

Stepper Motors

# Motor and Driver

## 5-Phase Stepper Motor and Driver RKII Series

Overview

Motor &  
Driver

5-Phase  
RKII

Driver

Motor

2-Phase  
PKP

5-Phase  
PKP

Page

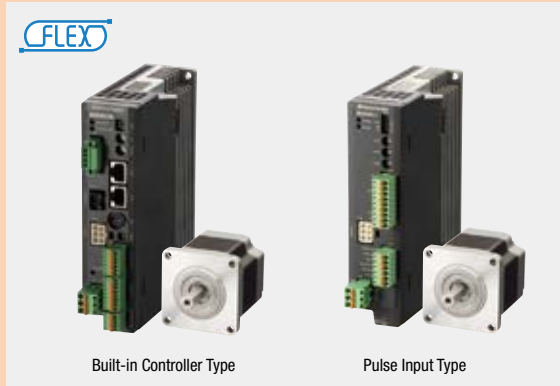
5-Phase Stepper Motor and Driver

**RKII** Series ..... **A-16**

# 5-Phase Stepper Motor and Driver RKII Series



For detailed information about regulations and standards, please refer to the Oriental Motor website.



5-phase stepper motor and driver with improved performance and ease of use, to achieve maximum performance the newly developed high efficiency 5-phase stepper motor is combined with a full digital control microstep driver.

- Affordably Priced from \$439.00 (Motor and Driver)
- Increased Accuracy, Decreased Vibration, Increased Torque
- High Efficiency Allows for Reduced Power Consumption and Lower Heat Generation
- A Variety of Geared Types are Available to Suit the Application
- 2 Driver Types to Choose from:  
Built-in Controller Type **FLEXO**/Pulse Input Type
- Various Easy-to-use Functions
- Improved Noise Resistance through Line Driver Connection



See Full Product Details Online  
[www.orientalmotor.com](http://www.orientalmotor.com)

- Manual
- Specifications
- Dimensions
- CAD
- Characteristics
- Connection and Operation

## Features

### High-Efficiency at Low Price

The **RKII** Series offers significant improvements in motor performance, driver operation and functions compared to conventional products and is available at a new lower price. In this example, the **RKII** Series is \$125.00 less.

- List Price starting from \$439.00 (Motor and Driver)



Conventional Product:  
**RK Series**  
□60 mm (2.36 in.)  
Standard Type  
**\$609.00**



**RKII Series**  
Pulse Input Type  
□60 mm (2.36 in.)  
Standard Type  
**\$484.00**

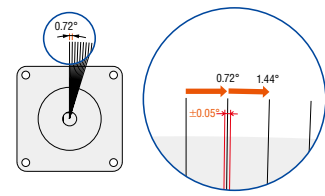
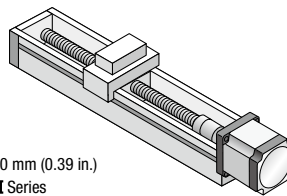
### Advanced Performance

#### High Accuracy

The positioning accuracy of the **RKII** Series is  $\pm 0.05^\circ$  ( $\pm 3$  arcmin). When used in combination with a ball screw as shown in the figure on the right, the positioning accuracy is  $\pm 0.0014$  mm. The accuracy of a regular ground ball screw is  $\pm 0.01$  mm, thus the accuracy is high enough for positioning operation.

- Conditions
- Ball screw lead: 10 mm (0.39 in.)
  - Motor used: **RKII** Series

Stopping Accuracy:  $\pm 0.0014$  mm

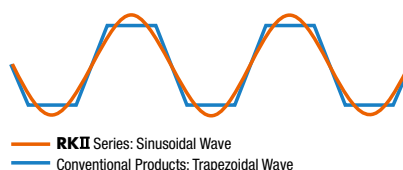


Positioning Accuracy  $\pm 0.05^\circ$

#### Low Vibration

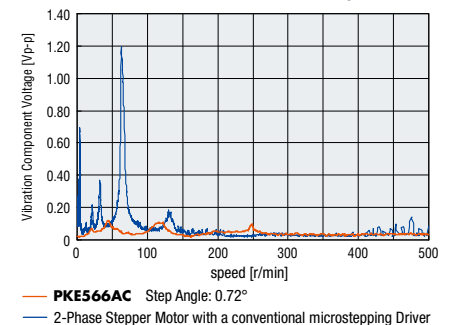
Utilizing a full-time microstepping driver controlled by a digital system improves the vibration characteristics of the 5-phase stepper motor. Current control is also done by a high specification digital CPU. This product uses PWM control instead of PAM control resulting in a sinusoidal wave form in each phase, significantly reducing vibration.

#### Current Waveform in Motor (theoretical figure)



Vibration is reduced when the motor current waveform changes from trapezoidal to sinusoidal.

#### Vibration Characteristics Comparison



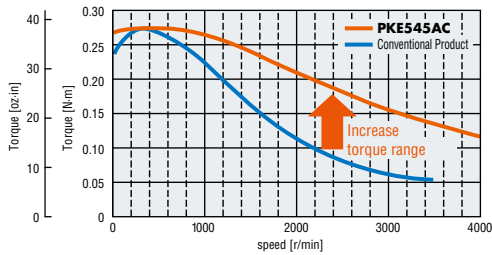
## ● High Torque

The **RKII** Series is compact and produces high torque. The torque of the 42 mm (1.65 in.) frame size has increased 50%. This contributes to reduced positioning time and increased equipment tact time. The series includes 60 mm (2.36 in.) and 85 mm (3.35 in.) frame size to cover a wide torque range.

### Note

● For 60 mm (2.36 in.) and 85 mm (3.35 in.) frame size products, the torque is equivalent to the conventional product.

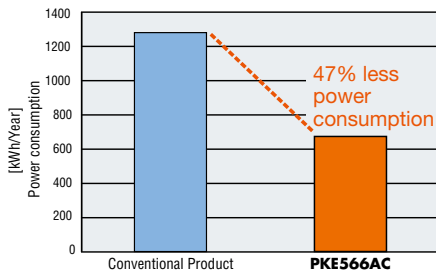
## ◇ Torque Comparison □ 42 mm (1.65 in.)



## ● High Efficiency, Power Saving, Low Heat Generation

By optimizing the motor material, loss has been greatly reduced and power consumption has been reduced by up to 47%. This results in reduced electricity cost and CO<sub>2</sub> emissions.

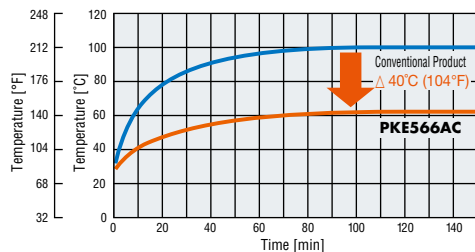
## ◇ Power Consumption Comparison



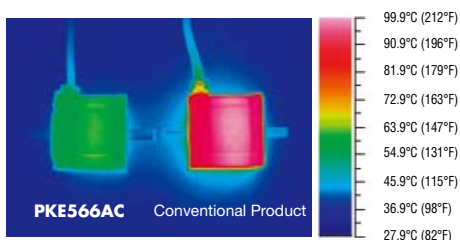
### Operating Condition

- Speed: 1000 r/min
- Load Torque: 0.47 N·m (67 oz-in)
- Operating Time: 24 hours  
(Operation 70%, Stand-by 25%, Off 5%)  
365 days/year

## ◇ Motor Surface Temperature Comparison when Operating under the Same Conditions



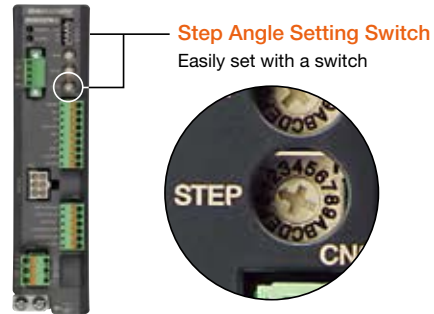
## ◇ Temperature Distribution by Thermography



## Easy-to-Use Functions

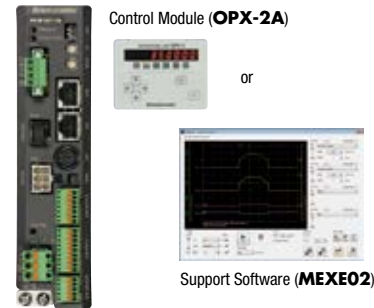
### ● Step Angle is Easy to Set

For pulse input type, 32 step angles can be selected. To easily upgrade from a 2-phase stepper motor, use the step angle setting switch to match the existing input pulses to the desired output speed and position. There is no software or control module required.



For built-in controller type, the value can be set between 200 p/rev~200000 p/rev.

Setting can be done by a control module, support software or RS-485 communication.

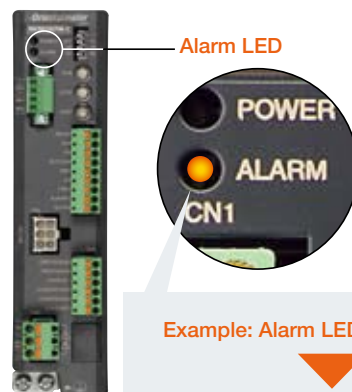


### ● Various Built-in Protective Functions

Protective functions are built-in to quickly respond when trouble occurs. The blink count of the alarm LED allows the problem to be quickly identified.

#### <Example of Alarm Types>

- Main circuit overheating
- Overvoltage
- Command pulse error
- Overcurrent
- Undervoltage
- Electrolytic capacitor error
- EEPROM error
- CPU error
- Automatic electromagnetic brake control error



Example: Alarm LED blinks 3 times

Overvoltage alarm

#### [Cause]

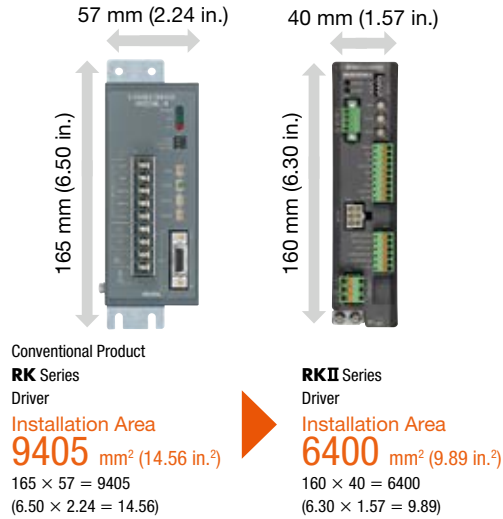
- Power supply voltage exceeded its permissible value.
- A large inertial load was stopped suddenly or lifted or lowered.

● **Space Saving**

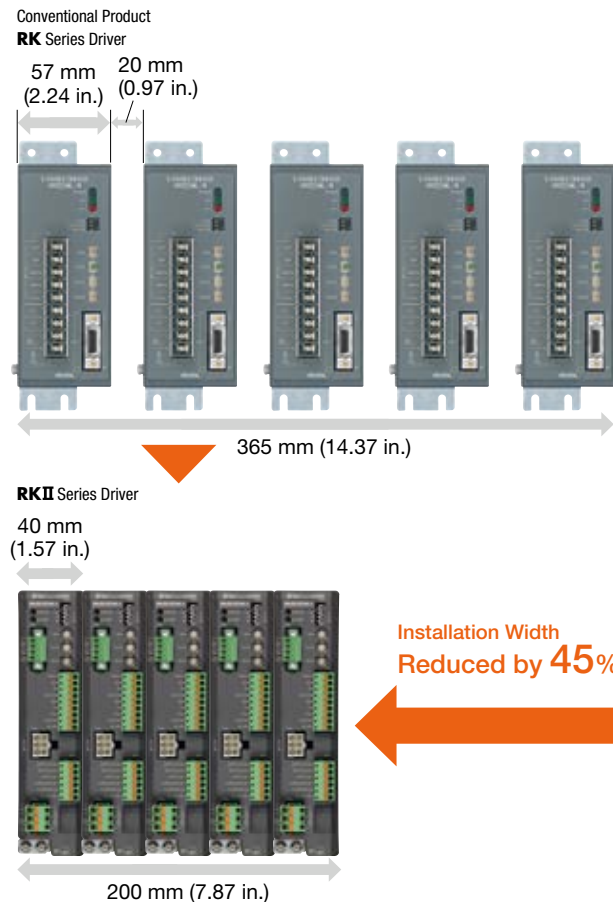
This new driver has a compact and slim body through the rearrangement of the internal components to optimize space. Multiple drivers can now be installed in contact with each other, making it possible to increase the number of axes within the same equipment space.

● When drivers are installed in contact with each other, the allowable ambient temperature range is 0~40°C (+32~+104°F).

**Compact Slim Body Driver**



**Multiple Drivers can be Installed in Contact with Each Other**



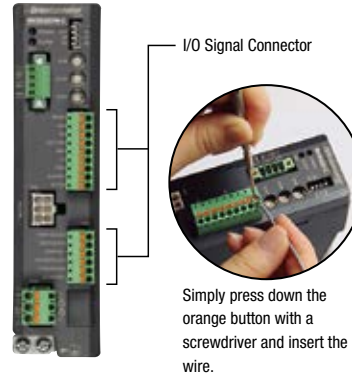
● **Easy Wiring**

Screwless I/O connectors eliminate the need for soldering or special crimping tools. The motor connector can be connected easily by using a dedicated cable. This will reduce wiring time, prevent mis-wiring and reduce maintenance.

◇ **I/O Connector Wiring**

- No soldering
- No special crimping tools
- No need to manage screw tightening torque

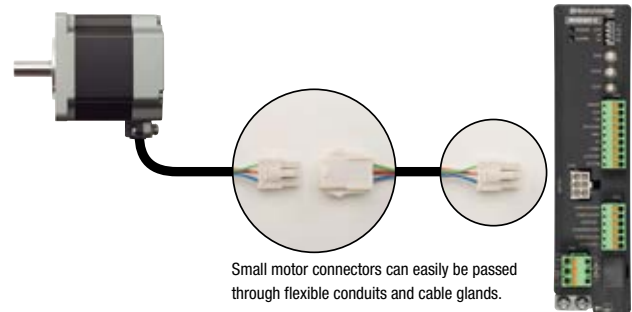
- **Wiring time reduction**
- **Reduced maintenance**



◇ **Motor Connector Wiring**

- No screw tightening
- No need to manage tightening torque
- No need to worry about mis-wiring

- **Wiring time reduction**
- **Reduced problems caused by mis-wiring**



## 2 Driver Types Available Depending on the System Configuration

2 types of **RKII** Series drivers are available, depending on the master control system in use.

### ● Built-in Controller Type FLEXO

● When Controlling with I/O

① I/O

● When Controlling from Computer or Touch Screen (HMI)

② Modbus (RTU)

● When Controlling with Serial Communication

② Modbus (RTU)

● When Controlling with FA Network

③ FA Network

② RS-485

With this type, the operating data is set in the driver, which can then be selected and executed from the host system. Host system connection and control are performed with ① I/O, ② Modbus (RTU)/RS-485 or ③ FA network.

● EtherCAT is a registered trademark for which a license is provided by Beckhoff Automation GmbH in Germany.  
 ● CC-Link is a registered trademark of CC-Link Partner Association and MECHATROLINK is a registered trademark of MECHATROLINK Members Association.

### ● Pulse Input Type

Pulse Input

This type executes operations by inputting pulses into the driver. It controls the motor using a positioning module (pulse generator).

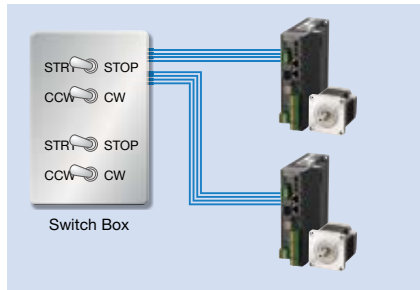
Overview
Motor & Driver
5-Phase RKII
Driver
Motor
2-Phase PKP
5-Phase PKP

### ● Control System Configuration for Built-in Controller Type

#### ① I/O Control

The positioning module (pulse generator) function is built into the driver, and therefore an operation system using I/O can be created by connecting directly to a switch box or PLC. A positioning module is not necessary on the PLC side, saving space and simplifying the system.

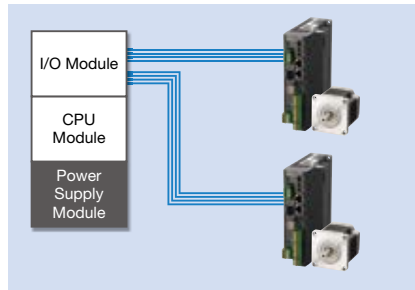
##### ● Example of Using a Switch Box



Operating data is set in the driver, and the motor can be started or stopped simply by connecting a switch. Control can be performed easily without using PLC.

- Easy Control
- Low-Cost Design

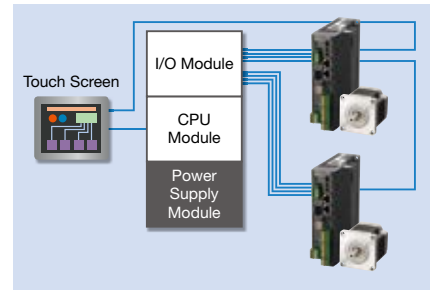
##### ● Example of Using PLC



When using PLC, an operation system can be created by connecting directly to an I/O module. A positioning module is not necessary on the PLC side, therefore space is saved and the system is simplified.

