RK Series

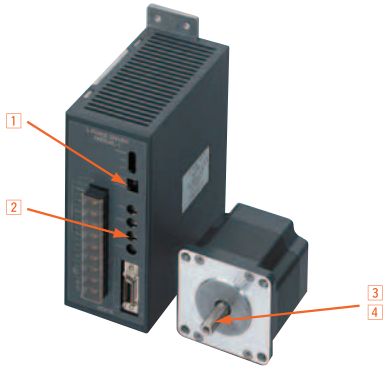
●Connection Information●
Technical reference ➜Page G-1
Safety standards ➜Page H-2

These products incorporate state-of-the-art technologies to achieve the ultimate ease of motor control. Various types including the standard type, electromagnetic brake type, terminal box type and various geared types are available. Two frame sizes of 60 mm and 85 (90) mm are available. The wide range of motor variations and affordable prices make these models perfect solutions for your various applications.

cULus CE RoHS

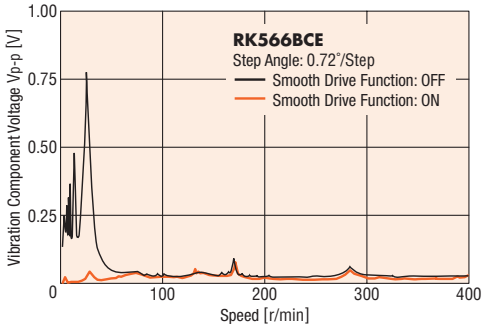
● For detailed product safety standard information including standards, file number and certification body, please visit www.orientalmotor.eu.

Features

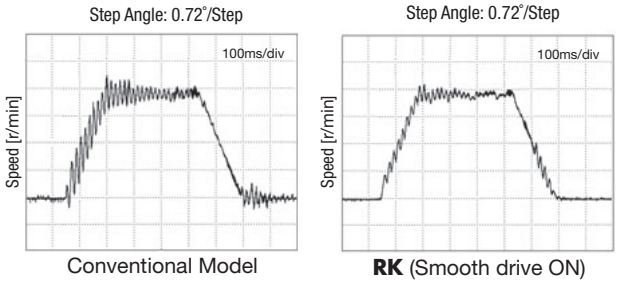


1 Smooth Drive Function

The smooth drive function is a control method that automatically implements microstep drive based on the same traveling amount and traveling speed used in the full step mode, without changing the pulse input settings. You can easily achieve microstep drive with low vibration with a touch of a button.



The smooth drive function of the **RK** Series also shortens the settling time.

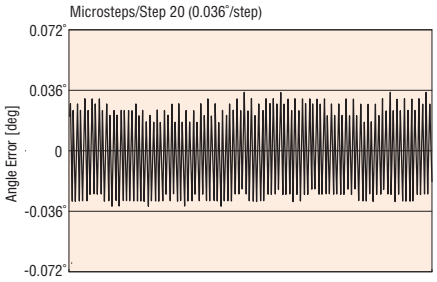


2 Microstep Drive System

The basic step angle of the motor can be divided into a maximum of 250 microstep angles without using any mechanical element such as a speed reduction mechanism. 16 levels of step angles are available to set the desired step angle. Setting is easy with the digital switch of the driver. This series makes fine positioning possible, and also makes it possible to perform operation from "low-vibration and low-speed transportation" to "high-speed return" without tuning.

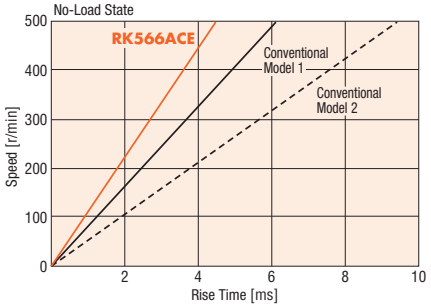
3 Improved Angular Accuracy

Angular accuracy may worsen with microstep drivers, due to the effect of poor current control. However, the **RK** Series is designed through advanced circuit technology and maximizes motor operation at high accuracy.



4 Improved Response

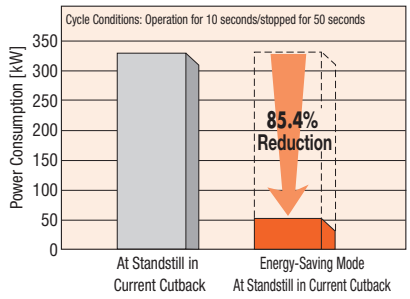
The **RK** Series, with its high starting frequency, shortens the machine cycle without affecting acceleration/deceleration rates. This produces a significant savings in time for an operation in which the same cycle is repeated thousands of times each day.



●Environmentally Friendly Energy-Saving Mode

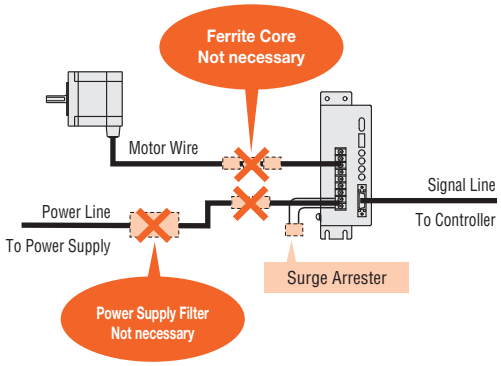
In the energy-saving mode, the supply of current to the motor is stopped and the load is held only with the electromagnetic brake while the motor remains at a standstill. Current supply to the motor is stopped and the position is held only with the brake. This function is effective in reducing the power consumption and extending the motor life.
(Electromagnetic brake type only)

Comparison of Annual Power Consumption at Motor Standstill (Per motor)



●Safe Operation in Many Countries around the World Conforms to Safety Standards

The **RK** Series features UL, CSA recognized products and EN conforming products. This product has the CE Marking affixed under the EMC Directive and Low Voltage Directive. The **RK** Series also conforms to the EMC Directive with the addition of only a surge arrester. An external ferrite core or filter in the motor line or power line is not required.



●Improved Motor for Easier Use

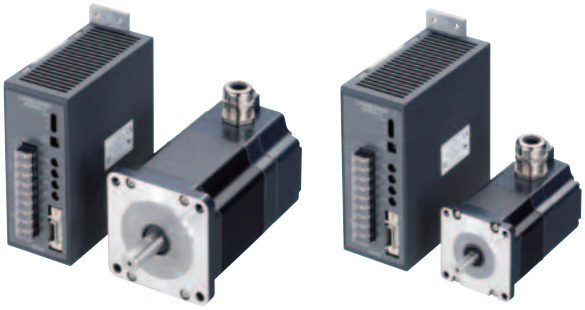
◇Twice the Motor Bearing Life (Compared with a conventional model)

A motor's life is determined by its bearing. We adopted high-performance bearing grease to lubricate this important component. Accordingly, life is twice as long as a conventional model.

◇Protective Earth Terminal

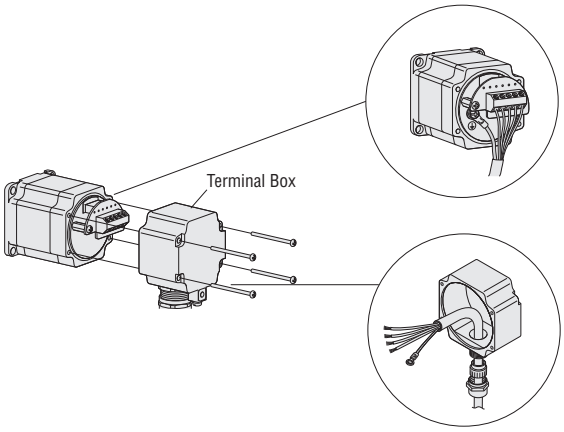
●Terminal Box Offering Excellent Watertight and Dust-Resistant Performance

The degree of protection conforms to the IP65 specification.
(Excluding shaft penetration)



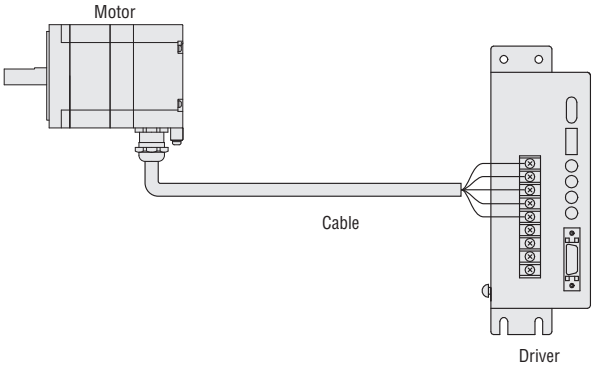
◇Terminal-Block Connection Design

The motor can be wired directly from its terminal block.



◇No Motor and Driver Relay

Since the motor cable can be connected directly with the driver terminals, there is no need for wire connection or soldering on a relay terminal block.



Wide Variety

We offer a range of motor frame sizes depending on the motor type and power-supply input, as shown below.
(□60: indicates a motor frame size of 60 mm.)

	Power Supply Voltage	Standard Type, Standard Type with Terminal Box	Standard Type with Electromagnetic Brake	**TH** Geared Type	**PS** Geared Type	**PN** Geared Type	Harmonic Geared Type
AC Power Supply Input **RK** Series 	Single-Phase 200-230 VAC	□60 □85	□60 □85	□60 □90	□60 □90	□60 □90	□60 □90

●Standard Type and Standard Type with Terminal Box

The easy-to-use standard type is the basic model regarding functions and characteristics. We also have motors with a terminal box offering excellent watertight and dust-resistant performance.

●Standard Type with Electromagnetic Brake

This product features a motor combined with a power off activated type electromagnetic brake.

●**TH** Geared Type (Low backlash gear)

This is a geared motor achieving both low backlash and low cost.

●**PS** Geared Type (Low backlash gear)

This is a geared motor offering low backlash, high strength and wide gear ratios.

●**PN** Geared Type (Non-backlash gear)

This is a high accuracy and high strength geared motor that achieves a backlash of 3 arc minutes or less. This geared motor provides wide gear ratios.

●Harmonic Geared Type (Non-backlash gear)

This high accuracy, non-backlash geared motor ensures high strength in a compact body.

Characteristics Comparison for Geared Motors

A wide variety of geared motors are available for your various applications.

Geared Type	Features	Permissible Torque and Maximum Torque [N·m]	Backlash [arc minute (degrees)]	Basic Resolution [deg/step]	Output Shaft Rotation Speed [r/min]
 **Standard Type**	· **Basic model of the RK Series**	Maximum Holding Torque 6.3	—	0.72	4000
 **Standard Type Terminal Box**	· **The industrial connector type motor offering IP65 ingress protection against dust and water.**	Maximum Holding Torque 6.3	—	0.72	4000
Low Backlash  **TH** Geared (Spur gear mechanism)	·A wide variety of low gear ratios, high-speed operations ·Gear Ratio Types 3.6, 7.2, 10, 20, 30	12	35 (0.59)	0.024	500
 **PS** Geared (Planetary gear mechanism)	·High Permissible Torque/Maximum Torque ·A wide variety of gear ratios for selecting the desired step angle ·Center Shaft ·Gear Ratio Types 5, 7.2, 10, 25, 36, 50	Permissible Torque 37 Maximum Torque 60	15 (0.25)	0.0144	600
Non-Backlash  **PN** Geared (Planetary gear mechanism)	·High Speed (Low gear ratio), High Positioning Accuracy ·High Permissible Torque/Maximum Torque ·A wide variety of gear ratios for selecting the desired step angle ·Center Shaft ·Gear Ratio Types 5, 7.2, 10, 25, 36, 50	Permissible Torque 37 Maximum Torque 60	3 (0.05)	0.0144	600
 Harmonic Geared (Harmonic drive)	·High Positioning Accuracy ·High Permissible Torque/Maximum Torque ·High Gear Ratio, High Resolution ·Center Shaft ·Gear Ratio Types 50, 100	Permissible Torque 37 Maximum Torque 55	0	0.0072	70

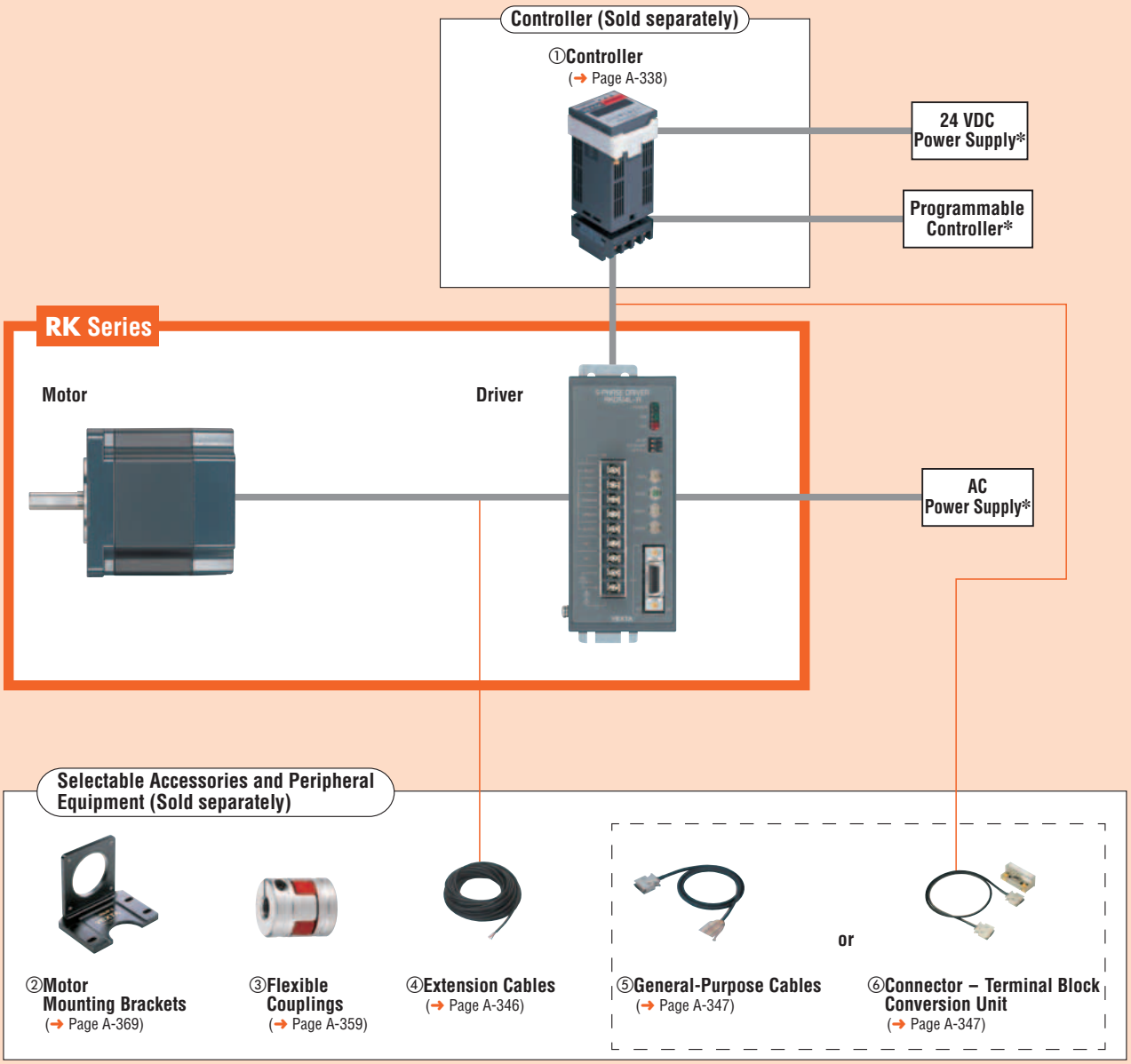
Note

● The values shown above must be used only as reference values to understand the differences of respective types. These values vary depending on the motor frame size and gear ratio.

