

# 1.8° Stepping Motor and Driver Package RBK Series

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

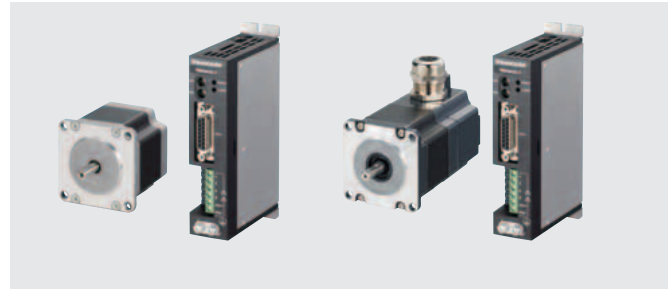
The **RBK Series** is a motor and driver package consisting of a 1.8° step angle stepping motor and DC input microstep driver.

It includes Oriental Motor's proprietary Smooth Drive Function to easily achieve low vibration operation.

**UL** **CE** (Terminal box type motor only)

**RoHS**

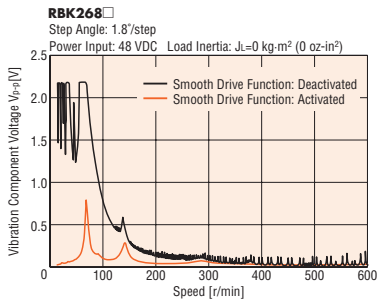
● For detailed product safety standard information including standards, file number and certification body, please visit [www.orientalmotor.com](http://www.orientalmotor.com).



## Features

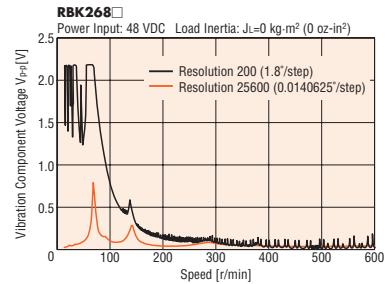
### ● Smooth Drive Function

The Smooth Drive Function is a function that automatically controls the motor's microstep drive operation at the same travel and speed as in the full-step mode, without the operator having to change the speed settings of the driver's pulse input. It enables low vibration operation available with the microstep drive to be achieved with the flick of a switch.



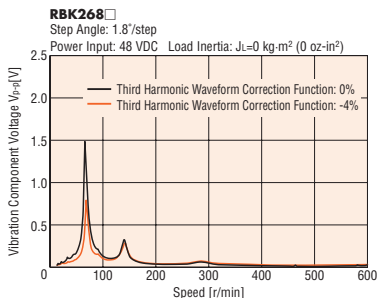
### ● Microstep Function

The microstep driver electronically divides the basic step angle of the motor (1.8°/step) by up to 128 without the use of a reduction mechanism or other mechanical elements. 16 different resolutions levels are available. The available range of resolution settings is 200 (1.8°/step) to 25600 (0.0140625°/step). The step angle can be easily set using the built-in switches on the driver. This function enables low vibration and low noise operation.



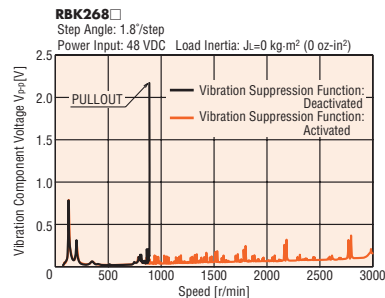
### ● Third Harmonic Waveform Correction Function

This function corrects motor drive current waveforms. It provides improved angle accuracy and reduced vibration.



### ● Vibration Suppression Function

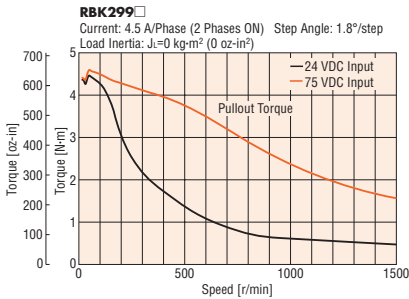
This function improves vibrations in the medium speed range of stepping motors. It enables reduced risk of missteps due to vibrations.



## Wide Voltage Range Driver

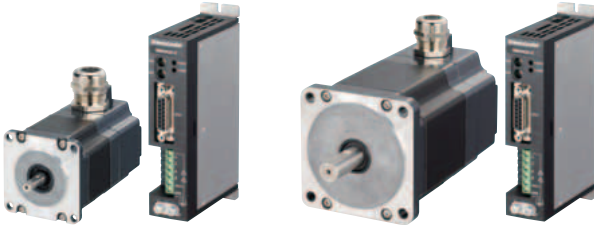
The **RBK** Series utilizes a constant current driver with a wide voltage range of 20 to 75 VDC and up to 4.5 A/phase effective value (6.3 A/phase peak value). This enables it to support a wide range of power sources.

### Comparison of Speed – Torque Characteristics



● Raising the power supply voltage enables increased torque during high speed operation.

## The Terminal Box Type Motor Conforms to the IP65 Standard of Ingress Protection against Dust and Water.



## Conforming to Major Safety Standards (Terminal box type motor only)

The **RBK** Series is UL recognized and CSA certified. It also bears the CE Mark as a proof of conformance to the Low Voltage Directives.

## Encoder Option Available

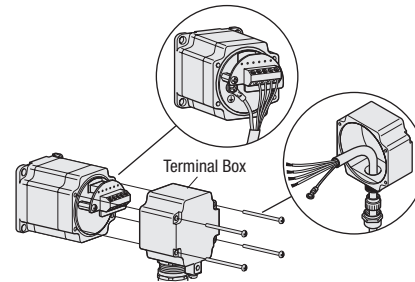
200 or 400 pulse/rev, 2 or 3 channel, TTL.

Motor rotations can be detected by taking in encoder output signals into a programmable controller (not supplied).



## Terminal-Block Connection Design

The motor can be wired directly from its terminal block.



## Lineup of Motors

□42 mm (□1.65 in.): indicates a motor frame size of 42 mm (1.65 in.).

Type	Feature	□28 mm (□1.10 in.)	□35 mm (□1.38 in.)	□42 mm (□1.65 in.)	□56.4 mm (□2.22 in.)*1	□85 mm (□3.35 in.)
Step Angle 1.8° High-Torque Type*2	A high-torque motor has approx. 1.3~1.5 times more torque when compared to a step angle 1.8° standard stepping motor.					
Step Angle 1.8° Standard Type*2	The basic model offers a good balance of torque and low vibration /noise characteristics.					
Step Angle 1.8° Terminal Box Type	A terminal box motor conforms to the IP65 standard of ingress protection against dust and water.					
<b>PS</b> Geared Type <b>PL</b> Geared Type*2	A geared stepping motor with planetary gear mechanism offering low backlash, high strength.					

\*1 Gearhead frame size is □60 mm (□2.36 in.)

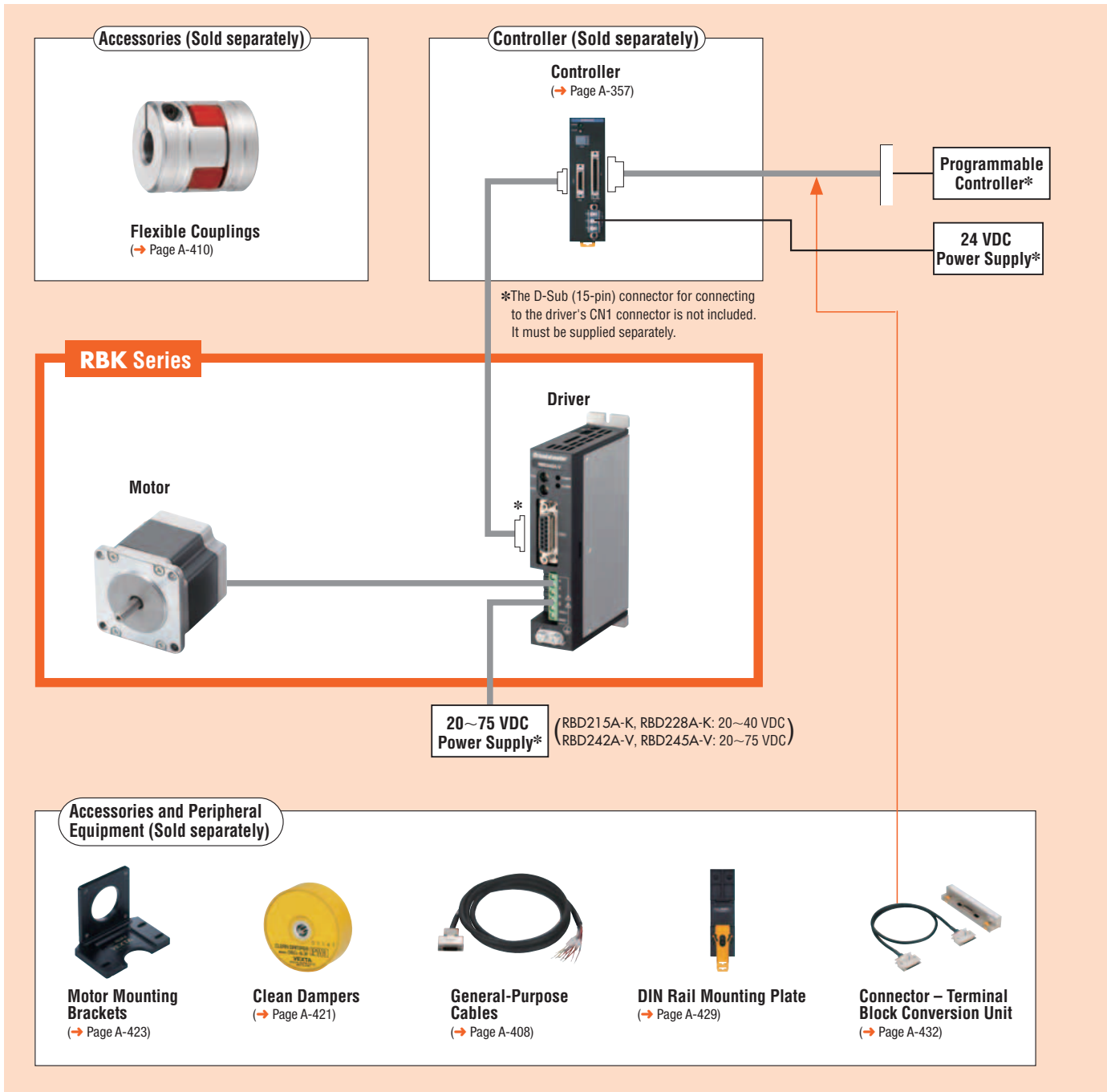
\*2 Motor with an encoder is also available

● An encoder is available → [www.orientalmotor.com](http://www.orientalmotor.com)

Introduction	AC Input Motor & Driver
AR	0.36° / Geared
AS	0.72° / Geared
UMK	0.9° / 1.8° / Geared
AR	0.36° / Geared
ASX	0.36° / Geared
CRK	0.36° / 0.72° / Geared
CMK	0.9° / 1.8° / Geared
RBK	1.8° / Geared
PK	0.36°
PK	0.72°
PK	0.9°
PK/PV	1.8°
PK	Geared
	Controllers SCX10 EMP400 /SG8030J
	Accessories

## System Configuration

An example of a single-axis system configuration with the **EMP400** Series controller.



### Example of System Configuration

RBK Series	Sold Separately						
	Controller	Motor Mounting Bracket	Flexible Coupling	Clean Damper	DIN Rail Mounting Plate	Connector – Terminal Block Conversion Unit [1m (3.3 ft.)]	General-Purpose Cable [1m (3.3 ft.)]
<b>RBK266B</b>	<b>EMP401-1</b>	<b>PAL2P-2</b>	<b>MCS2005F04</b>	<b>D6CL-6.3F</b>	<b>PADP01</b>	<b>CC50T1</b>	<b>CC15D1</b>

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

\*Not supplied

## Product Number Code

### Step Angle 1.8°

High-Torque Type, Standard Type

**RBK 2 9 6 A A**

① ② ③ ④ ⑤ ⑥ ⑦

① Series	<b>RBK: RBK Series</b>
② 2: 2-Phase	
③ Motor Frame Size	<b>2:</b> 28 mm (1.10 in.) <b>3:</b> 35 mm (1.38 in.) <b>4:</b> 42 mm (1.65 in.) <b>9:</b> 85 mm (3.35 in.)
④ Motor Case Length	
⑤ Motor Type	<b>P:</b> High-Torque Type Blank: Standard Type
⑥ Motor Shaft Type	<b>A:</b> Single Shaft <b>B:</b> Double Shaft
⑦ U.S.A. Version	

### Step Angle 1.8°

Standard Type Terminal Box

**RBK 2 6 4 T**

① ② ③ ④ ⑤

① Series	<b>RBK: RBK Series</b>
② 2: 2-Phase	
③ Motor Frame Size	<b>6:</b> 56.4 mm (2.22 in.) <b>9:</b> 85 mm (3.35 in.)
④ Motor Case Length	
⑤ T: Terminal Box	

### Step Angle 1.8°

High-Torque Type with Encoder, Standard Type with Encoder

**RBK 2 9 6 A A - R 1 5**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① Series	<b>RBK: RBK Series</b>
② 2: 2-Phase	
③ Motor Frame Size	<b>2:</b> 28 mm (1.10 in.) <b>3:</b> 35 mm (1.38 in.) <b>4:</b> 42 mm (1.65 in.) <b>6:</b> 56.4 mm (2.22 in.) <b>9:</b> 85 mm (3.35 in.)
④ Motor Case Length	
⑤ Motor Type	<b>P:</b> High-Torque Type Blank: Standard Type
⑥ Motor Shaft Type	<b>A:</b> Single Shaft
⑦ U.S.A. Version	
⑧ Encoder Version	
⑨ Encoder Output	<b>1:</b> 2-Channel A, B <b>2:</b> 3-Channel A, B, I
⑩ Encoder Resolution	<b>5:</b> 200 P/R <b>6:</b> 400 P/R

