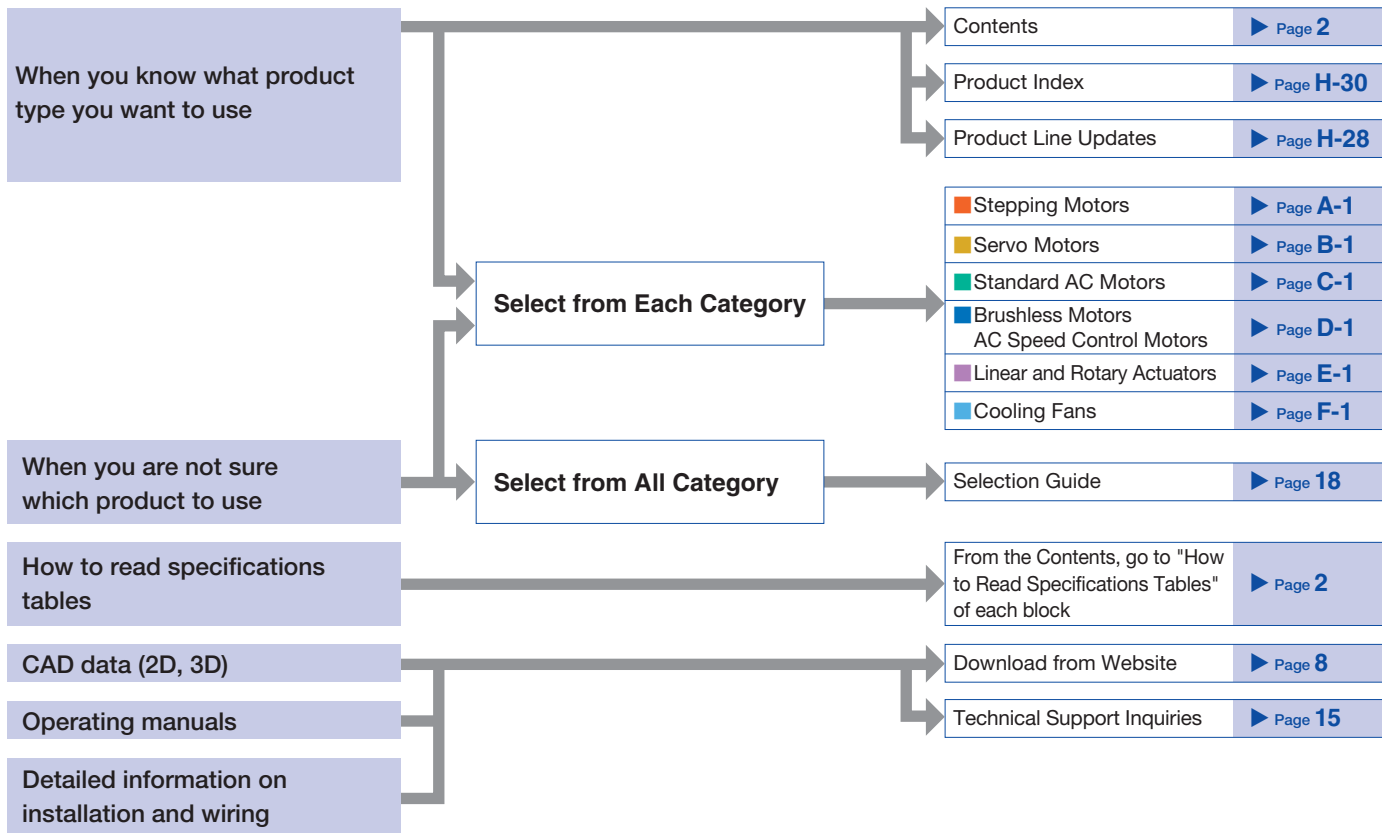
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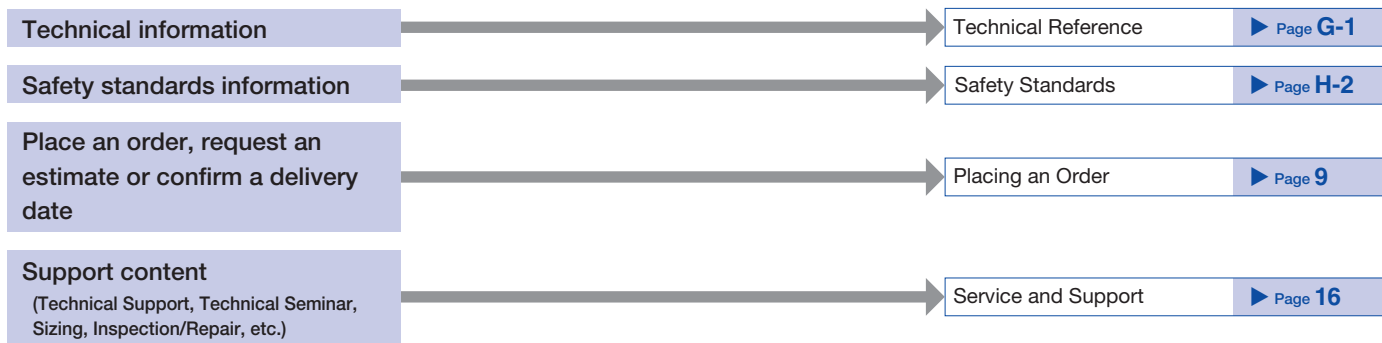
Web Catalog



How Contents are Organized



Service, Support and Technical Information



How to Read Product Pages

This catalog contains information necessary for informed product selection. Additional product details and information not outlined in this catalog can be found in each product's individual operating manual. Operating manuals can be downloaded from our website or obtained by contacting technical support or your nearest Oriental Motor sales office.

How to Read Product Information

Additional Information

Information on Safety Standards

Products conforming to safety standards are indicated by symbols of the approval. Check the details of each safety standard on page H-2. For detailed product safety standard information including standards, file number and certification body, please visit www.orientalmotor.com.

Information on RoHS Directive

Products conforming to the RoHS Directive are indicated by this mark.

● Details of RoHS Directive → Page H-12

Model Name

The model name uses both numbers and letters. In this catalog, model names are written in bold.

Example: **4IK25GN-AW2U**

For package products, the model names are given in bold and the component parts (motor model and driver model) are written in standard characters.

