



## *5-Phase Stepping Motors*

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# 5-Phase Stepping Motors

QSTEP

RK

CSK

PMC

NanoStep RPK

5-Phase Stepping Motors

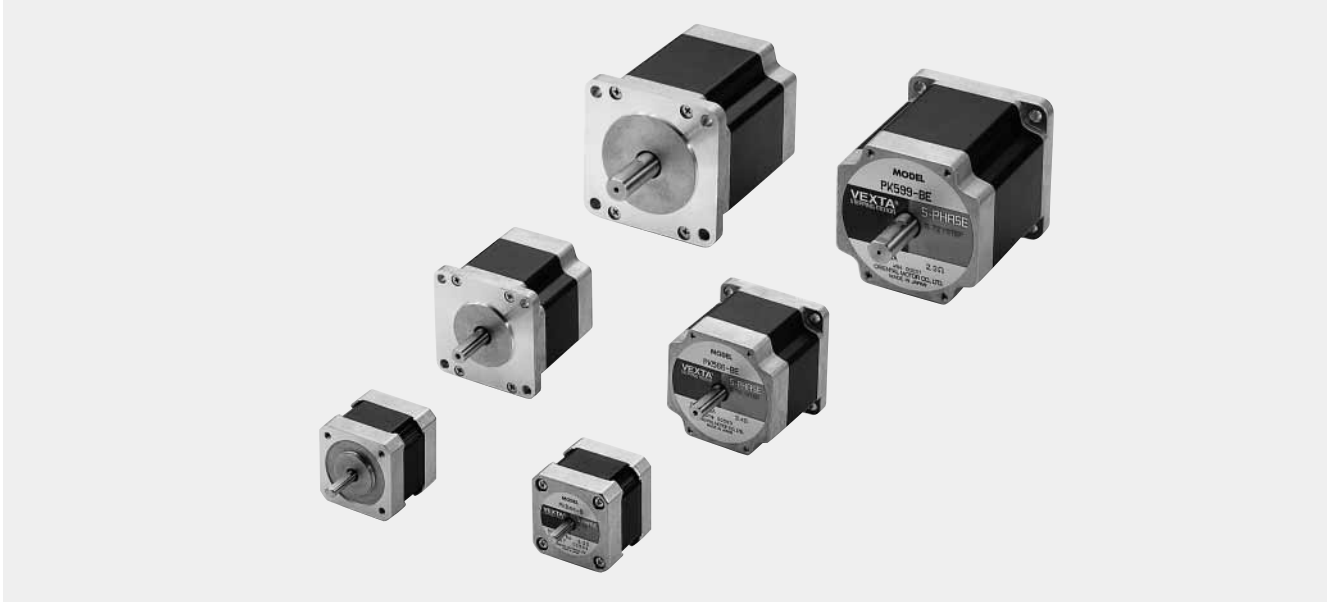
CSK

2-Phase Stepping Motors

Controller

Accessories

## High-Torque PK Type



### Features

#### 1. High Torque

The high torque of the **PK** type motor makes it possible to drive large equipment and is effective for equipment downsizing and for keeping heat generation low. The maximum static torque values are as follows.

**PK54** □ : 0.13N·m~0.24N·m  
**PK56** □ : 0.42N·m~1.66N·m  
**PK59** □ : 2.1N·m~6.3N·m

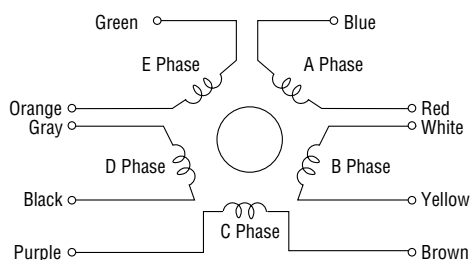
#### 2. Low Vibration

The **PK** motors do more than provide high torque: they were also designed to produce less vibration. This makes **PK** motors the ideal choice for micro-step driving.

#### 3. Low Audible Noise

The **PK** motor was designed to produce low audible noise.

