Introduction

AS

AS PLUS

ASC

RK

CRK II

CSK

PMC

UMK

CSK

PK/PV

PK

UI2120G

EMP401
EMP402

SG8030J

SMK

Accessories

Motor & Driver Packages

Closed Loop *αSTEP*
AC Input
DC Input

5-Phase Microstep
AC Input
DC Input

5-Phase Full/Half
DC Input

2-Phase Full/Half
AC Input
DC Input

2-Phase Stepping Motors
with
Encoder

Driver
with Indexer

Controllers

Low-Speed
Synchronous
Motors

Before Using
a Stepping
Motor

5-Phase Stepping Motor and Driver Package
NanoStep® RK Series

Additional Information

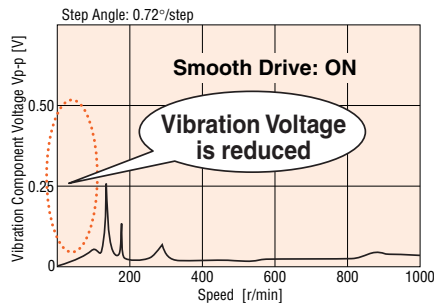# 5-Phase Stepping Motor and Driver Package
RK Series

The **RK** series offers both the high resolution and smooth motion of a 5-phase microstepping system with the simplicity of a full step system. The **RK** Series "Smooth Drive" function achieves low vibration without the need for a higher cost pulse generator usually required for microstepping systems.

■ Features

① Smooth Drive Function

Want to reduce vibration and noise during low-speed operation in microstepping mode without changing the full-step resolution? Or, are you looking for ways to use microstepping while keeping the pulse frequency low to accommodate the oscillator requirement? If so, the **RK** Series is the answer to your needs. The new and innovative Smooth Drive function ensures low-vibration and low-noise operation at low speeds by internally executing microstepping within the driver, working independently of the input pulse frequency of your controller.

Step Angle: 0.72°/step

Smooth Drive: ON

Vibration Voltage is reduced

Vibration Component Voltage Vp-p [V]

Speed [r/min]

② Lower Vibration
● Microstepping System

The motor's basic step angle is divided by a maximum of 1/250 without the use of a reduction mechanism or other mechanical elements. This enables fine positioning and the further reduction of vibration and noise. A motion sequence of "low-speed transfer → high-speed return" can easily be performed without the need for changing from a microstep pulse frequency to a full step pulse frequency. The **RK** Series can also be used in full-step operation.
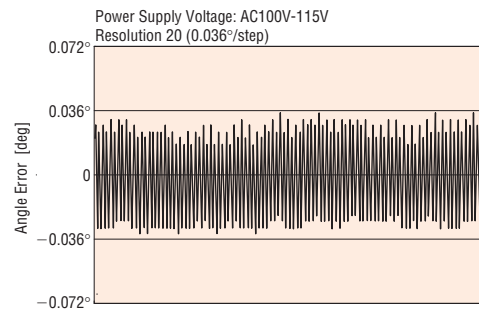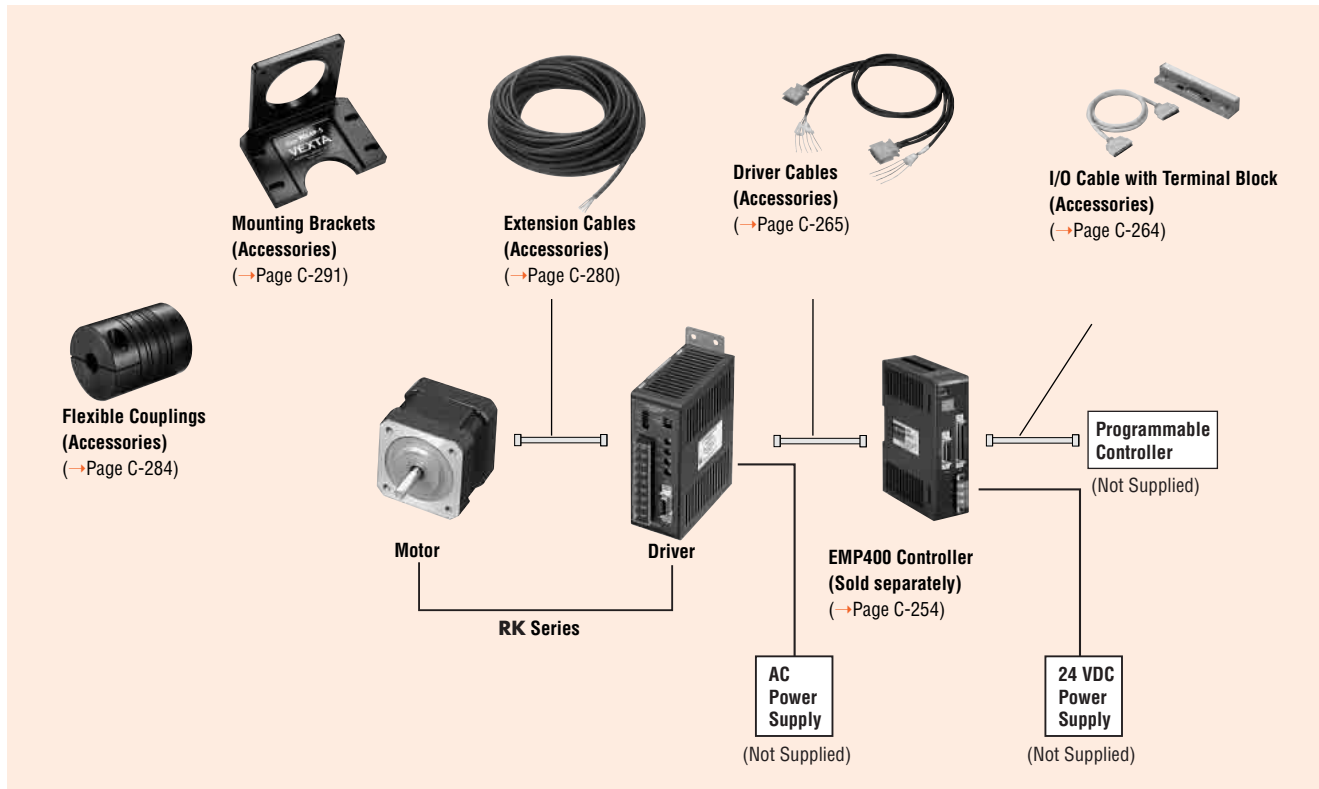
③ 100-115 V, 200-230 V Power Source Variation

The **RK** Series can be used with most common power supplies available around the world.

④ Improved Angle Accuracy

Angle accuracy may decrease during use of microstep drivers, due to the effect of current control. However, the drivers used in the **RK** Series are designed to ensure that the motor operates at maximum accuracy.
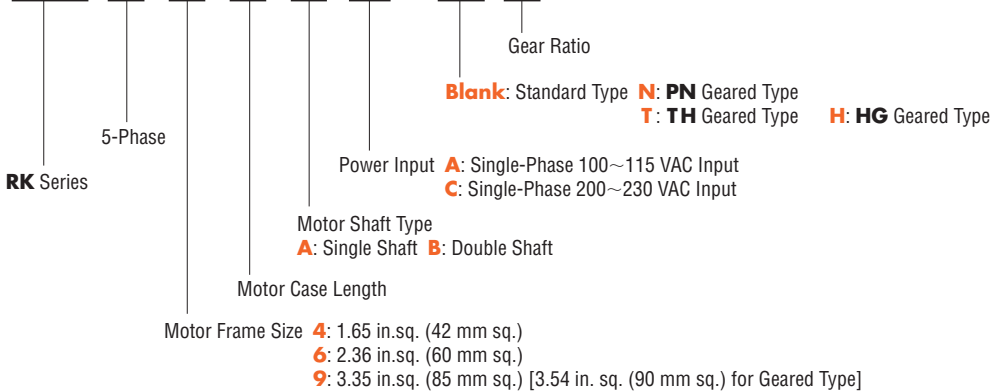
Power Supply Voltage: AC100V-115V
Resolution 20 (0.036°/step)

Angle Error [deg]

Stepping Motors

Introduction

AS

AS PLUS

ASC

RK

CFKII

CSK

PMC

UMK

CSK

PK/PV

PK

UI2120G

EMP401
EMP402

SG8030J

SMK

Accessories

Before Using
a Stepping
Motor

Closed Loop α STEP
AC Input   DC Input

Motor & Driver Packages

5-Phase Microstep
AC Input   DC Input

5-Phase Full/Half
DC Input

2-Phase Full/Half
AC Input   DC Input

2-Phase Stepping Motors
without   with
Encoder   Encoder

Driver
with Indexer

Controllers

Low-Speed
Synchronous
Motors

5 Improved Response

The **RK** Series, with its high starting frequency, shortens the machine cycle without affecting acceleration/deceleration rates. This produces a significant savings in time for an operation in which the same cycle is repeated thousands of times each day.

● Wide Variations

The **RK** Series is comprised of motors in various sizes and with varying functions, such as high-accuracy, and non-backlash geared types.

■ Safe Operation in Major Countries around the World

● Compliance with Safety Standards

The **RK** Series complies with the UL/CSA and EN standards. The CE marking certifies compliance with the EMC Directive and Low-Voltage Directive. Additionally, the **RK** Series conforms to the EMC Directive only through its use of surge protector. The **RK** Series doesn't require an external ferrite core or filter in the motor line or power line.

✱ With the **RK54□** type, only the driver conforms to the CSA standard.

■ Standards/CE Marking

Products	Standards	Certification Body	File No.	CE Marking
Stepping Motor	UL1004, UL2111 CSA C22.2 No.100✱3 CSA C22.2 No.77✱3	UL	E64199	Low Voltage Directives EMC Directives
	EN60950 EN60034-1 EN60034-5	VDE ✱2	114293	
Driver	UL508C ✱1 CSA C22.2 No.14	UL	E171462	
	EN50178	—	—	

✱1 Test Condition is Maximum Ambient Temperature 122°F (50°C) according to UL Standards. (UL508C)
✱2 Except for harmonic geared type **RK543-H□**, **RK564-H□**, and **PN** geared type **RK544-N□**.
✱3 Except for **RK54□** type.

• When the system is approved under various safety standards, the model names in the motor and driver nameplates are the approved model names.
  List of Motor and Driver Combinations → Page C-104
• **Details of Safety Standards** → Page G-2
• The EMC value changes according to the wiring and layout. Therefore, the final EMC level must be checked with the motor/driver incorporated in the user's equipment.

■ System Configuration

Mounting Brackets (Accessories) (→Page C-291)

Extension Cables (Accessories) (→Page C-280)

Driver Cables (Accessories) (→Page C-265)

I/O Cable with Terminal Block (Accessories) (→Page C-264)

Flexible Couplings (Accessories) (→Page C-284)

Motor

Driver

EMP400 Controller (Sold separately) (→Page C-254)

Programmable Controller (Not Supplied)

RK Series

AC Power Supply (Not Supplied)

24 VDC Power Supply (Not Supplied)

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

■ Product Number Code

RK 5 6 6 B A - N 5

Gear Ratio

Blank: Standard Type **N**: **PN** Geared Type
T : **TH** Geared Type **H**: **HG** Geared Type

RK Series

5-Phase

Power Input **A**: Single-Phase 100~115 VAC Input
C: Single-Phase 200~230 VAC Input

Motor Shaft Type
A: Single Shaft **B**: Double Shaft

Motor Case Length

Motor Frame Size **4**: 1.65 in.sq. (42 mm sq.)
6: 2.36 in.sq. (60 mm sq.)
9: 3.35 in.sq. (85 mm sq.) [3.54 in. sq. (90 mm sq.) for Geared Type]

■ Product Line

Type	Power Supply Voltage	Maximum Holding Torque		
		□1.65 in. (□42 mm)	□2.36 in. (□60 mm)	□3.35 in. (□85 mm) □3.54 in. (□90 mm) for geared type
Standard	Single-Phase 100-115 VAC	18.4~34 oz-in (0.13~0.24 N·m)	59~230 oz-in (0.42~1.66 N·m)	290~890 oz-in (2.1~6.3 N·m)
	Single-Phase 200-230 VAC	—	59~230 oz-in (0.42~1.66 N·m)	290~890 oz-in (2.1~6.3 N·m)
TH Geared	Single-Phase 100-115 VAC	3~13.2 lb-in (0.35~1.5 N·m)	11~35 lb-in (1.25~4 N·m)	39~106 lb-in (4.5~12 N·m)
	Single-Phase 200-230 VAC	—	11~35 lb-in (1.25~4 N·m)	39~106 lb-in (4.5~12 N·m)
PN Geared	Single-Phase 100-115 VAC	7~13.2 lb-in (0.8~1.5 N·m)	30~70 lb-in (3.5~8 N·m)	123~320 lb-in (14~37 N·m)
	Single-Phase 200-230 VAC	—	30~70 lb-in (3.5~8 N·m)	123~320 lb-in (14~37 N·m)
HG Geared	Single-Phase 100-115 VAC	30~44 lb-in (3.5~5 N·m)	48~70 lb-in (5.5~8 N·m)	220~320 lb-in (25~37 N·m)
	Single-Phase 200-230 VAC	—	48~70 lb-in (5.5~8 N·m)	220~320 lb-in (25~37 N·m)

Standard Type Motor Frame Size: □ 1.65 in. (□ 42 mm)

■ Specifications How to Read Specifications Table→Page C-9

c ℝ𝕌 us (Only the driver conforms to the CSA standard.) CE

Model	Single-Phase	Single Shaft	**RK543AA**	**RK544AA**	**RK545AA**
	100-115 VAC	Double Shaft	**RK543BA**	**RK544BA**	**RK545BA**
Maximum Holding Torque		oz-in (N·m)	18.4 (0.13)	25 (0.18)	34 (0.24)
Rotor Inertia J		oz-in^2 (kg·m^2)	0.191 (35×10^{-7})	0.3 (54×10^{-7})	0.37 (68×10^{-7})
Rated Current		A/Phase	0.75		
Basic Step Angle			0.72°		
Power Source Input			Single-Phase 100-115 VAC ±15% 50/60 Hz 1 A		
Excitation Mode			Microstep: Basic Angle/n * (/Step)		
Weight	Motor	lb. (kg)	0.55 (0.25)	0.66 (0.3)	0.88 (0.4)
	Driver	lb. (kg)	0.88 (0.4)		
Dimension No.	Motor		1		
	Driver		13		

∗ Sixteen resolutions are available, where n＝1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200 and 250.

## ■ Speed — Torque Characteristics How to Read Speed-Torque Characteristics→Page C-10

RK543□A

Current: 0.75 A/Phase   Step Angle: 0.72°/step
Load Inertia: J$_L$ = 0 oz-in^2

Pullout Torque
Driver Input Current
fs

Speed [r/min]
Pulse Speed [kHz]
Resolution1 (Resolution10)

RK544□A

Current: 0.75 A/Phase   Step Angle: 0.72°/step
Load Inertia: J$_L$ = 0 oz-in^2

Pullout Torque
Driver Input Current
fs

Speed [r/min]
Pulse Speed [kHz]
Resolution1 (Resolution10)

RK545□A

Current: 0.75 A/Phase   Step Angle: 0.72°/step
Load Inertia: J$_L$ = 0 oz-in^2

Pullout Torque
Driver Input Current
fs

Speed [r/min]
Pulse Speed [kHz]
Resolution1 (Resolution10)

Note: The pulse input circuit responds to approximately 200 kHz with a pulse duty of 50%.

Introduction AS AS PLUS ASC RK CFKII CSK PMC UMK CSK PK/PV PK UI2120G EMP401 EMP402 SG8030J SMK Accessories

Closed Loop αstep
AC Input DC Input

Motor & Driver Packages

5-Phase Microstep
AC Input DC Input

5-Phase Full/Half
DC Input

2-Phase Full/Half
AC Input DC Input

2-Phase Stepping Motors
without Encoder   with Encoder

Driver with Indexer

Controllers

Low-Speed Synchronous Motors

Before Using a Stepping Motor

Standard Type   Motor Frame Size: □ 2.36 in. (□ 60 mm), □ 3.35 in. (□ 85 mm)

■ Specifications   How to Read Specifications Table→Page C-9

cRUus CE

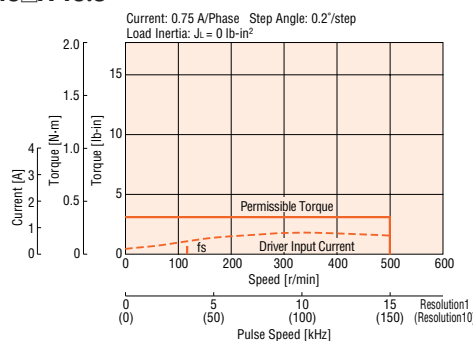| Model	Single-Phase 100-115 VAC	Single Shaft	RK564AA	RK566AA	RK569AA	RK596AA	RK599AA	RK5913AA
		Double Shaft	RK564BA	RK566BA	RK569BA	RK596BA	RK599BA	RK5913BA
	Single-Phase 200-230 VAC	Single Shaft	RK564AC	RK566AC	RK569AC	RK596AC	RK599AC	RK5913AC
		Double Shaft	RK564BC	RK566BC	RK569BC	RK596BC	RK599BC	RK5913BC
Maximum Holding Torque	oz-in (N·m)		59 (0.42)	117 (0.83)	230 (1.66)	290 (2.1)	580 (4.1)	890 (6.3)
Rotor Inertia J	oz-in^2 (kg·m^2)		0.96 (175×10^{-7})	1.53 (280×10^{-7})	3.1 (560×10^{-7})	7.7 (1400×10^{-7})	14.8 (2700×10^{-7})	22 (4000×10^{-7})
Rated Current	A/Phase		1.4					
Basic Step Angle			0.72°					
Power Source Input			Single-Phase 100-115 VAC ±15% 50/60 Hz 4.5 A Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A					
Excitation Mode			Microstep: Basic Angle/n * (/Step)					
Weight	Motor	lb. (kg)	1.3 (0.6)	1.8 (0.8)	2.9 (1.3)	3.7 (1.7)	6.2 (2.8)	8.4 (3.8)
	Driver	lb. (kg)	1.9 (0.85)					
Dimension No.	Motor		2			3		
	Driver		14					

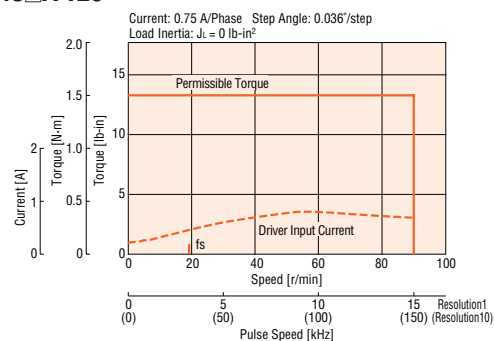* Sixteen resolutions are available, where n=1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200 and 250.