System Configuration

An example of a single-axis system configuration with the **SG8030JY** controller.

✻ Not supplied



Number	Name	Overview
①	Controller	This controller outputs pulse commands that determine the rotating amount and rotating speed.
②	Motor Mounting Brackets	Dedicated mounting bracket for the motor.
③	Flexible Couplings	Coupling that connects the motor shaft to the driven shaft.
④	Extension Cables	Cable for extending the wiring distance between the motor and driver (5 to 20 m).
⑤	General-Purpose Cables	General-purpose cable for connecting the driver and controller (1 m, 2 m).
⑥	Connector – Terminal Block Conversion Unit	Set of terminal block and cable for connecting the driver and controller (1 m).

●System Configuration Example

RK Series		Sold Separately				
		Controller	Extension Cable (5 m)	Motor Mounting Bracket	Flexible Coupling	Connector - Terminal Block Conversion Unit (1 m)
RK566ACE	+	SG8030JY-U	CC05PK5	PAL2P-5	MCS200808	CC20T1

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

Product Number Code

RK 5 6 6 B □ C E - N 5
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

RK 5 9 13 A C T
① ② ③ ④ ⑤ ⑦ ⑧

①	Series Name	**RK**: **RK** Series
②	**5**: 5-Phase	
③	Motor Frame Size	**6**: 60 mm **9**: 85 mm (Geared type: 90 mm)
④	Motor Case Length	
⑤	Motor Shaft Type	**A**: Single Shaft **B**: Double Shaft
⑥	Electromagnetic Brake	Blank: No Electromagnetic Brake **M**: With Electromagnetic Brake
⑦	Power Supply Voltage	**A**: Single-Phase 100-115 VAC **C**: Single-Phase 200-230 VAC
⑧	Motor Classification	
⑨	Gear Type	Blank: Standard Type **T**: **TH** Geared Type **PS**: **PS** Geared Type **N**: **PN** Geared Type **H**: Harmonic Geared Type
⑩	Gear Ratio	

Product Line

● For the single-phase 100-115 VAC models, please contact the nearest Oriental Motor sales office.

●Standard Type

Power Supply Voltage	Product Name (Single shaft)	Product Name (Double shaft)
Single-Phase 100-115 VAC	**RK564AAE**	**RK564BAE**
	RK566AAE	**RK566BAE**
	RK569AAE	**RK569BAE**
	RK596AAE	**RK596BAE**
	RK599AAE	**RK599BAE**
	RK5913AAE	**RK5913BAE**
Single-Phase 200-230 VAC	**RK564ACE**	**RK564BCE**
	RK566ACE	**RK566BCE**
	RK569ACE	**RK569BCE**
	RK596ACE	**RK596BCE**
	RK599ACE	**RK599BCE**
	RK5913ACE	**RK5913BCE**

●Standard Type with Terminal Box

Power Supply Voltage	Product Name (Single shaft)
Single-Phase 100-115 VAC	**RK564AAT**
	RK566AAT
	RK569AAT
	RK596AAT
	RK599AAT
	RK5913AAT
Single-Phase 200-230 VAC	**RK564ACT**
	RK566ACT
	RK569ACT
	RK596ACT
	RK599ACT
	RK5913ACT

●Standard Type with Electromagnetic Brake

Power Supply Voltage	Product Name (Single shaft)
Single-Phase 100-115 VAC	**RK564AMAE**
	RK566AMAE
	RK569AMAE
	RK596AMAE
	RK599AMAE
	RK5913AMAE
Single-Phase 200-230 VAC	**RK564AMCE**
	RK566AMCE
	RK569AMCE
	RK596AMCE
	RK599AMCE
	RK5913AMCE

●**TH** Geared Type

Power Supply Voltage	Product Name (Single shaft)	Product Name (Double shaft)
Single-Phase 100-115 VAC	**RK564AAE-T3.6**	**RK564BAE-T3.6**
	RK564AAE-T7.2	**RK564BAE-T7.2**
	RK564AAE-T10	**RK564BAE-T10**
	RK564AAE-T20	**RK564BAE-T20**
	RK564AAE-T30	**RK564BAE-T30**
	RK596AAE-T3.6	**RK596BAE-T3.6**
	RK596AAE-T7.2	**RK596BAE-T7.2**
	RK596AAE-T10	**RK596BAE-T10**
	RK596AAE-T20	**RK596BAE-T20**
	RK596AAE-T30	**RK596BAE-T30**
Single-Phase 200-230 VAC	**RK564ACE-T3.6**	**RK564BCE-T3.6**
	RK564ACE-T7.2	**RK564BCE-T7.2**
	RK564ACE-T10	**RK564BCE-T10**
	RK564ACE-T20	**RK564BCE-T20**
	RK564ACE-T30	**RK564BCE-T30**
	RK596ACE-T3.6	**RK596BCE-T3.6**
	RK596ACE-T7.2	**RK596BCE-T7.2**
	RK596ACE-T10	**RK596BCE-T10**
	RK596ACE-T20	**RK596BCE-T20**
	RK596ACE-T30	**RK596BCE-T30**

The following items are included in each product.
Motor, Parallel Key*, Driver, Connector for I/O Signal, Operating Manual
*Only for products with a key slot on the output shaft

●PS Geared Type

Power Supply Voltage	Product Name (Single shaft)	Product Name (Double shaft)
Single-Phase 100-115 VAC	RK566AAE-PS5	RK566BAE-PS5
	RK566AAE-PS7	RK566BAE-PS7
	RK566AAE-PS10	RK566BAE-PS10
	RK564AAE-PS25	RK564BAE-PS25
	RK564AAE-PS36	RK564BAE-PS36
	RK564AAE-PS50	RK564BAE-PS50
	RK599AAE-PS5	RK599BAE-PS5
	RK599AAE-PS7	RK599BAE-PS7
	RK599AAE-PS10	RK599BAE-PS10
	RK596AAE-PS25	RK596BAE-PS25
	RK596AAE-PS36	RK596BAE-PS36
	RK596AAE-PS50	RK596BAE-PS50
Single-Phase 200-230 VAC	RK566ACE-PS5	RK566BCE-PS5
	RK566ACE-PS7	RK566BCE-PS7
	RK566ACE-PS10	RK566BCE-PS10
	RK564ACE-PS25	RK564BCE-PS25
	RK564ACE-PS36	RK564BCE-PS36
	RK564ACE-PS50	RK564BCE-PS50
	RK599ACE-PS5	RK599BCE-PS5
	RK599ACE-PS7	RK599BCE-PS7
	RK599ACE-PS10	RK599BCE-PS10
	RK596ACE-PS25	RK596BCE-PS25
	RK596ACE-PS36	RK596BCE-PS36
	RK596ACE-PS50	RK596BCE-PS50

●PN Geared Type

Power Supply Voltage	Product Name (Single shaft)	Product Name (Double shaft)
Single-Phase 100-115 VAC	RK566AAE-N5	RK566BAE-N5
	RK566AAE-N7.2	RK566BAE-N7.2
	RK566AAE-N10	RK566BAE-N10
	RK564AAE-N25	RK564BAE-N25
	RK564AAE-N36	RK564BAE-N36
	RK564AAE-N50	RK564BAE-N50
	RK599AAE-N5	RK599BAE-N5
	RK599AAE-N7.2	RK599BAE-N7.2
	RK599AAE-N10	RK599BAE-N10
	RK596AAE-N25	RK596BAE-N25
	RK596AAE-N36	RK596BAE-N36
	RK596AAE-N50	RK596BAE-N50
Single-Phase 200-230 VAC	RK566ACE-N5	RK566BCE-N5
	RK566ACE-N7.2	RK566BCE-N7.2
	RK566ACE-N10	RK566BCE-N10
	RK564ACE-N25	RK564BCE-N25
	RK564ACE-N36	RK564BCE-N36
	RK564ACE-N50	RK564BCE-N50
	RK599ACE-N5	RK599BCE-N5
	RK599ACE-N7.2	RK599BCE-N7.2
	RK599ACE-N10	RK599BCE-N10
	RK596ACE-N25	RK596BCE-N25
	RK596ACE-N36	RK596BCE-N36
	RK596ACE-N50	RK596BCE-N50

●Harmonic Geared Type

Power Supply Voltage	Product Name (Single shaft)	Product Name (Double shaft)
Single-Phase 100-115 VAC	RK564AAE-H50	RK564BAE-H50
	RK564AAE-H100	RK564BAE-H100
	RK596AAE-H50	RK596BAE-H50
	RK596AAE-H100	RK596BAE-H100
Single-Phase 200-230 VAC	RK564ACE-H50	RK564BCE-H50
	RK564ACE-H100	RK564BCE-H100
	RK596ACE-H50	RK596BCE-H50
	RK596ACE-H100	RK596BCE-H100

Step Angle 0.72° Frame Size 60 mm, 85 mm

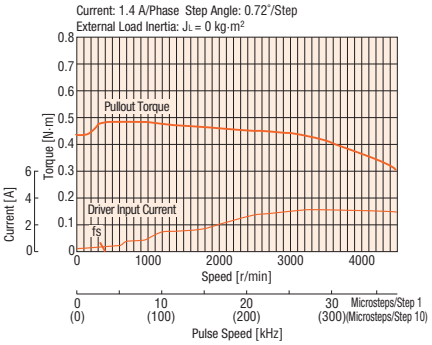
Standard Type

Specifications RoHS

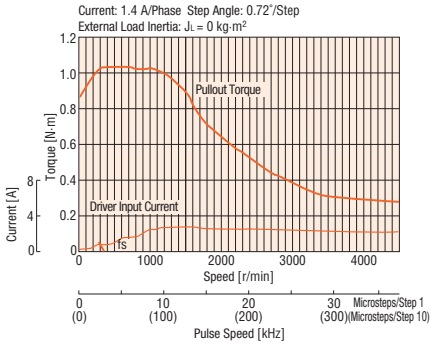
Product Name	Single-Phase 200-230 VAC		RK564ACE / RK564BCE	RK566ACE / RK566BCE	RK569ACE / RK569BCE	RK596ACE / RK596BCE	RK599ACE / RK599BCE	RK5913ACE / RK5913BCE
Maximum Holding Torque		N·m	0.42	0.83	1.66	2.1	4.1	6.3
Holding Torque at Motor Standstill	Power ON	N·m	0.21	0.41	0.83	1.05	2.05	3.15
Rotor Inertia		J: kg·m^2	175×10^{-7}	280×10^{-7}	560×10^{-7}	1400×10^{-7}	2700×10^{-7}	4000×10^{-7}
Rated Current		A/Phase	1.4					
Basic Step Angle			0.72°					
Power Supply Input			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A					
Excitation Mode			Microstep					

Speed – Torque Characteristics

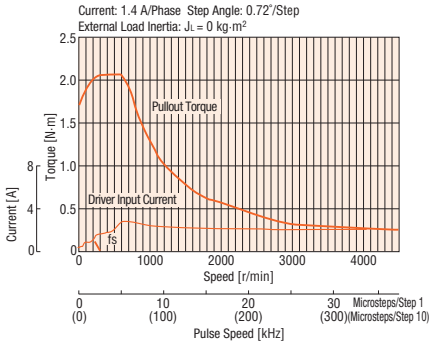
RK564□CE



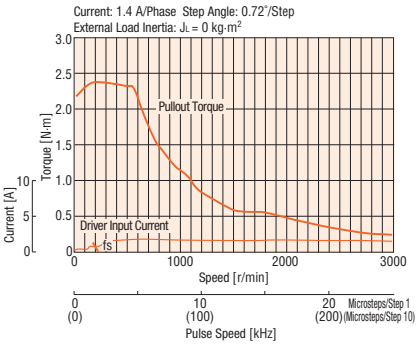
RK566□CE



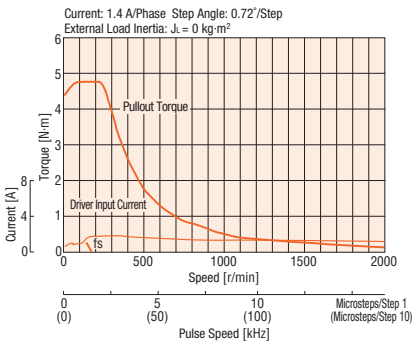
RK569□CE



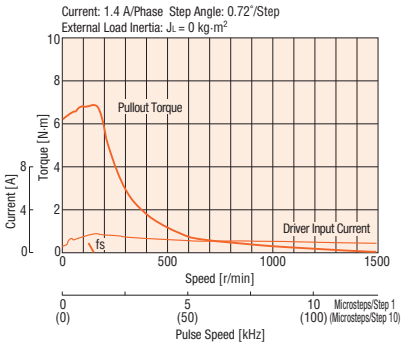
RK596□CE



RK599□CE



RK5913□CE



- Either **A** or **B** indicating the motor shaft type is entered where the box □ is located within the product name.
- The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  [When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]

Step Angle 0.72° Frame Size 60 mm, 85 mm
Standard Type with Terminal Box

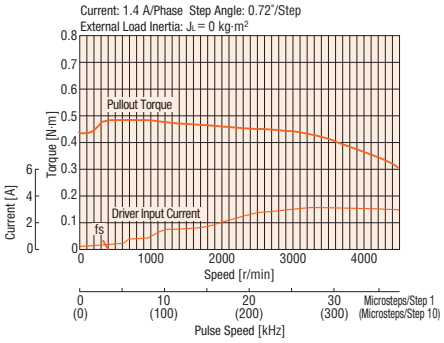
Specifications RoHS

Product Name	Single-Phase 200-230 VAC	Single Shaft	RK564ACT	RK566ACT	RK569ACT	RK596ACT	RK599ACT	RK5913ACT
Maximum Holding Torque		N·m	0.42	0.83	1.66	2.1	4.1	6.3
Holding Torque at Motor Standstill	Power ON	N·m	0.21	0.41	0.83	1.05	2.05	3.15
Rotor Inertia		J: kg·m^2	175×10^{-7}	280×10^{-7}	560×10^{-7}	1400×10^{-7}	2700×10^{-7}	4000×10^{-7}
Rated Current		A/Phase	1.4					
Basic Step Angle			0.72°					
Power Supply Input			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A					
Excitation Mode			Microstep					
Degree of Protection			Motor: IP65* Driver: IP10					