Example:

Package model: **AR46AA-3**

Motor Model: ARM46AC

Driver Model: ARD-A

About CAD Data (DXF Format)

CAD data (DXF format) is available for the items denoted by **DXF** (or DXF).

CAD data can be downloaded from Oriental Motor's website (www.orientalmotor.com).

● How to Use the Website → Page 8

(Sample)

0.36° Closed Loop Stepping Motor and Driver Package α STEP High-Efficiency AR Series

Additional information → Technical reference → Page G-1
Safety standards → Page H-2

For details on this product please refer to our website, technical support or your nearest Oriental Motor sales office.
www.orientalmotor.com

Step Angle 0.36° Motor Frame Standard Type

Specifications (RoHS)

Model	Standard (Single shaft)	AR46A-3	AR66A-3	AR96A-3	AR96B-3	AR98A-3	AR911A-3
Standard (Double shaft)*	AR46M-3	AR66M-3	AR96M-3	AR96M-3	AR98M-3	AR911M-3	AR911M-3
Electromagnetic brake	AR46B-3	AR66B-3	AR96B-3	AR96B-3	AR98B-3	AR911B-3	AR911B-3
Maximum Holding Torque (N·m (kg·cm))	2.7 (10)	2.7 (10)	2.7 (10)	2.7 (10)	2.7 (10)	2.7 (10)	2.7 (10)
Holding Torque (N·m (kg·cm))	0.18 (0.71)	0.6 (0.6)	0.6 (0.6)	0.6 (0.6)	0.6 (0.6)	0.6 (0.6)	0.6 (0.6)
Maximum Speed (rpm)	2000	2000	2000	2000	2000	2000	2000
Step Angle (°)	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Motor Frame Size (mm)	60	60	60	60	60	60	60
Weight (kg)	0.15	0.15	0.15	0.15	0.15	0.15	0.15

Product Line

- Step Angle 0.36° Standard Type

Motor (Single shaft)	Motor (Double shaft)	Motor
AR46A-3	AR46B-3	AR46M-3
AR66A-3	AR66B-3	AR66M-3
AR96A-3	AR96B-3	AR96M-3
AR96B-3	AR96B-3	AR96M-3
AR98A-3	AR98B-3	AR98M-3
AR911A-3	AR911B-3	AR911M-3
- Step Angle 0.36° Standard Type with Electromagnetic Brake

Motor
AR46B-3
AR66B-3
AR96B-3
AR98B-3
AR911B-3

Motor Frame Size 60 mm (2.36 in.)

Motor	Motor Model	L1	L2	Mass (kg (lb))	DXF
AR46A-3	ARM46AC	64.5 (2.54)	65.5 (2.57)	0.9 (1.98)	8448
AR66A-3	ARM66AC	80 (3.15)	81 (3.19)	1.4 (3.1)	8448
AR96A-3	ARM96AC	96 (3.78)	97 (3.82)	1.4 (3.1)	8448
AR96B-3	ARM96BC	96 (3.78)	97 (3.82)	1.4 (3.1)	8448

Motor Cable: 6S (48 3T)

5557-10R-210 (MOLEX) Connector Cover

These dimensions are for double shaft models. For single shaft models, quote the shaded areas.

Enter the power supply voltage (A, C or S) in the box (6) within the model name.

CAD Data Manuals www.orientalmotor.com Technical Support TEL: (800) 468-3982 E-mail: techsupport@orientalmotor.com ARa-22

How to Read Product Search Information

(Sample)

0.36° Stepping Motor and Driver Package α STEP AS Series

For details on this product please refer to our website, technical support or your nearest Oriental Motor sales office.
www.orientalmotor.com

The α STEP utilizes our unique closed loop control. This is a motor and driver package product offering the user-friendliness of a stepping motor combined with improved response and reliability.

Complying with Various Standards to Support Diverse Equipment Designs
Motor Protection Degree: IP54
The motor complies with the requirements of protection degree IP54 (enclosed for the motor mounting surface and connections). This means that the enclosure prevents infestation of dust that can otherwise inhibit normal operation.

Extended Functions to Accommodate Various Applications
You can combine a control microcontroller and software (MEX20) both with the motor and driver to add functions and capacity to the needs of your system.

High Duty Cycle
The motor can be used in applications where it is required to operate continuously for a long period of time.

Maintaining All the Beneficial Features of a Stepping Motor
The motor operates synchronously with pulse commands to achieve high response. There is no delay in operation following a pulse command.

ARa-3 ORIENTAL MOTOR GENERAL CATALOG 2012/2013

Page Features A-XXX / System Configuration A-XXX / Product Line A-XXX / Specifications, Characteristics A-XXX / Dimensions A-XXX / Connection and Operation A-XXX / Motor and Driver Combinations A-XXX

Guidance for detailed information

This indicates that detailed information is not provided in this catalog for that product. For details on this product, refer to our web catalog or contact technical support.

Footer

Indicates page references on left page.

Header and Side Bar

The categories/series of the catalog are listed at the top and side of the right page. The series of the page that is currently open is provided at the top of the left page.

(Sample)

Stepping Motors

Complying with Various Standards to Support Diverse Equipment Designs
Motor Protection Degree: IP54
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Maintaining All the Beneficial Features of a Stepping Motor
The motor operates synchronously with pulse commands to achieve high response. There is no delay in operation following a pulse command.

- Stepping Motors
- Servo Motors
- Standard AC Motors
- Brushless Motors/AC Speed Control Motors
- Linear and Rotary Actuators
- Cooling Fans

How to Use the Website

MyPage

Register for MyPage to build your custom catalog, view order history and access special content and promotions.

Products

Learn about the latest products and technology. Compare features and benefits and view full products specifications.



Search

Search by Part Number, Keyword, or Specification.

Live Chat

Ask questions and get live support.

Homepage

Discover the latest news and featured products from Oriental Motor.

<http://www.orientalmotor.com/>

Complete Product Specifications

The Online Product Catalog contains pricing, full products specifications, features, dimensions, speed-torque curves, connection diagrams, and more.

Download CAD, Operator Manuals and Product Literature.

View all available Accessories, Drivers and Controllers to build a complete system.



Order Online

Convenient online ordering is available on the website.