### PS/PL Geared Type

**RBK 2 4 4 P A - P 10**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Series	<b>RBK: RBK Series</b>
② 2: 2-Phase	
③ Motor Frame Size	<b>2:</b> 28 mm (1.10 in.) <b>4:</b> 42 mm (1.65 in.) <b>6:</b> 60 mm (2.36 in.)
④ Motor Case Length	
⑤ Motor Type	
⑥ Motor Shaft Type	<b>A:</b> Single Shaft <b>B:</b> Double Shaft
⑦ Gearhead Type	<b>PS: PS</b> Geared Type <b>P: PL</b> Geared Type
⑧ Gear Ratio	

### PL Geared Type with Encoder

**RBK 2 4 4 P A R 1 5 - P 10**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① Series	<b>RBK: RBK Series</b>
② 2: 2-Phase	
③ Motor Frame Size	<b>4:</b> 42 mm (1.65 in.) <b>6:</b> 60 mm (2.36 in.)
④ Motor Case Length	
⑤ Motor Type	
⑥ Motor Shaft Type	<b>A:</b> Single Shaft
⑦ Encoder Version	
⑧ Encoder Output	<b>1:</b> 2-Channel A, B <b>2:</b> 3-Channel A, B, I
⑨ Encoder Resolution	<b>5:</b> 200 P/R <b>6:</b> 400 P/R
⑩ Gearhead Type	<b>P: PL</b> Geared Type
⑪ Gear Ratio	

Introduction

AC Input Motor & Driver

0.36° / Geared / Geared

0.72° / Geared

0.9°/1.8° / Geared

0.36° / Geared / Geared

0.36° / Geared / Geared

0.9°/1.8° / Geared

1.8° / Geared

0.36°

0.72°

Motor Only

0.9°

1.8°

Geared

Controllers  
SCX10  
EMP400  
/SG8030J

Accessories

## Product Line

### ● Step Angle 1.8° High-Torque Type

Model (Single shaft)	Model (Double shaft)
<b>RBK223PA</b>	<b>RBK223PB</b>
<b>RBK224PA</b>	<b>RBK224PB</b>
<b>RBK225PA</b>	<b>RBK225PB</b>
<b>RBK233PA</b>	<b>RBK233PB</b>
<b>RBK235PA</b>	<b>RBK235PB</b>
<b>RBK244PA</b>	<b>RBK244PB</b>
<b>RBK246PA</b>	<b>RBK246PB</b>

### ● Step Angle 1.8° Standard Type Motor

Model (Single shaft)	Model (Double shaft)
<b>RBK264A</b>	<b>RBK264B</b>
<b>RBK266A</b>	<b>RBK266B</b>
<b>RBK268A</b>	<b>RBK268B</b>
<b>RBK296AA</b>	<b>RBK296BA</b>
<b>RBK299AA</b>	<b>RBK299BA</b>
<b>RBK2913AA</b>	<b>RBK2913BA</b>

### ● Step Angle 1.8° Terminal Box Type Motor

Model (Single shaft)
<b>RBK264T</b>
<b>RBK266T</b>
<b>RBK268T</b>
<b>RBK296T</b>
<b>RBK299T</b>
<b>RBK2913T</b>

### ● PS/PL Geared Type

Model (Single shaft)	Model (Double shaft)
<b>RBK223PA-PS5</b>	<b>RBK223PB-PS5</b>
<b>RBK223PA-PS10</b>	<b>RBK223PB-PS10</b>
<b>RBK244PA-P5</b>	<b>RBK244PB-P5</b>
<b>RBK244PA-P10</b>	<b>RBK244PB-P10</b>
<b>RBK244PA-P36</b>	<b>RBK244PB-P36</b>
<b>RBK266PA-P5</b>	<b>RBK266PB-P5</b>
<b>RBK266PA-P10</b>	<b>RBK266PB-P10</b>
<b>RBK264PA-P36</b>	<b>RBK264PB-P36</b>

### ● Step Angle 1.8° High-Torque Type with Encoder

Model	
<b>RBK223PA-R15</b>	—
<b>RBK224PA-R15</b>	—
<b>RBK225PA-R15</b>	—
<b>RBK233PA-R15</b>	<b>RBK233PA-R16</b>
<b>RBK233PA-R25</b>	<b>RBK233PA-R26</b>
<b>RBK235PA-R15</b>	<b>RBK235PA-R16</b>
<b>RBK235PA-R25</b>	<b>RBK235PA-R26</b>
<b>RBK244PA-R15</b>	<b>RBK244PA-R16</b>
<b>RBK244PA-R25</b>	<b>RBK244PA-R26</b>
<b>RBK246PA-R15</b>	<b>RBK246PA-R16</b>
<b>RBK246PA-R25</b>	<b>RBK246PA-R26</b>

### ● Step Angle 1.8° Standard Type Motor with Encoder

Model	
<b>RBK264A-R15</b>	<b>RBK264A-R16</b>
<b>RBK264A-R25</b>	<b>RBK264A-R26</b>
<b>RBK266A-R15</b>	<b>RBK266A-R16</b>
<b>RBK266A-R25</b>	<b>RBK266A-R26</b>
<b>RBK268A-R15</b>	<b>RBK268A-R16</b>
<b>RBK268A-R25</b>	<b>RBK268A-R26</b>
<b>RBK296AA-R15</b>	<b>RBK296AA-R16</b>
<b>RBK296AA-R25</b>	<b>RBK296AA-R26</b>
<b>RBK299AA-R15</b>	<b>RBK299AA-R16</b>
<b>RBK299AA-R25</b>	<b>RBK299AA-R26</b>
<b>RBK2913AA-R15</b>	<b>RBK2913AA-R16</b>
<b>RBK2913AA-R25</b>	<b>RBK2913AA-R26</b>

### ● PL Geared Type with Encoder

Model	
<b>RBK244PAR15-P5</b>	<b>RBK244PAR16-P5</b>
<b>RBK244PAR25-P5</b>	<b>RBK244PAR26-P5</b>
<b>RBK244PAR15-P10</b>	<b>RBK244PAR16-P10</b>
<b>RBK244PAR25-P10</b>	<b>RBK244PAR26-P10</b>
<b>RBK244PAR15-P36</b>	<b>RBK244PAR16-P36</b>
<b>RBK244PAR25-P36</b>	<b>RBK244PAR26-P36</b>
<b>RBK266PAR15-P5</b>	<b>RBK266PAR16-P5</b>
<b>RBK266PAR25-P5</b>	<b>RBK266PAR26-P5</b>
<b>RBK266PAR15-P10</b>	<b>RBK266PAR16-P10</b>
<b>RBK266PAR25-P10</b>	<b>RBK266PAR26-P10</b>
<b>RBK264PAR15-P36</b>	<b>RBK264PAR16-P36</b>
<b>RBK264PAR25-P36</b>	<b>RBK264PAR26-P36</b>

The following items are included in each product.

Motor, Driver, Connection Cable\*, Operating Manual

\*Only for connector-coupled motor

● Not included

• The D-sub (15-pin) connector for connecting to the driver's CN1

• For Terminal box type motor and driver product, the cable for connecting the motor and driver

## Step Angle 1.8° Motor Frame Size 28 mm (1.10 in.) High-Torque Type

### Specifications (RoHS)

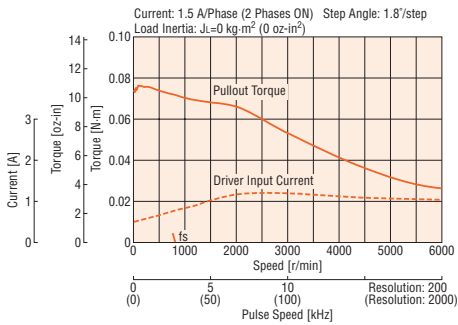
Model	Single Shaft	<b>RBK223PA</b>	<b>RBK224PA</b>	<b>RBK225PA</b>
	Double Shaft	<b>RBK223PB</b>	<b>RBK224PB</b>	<b>RBK225PB</b>
	With Encoder	<b>RBK223PA-R15</b>	<b>RBK224PA-R15</b>	<b>RBK225PA-R15</b>
Maximum Holding Torque	N·m (oz·in)	0.065 (9.2)	0.097 (13.7)	0.11 (15.6)
Holding Torque at Motor Standstill	Power ON N·m (oz·in)	0.032 (4.5)	0.048 (6.8)	0.055 (7.8)
Rotor Inertia	J: kg·m <sup>2</sup> (oz·in <sup>2</sup> )	9×10 <sup>-7</sup> (0.049)	12×10 <sup>-7</sup> (0.066)	18×10 <sup>-7</sup> (0.098)
Rated Current	A/Phase	1.5		
Basic Step Angle	1.8°			
Power Source	20-40 VDC 1.7 A			
Excitation Mode	Microstep			

● A connection cable [0.6 m (2 ft.)] is included with the connector-coupled motor and driver package.

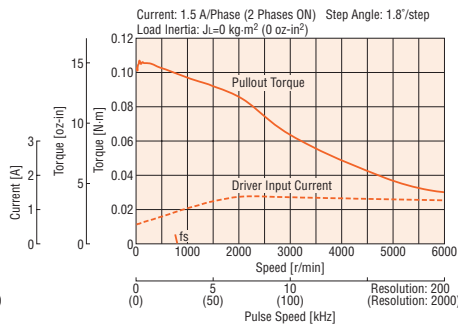
### Speed – Torque Characteristics

#### ● 24 VDC Input

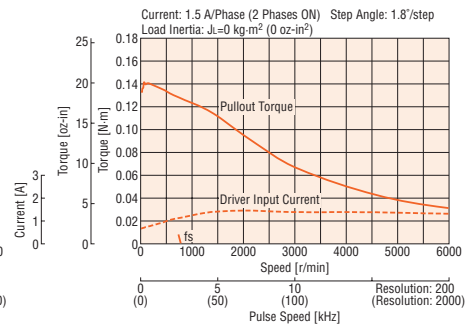
##### RBK223



##### RBK224

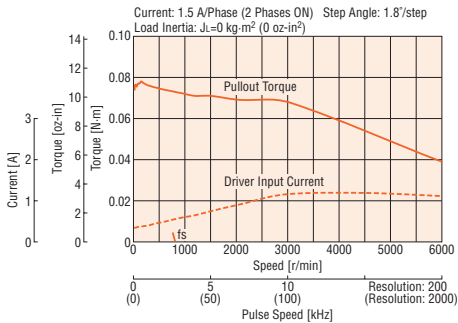


##### RBK225

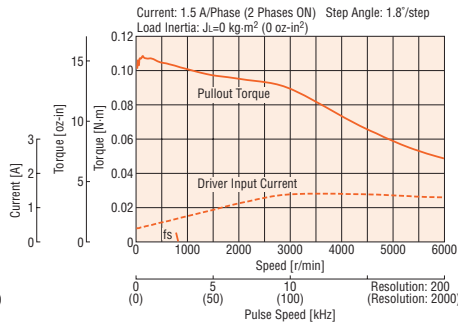


#### ● 36 VDC Input

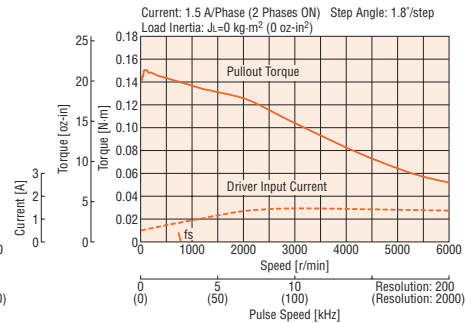
##### RBK223



##### RBK224



##### RBK225



● The pulse input circuit responds to approximately 250 kHz with a pulse duty of 50%.

#### Note

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C (212°F).

# Step Angle 1.8° Motor Frame Size 35 mm (1.38 in.)

## High-Torque Type

### Specifications RoHS

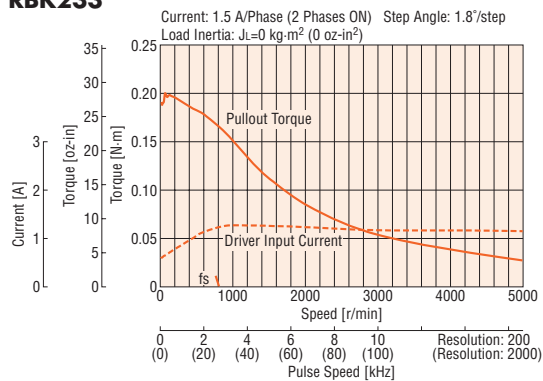
Model	Single Shaft	<b>RBK233PA</b>	<b>RBK235PA</b>
	Double Shaft	<b>RBK233PB</b>	<b>RBK235PB</b>
	With Encoder	<b>RBK233PA-R</b> <span style="border: 1px solid black; padding: 0 2px;"> </span>	<b>RBK235PA-R</b> <span style="border: 1px solid black; padding: 0 2px;"> </span>
Maximum Holding Torque	N-m (oz-in)	0.2 (28)	0.37 (52)
Holding Torque at Motor Standstill	Power ON N-m (oz-in)	0.1 (14.2)	0.185 (26)
Rotor Inertia	J: kg-m <sup>2</sup> (oz-in <sup>2</sup> )	24×10 <sup>-7</sup> (0.131)	50×10 <sup>-7</sup> (0.27)
Rated Current	A/Phase	1.5	
Basic Step Angle		1.8°	
Power Source		20-40 VDC 1.7 A	
Excitation Mode		Microstep	

- A connection cable [0.6 m (2 ft.)] is included with the connector-coupled motor and driver package.
- Enter the encoder code (**15**, **16**, **25** or **26**) in the box (   ) within the model name.