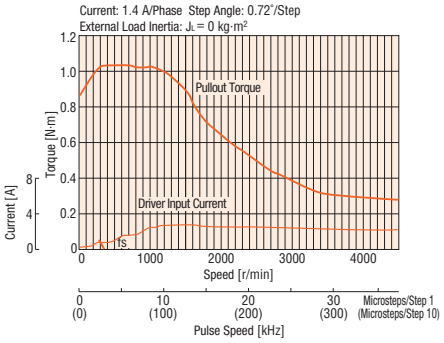
*Excluding-shaft penetration

Speed – Torque Characteristics

RK564ACT



RK566ACT



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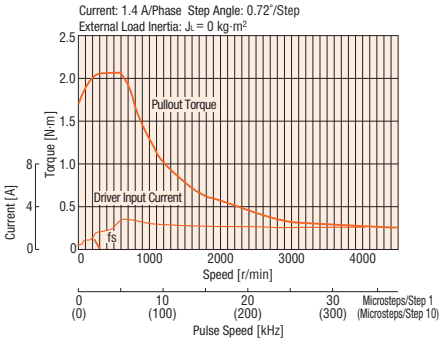
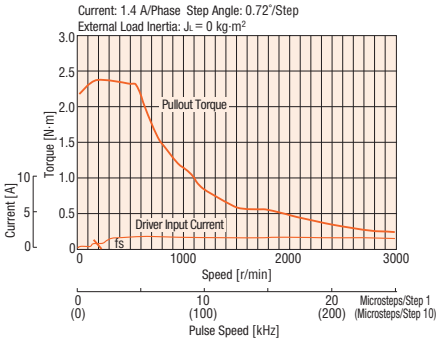
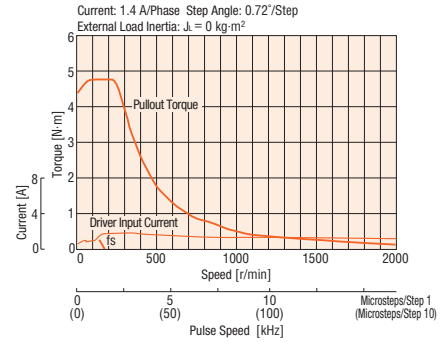


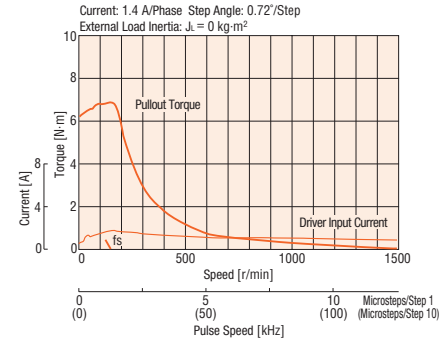
RK596ACT



RK599ACT



RK5913ACT



● The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
[When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]

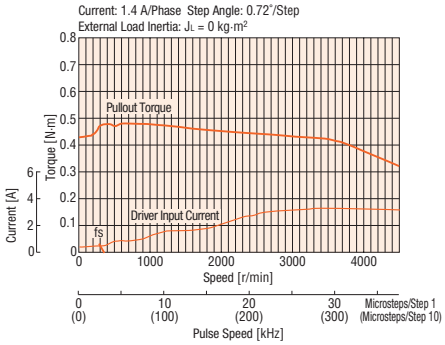
Step Angle 0.72° Frame Size 60 mm, 85 mm
Standard Type with Electromagnetic Brake

Specifications RoHS

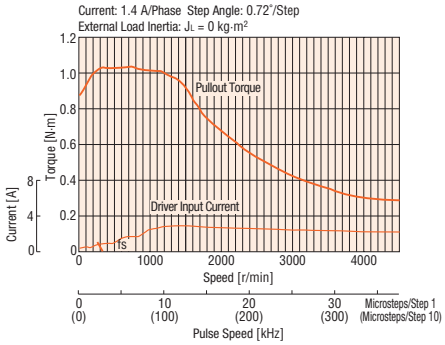
Product Name	Single-Phase 200-230 VAC	Single Shaft	RK564AMCE	RK566AMCE	RK569AMCE	RK596AMCE	RK599AMCE	RK5913AMCE
Maximum Holding Torque		N·m	0.42	0.83	1.66	2.1	4.1	6.3
Holding Torque at Motor Standstill	Power ON	N·m	0.21	0.41	0.83	1.05	2.05	3.15
Rotor Inertia		J: kg·m^2	335×10^{-7}	440×10^{-7}	720×10^{-7}	2470×10^{-7}	3770×10^{-7}	5070×10^{-7}
Rated Current		A/Phase	1.4					
Basic Step Angle			0.72°					
Power Supply Input			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A					
Excitation Mode			Microstep					
Electromagnetic Brake	Type		Power Off Activated Type					
	Power Supply Voltage		24 VDC					
	Power Supply Current	A	0.25			0.42		
	Static Friction Torque	N·m	0.8			4.0		
	Brake Operating Time	ms	20					
	Brake Release Time	ms	30			50		
	Time Rating		Continuous					

Speed – Torque Characteristics

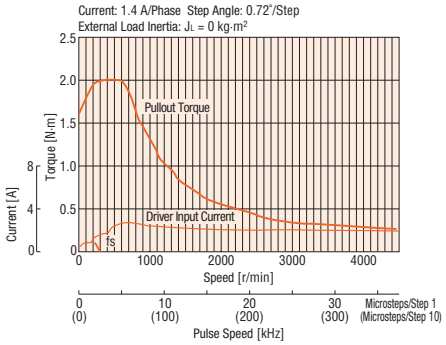
RK564AMCE



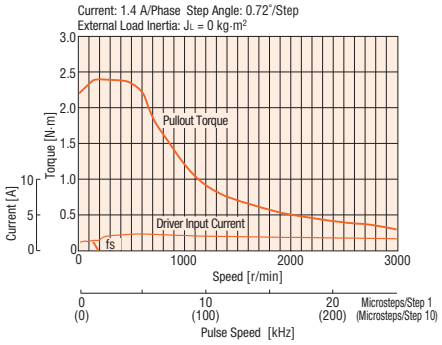
RK566AMCE



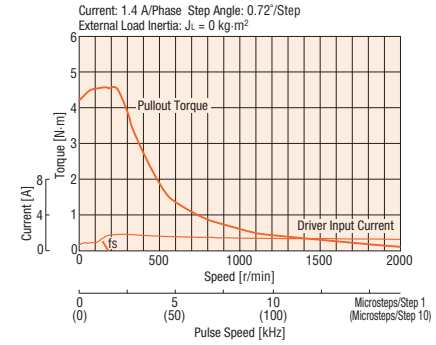
RK569AMCE



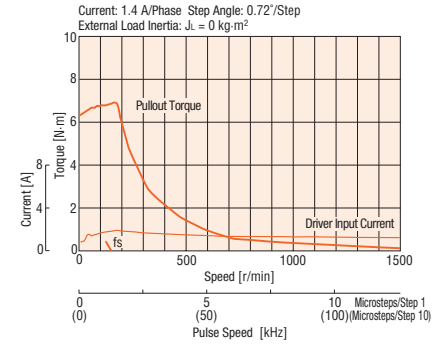
RK596AMCE



RK599AMCE



RK5913AMCE



● The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
[When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]

TH Geared Type Frame Size 60 mm

Specifications RoHS

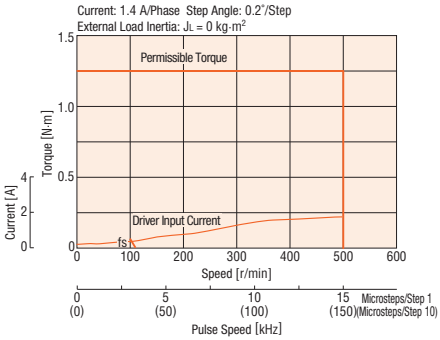
Product Name	Single-Phase 200-230 VAC		RK564ACE-T3.6 / RK564BCE-T3.6	RK564ACE-T7.2 / RK564BCE-T7.2	RK564ACE-T10 / RK564BCE-T10	RK564ACE-T20 / RK564BCE-T20	RK564ACE-T30 / RK564BCE-T30
Maximum Holding Torque		N·m	1.25	2.5	3	3.5	4
Rotor Inertia		J: kg·m^2	175×10^{-7}				
Rated Current		A/Phase	1.4				
Basic Step Angle			0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio			3.6	7.2	10	20	30
Permissible Torque		N·m	1.25	2.5	3	3.5	4
Holding Torque at Motor Standstill		Power ON N·m	0.75	1.5	2.1	3.5	4
Backlash		arc minute (degrees)	35 (0.59°)	15 (0.25°)		10 (0.17°)	
Permissible Speed Range		r/min	0～500	0～250	0～180	0～90	0～60
Power Supply Input			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A				
Excitation Mode			Microstep				

Note

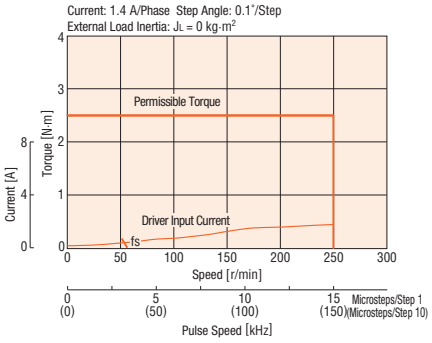
- The rotation direction of the motor and that of the gear output shaft are the same for the gear ratios 3.6, 7.2 and 10. It is the opposite for the 20 and 30 gear ratios.

Speed – Torque Characteristics

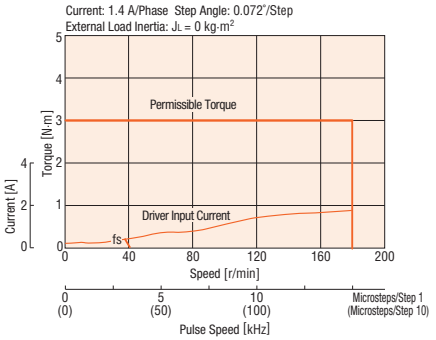
RK564□CE-T3.6



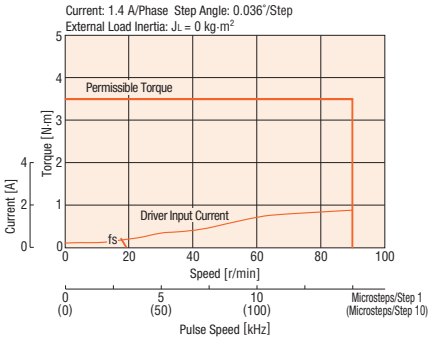
RK564□CE-T7.2



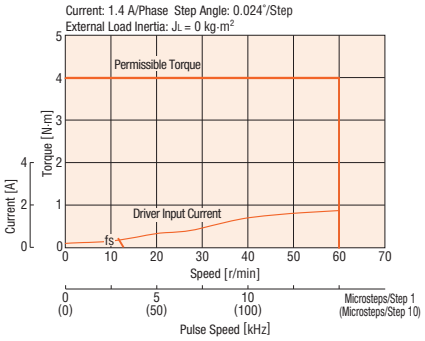
RK564□CE-T10



RK564□CE-T20



RK564□CE-T30



- Either **A** or **B** indicating the motor shaft type is entered where the box □ is located within the product name.
- The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  [When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]

TH Geared Type Frame Size 90 mm

Specifications RoHS

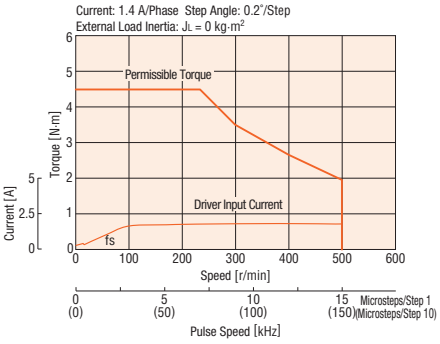
Product Name	Single-Phase 200-230 VAC		RK596ACE-T3.6 / RK596BCE-T3.6	RK596ACE-T7.2 / RK596BCE-T7.2	RK596ACE-T10 / RK596BCE-T10	RK596ACE-T20 / RK596BCE-T20	RK596ACE-T30 / RK596BCE-T30
Maximum Holding Torque		N·m	4.5	9		12	
Rotor Inertia		J: kg·m^2	1400×10^{-7}				
Rated Current		A/Phase	1.4				
Basic Step Angle			0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio			3.6	7.2	10	20	30
Permissible Torque		N·m	4.5	9		12	
Holding Torque at Motor Standstil	Power ON	N·m	3.7	7.5	9	12	
Backlash		arc minute (degrees)	25 (0.42°)	15 (0.25°)		10 (0.17°)	
Permissible Speed Range		r/min	0～500	0～250	0～180	0～90	0～60
Power Supply Input			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A				
Excitation Mode			Microstep				

Note

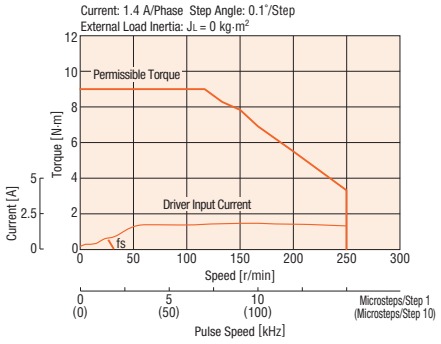
- The rotation direction of the motor and that of the gear output shaft are the same for the gear ratios 3.6, 7.2 and 10. It is the opposite for the 20 and 30 gear ratios.

Speed – Torque Characteristics

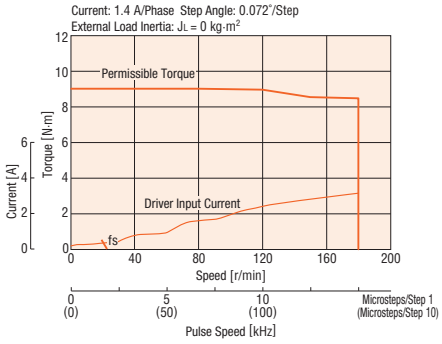
RK596□CE-T3.6



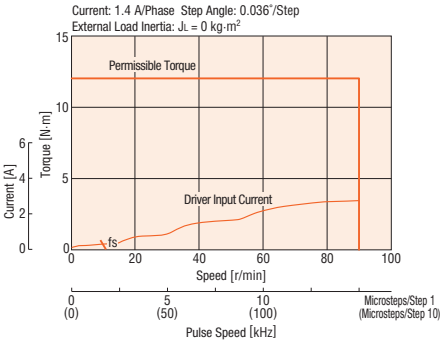
RK596□CE-T7.2



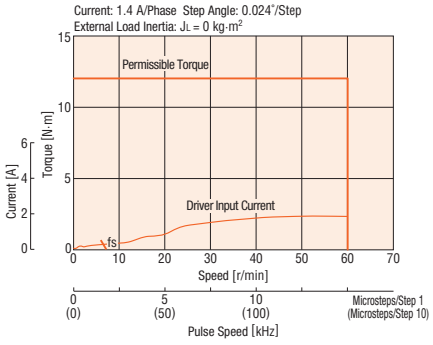
RK596□CE-T10



RK596□CE-T20



RK596□CE-T30



- Either **A** or **B** indicating the motor shaft type is entered where the box □ is located within the product name.
- The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  [When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]

PS Geared Type Frame Size 60 mm

Specifications RoHS

Product Name	Single-Phase 200-230 VAC						
		Single Shaft	RK566ACE-PS5	RK566ACE-PS7	RK566ACE-PS10	RK564ACE-PS25	RK564ACE-PS36	RK564ACE-PS50
		Double Shaft	RK566BCE-PS5	RK566BCE-PS7	RK566BCE-PS10	RK564BCE-PS25	RK564BCE-PS36	RK564BCE-PS50
Maximum Holding Torque		N·m	3.5	4	5	8		
Rotor Inertia		J: kg·m^2	280×10^{-7}			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	7.2	10	25	36	50
Permissible Torque		N·m	3.5	4	5	8		
Maximum Torque*		N·m	7	9	11	16	20	
Holding Torque at Motor Standstill	Power ON	N·m	2	2.9	4.1	5.2	7.5	8
Backlash		arc minute (degrees)	15 (0.25°)					
Permissible Speed Range		r/min	0～600	0～416	0～300	0～120	0～83	0～60
Power Supply Input			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A					
Excitation Mode			Microstep					

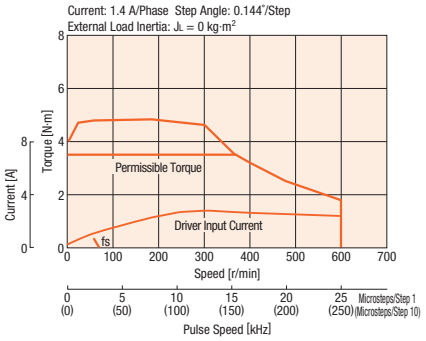
*The maximum torque value is for the gear. For the geared motor output torque, refer to the speed – torque characteristics.

