Stepping Motors

Stepping Motor and Driver Package

DC Input

RoHS RoHS-Compliant

5-Phase Stepping Motor and Driver Package

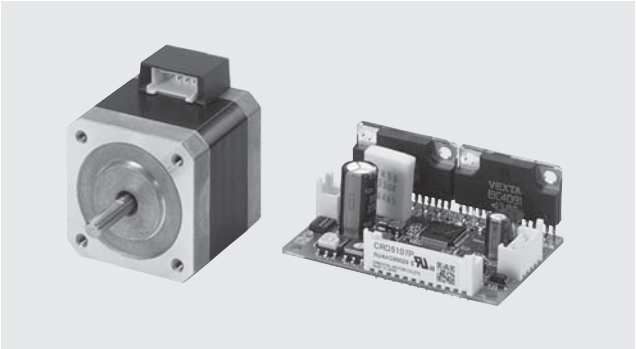
CRK Series

●Additional Information●
Technical reference ➜ Page F-1
Safety standards ➜ Page G-2

The **CRK** Series is a motor and driver package combining a high-performance, 5-phase stepping motor with a compact, low-vibration microstep driver offering the Smooth Drive Function. Four frame sizes of 20 mm, 28 mm, 42 mm and 60 mm are available, as well as various geared motor units.

c UL us CE

●List of safety standard approved products (Model, Standards, File No., Certification Body)
➜ Page G-10



■Features

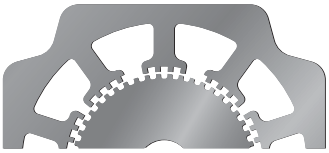
●Newly Designed Motors

◇High-Resolution Motor

• Improved Stopping Accuracy

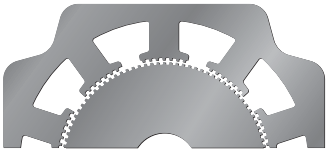
The positioning accuracy of a stepping motor is affected by friction load.
The high-resolution type achieve high accuracy and reliability based on Oriental Motor's latest precision machining technology. The motor resolution is increased to double the level of a standard model to reduce the displacement angle against load torque, thereby achieve high positioning accuracy. Vibration is also reduced.

Standard type: 50 teeth
Resolution: 500 per revolution = 0.72°/step

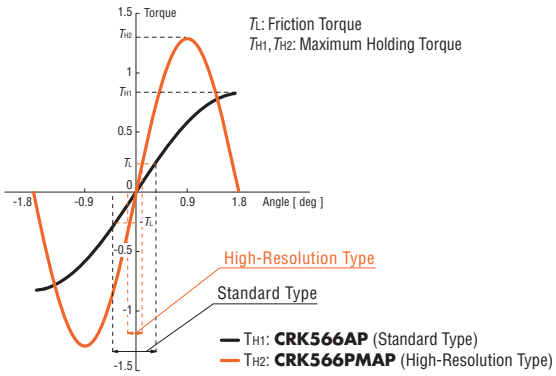


Resolution is increased!

High-resolution type: 100 teeth
Resolution: 1000 per revolution = 0.36°/step



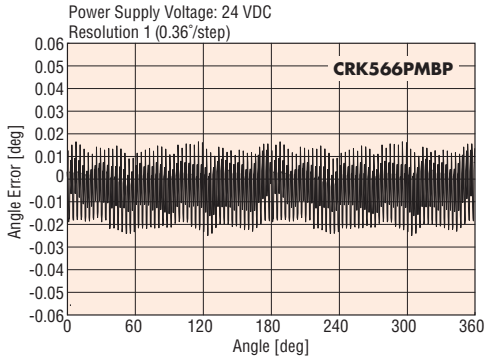
Comparison of Angle – Torque Characteristics



• Stop Position Accuracy

The high-resolution type is designed with a stop position accuracy of 2 arc minutes (0.034°) [standard type: 3 arc minutes (0.05°)]. The reduced error helps improve the positioning accuracy of your equipment.

Static Angle Characteristics

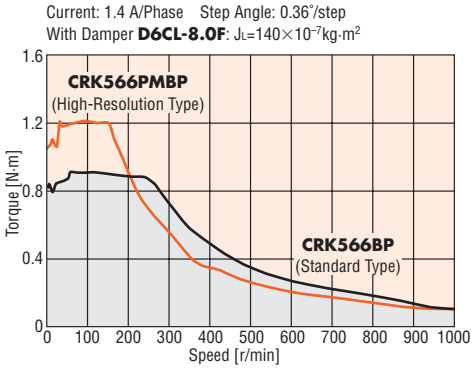


◇High-Torque Motor

The high-resolution type and high-torque type adopt a newly designed high-torque motor that widens the range of applications.