Pay by credit card or through PayPal.

Register for MyPage and save your shopping cart, view order history or re-order.

Online Support

The website features technical and product information and support:

- Online Motor Sizing Tools
- Live and On-Demand Training
- Product & Engineering Forum
- Technical Articles and Product Literature



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. If you intend to use our products in any of the above non-intended applications, please consult us regarding the specific application and operating environment before doing so. We must remind you, however, that our warranty only covers the items specified under “warranty and limitation of liability.”

■ 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 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.
- ORIENTAL MOTOR U.S.A. CORP. also offers a repair service for a nominal charge. Please contact your local sales office or distributor to receive an RMA number and instructions on how to send in the product if you wish to request a repair quotation.

■ Specification Change

The model names, specifications, appearances and other details of products featured in this catalog are subject to change without notice for purposes of improvement. Before you examine or order any product featured in the catalog, we recommend that you check with our sales office to confirm that the stated information is valid.

■ Delivery Times

Many Oriental Motor products are available for “same day” shipping in certain quantities. For more details on availability and delivery times for particular products, please contact your local Oriental Motor Customer Service Center.

■ Placing an order

There are several ways to place an order with Oriental Motor:

- Call our Customer Service Centers @1-800-418-7903
- E-mail our Customer Service Centers by using the following e-mail addresses:
 - ◇ Westcoastorders@orientalmotor.com (Los Angeles Sales Office)
 - ◇ Midwestorders@orientalmotor.com (Chicago Sales Office)
 - ◇ Eastcoastorders@orientalmotor.com (Boston Sales Office)
- Visit our Website (www.orientalmotor.com) for product specifications, to download CAD or PDF files and to purchase products. Please note that not all Oriental Motor products are available to order through the web.

● Oriental Motor accepts Visa, MasterCard and American Express. After your first order, you can apply to set up a terms account on future orders by contacting your local Customer Service Center.

*For Website orders only, PayPal is also available.

■ Warranty and Limitation of Liability

● Warranty

Oriental Motor U.S.A. Corporation (the "Company") warrants to the first end user Buyer that the products and parts thereof, when shipped will be free from defects in materials comprising the same and in the Company's workmanship. If any such defects exist or later appear, the Company shall undertake, at its sole expense, prompt remedial action as stated herein to correct the same; provided however, that the Company shall have no obligation or liability under this warranty unless it shall have received written notice specifying such defects no later than two (2) years from the date of shipment. Remedial action under this warranty shall require only that the Company, at its option, repair or modify the products or parts thereof, replace the same F.O.B. point of origin or except the return of the products or parts thereof by Buyer and refund the purchase price.

Products or parts thereof, manufactured by others are warranted hereunder only to the extent of such manufacturer's warranty to the Company.

Since after the shipment, the products and parts thereof are under the sole control of the Buyer, this warranty is subject to, and shall be applicable only if the following conditions are met;

- ① The Company's instructions as to installation, operation and maintenance have been followed.
- ② The products and parts thereof have been used under normal operating conditions or under such conditions as herein before specified by the Company, or specified by the Buyer and agreed to in writing by the Company.
- ③ The products and parts thereof have been erected, installed, operated and maintained and have not been affected by misuse, neglect or accident.
- ④ The Buyer has not attempted or performed corrective work or modification on the products and/or parts thereof without the Companies prior written consent as to the nature and expense thereof.
- ⑤ The Company shall have received notice of any defect no later than thirty (30) days after the Buyer first had knowledge of the same; and
- ⑥ Within the warranty period and after prior authorization from the Company, the products and/or parts are shipped freight prepaid to the Company at 1001 Knox Street, Torrance, CA. 90502.

THE FOREGOING WARRANTY IS IN SUBSTITUTION FOR, AND IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

● LIMITATION OF WARRANTY

THE COMPANY SHALL HAVE NO LIABILITY WHATSOEVER IN ANY EVENT FOR PAYMENT OF ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, DAMAGES FOR INJURY TO ANY PERSON OR PROPERTY. BY ACCEPTING THE PRODUCTS AND/OR PARTS THEREOF, THE FIRST END USER BUYER OR SUBSEQUENT USER AGREES THAT THE COMPANY SHALL NOT BE LIABLE FOR INDEMNIFICATION OR CONTRIBUTION (IN WHOLE OR IN PART) EITHER EXPRESSLY OR BY IMPLICATION. IF FOR ANY REASON OF THE FOREGOING PROVISIONS SHALL BE INEFFECTIVE, THE COMPANY'S LIABILITY FOR DAMAGES ARISING OUT OF ITS MANUFACTURE OR SALE OF ITS PRODUCTS OR PARTS, OR USE THEREOF, WHETHER SUCH LIABILITY IS BASED ON WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE, SHALL NOT IN ANY EVENT EXCEED THE FULL PURCHASE PRICE OF SUCH PRODUCTS AND PARTS THEREOF.

Any action against the Company based upon any liability or obligation arising hereunder any law applicable to the sale or its products or parts thereof, or the use thereof, must be commenced within two (2) years after the cause of such actions arises.

Symbols



The products conforming to the RoHS Directive



Recognized by Canadian safety requirements and UL under the recognition program of Underwriters Laboratories Inc.



UL recognized component



CSA certified component



CSA certified component
Indicates that UL has certified that the product meets CSA Standards.



EN or IEC certified component
Indicates that VDE has certified that the product meets EN or IEC Standards.



EN or IEC certified component
Indicates that TÜV Rheinland has certified that the product meets EN or IEC Standards.



EN or IEC certified component
Indicates that DEMKO has certified that the product meets EN or IEC Standards.



CCC certified component (GB certified component)



Products of self-declaration of conformity on EN/IEC Standards.



Products of self-declaration of conformity on Electrical Appliance and Material Safety Law (Japan).



Certified by Japan Electrical Safety & Environment Technology Laboratories (JET) based on Electrical Appliance and Material Safety Law (Japan).



JET components and materials certified products

The Products and Services Delivered by Oriental Motor

Oriental Motor globally provides the optimal motion systems as part of our total service, to meet wide market demands.

Offering an extensive product line-up that continues to interact with “movement” all around the world.

About 20,000 different products that provide the optimal motion systems.