- Easy Control
- Low-Cost Design
- Space Saving

##### ● Example of Using PLC and a Touch Screen



Normally, the motor is started and stopped with I/O. Changing the operating data settings and displaying the monitors and alarms is performed with the touch screen using Modbus (RTU) communication. When there is a lot of setup work, changes can be easily performed on the touch screen, and the burden of creating ladders is reduced.

- Easy Control
- Support for Small Lots of Multiple Products

#### ② Control via Modbus (RTU)/RS-485 Communication

RS-485 communication can be used to set operating data and parameters and input operation commands. Up to 31 drivers can be connected to 1 serial communication module. There is a function that enables multiple shafts to be started simultaneously. The Modbus (RTU) protocol is supported and can be used to connect to touch screens and computers.

- Easy Control
- Simple Wiring
- Supports Brands of Serial Modules
- Motor Controlled by Computer
- Simplified System

#### ③ Control via FA Network

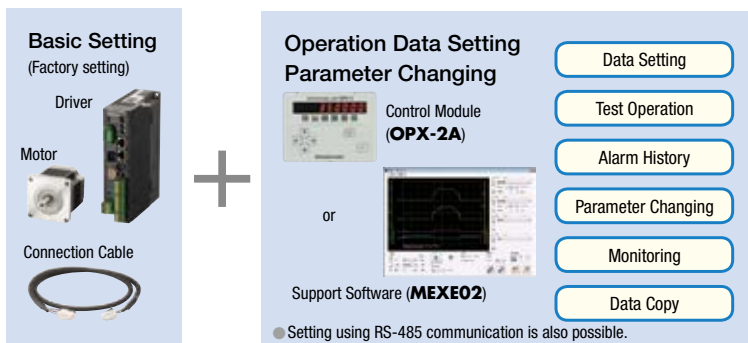
By using a network converter (sold separately), EtherCAT, CC-link or MECHATROLINK communication are possible. These can be used to set operating data and parameters and input operation commands.

- Easy Control
- Simple Wiring
- Multi-Axis Control at Low Cost

## Built-in Controller Type

Because the driver stores the information data necessary for motor operation, the burden on the host PLC is reduced. The system configuration for multi-axis control has been simplified.

Settings are configured using a control module (sold separately), support software or RS-485 communication.



### ● Operation Types

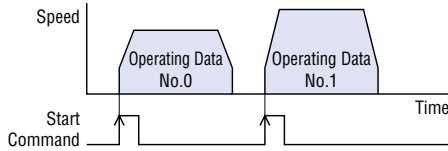
In the built-in controller type, the operating speed and traveling amount of the motor are set with operating data, and operation is performed according to the selected operating data. There are four types of motor operations.

Item		Description		
Common	Control Method	I/O control		
		RS-485 Communication	Network Converter Connection Modbus RTU Protocol Connection	
	Position Command Input	Setting with operating data number	Command range for each point: -8388608~8388607 [step] (Setting unit: 1 [step])	
	Speed Command Input	Setting with operating data number	Command Range: 0~1000000 [Hz] (Setting unit: 1 [Hz])	
	Acceleration/Deceleration Command Input	Set with the operating data number or parameter. The acceleration/deceleration rate [ms/kHz] or acceleration/deceleration time [s] can be selected. Command Range: 0.001~1000.000 [ms/kHz] (Setting unit: 0.001 [ms/kHz]) 0.001~1000.000 [s] (Setting unit: 0.001[s])		
	Acceleration/Deceleration Processing	Velocity Filter, Movement Average Filter		
Return-To-Home Operation	Return-to-Home Modes	2-Sensor Mode	A return-to-home operation that uses a limit sensor (+LS, -LS).	
		3-Sensor Mode	A return-to-home operation that uses a limit sensor and a HOME sensor.	
		Position Preset	A function where P-PRESET is input at the desired position to confirm the home position. The home position can be set to the desired value.	
Positioning Operation	Number of Positioning Points	64 points (No. 0~63)		
	Operating Modes	Incremental Mode (Relative positioning)		
		Absolute Mode (Absolute positioning)		
	Operation Functions	Independent Operation	A PTP (Point to Point) positioning operation.	
		Linked Operation	A multistep speed-change positioning operation that is linked with operating data.	
		Linked Operation 2	A positioning operation with a timer that is linked with operating data. The timer (dwell time) can be set from 0~50.000 [s]. (Setting unit: 0.001 [s])	
	Start Methods	Operating Data Selection Method	Starts the positioning operation when START is input after selecting M0~M5.	
Direct Method (Direct positioning)		Starts the positioning operation with the operating data number set in the parameters when MS0~MS5 is input.		
Sequential Method (Sequential positioning)		Starts the positioning operation in sequence from operating data No. 0 each time SSTART is input.		
Continuous Operation	Number of Speed Points	64 points (No. 0~63)		
	Speed Change Method	Changes the operating data number.		
Other Operations	JOG Operation	Regular feed is performed by inputting +JOG or -JOG.		

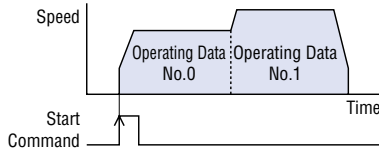
## Positioning Operation

### <Operation Functions>

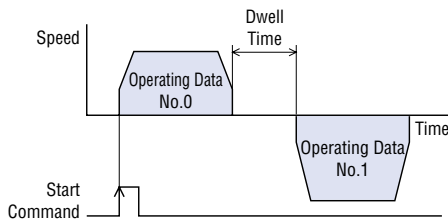
#### •Independent Operation



#### •Linked Operation



#### •Linked Operation 2

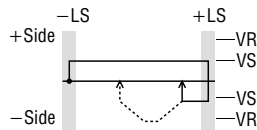


### <Start Methods>

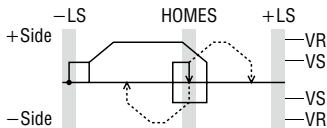
- Operating Data Selection Method
- Direct Positioning
- Sequential Positioning

## Return-To-Home Operation

#### •2-Sensor Mode

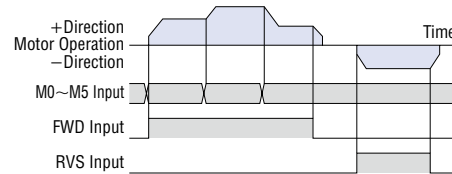


#### •3-Sensor Mode



#### •Position Preset

## Continuous Operation



## Other Operations

#### •JOG Operation (Test operation)

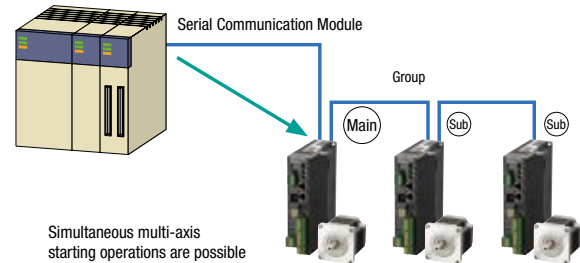
#### •Group Send Function

Modbus (RTU) communication and FA network have a function that enables multiple motors to be started simultaneously.

Multiple drivers can be grouped together, and when an operation command is sent to the master driver, all the drivers that belong to the same group as the master driver will operate simultaneously.

- Modbus (RTU) control: Support for simultaneous start, changes to traveling amount and speed and monitoring
- FA network control: Simultaneous start only

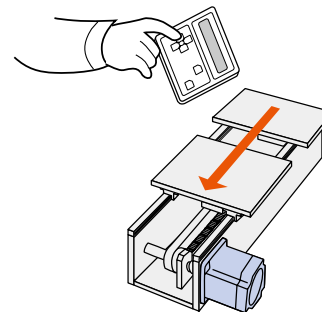
#### •Example of Modbus (RTU) Communication Control



#### •Teaching Function

Teaching can be performed with the **OPX-2A** control module (sold separately) or the **MEXE02\*** support software. The table is moved to the desired position, and the position data at that time is stored as the positioning data.

\*The support software can be downloaded from the website. Please contact us for details.







## Product Line of Motor

### Types and Features of Standard and Geared Motors


\*We provide encoder installed products, but only for the built-in controller products.


Type	Features	Permissible Torque and Max. Instantaneous Torque [N·m (lb-in)]	Backlash [arcmin (degrees)]	Basic Resolution [deg/step]	Output Shaft Speed [r/min]
<b>Standard Type</b> 	<ul style="list-style-type: none"> <li>Basic motors of the RKII Series</li> <li>For encoder installed motors, functions for monitoring positioning data, detecting positioning gap are available.</li> <li>Resolution of encoder installed: 500 p/r.</li> </ul>	Maximum Holding Torque 6.3 (55)	—	0.72	6000
<b>TS Geared Type</b> (Spur Gear Mechanism)	<ul style="list-style-type: none"> <li>High torque (Double of existing products)</li> <li>A wide variety of reduction gear ratios, high-speed operations</li> <li>Gear ratio: 3.6, 7.2, 10, 20, 30</li> </ul>	Permissible Torque Max. Instantaneous Torque 25 38 (220) (530)	10 (0.17)	0.024	833
<b>PS Geared Type</b> (Planetary Gear Mechanism)	<ul style="list-style-type: none"> <li>Less backlash (comparing with existing products)</li> <li>Highly permissible torque/ max. instantaneous torque</li> <li>A wide variety of gear ratios for selecting the desired step angle</li> <li>Centered shaft</li> <li>Gear ratio: 5, 7.2, 10, 25, 36, 50</li> </ul>	Permissible Torque Max. Instantaneous Torque 37 60 (320) (530)	7 (0.12)	0.0144	600
<b>Harmonic Geared Type</b> (Harmonic Drive)	<ul style="list-style-type: none"> <li>Longer mechanical life (2 times of existing products)</li> <li>Higher torque (1.3 times of existing products)</li> <li>High positioning accuracy</li> <li>Highly permissible torque/ max. instantaneous torque</li> <li>High reduction ratio, high resolution</li> <li>Center shaft</li> <li>Gear ratio: 50, 100</li> </ul>	Permissible Torque Max. Instantaneous Torque 52 107 (460) (940)	0	0.0072	70

**Note**

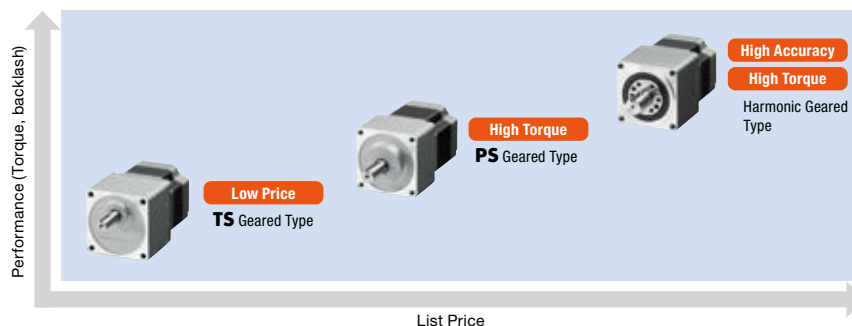
- Above values are for reference only. These values vary depending on motor frame size and gear ratios.
- Harmonic drive and  are registered trademarks of Harmonic drive systems Inc or trademarks.

### List of Drivers and Motors

Driver Type	Motor Type	Frame Size	Electromagnetic Brake	Power Supply Input
<b>Built-in Controller Type</b> 	Standard Type	42 mm (1.65 in.) 60 mm (2.36 in.) 85 mm (3.35 in.)	●	Single Phase 100-120 VAC Single Phase 200-240 VAC
	Standard Type with Encoder	42 mm (1.65 in.) 60 mm (2.36 in.) 85 mm (3.35 in.)	—	
	TS Geared Type PS Geared Type Harmonic Geared Type	42 mm (1.65 in.) 60 mm (2.36 in.) 90 mm (3.54 in.)	●	

Driver Type	Motor Type	Frame Size	Electromagnetic Brake	Power Supply Input
<b>Pulse Input Type</b> 	Standard Type	42 mm (1.65 in.) 60 mm (2.36 in.) 85 mm (3.35 in.)	●	Single Phase 100-120 VAC Single Phase 200-240 VAC
	TS Geared Type PS Geared Type Harmonic Geared Type	42 mm (1.65 in.) 60 mm (2.36 in.) 90 mm (3.54 in.)	●	

Oriental Motor offers geared motors, which come pre-assembled. Based on torque, accuracy (backlash) and list price, the optimal type can be selected from the various geared motors.





## Features of the Product Line

### Standard Type with Encoder (Built-in controller type only)

Encoder installed motors make it possible to monitor the present position and detect for errors.



#### ● Position Monitor

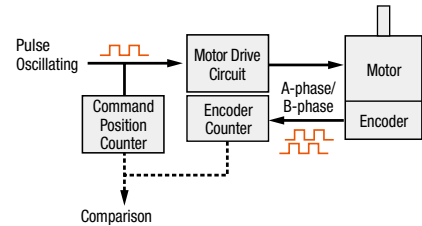
This feature can be used to detect the position of the motor. For instance, to confirm normal operations compare commanded position to the actual position.

#### ● Return-to-Home Operation by Using Z-phase Signal

Z-phase signal can be utilized for the return-to-home operation. Using Z-phase signal, the return-to-home point will be detected with higher accuracy than use of a return-to-home sensor.

#### ● Detecting for Errors

The encoder will compare commanded position and encoder-count. If deviation exceeds the set value, a STEPOUT signal will be output. Positional errors due to rapid changes in load can be detected. An alarm signal for abnormality in deviation is also available.



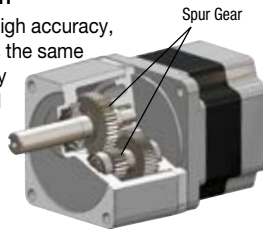
### TS Geared Type

This geared type is made with a simple spur gear design. The torque and speed have been improved.



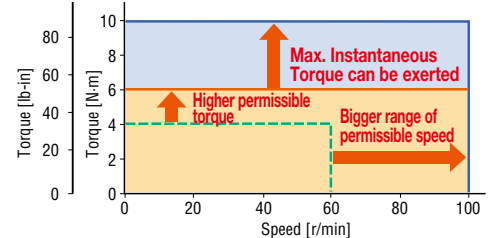
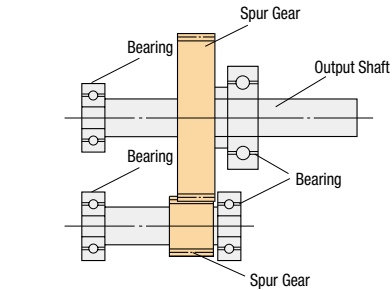
#### ● Mechanism

Because of its high accuracy, The **TS** type has the same level of accuracy when compared to our tapered (**TH**) type without the added cost of tapering.



#### ● Torque and Speed are Improved (compared with conventional product types)

The **TS** geared type realizes the improvement of permissible torque and at the same time, it can exert a maximum instantaneous torque. The rated input speed is increased to 3,000 r/min and the permissible speed range of the output shaft has been significantly increased as well. The motor allows for higher torque and shortens the time for positioning, because the maximum instantaneous torque range can be used for acceleration/deceleration.



— **PKE564** Gear Ratio 30, Max. Instantaneous Torque  
 --- Conventional Product Types Permissible Torque  
 — **PKE564** Gear Ratio 30, Permissible Torque

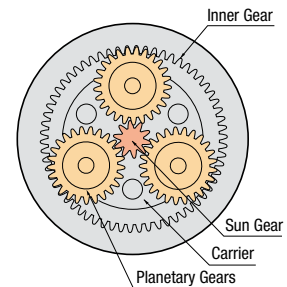
### PS Geared Type

The **PS** gear mechanism is comprised primarily of a sun gear, planetary gears and an internal tooth gear. The planetary gears design allows for higher output torque.



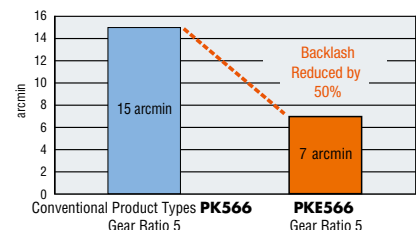
#### ● Mechanism

There are gears inside used to distribute torque, which allows for higher torque than a spur gear design. The **PS** gear uses a higher accuracy gear design which provides for a lower backlash when compared to a spur gear design.



#### ● Reduced Backlash (Compared with conventional product types)

Optimal design of gears reduced backlash. [Except: □42 mm (1.65 in.)] Positioning with higher accuracy is possible.



# Harmonic Geared Type

The mechanical life, permissible torque and maximum instantaneous torque are improved (compared with conventional products).



## Improved Rated Life (Twice the length of conventional products)

The rated life has been increased from 5,000 hours (conventional products) to 10,000 hours. [Except □42 mm (1.65 in.)]

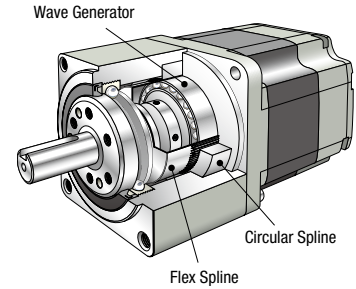
### [Condition for rated life time]

- Torque : Permissible torque
- Type of load: Uniform load
- Input speed : 1,500 r/min
- Radial load : Permissible radial load
- Axial load : Permissible axial load

## High Torque

With more permissible and maximum instantaneous torque available, more load can be handled with the same size geared motor.