■ Speed — Torque Characteristics   How to Read Speed-Torque Characteristics→Page C-10

RK564□A RK564□C
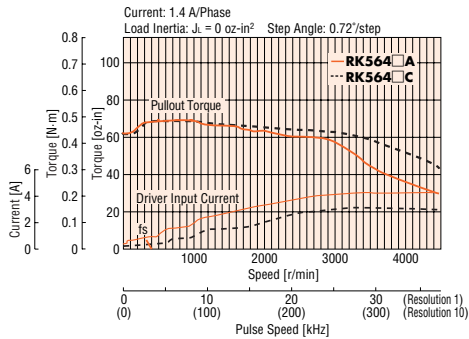
RK596□A RK596□C
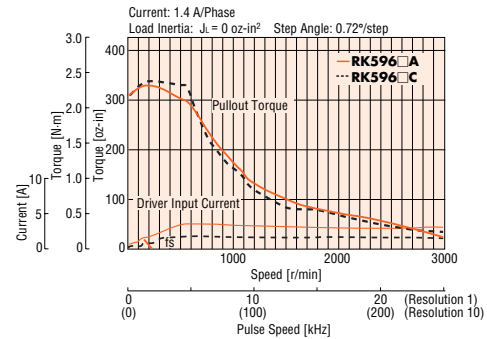
RK566□A RK566□C
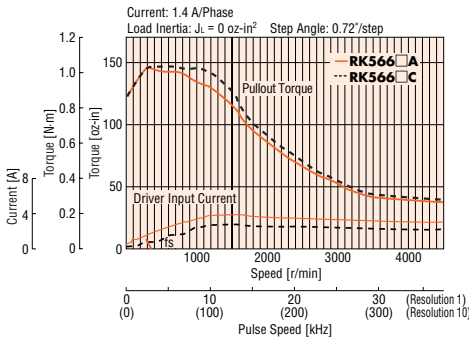
RK599□A RK599□C
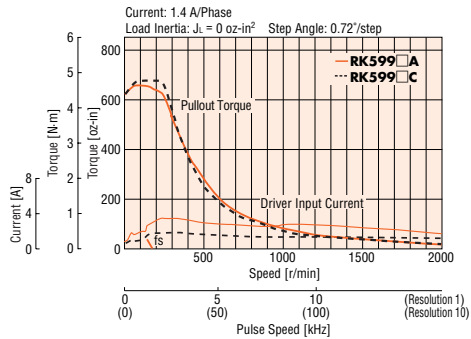
RK569□A RK569□C
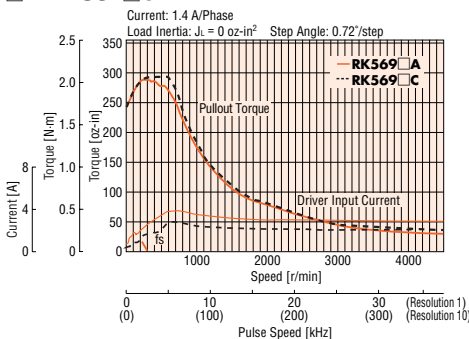
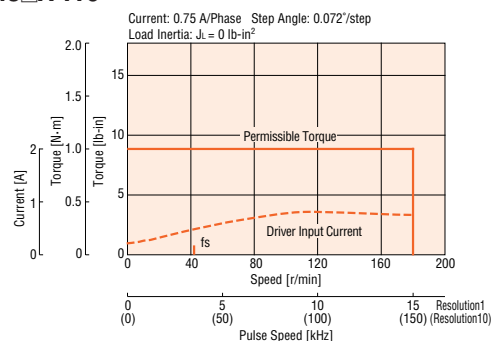### RK5913□A RK5913□C
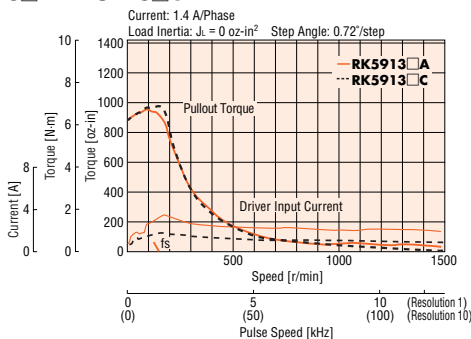
Note: The pulse input circuit responds to approximately 200 kHz with a pulse duty of 50%.

TH Geared Type Motor Frame Size: □ 1.65 in. (□ 42 mm)

■ Specifications How to Read Specifications Table→Page C-9

$_{c}$ⓤ$_{us}$ (Only the driver conforms to the CSA standard.) CE

Model	Single-Phase 100-115 VAC	Single Shaft	RK543AA-T3.6	RK543AA-T7.2	RK543AA-T10	RK543AA-T20	RK543AA-T30
		Double Shaft	RK543BA-T3.6	RK543BA-T7.2	RK543BA-T10	RK543BA-T20	RK543BA-T30
Maximum Holding Torque	lb-in (N·m)		3 (0.35)	6.1 (0.7)	8.8 (1.0)	13.2 (1.5)	
Rotor Inertia J	oz-in^2 (kg·m^2)		0.191 (35×10^{-7})				
Rated Current	A/Phase		0.75				
Basic Step Angle			0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio			3.6:1	7.2:1	10:1	20:1	30:1
Permissible Torque	lb-in. (N·m)		3 (0.35)	6.1 (0.7)	8.8 (1.0)	13.2 (1.5)	
Backlash	arc minute (degrees)		45 (0.75°)	25 (0.417°)		15 (0.25°)	
Permissible Speed Range	r/min		0~500	0~250	0~180	0~90	0~60
Power Source Input			Single-Phase 100-115 VAC ±15% 50/60 Hz 1 A				
Excitation Mode			Microstep: Basic Angle/n *(/Step)				
Weight	Motor	lb. (kg)	0.77 (0.35)				
	Driver	lb. (kg)	0.88 (0.4)				
Dimension No.	Motor		④				
	Driver		⑬				

✴ Sixteen resolutions are available, where n=1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200 and 250.
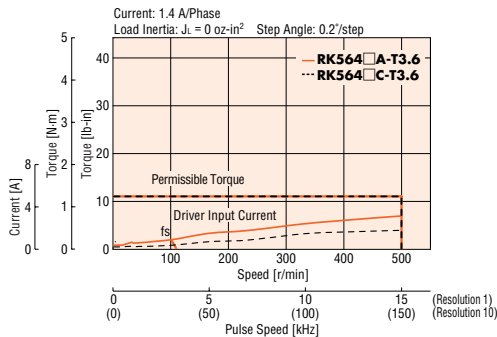
Note:
• Direction of rotation of the motor and that of the gear output shaft are the same for models with gear ratios of 3.6:1, 7.2:1 and 10:1.
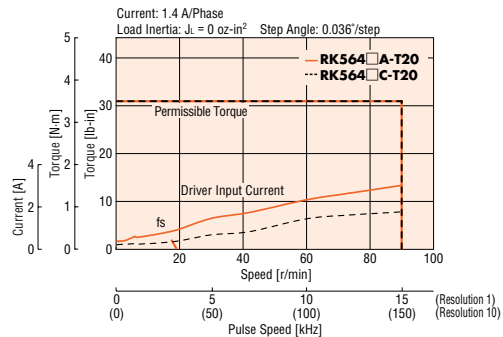 It is opposite for 20:1 and 30:1 gear ratio models.

■ Speed — Torque Characteristics How to Read Speed-Torque Characteristics→Page C-10
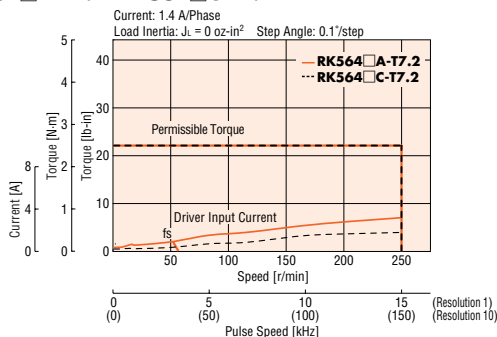
RK543□A-T3.6

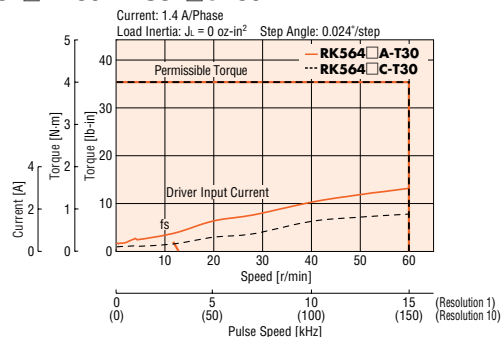Current: 0.75 A/Phase Step Angle: 0.2°/step
Load Inertia: J$_L$ = 0 lb-in^2

RK543□A-T7.2

Current: 0.75 A/Phase Step Angle: 0.1°/step
Load Inertia: J$_L$ = 0 lb-in^2

RK543□A-T10

Current: 0.75 A/Phase Step Angle: 0.072°/step
Load Inertia: J$_L$ = 0 lb-in^2

RK543□A-T20

Current: 0.75 A/Phase Step Angle: 0.036°/step
Load Inertia: J$_L$ = 0 lb-in^2

RK543□A-T30

Current: 0.75 A/Phase Step Angle: 0.024°/step
Load Inertia: J$_L$ = 0 lb-in^2

Note: The pulse input circuit responds to approximately 200 kHz with a pulse duty of 50%.

Introduction · AS · AS PLUS · ASC · RK · CFKII · CSK · PMC · UMK · CSK · PK/PV · PK · UI2120G · EMP401 EMP402 · SG8030J · SMK · Accessories

Closed Loop αSTEP AC Input / DC Input
Motor & Driver Packages
5-Phase Microstep AC Input / DC Input
5-Phase Full/Half DC Input
2-Phase Full/Half AC Input / DC Input
2-Phase Stepping Motors without Encoder / with Encoder
Driver with Indexer
Controllers
Low-Speed Synchronous Motors
Before Using a Stepping Motor

TH Geared Type Motor Frame Size: ☐ 2.36 in. (☐ 60 mm)

■ Specifications How to Read Specifications Table→Page C-9

Model	Single-Phase 100-115 VAC	Single Shaft	RK564AA-T3.6	RK564AA-T7.2	RK564AA-T10	RK564AA-T20	RK564AA-T30
		Double Shaft	RK564BA-T3.6	RK564BA-T7.2	RK564BA-T10	RK564BA-T20	RK564BA-T30
	Single-Phase 200-230 VAC	Single Shaft	RK564AC-T3.6	RK564AC-T7.2	RK564AC-T10	RK564AC-T20	RK564AC-T30
		Double Shaft	RK564BC-T3.6	RK564BC-T7.2	RK564BC-T10	RK564BC-T20	RK564BC-T30
Maximum Holding Torque	lb-in (N·m)		11 (1.25)	22 (2.5)	26 (3)	30 (3.5)	35 (4)
Rotor Inertia J	oz-in² (kg·m²)		\multicolumn{5}{c}{0.96 (175×10⁻⁷)}				
Rated Current	A/Phase		\multicolumn{5}{c}{1.4}				
Basic Step Angle			0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio			3.6:1	7.2:1	10:1	20:1	30:1
Permissible Torque	lb-in. (N·m)		11 (1.25)	22 (2.5)	26 (3)	30 (3.5)	35 (4)
Backlash	arc minute (degrees)		35 (0.584°)	15 (0.25°)		10 (0.167°)	
Permissible Speed Range	r/min		0∼500	0∼250	0∼180	0∼90	0∼60
Power Source Input			Single-Phase 100-115 VAC ±15% 50/60 Hz 4.5 A			Single-Phase 200-230 VAC $+10\%-15\%$ 50/60 Hz 3.5 A	
Excitation Mode			Microstep: Basic Angle/n * (/Step)				
Weight	Motor	lb. (kg)	2.1 (0.95)				
	Driver	lb. (kg)	1.9 (0.85)				
Dimension No.	Motor		5				
	Driver		14				

Rows that span all values (corrected): Rotor Inertia J = 0.96 (175×10⁻⁷); Rated Current = 1.4; Power Source Input spans; Excitation Mode spans; Weight Motor 2.1 (0.95); Weight Driver 1.9 (0.85); Dimension No. Motor 5; Dimension No. Driver 14.

✱ Sixteen resolutions are available, where n=1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200 and 250.
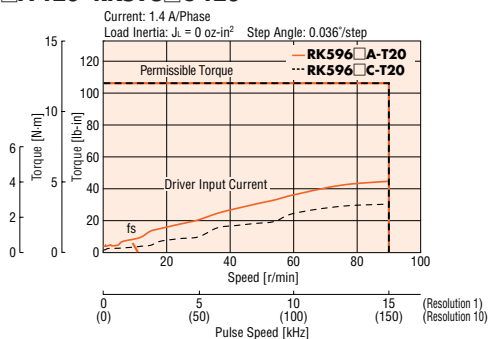
Note:
• Direction of rotation of the motor and that of the gear output shaft are the same for models with gear ratios of 3.6:1, 7.2:1 and 10:1.
  It is opposite for 20:1 and 30:1 gear ratio models.

■ Speed — Torque Characteristics How to Read Speed-Torque Characteristics→Page C-10
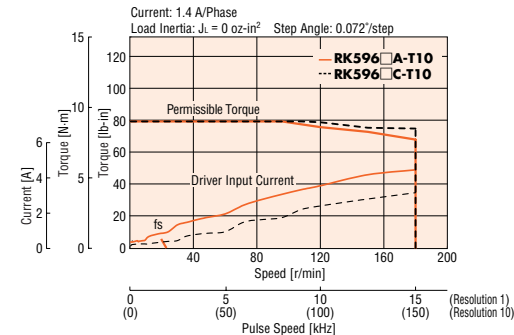
RK564☐A-T3.6 RK564☐C-T3.6

Current: 1.4 A/Phase
Load Inertia: J_L = 0 oz-in²   Step Angle: 0.2°/step

RK564☐A-T20 RK564☐C-T20

Current: 1.4 A/Phase
Load Inertia: J_L = 0 oz-in²   Step Angle: 0.036°/step

RK564☐A-T7.2 RK564☐C-T7.2

Current: 1.4 A/Phase
Load Inertia: J_L = 0 oz-in²   Step Angle: 0.1°/step

RK564☐A-T30 RK564☐C-T30

Current: 1.4 A/Phase
Load Inertia: J_L = 0 oz-in²   Step Angle: 0.024°/step

RK564☐A-T10 RK564☐C-T10

Current: 1.4 A/Phase
Load Inertia: J_L = 0 oz-in²   Step Angle: 0.072°/step

Note: The pulse input circuit responds to approximately 200 kHz with a pulse duty of 50%.

TH Geared Type Motor Frame Size: □ 3.54 in. (□ 90 mm)

■ Specifications How to Read Specifications Table→Page C-9

Model			RK596AA-T3.6	RK596AA-T7.2	RK596AA-T10	RK596AA-T20	RK596AA-T30
	Single-Phase 100-115 VAC	Single Shaft	RK596AA-T3.6	RK596AA-T7.2	RK596AA-T10	RK596AA-T20	RK596AA-T30
		Double Shaft	RK596BA-T3.6	RK596BA-T7.2	RK596BA-T10	RK596BA-T20	RK596BA-T30
	Single-Phase 200-230 VAC	Single Shaft	RK596AC-T3.6	RK596AC-T7.2	RK596AC-T10	RK596AC-T20	RK596AC-T30
		Double Shaft	RK596BC-T3.6	RK596BC-T7.2	RK596BC-T10	RK596BC-T20	RK596BC-T30
Maximum Holding Torque	lb-in (N·m)		39 (4.5)	79 (9)		106 (12)	
Rotor Inertia J	oz-in² (kg·m²)		7.7 (1400×10⁻⁷)				
Rated Current	A/Phase		1.4				
Basic Step Angle			0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio			3.6:1	7.2:1	10:1	20:1	30:1
Permissible Torque	lb-in. (N·m)		39 (4.5)	79 (9)		106 (12)	
Backlash	arc minute (degrees)		25 (0.417°)	15 (0.25°)		10 (0.167°)	
Permissible Speed Range	r/min		0~500	0~250	0~180	0~90	0~60
Power Source Input			Single-Phase 100-115 VAC ±15% 50/60 Hz 4.5 A		Single-Phase 200-230 VAC +10%/-15% 50/60 Hz 3.5 A		
Excitation Mode			Microstep: Basic Angle/n * (/Step)				
Weight	Motor	lb. (kg)	6.3 (2.85)				
	Driver	lb. (kg)	1.9 (0.85)				
Dimension No.	Motor		6				
	Driver		14				

✱ Sixteen resolutions are available, where n=1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200 and 250.
Note:
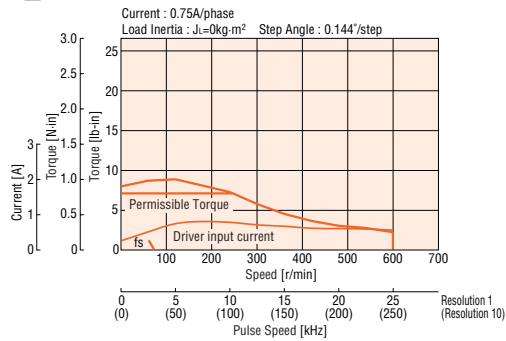• Direction of rotation of the motor and that of the gear output shaft are the same for models with gear ratios of 3.6:1, 7.2:1 and 10:1. It is opposite for 20:1 and 30:1 gear ratio models.