Oriental Motor offers approximately 20,000 items as standard products. Your optimal motion system can be found among our extensive product line-ups, which include constant speed motors, motors with more advanced movement such as speed and position control, motors with mechanism control such as linear drive and motors with accurate temperature control.

Servo Motors

- Servo Motors



Stepping Motors

- Closed Loop Stepping Motor and Driver Package
- Stepping Motor and Driver Package
- Stepping Motors (Motor Only)
- Controllers



Cooling Fans

- Axial Flow Fans
- Centrifugal Blowers
- Cross Flow Fans
- Cooling Module
- Thermostats



Standard AC Motors

- Constant Speed Motors
- Torque Motors
- Watertight, Dust-Resistant Motors



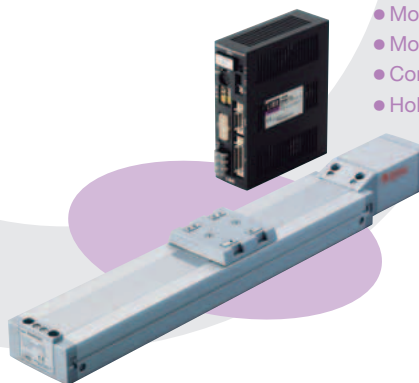
Brushless Motors AC Speed Control Motors

- Brushless Motors
- AC Speed Control Motors



Linear and Rotary Actuators

- Motorized Linear Slides
- Motorized Cylinders
- Compact Linear Actuators
- Hollow Rotary Actuators



Product development that meets the demands of our customers and society

Better efficiency, better energy saving, lower heat dissipation, and more accurate "movement" - our extensive product line-ups meet a variety of different demands. We also promote eco designs (Environmental-Friendly Design), which are conscious of product lifecycles, in order to contribute to global environmental protection.

Total Service Before and After Purchase

We offer short lead time, for one unit or larger quantities

Direct purchases are also possible by telephone, fax, and our website. We offer fast delivery for orders of single units and up.

Direct Backup/Support on Various Situations

We continue to provide information related to "movement" and directly support our customers from the moment they consider "movement" until after they purchase the product.

Face to face - We provide nearby support to customers whenever and wherever needed.

Service and Support **Page 16**



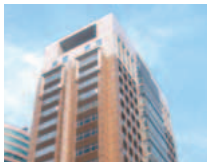
We have a Global Service Network established in 12 countries around the world

Our Direct Sales Network consists of locations in 12 countries around the world. We have a globally-developed service system that includes Technical Support, Technical Seminars, and Trade Shows.

Global Sales Network **Page H-16**



ORIENTAL MOTOR
U.S.A. CORP.



SHANGHAI ORIENTAL MOTOR
CO., LTD.



INA ORIENTAL MOTOR
CO., LTD.



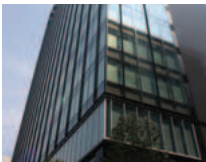
ORIENTAL MOTOR
(MALAYSIA) SDN. BHD.



ORIENTAL MOTOR
(EUROPA) GmbH



ORIENTAL MOTOR
(FRANCE) SARL



ORIENTAL MOTOR
CO., LTD.



TAIWAN ORIENTAL MOTOR
CO., LTD.



SINGAPORE ORIENTAL
MOTOR PTE LTD



ORIENTAL MOTOR
(THAILAND) CO., LTD.



ORIENTAL MOTOR
(UK) LTD.



ORIENTAL MOTOR
ITALIA s.r.l.

Environmental Efforts

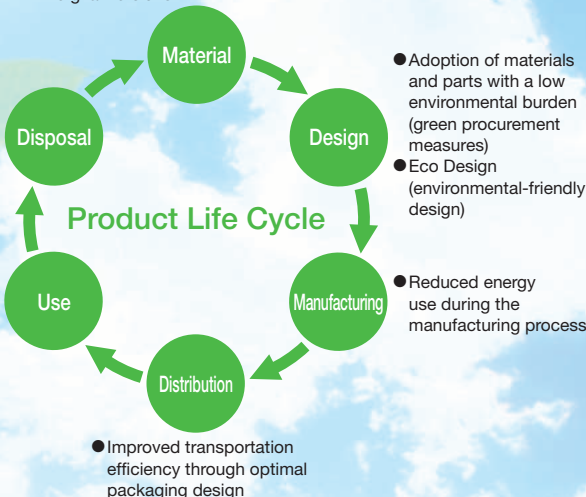
ECO MOTION

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

Oriental Motor proactively supports activities that take global environmental conservation into consideration. Energy savings, conserving natural resources, and reducing waste and carbon dioxide are implemented at every stage of the product life cycle. By providing products with benefits to customers, including high efficiency, compact size, high power and long life, we hope to contribute to all environmental conservation activities pertaining to the range of "motion" that our customers require.

- Adoption of materials and parts with a low environmental burden (green procurement measures)
- Reduction of paper use by converting operating manuals to digital versions

- Packaging that is easy to recycle
- Reduced waste through optimally designed packaging
- Reduced waste through products with longer lives
- Decreased energy consumption during product use



Eco Design (Environmental-Friendly Design)

① Energy Savings (High Efficiency)

Motors are converted from electrical energy to mechanical energy. The energy savings requires higher efficiency which curbs loss from the motor. Going forward, Oriental Motor will replace the international standards with a compact, precision motor, aiming at high efficiency.

- 0.36° Stepping Motor and Driver Package **QSTEP** High Efficiency AR Series [Page A-24, A-116](#)

An energy savings of 58% (Oriental Motors' comparison) has been achieved, reducing CO₂ emission.



- 1.8° Stepping Motors **PK** Series High-Torque, High Efficiency Type [Page A-269](#)

Reduced heat emission and lower power consumption has been achieved while maintaining high torque.



② Natural Resource Savings and Longer Life

We have made products more compact and with higher output to save natural resources, which has resulted in a product life style with a more effective use of natural resources. Going forward, we are promoting longer product life and less wiring to match product features.

- Brushless Motor and Driver Package **BLE** Series [Page D-84](#)

Contributing to natural resource conservation and energy savings through compact design and high power.



- AC Long Life Axial Flow Fans **MRE** Series [See Website](#)

These axial flows have an expected life of 100000 hours or more. That is approximately 11 years of continuous use.