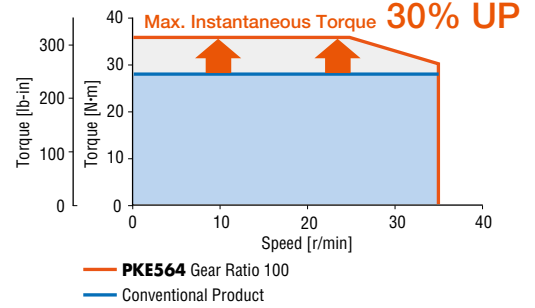
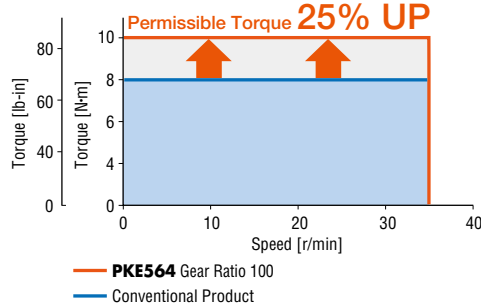
## Structure



## Comparison of Specification

Product Name	PKE564AC-HS100	Conventional Product
Permissible Torque N·m	10 (88 lb-in)	8 (70 lb-in)
Max. Instantaneous Torque N·m	36 (310 lb-in)	28 (240 lb-in)
Gear Ratio	100	
Lost Motion [Load Torque]	0.7 arcmin or less [±0.39 N·m (3.4 lb-in)]	

## Comparison of Torque Characteristics



## Surface Installation of Load Is Available

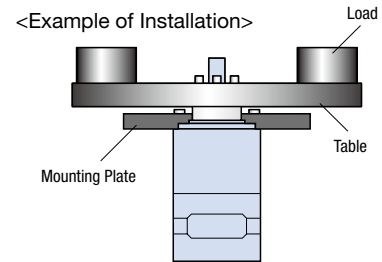
This type permits installation of load directly on the rotating surface integrated with the shaft. [Except: □90 mm (3.54 in.)]

## Appearance and Installation

Example: This surface rotates with the shaft



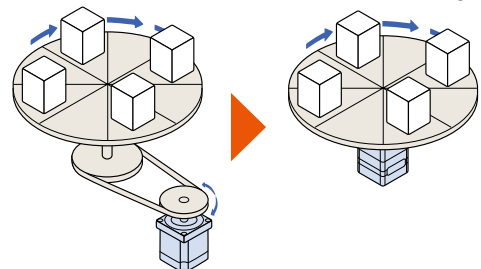
Tapped holes are provided on the rotating surface for load installation



## Application: Index Table

This type not only reduces the number of parts/processes, but also improves reliability. They are also suitable for operating with moment loads.

## <Conventional Mechanism> <Surface Mounting>



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## Advantages of Geared Motors

Using geared motors bring many advantages, such as speed reduction, high torque and high resolution.

### The Motor Can Drive a Large Inertial Load

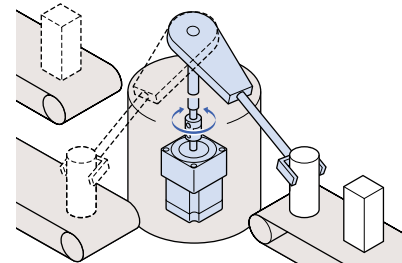
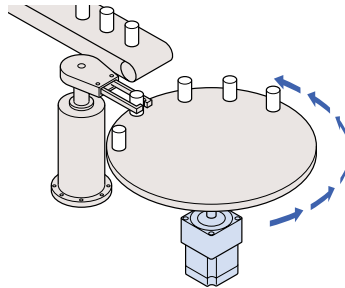
If compared with a standard motor, the geared motors can drive larger inertial loads because its permissible load moment of inertia increases with the square of the gear ratio. This means that larger inertial loads can be driven with geared motors.

### Comparison of Load Moment of Inertia

	Motor Type	Motor Product Name	Load Moment of Inertia (10 times of Rotor Inertia)	Diameter of Inertial Load (Thickness: 20 mm (0.79 in.), material: Aluminum)	Speed Range
	Standard Type	<b>PKE564AC</b>	$1.6 \times 10^{-4}$ kg·m <sup>2</sup> (8.8 oz-in <sup>2</sup> )	72 mm (2.83 in.)	0~6,000 r/min
	<b>PS</b> Geared Type (Gear ratio 5)	<b>PKE566AC-PS5</b>	$67.5 \times 10^{-4}$ kg·m <sup>2</sup> (370 oz-in <sup>2</sup> )	187 mm (7.36 in.)	0~600 r/min

### Improved Damping Characteristic at Start and Stop

If the inertial load is large or acceleration/ deceleration time is short, a geared motor can reduce damping more effectively and thereby ensure more stable driving compared to a standard motor. Geared motors are ideal for applications where a large inertia such as an index table or arm must be driven to perform quick positioning.

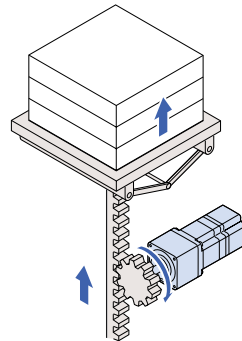


### High Rigidity, Resistant to Torsional Force

Geared motors have high rigidity and are resistant to torsional force. Therefore, compared to standard motors, geared motors are less subject to load torque fluctuation. This means that stability and high positioning accuracy can be ensured even when the load size changes.

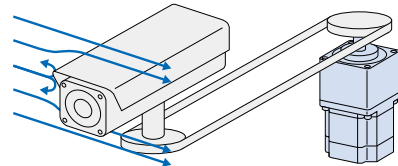
#### Application: Lifter

The application can perform high-precision stops, even with elevators and other mechanisms that perform vertical operations where the number of loads or weight of loads changes.



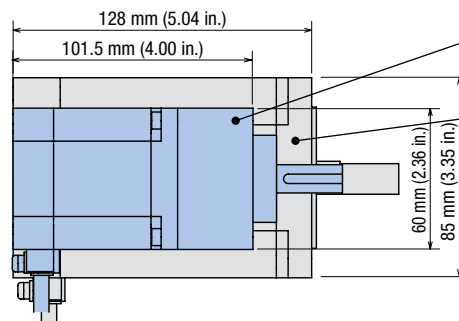
#### Application: Security Camera

The position can be held securely even when the camera sways from strong winds.



### Downsizing

If comparing the standard motor and the geared motor, which have similar maximum holding torque, the frame size of the geared motor is smaller than the standard motor. Geared motors are effective when the equipment must be kept small and light.



**PS Geared Motor**  
**PKE564AC-PS25** Weight: 1.4 kg (3.1 lb.),  
TH = 8 N·m (70 lb-in)

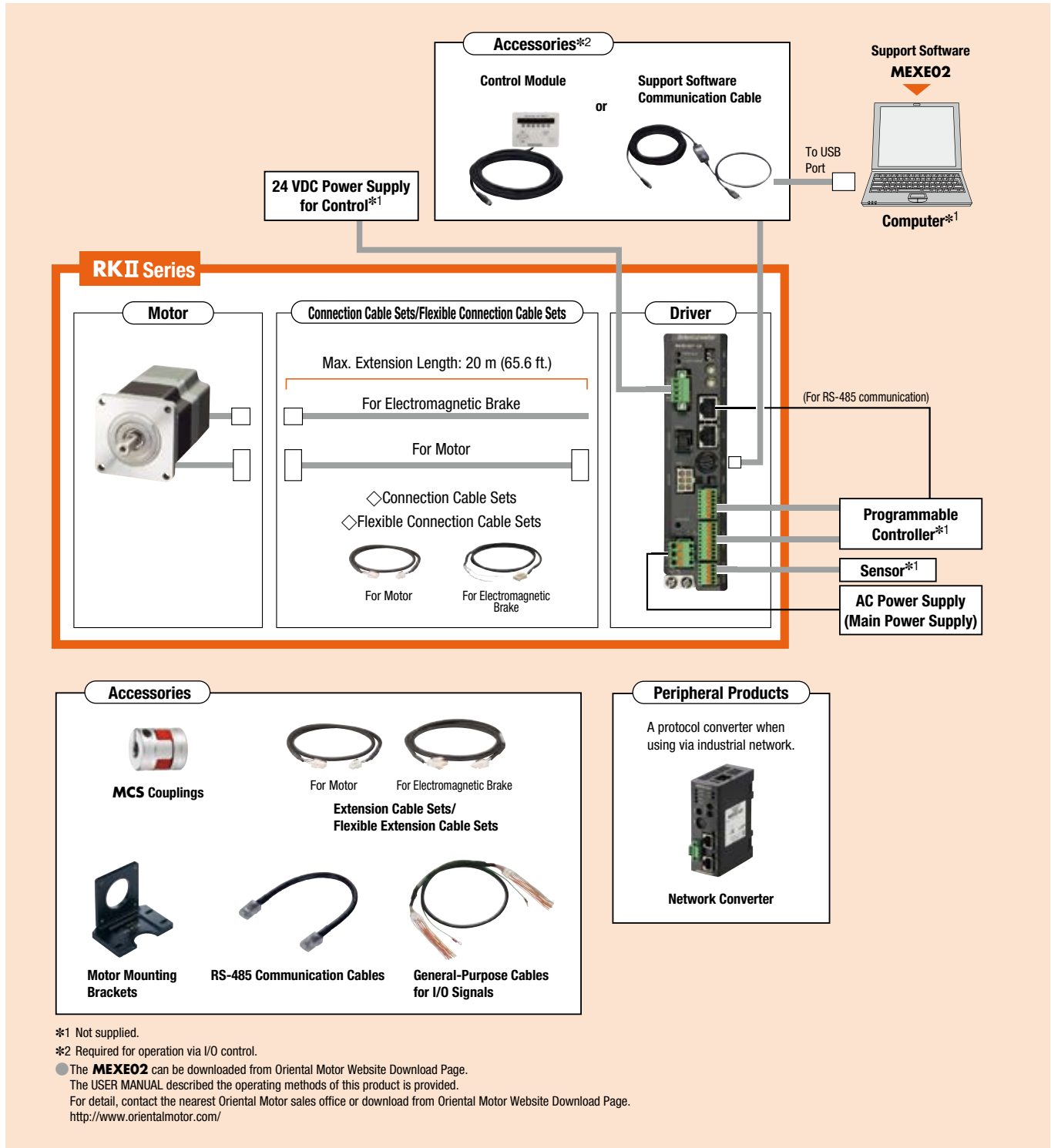
**Standard Motor**  
**PKE5913AC** Weight: 4.1 kg (9 lb.),  
TH = 6.3 N·m (55 lb-in)

\* TH means "Maximum Holding Torque"

### System Configuration

● Built-in Controller Type, Standard Type with Electromagnetic Brake

An example of a configuration using I/O control or RS-485 communication is shown below.



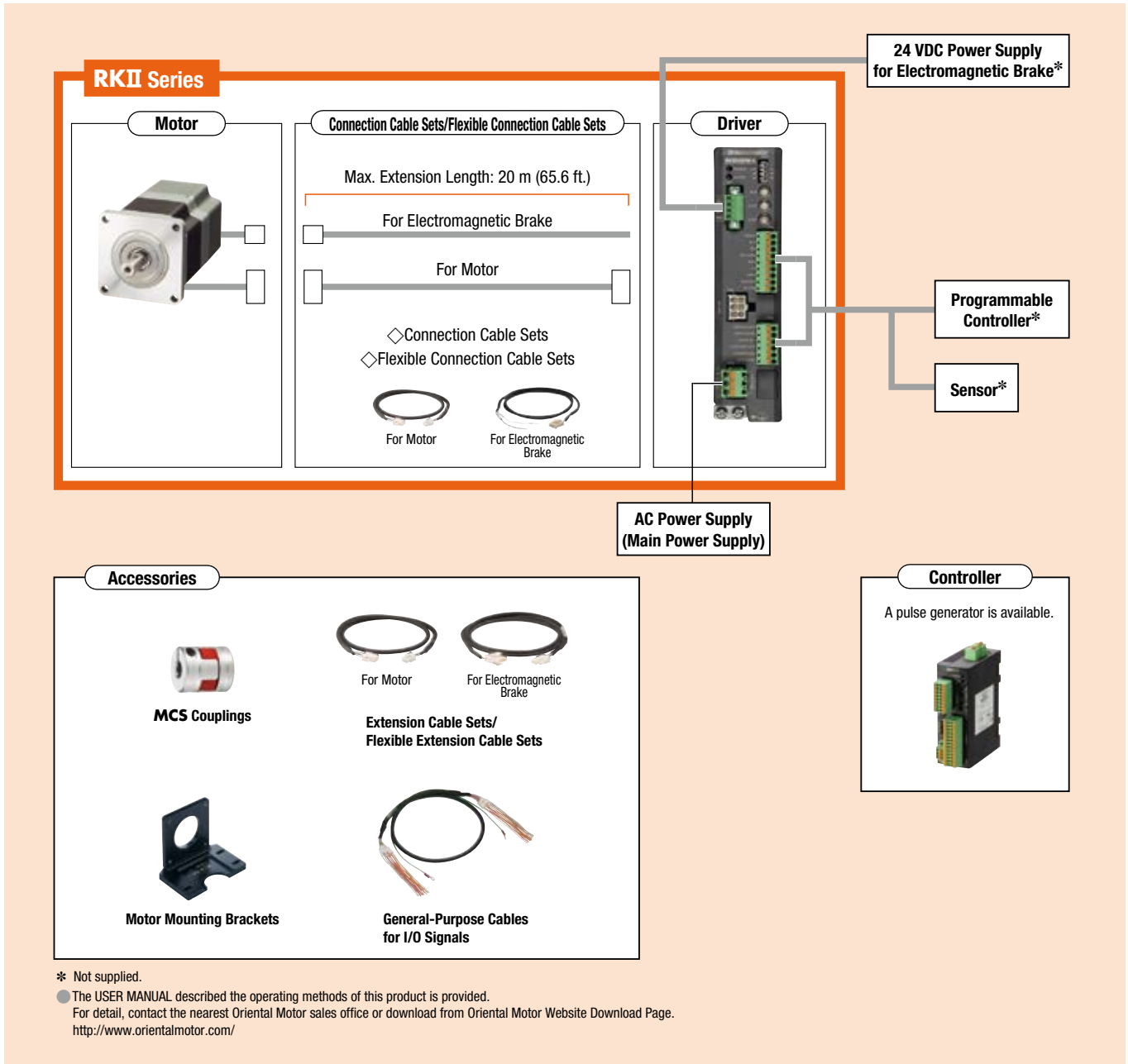
● Example of System Configuration Pricing

RKII Series			Accessories		
Motor	Driver	Connection Cable Set	Motor Mounting Bracket	Flexible Coupling	General Purpose Cables for I/O Signals 1 m (3.3 ft.)
<b>PKE566MC</b>	<b>RKSD507-CD</b>	<b>CC030VPFB</b>	<b>PAL2P-5A</b>	<b>MCS301010</b>	<b>CC16D010B-1</b>
\$276.00	\$404.00	\$66.00	\$17.00	\$71.00	\$25.00

● The system configuration shown above is an example. Other combinations are also available.

## ● Pulse Input Type, Standard Type with Electromagnetic Brake

This single-axis system configuration uses a programmable controller (with pulse oscillation function).



Overview

Motor & Driver

5-Phase RKII

Driver

Motor

2-Phase PKP

5-Phase PKP

## ● Example of System Configuration Pricing

RKII Series			+	Controller	Accessories		
Motor	Driver	Connection Cable Set			Motor Mounting Bracket	Flexible Coupling	General Purpose Cables for I/O Signals 1 m (3.3 ft.)
<b>PKE566MC</b>	<b>RKSD507M-C</b>	<b>CC030VPFB</b>		<b>SCX11</b>	<b>PAL2P-5A</b>	<b>MCS301010</b>	<b>CC16D010B-1</b>
\$276.00	\$404.00	\$66.00		\$349.00	\$17.00	\$71.00	\$25.00

● The system configuration shown above is an example. Other combinations are also available.