Note

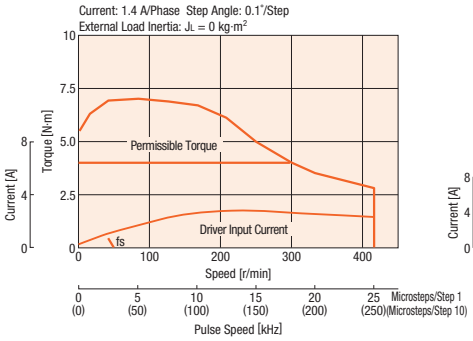
- The rotation direction of the motor and that of the gear output shaft are the same.

Speed – Torque Characteristics

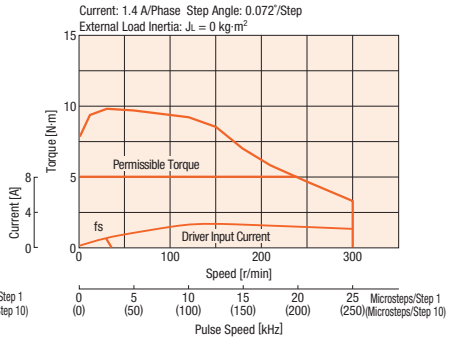
RK566□CE-PS5



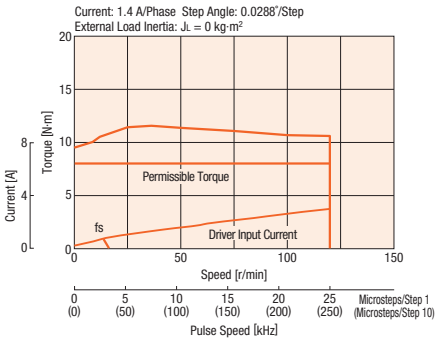
RK566□CE-PS7



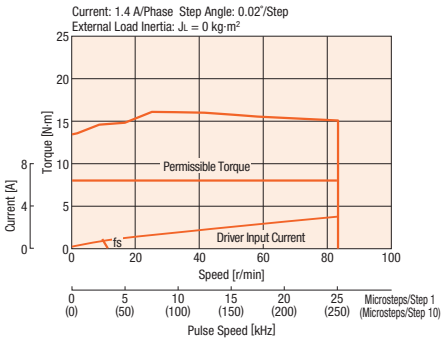
RK566□CE-PS10



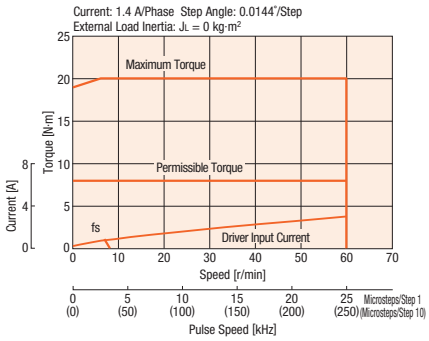
RK564□CE-PS25



RK564□CE-PS36



RK564□CE-PS50



- Either **A** or **B** indicating the motor shaft type is entered where the box □ is located within the product name.
- The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  [When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]

PS Geared Type Frame Size 90 mm

Specifications RoHS

Product Name	Single-Phase 200-230 VAC	Single Shaft / Double Shaft	RK599ACE-PS5 / RK599BCE-PS5	RK599ACE-PS7 / RK599BCE-PS7	RK599ACE-PS10 / RK599BCE-PS10	RK596ACE-PS25 / RK596BCE-PS25	RK596ACE-PS36 / RK596BCE-PS36	RK596ACE-PS50 / RK596BCE-PS50
Maximum Holding Torque		N·m	14	20		37		
Rotor Inertia		J: kg·m^2	2700×10^{-7}			1400×10^{-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	7.2	10	25	36	50
Permissible Torque		N·m	14	20		37		
Maximum Torque*		N·m	28	35		56	60	
Holding Torque at Motor Standstill	Power ON	N·m	10	14	20	26	37	
Backlash		arc minute (degrees)	15 (0.25°)					
Permissible Speed Range		r/min	0~600	0~416	0~300	0~120	0~83	0~60
Power Supply Input			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A					
Excitation Mode			Microstep					

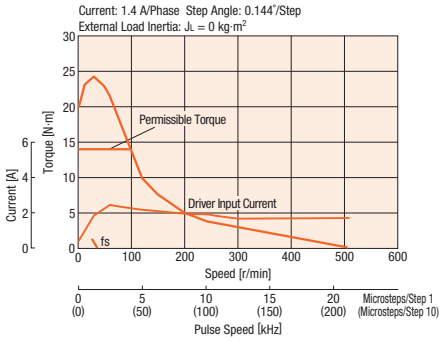
*The maximum torque value is for the gear. For the geared motor output torque, refer to the speed – torque characteristics.

Note

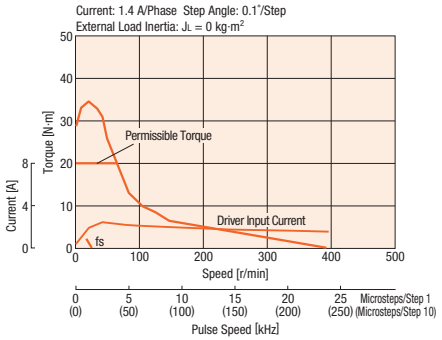
- The rotation direction of the motor and that of the gear output shaft are the same.

Speed – Torque Characteristics

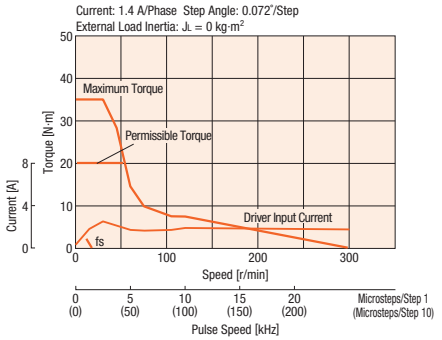
RK599□CE-PS5



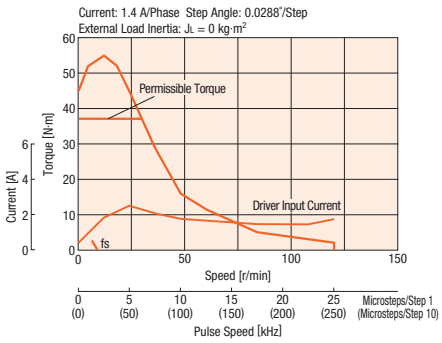
RK599□CE-PS7



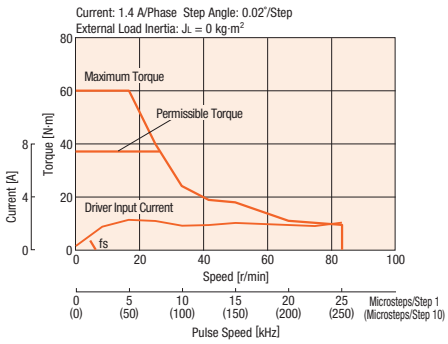
RK599□CE-PS10



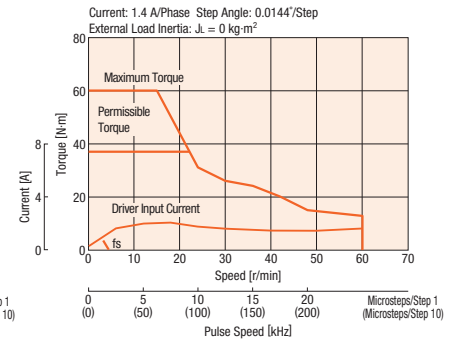
RK596□CE-PS25



RK596□CE-PS36



RK596□CE-PS50



- Either **A** or **B** indicating the motor shaft type is entered where the box □ is located within the product name.
- The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  [When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]

PN Geared Type Frame Size 60 mm

Specifications RoHS

Product Name	Single-Phase 200-230 VAC						
		Single Shaft	RK566ACE-N5	RK566ACE-N7.2	RK566ACE-N10	RK564ACE-N25	RK564ACE-N36	RK564ACE-N50
		Double Shaft	RK566BCE-N5	RK566BCE-N7.2	RK566BCE-N10	RK564BCE-N25	RK564BCE-N36	RK564BCE-N50
Maximum Holding Torque		N·m	3.5	4	5	8		
Rotor Inertia		J: kg·m^2	280×10^{-7}			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	7.2	10	25	36	50
Permissible Torque		N·m	3.5	4	5	8		
Maximum Torque*		N·m	7	9	11	16	20	
Holding Torque at Motor Standstill	Power ON	N·m	2	2.9	4.1	5.2	7.5	8
Backlash		arc minute (degrees)	2 (0.034°)			3 (0.05°)		
Permissible Speed Range		r/min	0～600	0～416	0～300	0～120	0～83	0～60
Power Supply Input			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A					
Excitation Mode			Microstep					

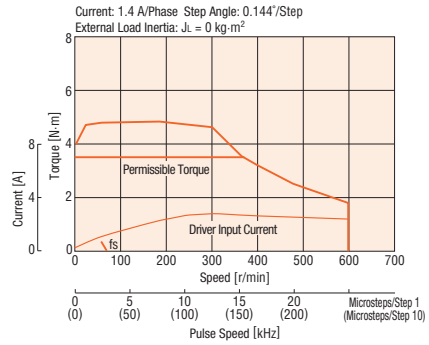
*The maximum torque value is for the gear. For the geared motor output torque, refer to the speed – torque characteristics.

Note

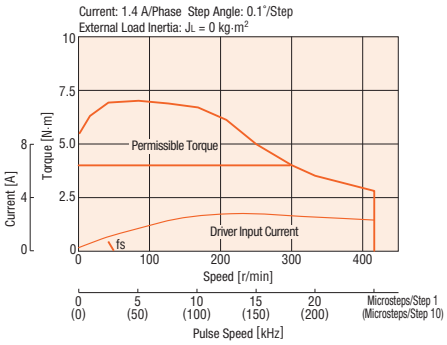
- The rotation direction of the motor and that of the gear output shaft are the same.

Speed – Torque Characteristics

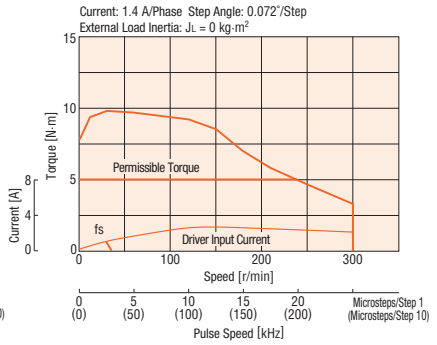
RK566□CE-N5



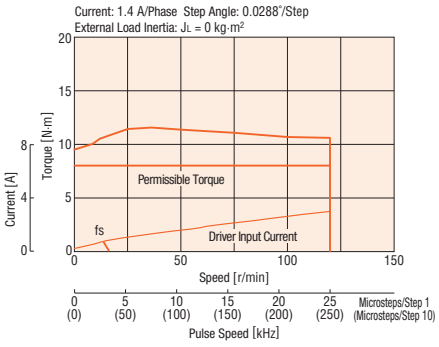
RK566□CE-N7.2



RK566□CE-N10



RK564□CE-N25



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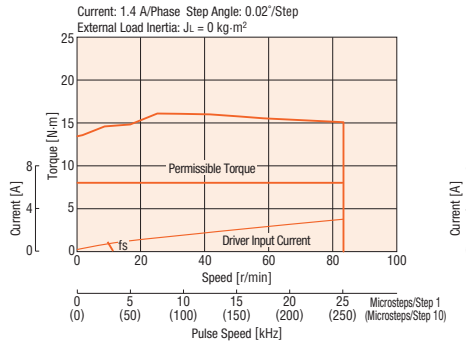
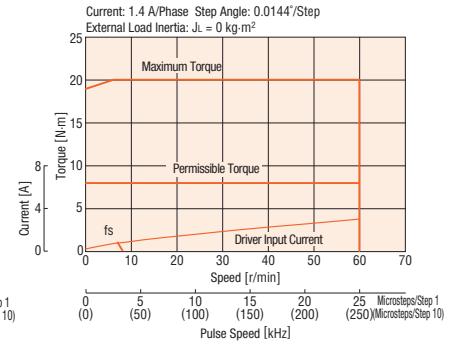


RK564□CE-N50



- Either **A** or **B** indicating the motor shaft type is entered where the box □ is located within the product name.
- The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  [When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]

PN Geared Type Frame Size 90 mm

Specifications RoHS

Product Name	Single-Phase 200-230 VAC		RK599ACE-N5 / RK599BCE-N5	RK599ACE-N7.2 / RK599BCE-N7.2	RK599ACE-N10 / RK599BCE-N10	RK596ACE-N25 / RK596BCE-N25	RK596ACE-N36 / RK596BCE-N36	RK596ACE-N50 / RK596BCE-N50
Maximum Holding Torque		N·m	14	20		37		
Rotor Inertia		J: kg·m^2	2700×10^{-7}			1400×10^{-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	7.2	10	25	36	50
Permissible Torque		N·m	14	20		37		
Maximum Torque*		N·m	28	35		56	60	
Holding Torque at Motor Standstill	Power ON	N·m	10	14	20	26	37	
Backlash		arc minute (degrees)	2 (0.034°)			3 (0.05°)		
Permissible Speed Range		r/min	0~600	0~416	0~300	0~120	0~83	0~60
Power Supply Input			Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A					
Excitation Mode			Microstep					

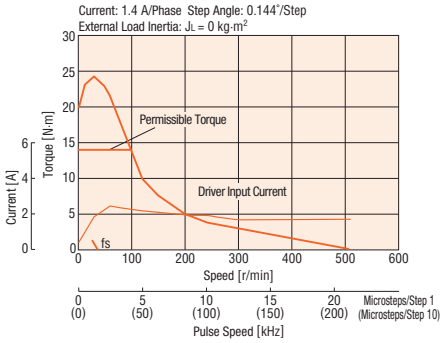
*The maximum torque value is for the gear. For the geared motor output torque, refer to the speed – torque characteristics.