③ Controlling Chemical Substances in Products

Oriental Motor uses green procurement standards that take into consideration the global electrical and electronic industry standard JIG-101 and customer requirements to curb the chemical substances in products.

- (a) **Green Procurement**
Products, parts, materials, packaging, and the like with a low environmental burden are given priority in procurement. The basic requirements are established as "Green Procurement Standards", promoted during business transactions.
- (b) **Measures and responses to chemical substances in products**
 - Management of Chemical Substances in Products [Page H-12](#)
- (c) **Quality and Environmental Management Systems**
 - ISO 9001, ISO 14001 [Page H-13](#)

Oriental Motor U.S.A. Sales and Customer Service

Oriental Motor U.S.A. has 8 Sales Offices, 3 Customer Service Centers and a large network of local distributors to support our motion system solutions. Our Customer Service Centers also services Mexico and South America along with supporting Spanish speaking customers.

Western Sales and Customer Service Center

Tel: (310) 715-3301

Fax: (310) 225-2594

Los Angeles Tel: (310) 715-3301

San Jose Tel: (408) 392-9735

Midwest Sales and Customer Service Center

Tel: (847) 871-5900

Fax: (847) 472-2623

Chicago Tel: (847) 871-5900

Dallas Tel: (214) 432-3386

Toronto Tel: (905) 502-5333

Eastern Sales and Customer Service Center

Tel: (781) 848-2426

Fax: (781) 848-2617

Boston Tel: (781) 848-2426

Charlotte Tel: (704) 766-1335

New York Tel: (973) 359-1100

- ▲ North American Offices
- North American Distributors



Service and Support

BEFORE

For Support



"I need help selecting a motor...."

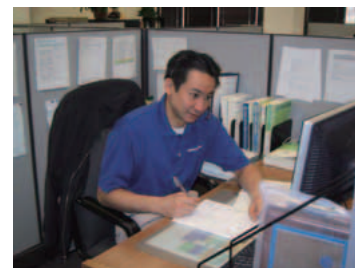
Our technical support team is here to help you with any needs you have in selecting the proper motor. If you need help understanding wiring, we can do that too. We can also connect you to the nearest Oriental Motor sales office.



► Oriental Motor sales office, Technical Support

We are committed to answer all of your questions about our products. Please feel free to contact us!

Page 15



Selection



"Can you help me size the right motor for my specifications?"

We have a complete sizing and selection service available over the phone or on line to help you choose the right motor for your application.



► Sizing and Selection

We are the experts, let us do all the calculations and provide you a complete report along with our recommendations to meet your needs.

TEL or FAX: Page 15

Free Online Motor Sizing Tool: www.orientalmotor.com



Training/Seminars



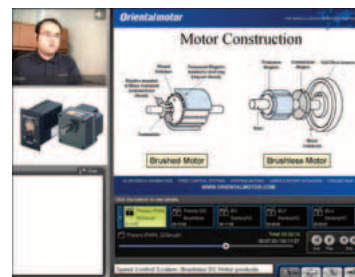
"I would like to understand the fundamentals and operating principles."
"I want to understand the motor technology I am considering."

Attend our monthly live, on-line training or view the many On-Demand seminars available. We can also tailor a seminar to your needs.



► Training/Seminars

Use our On-Demand seminars, available 24 hours a day, 7 days a week to learn about the technology of interest, when it is most convenient for you.



Introduction, Review, & Operation of the Actual Products



"I want to obtain information of a new product."
"I want to review the actual movement and details and performance of the product."
"I wonder if I could check the operation and movement with a loaner product."

We provide an opportunity for you to see our products at our local showrooms and at many of the Motor Fair events we host annually.



► Showroom

Our showrooms are available for you to see the displays of our new products, review details, experience the operation of a demo unit and work with our local staff. Our experienced team is here to help you with the proper selection, sizing and support of your project.

► Motor Fair/Trade Show


Our latest products are displayed along with expert presentations by our experienced application engineering staff.


ORDER

Ordering is available by calling, faxing or e-mailing to your local sales office or through our website. There are no minimum quantities to purchase. Many products are available for same day shipping. Web orders qualify for free shipping (domestic USA only).

- Same day shipping is available for many products
- Free shipping is available for products ordered on line (domestic USA only)

Placing an Order

 "I want to place an order, how do I find my price and lead time?"
"What are my options for ordering?"

We have several ways to place an order with Oriental Motor. Please see below. 

▶ Calling

Call our Customer Service Centers @1-800-418-7903

▶ E-mail

E-mail our Customer Service Centers by using the following e-mail addresses:

- Westcoastorders@orientalmotor.com (Los Angeles Sales Office)
- Midwestorders@orientalmotor.com (Chicago Sales Office)
- Eastcoastorders@orientalmotor.com (Boston Sales Office)

▶ Order on Line (www.orientalmotor.com)

You can building a complete system or order just one piece on line. It is easy and simple through the website to build a complete bill of materials (BOM) including pricing or order just one piece. We accept Master Card, Visa, American Express and PayPal for any on line orders.

Page 8


▶ Sales Office


See your local sales office for placing orders.

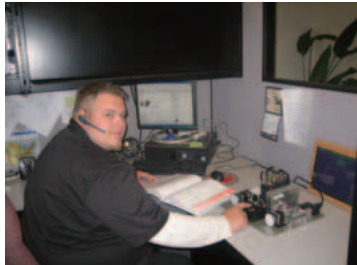
Page 15

AFTER

Technical Support

 "The motor stopped operating all of a sudden."
"It looks like there's a problem but I don't know the cause or how to fix the problem."

For assistance in troubleshooting and inspection, please contact our technical support center at 1-800-468-3982 for support. Local support is available for trouble shooting and assistance. Inspection/repair is also available for most products. 



▶ Inspection/Repair

Should our products show any signs of defect or failure, we will conduct an inspection (free of cost) and repair if necessary.

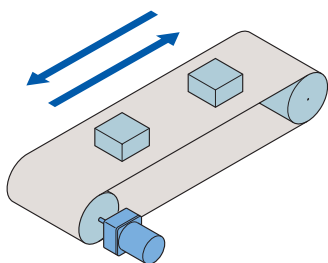
Page 9

Selection Guide Based on Operating Function

Various types of motors are available, such as motors operating at a constant speed, motors whose speed can be controlled, and motors capable of performing positioning operation. The following explains how to select a suitable motor based on the required operating function. For the steps to select a motor based on characteristics (resolution, accuracy and speed) and operating system, refer to the selection guide on the subsequent pages.