## Product Number

### Motor

#### Standard Type

**PKE 5 6 4 R C 2**

① ② ③ ④ ⑤ ⑥ ⑦

#### TH, PS, Harmonic Geared Type

**PKE 5 6 4 M C - HS 50**

① ② ③ ④ ⑤ ⑥ ⑧ ⑨

### Driver

#### Built-in Controller Type

**RKSD 5 07 - A D**

① ② ③ ④ ⑤

#### Pulse Input Type

**RKSD 5 07 M - A**

① ② ③ ④ ⑤

### Connection Cable Sets/Flexible Connection Cable Sets

**CC 050 V P F B**

① ② ③ ④ ⑤ ⑥

①	Motor Type	<b>PKE: RKII Series Motor</b>
②		<b>5: 5-Phase</b>
③	Motor Frame Size	<b>4:</b> 42 mm (1.65 in.) <b>6:</b> 60 mm (2.36 in.) <b>9:</b> 85 mm (3.35 in.) [90 mm (3.54 in.) for geared type]
④	Motor Case Length	
⑤	Shaft/Encoder/ Electromagnetic Brake	<b>A:</b> Single Shaft <b>B:</b> Double Shaft <b>R:</b> with Encoder <b>M:</b> with Electromagnetic Brake
⑥	Motor Specification	<b>C:</b> AC Power Supply Input
⑦	Reference Number	
⑧	Geared Type	<b>TS: TS</b> Geared Type <b>PS: PS</b> Geared Type <b>HS:</b> Harmonic Geared Type
⑨	Gear Ratio	

①	Driver Type	<b>RKSD: RKII Series Driver</b>
②		<b>5: 5-Phase</b>
③	Output Current	<b>03:</b> 0.35 A/Phase <b>07:</b> 0.75 A/Phase
④	Power Supply Input	<b>A:</b> Single-Phase 100-120 VAC <b>C:</b> Single-Phase 200-240 VAC
⑤	Type	<b>D:</b> Built-in Controller Type

①	Driver Type	<b>RKSD: RKII Series Driver</b>
②		<b>5: 5-Phase</b>
③	Output Current	<b>03:</b> 0.35 A/Phase <b>07:</b> 0.75 A/Phase
④	Electromagnetic Brake	<b>M:</b> with Electromagnetic Brake Blank: without Electromagnetic Brake
⑤	Power Supply Input	<b>A:</b> Single-Phase 100-120 VAC <b>C:</b> Single-Phase 200-240 VAC

①		<b>CC:</b> Cable
②	Length	<b>010:</b> 1 m (3.3 ft.) <b>020:</b> 2 m (6.6 ft.) <b>030:</b> 3 m (9.8 ft.) <b>050:</b> 5 m (16.4 ft.) <b>070:</b> 7 m (23 ft.) <b>100:</b> 10 m (32.8 ft.) <b>150:</b> 15 m (49.2 ft.) <b>200:</b> 20 m (65.6 ft.)
③	Reference Number	
④	Applicable Series	<b>P: RKII Series</b>
⑤	Cable Type	<b>F:</b> Connection Cable Set <b>R:</b> Flexible Connection Cable Set
⑥	Electromagnetic Brake/ Encoder	Blank: without Electromagnetic Brake <b>B:</b> with Electromagnetic Brake <b>E:</b> with Encoder



## Product Line

### Motor

#### ◇ Standard Type

Frame Size	Product Name (Single Shaft)	List Price	Product Name (Double Shaft)	List Price
42 mm (1.65 in.)	<b>PKE543AC</b>	\$69.00	<b>PKE543BC</b>	\$71.00
	<b>PKE544AC</b>	\$70.00	<b>PKE544BC</b>	\$72.00
	<b>PKE545AC</b>	\$77.00	<b>PKE545BC</b>	\$80.00
60 mm (2.36 in.)	<b>PKE564AC</b>	\$80.00	<b>PKE564BC</b>	\$82.00
	<b>PKE566AC</b>	\$85.00	<b>PKE566BC</b>	\$87.00
	<b>PKE569AC</b>	\$90.00	<b>PKE569BC</b>	\$93.00
85 mm (3.35 in.)	<b>PKE596AC</b>	\$140.00	<b>PKE596BC</b>	\$144.00
	<b>PKE599AC</b>	\$180.00	<b>PKE599BC</b>	\$186.00
	<b>PKE5913AC</b>	\$223.00	<b>PKE5913BC</b>	\$231.00

#### ◇ Standard Type with Encoder

Frame Size	Product Name (Single Shaft)	List Price
42 mm (1.65 in.)	<b>PKE543RC2</b>	\$143.00
	<b>PKE544RC2</b>	\$144.00
	<b>PKE545RC2</b>	\$152.00
60 mm (2.36 in.)	<b>PKE564RC2</b>	\$154.00
	<b>PKE566RC2</b>	\$159.00
	<b>PKE569RC2</b>	\$164.00
85 mm (3.35 in.)	<b>PKE596RC2</b>	\$214.00
	<b>PKE599RC2</b>	\$254.00
	<b>PKE5913RC2</b>	\$297.00

#### Note

● The electromagnetic brake cable and the encoder cable from the motor cannot be connected directly to the driver. When connecting to a driver, use a connection cable.

#### ◇ TS Geared Type

Frame Size	Product Name (Single Shaft)	List Price	Product Name (Double Shaft)	List Price
42 mm (1.65 in.)	<b>PKE543AC-TS3.6</b>	\$209.00	<b>PKE543BC-TS3.6</b>	\$211.00
	<b>PKE543AC-TS7.2</b>	\$209.00	<b>PKE543BC-TS7.2</b>	\$211.00
	<b>PKE543AC-TS10</b>	\$224.00	<b>PKE543BC-TS10</b>	\$227.00
	<b>PKE543AC-TS20</b>	\$224.00	<b>PKE543BC-TS20</b>	\$227.00
	<b>PKE543AC-TS30</b>	\$224.00	<b>PKE543BC-TS30</b>	\$227.00
60 mm (2.36 in.)	<b>PKE564AC-TS3.6</b>	\$235.00	<b>PKE564BC-TS3.6</b>	\$238.00
	<b>PKE564AC-TS7.2</b>	\$235.00	<b>PKE564BC-TS7.2</b>	\$238.00
	<b>PKE564AC-TS10</b>	\$251.00	<b>PKE564BC-TS10</b>	\$254.00
	<b>PKE564AC-TS20</b>	\$251.00	<b>PKE564BC-TS20</b>	\$254.00
	<b>PKE564AC-TS30</b>	\$251.00	<b>PKE564BC-TS30</b>	\$254.00
90 mm (3.54 in.)	<b>PKE596AC-TS3.6</b>	\$323.00	<b>PKE596BC-TS3.6</b>	\$327.00
	<b>PKE596AC-TS7.2</b>	\$323.00	<b>PKE596BC-TS7.2</b>	\$327.00
	<b>PKE596AC-TS10</b>	\$339.00	<b>PKE596BC-TS10</b>	\$343.00
	<b>PKE596AC-TS20</b>	\$339.00	<b>PKE596BC-TS20</b>	\$343.00
	<b>PKE596AC-TS30</b>	\$339.00	<b>PKE596BC-TS30</b>	\$343.00

#### ◇ Standard Type with Electromagnetic Brake

Frame Size	Product Name (Single Shaft)	List Price
42 mm (1.65 in.)	<b>PKE543MC</b>	\$217.00
	<b>PKE544MC</b>	\$218.00
	<b>PKE545MC</b>	\$226.00
60 mm (2.36 in.)	<b>PKE564MC</b>	\$270.00
	<b>PKE566MC</b>	\$276.00
	<b>PKE569MC</b>	\$281.00
85 mm (3.35 in.)	<b>PKE596MC</b>	\$352.00
	<b>PKE599MC</b>	\$392.00
	<b>PKE5913MC</b>	\$435.00

#### ◇ TS Geared Type with Electromagnetic Brake

Frame Size	Product Name (Single Shaft)	List Price
42 mm (1.65 in.)	<b>PKE543MC-TS3.6</b>	\$363.00
	<b>PKE543MC-TS7.2</b>	\$363.00
	<b>PKE543MC-TS10</b>	\$378.00
	<b>PKE543MC-TS20</b>	\$378.00
	<b>PKE543MC-TS30</b>	\$378.00
60 mm (2.36 in.)	<b>PKE564MC-TS3.6</b>	\$433.00
	<b>PKE564MC-TS7.2</b>	\$433.00
	<b>PKE564MC-TS10</b>	\$449.00
	<b>PKE564MC-TS20</b>	\$449.00
	<b>PKE564MC-TS30</b>	\$449.00
90 mm (3.54 in.)	<b>PKE596MC-TS3.6</b>	\$543.00
	<b>PKE596MC-TS7.2</b>	\$543.00
	<b>PKE596MC-TS10</b>	\$559.00
	<b>PKE596MC-TS20</b>	\$559.00
	<b>PKE596MC-TS30</b>	\$559.00

Overview

Motor & Driver

5-Phase RKII

Driver

Motor

2-Phase PKP

5-Phase PKP

## ◇ PS Geared Type

Frame Size	Product Name (Single Shaft)	List Price	Product Name (Double Shaft)	List Price
42 mm (1.65 in.)	<b>PKE545AC-PS5</b>	\$364.00	<b>PKE545BC-PS5</b>	\$366.00
	<b>PKE545AC-PS7.2</b>	\$364.00	<b>PKE545BC-PS7.2</b>	\$366.00
	<b>PKE545AC-PS10</b>	\$364.00	<b>PKE545BC-PS10</b>	\$366.00
	<b>PKE543AC-PS25</b>	\$414.00	<b>PKE543BC-PS25</b>	\$416.00
	<b>PKE543AC-PS36</b>	\$414.00	<b>PKE543BC-PS36</b>	\$416.00
	<b>PKE543AC-PS50</b>	\$414.00	<b>PKE543BC-PS50</b>	\$416.00
60 mm (2.36 in.)	<b>PKE566AC-PS5</b>	\$432.00	<b>PKE566BC-PS5</b>	\$435.00
	<b>PKE566AC-PS7.2</b>	\$432.00	<b>PKE566BC-PS7.2</b>	\$435.00
	<b>PKE566AC-PS10</b>	\$432.00	<b>PKE566BC-PS10</b>	\$435.00
	<b>PKE564AC-PS25</b>	\$510.00	<b>PKE564BC-PS25</b>	\$513.00
	<b>PKE564AC-PS36</b>	\$510.00	<b>PKE564BC-PS36</b>	\$513.00
	<b>PKE564AC-PS50</b>	\$510.00	<b>PKE564BC-PS50</b>	\$513.00
90 mm (3.54 in.)	<b>PKE599AC-PS5</b>	\$624.00	<b>PKE599BC-PS5</b>	\$630.00
	<b>PKE599AC-PS7.2</b>	\$624.00	<b>PKE599BC-PS7.2</b>	\$630.00
	<b>PKE599AC-PS10</b>	\$624.00	<b>PKE599BC-PS10</b>	\$630.00
	<b>PKE596AC-PS25</b>	\$722.00	<b>PKE596BC-PS25</b>	\$727.00
	<b>PKE596AC-PS36</b>	\$722.00	<b>PKE596BC-PS36</b>	\$727.00
	<b>PKE596AC-PS50</b>	\$722.00	<b>PKE596BC-PS50</b>	\$727.00

## ◇ Harmonic Geared Type

Frame Size	Product Name (Single Shaft)	List Price	Product Name (Double Shaft)	List Price
42 mm (1.65 in.)	<b>PKE543AC-HS50</b>	\$708.00	<b>PKE543BC-HS50</b>	\$710.00
	<b>PKE543AC-HS100</b>	\$708.00	<b>PKE543BC-HS100</b>	\$710.00
60 mm (2.36 in.)	<b>PKE564AC-HS50</b>	\$996.00	<b>PKE564BC-HS50</b>	\$999.00
	<b>PKE564AC-HS100</b>	\$996.00	<b>PKE564BC-HS100</b>	\$999.00
90 mm (3.54 in.)	<b>PKE596AC-HS50</b>	\$1,340.00	<b>PKE596BC-HS50</b>	\$1,345.00
	<b>PKE596AC-HS100</b>	\$1,340.00	<b>PKE596BC-HS100</b>	\$1,345.00

## Note

● The electromagnetic brake cable from the motor cannot be connected directly to the driver. When connecting to a driver, use a connection cable.

## ● Driver

## ◇ Built-in Controller Type

Power Supply Input	Product Name	List Price
Single-Phase 100-120 VAC	<b>RKSD503-AD</b>	\$370.00
	<b>RKSD507-AD</b>	\$404.00
Single-Phase 200-240 VAC	<b>RKSD503-CD</b>	\$370.00
	<b>RKSD507-CD</b>	\$404.00

## ◇ PS Geared Type with Electromagnetic Brake

Frame Size	Product Name (Single Shaft)	List Price
42 mm (1.65 in.)	<b>PKE545MC-PS5</b>	\$532.00
	<b>PKE545MC-PS7.2</b>	\$532.00
	<b>PKE545MC-PS10</b>	\$532.00
	<b>PKE543MC-PS25</b>	\$582.00
	<b>PKE543MC-PS36</b>	\$582.00
	<b>PKE543MC-PS50</b>	\$582.00
60 mm (2.36 in.)	<b>PKE566MC-PS5</b>	\$648.00
	<b>PKE566MC-PS7.2</b>	\$648.00
	<b>PKE566MC-PS10</b>	\$648.00
	<b>PKE564MC-PS25</b>	\$726.00
	<b>PKE564MC-PS36</b>	\$726.00
	<b>PKE564MC-PS50</b>	\$726.00
90 mm (3.54 in.)	<b>PKE599MC-PS5</b>	\$864.00
	<b>PKE599MC-PS7.2</b>	\$864.00
	<b>PKE599MC-PS10</b>	\$864.00
	<b>PKE596MC-PS25</b>	\$962.00
	<b>PKE596MC-PS36</b>	\$962.00
	<b>PKE596MC-PS50</b>	\$962.00

## ◇ Harmonic Geared Type with Electromagnetic Brake

Frame Size	Product Name (Single Shaft)	List Price
42 mm (1.65 in.)	<b>PKE543MC-HS50</b>	\$876.00
	<b>PKE543MC-HS100</b>	\$876.00
60 mm (2.36 in.)	<b>PKE564MC-HS50</b>	\$1,212.00
	<b>PKE564MC-HS100</b>	\$1,212.00
90 mm (3.54 in.)	<b>PKE596MC-HS50</b>	\$1,580.00
	<b>PKE596MC-HS100</b>	\$1,580.00

## ◇ Pulse Input Type

Power Supply Input	Driver	Product Name	List Price
Single-Phase 100-120 VAC	Standard Type	<b>RKSD503-A</b>	\$370.00
		<b>RKSD507-A</b>	\$404.00
	Standard Type with Electromagnetic Brake	<b>RKSD503M-A</b>	\$370.00
		<b>RKSD507M-A</b>	\$404.00
Single-Phase 200-240 VAC	Standard Type	<b>RKSD503-C</b>	\$370.00
		<b>RKSD507-C</b>	\$404.00
	Standard Type with Electromagnetic Brake	<b>RKSD503M-C</b>	\$370.00
		<b>RKSD507M-C</b>	\$404.00

## ● Connection Cable Sets/Flexible Connection Cable Sets

Use a flexible connection cable set if the cable will be bent. Extension cables and flexible extension cables that can extend the connection cables are available.

The electromagnetic brake cable and the encoder cable from the motor cannot be connected directly to the driver. When connecting to a driver, use a connection cable.

### ◇ For Motor

Type	Length L m (ft.)	Product Name	List Price
Connection Cable Sets	1 (3.3)	<b>CC010VPF</b>	\$34.00
	2 (6.6)	<b>CC020VPF</b>	\$39.00
	3 (9.8)	<b>CC030VPF</b>	\$44.00
	5 (16.4)	<b>CC050VPF</b>	\$53.00
	7 (23.0)	<b>CC070VPF</b>	\$71.00
	10 (32.8)	<b>CC100VPF</b>	\$97.00
	15 (49.2)	<b>CC150VPF</b>	\$142.00
	20 (65.6)	<b>CC200VPF</b>	\$186.00
Flexible Connection Cable Sets	1 (3.3)	<b>CC010VPR</b>	\$45.00
	2 (6.6)	<b>CC020VPR</b>	\$52.00
	3 (9.8)	<b>CC030VPR</b>	\$58.00
	5 (16.4)	<b>CC050VPR</b>	\$70.00
	7 (23.0)	<b>CC070VPR</b>	\$93.00
	10 (32.8)	<b>CC100VPR</b>	\$127.00
	15 (49.2)	<b>CC150VPR</b>	\$186.00
	20 (65.6)	<b>CC200VPR</b>	\$242.00

### ◇ For Motor/Encoder

Type	Length L m (ft.)	Product Name	List Price
Connection Cable Sets	1 (3.3)	<b>CC010VPFE</b>	\$78.00
	2 (6.6)	<b>CC020VPFE</b>	\$88.00
	3 (9.8)	<b>CC030VPFE</b>	\$100.00
	5 (16.4)	<b>CC050VPFE</b>	\$121.00
	7 (23.0)	<b>CC070VPFE</b>	\$149.00
	10 (32.8)	<b>CC100VPFE</b>	\$193.00
	15 (49.2)	<b>CC150VPFE</b>	\$267.00
	20 (65.6)	<b>CC200VPFE</b>	\$340.00
Flexible Connection Cable Sets	1 (3.3)	<b>CC010VPRE</b>	\$92.00
	2 (6.6)	<b>CC020VPRE</b>	\$109.00
	3 (9.8)	<b>CC030VPRE</b>	\$122.00
	5 (16.4)	<b>CC050VPRE</b>	\$155.00
	7 (23.0)	<b>CC070VPRE</b>	\$197.00
	10 (32.8)	<b>CC100VPRE</b>	\$259.00
	15 (49.2)	<b>CC150VPRE</b>	\$364.00
	20 (65.6)	<b>CC200VPRE</b>	\$467.00