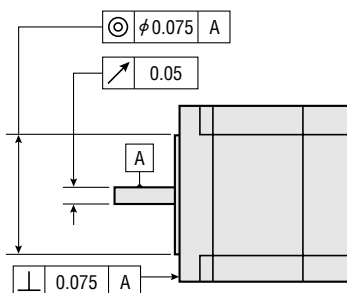
## Windings



## General Specifications

Item	Specifications
Shaft Runout	0.05 T.I.R (mm) *1
Concentricity	0.075 T.I.R (mm) *1
Perpendicularity	0.075 T.I.R (mm) *1
Shaft Radial Play *2	0.025mm Maximum (at 5N)
Shaft Axial Play *3	0.075mm Maximum (at 10N)
Stop Position Accuracy *4	±3 minutes
Insulation Resistance	100M Ω or more when the megger reading between the windings and the case is DC 500V.
Dielectric Strength	Sufficient to withstand 1kV (0.5kV for <b>PK54</b> ) at 50Hz applied between the windings and the case for one minute.
Insulation Class	Class B (130°C)
Temperature Rise	80°C or less as measured by the resistance change method with rated voltage, during five-phase excitation and motor standstill.
Ambient Temperature	-10°C ~ +50°C

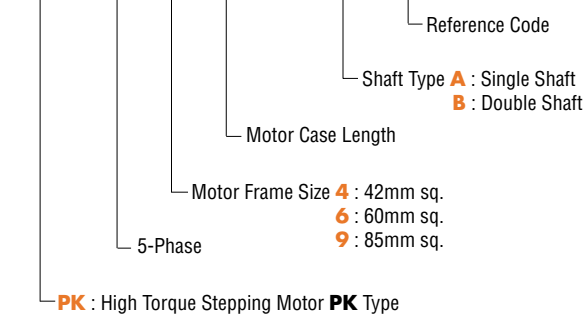
- \* 1 T.I.R. (Total Indicator Reading): It refers to the total dial gage reading when the measurement section is rotated 1 revolution centered on the reference axis center.
- \* 2 Radial Play: It refers to the displacement in shaft position in the radial direction when a 5N load is applied to the motor shaft tip in a radial direction.
- \* 3 Axial Play: It refers to the displacement in shaft position in the axial direction when a 10N load is applied to the motor shaft in the axial direction.
- \* 4 Stop Position Accuracy: This value is for full step with no load. (The value changes with size of load.)



# Product Specifications of 5-Phase Stepping Motors

## Product Number Code

**PK 5 6 6 - B E**



## Specifications

Model (Single Shaft / Double Shaft)	Basic Step Angle	Holding Torque * N · m	Current per Phase A/phase	Resistance per Phase Ω/phase	Rotor Inertia J kg · m <sup>2</sup>	Mass kg	Page
<b>PK543-A</b>	0.72°	0.13	0.75	1.7	35×10 <sup>-7</sup>	0.21	B-169
<b>PK543-B</b>							
<b>PK544-A</b>	0.72°	0.18	0.75	2.2	54×10 <sup>-7</sup>	0.27	B-169
<b>PK544-B</b>							
<b>PK545-A</b>	0.72°	0.24	0.75	2.2	68×10 <sup>-7</sup>	0.35	B-169
<b>PK545-B</b>							
<b>PK564-AE</b>	0.72°	0.42	0.75	2.3	175×10 <sup>-7</sup>	0.6	B-170
<b>PK564-BE</b>							
<b>PK566-AE</b>	0.72°	0.83	0.75	3.4	280×10 <sup>-7</sup>	0.8	B-170
<b>PK566-BE</b>							
<b>PK569-AE</b>	0.72°	1.66	1.4	1.7	560×10 <sup>-7</sup>	1.3	B-170
<b>PK569-BE</b>							
<b>PK596-AE</b>	0.72°	2.1	1.4	1.5	1400×10 <sup>-7</sup>	1.7	B-171
<b>PK596-BE</b>							
<b>PK599-AE</b>	0.72°	4.1	1.4	2.3	2700×10 <sup>-7</sup>	2.8	B-171
<b>PK599-BE</b>							
<b>PK5913-AE</b>	0.72°	6.3	2.8	0.75	4000×10 <sup>-7</sup>	3.8	B-171
<b>PK5913-BE</b>							

\* The value given for holding torque is the value when operated with rated current and five phase excitation.