For easy understanding of the difference among the various operating functions, the following examples assume a belt-drive mechanism.

Constant Speed Operation



The motor is operated continuously at a constant speed or operated bi-directionally such as moving the load backward after moving forward.

Continuous Operation
For continuous, uni-directional operation



Induction Motors

Page C-19

Bi-Directional Operation
For changing the rotation direction of the motor



Reversible Motors

Page C-75

Synchronous Rotation
For keeping the speed steady with uni-directional continuous operation (synchronous with the power supply frequency)



Synchronous Motors

Page C-189

Synchronous and Bi-Directional Operation
For momentary stop, start and rotation direction changes while keeping the speed steady (synchronous with the power supply frequency)

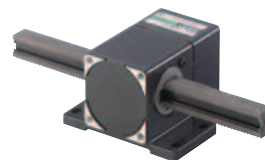


Low-Speed Synchronous Motors

Page C-191

Peripheral Products

Simple assembly of the motor and the linear motion mechanism



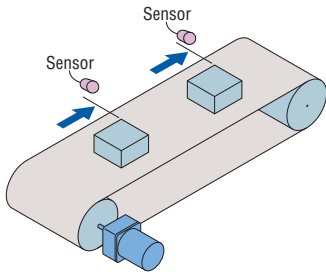
● Linear Heads ▶ Page C-247

Change the direction of the motor output shaft to save space



● Right-Angle Gearheads ▶ Page C-227

Constant Speed Operation and Positioning Control



This is an operation to stop the load at the target position.

To detect the load, it is necessary to install the sensor at each stop position and control it by a programmable controller etc.

Load Holding

For uses such as vertical operation where load holding is required when stopped



Electromagnetic Brake Motors

Page C-107

High-Frequency Start and Stop Operation

For high-frequency operation and stopping, positioning, indexing, intermittent inching feed and more



Clutch and Brake Motors

Page C-179

Instantaneous Stop Control

Suitable for applications where the overrun of an induction motor, reversible motor or electromagnetic brake motor should be suppressed.



Brake Pack

Page C-253

Peripheral Products

A brushless motor making speed and position control easy

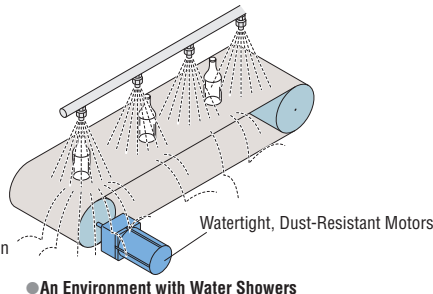
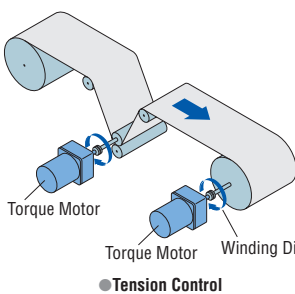


● BX Series ▶ Page D-17

For High Accuracy Positioning

- Stepping Motors
- Servo Motors
- Linear and Rotary Actuators

Operation under Specific Applications or Environments



This is a winding operation that must maintain constant tension or for use in an environment with splashing water, dust or a powdery substance.

Tension and Torque Control

For winding and applying tension



Torque Motors

Page C-213

Watertight, Dust-Resistant

For use in environments with a great deal of dust and splashing water



Watertight, Dust-Resistant Motors

Page C-203

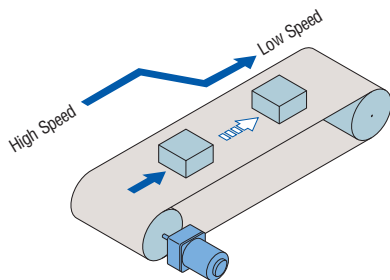
Peripheral Products

A stepping motor with terminal box offering excellent watertight and dust-resistant performance



● RK Series Terminal Box Type
▶ Page A-78

Variable Speed Operation



This is an operation to set the desired speed of automatic equipment.

High speed stability, energy saving and space saving

For stable speed control even with a fluctuating load

Simple settings with the feel of an AC motor

For simple, reasonable speed control



Brushless Motors

Page D-11



AC Speed Control Motors

Page D-153

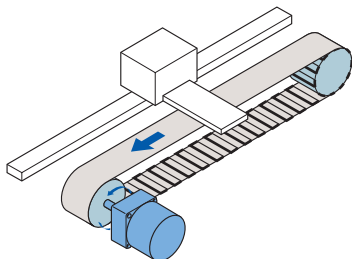
Peripheral Products

Even higher performance



● Servo Motors ▶ Page B-1

High Accuracy Positioning Operation



This is an operation to perform precise and accurate positioning.

In this positioning operation, a toothed belt is used to construct the mechanism instead of the friction belt that has a possibility of slipping.

Handles rapid acceleration and load fluctuation

For handling positioning at short distance, rapid acceleration and rapid load fluctuation

For positioning at short distance

For positioning with a compact, high-torque motor

For positioning at long distance

For positioning with a compact motor having a flat torque characteristic from low speed to high speed



0.36° Closed Loop Stepping Motor and Driver Packages

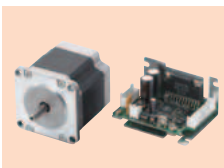
αSTEP

Page A-24, A-68, A-116, A-168



0.36°/0.72° Stepping Motor and Driver Packages

Page A-78, A-168



0.9°/1.8° Stepping Motor and Driver Packages

Page A-114, A-218, A-244



Servo Motors

Page B-1

Peripheral Products

A ball screw, belt-and-pulley, rack-and-pinion, hollow table and other mechanisms are incorporated in the stepping motor.



● Linear and Rotary Actuators ▶ Page E-1

The linear/rotary mechanism components are assembled in the motor, saving in-house labor

Transferring Loads

Ball Screw, Belt, etc.