### ◇ For Motor/Electromagnetic Brake

Type	Length L m (ft.)	Product Name	List Price
Connection Cable Sets	1 (3.3)	<b>CC010VPFB</b>	\$51.00
	2 (6.6)	<b>CC020VPFB</b>	\$58.00
	3 (9.8)	<b>CC030VPFB</b>	\$66.00
	5 (16.4)	<b>CC050VPFB</b>	\$81.00
	7 (23.0)	<b>CC070VPFB</b>	\$104.00
	10 (32.8)	<b>CC100VPFB</b>	\$138.00
	15 (49.2)	<b>CC150VPFB</b>	\$197.00
	20 (65.6)	<b>CC200VPFB</b>	\$255.00
Flexible Connection Cable Sets	1 (3.3)	<b>CC010VPRB</b>	\$77.00
	2 (6.6)	<b>CC020VPRB</b>	\$90.00
	3 (9.8)	<b>CC030VPRB</b>	\$101.00
	5 (16.4)	<b>CC050VPRB</b>	\$125.00
	7 (23.0)	<b>CC070VPRB</b>	\$159.00
	10 (32.8)	<b>CC100VPRB</b>	\$210.00
	15 (49.2)	<b>CC150VPRB</b>	\$296.00
	20 (65.6)	<b>CC200VPRB</b>	\$379.00

Overview

Motor & Driver

5-Phase R1I

Driver

Motor

2-Phase PKP

5-Phase PKP

## ■ Included

### ● Motor

Type	Included	Parallel Key	Motor Mounting Screws	Operating Manual
Standard		—	—	1 Copy
TS Geared	Frame Size 42 mm (1.65 in.)	—	—	
	Frame Size 60 mm (2.36 in.)	1 pc.	M4×60 P0.7 (4 Screws)	
	Frame Size 90 mm (3.54 in.)	1 pc.	M8×90 P1.25 (4 Screws)	
PS Geared		1 pc.	—	
Harmonic Geared		1 pc.	—	

### ● Driver

Type	Included	Connector	Operating Manual
Built-in Controller Type		<ul style="list-style-type: none"> <li>• CN1 Connector (1 pc.)</li> <li>• CN3 Connector (1 pc.)</li> <li>• CN5 Connector (1 pc.)</li> <li>• CN8 Connector (1 pc.)</li> <li>• CN9 Connector (1 pc.)</li> </ul>	1 Copy
Pulse Input Type		<ul style="list-style-type: none"> <li>• CN1 Connector (1 pc.)</li> <li>• CN3 Connector (1 pc.)</li> <li>• CN4 Connector (1 pc.)</li> <li>• CN5 Connector (1 pc.)</li> </ul>	1 Copy

### ● Connection Cable Sets/Flexible Connection Cable Sets

Type	Included	Operating Manual
Connection Cable Set		—
Flexible Connection Cable Set		1 Copy

## Stepper Motor Output Power Guidelines

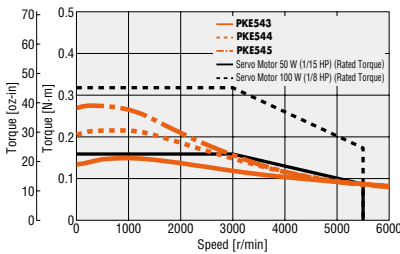
For servo motor output power (W), the output power (W) is indicated as the "rated output power" when the motor is running at the "rated speed." However, stepper motors with high positioning accuracy and high torque in the medium/low-speed range do not have "rated speeds" so no "rated output power" is listed.

For reference purposes, the following lists the servo motor rated torque (W) corresponding to the rated torque of each **RKII** Series standard type motor.

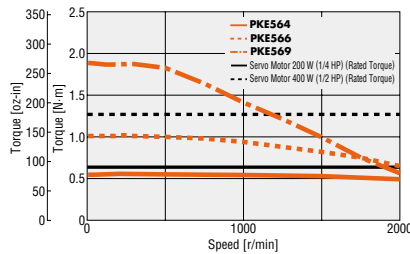
RKII Series (Standard Type)			Servo Motor with Rated Torque or Equivalent (Reference)
Frame Size	Product Name	List Price*	
42 mm (1.65 in.)	<b>PKE543</b>	\$473.00~	50-100 W (1/15-1/8 HP) Rated Torque or Equivalent
	<b>PKE544</b>	\$474.00~	
	<b>PKE545</b>	\$481.00~	
60 mm (2.36 in.)	<b>PKE564</b>	\$518.00~	100-200 W (1/8-1/4 HP) Rated Torque or Equivalent
	<b>PKE566</b>	\$523.00~	
	<b>PKE569</b>	\$528.00~	
85 mm (3.35 in.)	<b>PKE596</b>	\$578.00~	400-750 W (1/2-1 HP) Rated Torque or Equivalent
	<b>PKE599</b>	\$618.00~	
	<b>PKE5913</b>	\$661.00~	

\*Each price shows an example of the total price of a motor, a driver, and a 1 m (3.3 ft.) connection cable.

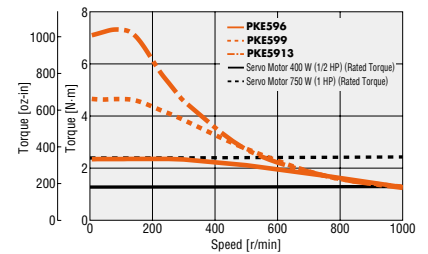
### Frame Size 42 mm (1.65 in.)



### Frame Size 60 mm (2.36 in.)



### Frame Size 85 mm (3.35 in.)



● 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.

Overview

Motor & Driver

5-Phase RKII

Driver

Motor

2-Phase PKP

5-Phase PKP

# Standard Type

## Standard Type with Electromagnetic Brake

## Standard Type with Encoder

Frame Size 42 mm (1.65 in.), 60 mm (2.36 in.)

### Specifications



Motor Product Name	Single Shaft	PKE543AC	PKE544AC	PKE545AC	PKE564AC	PKE566AC	PKE569AC	
	Double Shaft	PKE543BC	PKE544BC	PKE545BC	PKE564BC	PKE566BC	PKE569BC	
	with Encoder	PKE543RC2	PKE544RC2	PKE545RC2	PKE564RC2	PKE566RC2	PKE569RC2	
	with Electromagnetic Brake	PKE543MC	PKE544MC	PKE545MC	PKE564MC	PKE566MC	PKE569MC	
Driver Product Name	Built-in Controller Type	RKSD503-□D			RKSD507-□D			
	Pulse Input Type	RKSD503□-□			RKSD507□-□			
Maximum Holding Torque	N · m (oz-in)	0.14 (19.8)	0.21 (29)	0.27 (38)	0.52 (73)	0.96 (136)	1.77 (250)	
Holding Torque at	Power On	0.07 (9.9)	0.10 (14.2)	0.13 (18.4)	0.26 (36)	0.48 (68)	0.88 (124)	
Motor Standstill	Electromagnetic Brake	0.07 (9.9)	0.10 (14.2)	0.13 (18.4)	0.26 (36)	0.48 (68)	0.88 (124)	
Rotor Inertia	J: kg · m <sup>2</sup> (oz-in <sup>2</sup> )	30×10 <sup>-7</sup> (0.164) [45×10 <sup>-7</sup> (0.25)]*1 (31×10 <sup>-7</sup> (0.17))*2	47×10 <sup>-7</sup> (0.26) [62×10 <sup>-7</sup> (0.34)]*1 (48×10 <sup>-7</sup> (0.26))*2	64×10 <sup>-7</sup> (0.35) [79×10 <sup>-7</sup> (0.43)]*1 (65×10 <sup>-7</sup> (0.36))*2	160×10 <sup>-7</sup> (0.88) [320×10 <sup>-7</sup> (1.75)]*1 (160×10 <sup>-7</sup> (0.88))*2	270×10 <sup>-7</sup> (1.48) [430×10 <sup>-7</sup> (2.4)]*1 (270×10 <sup>-7</sup> (1.48))*2	540×10 <sup>-7</sup> (3.0) [700×10 <sup>-7</sup> (3.8)]*1 (540×10 <sup>-7</sup> (3.0))*2	
Rated Current	A/Phase	0.35			0.75			
Basic Step Angle		0.72°						
Power Supply Input	Voltage and Frequency		Single-Phase 100-120 VAC, Single-Phase 200-240 VAC -15 to +10% 50/60Hz					
	Input Current	Single-Phase 100-120 VAC	2.1	1.9	1.9	4.0	3.8	4.0
Excitation Mode	A	Single-Phase 200-240 VAC	1.3	1.2	1.2	2.4	2.4	2.5
			Microstep					
Control Power Supply*3		24 VDC±5% 0.2 A						
Electromagnetic Brake*4	Power Supply Input	24 VDC±5%*5 0.08 A			24 VDC±5%*5 0.25 A			

● The box □ in the product name indicates the power supply input **A** (single phase 100-120 VAC) or **C** (single-phase 200-240 VAC).

When a driver is the one for a motor with an electromagnetic brake, the box □ in the product name indicates **M** (with electromagnetic brake).

\*1 The bracket [ ] indicates the value for the product with an electromagnetic brake.

\*2 The parenthesis ( ) indicates the value for the product with an encoder.

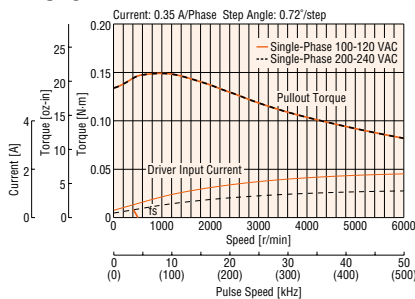
\*3 For built-in controller type, the control power supply is required.

\*4 For the pulse input type, when operating the motor with an electromagnetic brake, be sure to connect the power supply for electromagnetic brake.

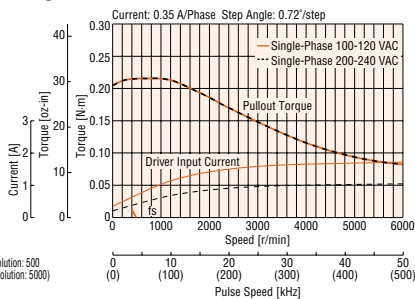
\*5 If the wiring distance between the motor and driver is extended to 15 m (49.2 ft.) or longer by using a connection cable (sold separately), 24 VDC±4% is applied to the specification of power supply input.

### Speed – Torque Characteristics (Reference Values) fs: Max. Starting Frequency

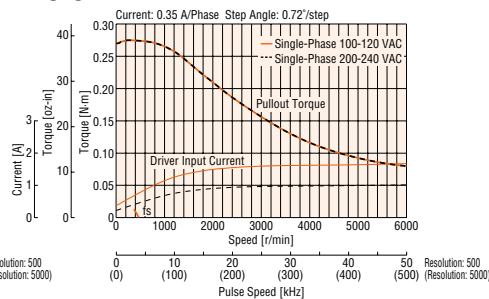
PKE543



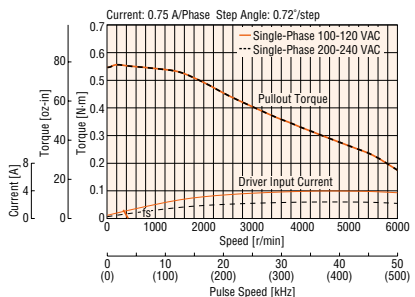
PKE544



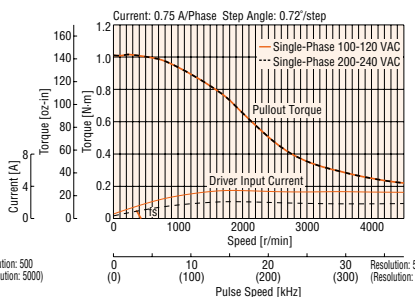
PKE545



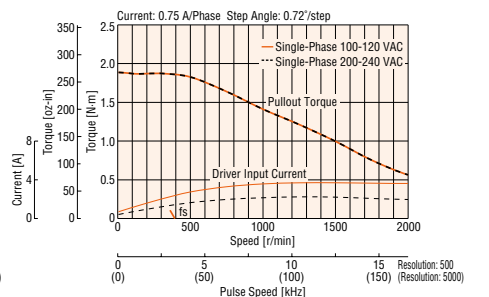
PKE564



PKE566



PKE569



#### Note

- 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.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) max. For the type with an encoder, to protect the encoder, be sure to keep the motor case temperature at 85°C (185°F) max. (When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C (167°F) max. since the motor is recognized as heat-resistant class A.)



## Standard Type Frame Size 85 mm (3.35 in.) Standard Type with Electromagnetic Brake Standard Type with Encoder

### Specifications

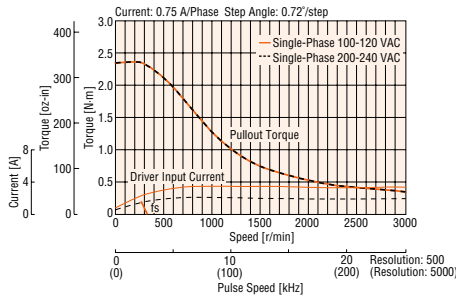


Motor Product Name	Single Shaft	<b>PKE596AC</b>	<b>PKE599AC</b>	<b>PKE5913AC</b>	
	Double Shaft	<b>PKE596BC</b>	<b>PKE599BC</b>	<b>PKE5913BC</b>	
	with Encoder	<b>PKE596RC2</b>	<b>PKE599RC2</b>	<b>PKE5913RC2</b>	
	with Electromagnetic Brake	<b>PKE596MC</b>	<b>PKE599MC</b>	<b>PKE5913MC</b>	
Driver Product Name	Built-in Controller Type	<b>RKSD507-<input type="checkbox"/>D</b>			
	Pulse Input Type	<b>RKSD507-<input type="checkbox"/>-<input type="checkbox"/></b>			
Maximum Holding Torque	N · m (oz-in)	2.1 (290)	4.1 (580)	6.3 (890)	
Holding Torque at Power On	N · m (oz-in)	1.05 (149)	2.05 (290)	3.15 (440)	
Motor Standstill	Electromagnetic Brake N · m (oz-in)	1.05 (149)	2.05 (290)	3.15 (440)	
Rotor Inertia	J : kg · m <sup>2</sup> (oz-in <sup>2</sup> )	1100×10 <sup>-7</sup> (6.0) [2200×10 <sup>-7</sup> (12.0)]*1 (1100×10 <sup>-7</sup> (6.0))*2	2200×10 <sup>-7</sup> (12.0) [3300×10 <sup>-7</sup> (18.1)]*1 (2200×10 <sup>-7</sup> (12.0))*2	3300×10 <sup>-7</sup> (18.1) [4400×10 <sup>-7</sup> (24)]*1 (3300×10 <sup>-7</sup> (18.1))*2	
Rated Current	A/Phase	0.75			
Basic Step Angle		0.72°			
Power Supply Input	Voltage and Frequency				
	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC -15 to +10% 50/60Hz				
Excitation Mode	Input Current	Single-Phase 100-120 VAC	3.6	3.5	3.5
	A	Single-Phase 200-240 VAC	2.1	2.2	2.2
Control Power Supply*3		Microstep			
Electromagnetic Brake*4	Power Supply Input	24 VDC±5%*5 0.2 A			

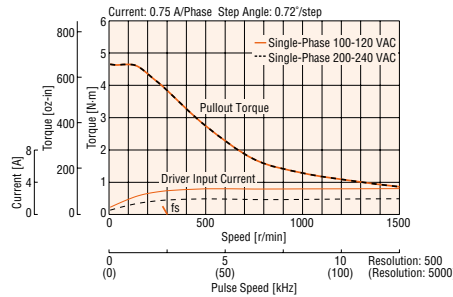
- The box  in the product name indicates the power supply input **A** (single phase 100-120 VAC) or **C** (single-phase 200-240 VAC).
- When a driver is the one for a motor with an electromagnetic brake, the box  in the product name indicates **M** (with electromagnetic brake).
- \*1 The bracket [ ] indicates the value for the product with an electromagnetic brake.
- \*2 The parenthesis ( ) indicates the value for the product with an encoder.
- \*3 For built-in controller type, the control power supply is required.
- \*4 For the pulse input type, when operating the motor with an electromagnetic brake, be sure to connect the power supply for electromagnetic brake.
- \*5 If the wiring distance between the motor and driver is extended to 15 m (49.2 in.) or longer by using a connection cable (sold separately), 24 VDC±4% is applied to the specification of power supply input.

### Speed – Torque Characteristics (Reference Values) fs: Max. Starting Frequency

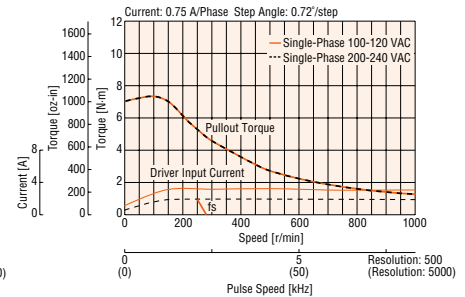
**PKE596**



**PKE599**



**PKE5913**



**Note**

- 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.
  - Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) max.
- For the type with an encoder, to protect the encoder, be sure to keep the motor case temperature at 85°C (185°F) max.  
 (When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C (167°F) max. since the motor is recognized as heat-resistant class A.)

Overview

Motor & Driver

5-Phase RKII

Driver

Motor

2-Phase PKP

5-Phase PKP

# TS Geared Type

Frame Size 42 mm (1.65 in.)