Note

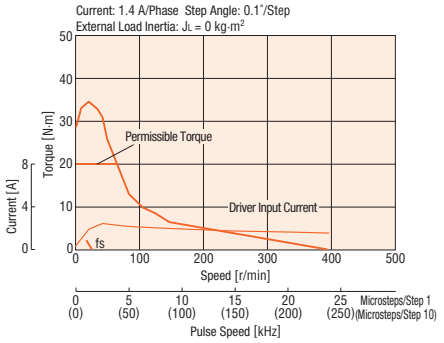
- The rotation direction of the motor and that of the gear output shaft are the same.

Speed – Torque Characteristics

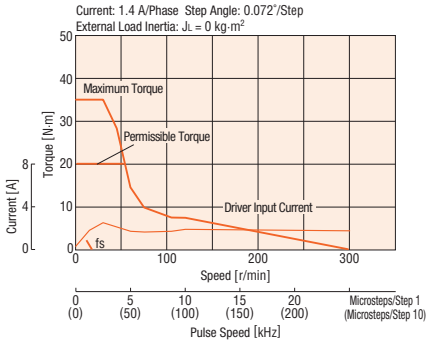
RK599□CE-N5



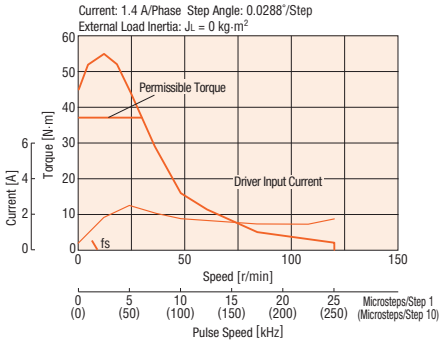
RK599□CE-N7.2



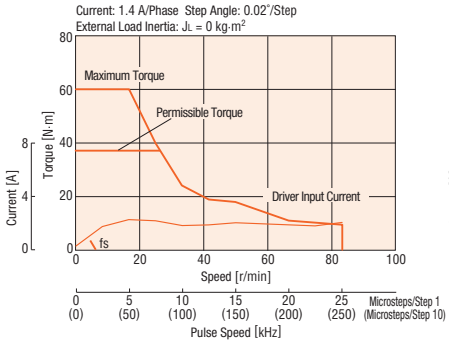
RK599□CE-N10



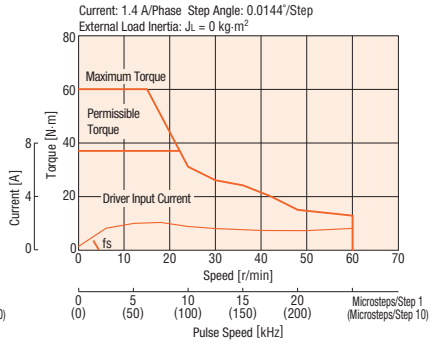
RK596□CE-N25



RK596□CE-N36



RK596□CE-N50



- Either **A** or **B** indicating the motor shaft type is entered where the box □ is located within the product name.
- The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  [When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]

Harmonic Geared Type Frame Size 60 mm, 90 mm

Specifications RoHS

Product Name	Single-Phase 200-230 VAC			RK564ACE-H50	RK564ACE-H100	RK596ACE-H50	RK596ACE-H100
		Single Shaft		RK564BCE-H50	RK564BCE-H100	RK596BCE-H50	RK596BCE-H100
Maximum Holding Torque			N·m	5.5	8	25	37
Rotor Inertia			J: kg·m^2	210×10^{-7}		1600×10^{-7}	
Rated Current			A/Phase	1.4			
Basic Step Angle				0.0144°	0.0072°	0.0144°	0.0072°
Gear Ratio				50	100	50	100
Permissible Torque			N·m	5.5	8	25	37
Maximum Torque*			N·m	18	28	35	55
Holding Torque at Motor Standstill		Power ON	N·m	5.5	8	25	37
Lost Motion (Load torque)			arc minute	0.7 max. (±0.28 N·m)	0.7 max. (±0.39 N·m)	1.5 max. (±1.2 N·m)	
Permissible Speed Range			r/min	0~70	0~35	0~70	0~35
Power Supply Input				Single-Phase 200-230 VAC $^{+10\%}_{-15\%}$ 50/60 Hz 3.5 A			
Excitation Mode				Microstep			

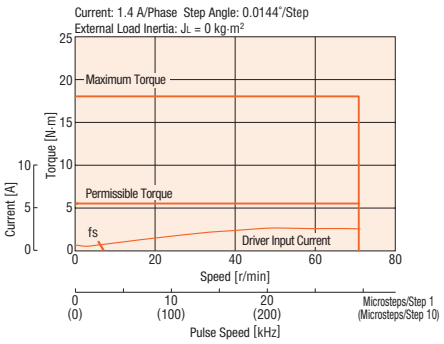
*The maximum torque value is for the gear. For the geared motor output torque, refer to the speed – torque characteristics.

Note

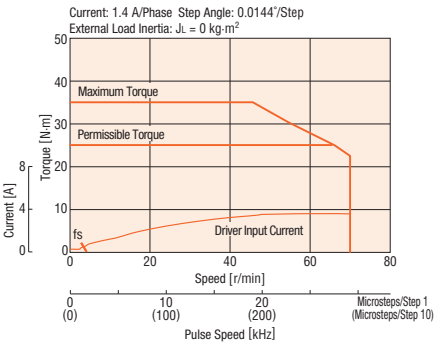
- The rotor inertia represents a sum of the moments of inertia of the harmonic gear converted to motor shaft values.
- The rotation direction of the motor and that of the gear output shaft are the opposite.

Speed – Torque Characteristics

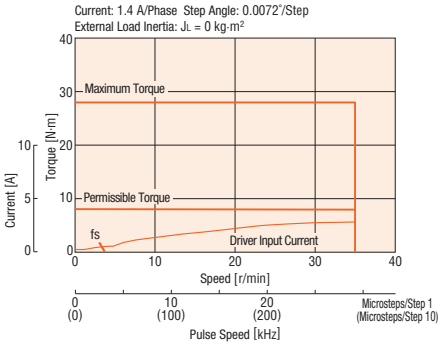
RK564□CE-H50



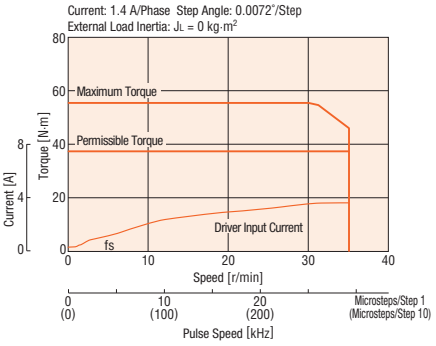
RK596□CE-H50



RK564□CE-H100



RK596□CE-H100



- Either **A** or **B** indicating the motor shaft type is entered where the box □ is located within the product name.
- The pulse input circuit responds up to 200 kHz with a pulse duty of 50%.

Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  [When conforming to the UL or CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as Thermal class 105 (A).]
- In order to prevent deterioration of the gear grease in the harmonic geared type, keep the temperature of the gear case at 70°C or less.

Common to Each Type

Driver Specifications

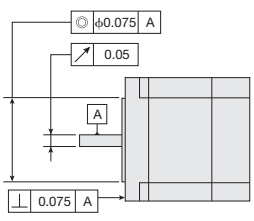
Input Signals	Input Mode	Photocoupler Input, Input Resistance 220 Ω, Input Current 7～20 mA, Photocoupler "ON": +4.5～5 V, Photocoupler "OFF": 0～+1 V (Voltage between terminals)
	Pulse Signal (CW Pulse Signal)	Operation command pulse signal (CW direction operation command pulse signal when in 2-pulse input mode), Negative logic pulse input 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 pulse duty is 50%)
	Rotation Direction Signal (CCW Pulse Signal)	Rotation direction signal, Photocoupler ON: CW, Photocoupler OFF: CCW CCW direction operation command pulse signal when in 2-pulse input mode, Negative logic pulse input 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 pulse duty is 50%)
	All Windings OFF Signal	When the signal is photocoupler "ON," the output current to the motor is cut off and the motor shaft can be rotated manually. (Release the electromagnetic brake when the motor shaft is turned by external force.) When the signal is photocoupler "OFF," the output current is supplied to the motor.
	Electromagnetic Brake Release Signal*	When the signal is photocoupler "ON," the electromagnetic brake is released and the motor is ready for operation. When the signal is photocoupler "OFF," the electromagnetic brake is activated to hold the motor shaft.
	Step Angle Select Signal	When the signal is photocoupler "OFF," a step angle set by DATA1 is selected; when the signal is photocoupler "ON," DATA2 is selected.
Output Signals	Output Mode	Photocoupler and Open Collector Output, External Use Condition: 24 VDC max., 10 mA max.
	Excitation Timing Signal	Outputs signals when the excitation sequence is at STEP "0." (Photocoupler "ON") Example: 0.72°/Step (Microsteps/Step 1): Signal is output every 10 pulses 0.072°/Step (Microsteps/Step 10): Signal is output every 100 pulses
	Overheat Signal	When the temperature of the driver heat sink reaches approximately 80°C, this function automatically turns the output signal OFF. (Photocoupler "OFF")
Functions		Automatic Current Cutback, Automatic All Windings Off, Step Angle Switching, Pulse Input Mode Switch, Electromagnetic Brake Function Switch*, Smooth Drive Function, Energy-Saving Mode*
Indicators (LED)		Power Supply Input, Excitation Timing Output Signal, Overheat Output Signal
Cooling Method		Natural Cooling Method

*Only for electromagnetic brake type

General Specifications

Specifications		Motor	Driver
Thermal Class		130 (B) [Recognized as 105 (A) by UL]	–
Insulation Resistance		The measured value is 100 MΩ min. when a 500 VDC megger is applied between the windings and the case under normal ambient temperature and humidity.	The measured value is 100 MΩ min. when a 500 VDC megger is applied between the following places under normal ambient temperature and humidity: ・Power Input Terminal – Protective Earth Terminal ・Motor Output Terminal – Protective Earth Terminal ・Electromagnetic Brake Power Output Terminal*1 – Protective Earth Terminal ・Signal I/O Terminal – Power Input Terminal ・Signal I/O Terminal – Motor Output Terminal ・Signal I/O Terminal – Electromagnetic Brake Power Output Terminal*1
Dielectric Strength		No abnormality is judged even with application of 1.5 kV at 50 Hz or 60 Hz between the windings and the case for 1 minute under normal ambient temperature and humidity.	No abnormality is judged with the following application for 1 minute under normal ambient temperature and humidity: ・Power Input Terminal – Protective Earth Terminal 1.5 kVAC, 50 Hz or 60 Hz ・Motor Output Terminal – Protective Earth Terminal 1.5 kVAC, 50 Hz or 60 Hz ・Electromagnetic Brake Power Output Terminal*1 – Protective Earth Terminal 1.5 kVAC, 50 Hz or 60 Hz ・Signal I/O Terminal – Power Input Terminal 1.8 kVAC, 50 Hz or 60 Hz ・Signal I/O Terminal – Motor Output Terminal 1.8 kVAC, 50 Hz or 60 Hz ・Signal I/O Terminal – Electromagnetic Brake Power Output Terminal*1 1.8 kVAC, 50 Hz or 60 Hz
Operating Environment (In operation)	Ambient Temperature	−10～+50°C (non-freezing): Standard Type, **TH**, **PS**, **PN** Geared Types 0～+40°C (non-freezing): Harmonic Geared Type	0～+50°C (non-freezing)
	Ambient Humidity	85% max. (non-condensing)	
	Atmosphere	Use in an area without corrosive gases or dust. The product should not be exposed to water, oil or other liquids. (Standard Type Terminal Box Motor: Use in an area without corrosive gases and do not expose to oil.)	
Temperature Rise		Winding temperature rise is 80°C max. (measured by the resistance change method) at the rated current, at standstill, and 5-phases energized.	–
Stop Position Accuracy*2		±3 arc minutes (±0.05°)	–
Shaft Runout		0.05 T.I.R. (mm)*5	–
Radial Play*3		0.025 mm max. of 5 N	–
Axial Play*4		0.075 mm max. of 10 N	–
Concentricity for Shaft in the Mounting Pilot		0.075 T.I.R. (mm)*5	–
Perpendicularity for Shaft of the Mounting Surface		0.075 T.I.R. (mm)*5	–

*1 Only for electromagnetic brake type
*2 This value is for 0.72° step under no load. (The value changes with the size of the load.)
*3 Radial Play: Displacement in shaft position in the radial direction when 5 N load is applied in the vertical direction to the tip of the motor's shaft.
*4 Axial Play: Displacement in shaft position in the axial direction when a 10 N load is applied to the motor's shaft in the axial direction.
*5 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.