●The smaller motor allows for compact equipment design.
●The motor current is reduced to suppress heat generation.
Example: Avoidance of temperature rise in precision equipment or machinery

Comparison of Speed – Torque Characteristics



◇Adopting a Connector Coupling Method

The high-resolution type and high-torque type are connected using a connector — a connection method everyone is familiar with.

●Desired cable length and type can be selected.
●Maintenance becomes easy.
●Motor lead wire/connector assembly (0.6m) is included with motor and driver package.

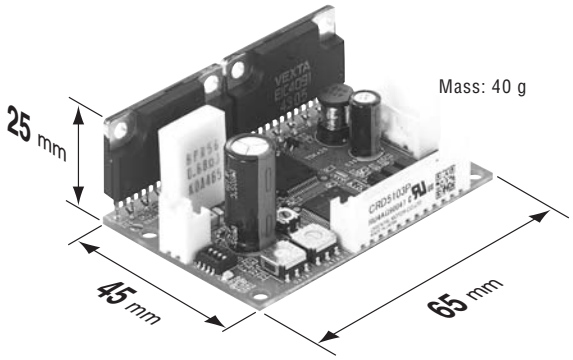
●Wide Range of Motor Variations

The **CRK** Series offers models of the high-resolution type, high-torque type and standard type, as well as various geared types. You can find a product meeting your specific torque, resolution or other needs from a wide range of specifications.

●Compact, Lightweight Microstep Driver

The driver in the **CRK** Series achieves microstep drive in a compact, lightweight body (Mass: 40 g).
A new IC allows the driver to provide various functions, including the following:

- ●Smooth Drive Function
- ●1-pulse/2-pulse input mode switching
- ●25 preset step angles
- ●Power LED
- ●Photocoupler input
- ●Connector with lock (by MOLEX)



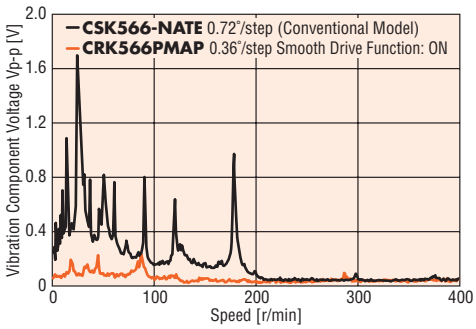
◇Lower Vibration and Noise Achieved by Microstep Drive

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 reduction gear.
As a result, vibration and noise are further reduced.

◇Smooth Drive Function for Enhanced Ease of Use

The Smooth Drive Function automatically controls operations via microstep drive, at the same travel distance and speed used in the full-step mode, without requiring the operator to change the pulse input settings.
This function is particularly useful when the **CRK** Series is used in the full-step or half-step mode.

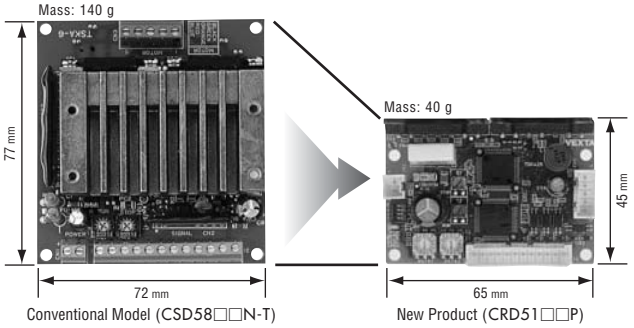
Comparison of Vibration Characteristics



◇Compact Size

The compact, lightweight driver in the **CRK** Series is approximately 47% smaller than a conventional full-step driver.

Comparison of Driver Size and Mass



●Conforming to Major Safety Standards

The **CRK** Series is UL-recognized and CSA-certified.
It also bears the CE Mark as a proof of conformance to the EMC Directives.
Safe operation is ensured anywhere in the world.

●RoHS-Compliant

The **CRK** Series conforms to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.