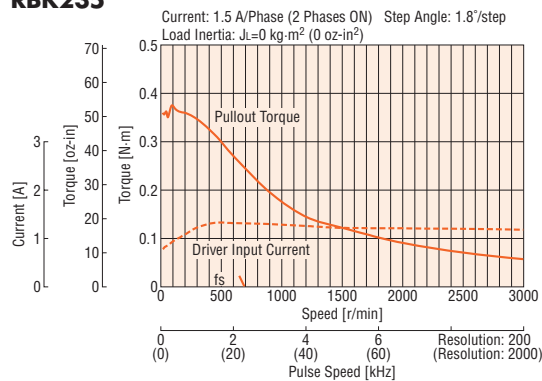
### Speed –Torque Characteristics

#### ● 24 VDC Input

##### RBK233

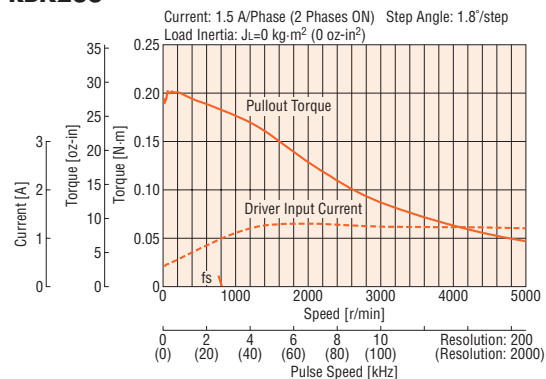


##### RBK235

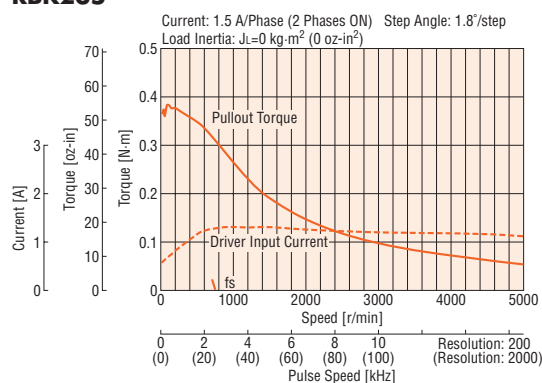


#### ● 36 VDC Input

##### RBK233



##### RBK235



- The pulse input circuit responds to approximately 250 kHz with apulse duty of 50%.

#### Note

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C (212°F).

## Step Angle 1.8° Motor Frame Size 42 mm (1.65 in.)

### High-Torque Type

#### Specifications (RoHS)

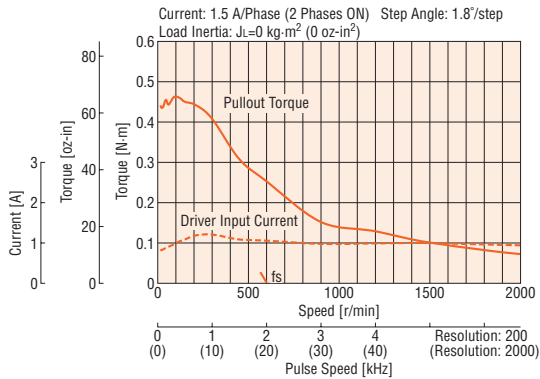
Model	Single Shaft	<b>RBK244PA</b>	<b>RBK246PA</b>
	Double Shaft	<b>RBK244PB</b>	<b>RBK246PB</b>
	With Encoder	<b>RBK244PA-R</b> <input type="checkbox"/>	<b>RBK246PA-R</b> <input type="checkbox"/>
Maximum Holding Torque	N-m (oz-in)	0.48 (68)	0.93 (132)
Holding Torque at Motor Standstill	Power ON N-m (oz-in)	0.24 (34)	0.46 (65)
Rotor Inertia	J: kg-m <sup>2</sup> (oz-in <sup>2</sup> )	57×10 <sup>-7</sup> (0.31)	114×10 <sup>-7</sup> (0.62)
Rated Current	A/Phase	1.5	
Basic Step Angle		1.8°	
Power Source		20-40 VDC 1.7 A	
Excitation Mode		Microstep	

- A connection cable [0.6 m (2 ft.)] is included with the connector-coupled motor and driver package.
- Enter the encoder code (**15**, **16**, **25** or **26**) in the box (  ) within the model name.

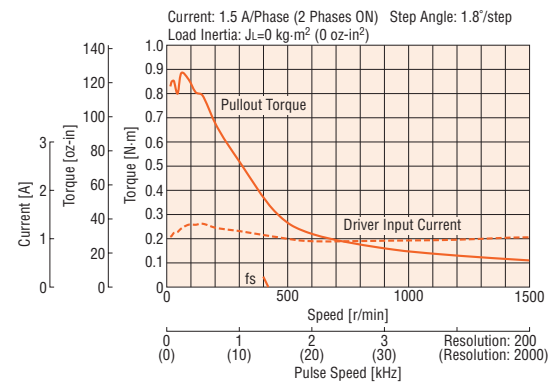
#### Speed – Torque Characteristics

##### ● 24 VDC Input

###### RBK244

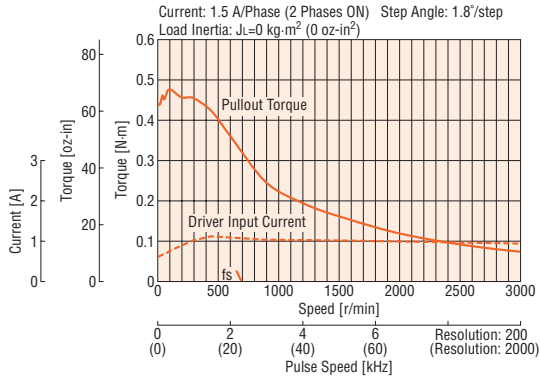


###### RBK246

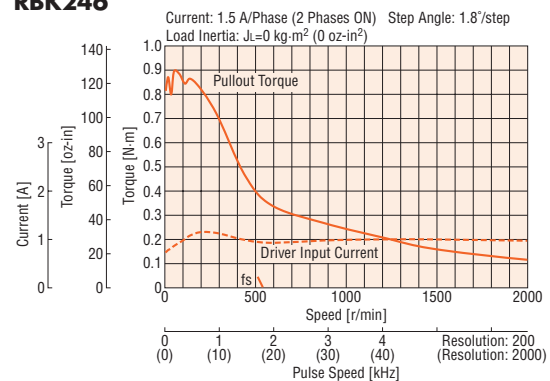


##### ● 36 VDC Input

###### RBK244



###### RBK246



- The pulse input circuit responds to approximately 250 kHz with a pulse duty of 50%.

#### Note

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C (212°F).



# Step Angle 1.8° Motor Frame Size 56.4 mm (2.22 in.)

## Standard Type

### Specifications RoHS

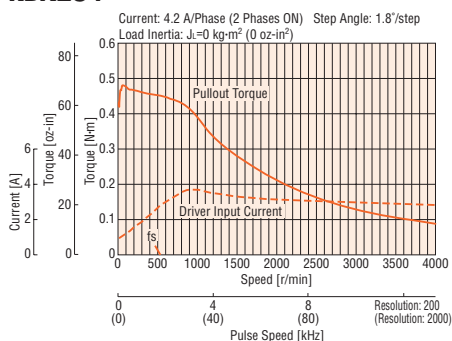
Model	Single Shaft	<b>RBK264A</b>	<b>RBK266A</b>	<b>RBK268A</b>
	Double Shaft	<b>RBK264B</b>	<b>RBK266B</b>	<b>RBK268B</b>
	With Encoder	<b>RBK264A-R</b> <span style="border: 1px solid black; padding: 0 2px;"> </span>	<b>RBK266A-R</b> <span style="border: 1px solid black; padding: 0 2px;"> </span>	<b>RBK268A-R</b> <span style="border: 1px solid black; padding: 0 2px;"> </span>
Maximum Holding Torque	N·m (oz·in)	0.48 (68)	1.17 (166)	1.75 (240)
Holding Torque at Motor Standstill	Power ON N·m (oz·in)	0.24 (34)	0.58 (82)	0.87 (123)
Rotor Inertia	J: kg·m <sup>2</sup> (oz·in <sup>2</sup> )	120×10 <sup>-7</sup> (0.66)	300×10 <sup>-7</sup> (1.64)	480×10 <sup>-7</sup> (2.6)
Rated Current	A/Phase	4.2		
Basic Step Angle	1.8°			
Power Source	20-75 VDC 4.9 A			
Excitation Mode	Microstep			

● Enter the encoder code (**15**, **16**, **25** or **26**) in the box (   ) within the model name.

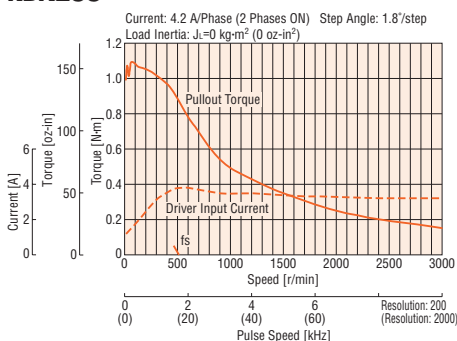
### Speed – Torque Characteristics

#### ● 24 VDC Input

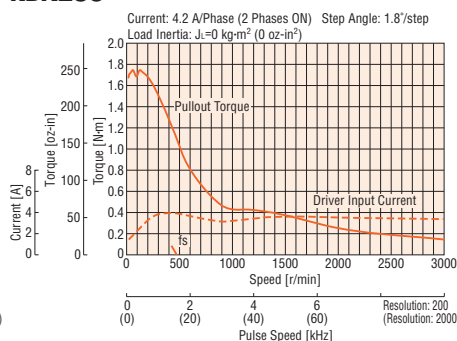
##### RBK264



##### RBK266

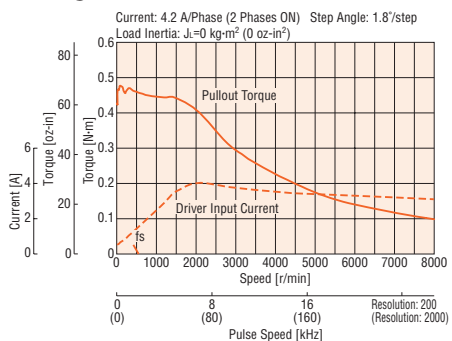


##### RBK268

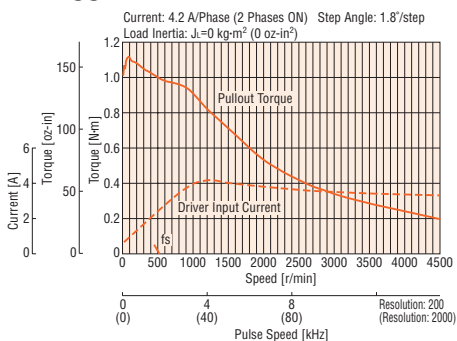


#### ● 48 VDC Input

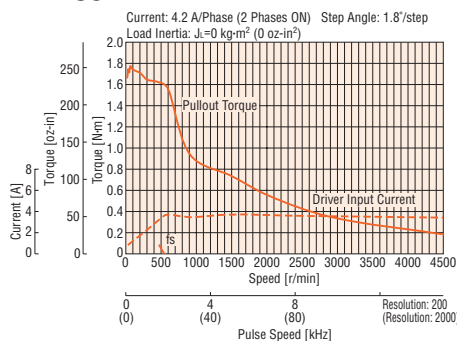
##### RBK264



##### RBK266

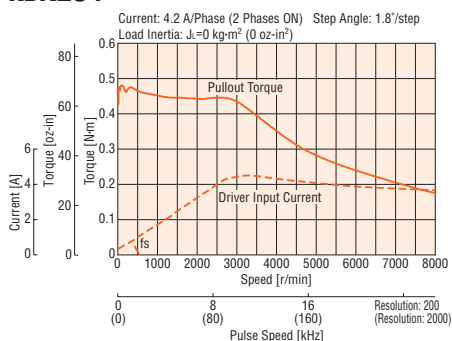


##### RBK268

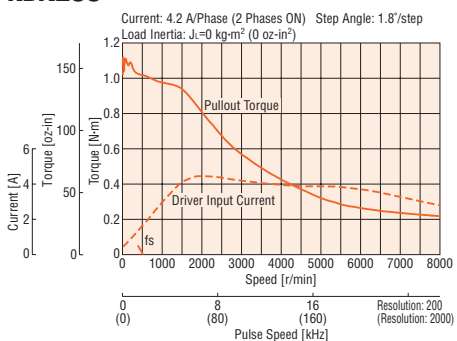


#### ● 75 VDC Input

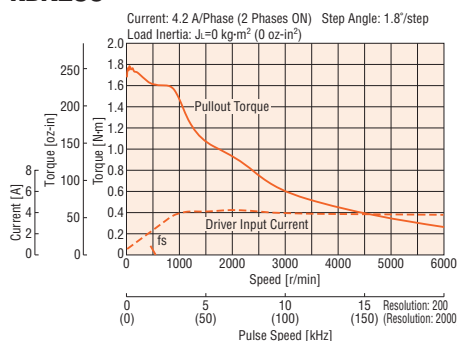
##### RBK264



##### RBK266



##### RBK268



● The pulse input circuit responds to 250 kHz with a pulse duty of 50%.

#### Note

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C (212°F).

## Step Angle 1.8° Motor Frame Size 85 mm (3.35 in.)

### Standard Type

#### Specifications (RoHS)

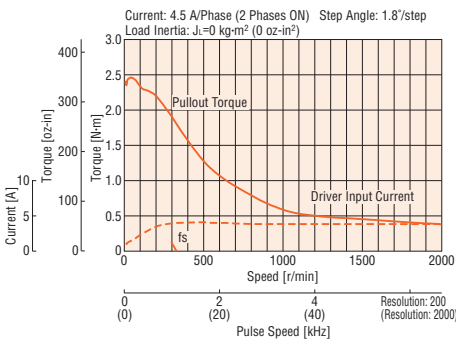
Model	Single Shaft	<b>RBK296AA</b>	<b>RBK299AA</b>	<b>RBK2913AA</b>
	Double Shaft	<b>RBK296BA</b>	<b>RBK299BA</b>	<b>RBK2913BA</b>
	With Encoder	<b>RBK296AA-R</b>	<b>RBK299AA-R</b>	<b>RBK2913AA-R</b>
Maximum Holding Torque	N-m (oz-in)	2.2 (310)	4.4 (620)	6.6 (930)
Holding Torque at Motor Standstill	Power ON N-m (oz-in)	1.1 (156)	2.2 (310)	3.3 (460)
Rotor Inertia	J: kg·m <sup>2</sup> (oz-in <sup>2</sup> )	1400×10 <sup>-7</sup> (7.7)	2700×10 <sup>-7</sup> (14.8)	4000×10 <sup>-7</sup> (22)
Rated Current	A/Phase	4.5		
Basic Step Angle	1.8°			
Power Source	20-75 VDC 5.2 A			
Excitation Mode	Microstep			

Enter the encoder code (**15**, **16**, **25** or **26**) in the box ( ) within the model name.