## Accessories

● Motor Mounting Brackets: Page B-248

● Clean Dampers: Page B-251  
Effective at suppressing motor vibration and improving performance.

● Flexible Couplings: Page B-252  
Clamping Type



# 5-Phase Stepping Motors High-Torque Type **PK54** Step Angle 0.72°



## Specifications (at 5-phase excitation)

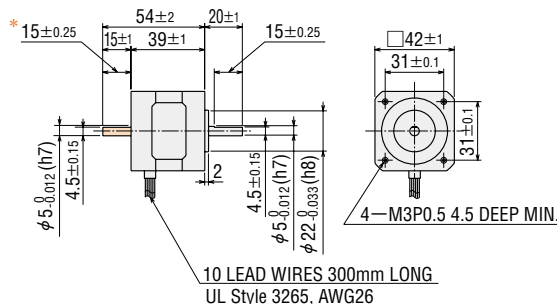
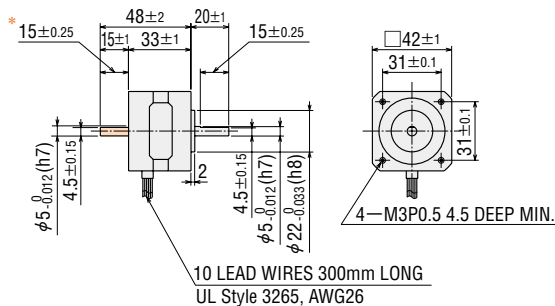
Model (Single Shaft / Double Shaft)	Holding Torque* N·m	Current per Phase A/phase	Resistance per Phase $\Omega$ /phase	Rotor Inertia J kg·m <sup>2</sup>	Corresponding DC-Input Motor / Driver Unit	Page with Speed-Torque Characteristics
<b>PK543-A</b>	0.13	0.75	1.7	$35 \times 10^{-7}$	<b>CSK543-N□TE</b>	B-123
<b>PK543-B</b>						
<b>PK544-A</b>	0.18	0.75	2.2	$54 \times 10^{-7}$	<b>CSK544-N□TE</b>	B-123
<b>PK544-B</b>						
<b>PK545-A</b>	0.24	0.75	2.2	$68 \times 10^{-7}$	<b>CSK545-N□TE</b>	B-123
<b>PK545-B</b>						

- If you are considering buying both a motor and driver, we recommend the purchase of one of the **CSK** Series products, which combine a dedicated motor and driver into a single unit.
- The motors in the table above cannot be connected to **CSK** Series drivers. Consult us regarding drivers before your purchase.
- For the speed-torque characteristics of the motors in the above table, see the corresponding **CSK** series characteristics.

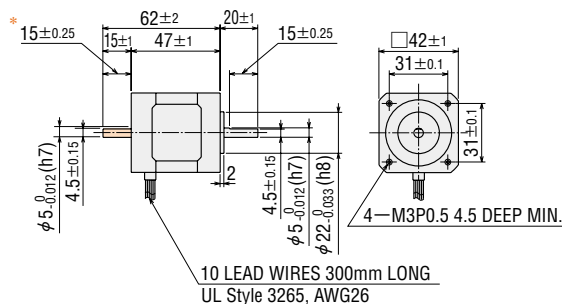
## Dimensions scale 1/4, unit = mm

- **PK543-A** (Single shaft) Mass 0.21kg
- **PK543-B** (Double shaft) Mass 0.21kg

- **PK544-A** (Single shaft) Mass 0.27kg
- **PK544-B** (Double shaft) Mass 0.27kg



- **PK545-A** (Single shaft) Mass 0.35kg
- **PK545-B** (Double shaft) Mass 0.35kg



- \* 15±0.25 indicates the length of milling on motor shaft.
- These dimensions are for double shaft models. For single shaft, ignore the colored areas.
- Refer to page B-42 for information on motor installation.