■ Speed — Torque Characteristics How to Read Speed-Torque Characteristics→Page C-10

RK596□A-T3.6 RK596□C-T3.6
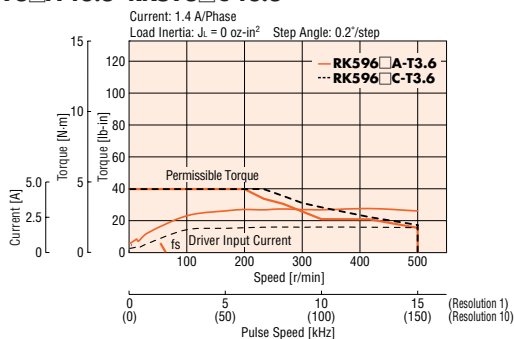
RK596□A-T20 RK596□C-T20

RK596□A-T7.2 RK596□C-T7.2
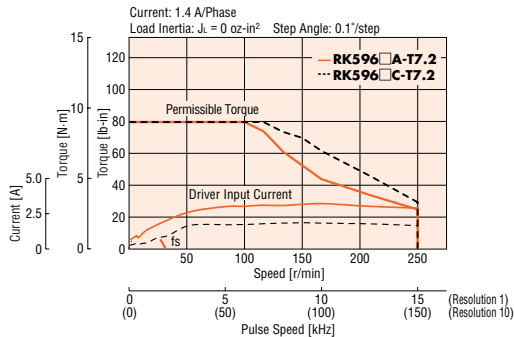
RK596□A-T30 RK596□C-T30
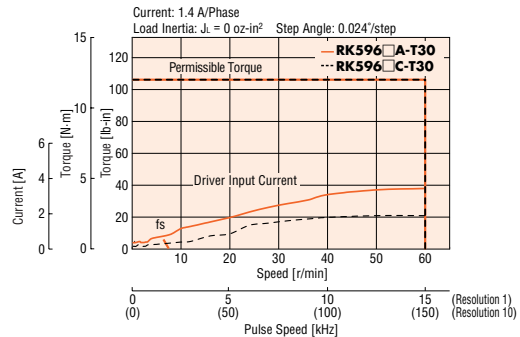
RK596□A-T10 RK596□C-T10

Note: The pulse input circuit responds to approximately 200 kHz with a pulse duty of 50%.

Common Specifications C-90 | Dimensions C-92 | Connection and Operation C-98 | Motor and Driver Combinations C-104

C-85

PN Geared Type Motor Frame Size: ☐ 1.65 in. (☐ 42 mm)

■ Specifications How to Read Specifications Table→Page C-9   c⒰us (Only the driver conforms to the CSA standard.) C€

| Model	Single-Phase 100-115 VAC	Single Shaft	RK544AA-N5	RK544AA-N7.2	RK544AA-N10
		Double Shaft	RK544BA-N5	RK544BA-N7.2	RK544BA-N10
Maximum Holding Torque	lb-in (N·m)		7 (0.8)	10.6 (1.2)	13.2 (1.5)
Rotor Inertia J	oz-in^2 (kg·m^2)		0.30 (54×10^{-7})		
Rated Current	A/Phase		0.75		
Basic Step Angle			0.144°	0.1°	0.072°
Gear Ratio			5:1	7.2:1	10:1
Permissible Torque	lb-in. (N·m)		7 (0.8)	10.6 (1.2)	13.2 (1.5)
Maximum Torque	lb-in. (N·m)		13.2 (1.5)	17.7 (2)	17.7 (2)
Backlash	arc minute (degrees)		2 (0.034°)		
Angle Error	arc minute (degrees)		6 (0.1°)		
Permissible Speed Range	r/min		0~600	0~416	0~300
Power Source Input			Single-Phase 100-115 VAC ±15% 50/60 Hz 1 A		
Excitation Mode			Microstep: Basic Angle/n * (/Step)		
Weight	Motor	lb. (kg)	1.2 (0.56)		
	Driver	lb. (kg)	0.88 (0.4)		
Dimension No.	Motor		7		
	Driver		13		

✻ Sixteen resolutions are available, where n=1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200 and 250.
Notes:
• Direction of rotation of the motor and that of the gear output shaft are the same.
• The value of Maximum Torque is for the gear. Refer to the Speed-Torque Characteristics for the output torque of the geared motors.

■ Speed — Torque Characteristics How to Read Speed-Torque Characteristics→Page C-10
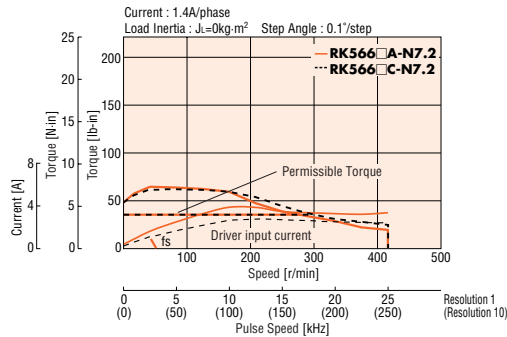
RK544☐A-N5

RK544☐A-N10
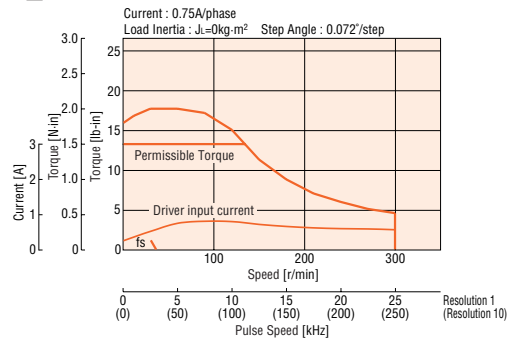
RK544☐A-N7.2
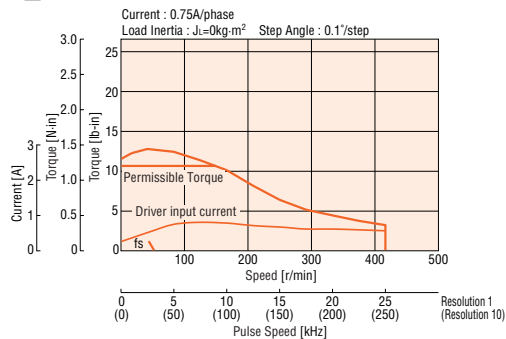
Note: The pulse input circuit responds to approximately 200 kHz with a pulse duty of 50%.

PN Geared Type Motor Frame Size: □ 2.36 in. (□ 60 mm)

■ Specifications How to Read Specifications Table→Page C-9

c**UL**us **CE**

Model	Single-Phase 100-115 VAC	Single Shaft	RK566AA-N5	RK566AA-N7.2	RK566AA-N10	RK564AA-N25	RK564AA-N36	RK564AA-N50
		Double Shaft	RK566BA-N5	RK566BA-N7.2	RK566BA-N10	RK564BA-N25	RK564BA-N36	RK564BA-N50
	Single-Phase 200-230 VAC	Single Shaft	RK566AC-N5	RK566AC-N7.2	RK566AC-N10	RK564AC-N25	RK564AC-N36	RK564AC-N50
		Double Shaft	RK566BC-N5	RK566BC-N7.2	RK566BC-N10	RK564BC-N25	RK564BC-N36	RK564BC-N50
Maximum Holding Torque	lb-in (N·m)		30 (3.5)	35 (4)	44 (5)	70 (8)		
Rotor Inertia J	oz-in² (kg·m²)		1.53 (280×10^{-7})			0.96 (175×10^{-7})		
Rated Current	A/Phase		1.4					
Basic Step Angle			0.144°	0.1°	0.072°	0.0288°	0.02°	0.0144°
Gear Ratio			5:1	7.2:1	10:1	25:1	36:1	50:1
Permissible Torque	lb-in. (N·m)		30 (3.5)	35 (4)	44 (5)	70 (8)		
Maximum Torque	lb-in. (N·m)		61 (7)	79 (9)	97 (11)	141 (16)	177 (20)	177 (20)
Backlash	arc minute (degrees)		2 (0.034°)			3 (0.05°)		
Angle Error	arc minute (degrees)		5 (0.084°)					
Permissible Speed Range	r/min		0~600	0~416	0~300	0~120	0~83	0~60
Power Source Input			Single-Phase 100-115 VAC ±15% 50/60 Hz 4.5 A			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A		
Excitation Mode			Microstep: Basic Angle/n ＊ (/Step)					
Weight	Motor	lb. (kg)	3.3 (1.5)					
	Driver	lb. (kg)	1.9 (0.85)					
Dimension No.	Motor		8					
	Driver		14					

＊ Sixteen resolutions are available, where n＝1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200 and 250.
Notes: • Direction of rotation of the motor and that of the gear output shaft are the same.
• The value of Maximum Torque is for the gear. Refer to the Speed-Torque Characteristics for the output torque of the geared motors.

■ Speed — Torque Characteristics How to Read Speed-Torque Characteristics→Page C-10
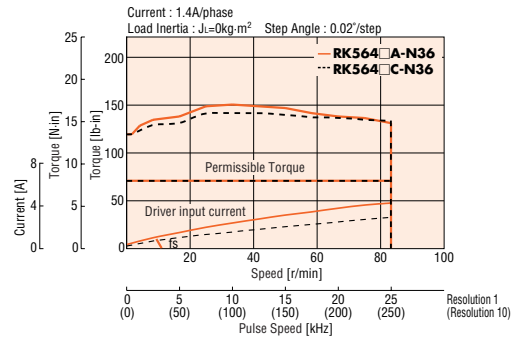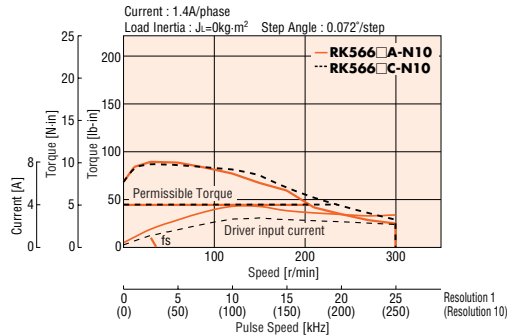
RK566□A-N5 RK566□C-N5
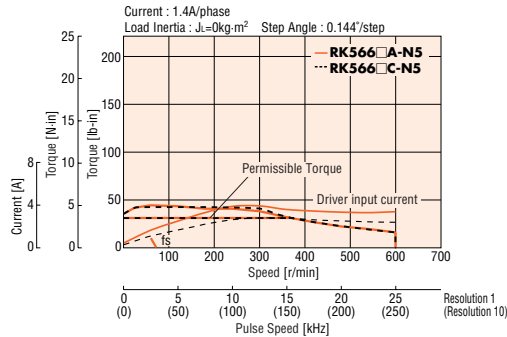
RK564□A-N25 RK564□C-N25
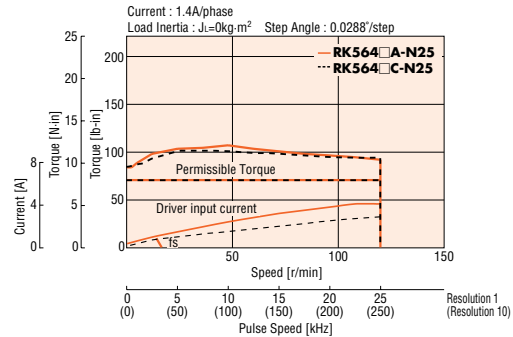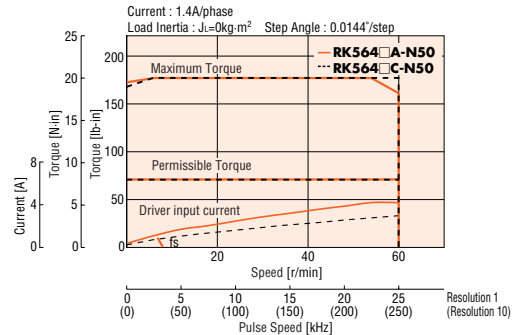

RK566□A-N7.2 RK566□C-N7.2

RK564□A-N36 RK564□C-N36

RK566□A-N10 RK566□C-N10

RK564□A-N50 RK564□C-N50

Note: The pulse input circuit responds to approximately 200 kHz with a pulse duty of 50%.

Common Specifications C-90   Dimensions C-92   Connection and Operation C-98   Motor and Driver Combinations C-104

Introduction

AS

AS PLUS

ASC

RK

CRK II

CSK

PMC

UMK

CSK

PK/PV

PK

UI2120G

EMP401 EMP402

SG8030J

SMK

Accessories

Closed Loop αSTEP
AC Input | DC Input

Motor & Driver Packages
5-Phase Microstep
AC Input | DC Input

5-Phase Full/Half
DC Input

2-Phase Full/Half
AC Input | DC Input

2-Phase Stepping Motors
without Encoder | with Encoder

Driver with Indexer

Controllers

Low-Speed Synchronous Motors

Before Using a Stepping Motor

PN Geared Type Motor Frame Size: ☐ 3.54 in. (☐ 90 mm)

■ Specifications How to Read Specifications Table→Page C-9

Model	Single-Phase 100-115 VAC	Single Shaft	RK599AA-N5	RK599AA-N7.2	RK599AA-N10	RK596AA-N25	RK596AA-N36	RK596AA-N50
		Double Shaft	RK599BA-N5	RK599BA-N7.2	RK599BA-N10	RK596BA-N25	RK596BA-N36	RK596BA-N50
	Single-Phase 200-230 VAC	Single Shaft	RK599AC-N5	RK599AC-N7.2	RK599AC-N10	RK596AC-N25	RK596AC-N36	RK596AC-N50
		Double Shaft	RK599BC-N5	RK599BC-N7.2	RK599BC-N10	RK596BC-N25	RK596BC-N36	RK596BC-N50
Maximum Holding Torque	lb-in (N·m)		123 (14)	177 (20)		320 (37)		
Rotor Inertia J	oz-in^2 (kg·m^2)		14.8 (2700$\times$10^{-7})			7.7 (1400$\times$10^{-7})		
Rated Current	A/Phase		1.4					
Basic Step Angle			0.144°	0.1°	0.072°	0.0288°	0.02°	0.0144°
Gear Ratio			5:1	7.2:1	10:1	25:1	36:1	50:1
Permissible Torque	lb-in. (N·m)		123 (14)	177 (20)		320 (37)		
Maximum Torque	lb-in. (N·m)		240 (28)	300 (35)	300 (35)	490 (56)	530 (60)	530 (60)
Backlash	arc minute (degrees)		2 (0.034°)			3 (0.05°)		
Angle Error	arc minute (degrees)		4 (0.067°)					
Permissible Speed Range	r/min		0~600	0~416	0~300	0~120	0~83	0~60
Power Source Input			Single-Phase 100-115 VAC $\pm$15% 50/60 Hz 4.5 A			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A		
Excitation Mode			Microstep: Basic Angle/n * (/Step)					
Weight	Motor	lb. (kg)	11 (5)			10 (4.7)		
	Driver	lb. (kg)	1.9 (0.85)					
Dimension No.	Motor		9					
	Driver		14					

* Sixteen resolutions are available, where n＝1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200 and 250.