# TS Geared Type with Electromagnetic Brake

## Specifications



Motor Product Name	Single Shaft	PKE543AC-TS3.6	PKE543AC-TS7.2	PKE543AC-TS10	PKE543AC-TS20	PKE543AC-TS30
Motor Product Name	Double Shaft	PKE543BC-TS3.6	PKE543BC-TS7.2	PKE543BC-TS10	PKE543BC-TS20	PKE543BC-TS30
Motor Product Name	with Electromagnetic Brake	PKE543MC-TS3.6	PKE543MC-TS7.2	PKE543MC-TS10	PKE543MC-TS20	PKE543MC-TS30
Driver Product Name	Built-in Controller Type	RKSD503- <input type="checkbox"/> D				
Driver Product Name	Pulse Input Type	RKSD503- <input type="checkbox"/> - <input type="checkbox"/>				
Maximum Holding Torque	N · m (lb-in)	0.5 (4.4)	1 (8.8)	1.4 (12.3)	2 (17.7)	2.3 (20)
Rotor Inertia	J : kg · m <sup>2</sup> (oz-in <sup>2</sup> )	30 × 10 <sup>-7</sup> (0.164) [45 × 10 <sup>-7</sup> (0.25)]*1				
Rated Current	A/Phase	0.35				
Basic Step Angle		0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio		3.6	7.2	10	20	30
Permissible Torque*	N · m (lb-in)	*	*	*	2 (17.7)	2.3 (20)
Maximum Instantaneous Torque*	N · m (lb-in)	*	*	*	*	3 (26)
Holding Torque at Power On	N · m (lb-in)	0.26 (2.3)	0.53 (4.6)	0.74 (6.5)	1.48 (13)	2.2 (19.4)
Motor Standstill Electromagnetic Brake	N · m (lb-in)	0.26 (2.3)	0.53 (4.6)	0.74 (6.5)	1.48 (13)	2.2 (19.4)
Speed Range	r/min	0 - 833	0 - 416	0 - 300	0 - 150	0 - 100
Backlash	arcmin	45 (0.75°)	25 (0.42°)		15 (0.25°)	
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC - 15 to +10% 50/60 Hz				
Power Supply Input	Input Current Single-Phase 100-120 VAC	2.1				
Power Supply Input	A Single-Phase 200-240 VAC	1.3				
Excitation Mode		Microstep				
Control Power Supply*2		24 VDC ± 5% 0.2 A				
Electromagnetic Brake*3	Power Supply Input	24 VDC ± 5%*4 0.08 A				

\*For the geared motor output torque, refer to the speed – torque characteristics.

● The box  in the product name indicates the power supply input **A** (single phase 100-120 VAC) or **C** (single-phase 200-240 VAC).

When a driver is the one for a motor with an electromagnetic brake, the box  in the product name indicates **M** (with electromagnetic brake).

\*1 The bracket [ ] indicates the value for the product with an electromagnetic brake.

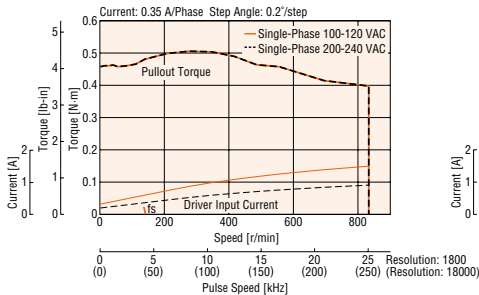
\*2 For built-in controller type, the control power supply is required.

\*3 For the pulse input type, when operating the motor with an electromagnetic brake, be sure to connect the power supply for electromagnetic brake.

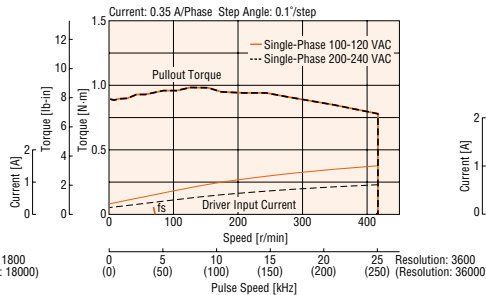
\*4 If the wiring distance between the motor and driver is extended to 15 m (49.2 ft.) or longer by using a connection cable (sold separately), 24 VDC ± 4% is applied to the specification of power supply input.

## Speed – Torque Characteristics (Reference Values) fs: Max. Starting Frequency

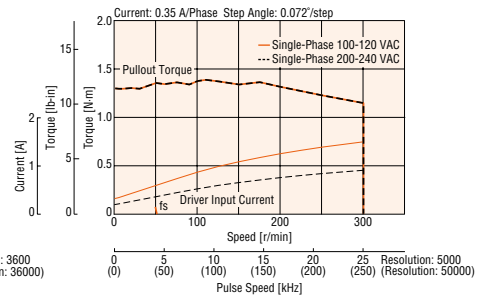
**PKE543 Gear Ratio 3.6**



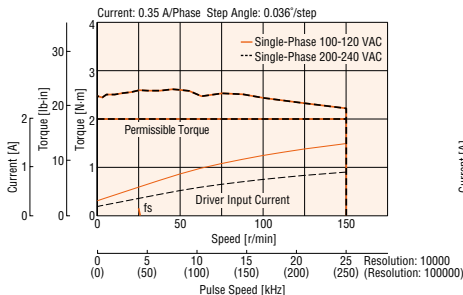
**PKE543 Gear Ratio 7.2**



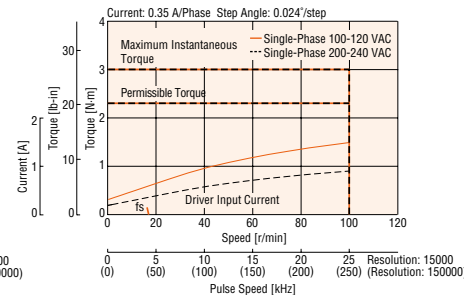
**PKE543 Gear Ratio 10**



**PKE543 Gear Ratio 20**



**PKE543 Gear Ratio 30**



### Note

● 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.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) max.

(When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C (167°F) max. since the motor is recognized as heat-resistant class A.)

## TS Geared Type

Frame Size 60 mm (2.36 in.)

## TS Geared Type with Electromagnetic Brake

### Specifications

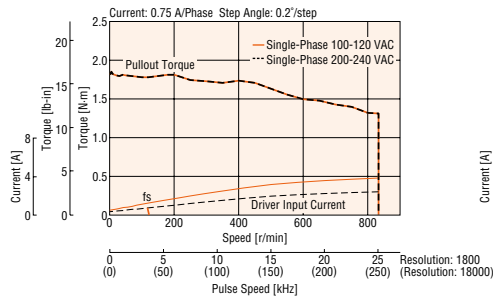


Motor Product Name	Single Shaft	<b>PKE564AC-TS3.6</b>	<b>PKE564AC-TS7.2</b>	<b>PKE564AC-TS10</b>	<b>PKE564AC-TS20</b>	<b>PKE564AC-TS30</b>
Motor Product Name	Double Shaft	<b>PKE564BC-TS3.6</b>	<b>PKE564BC-TS7.2</b>	<b>PKE564BC-TS10</b>	<b>PKE564BC-TS20</b>	<b>PKE564BC-TS30</b>
Motor Product Name	with Electromagnetic Brake	<b>PKE564MC-TS3.6</b>	<b>PKE564MC-TS7.2</b>	<b>PKE564MC-TS10</b>	<b>PKE564MC-TS20</b>	<b>PKE564MC-TS30</b>
Driver Product Name	Built-in Controller Type	<b>RKSD507-<input type="checkbox"/>D</b>				
Driver Product Name	Pulse Input Type	<b>RKSD507-<input type="checkbox"/>□-<input type="checkbox"/></b>				
Maximum Holding Torque	N·m (lb-in)	1.8 (15.9)	3 (26)	4 (35)	5 (44)	6 (53)
Rotor Inertia	J: kg·m <sup>2</sup> (oz-in <sup>2</sup> )	160×10 <sup>-7</sup> (0.88) [320×10 <sup>-7</sup> (1.75)]*1				
Rated Current	A/Phase	0.75				
Basic Step Angle		0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio		3.6	7.2	10	20	30
Permissible Torque*	N·m (lb-in)	*	3 (26)	4 (35)	5 (44)	6 (53)
Maximum Instantaneous Torque**	N·m (lb-in)	*	*	*	8 (70)	10 (88)
Holding Torque at Motor Standstill	Power On	1 (8.8)	2 (17.7)	2.9 (25)	5 (44)	6 (53)
	Electromagnetic Brake	1 (8.8)	2 (17.7)	2.9 (25)	5 (44)	6 (53)
Speed Range	r/min	0 - 833	0 - 416	0 - 300	0 - 150	0 - 100
Backlash	arcmin	35 (0.59°)	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC – 15 to +10% 50/60 Hz				
	Input Current	4.0				
	A Single-Phase 200-240 VAC	2.4				
Excitation Mode		Microstep				
Control Power Supply*2		24 VDC±5% 0.2 A				
Electromagnetic Brake*3	Power Supply Input	24 VDC±5%*4 0.25 A				

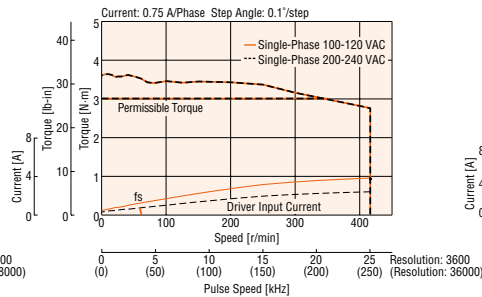
- \* For the geared motor output torque, refer to the speed – torque characteristics.
- The box  in the product name indicates the power supply input **A** (single phase 100-120 VAC) or **C** (single-phase 200-240 VAC).  
When a driver is the one for a motor with an electromagnetic brake, the box  in the product name indicates **M** (with electromagnetic brake).
- \*1 The bracket [ ] indicates the value for the product with an electromagnetic brake.
- \*2 For built-in controller type, the control power supply is required.
- \*3 For the pulse input type, when operating the motor with an electromagnetic brake, be sure to connect the power supply for electromagnetic brake.
- \*4 If the wiring distance between the motor and driver is extended to 15 m (49.2 ft.) or longer by using a connection cable (sold separately), 24 VDC±4% is applied to the specification of power supply input.

### Speed – Torque Characteristics (Reference Values) fs: Max. Starting Frequency

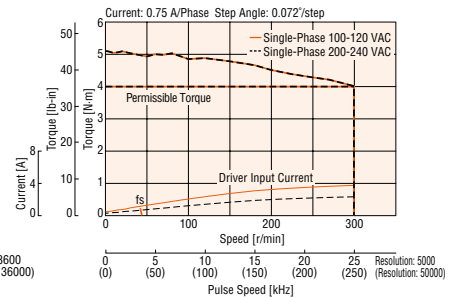
**PKE564 Gear Ratio 3.6**



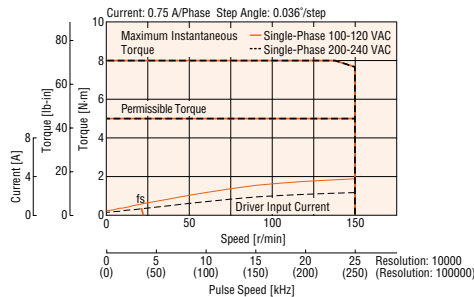
**PKE564 Gear Ratio 7.2**



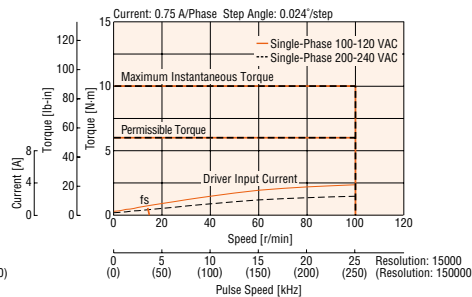
**PKE564 Gear Ratio 10**



**PKE564 Gear Ratio 20**



**PKE564 Gear Ratio 30**



**Note**

- 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.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) max.  
(When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C (167°F) max. since the motor is recognized as heat-resistant class A.)

# TS Geared Type

Frame Size 90 mm (3.54 in.)

# TS Geared Type with Electromagnetic Brake

## Specifications



Motor Product Name	Single Shaft	<b>PKE596AC-TS3.6</b>	<b>PKE596AC-TS7.2</b>	<b>PKE596AC-TS10</b>	<b>PKE596AC-TS20</b>	<b>PKE596AC-TS30</b>
Motor Product Name	Double Shaft	<b>PKE596BC-TS3.6</b>	<b>PKE596BC-TS7.2</b>	<b>PKE596BC-TS10</b>	<b>PKE596BC-TS20</b>	<b>PKE596BC-TS30</b>
Motor Product Name	with Electromagnetic Brake	<b>PKE596MC-TS3.6</b>	<b>PKE596MC-TS7.2</b>	<b>PKE596MC-TS10</b>	<b>PKE596MC-TS20</b>	<b>PKE596MC-TS30</b>
Driver Product Name	Built-in Controller Type	<b>RKSD507-<input type="checkbox"/>D</b>				
Driver Product Name	Pulse Input Type	<b>RKSD507-<input type="checkbox"/>-<input type="checkbox"/></b>				
Maximum Holding Torque	N·m (lb-in)	6 (53)	10 (88)	14 (123)	20 (177)	25 (220)
Rotor Inertia	J: kg·m <sup>2</sup> (oz-in <sup>2</sup> )	1100×10 <sup>-7</sup> (6) [2200×10 <sup>-7</sup> (12)]*1				
Rated Current	A/Phase	0.75				
Basic Step Angle		0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio		3.6	7.2	10	20	30
Permissible Torque*	N·m (lb-in)	6 (53)	10 (88)	*	20 (177)	25 (220)
Maximum Instantaneous Torque**	N·m (lb-in)	*	15 (132)	*	*	*
Holding Torque at Power On	N·m (lb-in)	4.5 (39)	9 (79)	7.4 (65)	14.8 (130)	22 (194)
Motor Standstill Electromagnetic Brake	N·m (lb-in)	4.5 (39)	9 (79)	7.4 (65)	14.8 (130)	22 (194)
Speed Range	r/min	0 - 833	0 - 416	0 - 300	0 - 150	0 - 100
Backlash	arcmin	25 (0.42°)	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC – 15 to +10% 50/60Hz				
Power Supply Input	Input Current	Single-Phase 100-120 VAC		Single-Phase 200-240 VAC		
	A	3.6		4.9		
		2.1		3.0		
Excitation Mode		Microstep				
Control Power Supply*2		24 VDC±5% 0.2 A				
Electromagnetic Brake*3	Power Supply Input	24 VDC±5%*4 0.42 A				

\*For the geared motor output torque, refer to the speed – torque characteristics.

● The box  in the product name indicates the power supply input **A** (single phase 100-120 VAC) or **C** (single-phase 200-240 VAC).

When a driver is the one for a motor with an electromagnetic brake, the box  in the product name indicates **M** (with electromagnetic brake).

\*1 The bracket [ ] indicates the value for the product with an electromagnetic brake.

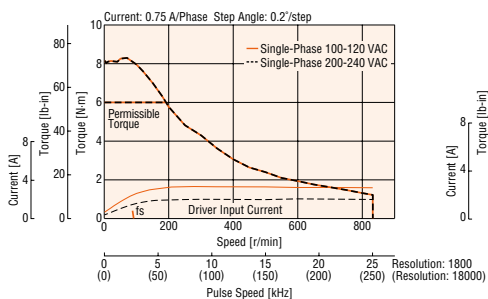
\*2 For built-in controller type, the control power supply is required.

\*3 For the pulse input type, when operating the motor with an electromagnetic brake, be sure to connect the power supply for electromagnetic brake.

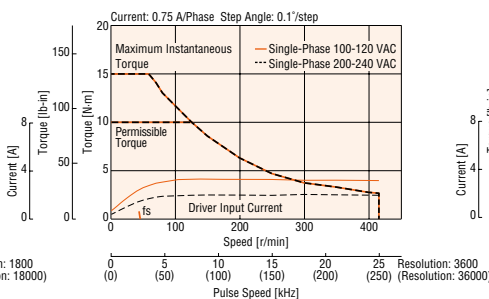
\*4 If the wiring distance between the motor and driver is extended to 15 m (49.2 ft.) or longer by using a connection cable (sold separately), 24 VDC±4% is applied to the specification of power supply input.

## Speed – Torque Characteristics (Reference Values) fs: Max. Starting Frequency

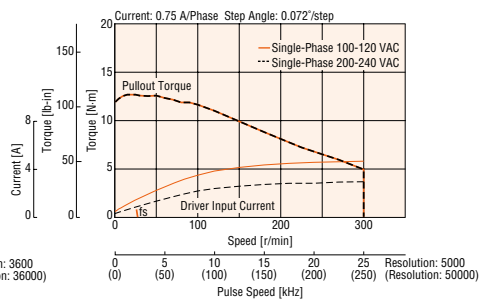
**PKE596 Gear Ratio 3.6**



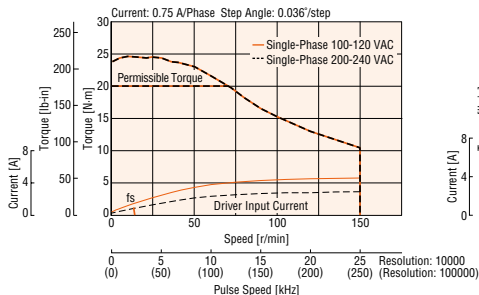
**PKE596 Gear Ratio 7.2**



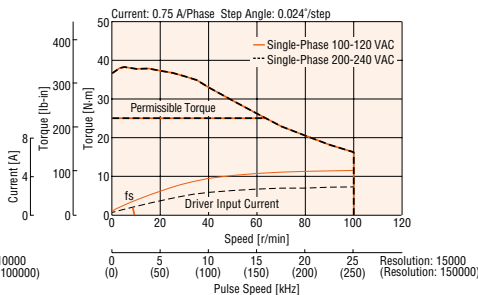
**PKE596 Gear Ratio 10**



**PKE596 Gear Ratio 20**



**PKE596 Gear Ratio 30**



**Note**

- 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.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) max. (When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C (167°F) max. since the motor is recognized as heat-resistant class A.)