●**Details of RoHS Directive** ➜ Page G-23

●Useful Accessories

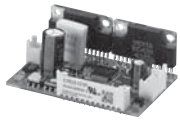
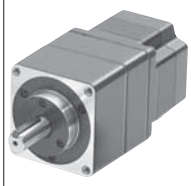
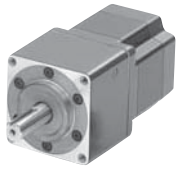
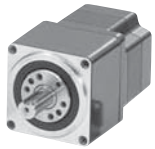
• Driver Lead Wire Set

These lead wires allow for easy connection of the motor, power supply and input signals without crimping. All driver lead wires needed to connect the motor, power supply and I/O signals are combined in a single set. Various other parts and accessories useful in different applications are also available (sold separately).

Driver lead wire set ➜ Page C-257

Wide Variety

The **CRK** Series motor and driver package comes in four motor frame sizes of 20 to 60 mm, as well as four geared types.

Type		Features	□20 mm	□28 mm	□42 mm	□60 mm	Driver
High-Resolution Type		A high-torque motor offering higher positioning accuracy with the basic step angle set to 0.36°/step, which is just half the basic step angle of the standard type.					
High-Torque Type		A high-torque motor generating high torque of approx. 1.3 to 1.5 times the level achieved by the standard type.					
Standard Type		The basic model in the **CRK** Series offering an optimal balance of torque, low vibration and low noise.					
Low Backlash Type	**TH** Geared Type	A geared motor achieving both low backlash and low cost.					
	PL Geared Type	A geared motor offering low backlash, high strength and wide gear ratios.					
Non-Backlash Type	**PN** Geared Type	A high-accuracy, high strength geared motor achieving a backlash of 3 arc minutes or less.					
	Harmonic Geared Type	A high-accuracy, backlash-free geared motor adopting a newly developed harmonic gear. It ensures high strength in a compact body.					

Characteristics Comparison for Geared Motors

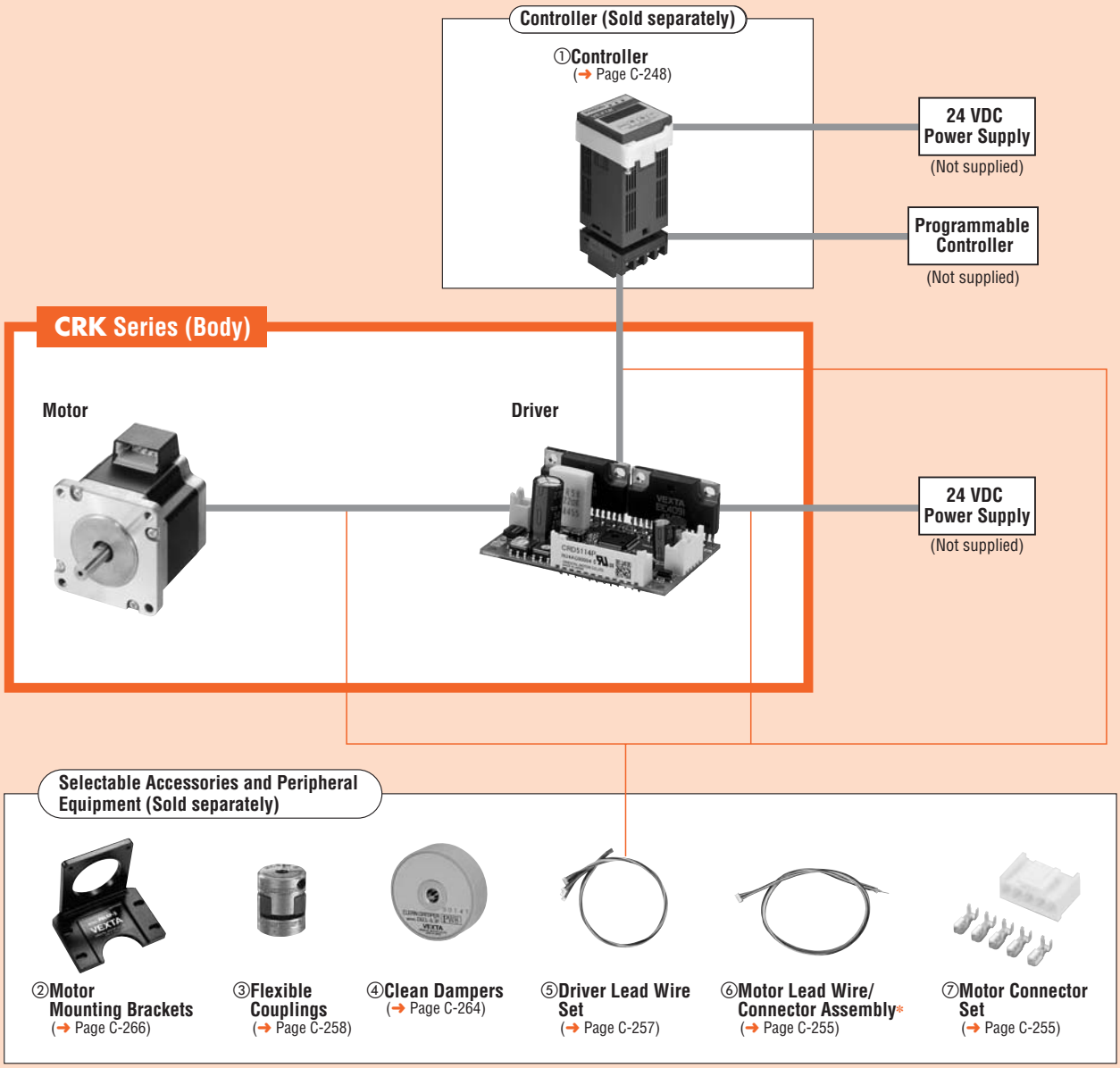
	Geared Type	Features	Permissible Torque/ Maximum Torque [N·m]	Backlash [arc min]	Basic Resolution [deg/step]	Output Shaft Speed [r/min]
Low Backlash Type	 **TH Geared** (Parallel Shaft)	· **A wide variety of low gear ratios for high-speed operation** · **Gear ratios:** 1:3.6, 1:7.2, 1:10, 1:20, 1:30	4	60	0.024	500
	 **PL Geared** (Planetary Gear)	· **High permissible torque** · **A wide variety of gear ratios for selecting the desired step angle** · **Centered output shaft** · **Gear ratios:** 1:5, 1:7.2, 1:10, 1:25, 1:36, 1:50	8	35	0.0144	360
Non-Backlash Type	 **PN Geared** (Planetary Gear)	· **High speed (low gear ratio), high positioning precision** · **High permissible/maximum torque** · **A wide variety of gear ratios for selecting the desired step angle** · **Centered output shaft** · **Gear ratios:** 1:5, 1:7.2, 1:10, 1:25, 1:36, 1:50	**Permissible Torque** 8 **Maximum Torque** 20	3	0.0144	600
	 **Harmonic Geared** (Harmonic Drive)	· **High positioning precision** · **High permissible/maximum torque** · **High gear ratio, high resolution** · **Centered output shaft** · **Gear ratios:** 1:50, 1:100	**Permissible Torque** 8 **Maximum Torque** 28	0	0.0072	70