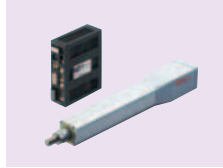


Motorized Linear Slides

Page E-7

Pushing and Pulling Loads

Ball Screw

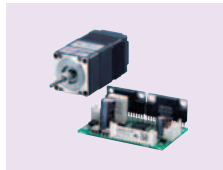


Motorized Cylinders

Page E-47

Pushing and Pulling Small Loads or Fine-Tuning

Ball Screw



Compact Linear Actuators

Page E-120

Index-Drive

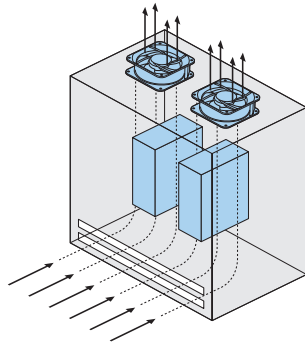
Hollow Rotary Table



Hollow Rotary Actuators

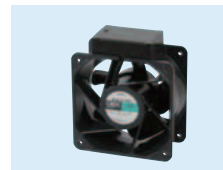
Page E-130

Take cooling and heating measures for equipment and applications



If cooling for a heat source, drying for an application or ventilation for equipment is needed

Cooling, drying and ventilation



Cooling Fans

Page F-2

Energy saving: operation only when needed



Thermostats

Page F-113

Selection Guide Based on Characteristics

Motors are classified according to their differences in basic principles of operation and their structures. When using a motor, it is critical to first thoroughly understand the basic characteristics of that motor.

Classification Based on Motor Characteristics

Motors Suited for Constant Speed

The induction motor is operated merely by connection to an AC power supply and has a rated speed of approximately 1450 rpm (60 Hz). It is ordinarily used with a gearhead connected directly for a lower speed. Induction motors are available with a reversible motor (30 minutes rating) for instantaneous reverse operation and an electromagnetic brake attached to the rear of the motor. These motors are equipped with a brake pack for instantaneous stopping and switching the rotation direction.

Standard AC Motors

Constant Speed Motors

→ Page C-9

Torque Motors (3 W~20 W)

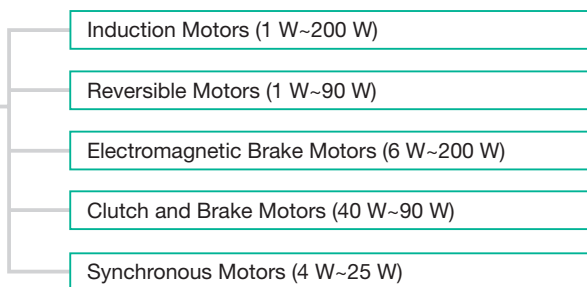
→ Page C-213

Watertight, Dust-Resistant Motors (25 W~90 W)

→ Page C-203

Brake Pack

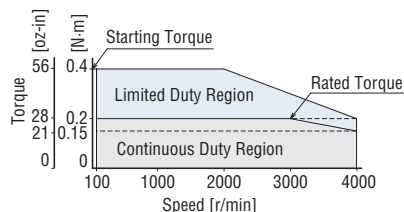
→ Page C-253



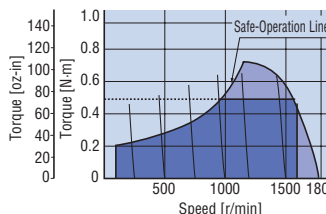
Motors Suited for Speed Control

For motors intended for speed control, we have high-efficiency brushless motors and AC speed control motors for controlling induction motors.

● Brushless Motors

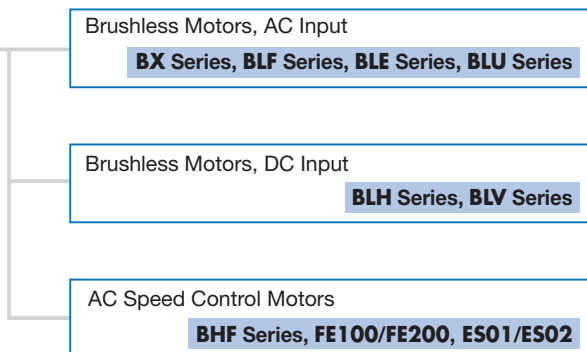


● AC Speed Control Motors



Brushless Motors AC Speed Control Motors

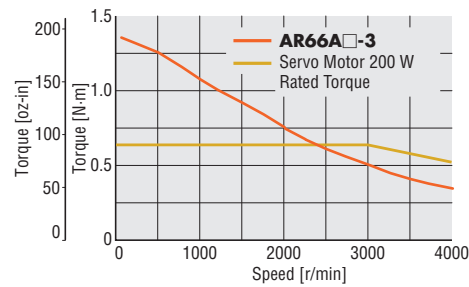
→ Page D-1



Motors Suited for Position Control

Position control motors are compact, have a wide speed range with high torque and provide superior control. The pulse signal from the controller (pulse generator) specifies the rotation angle and speed for accurate positioning operation. Stepping motors do not require tuning, have superior synchronization and position holding and can be used in simple system configurations. The servo motor follows up on commands, providing high speed and superior responsiveness.

● Stepping Motor vs. Servo Motor



The stepping motor generates a high torque at low-speed range and the servo motor differs in having a flat characteristic at high-speed range. With positioning operation, the stepping motor is therefore faster at short distances and the servo motor is faster at long distances.

Stepping Motors

→ Page A-1

AC Input, Stepping Motor and Driver Packages

0.36° High-Efficiency α STEP AR Series

0.72° RK Series

0.9°/1.8° UMK Series

DC Input, Stepping Motor and Driver Packages

0.36° High-Efficiency α STEP AR Series

0.36°/0.72° CRK Series

0.9°/1.8° CMK Series

1.8° RBK Series

Stepping Motors (Motor Only)

0.36° PK Series

0.72° PK Series

0.9° PK Series

1.8° PK/PV Series

Servo Motors

→ Page B-1

Servo Motors

NX Series

Motor + Linear and Index Table Mechanism

Mechanisms such as a ball screw and index table are built into the control motor.

Linear and Rotary Actuators

→ Page E-1

Air-Cool and Heat Measures

The cooling fans has blades and an impeller built into the motor and can be used for ventilation, cooling and more.