Notes: • Direction of rotation of the motor and that of the gear output shaft are the same.
• The value of Maximum Torque is for the gear. Refer to the Speed-Torque Characteristics for the output torque of the geared motors.
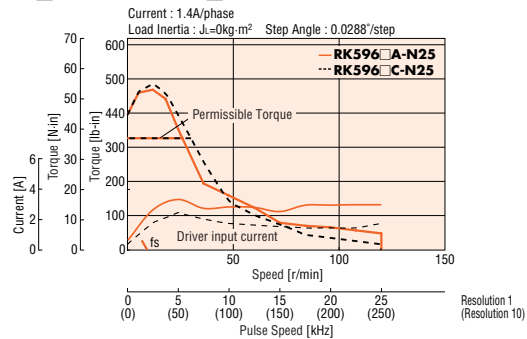
■ Speed — Torque Characteristics How to Read Speed-Torque Characteristics→Page C-10
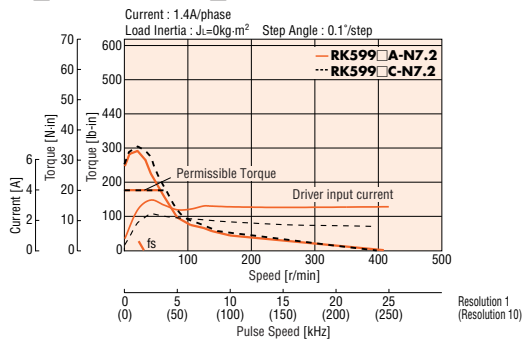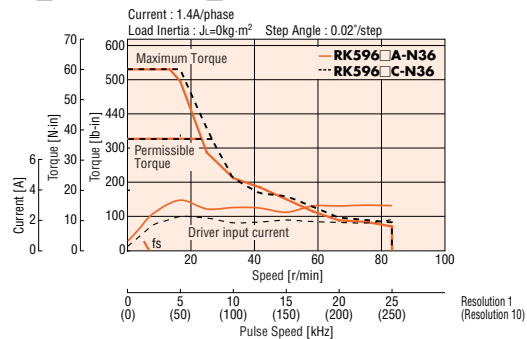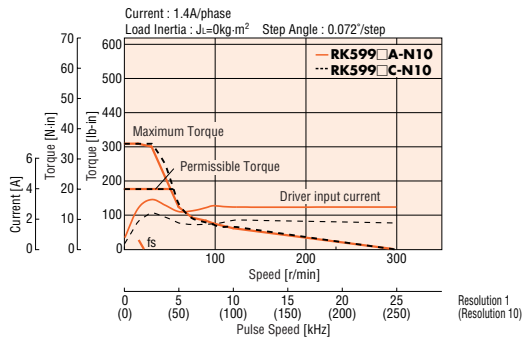
RK599☐A-N5 RK599☐C-N5
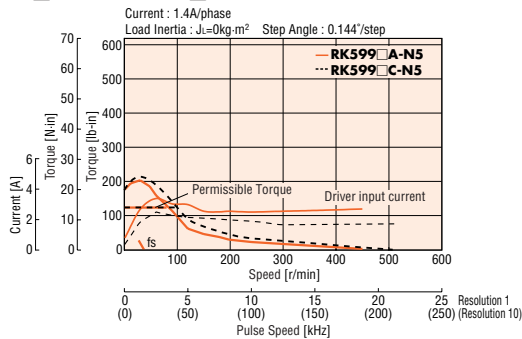
RK596☐A-N25 RK596☐C-N25

RK599☐A-N7.2 RK599☐C-N7.2
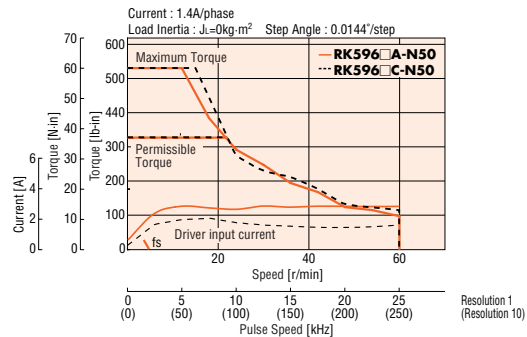

RK596☐A-N36 RK596☐C-N36

RK599☐A-N10 RK599☐C-N10

RK596☐A-N50 RK596☐C-N50

Note: The pulse input circuit responds to approximately 200 kHz with a pulse duty of 50%.

HG Geared Type Motor Frame Size: □ 1.65 in. (□ 42 mm), □ 2.36 in. (□ 60 mm), □ 3.54 in. (□ 90 mm)

■ Specifications How to Read Specifications Table→Page C-9 c ⦿ us (With the **RK543** type, only the driver conforms to the CSA standard.) CE

|								
Model	Single-Phase 100-115 VAC	Single Shaft	**RK543AA-H50**	**RK543AA-H100**	**RK564AA-H50**	**RK564AA-H100**	**RK596AA-H50**	**RK596AA-H100**
		Double Shaft	**RK543BA-H50**	**RK543BA-H100**	**RK564BA-H50**	**RK564BA-H100**	**RK596BA-H50**	**RK596BA-H100**
	Single-Phase 200-230 VAC	Single Shaft	—	—	**RK564AC-H50**	**RK564AC-H100**	**RK596AC-H50**	**RK596AC-H100**
		Double Shaft	—	—	**RK564BC-H50**	**RK564BC-H100**	**RK596BC-H50**	**RK596BC-H100**
Maximum Holding Torque	lb-in (N·m)		30 (3.5)	44 (5.0)	48 (5.5)	70 (8)	220 (25)	320 (37)
Rotor Inertia J	oz-in^2 (kg·m^2)		0.28 (52×10^{-7})		1.15 (210×10^{-7})		8.8 (1600×10^{-7})	
Rated Current	A/Phase		0.75		1.4			
Basic Step Angle			0.0144°	0.0072°	0.0144°	0.0072°	0.0144°	0.0072°
Gear Ratio			50:1	100:1	50:1	100:1	50:1	100:1
Permissible Torque	lb-in. (N·m)		30 (3.5)	44 (5.0)	48 (5.5)	70 (8)	220 (25)	320 (37)
Maximum Torque	lb-in. (N·m)		73 (8.3)	97 (11)	159 (18)	240 (28)	300 (35)	480 (55)
Lost Motion (Load Torque)	arc minute (degrees)		Maximum 1.5 (±0.16 N·m)	Maximum 1.5 (±0.2 N·m)	Maximum 0.7 (±0.28 N·m)	Maximum 0.7 (±0.39 N·m)	Maximum 1.5 (±1.2 N·m)	Maximum 1.5 (±1.2 N·m)
Permissible Speed Range	r/min		0~70	0~35	0~70	0~35	0~70	0~35
Power Source Input			Single-Phase 100-115 VAC ±15% 50/60 Hz 1 A		Single-Phase 100-115 VAC ±15% 50/60 Hz 4.5 A		Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A	
Excitation Mode			Microstep: Basic Angle/n ✻ (/Step)					
Weight	Motor	lb. (kg)	1 (0.46)		2.4 (1.08)		8.1 (3.7)	
	Driver	lb. (kg)	0.88 (0.4)		1.9. (0.85)			
Dimension No.	Motor/Driver		10/13		11/14		12/14	

✻ Sixteen resolutions are available, where n=1, 2, 2.5, 4, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200 and 250.
Notes: • The inertia represents a sum of the inertia at the harmonic gear converted to a motor shaft value, and the rotor inertia.
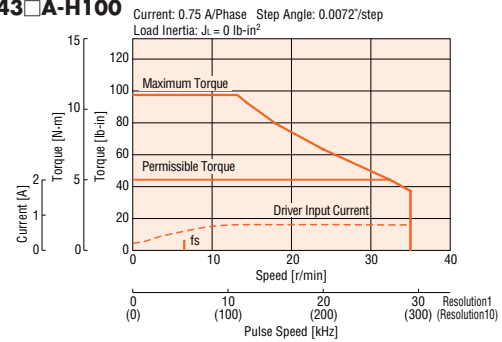• Direction of rotation of the motor and that of the gear output shaft are the opposite.
• The value of Maximum Torque is for the gear. Refer to the Speed-Torque Characteristics for the output torque of the geared motors.

■ Speed — Torque Characteristics How to Read Speed-Torque Characteristics→Page C-10
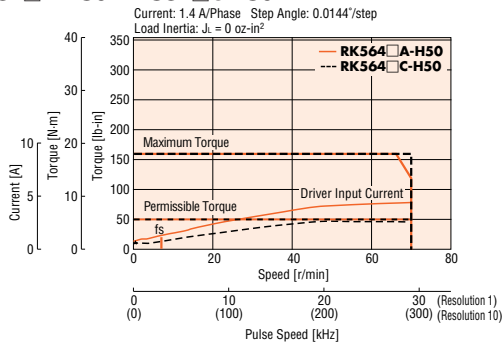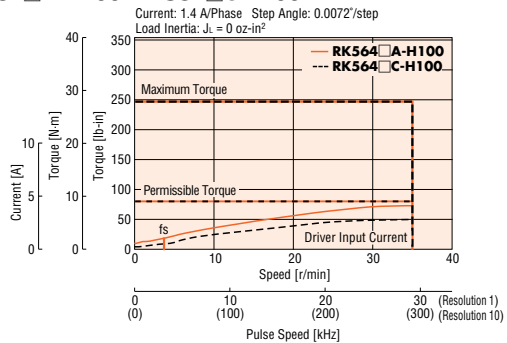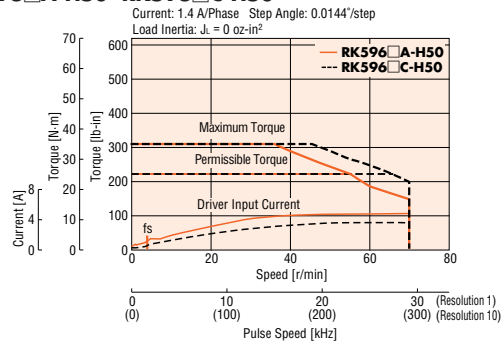
RK543☐A-H50
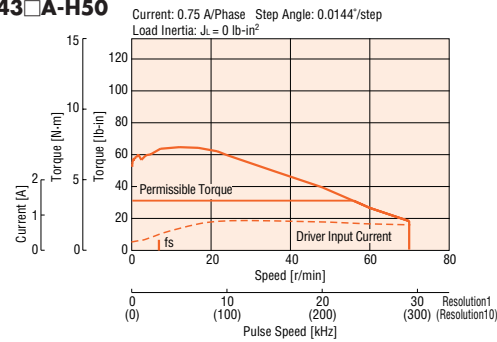
RK543☐A-H100

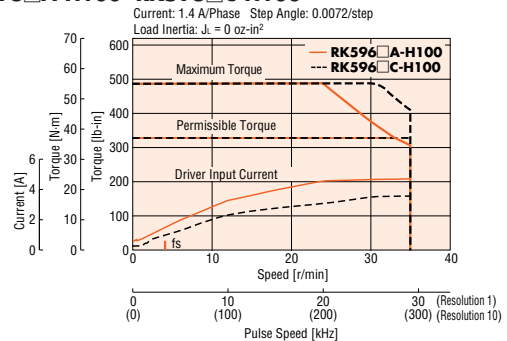**RK564☐A-H50 RK564☐C-H50**

RK564☐A-H100 RK564☐C-H100

RK596☐A-H50 RK596☐C-H50

RK596☐A-H100 RK596☐C-H100

Note: The pulse input circuit responds to approximately 200 kHz with a pulse duty of 50%.

■ Common Specifications

Input Signal	Input Mode	Photocoupler input, Input impedance: 220 Ω; Input current: 10 to 20 mA ON: +4.5 V～5 V, OFF: 0～+1 V (Voltage between terminals)
	Pulse Signal (CW Pulse Signal)	Operation command pulse signal (CW direction operation command pulse signal when in 2-pulse input mode) Pulse width: 2.5 μs minimum; Pulse rise/fall: 2 μs maximum Pulse duty: 50% and below The motor moves one step when the pulse input is switched from photocoupler On to Off. Maximum input frequency: 200 kHz (When the duty is 50%) Negative logic pulse input.
	Rotation Direction Signal (CCW Pulse Signal)	Rotation direction signal, Photocoupler OFF: CCW; Photocoupler ON: CW (CCW direction operation command pulse signal when in 2-pulse input mode Pulse width: 2.5 μs minimum; Pulse rise/fall: 2 μs maximum Pulse duty: 50% and below The motor moves one step when the pulse input is switched from photocoupler On to Off. Maximum input pulse frequency: 200 kHz (When the duty is 50%) Negative logic pulse input.)
	All Windings Off Signal	When in the "photocoupler ON" state, the output current to the motor is cut off and the motor's shaft can be rotated manually. When in the "photocoupler OFF" state, the output current is supplied to the motor.
	Step Angle Select Signal	Step angle specified in DATA1 when photocoupler OFF Step angle specified in DATA2 when photocoupler ON
Output Signal	Output Mode	Photocoupler, Open Collector Output External usage conditions 24 VDC maximum, 10 mA maximum
	Excitation Timing Signal	The signal is output every time the excitation sequence returns to the initial stage "0." (Photocoupler: ON) 0.72°/step (1 resolution): Signal output every 10 pulses; 0.072°/step (10 resolutions): Signal output every 100 pulses
	Overheat Signal	Output is turned off when the driver's internal temperature rises to approximately 176°F (80°C) or above. (Photocoupler: OFF)
Functions		Automatic Current Cutback, Automatic current off, Step Angle Switch, Pulse Input Mode Switch, Smooth Drive Function
Indicators (LED)		Power input, Excitation Timing signal output, Overheat signal output
Cooling Method		Natural Ventilation

■ General Specifications

Specifications		Motor	Driver
Insulation Class		Class B [266°F (130°C)] [Recognized as Class A 221°F (105°C) by UL/CSA standard]	—
Insulation Resistance		100 MΩ minimum under normal temperature and humidity, when measured by a 500 VDC megger between the windings and the motor casing.	100 MΩ minimum under normal temperature and humidity, when measured by a 500 VDC megger between the following places: • Power input terminal - Protective earth terminal • Motor output terminal - Protective earth terminal • Electromagnetic brake power output terminal* - Protective earth terminal • Signal input/output terminals - Power input terminal • Signal input/output terminals - Motor output terminal • Signal input/output terminals* - Electromagnetic brake power output terminal *Only for electromagnetic brake type
Dielectric Strength		Sufficient to withstand 1.5 kV (1.0 kV for **RK54□**), 60 Hz applied for one minute between the windings and casing under normal temperature and humidity.	Sufficient to withstand the following for one minute, under normal temperature and humidity. • Power input terminal - Protective earth terminal 1.1 k VAC 60 Hz • Motor output terminal - Protective earth terminal 1.1 k VAC 60 Hz • Electromagnetic brake power output terminal* - Protective earth terminal 1.1 k VAC 60 Hz • Signal input/output terminals - Power input terminal 1.8 k VAC 60 Hz • Signal input/output terminals - Motor output terminal 1.8 k VAC 60 Hz • Signal input/output terminals* - Electromagnetic brake power output terminal 1.8 k VAC 60 Hz *Only for electromagnetic brake type
Operating Environment	Ambient Temperature	14°F～122°F (−10°C～+50°C) (nonfreezing) [Harmonic geared type: 32°F～104°F (0°C～+40°C)]	32°F～122°F (0°C～+50°C) (nonfreezing)
	Humidity	85% or less, noncondensing	
	Atmosphere	No corrosive gases, dust, water or oil.	
Temperature Rise		Temperature rise of the coil measured by the Change Resistance Method is 144°F (80°C) or less. (at standstill, five phases energized)	—
Stop Position Accuracy *1		±3 minutes (±0.05°)	—
Shaft Runout		0.002 inch (0.05 mm) T.I.R. at top of output shaft*4	—
Radial Play *2		0.001 inch (0.025 mm) max. of 1.12 lb. (5 N)	—
Axial Play *3		0.003 inch (0.075 mm) max. of 2.2 lb. (10 N)	—
Concentricity		0.003 inch (0.075 mm) T.I.R.*4	—
Perpendicularity		0.003 inch (0.075 mm) 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 1.12 lb. (5 N) 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 2.2 lb. (10 N) load is applied to the motor's shaft in the axial direction.
*4 T.I.R. (Total Indicator Reading): Total dial gauge reading when the measurement section is rotated one revolution centered on a reference axis.

Note:
● Do not measure insulation resistance or perform a dielectric strength test while the motor and driver are connected.

Permissible Overhung Load and Permissible Thrust Load
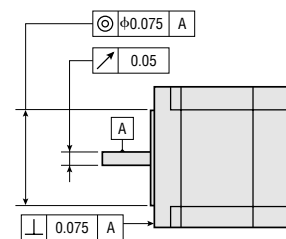
Unit = Upper values: lb./Lower values: N

Model	Overhung Load Distance from the Output Shaft End [inch (mm)]					Thrust Load
	0 (0)	0.2 (5)	0.39 (10)	0.59 (15)	0.79 (20)	
RK543 **RK544** **RK545**	4.5 20	5.6 25	7.6 34	11.7 52	—	The permissible thrust load [lb. (N)] shall be no greater than the motor mass.
RK564 **RK566** **RK569**	14.1 63	16.8 75	21 95	29 130	42 190	
RK596 **RK599** **RK5913**	58 260	65 290	76 340	87 390	108 480	
RK543-T□	2.2 10	3.1 14	4.5 20	6.7 30	—	3.3 15
RK564-T□	15.7 70	18 80	22 100	27 120	33 150	9 40
RK596-T□	49 220	56 250	67 300	78 350	90 400	22 100
RK544-N□	22 100	27 120	33 150	42 190	—	22 100
RK566-N5	45 200	49 220	56 250	63 280	72 320	22 100
RK566-N7.2 **RK566-N10**	56 250	60 270	67 300	76 340	87 390	
RK564-N25 **RK564-N36** **RK564-N50**	74 330	81 360	90 400	101 450	117 520	
RK599-N5	108 480	117 520	123 550	130 580	139 620	67 300
RK599-N7.2 **RK599-N10**	108 480	121 540	135 600	153 680	177 790	
RK596-N25	191 850	210 940	230 1050	240 1110	260 1190	
RK596-N36	200 930	230 1030	250 1150	270 1220	290 1300	
RK596-N50	230 1050	260 1160	290 1300	310 1380	330 1490	
RK543-H□	40 180	49 220	60 270	81 360	114 510	49 220
RK564-H□	72 320	83 370	99 440	123 550	162 720	101 450
RK596-H□	240 1090	250 1150	270 1230	290 1310	310 1410	290 1300

● Enter the gear ratio in the box (□) within the model numbers.