Permissible Overhung and Permissible Thrust Load

➜ Page A-14

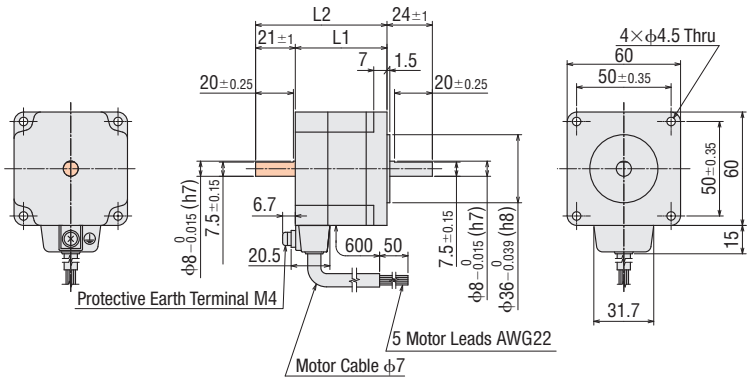
Dimensions (Unit = mm)

●Motors

◇Standard Type

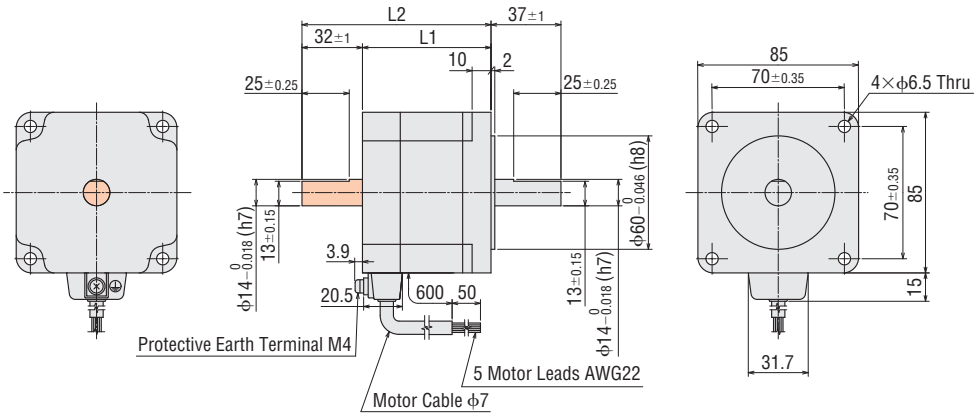
Frame Size 60 mm

Product Name	Motor Product Name	L1	L2	Mass kg
RK564ACE	PK564AE	48.5	—	0.6
RK564BCE	PK564BE		69.5	
RK566ACE	PK566AE	59.5	—	0.8
RK566BCE	PK566BE		80.5	
RK569ACE	PK569AE	89	—	1.3
RK569BCE	PK569BE		110	



Frame Size 85 mm

Product Name	Motor Product Name	L1	L2	Mass kg
RK596ACE	PK596AE	68	—	1.7
RK596BCE	PK596BE		100	
RK599ACE	PK599AE	98	—	2.8
RK599BCE	PK599BE		130	
RK5913ACE	PK5913AE	128	—	3.8
RK5913BCE	PK5913BE		160	

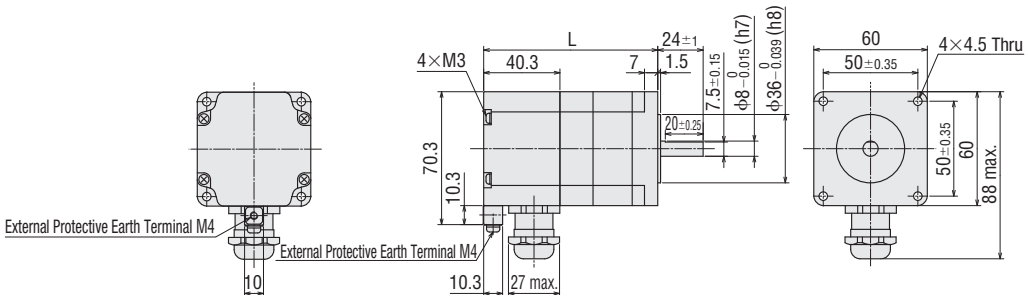


● These dimensions are for double shaft models. For single shaft models, ignore the ▭ areas.

◇Standard Type with Terminal Box

Frame Size 60 mm

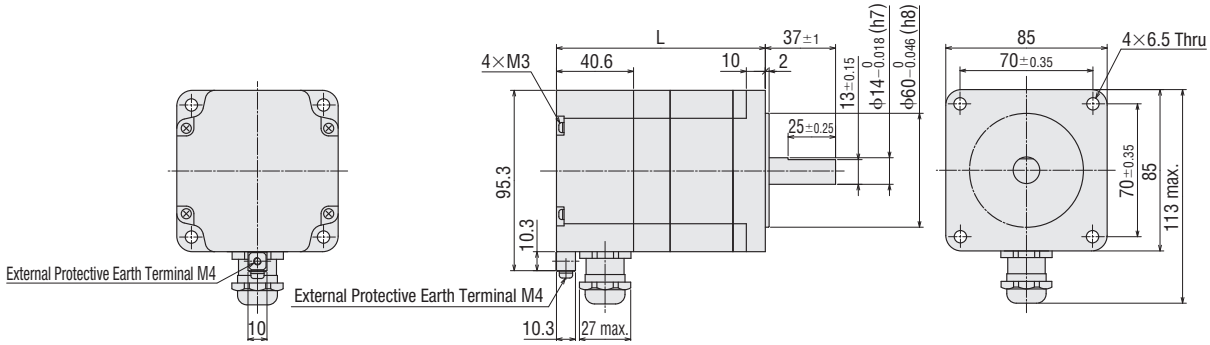
Product Name	Motor Product Name	L	Mass kg
RK564ACT	PK564AT	92	0.8
RK566ACT	PK566AT	103	1.1
RK569ACT	PK569AT	132.5	1.6



● The outer diameter of the applicable cable (VCT) is ϕ7 to ϕ13 mm. A cable for terminal box motor is available as an accessory (sold separately). ➜ Page A-346

Frame Size 85 mm

Product Name	Motor Product Name	L	Mass kg
RK596ACT	PK596AT	110	2.2
RK599ACT	PK599AT	140	3.3
RK5913ACT	PK5913AT	170	4.4

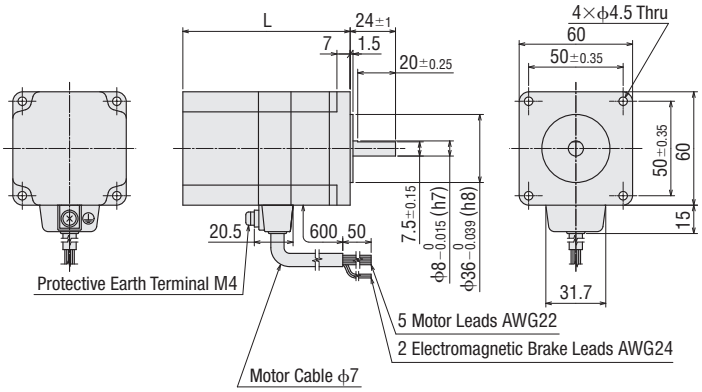


● The outer diameter of the applicable cable (VCT) is ϕ7 to ϕ13 mm. A cable for terminal box motor is available as an accessory (sold separately). ➜ Page A-346

◇Standard Type with Electromagnetic Brake

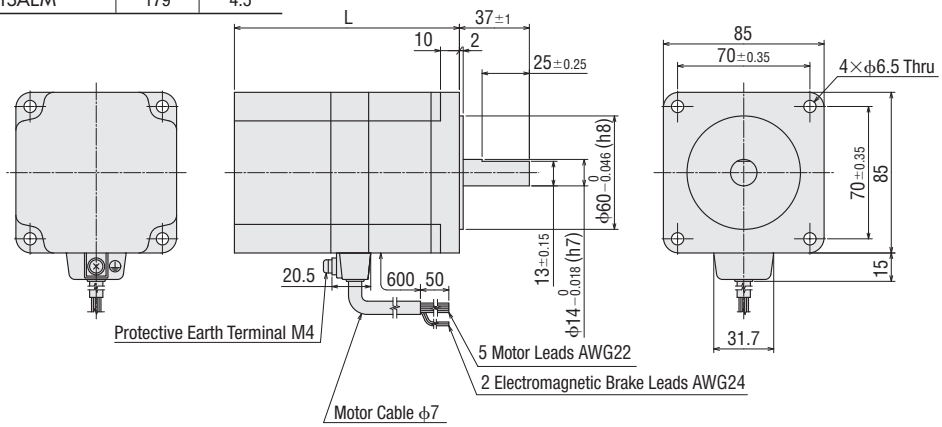
Frame Size 60 mm

Product Name	Motor Product Name	L	Mass kg
RK564AMCE	PK564AEM	88.5	0.9
RK566AMCE	PK566AEM	99.5	1.1
RK569AMCE	PK569AEM	129	1.6



Frame Size 85 mm

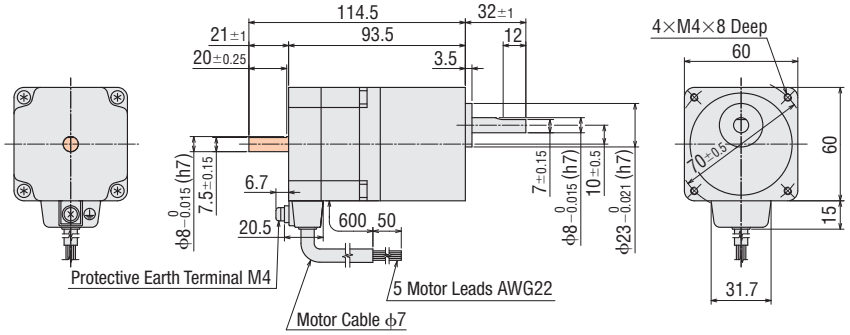
Product Name	Motor Product Name	L	Mass kg
RK596AMCE	PK596AEM	119	2.4
RK599AMCE	PK599AEM	149	3.5
RK5913AMCE	PK5913AEM	179	4.5



◇TH Geared Type

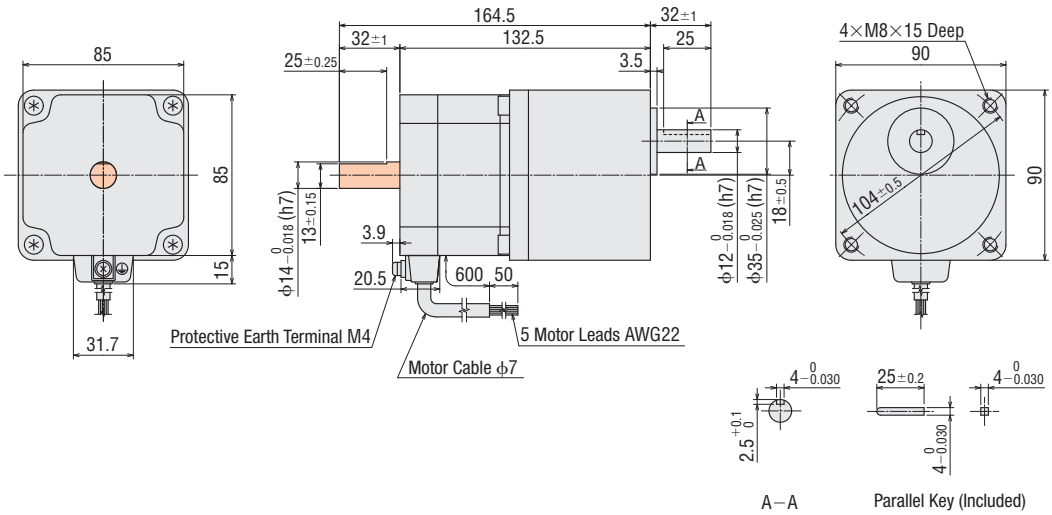
Frame Size 60 mm

Product Name	Motor Product Name	Gear Ratio	Mass kg
RK564ACE-T□	PK564AE-T□	**3.6**, **7.2**, **10**, **20**, **30**	0.95
RK564BCE-T□	PK564BE-T□		



Frame Size 90 mm

Product Name	Motor Product Name	Gear Ratio	Mass kg
RK596ACE-T□	PK596AE-T□	**3.6**, **7.2**	2.85
RK596ACE-T□	PK596AE1-T□	**10**, **20**, **30**	
RK596BCE-T□	PK596BE-T□	**3.6**, **7.2**	
RK596BCE-T□	PK596BE1-T□	**10**, **20**, **30**	

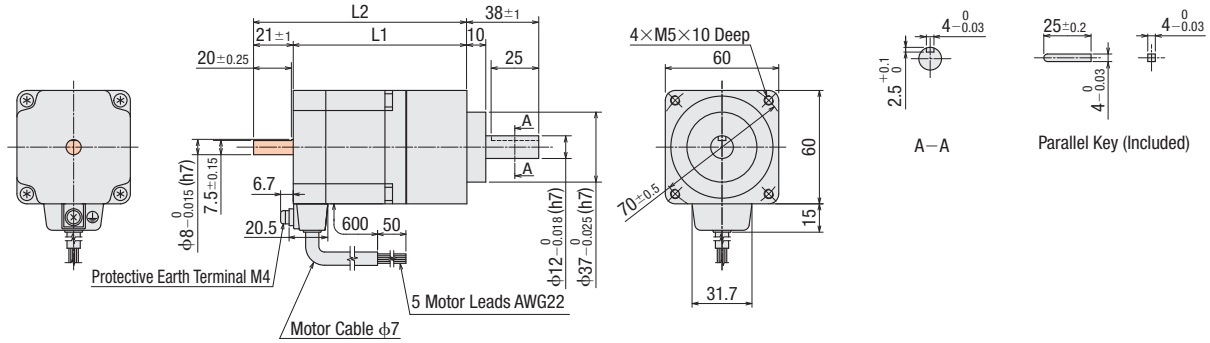


- A number indicating the gear ratio is entered where the box □ is located within the product name.
- These dimensions are for double shaft models. For single shaft models, ignore the ▭ areas.

◇**PS** Geared Type

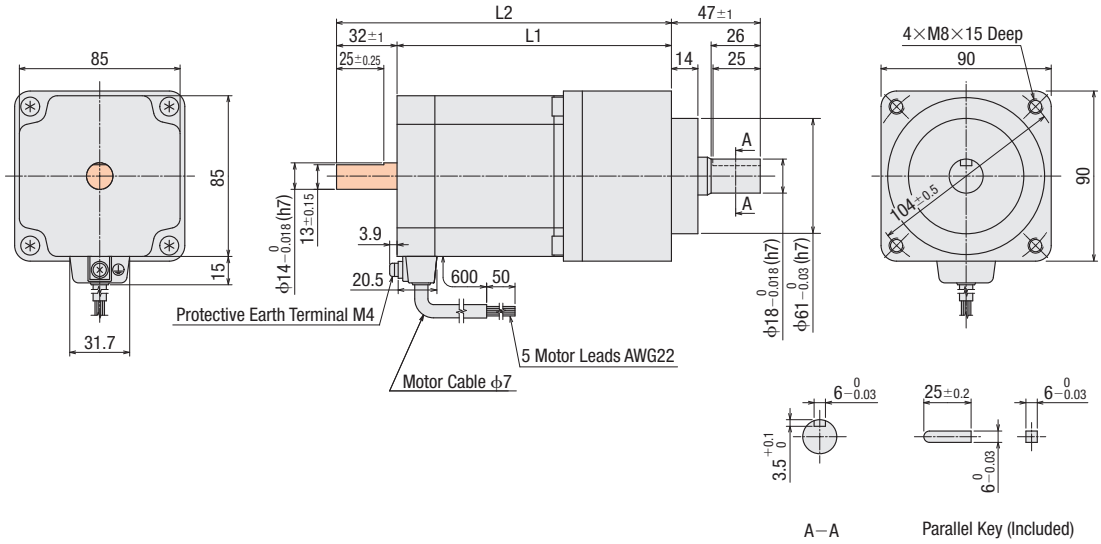
Frame Size 60 mm

Product Name	Motor Product Name	Gear Ratio	L1	L2	Mass kg
RK566ACE-PS□	PK566AE-PS□	**5, 7.2, 10**	91.5	—	1.3
RK566BCE-PS□	PK566BE-PS□			112.5	
RK564ACE-PS□	PK564AE-PS□	**25, 36, 50**	101	—	1.4
RK564BCE-PS□	PK564BE-PS□			122	