Cooling Fans

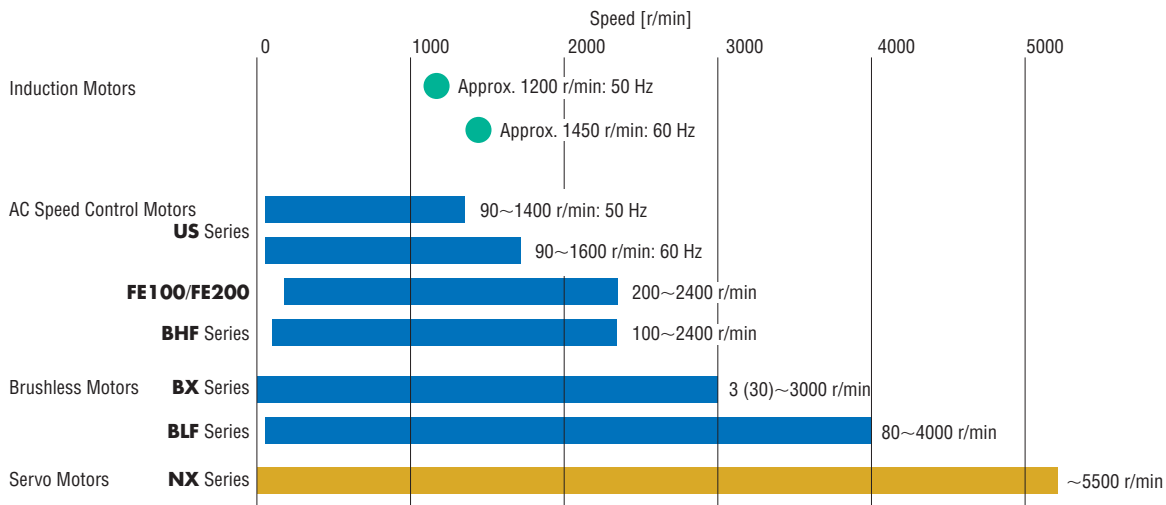
→ Page F-1

To meet the specification required for your application, the motor must meet the required characteristics such as speed, speed control range, braking characteristics and resolution as well as meet the operating functions. The following explains how to select a motor based on the required characteristics, by using representative motors as examples.

Motor Characteristics Comparison

Speed and Speed Control Range (Motor alone)

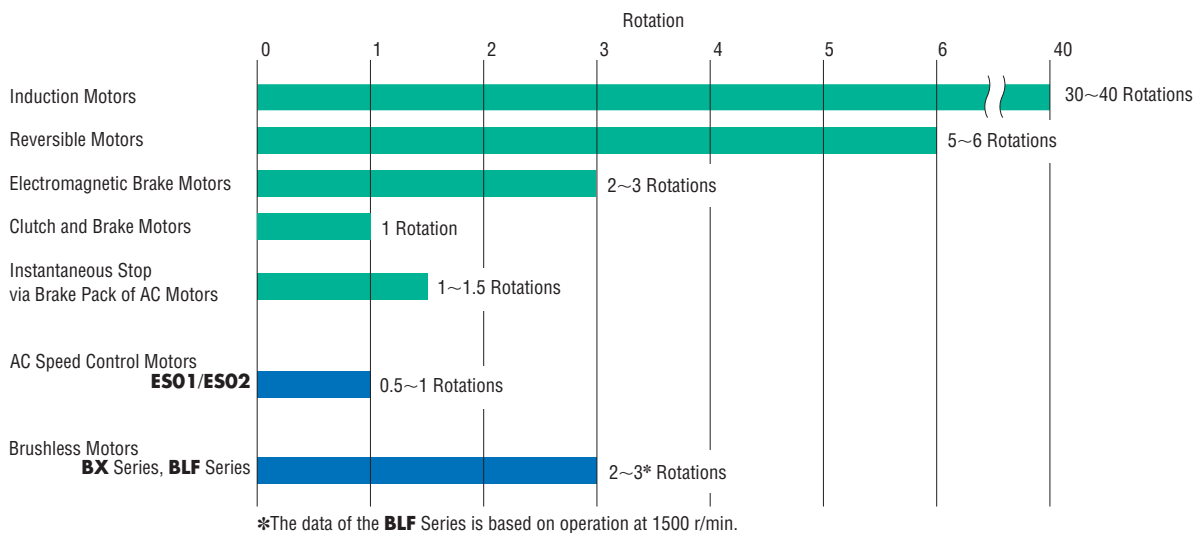
In an application where the motor operates at a constant speed, an induction motor is sufficient to carry out the required operating function. Take note that standard AC motors vary their speed according to the power supply frequency and the rated speed is approximately 1200 r/min at a frequency of 50 Hz and approximately 1450 r/min at 60 Hz. If the required speed exceeds 1200 r/min, an inverter or brushless motor is applicable. If the required speed 5000 r/min, an servo motor is applicable.



Braking Characteristics (Motor alone)

In a positioning application, you can use the instantaneous stop function of an electromagnetic brake motor, brake pack, speed control motor or brushless motor, as far as the operating function is considered. However, all of these motors use sensors to stop the load and are therefore subject to overrun. If the equipment must perform high accuracy positioning, a stepping motor offering excellent stopping accuracy is applicable. The stopping accuracy of stepping motors is $\pm 0.05^\circ$ (**RK** Series, No-load state). The stopping accuracy of servo motors is $\pm 0.05^\circ$ (**NX** Series).

Number of Rotations until Motor Stops (Reference values)



Stopping Precision

- Stepping Motors **RK** Series: $\pm 0.05^\circ$
- Servo Motors **NX** Series: $\pm 0.05^\circ$

Note

The above values are measured at the motor shaft under no load. Use this data only as a reference because the actual values will vary depending on the specific load condition.

Resolution (Motor alone)

For high-precision positioning, select a stepping motor or a servo motor. Oriental Motor's stepping motors have four basic step angles (0.36°, 0.72°, 0.9° and 1.8°). The smaller the basic step, the better suited to fine positioning. The 0.72° stepping motor and driver package and the servo motor resolution are nearly equivalent (with their initial settings), but stepping motors generally have the basic characteristic of generating high torque at low-speed range and servo motors generally have the basic characteristic of generating high torque at high-speed range. This is a factor that should be assessed when selecting a motor.