Stepping Motors

Introduction

AS

AS PLUS

ASC

RK

CRK II

CSK

PMC

UMK

CSK

PK/PV

PK

UI2120G

EMP401 EMP402

SG8030J

SMK

Accessories

Before Using a Stepping Motor

Closed Loop αSTEP
AC Input
DC Input

Motor & Driver Packages
5-Phase Microstep
AC Input
DC Input
5-Phase Full/Half
DC Input
2-Phase Full/Half
AC Input
DC Input

2-Phase Stepping Motors
without Encoder
with Encoder

Driver
with Indexer

Controllers

Low-Speed Synchronous Motors
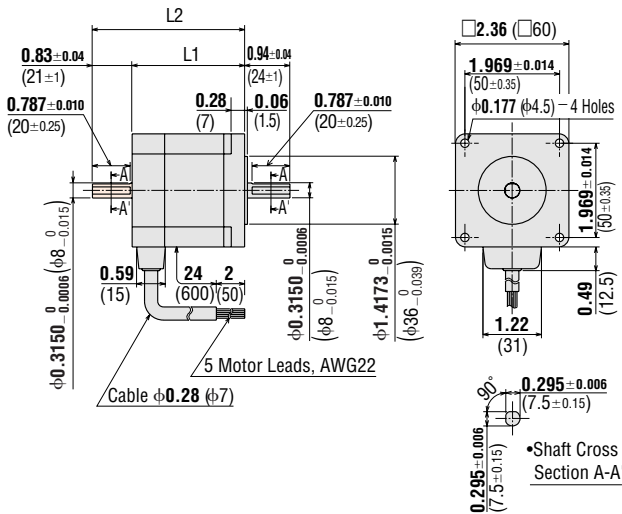
■ Dimensions Scale 1/4, Unit = **inch** (mm)
● Motor
### ◆ Standard Type

1 Motor Frame Size: □1.65 in. (□42 mm)

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

Model	Motor Model	L1 inch (mm)	L2 inch (mm)	Weight lb. (kg)	DXF
RK543AA	PK543AW	1.3 (33)	—	0.55 (0.25)	B001
RK543BA	PK543BW		1.89 (48)		
RK544AA	PK544AW	1.54 (39)	—	0.66 (0.3)	B002
RK544BA	PK544BW		2.13 (54)		
RK545AA	PK545AW	1.85 (47)	—	0.88 (0.4)	B003
RK545BA	PK545BW		2.44 (62)		

2 Motor Frame Size: □2.36 in. (□60 mm)

Model	Motor Model	L1 inch (mm)	L2 inch (mm)	Weight lb. (kg)	DXF
RK564AA	PK564AW	1.91 (48.5)	—	1.3 (0.6)	B004
RK564AC					
RK564BA	PK564BW		2.74 (69.5)		
RK564BC					
RK566AA	PK566AW	2.34 (59.5)	—	1.8 (0.8)	B005
RK566AC					
RK566BA	PK566BW		3.17 (80.5)		
RK566BC					
RK569AA	PK569AW	3.50 (89)	—	2.9 (1.3)	B006
RK569AC					
RK569BA	PK569BW		4.33 (110)		
RK569BC					

3 Motor Frame Size: □3.35 in. (□85 mm)

Model	Motor Model	L1 inch (mm)	L2 inch (mm)	Weight lb. (kg)	DXF
RK596AA	PK596AW	2.68 (68)	—	3.7 (1.7)	B007
RK596AC					
RK596BA	PK596BW		3.94 (100)		
RK596BC					
RK599AA	PK599AW	3.86 (98)	—	6.2 (2.8)	B008
RK599AC					
RK599BA	PK599BW		5.12 (130)		
RK599BC					
RK5913AA	PK5913AW	5.04 (128)	—	8.4 (3.8)	B009
RK5913AC					
RK5913BA	PK5913BW		6.3 (160)		
RK5913BC					

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

◆ TH Geared Type

4 Motor Frame Size: □1.65 in. (□42 mm)

Model	Motor Model	Gear Ratio	Weight lb. (kg)	DXF
RK543AA-T□	PK543AW-T□	**3.6**, **7.2**,	0.77 (0.35)	B183
RK543BA-T□	PK543BW-T□	**10**, **20**, **30**		

● Enter the gear ratio in the box (□) within the model number.

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

5 Motor Frame Size: □2.36 in. (□60 mm)
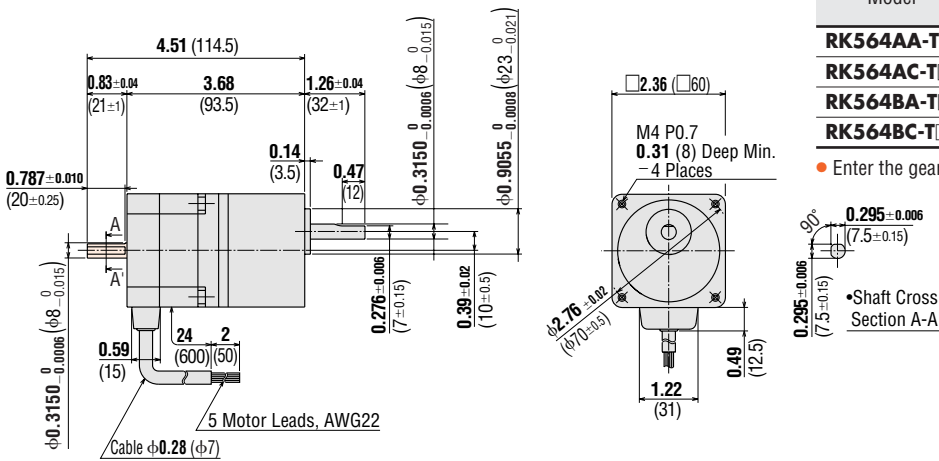
Model	Motor Model	Gear Ratio	Weight lb. (kg)	DXF
RK564AA-T□	PK564AW-T□	**3.6**, **7.2**,	2.1 (0.95)	B187
RK564AC-T□		**10**, **20**, **30**		
RK564BA-T□	PK564BW-T□			
RK564BC-T□				

● Enter the gear ratio in the box (□) within the model number.

•Shaft Cross Section A-A'

6 Motor Frame Size: □3.54 in. (□90 mm)
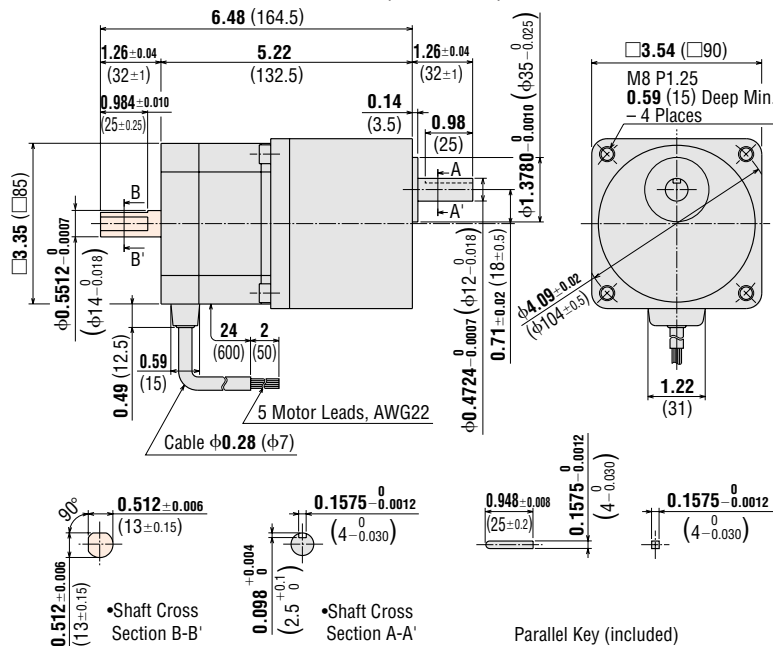
Model	Motor Model	Gear Ratio	Weight lb. (kg)	DXF
RK596AA-T□	PK596AW-T□	**3.6**, **7.2**	6.3 (2.85)	B188
RK596AC-T□				
RK596AA-T□	PK596AW1-T□	**10**, **20**, **30**		
RK596AC-T□				
RK596BA-T□	PK596BW-T□	**3.6**, **7.2**		
RK596BC-T□				
RK596BA-T□	PK596BW1-T□	**10**, **20**, **30**		
RK596BC-T□				

● Enter the gear ratio in the box (□) within the model number.

•Shaft Cross Section B-B'

•Shaft Cross Section A-A'

Parallel Key (included)

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

◆ PN Geared Type

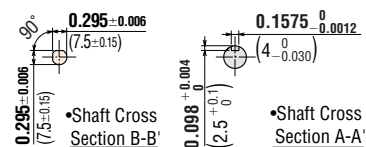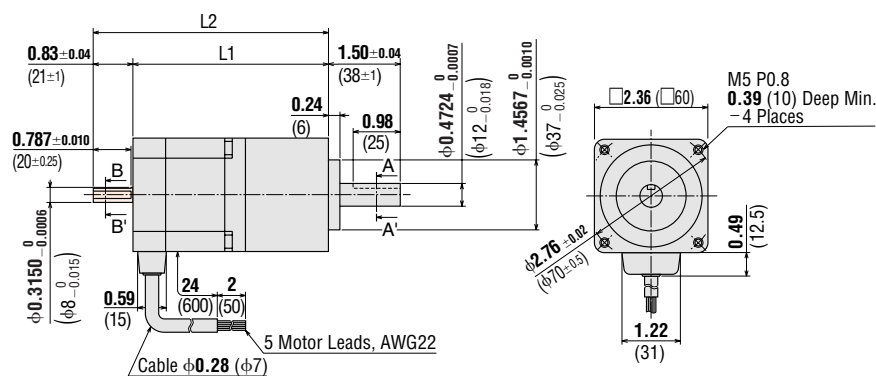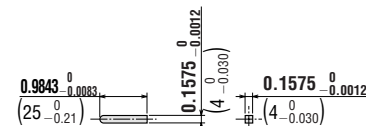7 Motor Frame Size: □1.65 in. (□42 mm)

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

Shaft Cross Section A-A'
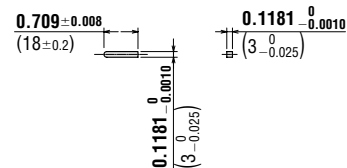
Parallel Key (Included)

Model	Motor Model	Gear Ratio	Weight lb. (kg)	DXF
RK544AA-N□	PK544AW-N□	**5**, **7.2**, **10**	1.2 (0.56)	B312
RK544BA-N□	PK544BW-N□			

● Enter the gear ratio in the box (□) within the model number.

8 Motor Frame Size: □2.36 in. (□60 mm)

•Shaft Cross Section B-B'

•Shaft Cross Section A-A'

Parallel Key (Included)

Model	Motor Model	Gear Ratio	L1 inch (mm)	L2 inch (mm)	Weight lb. (kg)	DXF
RK566AA-N□	PK566AW-N□	**5**, **7.2**, **10**	4.07 (103.5)	—	3.3 (1.5)	B190
RK566AC-N□						
RK566BA-N□	PK566BW-N□			4.90 (124.5)		
RK566BC-N□						
RK564AA-N□	PK564AW-N□	**25**, **36**, **50**	4.27 (108.5)	—		B191
RK564AC-N□						
RK564BA-N□	PK564BW-N□			5.1 (129.5)		
RK564BC-N□						

● Enter the gear ratio in the box (□) within the model number.

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

9 Motor Frame Size: □3.54 in. (□90 mm)
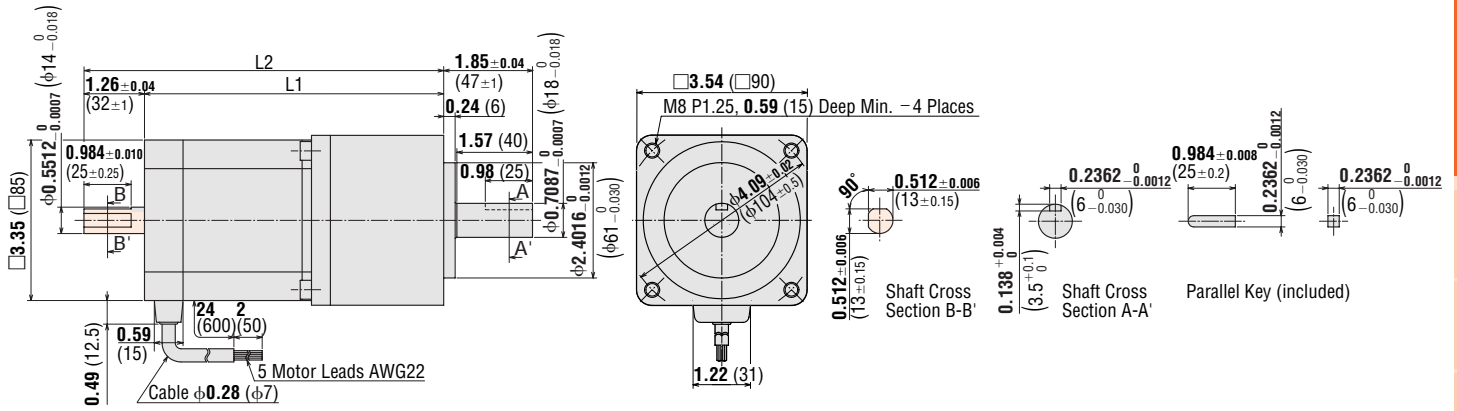
Model	Motor Model	Gear Ratio	L1 inch (mm)	L2 inch (mm)	Weight lb. (kg)	DXF
RK599AA-N□	PK599AW-N□	**5**, **7.2**, **10**	6.22 (158)	—	11 (5.0)	B282
RK599AC-N□						
RK599BA-N□	PK599BW-N□			7.48 (190)		
RK599BC-N□						
RK596AA-N□	PK596AW-N□	**25**, **36**, **50**	5.94 (151)	—	10 (4.7)	B283
RK596AC-N□						
RK596BA-N□	PK596BW-N□			7.20 (183)		
RK596BC-N□						

● Enter the gear ratio in the box (□) within the model number.

◆ **HG Geared Type**

10 Motor Frame Size: □1.65 in. (□42 mm)

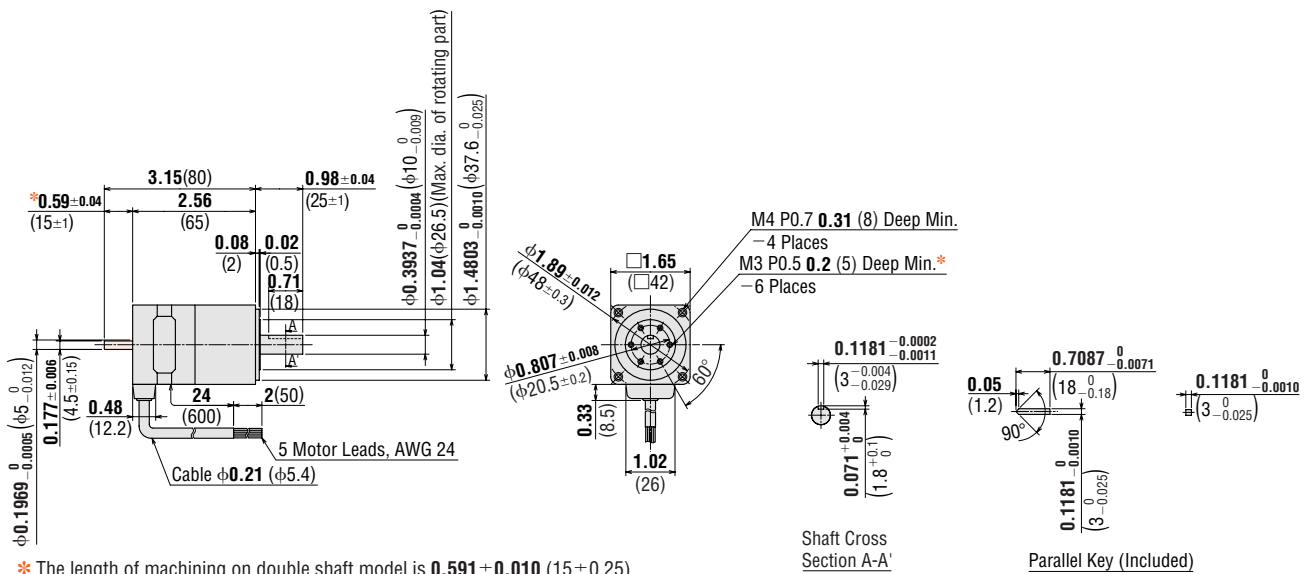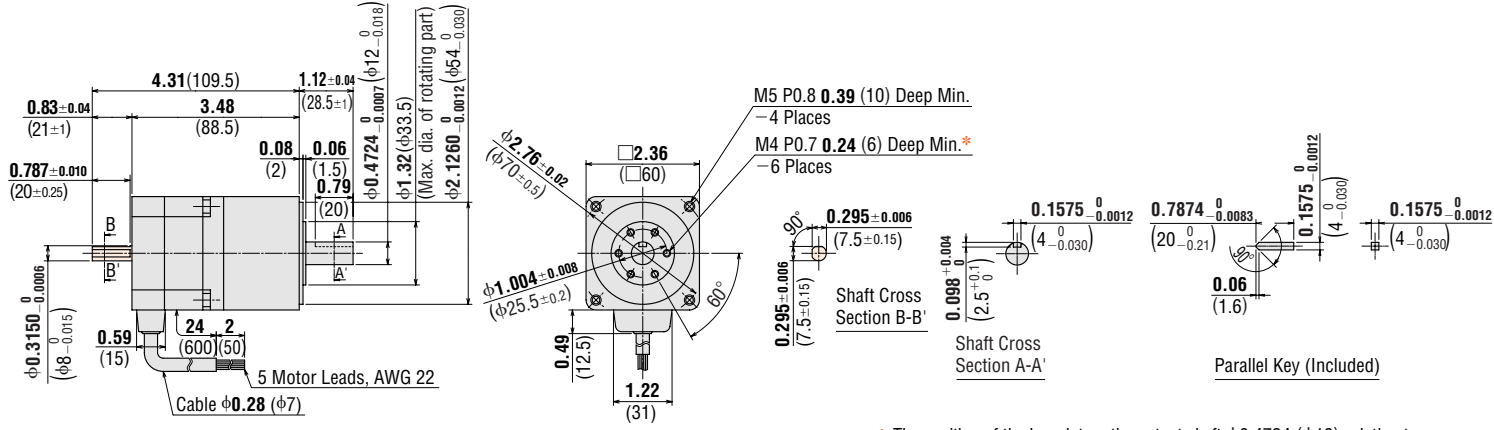✳ The length of machining on double shaft model is **0.591**±**0.010** (15±0.25).