Note:

● The values shown above must be used as reference. These values vary depending on the frame size and gear ratio.

System Configuration

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



*A motor lead wire/connector assembly of 0.6 m is included with the motor and driver package of connector-coupled type.

No.	Product Name	Overview	Page
①	Controller	This controller outputs pulse commands that determine the rotating amount and rotating speed.	C-248
②	Motor Mounting Brackets	Dedicated mounting bracket for the motor.	C-266
③	Flexible Couplings	Coupling that connects the motor shaft to the driven shaft.	C-258
④	Clean Dampers	Dedicated damper for suppressing stepping motor vibration.	C-264
⑤	Driver Lead Wire Set	Cables for connecting the driver and motor, DC power supply or host controller (0.6 m).	C-257
⑥	Motor Lead Wire/Connector Assembly	Lead wire with a connector crimped for connector-coupled motors (0.6 m, 1 m).	C-255
⑦	Motor Connector Set	Set of connector housings and contacts for use with connector-coupled motors (for 30 units).	C-255

●Example of System Configuration

(Body)		(Sold separately)				
CRK Series	+	Controller	Motor Mounting Bracket	Flexible Coupling	Clean Damper	Driver Lead Wire Set (0.6 m)
CRK566PMBP		SG8030JY-U	PAL2P-5	MCS300808	D6CL-8.0F	LCS04SD5

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

Product Number Code

High-Resolution Type/High-Torque Type/Standard Type

CRK 5 4 4 P M A P

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Series	**CRK**: **CRK** Series
②	**5**: 5-Phase	
③	Motor Frame Size	**1**: 20 mm **2**: 28 mm **4**: 42 mm **6**: 60 mm
④	Motor Case Length	
⑤	Motor Type	
⑥	Resolution	**M**: High-Resolution
⑦	Motor Shaft Type	**A**: Single Shaft **B**: Double Shaft
⑧	Signal I/O Mode of Driver	**P**: Photocoupler