## PS Geared Type Frame Size 42 mm (1.65 in.) PS Geared Type with Electromagnetic Brake

### Specifications



Motor Product Name	Single Shaft	PKE545AC-PS5	PKE545AC-PS7.2	PKE545AC-PS10	PKE543AC-PS25	PKE543AC-PS36	PKE543AC-PS50
Motor Product Name	Double Shaft	PKE545BC-PS5	PKE545BC-PS7.2	PKE545BC-PS10	PKE543BC-PS25	PKE543BC-PS36	PKE543BC-PS50
Motor Product Name	with Electromagnetic Brake	PKE545MC-PS5	PKE545MC-PS7.2	PKE545MC-PS10	PKE543MC-PS25	PKE543MC-PS36	PKE543MC-PS50
Driver Product Name	Built-in Controller Type	<b>RKSD503-<input type="checkbox"/>-D</b>					
Driver Product Name	Pulse Input Type	<b>RKSD503-<input type="checkbox"/>-<input type="checkbox"/></b>					
Maximum Holding Torque	N·m (lb-in)	1 (8.8)	1.5 (13.2)		2.5 (22)	3 (26)	
Rotor Inertia	J: kg·m <sup>2</sup> (oz-in <sup>2</sup> )	64×10 <sup>-7</sup> (0.35) [79×10 <sup>-7</sup> (0.43)]*1			30×10 <sup>-7</sup> (0.164) [45×10 <sup>-7</sup> (0.25)]*1		
Rated Current	A/Phase	0.35					
Basic Step Angle		0.144°	0.1°	0.072°	0.0288°	0.02°	0.0144°
Gear Ratio		5	7.2	10	25	36	50
Permissible Torque*	N·m (lb-in)	1 (8.8)	1.5 (13.2)		2.5 (22)	3 (26)	
Maximum Instantaneous Torque**	N·m (lb-in)	*	*	2 (17.7)	*	*	6 (53)
Holding Torque at Power On	N·m (lb-in)	0.74 (6.5)	1.07 (9.4)	1.49 (13.1)	1.85 (16.3)	2.6 (23)	3 (26)
Motor Standstill Electromagnetic Brake	N·m (lb-in)	0.74 (6.5)	1.07 (9.4)	1.49 (13.1)	1.85 (16.3)	2.6 (23)	3 (26)
Speed Range	r/min	0 - 600	0 - 416	0 - 300	0 - 120	0 - 83	0 - 60
Backlash	arcmin	25 (0.42°)					
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC - 15 to +10% 50/60 Hz					
Power Supply Input	Input Current	1.9			2.1		
Power Supply Input	A Single-Phase 100-120 VAC				1.3		
Power Supply Input	A Single-Phase 200-240 VAC	1.2					
Excitation Mode		Microstep					
Control Power Supply*2		24 VDC±5% 0.2 A					
Electromagnetic Brake*3	Power Supply Input	24 VDC±5%*4 0.08 A					

\*For the geared motor output torque, refer to the speed – torque characteristics.

● The box  in the product name indicates the power supply input **A** (single phase 100-120 VAC) or **C** (single-phase 200-240 VAC).

When a driver is the one for a motor with an electromagnetic brake, the box  in the product name indicates **M** (with electromagnetic brake).

\*1 The bracket [ ] indicates the value for the product with an electromagnetic brake.

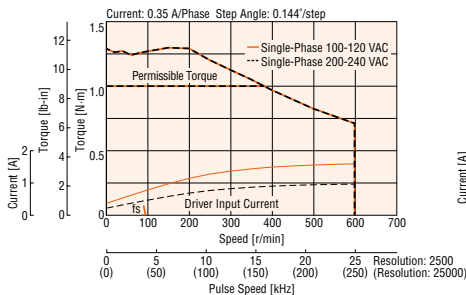
\*2 For built-in controller type, the control power supply is required.

\*3 For the pulse input type, when operating the motor with an electromagnetic brake, be sure to connect the power supply for electromagnetic brake.

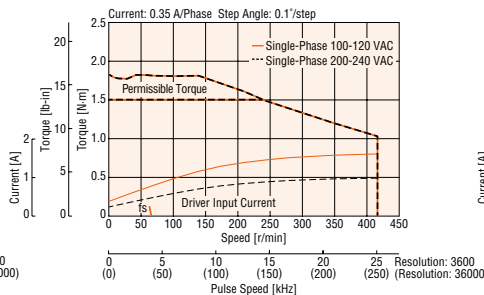
\*4 If the wiring distance between the motor and driver is extended to 15 m (49.2 ft.) or longer by using a connection cable (sold separately), 24 VDC±4% is applied to the specification of power supply input.

### Speed – Torque Characteristics (Reference Values) fs: Max. Starting Frequency

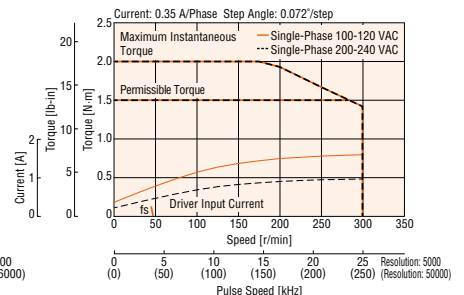
**PKE545 Gear Ratio 5**



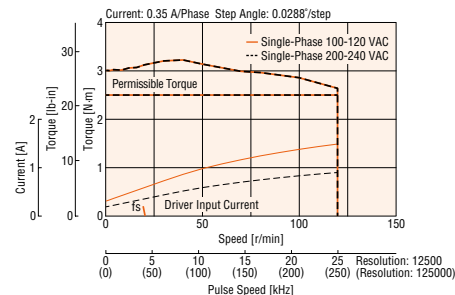
**PKE545 Gear Ratio 7.2**



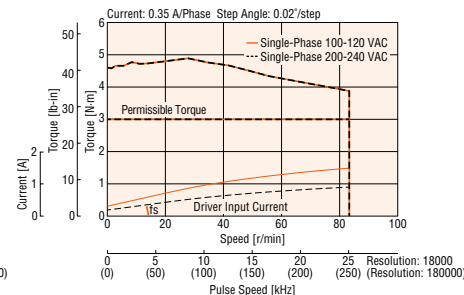
**PKE545 Gear Ratio 10**



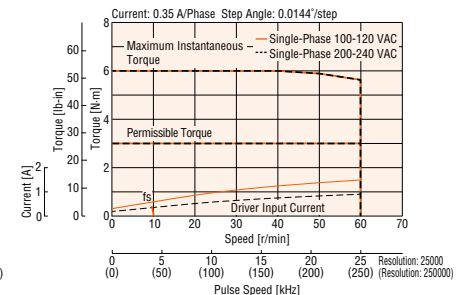
**PKE543 Gear Ratio 25**



**PKE543 Gear Ratio 36**



**PKE543 Gear Ratio 50**



#### Note

● 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.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) max.

(When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C (167°F) max. since the motor is recognized as heat-resistant class A.)

# PS Geared Type PS Geared Type with Electromagnetic Brake

Frame Size 60 mm (2.36 in.)

## Specifications



Motor Product Name	Single Shaft	PKE566AC-PS5	PKE566AC-PS7.2	PKE566AC-PS10	PKE564AC-PS25	PKE564AC-PS36	PKE564AC-PS50
Motor Product Name	Double Shaft	PKE566BC-PS5	PKE566BC-PS7.2	PKE566BC-PS10	PKE564BC-PS25	PKE564BC-PS36	PKE564BC-PS50
Motor Product Name	with Electromagnetic Brake	PKE566MC-PS5	PKE566MC-PS7.2	PKE566MC-PS10	PKE564MC-PS25	PKE564MC-PS36	PKE564MC-PS50
Driver Product Name	Built-in Controller Type	RKSD507- <input type="checkbox"/> D					
Driver Product Name	Pulse Input Type	RKSD507/ <input type="checkbox"/> - <input type="checkbox"/>					
Maximum Holding Torque	N·m (lb-in)	3.5 (30)	4 (35)	5 (44)	8 (70)		
Rotor Inertia	J: kg·m <sup>2</sup> (oz-in <sup>2</sup> )	270×10 <sup>-7</sup> (1.48) [430×10 <sup>-7</sup> (2.4)]*1			160×10 <sup>-7</sup> (0.88) [320×10 <sup>-7</sup> (1.75)]*1		
Rated Current	A/Phase	0.75					
Basic Step Angle		0.144°	0.1°	0.072°	0.0288°	0.02°	0.0144°
Gear Ratio		5	7.2	10	25	36	50
Permissible Torque*	N·m (lb-in)	3.5 (30)	4 (35)	5 (44)	8 (70)		
Maximum Instantaneous Torque*	N·m (lb-in)	*	*	*	*	*	20 (177)
Holding Torque at Power On	N·m (lb-in)	2.7 (23)	3.9 (34)	5 (44)	7.2 (63)	8 (70)	
Motor Standstill Electromagnetic Brake	N·m (lb-in)	2.7 (23)	3.9 (34)	5 (44)	7.2 (63)	8 (70)	
Speed Range	r/min	0 - 600	0 - 416	0 - 300	0 - 120	0 - 83	0 - 60
Backlash	arcmin	7 (0.12°)			9 (0.15°)		
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC - 15 to +10% 50/60 Hz					
Power Supply Input	Input Current	Single-Phase 100-120 VAC	3.8			Single-Phase 200-240 VAC	4.0
Power Supply Input	A	Single-Phase 200-240 VAC	2.4			Single-Phase 200-240 VAC	2.4
Excitation Mode		Microstep					
Control Power Supply*2		24 VDC±5% 0.2 A					
Electromagnetic Brake*3	Power Supply Input	24 VDC±5%*4 0.25 A					

\*For the geared motor output torque, refer to the speed – torque characteristics.

● The box  in the product name indicates the power supply input **A** (single phase 100-120 VAC) or **C** (single-phase 200-240 VAC).

When a driver is the one for a motor with an electromagnetic brake, the box  in the product name indicates **M** (with electromagnetic brake).

\*1 The bracket [ ] indicates the value for the product with an electromagnetic brake.

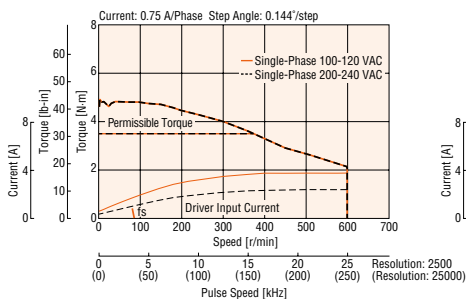
\*2 For built-in controller type, the control power supply is required.

\*3 For the pulse input type, when operating the motor with an electromagnetic brake, be sure to connect the power supply for electromagnetic brake.

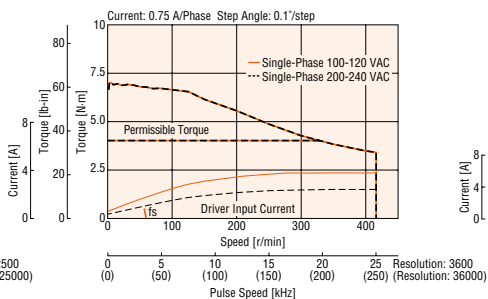
\*4 If the wiring distance between the motor and driver is extended to 15 m (49.2 ft.) or longer by using a connection cable (sold separately), 24 VDC±4% is applied to the specification of power supply input.

## Speed – Torque Characteristics (Reference Values) fs: Max. Starting Frequency

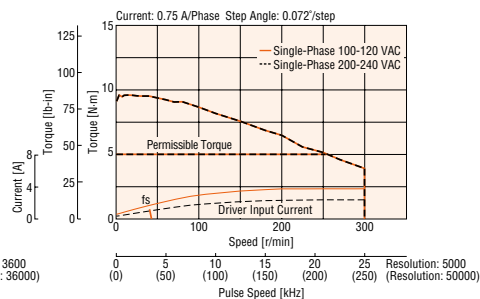
**PKE566 Gear Ratio 5**



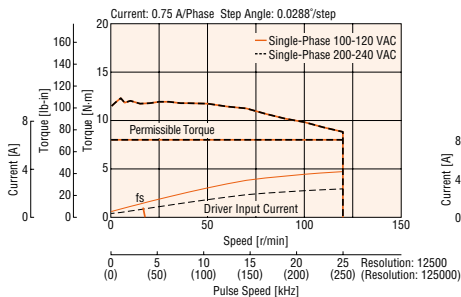
**PKE566 Gear Ratio 7.2**



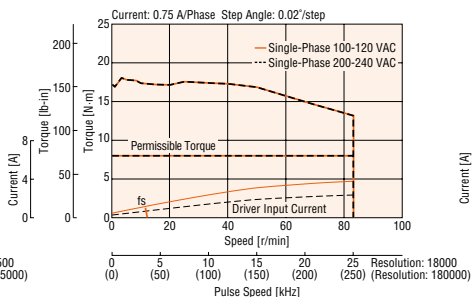
**PKE566 Gear Ratio 10**



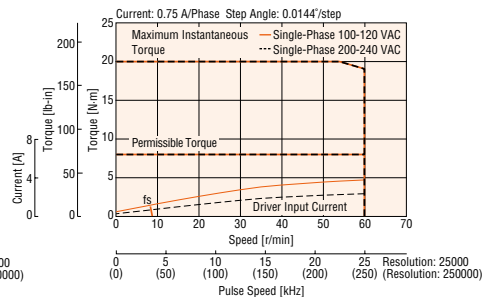
**PKE564 Gear Ratio 25**



**PKE564 Gear Ratio 36**



**PKE564 Gear Ratio 50**



### Note

- 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.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) max. (When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C (167°F) max. since the motor is recognized as heat-resistant class A.)



## PS Geared Type

Frame Size 90 mm (3.54 in.)

## PS Geared Type with Electromagnetic Brake

### Specifications

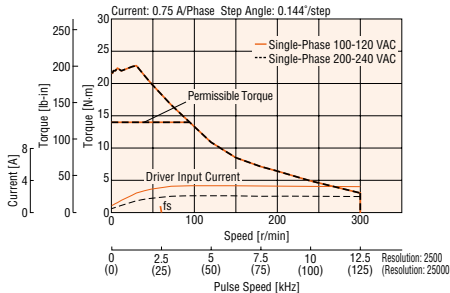


Motor Product Name	Single Shaft	PKE599AC-PS5	PKE599AC-PS7.2	PKE599AC-PS10	PKE596AC-PS25	PKE596AC-PS36	PKE596AC-PS50
Motor Product Name	Double Shaft	PKE599BC-PS5	PKE599BC-PS7.2	PKE599BC-PS10	PKE596BC-PS25	PKE596BC-PS36	PKE596BC-PS50
Motor Product Name	with Electromagnetic Brake	PKE599MC-PS5	PKE599MC-PS7.2	PKE599MC-PS10	PKE596MC-PS25	PKE596MC-PS36	PKE596MC-PS50
Driver Product Name	Built-in Controller Type	<b>RKSD507-□-D</b>					
Pulse Input Type	<b>RKSD507□-□-□</b>						
Maximum Holding Torque	N·m (lb-in)	14 (123)	20 (177)		36 (310)	37 (320)	
Rotor Inertia	J: kg·m <sup>2</sup> (oz-in <sup>2</sup> )	2200×10 <sup>-7</sup> (12) [3300×10 <sup>-7</sup> (18.1)]*1			1100×10 <sup>-7</sup> (6) [2200×10 <sup>-7</sup> (12)]*1		
Rated Current	A/Phase	0.75					
Basic Step Angle		0.144°	0.1°	0.072°	0.0288°	0.02°	0.0144°
Gear Ratio		5	7.2	10	25	36	50
Permissible Torque*	N·m (lb-in)	14 (123)	20 (177)		*	37 (320)	
Maximum Instantaneous Torque**	N·m (lb-in)	*	*	35 (300)	*	*	60 (530)
Holding Torque at Power On	N·m (lb-in)	12.5 (110)	18 (159)	20 (177)	18.5 (163)	26 (230)	37 (320)
Motor Standstill Electromagnetic Brake	N·m (lb-in)	12.5 (110)	18 (159)	20 (177)	18.5 (163)	26 (230)	37 (320)
Speed Range	r/min	0 - 300	0 - 208	0 - 150	0 - 120	0 - 83	0 - 60
Backlash	arcmin	7 (0.12°)			9 (0.15°)		
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC – 15 to +10% 50/60 Hz					
Excitation Mode	Input Current	3.5			4.9		
	A Single-Phase 100-120 VAC	2.2			3.0		
Control Power Supply*2		24 VDC±5% 0.2 A					
Electromagnetic Brake*3	Power Supply Input	24 VDC±5%*4 0.42 A					

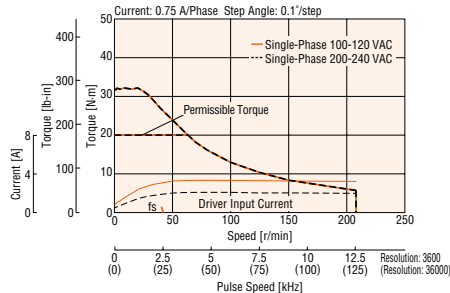
- \* For the geared motor output torque, refer to the speed – torque characteristics.
- The box  in the product name indicates the power supply input **A** (single phase 100-120 VAC) or **C** (single-phase 200-240 VAC).  
When a driver is the one for a motor with an electromagnetic brake, the box  in the product name indicates **M** (with electromagnetic brake).
- \*1 The bracket [ ] indicates the value for the product with an electromagnetic brake.
- \*2 For built-in controller type, the control power supply is required.
- \*3 For the pulse input type, when operating the motor with an electromagnetic brake, be sure to connect the power supply for electromagnetic brake.
- \*4 If the wiring distance between the motor and driver is extended to 15 m (49.2 ft.) or longer by using a connection cable (sold separately), 24 VDC±4% is applied to the specification of power supply input.