✳ The position of the key slot on the output shaft φ0.3937 (φ10) relative to the screw holes on a maximum diameter of φ1.04 (φ26.5) on the rotating part is arbitrary.

Model	Motor Model	Gear Ratio	Weight lb. (kg)	DXF
RK543AA-H□	PK543AW-H□S	**50**, **100**	1.0 (0.46)	B313
RK543BA-H□	PK543BW-H□S			

● Enter the gear ratio in the box (□) within the model number.

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

Introduction AS AS PLUS ASC RK CRK II CSK PMC UMK CSK PK/PV PK UI2120G EMP401 EMP402 SG8030J SMK Accessories Before Using a Stepping Motor

Closed Loop αSTEP AC Input DC Input | 5-Phase Microstep AC Input DC Input | 5-Phase Full/Half DC Input | 2-Phase Full/Half AC Input DC Input | 2-Phase Stepping Motors without Encoder with Encoder | Driver with Indexer Controllers Low-Speed Synchronous Motors

Motor & Driver Packages

11 Motor Frame Size: □2.36 in. (□60 mm)

M5 P0.8 **0.39** (10) Deep Min.
−4 Places

M4 P0.7 **0.24** (6) Deep Min.*
−6 Places

0.295±**0.006**
(7.5±0.15)

Shaft Cross
Section B-B'

0.1575 0
−0.0012
(4 0
−0.030)

0.7874 0
−0.0083
(20 0
−0.21)

0.1575 0
−0.0012
(4 0
−0.030)

0.098 +0.004
0
(2.5 +0.1
0)

Shaft Cross
Section A-A'

0.06
(1.6)

Parallel Key (Included)

4.31(109.5)
3.48
(88.5)
0.83±**0.04**
(21±1)
0.787±**0.010**
(20±0.25)
1.12±**0.04**
(28.5±1)
0.08
(2)
0.06
(1.5)
0.79
(20)

φ**0.3150** 0
−0.0006
(φ8 0
−0.015)

0.59
(15)

24
(600)
2
(50)

5 Motor Leads, AWG 22
Cable φ**0.28** (φ7)

□**2.36**
(□60)

φ**2.76**±**0.02**
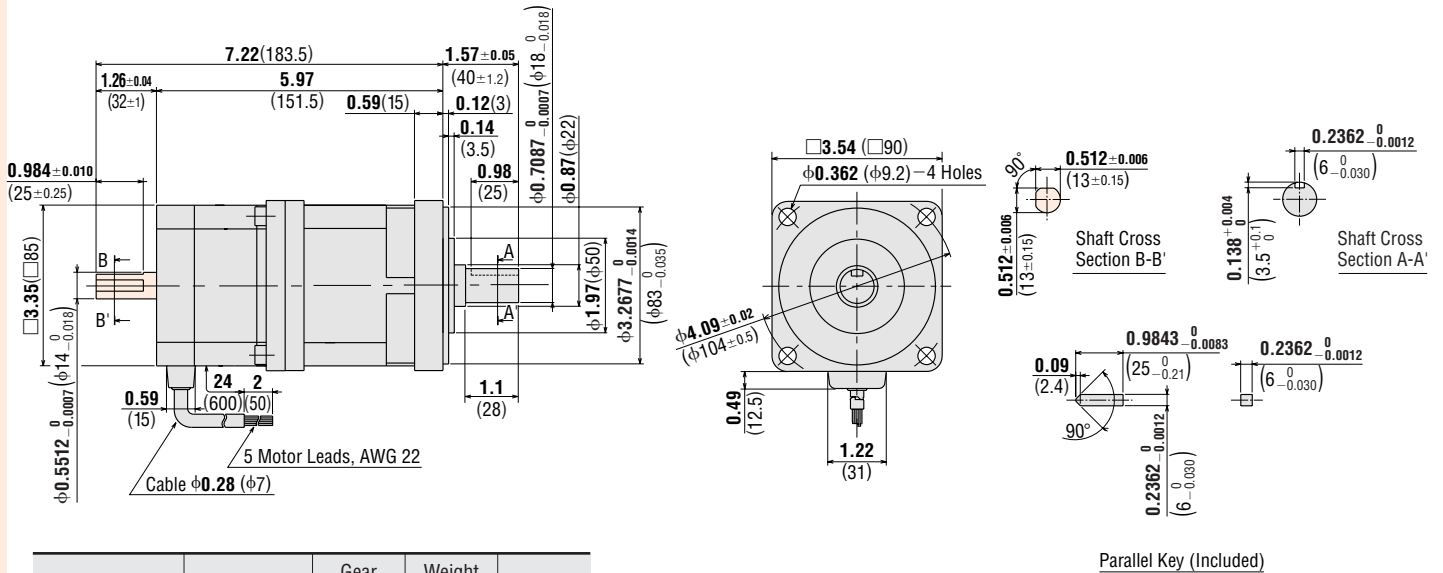(φ70±0.5)

φ**1.004**±**0.008**
(φ25.5±0.2)

60°

0.49
(12.5)

1.22
(31)

* The position of the key slot on the output shaft φ0.4724 (φ12) relative to the screw holes on a maximum diameter of φ1.32 (φ33.5) on the rotating part is arbitrary.

Model	Motor Model	Gear Ratio	Weight lb. (kg)	DXF
RK564AA-H□	PK564AW-H□S	**50**, **100**	2.4 (1.08)	B314
RK564AC-H□				
RK564BA-H□	PK564BW-H□S			
RK564BC-H□				

● Enter the gear ratio in the box (□) within the model number.

12 Motor Frame Size: □3.54 in. (□90 mm)

7.22(183.5)
5.97
(151.5)
1.26±**0.04**
(32±1)
0.984±**0.010**
(25±0.25)
0.59(15)
1.57±**0.05**
(40±1.2)
0.12(3)
0.14
(3.5)
0.98
(25)

□**3.35**(□85)

φ**0.5512** 0
−0.0007
(φ14 0
−0.018)

0.59
(15)

24
(600)
2
(50)

5 Motor Leads, AWG 22
Cable φ**0.28** (φ7)

1.1
(28)

□**3.54** (□90)
φ**0.362** (φ9.2)−4 Holes

φ**4.09**±**0.02**
(φ104±0.5)

0.49
(12.5)

1.22
(31)

0.512±**0.006**
(13±0.15)

Shaft Cross
Section B-B'

0.2362 0
−0.0012
(6 0
−0.030)

Shaft Cross
Section A-A'

0.138 +0.004
0
(3.5 +0.1
0)

0.9843 0
−0.0083
(25 0
−0.21)

0.2362 0
−0.0012
(6 0
−0.030)

0.09
(2.4)

90°

0.2362 0
−0.0012
(6 0
−0.030)

Parallel Key (Included)

Model	Motor Model	Gear Ratio	Weight lb. (kg)	DXF
RK596AA-H□	PK596AW1-H□	**50**, **100**	8.1 (3.7)	B136
RK596AC-H□				
RK596BA-H□	PK596BW1-H□			
RK596BC-H□				

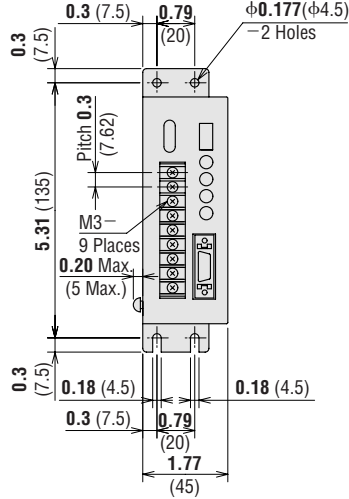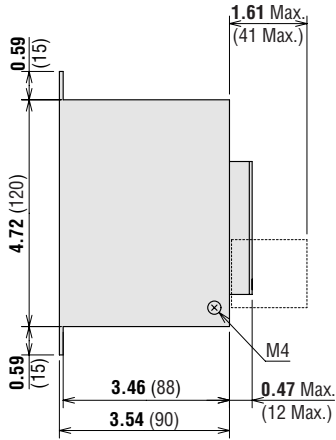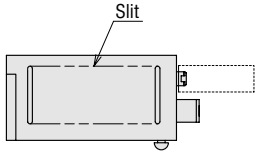● Enter the gear ratio in the box (□) within the model number.

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

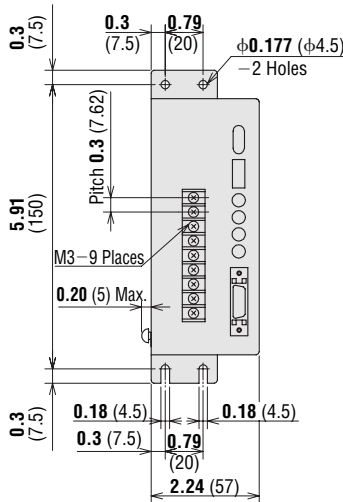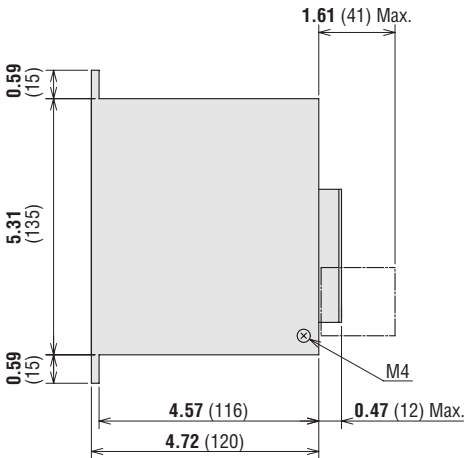● **Driver**

13 RKD507-A
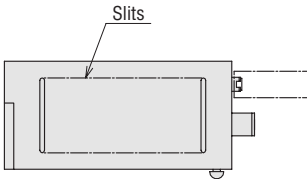
Weight: 0.88 lb. (0.4 kg)

DXF B315

Slit

●**I/O Connector (included)**
Connector: 54306-2011 (MOLEX)
Cover Assembly: 54331-1201 (MOLEX)

1.61 Max.
(41 Max.)
0.59 (15)
4.72 (120)
0.59 (15)
3.46 (88)
3.54 (90)
0.47 Max. (12 Max.)
M4

0.3 (7.5)
0.79 (20)
φ0.177 (φ4.5) −2 Holes
Pitch 0.3 (7.62)
5.31 (135)
M3− 9 Places
0.20 Max. (5 Max.)
0.3 (7.5)
0.18 (4.5)
0.18 (4.5)
0.3 (7.5)
0.79 (20)
1.77 (45)

14 RKD514L-A, RKD514L-C, RKD514H-A, RKD514H-C

Weight: 1.9 lb. (0.85 kg)

DXF B284

Slits

●**I/O Connector (included)**
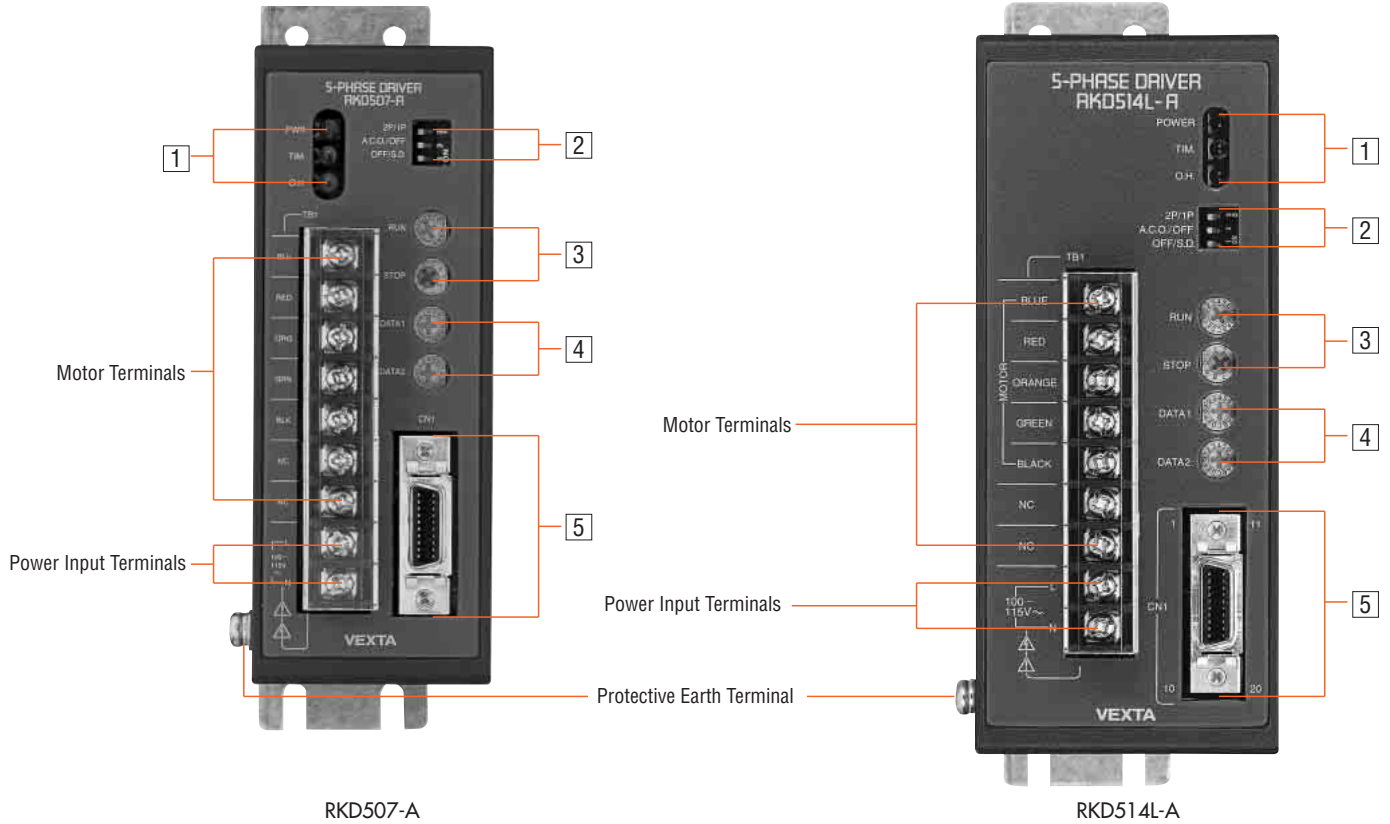Connector: 54306-2011 (MOLEX)
Cover Assembly: 54331-1201 (MOLEX)

1.61 (41) Max.
0.59 (15)
5.31 (135)
0.59 (15)
4.57 (116)
4.72 (120)
0.47 (12) Max.
M4

0.3 (7.5)
0.3 (7.5)
0.79 (20)
φ0.177 (φ4.5) −2 Holes
Pitch 0.3 (7.62)
5.91 (150)
M3−9 Places
0.20 (5) Max.
0.3 (7.5)
0.18 (4.5)
0.3 (7.5)
0.18 (4.5)
0.79 (20)
2.24 (57)

■ Connection and Operation

Motor Terminals

Power Input Terminals

Protective Earth Terminal

RKD507-A

Motor Terminals

Power Input Terminals

RKD514L-A

1 LED Monitor Display

Indication	Color	Function
POWER	Green	Power Input Display
TIM.	Green	Excitation Timing Output Display
O.H.	Red	Overheat Output Display