Frame Size 90 mm

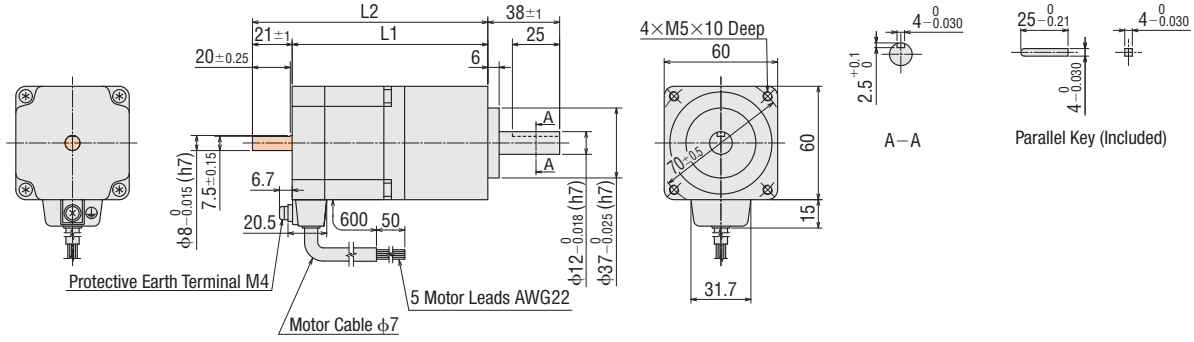
Product Name	Motor Product Name	Gear Ratio	L1	L2	Mass kg
RK599ACE-PS□	PK599AE-PS□	**5, 7.2, 10**	145	—	4.4
RK599BCE-PS□	PK599BE-PS□			177	
RK596ACE-PS□	PK596AE-PS□	**25, 36, 50**	142.5	—	4.2
RK596BCE-PS□	PK596BE-PS□			174.5	



◇**PN** Geared Type

Frame Size 60 mm

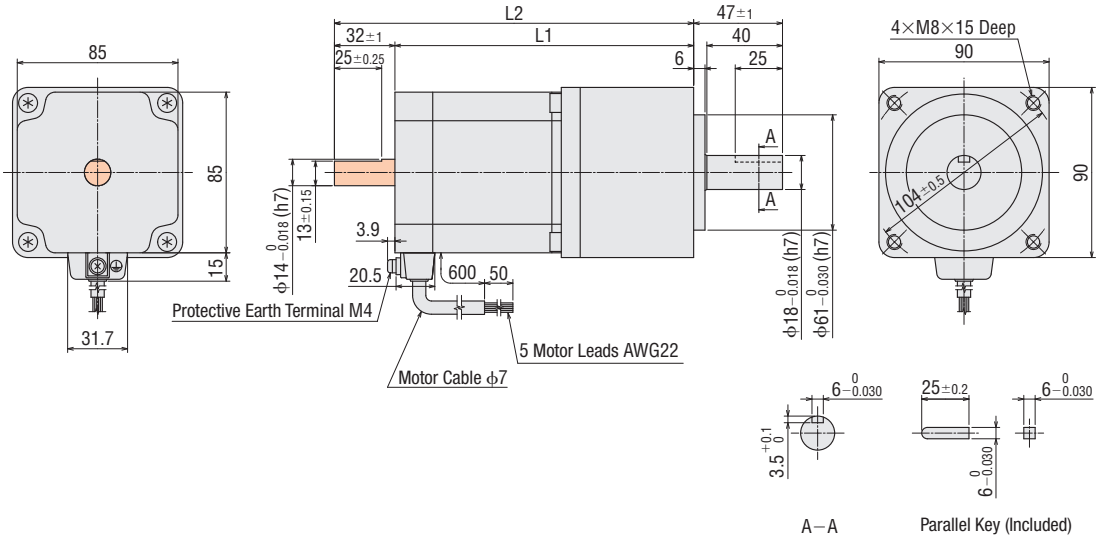
Product Name	Motor Product Name	Gear Ratio	L1	L2	Mass kg
RK566ACE-N□	PK566AE-N□	**5, 7.2, 10**	103.5	—	1.5
RK566BCE-N□	PK566BE-N□			124.5	
RK564ACE-N□	PK564AE-N□	**25, 36, 50**	108.5	—	1.5
RK564BCE-N□	PK564BE-N□			129.5	



- A number indicating the gear ratio is entered where the box □ is located within the product name.
- These dimensions are for double shaft models. For single shaft models, ignore the ▭ areas.

Frame Size 90 mm

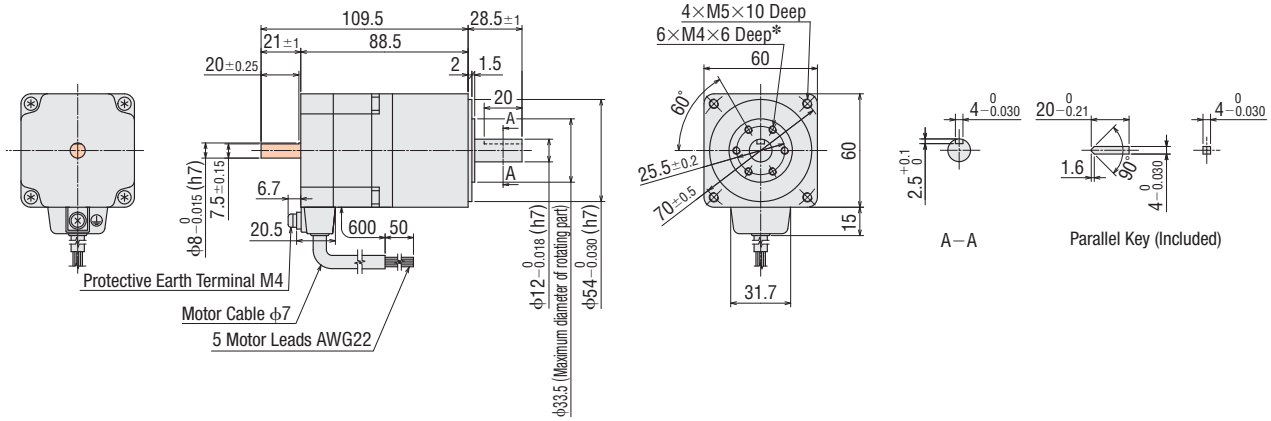
Product Name	Motor Product Name	Gear Ratio	L1	L2	Mass kg
RK599ACE-N□	PK599AE-N□	**5, 7.2, 10**	158	—	5
RK599BCE-N□	PK599BE-N□			190	
RK596ACE-N□	PK596AE-N□	**25, 36, 50**	151	—	4.7
RK596BCE-N□	PK596BE-N□			183	



◇Harmonic Geared Type

Frame Size 60 mm

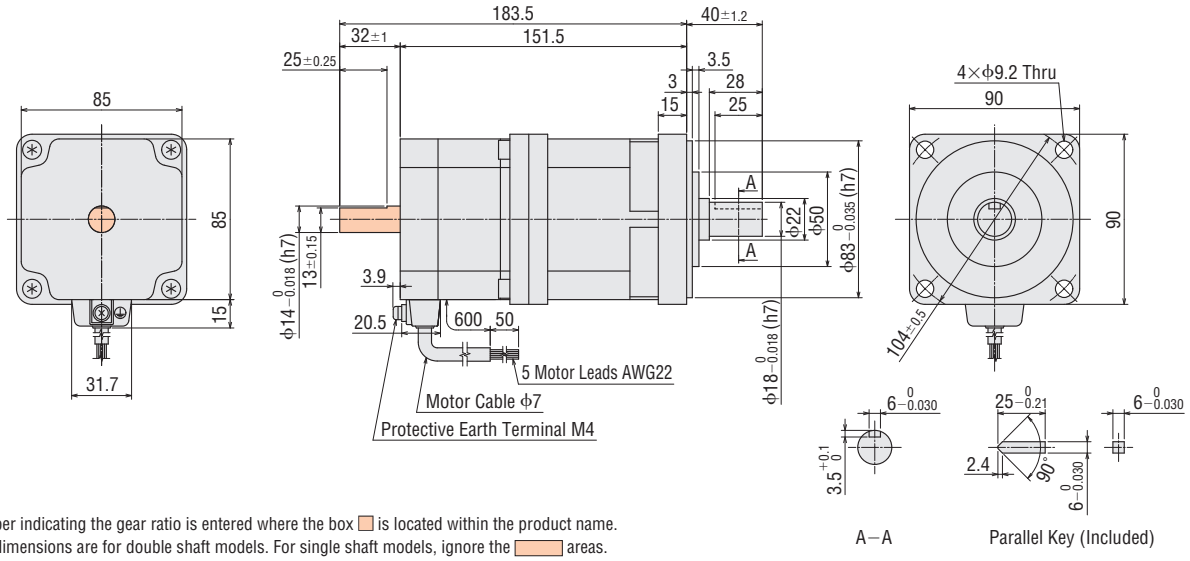
Product Name	Motor Product Name	Gear Ratio	Mass kg
RK564ACE-H□	PK564AE-H□S	**50, 100**	1.08
RK564BCE-H□	PK564BE-H□S		



✻The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

Frame Size 90 mm

Product Name	Motor Product Name	Gear Ratio	Mass kg
RK596ACE-H□	PK596AE1-H□	**50, 100**	3.7
RK596BCE-H□	PK596BE1-H□		

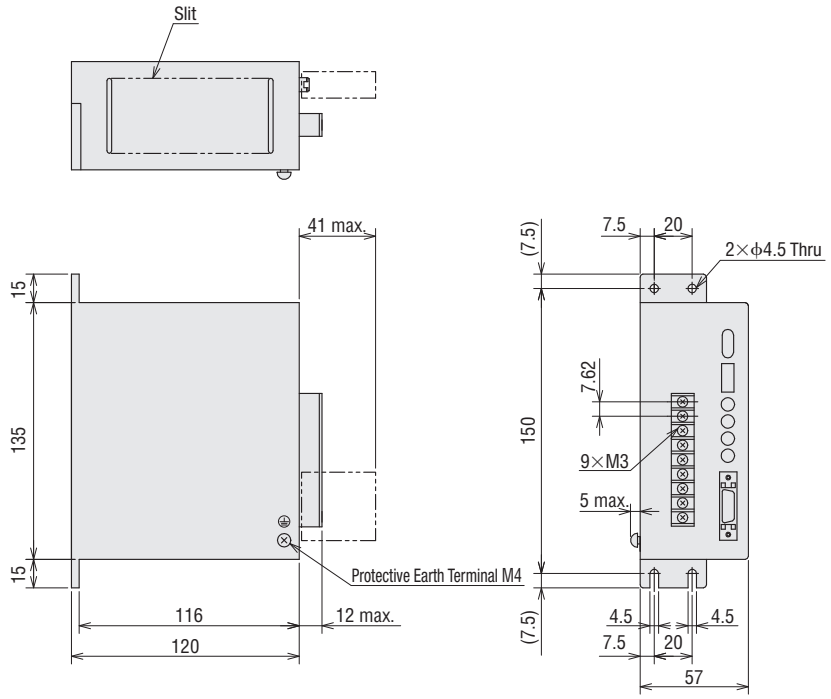


- A number indicating the gear ratio is entered where the box □ is located within the product name.
- These dimensions are for double shaft models. For single shaft models, ignore the ▭ areas.

Driver

Driver Product Name: RKD514L-C
RKD514H-C
RKD514LM-C
RKD514HM-C

Mass: 0.85 kg



● Accessories

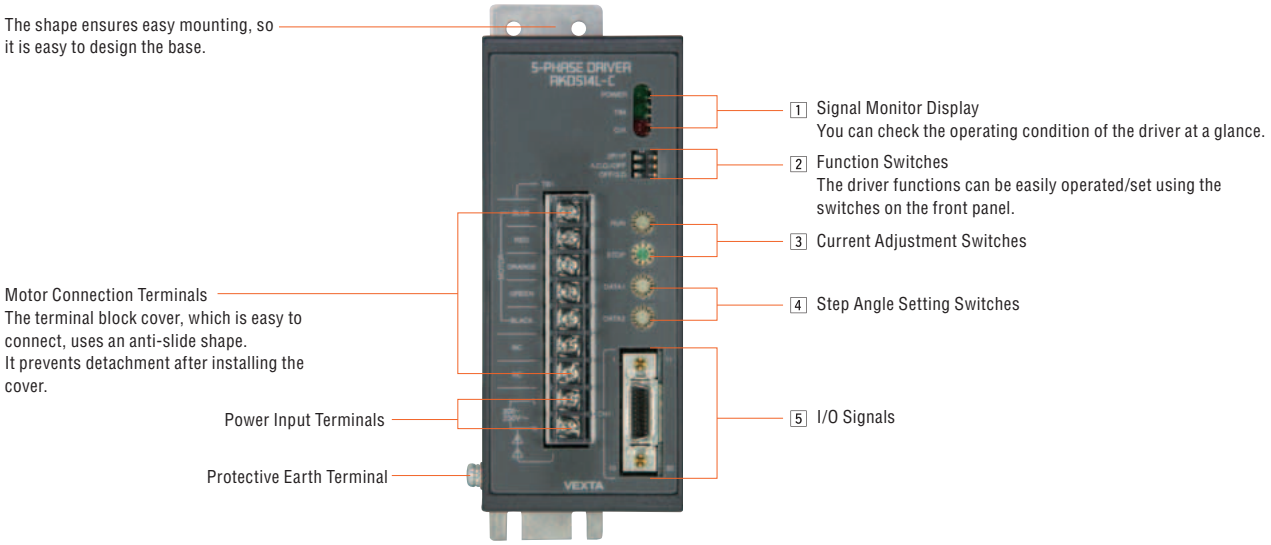
Control I/O Connector

Case : 10320-52A0-008 (Sumitomo 3M Limited)

Connector : 10120-3000PE (Sumitomo 3M Limited)

Connection and Operation

Names and Functions of Driver Parts



1 Signal Monitor Displays

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

2 Function 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 of heat sink of the driver rises to approximately 80°C, this function automatically switches the motor current off. The function can be set or deactivated 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 or deactivated with this switch.
M.B.F./OFF	Electromagnetic Brake Function Switch (Only for electromagnetic brake type)	The modes of the electromagnetic brake can be switched by combination of the switch settings. The following three modes are available; Power-failure position-holding mode Energy-saving mode Electromagnetic brake control mode
OFF/E.S.	Energy-Saving Mode Switch (Only for electromagnetic brake type)	

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 motor current at standstill