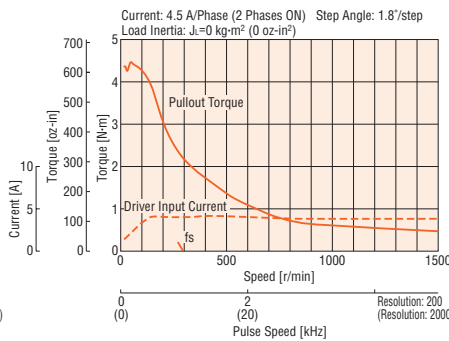
#### Speed – Torque Characteristics

##### 24 VDC Input

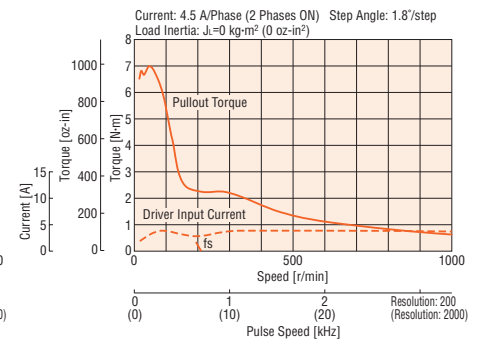
###### RBK296



###### RBK299

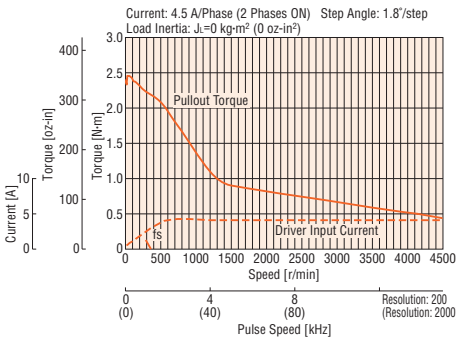


###### RBK2913

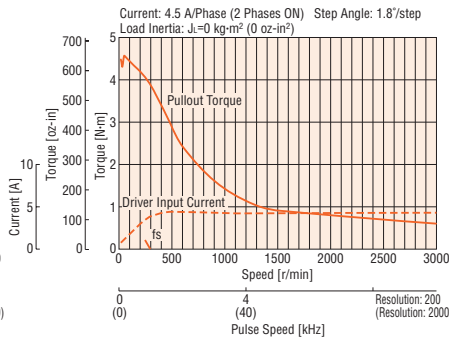


##### 48 VDC Input

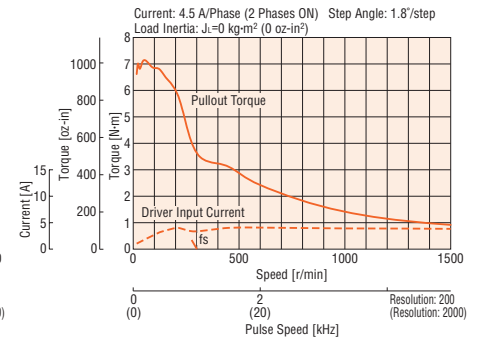
###### RBK296



###### RBK299

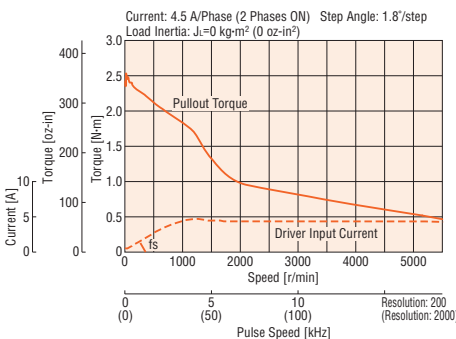


###### RBK2913

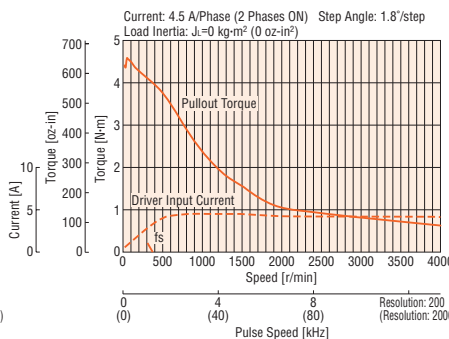


##### 75 VDC Input

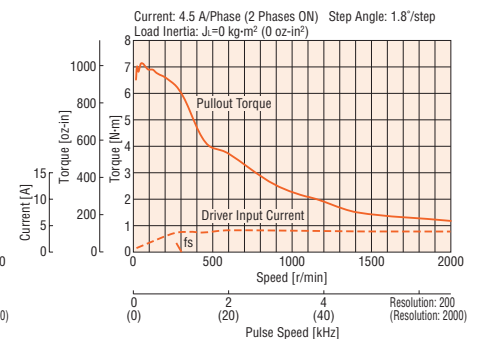
###### RBK296



###### RBK299



###### RBK2913



The pulse input circuit responds to 250 kHz with a pulse duty of 50%.

#### Note

Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C (212°F).

Introduction  
AC Input Motor & Driver  
0.36° / Geared  
0.72° / Geared  
0.9° / 1.8° / Geared  
0.36° / Geared  
0.36° / Geared  
0.36° / Geared  
0.36° / Geared  
0.36° / Geared  
1.8° / Geared  
0.36° / Geared  
0.72° / Geared  
Motor Only  
0.9° / Geared  
1.8° / Geared  
Geared  
Controllers  
SCX10 / EMP400 / 5G80301  
Accessories

# Step Angle 1.8° Motor Frame Size 56.4 mm (2.22 in.)

## Terminal Box Type

### Specifications RoHS



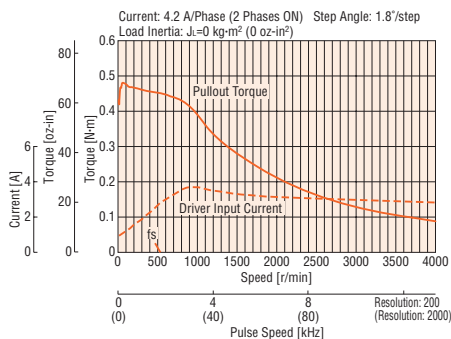
Model	Single Shaft	RBK264T	RBK266T	RBK268T
Maximum Holding Torque	N-m (oz-in)	0.48 (68)	1.17 (166)	1.75 (240)
Holding Torque at Motor Standstill	Power ON N-m (oz-in)	0.24 (34)	0.58 (82)	0.87 (123)
Rotor Inertia	J: kg-m <sup>2</sup> (oz-in <sup>2</sup> )	120×10 <sup>-7</sup> (0.66)	300×10 <sup>-7</sup> (1.64)	480×10 <sup>-7</sup> (2.6)
Rated Current	A/Phase	4.2		
Basic Step Angle		1.8°		
Power Source		20-75 VDC 4.9 A		
Excitation Mode		Microstep		
Degree of Protection		Motor: IP65* Driver: IP20		

\*Excluding the gap between the shaft and the flange.

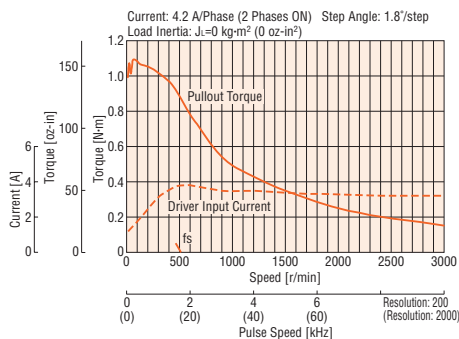
### Speed – Torque Characteristics

#### ● 24 VDC Input

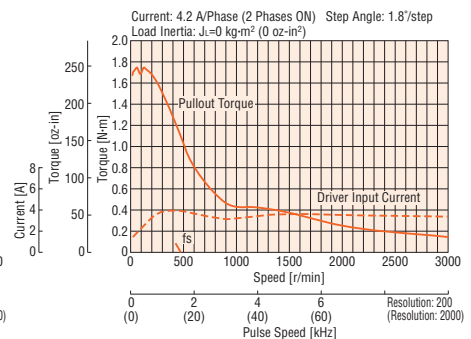
##### RBK264T



##### RBK266T

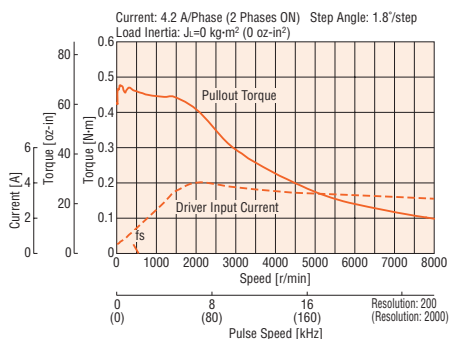


##### RBK268T

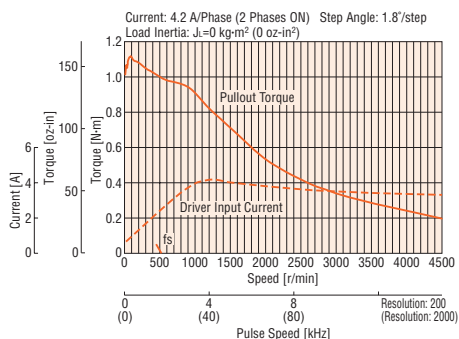


#### ● 48 VDC Input

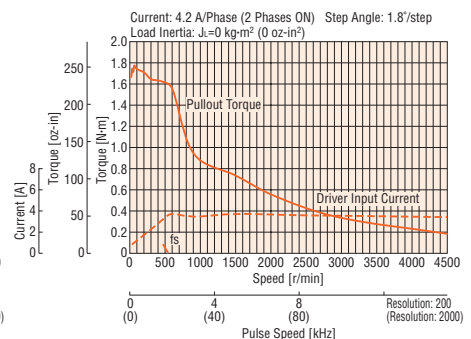
##### RBK264T



##### RBK266T

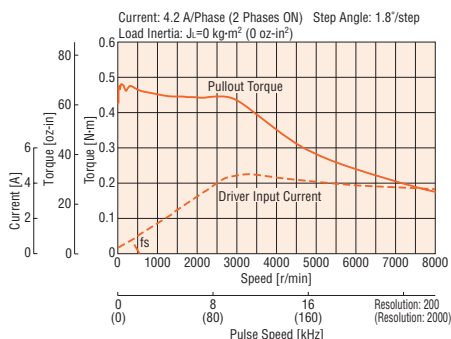


##### RBK268T

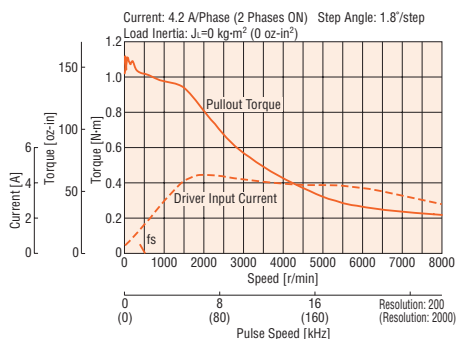


#### ● 75 VDC Input

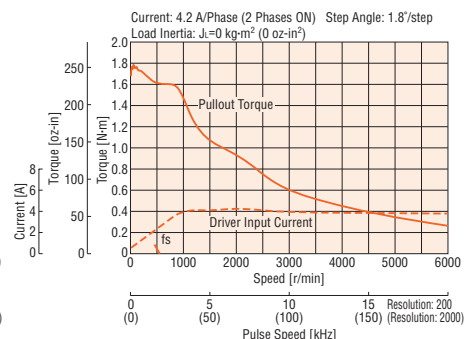
##### RBK264T



##### RBK266T



##### RBK268T



● The pulse input circuit responds to 250 kHz with a pulse duty of 50%.

#### Note

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C (212°F). [Under 75°C (167°F) is required to comply with UL or CSA Standards as the motor is recognized as thermal class 105 (A).]

## Step Angle 1.8° Motor Frame Size 85 mm (3.35 in.)

Terminal Box Type

### Specifications (RoHS)



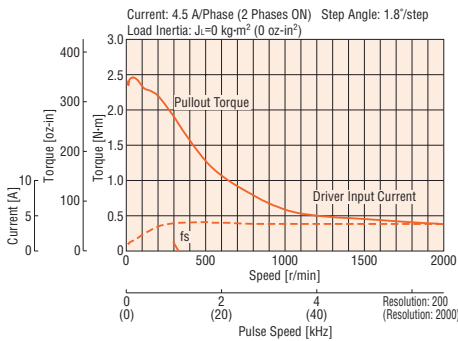
Model	Single Shaft	RBK296T	RBK299T	RBK2913T
Maximum Holding Torque	N-m (oz-in)	2.2 (310)	4.4 (620)	6.6 (930)
Holding Torque at Motor Standstill	Power ON N-m (oz-in)	1.1 (156)	2.2 (310)	3.3 (460)
Rotor Inertia	J: kg·m <sup>2</sup> (oz-in <sup>2</sup> )	1400×10 <sup>-7</sup> (7.7)	2700×10 <sup>-7</sup> (14.8)	4000×10 <sup>-7</sup> (22)
Rated Current	A/Phase	4.5		
Basic Step Angle	1.8°			
Power Source	20-75 VDC 5.2 A			
Excitation Mode	Microstep			
Degree of Protection	Motor: IP65* Driver: IP20			

\*Excluding the gap between the shaft and the flange.