2 Function Select Switches

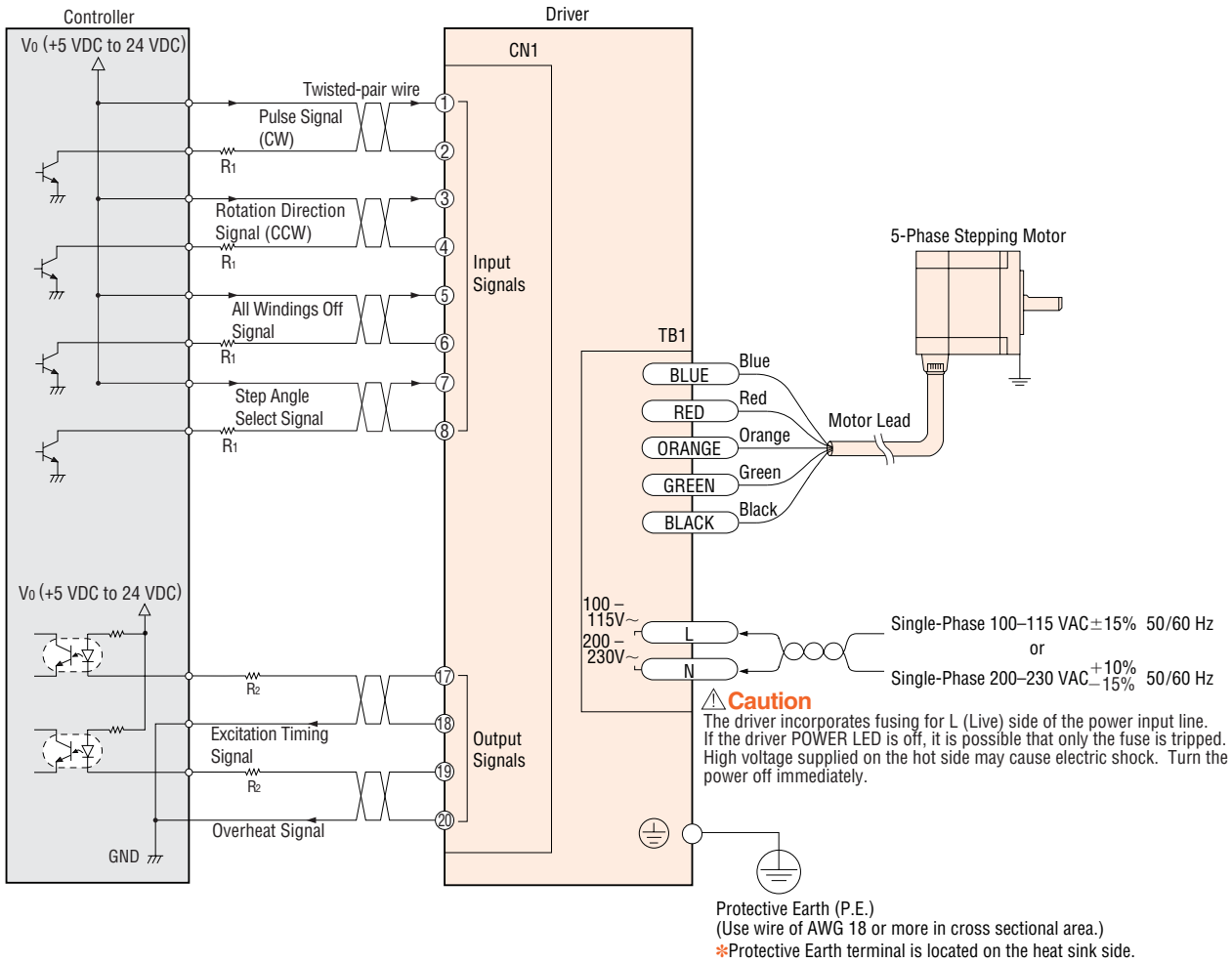| Indication	Switch Name	Function
2P/1P	Pulse Input Mode Switch	Switches between 1-pulse input and 2-pulse input.
A.C.O./OFF	Automatic Current Off Function Switch	When the temperature inside the driver rises above 176°F (80°C), this function automatically switches the motor current off. The function can be set and defeated with this switch.
OFF/S.D.	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 defeated with this switch.

3 Current Adjustment Switches

Indication	Switch Name	Function
RUN	Motor Run Current Switch	For adjusting the motor running current.
STOP	Motor Stop Current Switch	For adjusting the current at motor standstill.

4 Resolution Switches

Indication	Switch Name	Function
DATA1	Step Angle Switch	Each switch can be set to the desired resolution from the 16 resolution levels.
DATA2		

5 Input/Output Signals

Indication	Terminal No.	Input/Output	Terminal Name
CN1	1	Input Signals	Pulse Signal (CW Pulse Signal)
	2		
	3		Rotation Direction Signal (CCW Pulse Signal)
	4		
	5		All Windings Off Signal
	6		
	7		Step Angle Select Signal
	8		
	17	Output Signals	Excitation Timing Signal
	18		
	19		Overheat Signal
	20		

Stepping Motors

Introduction

AS

AS PLUS

ASC

RK

CRKII

CSK

PMC

UMK

CSK

PK/PV

PK

UI2120G

EMP401
EMP402

SG8030J

SMK

Accessories

Closed Loop αSTEP
AC Input
DC Input

5-Phase Microstep
AC Input
DC Input

5-Phase Full/Half
DC Input

2-Phase Full/Half
AC Input
DC Input

2-Phase Stepping Motors
without Encoder

with Encoder

Driver with Indexer

Controllers

Low-Speed Synchronous Motors

Before Using a Stepping Motor

Motor & Driver Packages

■ Connection Diagrams

Controller — V_0 (+5 VDC to 24 VDC)

Twisted-pair wire

Pulse Signal (CW)
R_1

Rotation Direction Signal (CCW)
R_1

All Windings Off Signal
R_1

Step Angle Select Signal
R_1

V_0 (+5 VDC to 24 VDC)

R_2

Excitation Timing Signal
R_2

Overheat Signal

GND

Driver — CN1

Input Signals: 1, 2, 3, 4, 5, 6, 7, 8

Output Signals: 17, 18, 19, 20

TB1

BLUE — Blue
RED — Red
ORANGE — Orange
GREEN — Green
BLACK — Black

Motor Lead

5-Phase Stepping Motor

$100 – 115V\sim$
$200 – 230V\sim$

L
N

Single-Phase 100–115 VAC$\pm$15% 50/60 Hz
or
Single-Phase 200–230 VAC$^{+10\%}_{-15\%}$ 50/60 Hz

⚠ **Caution**
The driver incorporates fusing for L (Live) side of the power input line.
If the driver POWER LED is off, it is possible that only the fuse is tripped.
High voltage supplied on the hot side may cause electric shock. Turn the power off immediately.

Protective Earth (P.E.)
(Use wire of AWG 18 or more in cross sectional area.)
∗Protective Earth terminal is located on the heat sink side.

◆ Power Supply

Can be used with single-phase 100-115 VAC or single-phase 200-230 VAC 50/60 Hz power supply. Use a power supply that can supply sufficient input current. When power supply capacity is insufficient, a decrease in motor output can cause the following malfunctions:
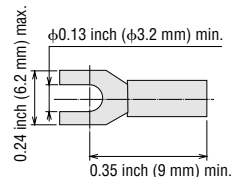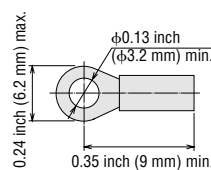• Motor does not rotate properly at high-speed (insufficient torque).
• Slow motor startup and stopping.

Notes:
• Keep the voltage Vo between 5 VDC and 24 VDC. When they are equal to 5 VDC, the external resistance R_1 is not necessary. When they are above 5 VDC, connect R_1 to keep the current between 10 mA and 20 mA, and connect R_2 to keep the current below 10 mA.
• Use twisted-pair wire of AWG 24 or thicker and 6.6 feet (2 m) or less in length for the signal line.
• Note that as the length of the pulse signal line increases, the maximum transmission frequency decreases. (→ Technical Reference F-36)
• Use AWG 22 or thicker for motor lines (when extended) and power supply lines, and use AWG 18 or thicker for the wire for the protective earthing line.
• Use spot grounding for the grounding of the driver and external controller.
• Signal lines should be kept at least 3.9 inch (10 cm) away from power lines (power supply lines and motor lines). Do not bind the signal line and power line together.

◆ Recommended Crimp Terminals
• Round shape terminal with insulator   • U shape terminal with insulator

ϕ0.13 inch (ϕ3.2 mm) min.
0.24 inch (6.2 mm) max.
0.35 inch (9 mm) min.

ϕ0.13 inch (ϕ3.2 mm) min.
0.24 inch (6.2 mm) max.
0.35 inch (9 mm) min.

∗ Crimp terminals are not provided with the package. They must be furnished separately.

● **Setting the Step Angles (Resolution)**
The driver can be preset to two different step angles (resolutions) using the step angle select switches DATA1 and DATA2.
Use these switches to set the desired resolution from the 16 resolution levels available. (Refer to the table below.)
After setting the two step angles (resolutions), use the step angle select signal to change the step angle.
Photocoupler OFF: Step angle (resolution) set by DATA1 is selected
Photocoupler ON: Step angle (resolution) set by DATA2 is selected

◆ **Standard Type**

Step Angle Select Switch (Common to DATA1 and DATA2)	Resolution	Step Angle
0	1	0.72˚
1	2	0.36˚
2	2.5	0.288˚
3	4	0.18˚
4	5	0.144˚
5	8	0.09˚
6	10	0.072˚
7	20	0.036˚
8	25	0.0288˚
9	40	0.018˚
A	50	0.0144˚
B	80	0.009˚
C	100	0.0072˚
D	125	0.00576˚
E	200	0.0036˚
F	250	0.00288˚

◆ **TH Geared Type**

Step Angle Select Switch (Common to DATA1 and DATA2)	Resolution	Step Angle at Output Shaft				
		Gear Ratio 3.6:1	Gear Ratio 7.2:1	Gear Ratio 10:1	Gear Ratio 20:1	Gear Ratio 30:1
0	1	0.2˚	0.1˚	0.072˚	0.036˚	0.024˚
1	2	0.1˚	0.05˚	0.036˚	0.018˚	0.012˚
2	2.5	0.08˚	0.04˚	0.0288˚	0.0144˚	0.0096˚
3	4	0.05˚	0.025˚	0.018˚	0.009˚	0.006˚
4	5	0.04˚	0.02˚	0.0144˚	0.0072˚	0.0048˚
5	8	0.025˚	0.0125˚	0.009˚	0.0045˚	0.003˚
6	10	0.02˚	0.01˚	0.0072˚	0.0036˚	0.0024˚
7	20	0.01˚	0.005˚	0.0036˚	0.0018˚	0.0012˚
8	25	0.008˚	0.004˚	0.00288˚	0.00144˚	0.00096˚
9	40	0.005˚	0.0025˚	0.00188˚	0.0009˚	0.0006˚
A	50	0.004˚	0.002˚	0.00144˚	0.00072˚	0.00048˚
B	80	0.0025˚	0.00125˚	0.0009˚	0.00045˚	0.0003˚
C	100	0.002˚	0.001˚	0.00072˚	0.00036˚	0.00024˚
D	125	0.0016˚	0.0008˚	0.000576˚	0.000288˚	0.000192˚
E	200	0.001˚	0.0005˚	0.00036˚	0.00018˚	0.00012˚
F	250	0.0008˚	0.0004˚	0.000288˚	0.000144˚	0.000096˚

◆ **PN Geared Type**

Step Angle Select Switch (Common to DATA1 and DATA2)	Resolution	Step Angle at Output Shaft					
		Gear Ratio 5:1	Gear Ratio 7.2:1	Gear Ratio 10:1	Gear Ratio 25:1	Gear Ratio 36:1	Gear Ratio 50:1
0	1	0.144˚	0.1˚	0.072˚	0.0288˚	0.02˚	0.0144˚
1	2	0.072˚	0.05˚	0.036˚	0.0144˚	0.01˚	0.0072˚
2	2.5	0.0576˚	0.04˚	0.0288˚	0.01152˚	0.008˚	0.00576˚
3	4	0.036˚	0.025˚	0.018˚	0.0072˚	0.005˚	0.0036˚
4	5	0.0288˚	0.02˚	0.0144˚	0.00576˚	0.004˚	0.00288˚
5	8	0.018˚	0.0125˚	0.009˚	0.0036˚	0.0025˚	0.0018˚
6	10	0.0144˚	0.01˚	0.0072˚	0.00288˚	0.002˚	0.00144˚
7	20	0.0072˚	0.005˚	0.0036˚	0.00144˚	0.001˚	0.00072˚
8	25	0.00576˚	0.004˚	0.00288˚	0.001152˚	0.0008˚	0.000576˚
9	40	0.0036˚	0.0025˚	0.0018˚	0.00072˚	0.0005˚	0.0036˚
A	50	0.00288˚	0.002˚	0.00144˚	0.000576˚	0.0004˚	0.000288˚
B	80	0.0018˚	0.00125˚	0.0009˚	0.00036˚	0.00025˚	0.0018˚
C	100	0.00144˚	0.001˚	0.00072˚	0.000288˚	0.0002˚	0.000144˚
D	125	0.001152˚	0.0008˚	0.000576˚	0.0002304˚	0.00016˚	0.0001152˚
E	200	0.00072˚	0.0005˚	0.00036˚	0.000144˚	0.0001˚	0.000072˚
F	250	0.000576˚	0.0004˚	0.000288˚	0.0001152˚	0.00008˚	0.0000576˚

◆ **HG Geared Type**

Step Angle Select Switch (Common to DATA1 and DATA2)	Resolution	Step Angle at Output Shaft	
		Gear Ratio 50:1	Gear Ratio 100:1
0	1	0.0144˚	0.0072˚
1	2	0.0072˚	0.0036˚
2	2.5	0.00576˚	0.00288˚
3	4	0.0036˚	0.0018˚
4	5	0.00288˚	0.00144˚
5	8	0.0018˚	0.0009˚
6	10	0.00144˚	0.00072˚
7	20	0.00072˚	0.00036˚
8	25	0.000576˚	0.000288˚
9	40	0.00036˚	0.00018˚
A	50	0.000288˚	0.000144˚
B	80	0.0018˚	0.00009˚
C	100	0.000144˚	0.000072˚
D	125	0.0001152˚	0.0000576˚
E	200	0.000072˚	0.000036˚
F	250	0.0000576˚	0.0000288˚

Notes:
• Do not change the step angle input setting unless the pulse signal is at rest.
 If the setting is changed while pulses are being input, a motor positional error may result.
• There is no positional error when changing the step angle with the motor is at rest.
• Step angle does not affect torque based on the shaft speed of the motor.

Pulse (CW) and Rotation Direction (CCW) Input Signal

◆ Input Circuit and Sample Connection
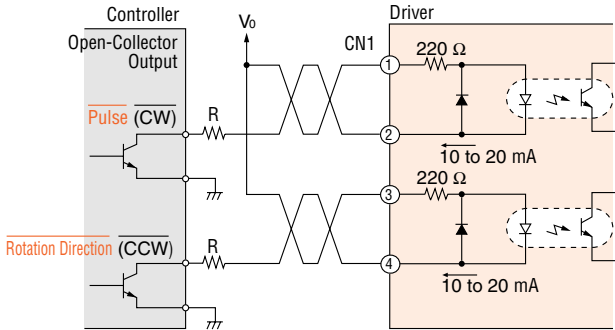
The letters indicate signals under the 1-pulse input mode, while the letters in parentheses indicate signals under the 2-pulse input mode.

Note:
- When Vo is equal to 5 VDC, the external resistance (R) is not necessary. When Vo is above 5 VDC, connect the external resistance (R) and keep the input current between 10 mA and 20 mA.

1-Pulse Input Mode

Pulse Signal
The "Pulse" signal is input to the pulse signal terminal. When the photocoupler state changes from "ON" to "OFF", the motor rotates one step. The direction of rotation is determined by the rotation direction signal.

Rotation Direction Signal
The "Rotation Direction" signal is input to the rotation direction signal input terminal. A "photocoupler ON" signal input commands a clockwise direction rotation. A "photocoupler OFF" signal input commands a counterclockwise direction rotation.

2-Pulse Input Mode

CW Pulse Signal
When the photocoupler state changes from "ON" to "OFF", the motor rotates one step in the clockwise direction.

CCW Pulse Signal
When the photocoupler state changes from "ON" to "OFF", the motor rotates one step in the counterclockwise direction.

CW and CCW refer to clockwise and counterclockwise direction respectively, from a reference point of facing the motor output shaft.

◆ Pulse Waveform Characteristics
(Photocoupler state corresponding to the input pulse)

Pulse signal
Photocoupler ON
Photocoupler OFF
90%
10%

Rotation direction signal
Photocoupler ON
Photocoupler OFF

2.5 µs min.   2.5 µs min.   10 µs min. 10 µs min.
2 µs max.   2 µs max.
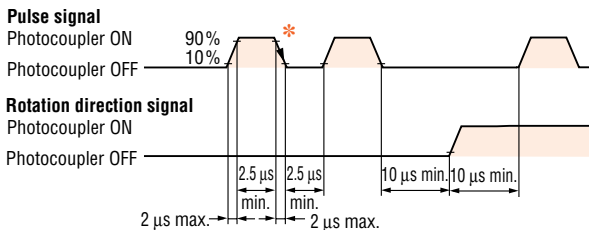
∗The shaded area indicates when the photocoupler diode is ON. The motor moves when the photocoupler state changes from ON to OFF as indicated by the arrow.

◆ Pulse Signal Characteristics
- The pulse voltage is 4.5 to 5 V in the "photocoupler ON" state, and 0 to 1 V in the "photocoupler OFF" state.
- Input pulse signals should have a pulse width over 2.5 µs, pulse rise/fall below 2 µs, and a pulse duty below 50%.
- Keep the pulse signal at the "photocoupler OFF" state when no pulses are being input.
- The minimum interval time when changing rotation direction is 10 µs. This value varies greatly depending on the motor type, pulse frequency and load inertia. It may be necessary to increase this time interval.
- In 1-pulse input mode, leave the pulse signal at rest ("photocoupler OFF") when changing rotation directions.

All Windings Off (A.W.OFF) Input Signal

◆ Input Circuit and Sample Connection
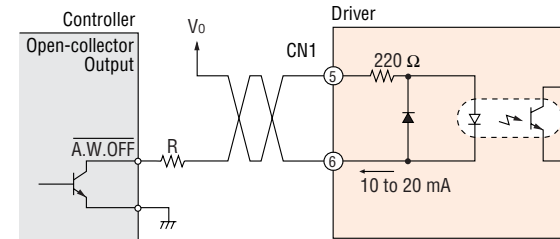
Note:
- When Vo is equal to 5 VDC, the external resistance (R) is not necessary. When Vo is above 5 VDC, connect the external resistance (R) and keep the input current between 10 mA and 20 mA.