4 Step Angle Setting Switches

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

Step Angle Setting 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°

◇Setting Method

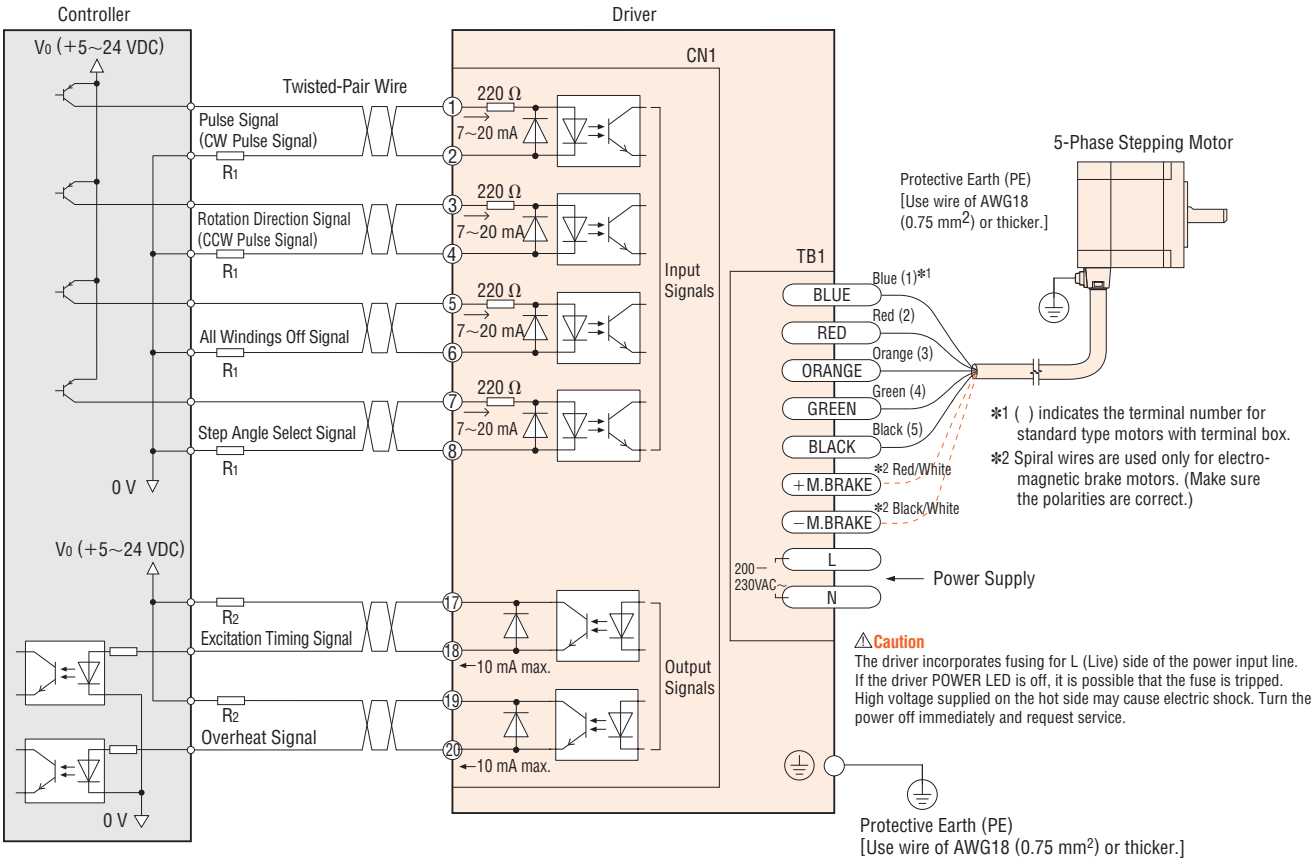
Selects and switches between the two step angle setting switches (DATA1 and DATA2).
Use the step angle select signal to change the step angle.
Photocoupler OFF: Step angle (resolution) set by DATA1 is selected.
Photocoupler ON: Step angle (resolution) set by DATA2 is selected.

5 I/O Signals

Indication	Input/Output	Pin No.	Terminal Name	Function
CN1	Input Signals	1	Pulse Signal (CW Pulse Signal)	Operation command pulse signal (The motor will rotate in the CW direction when in 2-pulse input mode.)
		2		
		3	Rotation Direction Signal (CCW Pulse Signal)	Rotation direction signal, Photocoupler ON: CW, Photocoupler OFF: CCW (The motor will rotate in the CCW direction when in 2-pulse input mode.)
		4		
		5	All Windings Off Signal	Cuts the output current to the motor and allows the motor shafts to be rotated manually.
		6		
		7	Step Angle Select Signal	Switches to step angle set in DATA1 and DATA2.
		8		
		9	Electromagnetic Brake Release Signal (Electromagnetic Brake Type Only)	Releases the electromagnetic brake and enables motor operation.
		10		
	Output Signals	17	Excitation Timing Signal	Outputs signals when the excitation sequence is at STEP 0.
		18		
		19	Overheat Signal	When the temperature of heat sink of the driver rises to approximately 80°C, this function automatically turns the output signal OFF.
		20		

●Connection Diagram

◇Connection to Current Source Output Circuit



Notes on Wiring

◇I/O Signal Connection

- Input Signal
  The external resistor is not needed when the voltage is 5 VDC. If voltage exceeding 5 VDC is applied, connect an appropriate external resistor R_1 so that the current becomes 7 to 20 mA.
  Example: When V_0 is 24 VDC, R_1: 1.5 to 2.2 kΩ 0.5 W or more
- Output Signal
  Check the specifications of all devices to be connected and if the current will exceed 10 mA, connect an external resistor R_2.
- Use a twisted-pair wire of AWG28 to 24 (0.08 to 0.2 mm^2).
- Since the maximum transmissible frequency drops as the pulse line becomes longer, keep the wiring length as short as possible (within 2 m).
  Technical reference ➜ Page G-46
- Provide a minimum distance of 100 mm between the I/O signal lines and power lines (power supply lines, motor lines and other large-current circuits).

◇Power Connection

- Use a thick wire of AWG22 (0.3 mm^2) or thicker.

◇Extension of Motor Cable

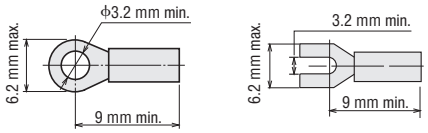
- Use a wire of AWG22 (0.3 mm^2) or thicker.

◇Ground Connection

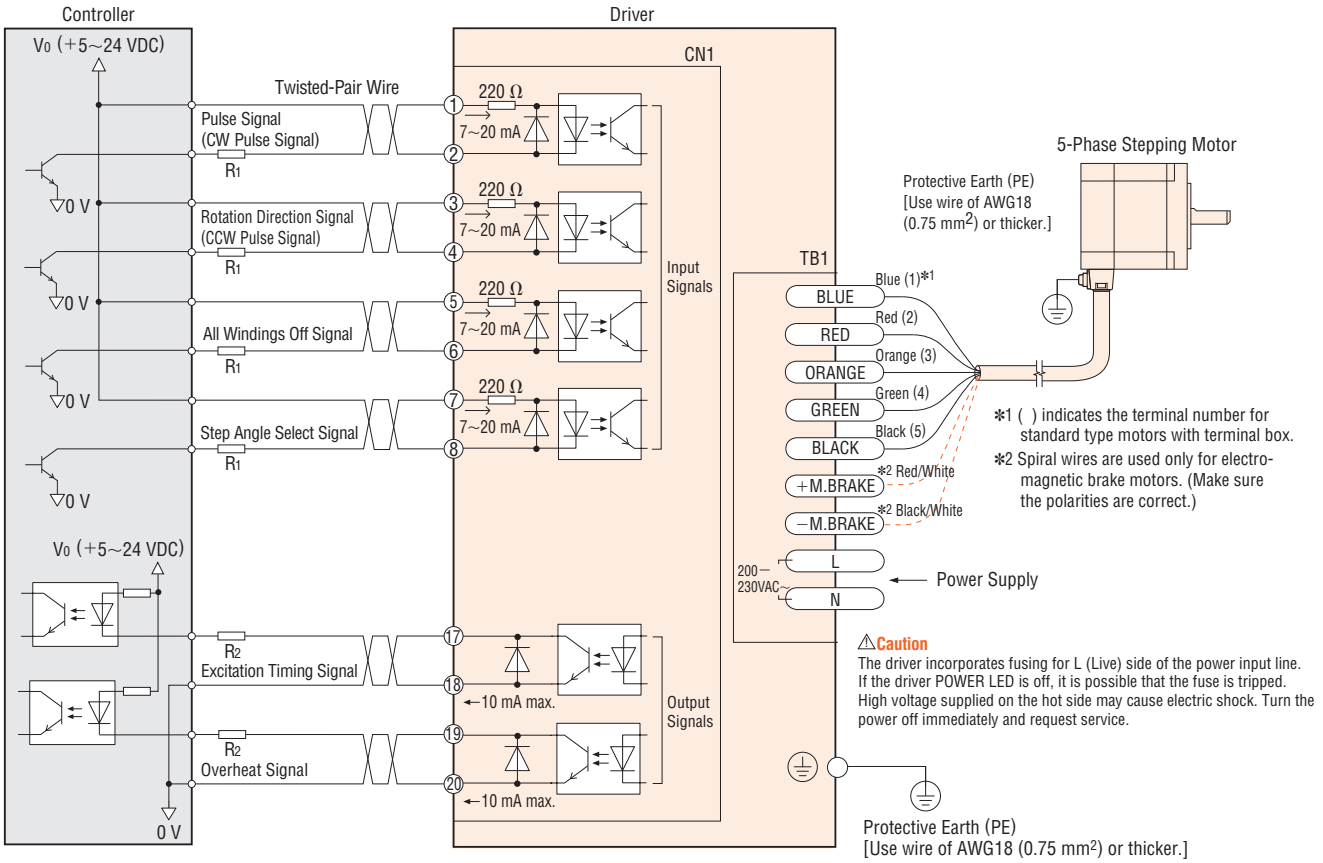
- Use a wire of AWG18 (0.75 mm^2) or thicker.
- Connect the driver and controller to a ground at a single point.

◇General

- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.
- Applicable Crimp Terminals (Not included)



◇Connection to Current Sink Output Circuit



Notes on Wiring

◇I/O Signal Connection

- Input Signal
  The external resistor is not needed when the voltage is 5 VDC. If voltage exceeding 5 VDC is applied, connect an appropriate external resistor R_1 so that the current becomes 7 to 20 mA.
  Example: When V_0 is 24 VDC, R_1: 1.5 to 2.2 kΩ 0.5 W or more
- Output Signal
  Check the specifications of all devices to be connected and if the current will exceed 10 mA, connect an external resistor R_2.
- Use a twisted-pair wire of AWG28 to 24 (0.08 to 0.2 mm^2).
- Since the maximum transmissible frequency drops as the pulse line becomes longer, keep the wiring length as short as possible (within 2 m).
  Technical reference ➜ Page G-46
- Provide a minimum distance of 100 mm between the I/O signal lines and power lines (power supply lines, motor lines and other large-current circuits).

◇Power Connection

- Use a thick wire of AWG22 (0.3 mm^2) or thicker.

◇Extension of Motor Cable

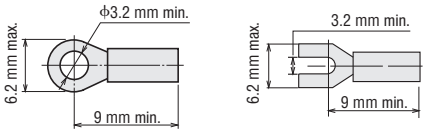
- Use a wire of AWG22 (0.3 mm^2) or thicker.

◇Ground Connection

- Use a wire of AWG18 (0.75 mm^2) or thicker.
- Connect the driver and controller to a ground at a single point.

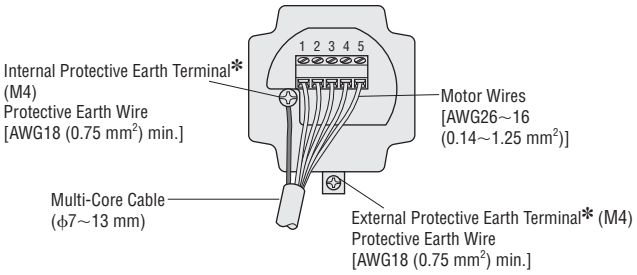
◇General

- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.
- Applicable Crimp Terminals (Not included)

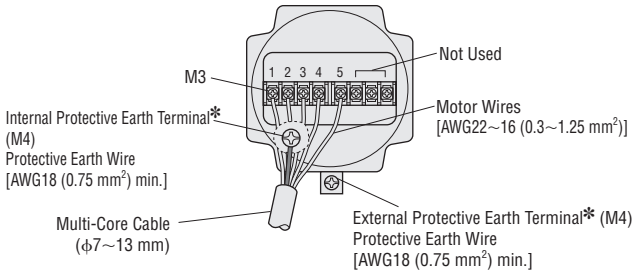


●Connection of Standard Type with Terminal Box

RK564ACT, RK566ACT, RK569ACT



RK596ACT, RK599ACT, RK5913ACT



*Use either the internal or external protective earth terminal for grounding.

Motor and Driver Combinations

Model names for motor and driver combinations are shown below.

Type	Product Name	Motor Product Name	Driver Product Name
Standard Type	**RK564□CE** **RK566□CE** **RK569□CE**	PK564□E PK566□E PK569□E	RKD514L-C
	RK596□CE **RK599□CE** **RK5913□CE**	PK596□E PK599□E PK5913□E	RKD514H-C
Standard Type with Terminal Box	**RK564ACT** **RK566ACT** **RK569ACT**	PK564AT PK566AT PK569AT	RKD514L-C
	RK596ACT **RK599ACT** **RK5913ACT**	PK596AT PK599AT PK5913AT	RKD514H-C
Standard Type with Electromagnetic Brake	**RK564AMCE** **RK566AMCE** **RK569AMCE**	PK564AEM PK566AEM PK569AEM	RKD514LM-C
	RK596AMCE **RK599AMCE** **RK5913AMCE**	PK596AEM PK599AEM PK5913AEM	RKD514HM-C
TH Geared Type	**RK564□CE-T3.6** **RK564□CE-T7.2** **RK564□CE-T10** **RK564□CE-T20** **RK564□CE-T30**	PK564□E-T3.6 PK564□E-T7.2 PK564□E-T10 PK564□E-T20 PK564□E-T30	RKD514L-C
	RK596□CE-T3.6 **RK596□CE-T7.2** **RK596□CE-T10** **RK596□CE-T20** **RK596□CE-T30**	PK596□E-T3.6 PK596□E-T7.2 PK596□E1-T10 PK596□E1-T20 PK596□E1-T30	RKD514H-C
PS Geared Type	**RK566□CE-PS5** **RK566□CE-PS7** **RK566□CE-PS10** **RK564□CE-PS25** **RK564□CE-PS36** **RK564□CE-PS50**	PK566□E-PS5 PK566□E-PS7 PK566□E-PS10 PK564□E-PS25 PK564□E-PS36 PK564□E-PS50	RKD514L-C
	RK599□CE-PS5 **RK599□CE-PS7** **RK599□CE-PS10** **RK596□CE-PS25** **RK596□CE-PS36** **RK596□CE-PS50**	PK599□E-PS5 PK599□E-PS7 PK599□E-PS10 PK596□E-PS25 PK596□E-PS36 PK596□E-PS50	RKD514H-C
PN Geared Type	**RK566□CE-N5** **RK566□CE-N7.2** **RK566□CE-N10** **RK564□CE-N25** **RK564□CE-N36** **RK564□CE-N50**	PK566□E-N5 PK566□E-N7.2 PK566□E-N10 PK564□E-N25 PK564□E-N36 PK564□E-N50	RKD514L-C
	RK599□CE-N5 **RK599□CE-N7.2** **RK599□CE-N10** **RK596□CE-N25** **RK596□CE-N36** **RK596□CE-N50**	PK599□E-N5 PK599□E-N7.2 PK599□E-N10 PK596□E-N25 PK596□E-N36 PK596□E-N50	RKD514H-C
Harmonic Geared Type	**RK564□CE-H50** **RK564□CE-H100**	PK564□E-H50S PK564□E-H100S	RKD514L-C
	RK596□CE-H50 **RK596□CE-H100**	PK596□E1-H50 PK596□E1-H100	RKD514H-C

● Either **A** or **B** indicating the motor shaft type is entered where the box □ is located within the product name.