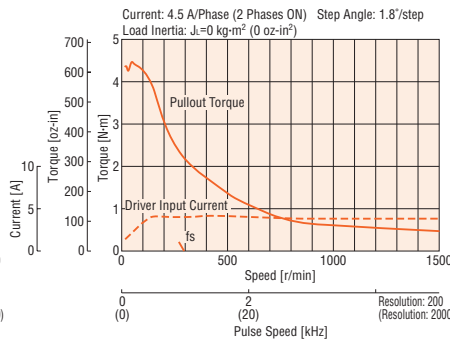
### Speed – Torque Characteristics

#### ● 24 VDC Input

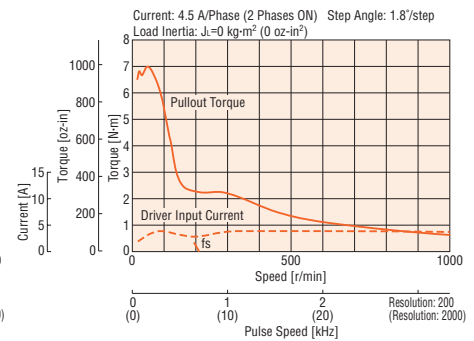
##### RBK296T



##### RBK299T

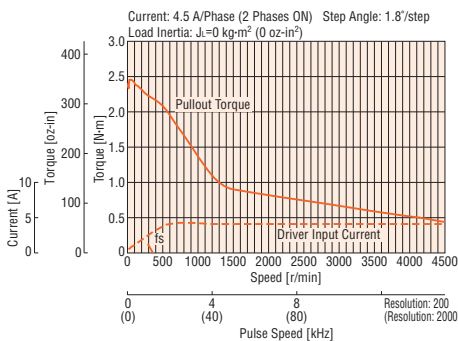


##### RBK2913T

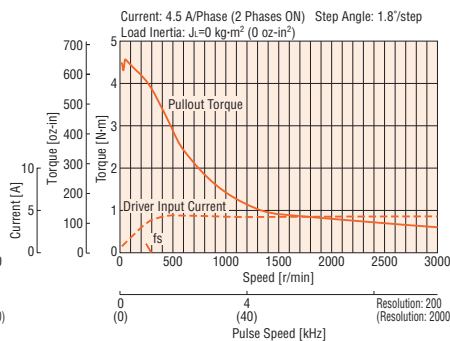


#### ● 48 VDC Input

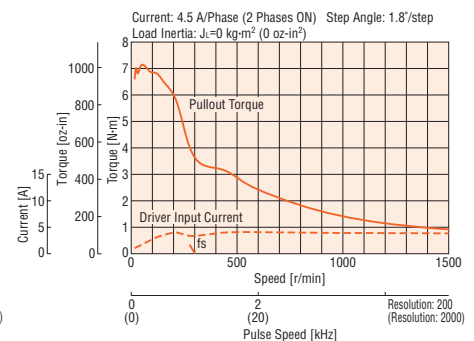
##### RBK296T



##### RBK299T

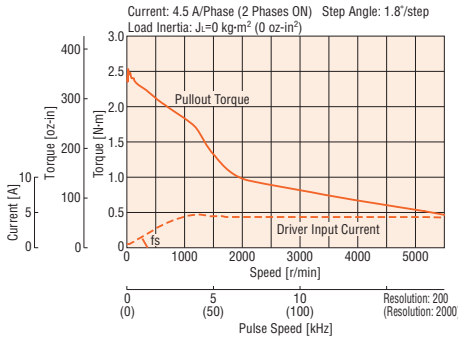


##### RBK2913T

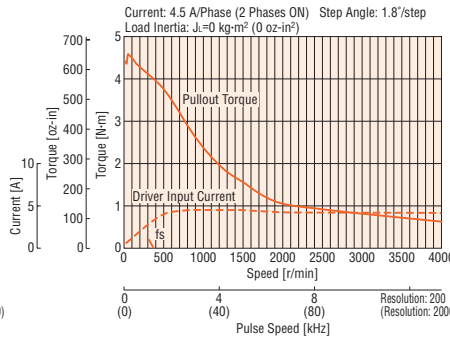


#### ● 75 VDC Input

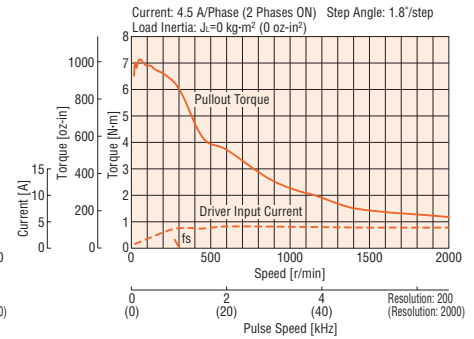
##### RBK296T



##### RBK299T



##### RBK2913T



● The pulse input circuit responds to 250 kHz with a pulse duty of 50%.

#### Note

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C (212°F). [Under 75°C (167°F) is required to comply with UL or CSA Standards as the motor is recognized as thermal class 105 (A).]

Introduction

0.36° / Geared / AC Input Motor & Driver

0.72° / Geared / RK

0.9° / 1.8° / Geared / UMK

0.36° / Geared / ASX

0.36° / Geared / CRK

0.9° / 1.8° / Geared / CMK

1.8° / Geared / RBK

0.36° / PK

0.72° / PK

Motor Only

0.9° / PK

1.8° / PK/PV

Geared / PK

Controllers / SCX10 / EMP400 / EMP8030J

Accessories

# PS Geared Type Motor Frame Size 28 mm (1.10 in.)

## Specifications RoHS

Model	Single Shaft	<b>RBK223PA-PS5</b>	<b>RBK223PA-PS10</b>
	Double Shaft	<b>RBK223PB-PS5</b>	<b>RBK223PB-PS10</b>
Maximum Holding Torque	N·m (oz·in)	0.3 (42)	0.5 (71)
Rotor Inertia	J: kg·m <sup>2</sup> (oz·in <sup>2</sup> )	9×10 <sup>-7</sup> (0.049)	
Rated Current	A/Phase	1.5	
Basic Step Angle		0.36°	0.18°
Gear Ratio		5	10
Permissible Torque	N·m (oz·in)	0.3 (42)	0.5 (71)
Maximum Torque	N·m (oz·in)	0.5 (71)	0.5 (71)
Holding Torque at Motor Standstill	Power ON N·m (oz·in)	0.3 (42)	0.5 (71)
Backlash	arc min (degrees)	35 (0.58)	
Permissible Speed Range	r/min	0~600	0~300
Power Source		20-40 VDC 1.7 A	
Excitation Mode		Microstep	

● Connection Cable [0.6 m (2 ft.)] is included with the connector-coupled motor and driver package.

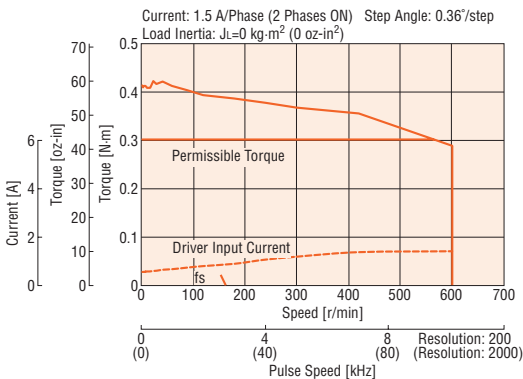
**Note**

● Direction of rotation of the motor shaft and that of the gear output shaft are the same.

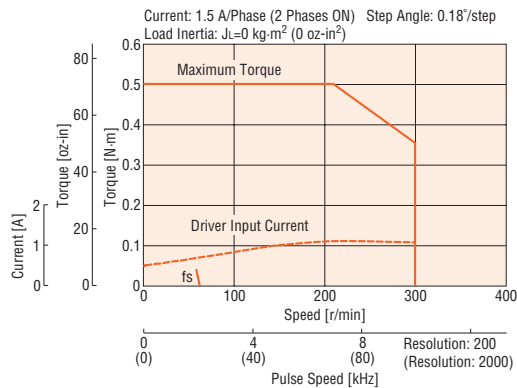
## Speed – Torque Characteristics

### ● 24 VDC Input

#### RBK223 Gear Ratio 5

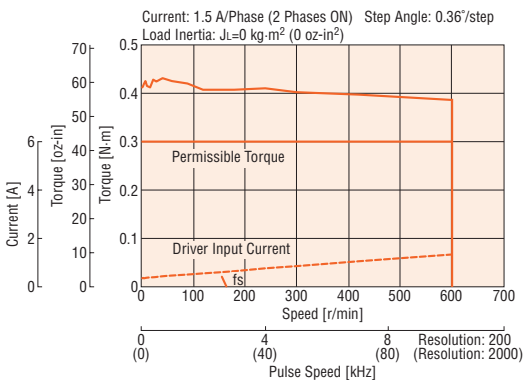


#### RBK223 Gear Ratio 10

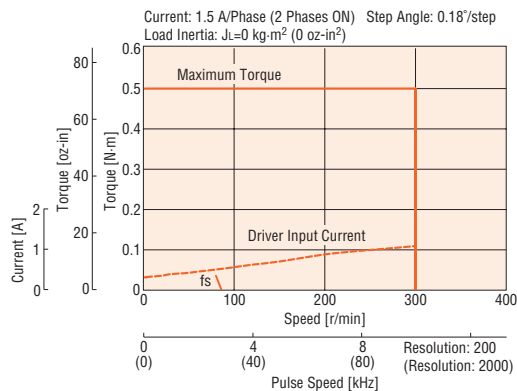


### ● 36 VDC Input

#### RBK223 Gear Ratio 5



#### RBK223 Gear Ratio 10



● The pulse input circuit responds to approximately 250 kHz with a pulse duty of 50%.

**Note**

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C (212°F).



# PL Geared Type Motor Frame Size 60 mm (2.36 in.)

## Specifications RoHS

Model	Single Shaft	<b>RBK266PA-P5</b>	<b>RBK266PA-P10</b>	<b>RBK264PA-P36</b>
	Double Shaft	<b>RBK266PB-P5</b>	<b>RBK266PB-P10</b>	<b>RBK264PB-P36</b>
	With Encoder	<b>RBK266PAR-<span style="border: 1px solid black; padding: 0 2px;"> </span>-P5</b>	<b>RBK266PAR-<span style="border: 1px solid black; padding: 0 2px;"> </span>-P10</b>	<b>RBK264PAR-<span style="border: 1px solid black; padding: 0 2px;"> </span>-P36</b>
Maximum Holding Torque	N·m (lb·in)	3.5 (30)	5 (44)	8 (70)
Rotor Inertia	J: kg·m <sup>2</sup> (oz·in <sup>2</sup> )	290×10 <sup>-7</sup> (1.59)		120×10 <sup>-7</sup> (0.66)
Rated Current	A/Phase	2.8		
Basic Step Angle		0.36°	0.18°	0.05°
Gear Ratio		5	10	36
Permissible Torque	N·m (lb·in)	3.5 (30)	5 (44)	8 (70)
Holding Torque at Motor Standstill	Power ON N·m (lb·in)	2 (17.7)	4 (35)	7 (61)
Backlash	arc min (degrees)	20 (0.33)		
Permissible Speed Range	r/min	0~360	0~180	0~50
Power Source		20-40 VDC 3.7 A		
Excitation Mode		Microstep		

- A connection cable [0.6 m (2 ft.)] is included with the connector-coupled motor and driver package.
- Enter the encoder code (**15**, **16**, **25** or **26**) in the box ( ) within the model name.

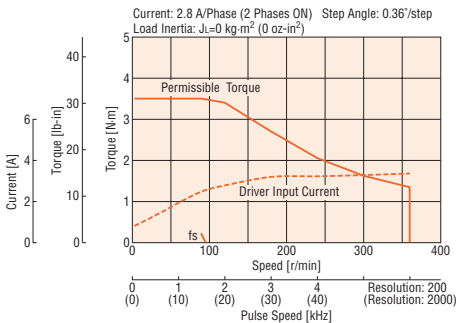
### Note

- Direction of rotation of the motor shaft and that of the gear output shaft are the same.

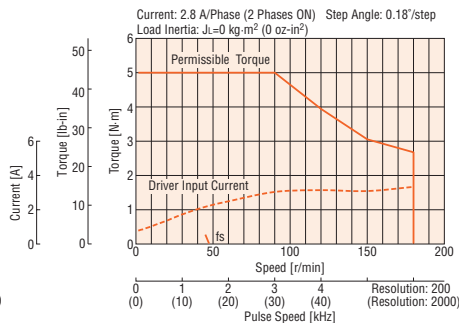
## Speed – Torque Characteristics

### ● 24 VDC Input

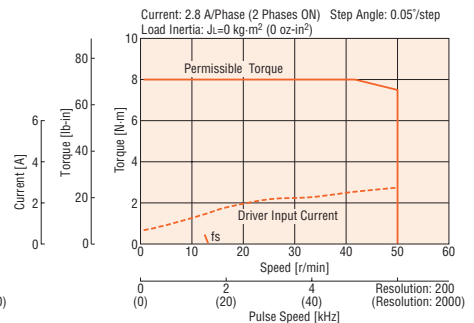
#### RBK266 Gear Ratio 5



#### RBK266 Gear Ratio 10

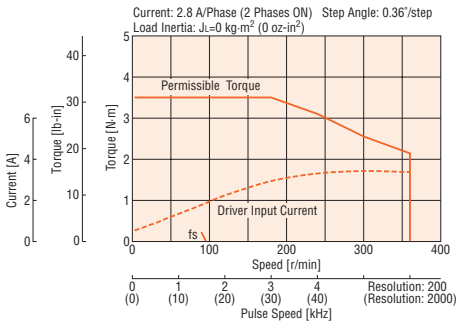


#### RBK264 Gear Ratio 36

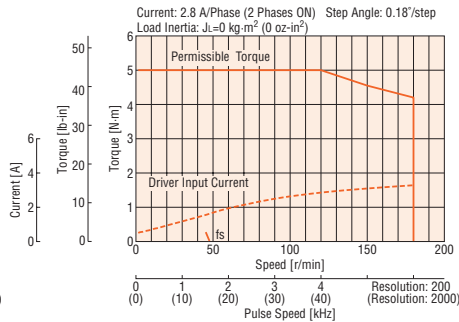


### ● 36 VDC Input

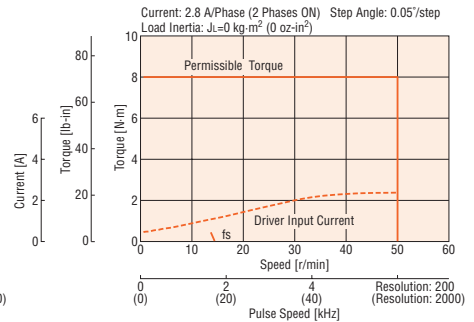
#### RBK266 Gear Ratio 5



#### RBK266 Gear Ratio 10



#### RBK264 Gear Ratio 36



- The pulse input circuit responds to approximately 250 kHz with a pulse duty of 50%.