When the "All Windings Off" signal is in the "photocoupler ON" state, the current to the motor is cut off and motor torque is reduced to zero. The motor output shaft can then be rotated freely by hand.
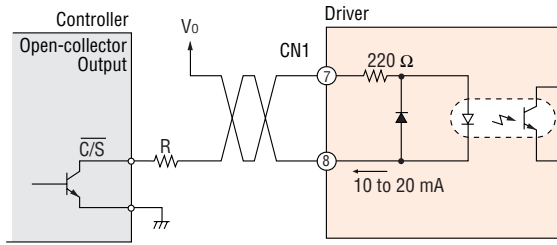
When the "All Windings Off" signal is in the "photocoupler OFF" state, the motor holding torque is proportional to the current set by the current adjustment rotary switches. During motor operation, be sure to keep the signal in the "photocoupler OFF" state.

This signal is used when moving the motor by external force or manual home position is desired. If this function is not needed, it is not necessary to connect this terminal.

Switching the "All Windings Off" signal from "photocoupler ON" to "photocoupler OFF" does not alter the excitation sequence. When the motor shaft is manually adjusted with the "All Windings Off" signal input, the shaft will shift up to ±3.6° from the position set after the "All Windings Off" signal is released.

Introduction

AS

AS PLUS

ASC

RK

CRK II

CSK

PMC

UMK

CSK

PK/PV

PK

UI2120G

EMP401 EMP402

SG8030J

SMK

Accessories

Closed Loop αSTEP
AC Input DC Input

Motor & Driver Packages
5-Phase Microstep
AC Input DC Input
5-Phase Full/Half
DC Input
2-Phase Full/Half
AC Input DC Input

2-Phase Stepping Motors
without Encoder with Encoder

Driver
with Indexer

Controllers

Low-Speed Synchronous Motors

Before Using a Stepping Motor

Step Angle Select (C/S) Input Signal
♦ Input Circuit and Sample Connection

Note:
• When Vo is equal to 5 VDC, the external resistance (R) is not necessary. When Vo is above 5 VDC, connect the external resistance (R) and keep the input current between 10 mA and 20 mA.

You may select two step angles (resolutions) from 16 available step angles (resolutions) with the step angle select switches DATA1 and DATA2. When the signal is at "photocoupler OFF", a step angle set by DATA1 is selected; at "photocoupler ON", DATA2 is selected.

Example: Changing the step angle from 0.072˚ to 0.72˚.
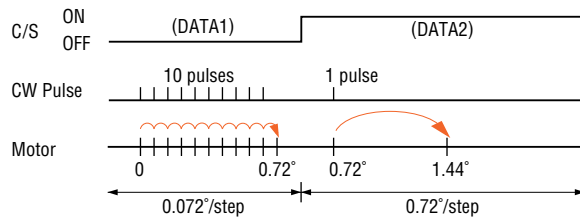
Notes:
• Be sure to change step angle setting inputs only when the pulse signals are at rest. Switching while moving may cause a positional error of the motor.
• There is no positional error if the step angle setting is changed with the motor at rest.
• When the step angle is changed by the "C/S" signal, the "TIMING" signal output shown below may become impossible for some combinations of step angles.When the "TIMING" signal is used, adjust the number of pulses so that the motor can operate with angles that are multiples of 7.2˚.

Example:
After operate 9 pulses with 0.072˚/step setting, change the step angle 0.72˚/step and operate with 1 pulse. In this case, "Excitation Timing" signal will not be output because step 0 position is skipped.
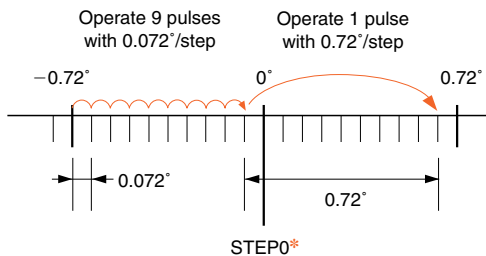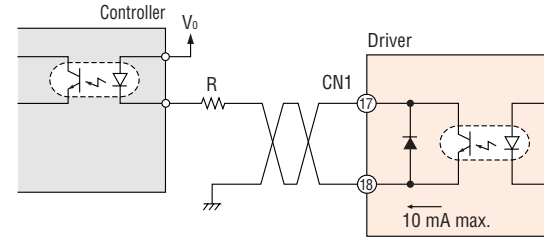

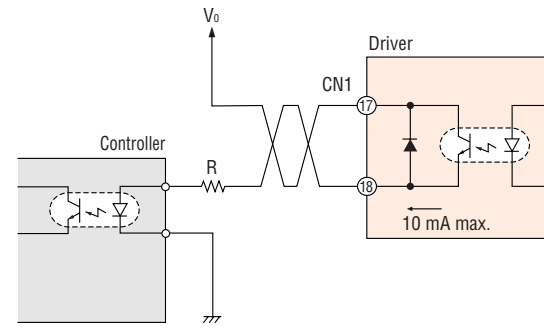✱ "Excitation Timing" signal only output at step 0 sequence.

Excitation Timing (TIM.) Output Signal
♦ Output Circuit and Sample Connection
Current Sink Output

Current Source Output

Note:
• Keep the voltage between 5 VDC and 24 VDC. Keep the current below 10 mA. If the current exceeds 10 mA, connect external resistance (R).

The "Excitation Timing" signal is output to indicate when the motor excitation (current flowing through the winding) is in the initial stage (step "0" at power up).
The "Excitation Timing" signal can be used to increase the accuracy of home position detection by setting the mechanical home position of your equipment (for example, a photo-sensor) to coincide with the excitation sequence initial stage (step "0").

The motor excitation stage changes simultaneously with pulse input, and returns to the initial stage for each 7.2˚ rotation of the motor output shaft.
When power is turned ON, the excitation sequence is reset to step "0".

The TIM. LED lights when the "Excitation Timing" signal is output. While the motor is rotating, the LED will turn ON and OFF at a high speed and will appear to be continuously lit.

The "Excitation Timing" signal is output simultaneously with a pulse input each time the excitation sequence returns to step "0".
The excitation sequence will complete one cycle for every 7.2˚ rotation of the motor output shaft.
Resolution 1: Signal is output once every 10 pulses.
Resolution 10: Signal is output once every 100 pulses.

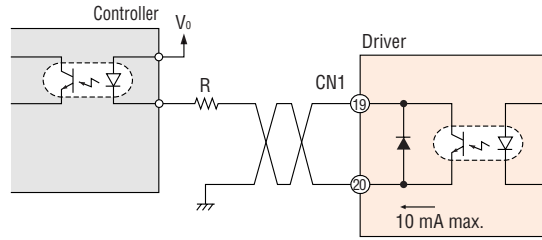Timing chart at 0.72˚/step (Resolution 1)
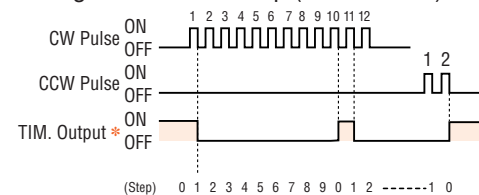
✱ When connected as shown in the example connection, the signal will be "photocoupler ON" at step "0".
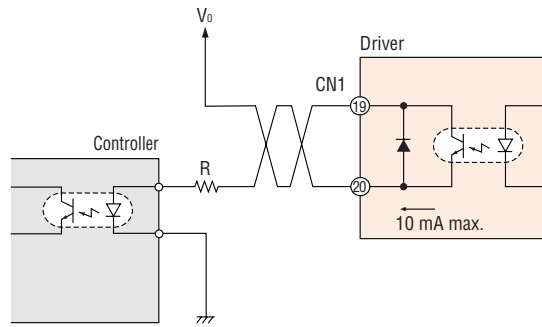
Overheat (O.HEAT) Output Signal
◆ Output Circuit and Sample Connection
Current Sink Output


Current Source Output

Note:
• Keep the voltage between 5 VDC and 24 VDC.
  Keep the current below 10 mA. If the current exceeds 10 mA, connect external resistance (R).

The "Overheat" signal is output to protect the driver from heat damage if the internal temperature of the driver rises above 176˚F (80˚C).

When connected as shown in the example connection, the signal will be "photocoupler ON" during normal conditions, and "photocoupler OFF" when the temperature exceeds 176˚F (80˚C).

When the "Overheat" signal is output, turn the driver power OFF, then adjust the operating conditions (ambient temperature, driver/controller settings), or use a fan to cool the driver. After taking appropriate measures, turn the power ON. Turning the power ON will reset the "Overheat" signal and release the "Automatic Current Off" condition.
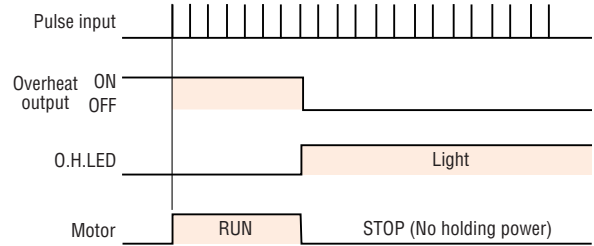

If the "Automatic Current Off" function switch is set to "OFF" position, the motor continues operation even when the "Overheat" signal is output. The output current does not cut off at this time.

When the "Overheat" signal is output, turn the driver power OFF, then adjust the operating conditions (ambient temperature, driver/controller settings), or use a fan to cool the driver. After taking appropriate measures, turn the power ON. Once the power has been turned OFF, wait at least 5 seconds before turning it ON again. After driver's temperature falls to 176˚F (80˚C) or less, turning the power ON will release the "Automatic Current Off" condition.
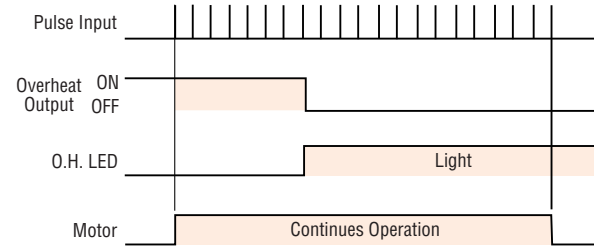
●Timing Chart
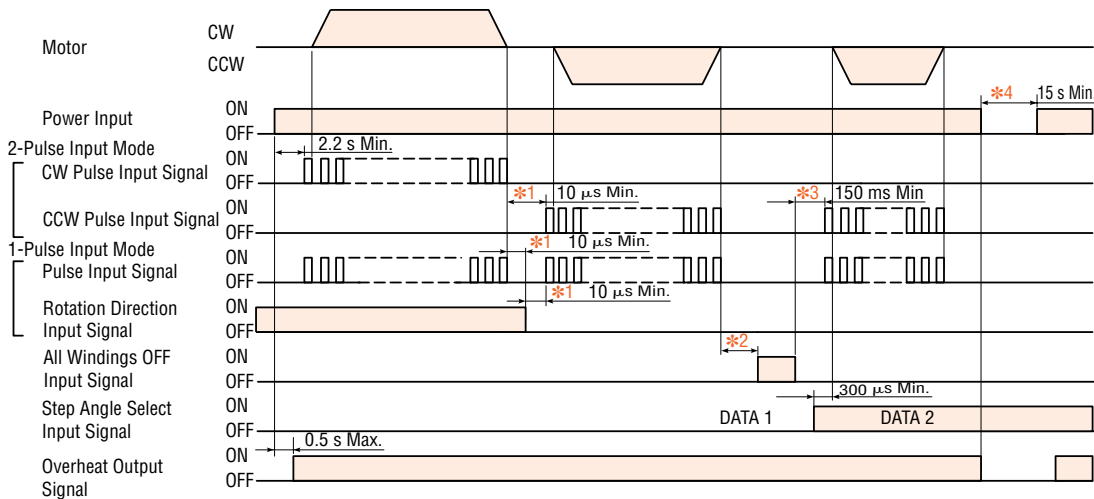
∗1 Switching time to change CW, CCW pulse (2-pulse input mode), and switching time to change direction (1-pulse input mode) 10 μ sec is shown as a response time of circuit. The motor may need more time.
∗2 Depends on load Inertia, load torque, and starting frequency.
∗3 Never input a step pulse signal immediately after switching the "All Winding Off" signal to the photocoupler off state. The motor may not start.
∗4 Wait at least 15 seconds before turning on the power.

Introduction
AS
AS PLUS
ASC
RK
CRK II
CSK
PMC
UMK
CSK
PK/PV
PK
UI2120G
EMP401 EMP402
SG8030J
SMK
Accessories
Before Using a Stepping Motor

Closed Loop αSTEP
AC Input / DC Input
Motor & Driver Packages
5-Phase Microstep AC Input / DC Input
5-Phase Full/Half DC Input
2-Phase Full/Half AC Input / DC Input
2-Phase Stepping Motors without Encoder / with Encoder
Driver with Indexer
Controllers
Low-Speed Synchronous Motors

■ List of Motor and Driver Combinations

Model numbers for motor driver combinations are shown below.

Type	Model	Motor Model	Driver Model
Standard	RK543□A	PK543□W	RKD507-A
	RK544□A	PK544□W	
	RK545□A	PK545□W	
	RK564□A	PK564□W	RKD514L-A
	RK566□A	PK566□W	
	RK569□A	PK569□W	
	RK596□A	PK596□W	RKD514H-A
	RK599□A	PK599□W	
	RK5913□A	PK5913□W	
	RK564□C	PK564□W	RKD514L-C
	RK566□C	PK566□W	
	RK569□C	PK569□W	
	RK596□C	PK596□W	RKD514H-C
	RK599□C	PK599□W	
	RK5913□C	PK5913□W	
TH Geared	RK543□A-T3.6	PK543□W-T3.6	RKD507-A
	RK543□A-T7.2	PK543□W-T7.2	
	RK543□A-T10	PK543□W-T10	
	RK543□A-T20	PK543□W-T20	
	RK543□A-T30	PK543□W-T30	
	RK564□A-T3.6	PK564□W-T3.6	RKD514L-A
	RK564□A-T7.2	PK564□W-T7.2	
	RK564□A-T10	PK564□W-T10	
	RK564□A-T20	PK564□W-T20	
	RK564□A-T30	PK564□W-T30	
	RK596□A-T3.6	PK596□W-T3.6	RKD514H-A
	RK596□A-T7.2	PK596□W-T7.2	
	RK596□A-T10	PK596□W1-T10	
	RK596□A-T20	PK596□W1-T20	
	RK596□A-T30	PK596□W1-T30	
	RK564□C-T3.6	PK564□W-T3.6	RKD514L-C
	RK564□C-T7.2	PK564□W-T7.2	
	RK564□C-T10	PK564□W-T10	
	RK564□C-T20	PK564□W-T20	
	RK564□C-T30	PK564□W-T30	
	RK596□C-T3.6	PK596□W-T3.6	RKD514H-C
	RK596□C-T7.2	PK596□W-T7.2	
	RK596□C-T10	PK596□W1-T10	
	RK596□C-T20	PK596□W1-T20	
	RK596□C-T30	PK596□W1-T30	

✱ Enter **A** (Single shaft) or **B** (double shaft) in the box (□) within the model numbers.

Type	Model	Motor Model	Driver Model
PN Geared	RK544□A-N5	PK544□W-N5	RKD507-A
	RK544□A-N7.2	PK544□W-N7.2	
	RK544□A-N10	PK544□W-N10	
	RK566□A-N5	PK566□W-N5	RKD514L-A
	RK566□A-N7.2	PK566□W-N7.2	
	RK566□A-N10	PK566□W-N10	
	RK564□A-N25	PK564□W-N25	
	RK564□A-N36	PK564□W-N36	
	RK564□A-N50	PK564□W-N50	
	RK599□A-N5	PK599□W-N5	RKD514H-A
	RK599□A-N7.2	PK599□W-N7.2	
	RK599□A-N10	PK599□W-N10	
	RK596□A-N25	PK596□W-N25	
	RK596□A-N36	PK596□W-N36	
	RK596□A-N50	PK596□W-N50	
	RK566□C-N5	PK566□W-N5	RKD514L-C
	RK566□C-N7.2	PK566□W-N7.2	
	RK566□C-N10	PK566□W-N10	
	RK564□C-N25	PK564□W-N25	
	RK564□C-N36	PK564□W-N36	
	RK564□C-N50	PK564□W-N50	
	RK599□C-N5	PK599□W-N5	RKD514H-C
	RK599□C-N7.2	PK599□W-N7.2	
	RK599□C-N10	PK599□W-N10	
	RK596□C-N25	PK596□W-N25	
	RK596□C-N36	PK596□W-N36	
	RK596□C-N50	PK596□W-N50	
HG Geared	RK543□A-H50	PK543□W-H50S	RKD507-A
	RK543□A-H100	PK543□W-H100S	
	RK564□A-H50	PK564□W-H50S	RKD514L-A
	RK564□A-H100	PK564□W-H100S	
	RK564□C-H50	PK564□W-H50S	RKD514L-C
	RK564□C-H100	PK564□W-H100S	
	RK596□A-H50	PK596□W1-H50	RKD514H-A
	RK596□A-H100	PK596□W1-H100	
	RK596□C-H50	PK596□W1-H50	RKD514H-C
	RK596□C-H100	PK596□W1-H100	

✱ Enter **A** (Single shaft) or **B** (double shaft) in the box (□) within the model numbers.