# 5-Phase Stepping Motors High-Torque Type

## PK56

Step Angle 0.72°



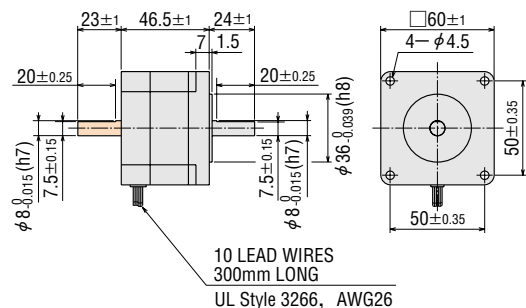
### Specifications (at 5-phase excitation)

Model (Single Shaft / Double Shaft)	Holding Torque* N·m	Current per Phase A/phase	Resistance per Phase Ω/phase	Rotor Inertia J kg·m <sup>2</sup>	Corresponding AC-Input Motor / Driver Unit	Page with speed-torque characteristics
<b>PK564-AE</b>	0.42	0.75	2.3	175×10 <sup>-7</sup>	<b>RK564AC</b> <b>RK564BC</b>	B-96
<b>PK564-BE</b>						
<b>PK566-AE</b>	0.83	0.75	3.4	280×10 <sup>-7</sup>	<b>RK566AC</b> <b>RK566BC</b>	B-96
<b>PK566-BE</b>						
<b>PK569-AE</b>	1.66	1.4	1.7	560×10 <sup>-7</sup>	<b>RK569AC</b> <b>RK569BC</b>	B-96
<b>PK569-BE</b>						

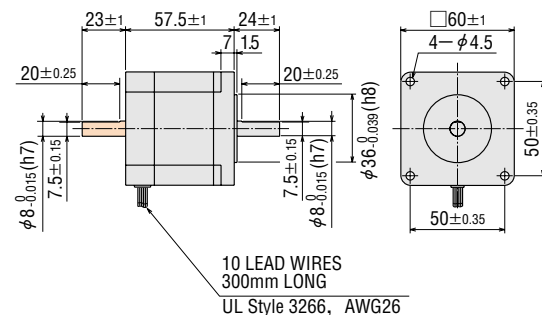
- If you are considering buying both a motor and driver, we recommend the purchase of one of the **RK Series** products, which combine a dedicated motor and driver into a single unit.
- The motors in the table above cannot be connected to **RK Series** drivers. Consult us regarding drivers before your purchase.
- For the speed-torque characteristics of the motors in the above table, see the corresponding **RK series** characteristics.

### Dimensions scale 1/4, unit = mm

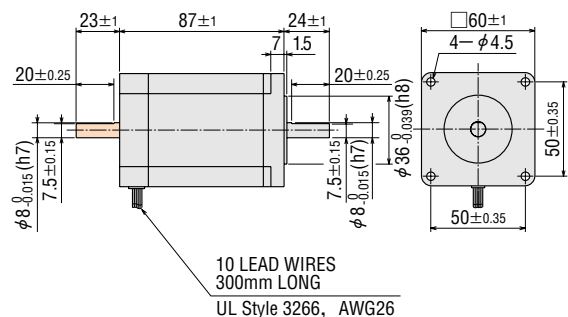
- **PK564-AE** (Single shaft) Mass 0.6kg
- **PK564-BE** (Double shaft) Mass 0.6kg



- **PK566-AE** (Single shaft) Mass 0.8kg
- **PK566-BE** (Double shaft) Mass 0.8kg



- **PK569-AE** (Single shaft) Mass 1.3kg
- **PK569-BE** (Double shaft) Mass 1.3kg



- These dimensions are for double shaft models. For single shaft, ignore the colored areas.
- Refer to page B-42 for information on motor installation.