### Note

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C (212°F).

## Driver Specifications

Input Signals	Input Mode	Photocoupler Input PLS signal, DIR signal: Input resistance 200 Ω, Input current 5~20 mA Photocoupler ON: +3~5.25 V, Photocoupler OFF: 0~+1 V (Line driver input: -5.25~+1 V) (Voltage between terminals) PLS24 signal, DIR24 signal: Input resistance 2.7 kΩ, Input current 5~20 mA Photocoupler ON: +21.6~26.4 V, Photocoupler OFF: 0~+1 V (Voltage between terminals) All windings off signal, Step angle select signal: Input resistance 3 kΩ, Input current 20 mA or less Photocoupler ON: +4.5~26.4 V Photocoupler OFF: 0~+1 V (Voltage between terminals)
	Pulse Signal	Operation command pulse signal, Negative logic pulse input Pulse width: 2 μs minimum (Line driver input: 1 μs minimum), Pulse rise/fall: 1 μs maximum, Pulse duty 50% and below Motor moves one step when the pulse input is switched from photocoupler ON to OFF. Maximum input pulse frequency: 250 kHz (Line driver input: 500 kHz) (When the pulse duty is 50%)
	Rotation Direction Signal	Rotation direction signal, Photocoupler ON: CW, Photocoupler OFF: CCW
	All Windings Off Signal	When in the "photocoupler ON" state, the output current to the motor is cut off and the motor shaft can be rotated manually. When in the "photocoupler OFF" state, the current is supplied to the motor.
	Step Angle Select Signal	When in the "photocoupler ON" state, the motor operates with the basic step angle, regardless of the setting of the step angle setting switch. When in the "photocoupler OFF" state, the motor operates with the step angle set with the step angle setting switch.
Output Signals	Output Mode	Photocoupler, Open-collector output External use condition: 30 VDC maximum, 10 mA maximum
	Current Cutback Signal	When the automatic current cutback function is activated, the output turns on. (Photocoupler: ON)
	Alarm Signal	When one of the driver's protective functions is activated, the output turns off. (Photocoupler: OFF)
	Excitation Timing Signal	The signal is output every time the excitation sequence returns to the initial stage "0." (Photocoupler: ON) 1.8°/step [Microsteps/step: 1 (Resolution: 200)]: Signal is output every 4 pulses. 0.45°/step [Microsteps/step: 4 (Resolution: 800)]: Signal is output every 16 pulses.
Functions	Third harmonic waveform correction, Smooth drive, Vibration suppression, Automatic current cutback, Step angle select, All windings off, Excitation timing	
Cooling Method	Natural ventilation	

## General Specifications

Item	Motor	Driver
Thermal Class	130 (B) [Recognized as 105 (A) by UL/CSA Standards]	-
Insulation Resistance	100 MΩ or more when 500 VDC megger is applied between the windings and the case under normal ambient temperature and humidity.	-
Dielectric Strength	Sufficient to withstand 1.0 kVAC at 50 Hz or 60 Hz applied between the windings and the case for 1 minute under normal ambient temperature and humidity. (1.5 kVAC for terminal box type motor)	-
Operating Environment	Ambient Temperature	-10~+50°C (+14~+122°F) (non-freezing)
	Ambient Humidity	85% or less (non-condensing)
	Atmosphere	Standard type motor: No corrosive gases, dust, water or oil Terminal box type motor: No corrosive gases
Temperature Rise	Temperature rise of the windings is 80°C (144°F) or less measured by the resistance change method. (at rated current, at standstill, two phases energized) When equipped with an aluminum heat sink shown below. <b>RBK22</b> □: 115×115 mm, 5 mm thick (4.53×4.53 in., 0.2 in. thick) <b>RBK24</b> □: 175×175 mm, 5 mm thick (6.89×6.89 in., 0.2 in. thick) <b>RBK26</b> □: 250×250 mm, 10 mm thick (9.84×9.84 in., 0.39 in. thick)  When using the <b>RBK26</b> □ <b>T</b> or the <b>RBK29</b> □ <b>T</b> as a UL or CSA recognized component, make sure the temperature rise of the windings is 50°C (90°F) or less, by mounting the motor to a heat sink (material: aluminum) of the following size. <b>RBK26</b> □ <b>T</b> : 400×400 mm, 10 mm thick (15.75×15.75 in., 0.39 in. thick) <b>RBK29</b> □ <b>T</b> : 200×200 mm, 10 mm thick (7.87×7.87 in., 0.39 in. thick)	-
Stop Position Accuracy*1	±3 arc minutes (±0.05°)	-
Shaft Runout	0.05 mm (0.002 in.) T.I.R.*4	-
Radial Play*2	0.025 mm (0.001 in.) maximum of 5 N (1.12 lb.)	-
Axial Play*3	0.075 mm (0.003 in.) maximum of 10 N (2.2 lb.)	-
Concentricity	0.075 mm (0.003 in.) T.I.R.*4	-
Perpendicularity	0.075 mm (0.003 in.) T.I.R.*4	-

\*1 This value is for full step under no load. (The value changes with the size of the load.)

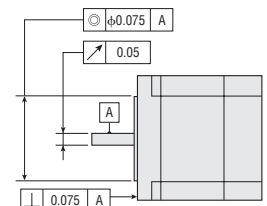
\*2 Radial Play: Displacement in shaft position in the radial direction when a 5 N (1.12 lb.) load is applied in the vertical direction to the tip of the motor's shaft.

\*3 Axial Play: Displacement in shaft position in the axial direction when a 10 N (2.2 lb.) load is applied to the motor's shaft in the axial direction.

\*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.

### Note

- Do not measure insulation resistance or perform the dielectric strength test while the motor and driver are connected.



Introduction  
AC Input Motor & Driver  
0.36° / Geared / AS  
0.72° / Geared / RK  
0.9°/1.8° / Geared / UMK  
0.36° / Geared / AR  
0.36° / Geared / ASX  
DC Input Motor & Driver  
0.36°/0.72° / Geared / CRK  
0.9°/1.8° / Geared / CMK  
1.8° / Geared / RBK  
Motor Only  
0.36° / PK  
0.72° / PK  
0.9° / PK  
1.8° / PK/PV  
Geared / PK  
Controllers  
SCX10 / EMP400 / SG8030J  
Accessories



## Permissible Overhung Load and Permissible Thrust Load

→ Page A-14

## Encoder Specifications

→ Page A-17

## Dimensions Unit = mm (in.)

The dimensions of a motor with an encoder can be found on page A-19 or at [www.orientalmotor.com](http://www.orientalmotor.com).

### Motor

#### Step Angle 1.8° High-Torque Type

Motor Frame Size 28 mm (1.10 in.)

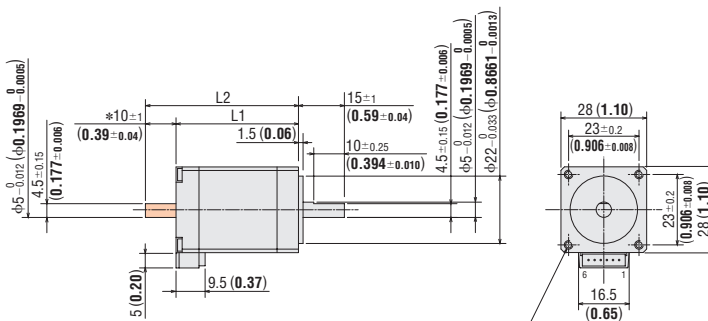
Model	Motor Model	L1	L2	Mass kg (lb.)	DXF
<b>RBK223PA</b>	PK223PDA	32 (1.26)	—	0.11 (0.24)	B326
<b>RBK223PB</b>	PK223PDB		42 (1.65)		
<b>RBK224PA</b>	PK224PDA	40 (1.57)	—	0.14 (0.31)	B327
<b>RBK224PB</b>	PK224PDB		50 (1.97)		
<b>RBK225PA</b>	PK225PDA	51.5 (2.03)	—	0.2 (0.44)	B328
<b>RBK225PB</b>	PK225PDB		61.5 (2.42)		

A connection cable of 0.6 m (2 ft.) is included with the package. UL Style 3265, AWG24

If you are purchasing only a motor for maintenance purposes, etc., the connection cable and connector will not be supplied. They must be purchased separately.

→ Page A-407

- Applicable Connector for Motor:  
Connector housing: 51065-0600 (MOLEX)  
Contact: 50212-8100 (MOLEX)  
Crimp tool: 57176-5000 (MOLEX)



\*The length of machining on the double shaft model is 10±0.25 (0.394±0.010).

Motor Frame Size 35 mm (1.38 in.)

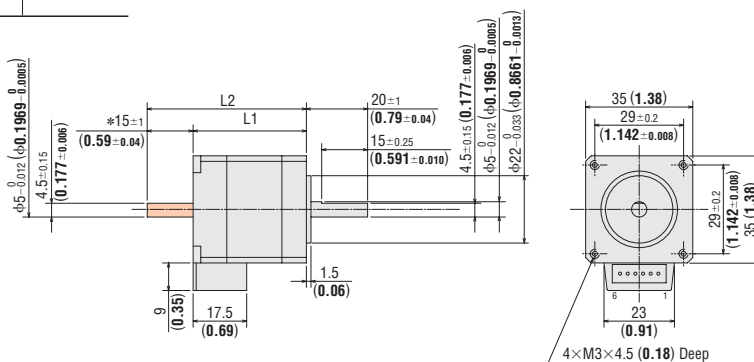
Model	Motor Model	L1	L2	Mass kg (lb.)	DXF
<b>RBK233PA</b>	PK233PDA	37 (1.46)	—	0.18 (0.4)	B329
<b>RBK233PB</b>	PK233PDB		52 (2.05)		
<b>RBK235PA</b>	PK235PDA	52 (2.05)	—	0.285 (0.63)	B330
<b>RBK235PB</b>	PK235PDB		67 (2.64)		

A connection cable of 0.6 m (2 ft.) is included with the package. UL Style 3265, AWG24

If you are purchasing only a motor for maintenance purposes, etc., the connection cable and connector will not be supplied. They must be purchased separately.

→ Page A-407

- Applicable Connector for Motor:  
Connector housing: 51103-0600 (MOLEX)  
Contact: 50351-8100 (MOLEX)  
Crimp tool: 57295-5000 (MOLEX)



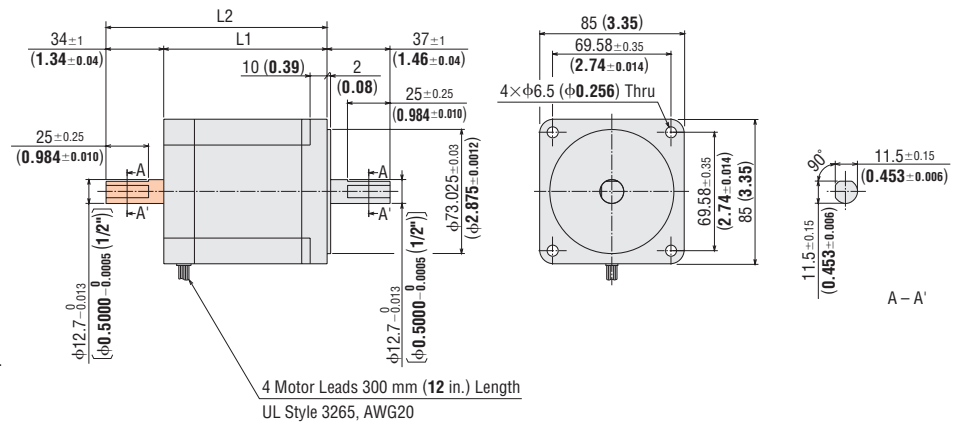
\*The length of machining on the double shaft model is 15±0.25 (0.591±0.010).

- These dimensions are for the double shaft models.  
For the single shaft models, ignore the shaded ( ) areas.
- The dimensions of a motor with an encoder can be found on page A-19 or at [www.orientalmotor.com](http://www.orientalmotor.com).



Motor Frame Size 85 mm (3.35 in.)