### Speed – Torque Characteristics (Reference Values) fs: Max. Starting Frequency

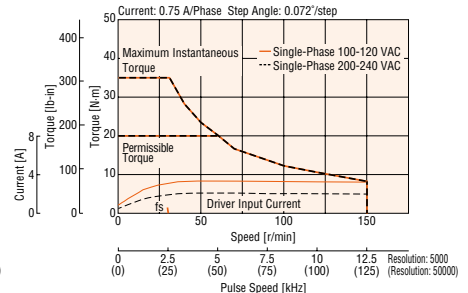
**PKE599 Gear Ratio 5**



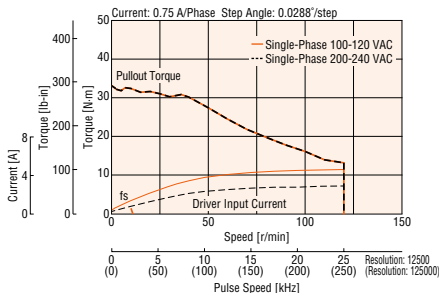
**PKE599 Gear Ratio 7.2**



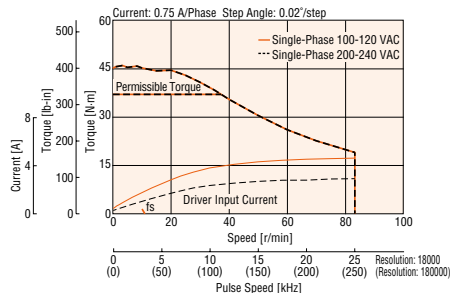
**PKE599 Gear Ratio 10**



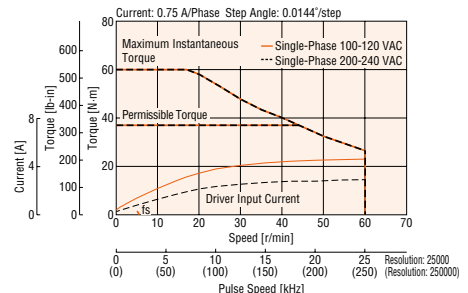
**PKE596 Gear Ratio 25**



**PKE596 Gear Ratio 36**



**PKE596 Gear Ratio 50**



**Note**

- 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.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) max. (When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C (167°F) max. since the motor is recognized as heat-resistant class A.)

# Harmonic Geared Type Frame Size 42 mm (1.65 in.), 60 mm (2.36 in.), 90 mm (3.54 in.)

## Harmonic Geared Type with Electromagnetic Brake

### Specifications



Motor Product Name		PKE543AC-H550	PKE543AC-H5100	PKE564AC-H550	PKE564AC-H5100	PKE596AC-H550	PKE596AC-H5100
Single Shaft							
	Double Shaft	PKE543BC-H550	PKE543BC-H5100	PKE564BC-H550	PKE564BC-H5100	PKE596BC-H550	PKE596BC-H5100
with Electromagnetic Brake		PKE543MC-H550	PKE543MC-H5100	PKE564MC-H550	PKE564MC-H5100	PKE596MC-H550	PKE596MC-H5100
Driver Product Name		RKSD503-□D			RKSD507-□D		
Built-in Controller Type							
Pulse Input Type		RKSD503□-□			RKSD507□-□		
Maximum Holding Torque	N·m (lb-in)	3.5 (30)	5 (44)	7 (61)	10 (88)	33 (290)	52 (460)
Rotor Inertia	J: kg·m <sup>2</sup> (oz-in <sup>2</sup> )	47×10 <sup>-7</sup> (0.26) [62×10 <sup>-7</sup> (0.34)]*1		195×10 <sup>-7</sup> (1.07) [355×10 <sup>-7</sup> (1.94)]*1		1300×10 <sup>-7</sup> (7.1) [2400×10 <sup>-7</sup> (13.1)]*1	
Rated Current	A/Phase	0.35			0.75		
Basic Step Angle		0.0144°	0.0072°	0.0144°	0.0072°	0.0144°	0.0072°
Gear Ratio		50	100	50	100	50	100
Permissible Torque*	N·m (lb-in)	3.5 (30)	5 (44)	7 (61)	10 (88)	33 (290)	52 (460)
Maximum Instantaneous Torque*	N·m (lb-in)	*	11 (97)	*	36 (310)	*	107 (940)
Holding Torque at Motor Standstill	Power On	3.5 (30)	5 (44)	7 (61)	10 (88)	33 (290)	52 (460)
	Electromagnetic Brake	3.5 (30)	5 (44)	7 (61)	10 (88)	33 (290)	52 (460)
Speed Range	r/min	0 - 70	0 - 35	0 - 70	0 - 35	0 - 70	0 - 35
Lost Motion (Load Torque)	arcmin	1.5 max. (±0.16 N·m)	1.5 max. (±0.20 N·m)	0.7 max. (±0.28 N·m)	0.7 max. (±0.39 N·m)	0.7 max. (±1.2 N·m)	0.7 max. (±1.2 N·m)
Voltage and Frequency		Single-Phase 100-120 VAC, Single-Phase 200-240 VAC -15 to +10% 50/60 Hz					
Power Supply Input	Input Current Single-Phase 100-120 VAC	2.1		4.0		4.9	
	A Single-Phase 200-240 VAC	1.3		2.4		3.0	
Excitation Mode		Microstep					
Control Power Supply*2		24 VDC±5% 0.2 A					
Electromagnetic Brake*3 Power Supply Input		24 VDC±5%*4 0.08 A		24 VDC±5%*4 0.25 A		24 VDC±5%*4 0.42 A	

\*For the geared motor output torque, refer to the speed – torque characteristics.

● The box □ in the product name indicates the power supply input **A** (single phase 100-120 VAC) or **C** (single-phase 200-240 VAC).

When a driver is the one for a motor with an electromagnetic brake, the box □ in the product name indicates **M** (with electromagnetic brake).

\*1 The bracket [ ] indicates the value for the product with an electromagnetic brake.

\*2 For built-in controller type, the control power supply is required.

\*3 For the pulse input type, when operating the motor with an electromagnetic brake, be sure to connect the power supply for electromagnetic brake.

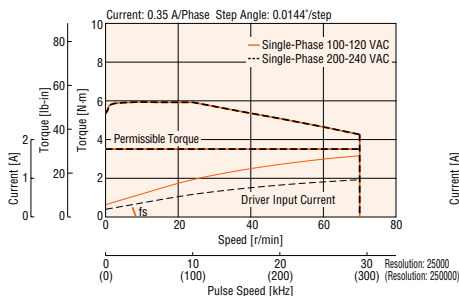
\*4 If the wiring distance between the motor and driver is extended to 15 m (49.2 ft.) or longer by using a connection cable (sold separately), 24 VDC±4% is applied to the specification of power supply input.

### Note

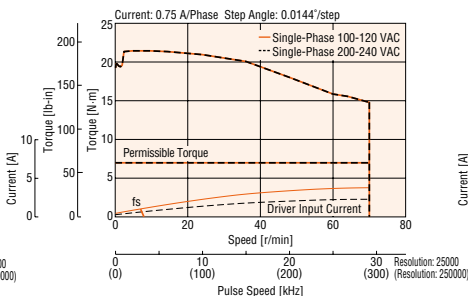
● The rotor inertia represents a sum of the inertia of the harmonic gear converted to motor shaft values.

### Speed – Torque Characteristics (Reference Values) fs: Max. Starting Frequency

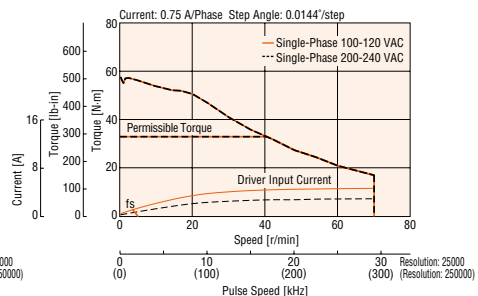
**PKE543 Gear Ratio 50**



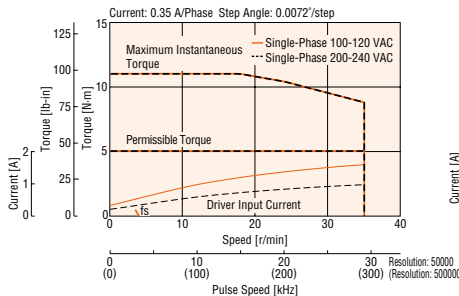
**PKE564 Gear Ratio 50**



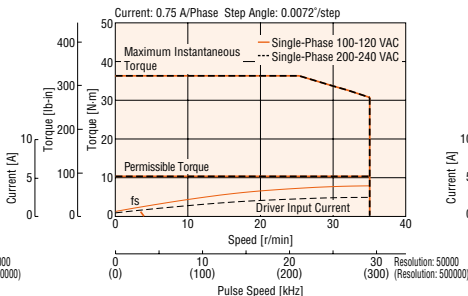
**PKE596 Gear Ratio 50**



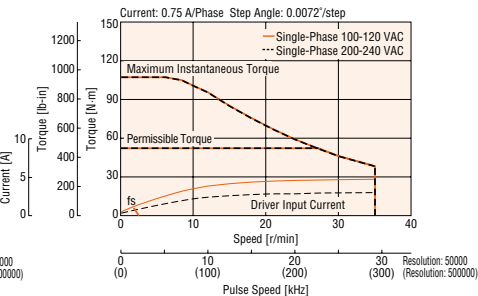
**PKE543 Gear Ratio 100**



**PKE564 Gear Ratio 100**



**PKE596 Gear Ratio 100**



### Note

● 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.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C (212°F) max.

(When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C (167°F) max. since the motor is recognized as heat-resistant class A.)

## Driver Specifications

	Built-in Controller Type	Pulse Input Type
Max. Input Pulse Frequency	—	Line driver output by programmable controller: 500 kHz (When the pulse duty is 50%) Open-collector output by programmable controller: 250 kHz (When the pulse duty is 50%) Negative Logic Pulse Input
Input Signal	Photocoupler input Input-signal voltage: 11.4 VDC-26.4 VDC	Photocoupler Input Input-signal voltage: 11.4 VDC-26.4 VDC (AWO, CS, FREE, ALM-RST) Photocoupler input Input-signal voltage: 3 VDC-5.25 VDC (CW (PLS) +5 V, CCW (DIR) +5 V) Photocoupler input Input-signal voltage: 21.6 VDC-26.4 VDC (CW (PLS) +24 V, CCW (DIR) +24 V)
Output Signal	Photocoupler: Open-collector output External use condition: 30 VDC 10 mA max.	Photocoupler: Open-collector output External use condition: 30 VDC 10 mA max. (READY, ALM, TIM)
Positioning Data Points	64 Points	—
Positioning Operation	Single-Motion, Linked-Motion, Linked-Motion 2, Sequential, Direct	—
Other Operations	Continuous Operation, JOG Operation, Return-To-Home Operation, Test Operation	—
Data Setter <b>OPX-2A</b>	<input type="radio"/>	—
Support Software <b>MEXE02</b>	<input type="radio"/>	—

## RS-485 Communication Specifications

Protocol	Modbus RTU Mode
Electrical Characteristics	EIA-485 Based, Straight Cable Use a shielded twisted pair cable (TIA/EIA-568B CAT5e or higher is recommended) and keep the total wiring distance including extension to 50 m (164 ft.) or less.*
Communication Mode	Half duplex, asynchronous communication (data: 8 bits, stop bit: 1 bit or 2 bits, parity: none, even, or odd)
Transmission Rate	Select either from 9600 bps, 19200 bps, 38400 bps, 57600 bps, or 115200 bps
Connection Units	Up to 31 drivers can be connected to a single programmable controller (master device).

\*If the motor cable or power supply cable generates an undesirable amount of noise depending on the wiring or configuration, shield the cable or install a ferrite core.

Overview

Motor &  
Driver5-Phase  
RKII

Driver

Motor

2-Phase  
PKP5-Phase  
PKP

## General Specifications

	Motor	Driver	
		Built-in Controller Type	Pulse Input Type
Thermal Class	130 (B) [UL Recognized 105 (A)]	—	
Insulation Resistance	100 MΩ or more when 500 VDC megger is applied between the following places: • Case – Motor Windings • Case – Electromagnetic Brake Windings*1	100 MΩ or more when 500 VDC megger is applied between the following places: • PE Terminal – Power Supply Terminal • I/O Signal Terminal – Power Supply Terminal	
Dielectric Strength	Sufficient to withstand the following for 1 minute: • Case – Motor Windings 1.5 kVAC 50/60 Hz • Case – Electromagnetic Brake Windings*1 1.5 kVAC 50/60 Hz	Sufficient to withstand the following for 1 minute. • PE Terminal – Power Supply Terminal 1.5 kVAC 50/60 Hz • I/O Signal Terminal – Power Supply Terminal 1.8 kVAC 50/60 Hz	• PE Terminal – Power Supply Terminal 1.8 kVAC 50/60 Hz • I/O Signal Terminal – Power Supply Terminal 1.9 kVAC 50/60 Hz
Operating Environment	Ambient Temperature	0 to +55°C (+32 to +131°F)*2(non-freezing)	
	Ambient Humidity	85% or less (Non-Condensing)	
	Surrounding Atmosphere	No corrosive gas or dust. No water or oil.	
Temperature Rise	The temperature rise of the windings is 80°C (176°F) or less (measured by resistance change method) at the rated current, 5-phase excited, and at standstill.	—	
Degree of Protection	IP20	IP10	IP20
Stop Position Accuracy*3	±3 arcmin (±0.05°)		
Shaft Runout	0.05 (0.002 in.) T.I.R.(mm)*4	—	
Radial Play*5	0.025 mm (0.001 in.) Max. [Load 5 N (1.12 lb.)]	—	
Axial Play*6	0.075 mm (0.003 in.) Max. [Load 10 N (2.2 lb.)]	—	
Concentricity of Installing Pilot to the Shaft	0.075 (0.003 in.)T.I.R.(mm)*4	—	
Perpendicularity of Installation Surface to the Shaft	0.075 (0.003 in.)T.I.R.(mm)*4	—	

\*1 Electromagnetic brake type only.

\*2 When installing a motor to a heat sink of a capacity at least equivalent to an aluminum plate 200×200 mm (7.87×7.87 in.), thickness 2 mm (0.08 in.).

\*3 This value is for full step under no load. (The value changes with the size of the load.)

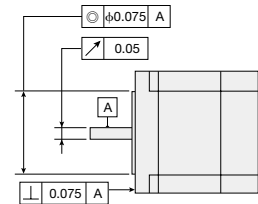
\*4 T.I.R. (Total Indicator Reading): The total dial gauge reading when the measurement section is rotated one revolution centered on the reference axis center.

\*5 Radial Play: Displacement in shaft position in the radial direction when a 5 N (1.12 lb.) load is applied in the vertical direction to the tip of the motor shaft.

\*6 Axial Play: Displacement in shaft position in the axial direction when a 10 N (2.2 lb.) load is applied to the motor shaft in the axial direction.

### Note

● Disconnect the motor and driver when measuring insulation resistance or conducting a dielectric strength test.



## Electromagnetic Brake Specifications

Product Name	PKE54	PKE56	PKE59	
Brake Type	Power Off Activated Type			
Power Supply Voltage	24 VDC $\pm$ 5%*			
Power Supply Current	A	0.08	0.25	0.42
Brake Operating Time	ms	20		
Brake Releasing Time	ms	30	50	
Time Rating	Continuous			

\*For the type with an electromagnetic brake, 24 VDC $\pm$ 4% specification applies if the wiring distance between the motor and driver is extended to 15 m (49.2 ft.) or longer using a cable.

● The product names are listed such that the product names are distinguishable.

## Encoder Specifications

Resolution	500 P/R
Output Mode	Incremental
Output Signal	3-Channel
Output Circuit Type	Line Driver

## Permissible Moment Load

→ Page A-12

## Permissible Radial Load and Permissible Axial Load

→ Page A-13

## Rotation Direction

→ Page A-12

Overview

Motor &  
Driver

5-Phase  
RKII

Driver

Motor

2-Phase  
PKP

5-Phase  
PKP