# 5-Phase Stepping Motors High-Torque Type **PK59** □ Step Angle 0.72°



## ■ Specifications (at 5-phase excitation)

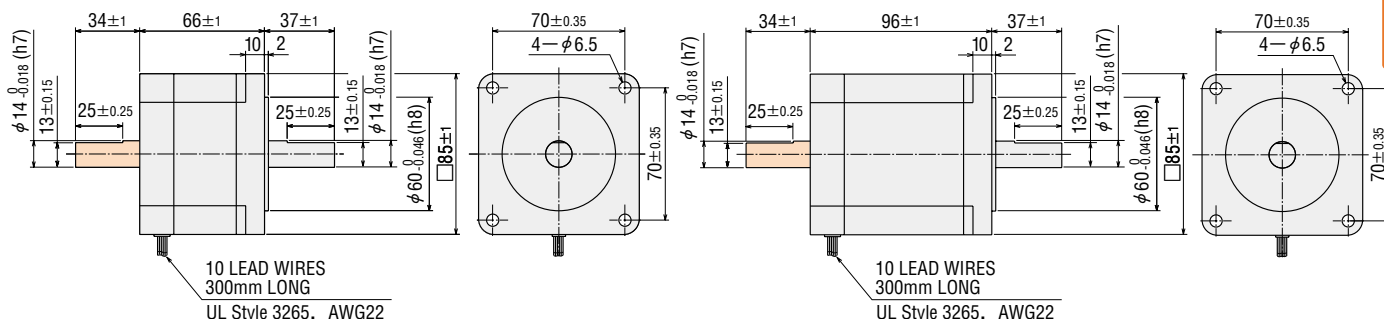
Model (Single Shaft / Double Shaft)	Holding Torque N · m	Current per Phase A/phase	Resistance per Phase Ω/phase	Rotor Inertia J kg · m <sup>2</sup>	Corresponding AC-Input Motor / Driver Unit	Page with Speed-Torque Characteristics
<b>PK596-AE</b>	2.1	1.4	1.5	1400 × 10 <sup>-7</sup>	<b>RK596AC</b>	B-96
<b>PK596-BE</b>					<b>RK596BC</b>	
<b>PK599-AE</b>	4.1	1.4	2.3	2700 × 10 <sup>-7</sup>	<b>RK599AC</b>	B-96
<b>PK599-BE</b>					<b>RK599BC</b>	
<b>PK5913-AE</b>	6.3	2.8	0.75	4000 × 10 <sup>-7</sup>	<b>RK5913AC</b>	B-96
<b>PK5913-BE</b>					<b>RK5913BC</b>	

- If you are considering buying both a motor and driver, we recommend the purchase of one of the **RK** Series products, which combine a dedicated motor and driver into a single unit.
- The motors in the table above cannot be connected to **RK** Series drivers. Consult us regarding drivers before your purchase.
- For the speed-torque characteristics of the motors in the above table, see the corresponding **RK** series characteristics.

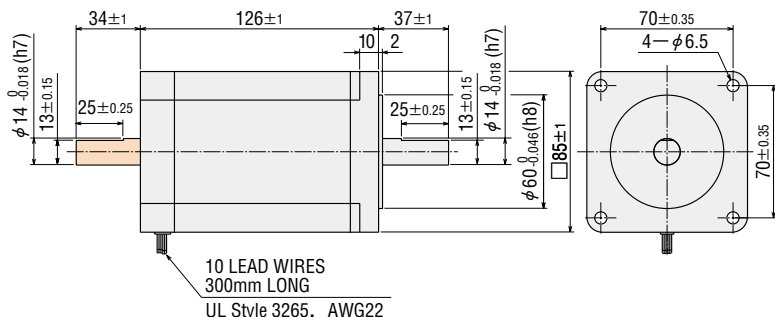
## ■ Dimensions scale 1/4, unit = mm

- **PK596-AE** (Single shaft) Mass 1.7kg
- **PK596-BE** (Double shaft) Mass 1.7kg

- **PK599-AE** (Single shaft) Mass 2.8kg
- **PK599-BE** (Double shaft) Mass 2.8kg



- **PK5913-AE** (Single shaft) Mass 3.8kg
- **PK5913-BE** (Double shaft) Mass 3.8kg



- These dimensions are for double shaft models. For single shaft, ignore the colored areas.
- Refer to page B-42 for information on motor installation.