Model	Motor Model	L1	L2	Mass kg (lb.)	DXF
<b>RBK296AA</b>	PK296DAA	66 (2.6)	—	1.7 (3.7)	B122U
<b>RBK296BA</b>	PK296DBA		100 (3.94)		
<b>RBK299AA</b>	PK299DAA	96 (3.78)	—	2.8 (6.2)	B123U
<b>RBK299BA</b>	PK299DBA		130 (5.12)		
<b>RBK2913AA</b>	PK2913DAA	126 (4.96)	—	3.8 (8.4)	B124U
<b>RBK2913BA</b>	PK2913DBA		160 (6.3)		

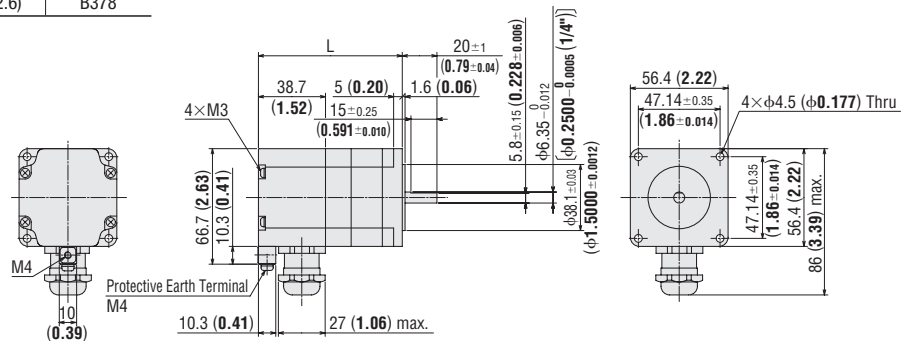


- These dimensions are for the double shaft models. For the single shaft models, ignore the orange ( ) areas.
- The dimensions of a motor with an encoder can be found on page A-19 or at [www.orientalmotor.com](http://www.orientalmotor.com).

◇ Step Angle 1.8° Terminal Box Type

Motor Frame Size 56.4 mm (2.22 in.)

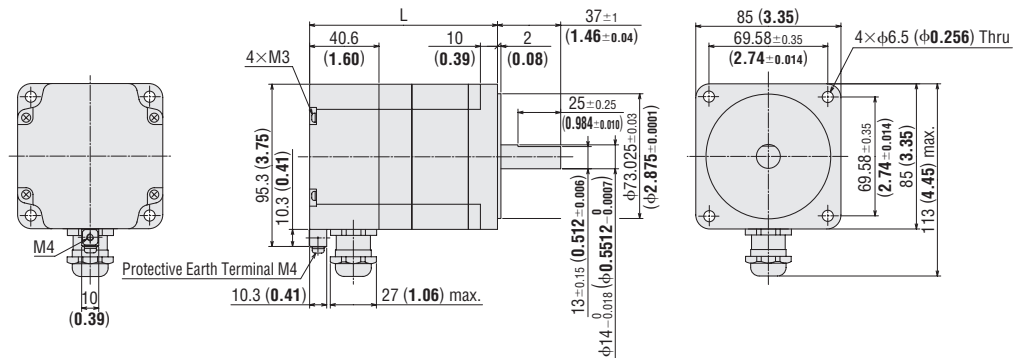
Model	Motor Model	L	Mass kg (lb.)	DXF
<b>RBK264T</b>	PK264D1T	83 (3.27)	0.6 (1.32)	B376
<b>RBK266T</b>	PK266D1T	98 (3.86)	0.9 (1.98)	B377
<b>RBK268T</b>	PK268D1T	120 (4.72)	1.2 (2.6)	B378



- Use cable (VCT) with a diameter of φ7~φ13 mm (φ0.28~φ0.51 in.). A connection cable is available as an accessory (sold separately). → Page A-407

Motor Frame Size 85 mm (3.35 in.)

Model	Motor Model	L	Mass kg (lb.)	DXF
<b>RBK296T</b>	PK296DT	110 (4.33)	2.1 (4.6)	B379
<b>RBK299T</b>	PK299DT	140 (5.51)	3.2 (7)	B380
<b>RBK2913T</b>	PK2913DT	170 (6.69)	4.3 (9.5)	B381



- Use cable (VCT) with a diameter of φ7~φ13 mm (φ0.28~φ0.51 in.). A connection cable is available as an accessory (sold separately). → Page A-407

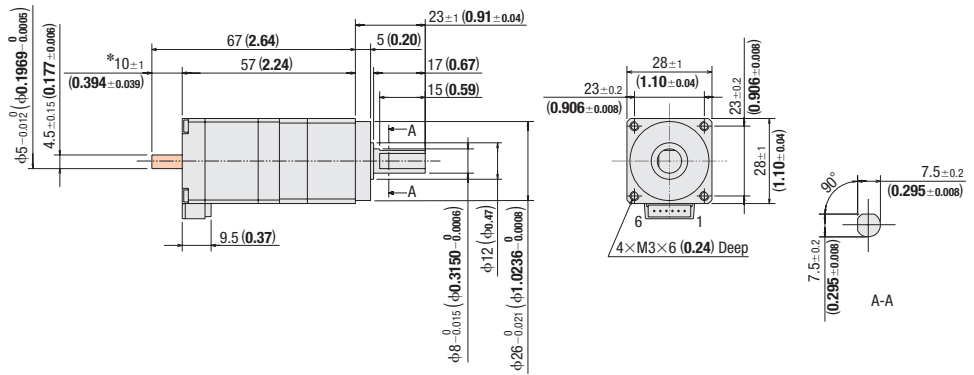
## ◇ PS Geared Type

Motor Frame Size 28 mm (1.10 in.)

Model	Motor Model	Mass kg (lb.)	DXF
<b>RBK223PA-PS5</b>	PK223PDA-PS5	0.21 (0.46)	B975
<b>RBK223PB-PS5</b>	PK223PDB-PS5		
<b>RBK223PA-PS10</b>	PK223PDA-PS10		
<b>RBK223PB-PS10</b>	PK223PDB-PS10		

A connection cable of 0.6 m (2 ft.) is included with the package. UL Style 3265, AWG24  
If you are purchasing only a motor for maintenance purposes, etc., the connection cable and connector will not be supplied. They must be purchased separately. → Page A-407

- Applicable Connector for Motor:  
Connector housing: 51065-0600 (MOLEX)  
Contact: 50212-8100 (MOLEX)  
Crimp tool: 57176-5000 (MOLEX)



## ◇ PL Geared Type

Motor Frame Size 42 mm (1.65 in.)

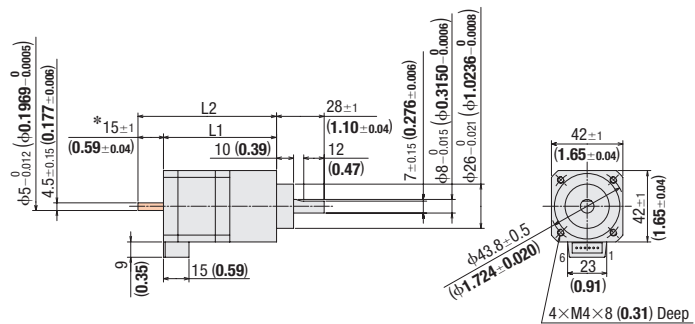
Model	Motor Model	L1	L2	Mass kg (lb.)	DXF
<b>RBK244PA-P5</b>	PK244PDA-P5	66.5 (2.62)	—	0.48 (1.06)	B713
<b>RBK244PB-P5</b>	PK244PDB-P5		81.5 (3.21)		
<b>RBK244PA-P10</b>	PK244PDA-P10		—		
<b>RBK244PB-P10</b>	PK244PDB-P10	—	81.5 (3.21)	0.6 (1.32)	B714
<b>RBK244PA-P36</b>	PK244PDA-P36	90 (3.54)	—		
<b>RBK244PB-P36</b>	PK244PDB-P36		105 (4.13)		

A connection cable of 0.6 m (2 ft.) is included with the package. UL Style 3265, AWG24  
If you are purchasing only a motor for maintenance purposes, etc., the connection cable and connector will not be supplied. They must be purchased separately.

→ Page A-407

- Applicable Connector for Motor:  
Connector housing: 51103-0600 (MOLEX)  
Contact: 50351-8100 (MOLEX)  
Crimp tool: 57295-5000 (MOLEX)

- The dimensions of a motor with an encoder can be found on page A-19 or at [www.orientalmotor.com](http://www.orientalmotor.com).



- These dimensions are for the double shaft models.  
For the single shaft models, ignore the shaded ( ) areas.

Introduction	AC Input Motor & Driver	DC Input Motor & Driver	Motor Only	Controllers	Accessories
AR	0.36° / Geared	0.36° / Geared	0.36° / Geared	SCX10 / EMP400 / 5G8030J	
AS	0.72° / Geared	0.36° / Geared	0.72° / Geared		
RK	0.9° / Geared	0.36° / Geared	0.9° / Geared		
UMK	0.9° / Geared	0.36° / Geared	0.9° / Geared		
AR	0.36° / Geared	0.36° / Geared	0.36° / Geared		
ASX	0.36° / Geared	0.36° / Geared	0.36° / Geared		
CRK	0.36° / Geared	0.36° / Geared	0.36° / Geared		
CMK	0.36° / Geared	0.36° / Geared	0.36° / Geared		
RBK	1.8° / Geared	1.8° / Geared	1.8° / Geared		
PK	0.36° / Geared	0.36° / Geared	0.36° / Geared		
PK	0.72° / Geared	0.72° / Geared	0.72° / Geared		
PK	0.9° / Geared	0.9° / Geared	0.9° / Geared		
PK/PV	1.8° / Geared	1.8° / Geared	1.8° / Geared		
PK	Geared	Geared	Geared		

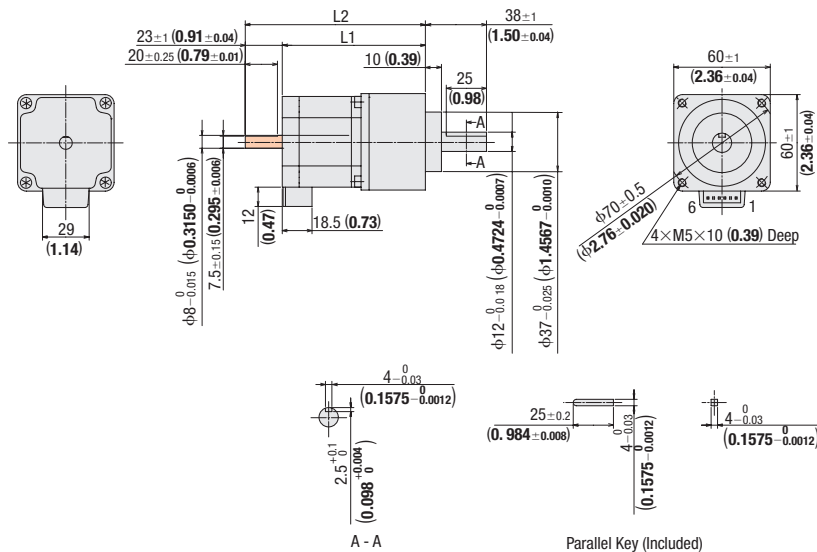
Motor Frame Size 60 mm (2.36 in.)

Model	Motor Model	L1	L2	Mass kg (lb.)	DXF
<b>RBK266PA-P5</b>	PK266PDA-P5	89 (3.5)	—	1.23 (2.71)	B715
<b>RBK266PB-P5</b>	PK266PDB-P5		112 (4.41)		
<b>RBK266PA-P10</b>	PK266PDA-P10		—		
<b>RBK266PB-P10</b>	PK266PDB-P10		112 (4.41)		
<b>RBK264PA-P36</b>	PK264PDA-P36	99 (3.9)	—	1.26 (2.77)	B716
<b>RBK264PB-P36</b>	PK264PDB-P36		122 (4.8)		

A connection cable of 0.6 m (2 ft.) is included with the package. UL Style 3265, AWG24  
If you are purchasing only a motor for maintenance purposes, etc., the connection cable and connector will not be supplied. They must be purchased separately.

→ Page A-407

- Applicable Connector for Motor:  
Connector housing: 51067-0600 (MOLEX)  
Contact: 50217-9101 (MOLEX)  
Crimp tool: 57189-5000 (MOLEX)  
57190-5000 (MOLEX)



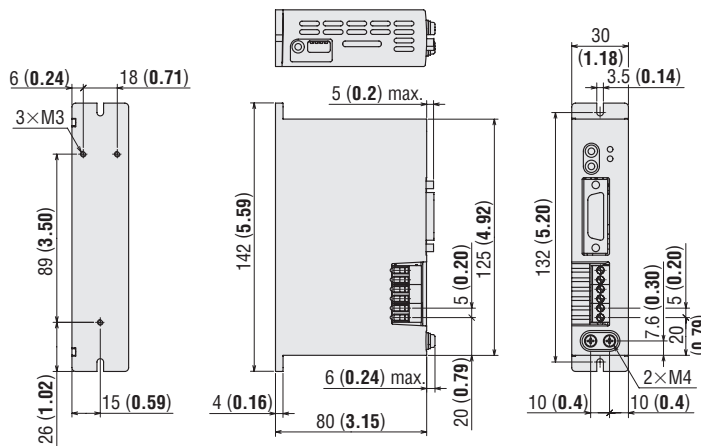
- These dimensions are for the double shaft models.  
For the single shaft models, ignore the shaded ( ) areas.
- The dimensions of a motor with an encoder can be found on page A-19 or at [www.orientalmotor.com](http://www.orientalmotor.com).

● Driver

RBD215A-K, RBD228A-K, RBD242A-K, RBD242A-V, RBD245A-V

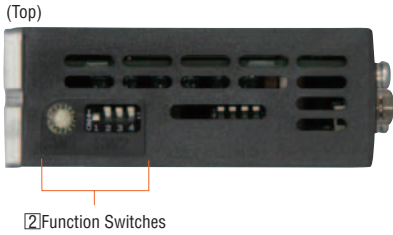
Mass: 0.35 kg (0.77 lb.)

DXF B446



## Connection and Operation

### Names and Functions of Driver Parts



#### ① Signal Monitor Displays

##### ◇ LED Indicators

Indication	Color	Function	When Activated
POWER	Green	Power supply indication	Lights when power is on.
ALARM	Red	Alarm indication	Blinks when protective functions are activated.

##### ◇ Alarm

Blink Count	Function	When Activated
2	Overheat	The temperature of the driver's internal heat sink exceeds the specified value.
3	Overvoltage	The primary voltage of the driver's inverter exceeds the permissible value.
5	Overcurrent	An excessive current flows to the driver's inverter.

#### ② Function Switches

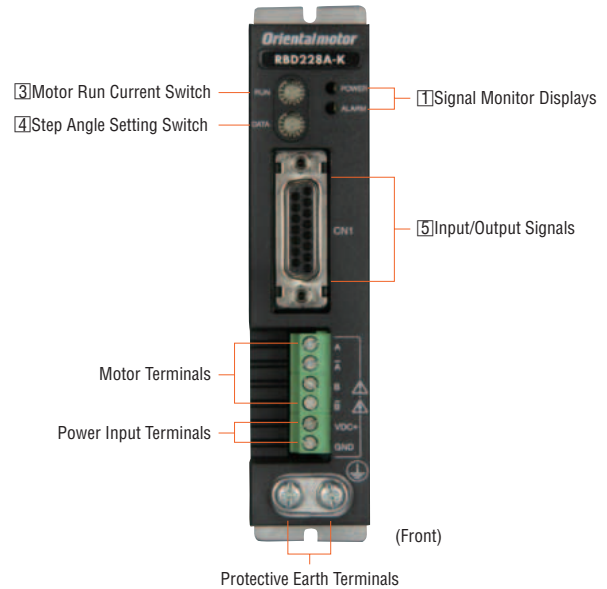
Indication	Switch Name	Function
SW1	Third Harmonic Waveform Correction Function Select Switch	A function that provides improved angle accuracy and reduced vibrations by optimizing the motor drive current waveforms. You can set the correction value using the select switch.
SW2-1	Smooth Drive Function Switch	Low vibration and low noise operation are available even in the low speed range without changing the step angle setting. The function can be set and deactivated with this switch.
SW2-2	Vibration Suppression Function Select Switch	A function that provides reduced vibrations at medium speed operation. The function can be set or deactivated with this switch.
SW2-3	Not used.	—
SW2-4	Motor Stop Current Switch	For adjusting the motor current at standstill

#### ③ Motor Run Current Switch

Indication	Switch Name	Function
RUN	Motor Run Current Switch	For adjusting the motor running current

#### ⑤ Input/Output Signals

Indication	Input/Output	Pin No.	Signal	Signal Name	Function
CN1	Input	1	PLS+	Pulse Signal	Operation command pulse signal
		2	PLS24+		
		9	PLS-		
		3	DIR+	Rotation Direction Signal	
		10	DIR24+		
		11	DIR-		
	Output	4	AWO	All Windings Off Signal	Cuts the output current to the motor and allows the motor shafts to be rotated manually.
		12	CS	Step Angle Select Signal	The motor will operate at the basic step angle regardless of the settings of the step angle setting switches.
		5	IN-COM	Input Common	Input common for the "All Windings Off" signal and "Step Angle Select" signal.
		13	CD+	Current Cutback Signal	Outputs a signal when the automatic current cutback function activates.
		6	CD-		
14	ALM+	Alarm Signal	Turns the output off when one of the driver's protective functions is activated.		
7	ALM-				
15	TIM+	Excitation Timing Signal	Outputs signals when the excitation sequence is at STEP "0."		
8	TIM-				



#### ④ Step Angle Setting Switch

Indication	Switch Name	Function
DATA	Step Angle Setting Switch	The switch can be set to the desired resolution from the 16 resolution levels.

Step Angle Setting Switch	Microsteps/Step	Resolution	Step Angle
0	1	200	1.8°
1	2	400	0.9°
2	4	800	0.45°
3	5	1000	0.36°
4	8	1600	0.225°
5	9	1800	0.2°
6	10	2000	0.18°
7	16	3200	0.1125°
8	18	3600	0.1°
9	20	4000	0.09°
A	32	6400	0.05625°
B	36	7200	0.05°
C	40	8000	0.045°
D	64	12800	0.028125°
E	80	16000	0.0225°
F	128	25600	0.0140625°

- The step angle set with the step angle setting switch will become effective when the "Step Angle Select" (CS) signal input is OFF.
- Do not change the "Step Angle Select" (CS) signal input or step angle setting switch while the motor is operating. It may cause the motor to misstep and stop. Change the step angle setting switch, when the "Step Angle Select" (CS) signal input is OFF and the "Excitation Timing" (TIM) signal output is ON.

Introduction

AC Input Motor & Driver

0.36° / Geared

0.72° / Geared

0.9°/1.8° / Geared

0.36° / Geared

0.36° / Geared

DC Input Motor & Driver

0.36° / Geared

0.36° / Geared

0.9°/1.8° / Geared

1.8° / Geared

0.36°

0.72°

Motor Only

0.9°

1.8°

Geared

Controllers

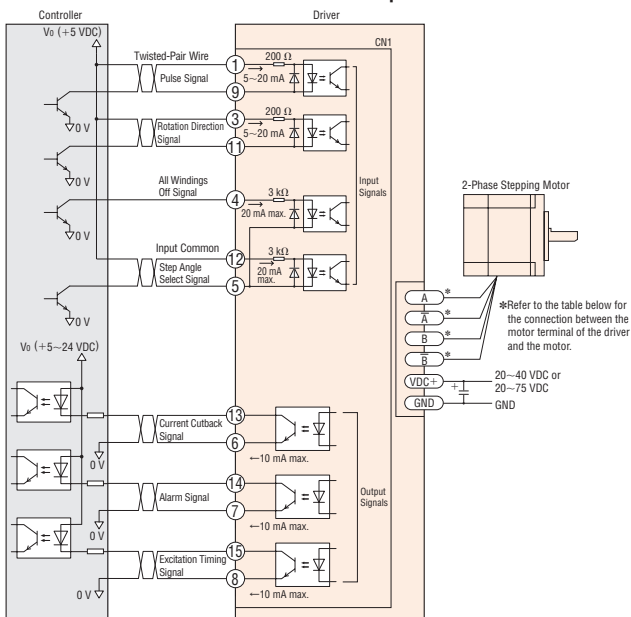
SCX10 / EMP400 / SG8030J

Accessories

● Connection Diagrams

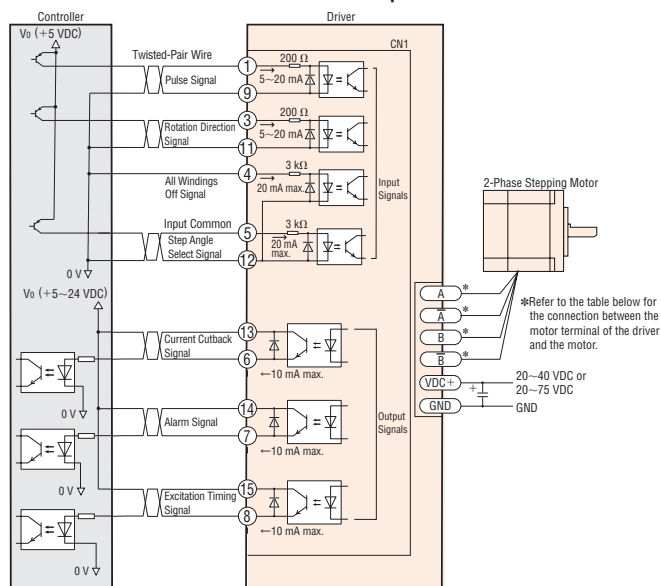
◇ Current Sink Output Circuit

● 5 VDC Connection or Line Driver Input

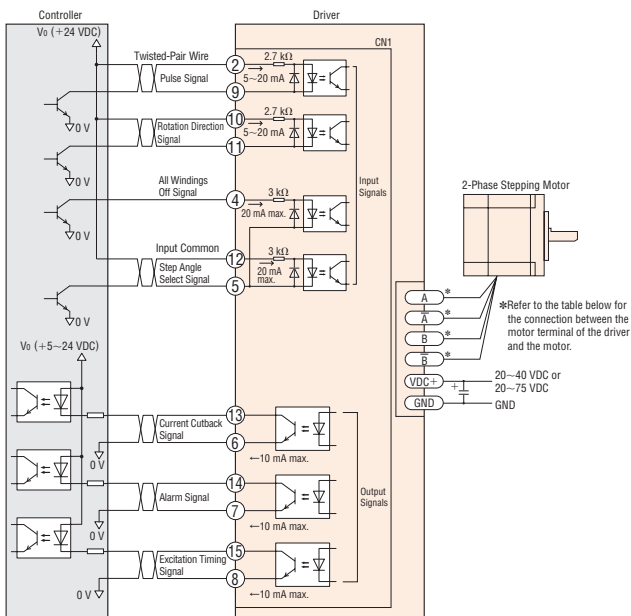


◇ Current Source Output Circuit

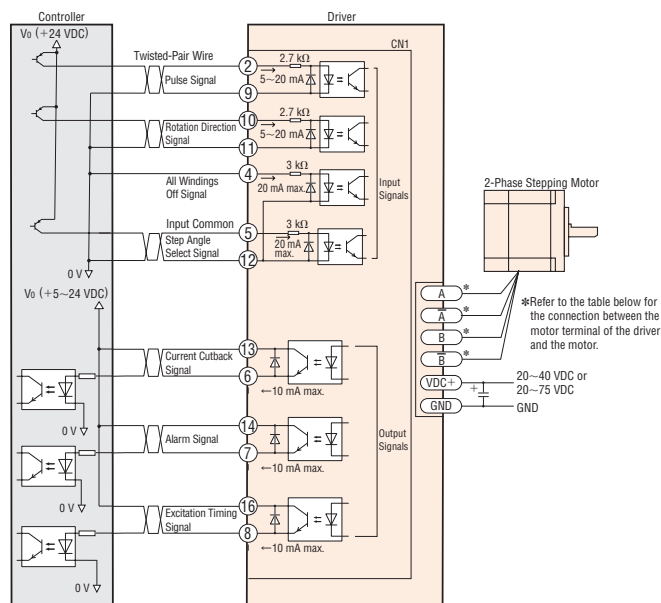
● 5 VDC Connection or Line Driver Input



● 24 VDC Connection



● 24 VDC Connection







## List of Motor and Driver Combinations

Model names for motor and driver combinations are shown below.

Type	Model	Motor Model	Driver Model
Step Angle 1.8° High-Torque Type	<b>RBK223P</b> □	PK223PD□*	RBD215A-K
	<b>RBK224P</b> □	PK224PD□*	
	<b>RBK225P</b> □	PK225PD□*	
	<b>RBK233P</b> □	PK233PD□*	
	<b>RBK235P</b> □	PK235PD□*	
	<b>RBK244P</b> □	PK244PD□*	
	<b>RBK246P</b> □	PK246PD□*	
Step Angle 1.8° High-Torque Type with Encoder	<b>RBK223PA-R15</b>	PK223PDAR15	RBD215A-K
	<b>RBK224PA-R15</b>	PK224PDAR15	
	<b>RBK225PA-R15</b>	PK225PDAR15	
	<b>RBK233PA-R</b> ■	PK233PDAR■	
	<b>RBK235PA-R</b> ■	PK235PDAR■	
	<b>RBK244PA-R</b> ■	PK244PDAR■	
	<b>RBK246PA-R</b> ■	PK246PDAR■	
Step Angle 1.8° Standard Type	<b>RBK264</b> □	PK264D□	RBD242A-V
	<b>RBK266</b> □	PK266D□	RBD245A-V
	<b>RBK268</b> □	PK268D□	
	<b>RBK296</b> □ <b>A</b>	PK296D□ <b>A</b>	RBD245A-V
	<b>RBK299</b> □ <b>A</b>	PK299D□ <b>A</b>	
Step Angle 1.8° Standard Type with Encoder	<b>RBK2913</b> □ <b>A</b>	PK2913D□ <b>A</b>	RBD245A-V
	<b>RBK264A-R</b> ■	PK264DAR■	
	<b>RBK266A-R</b> ■	PK266DAR■	
	<b>RBK268A-R</b> ■	PK268DAR■	
	<b>RBK296AA-R</b> ■	PK296DAAR■	
	<b>RBK299AA-R</b> ■	PK299DAAR■	

Type	Model	Motor Model	Driver Model	
Step Angle 1.8° Terminal Box Type	<b>RBK264T</b>	PK264D1T	RBD242A-V	
	<b>RBK266T</b>	PK266D1T		
	<b>RBK268T</b>	PK268D1T		
	PS/PL Geared Type	<b>RBK296T</b>	PK296DT	RBD245A-V
		<b>RBK299T</b>	PK299DT	
		<b>RBK2913T</b>	PK2913DT	
		<b>RBK223P</b> □- <b>PS5</b>	PK223PD□-PS5*	
PS/PL Geared Type	<b>RBK223P</b> □- <b>PS10</b>	PK223PD□-PS10*	RBD215A-K	
	<b>RBK244P</b> □- <b>P5</b>	PK244PD□-P5*		
	<b>RBK244P</b> □- <b>P10</b>	PK244PD□-P10*		
	PL Geared Type with Encoder	<b>RBK244P</b> □- <b>P36</b>	PK244PD□-P36*	RBD228A-K
		<b>RBK266P</b> □- <b>P5</b>	PK266PD□-P5*	
		<b>RBK266P</b> □- <b>P10</b>	PK266PD□-P10*	
		<b>RBK264P</b> □- <b>P36</b>	PK264PD□-P36*	
<b>RBK244PAR</b> ■- <b>P5</b>		PK244PDAR■-P5		
PL Geared Type with Encoder	<b>RBK244PAR</b> ■- <b>P10</b>	PK244PDAR■-P10	RBD228A-K	
	<b>RBK244PAR</b> ■- <b>P36</b>	PK244PDAR■-P36		
	<b>RBK266PAR</b> ■- <b>P5</b>	PK266PDAR■-P5		
	<b>RBK266PAR</b> ■- <b>P10</b>	PK266PDAR■-P10		
	<b>RBK264PAR</b> ■- <b>P36</b>	PK264PDAR■-P36		

● Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name.

\* If you are purchasing only a motor for maintenance purposes, etc., the connection cable and connector will not be supplied. They must be purchased separately.

They are available as accessories.  
Connection cable → Page A-407