Geared Type

CRK 5 2 3 P A P-N 7.2

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①	Series	**CRK**: **CRK** Series
②	**5**: 5-Phase	
③	Motor Frame Size	**1**: 20 mm **2**: 28 mm **4**: 42 mm **6**: 60 mm
④	Motor Case Length	
⑤	Motor Type	
⑥	Motor Shaft Typ	**A**: Single Shaft **B**: Double Shaft
⑦	Signal I/O Mode of Driver	**P**: Photocoupler
⑧	Gearhead Type	**T**: **TH** Geared Type **P**: **PL** Geared Type **N**: **PN** Geared Type **H**: Harmonic Geared Type
⑨	Gear Ratio	

Product Line

High-Resolution Type

Model (Single Shaft)	Model (Double Shaft)
CRK523PMAP	**CRK523PMBP**
CRK524PMAP	**CRK524PMBP**
CRK525PMAP	**CRK525PMBP**
CRK544PMAP	**CRK544PMBP**
CRK546PMAP	**CRK546PMBP**
CRK564PMAP	**CRK564PMBP**
CRK566PMAP	**CRK566PMBP**
CRK569PMAP	**CRK569PMBP**

High-Torque Type

Model (Single Shaft)	Model (Double Shaft)
CRK513PAP	**CRK513PBP**
CRK523PAP	**CRK523PBP**
CRK525PAP	**CRK525PBP**
CRK544PAP	**CRK544PBP**
CRK546PAP	**CRK546PBP**

Standard Type

Model (Single Shaft)	Model (Double Shaft)
CRK543AP	**CRK543BP**
CRK544AP	**CRK544BP**
CRK545AP	**CRK545BP**
CRK564AP	**CRK564BP**
CRK566AP	**CRK566BP**
CRK569AP	**CRK569BP**

TH Geared Type

Model (Single Shaft)	Model (Double Shaft)
CRK523PAP-T7.2	**CRK523PBP-T7.2**
CRK523PAP-T10	**CRK523PBP-T10**
CRK523PAP-T20	**CRK523PBP-T20**
CRK523PAP-T30	**CRK523PBP-T30**
CRK543AP-T3.6	**CRK543BP-T3.6**
CRK543AP-T7.2	**CRK543BP-T7.2**
CRK543AP-T10	**CRK543BP-T10**
CRK543AP-T20	**CRK543BP-T20**
CRK543AP-T30	**CRK543BP-T30**
CRK564AP-T3.6	**CRK564BP-T3.6**
CRK564AP-T7.2	**CRK564BP-T7.2**
CRK564AP-T10	**CRK564BP-T10**
CRK564AP-T20	**CRK564BP-T20**
CRK564AP-T30	**CRK564BP-T30**

PL Geared Type

Model (Single Shaft)	Model (Double Shaft)
CRK545AP-P5	**CRK545BP-P5**
CRK545AP-P7.2	**CRK545BP-P7.2**
CRK545AP-P10	**CRK545BP-P10**
CRK543AP-P25	**CRK543BP-P25**
CRK543AP-P36	**CRK543BP-P36**
CRK543AP-P50	**CRK543BP-P50**
CRK566AP-P5	**CRK566BP-P5**
CRK566AP-P7.2	**CRK566BP-P7.2**
CRK566AP-P10	**CRK566BP-P10**
CRK564AP-P25	**CRK564BP-P25**
CRK564AP-P36	**CRK564BP-P36**
CRK564AP-P50	**CRK564BP-P50**

PN Geared Type

Model (Single Shaft)	Model (Double Shaft)
CRK523PAP-N5	**CRK523PBP-N5**
CRK523PAP-N7.2	**CRK523PBP-N7.2**
CRK523PAP-N10	**CRK523PBP-N10**
CRK544AP-N5	**CRK544BP-N5**
CRK544AP-N7.2	**CRK544BP-N7.2**
CRK544AP-N10	**CRK544BP-N10**
CRK566AP-N5	**CRK566BP-N5**
CRK566AP-N7.2	**CRK566BP-N7.2**
CRK566AP-N10	**CRK566BP-N10**
CRK564AP-N25	**CRK564BP-N25**
CRK564AP-N36	**CRK564BP-N36**
CRK564AP-N50	**CRK564BP-N50**

Harmonic Geared Type

Model (Single Shaft)	Model (Double Shaft)
CRK513PAP-H50	**CRK513PBP-H50**
CRK513PAP-H100	**CRK513PBP-H100**
CRK543AP-H50	**CRK543BP-H50**
CRK543AP-H100	**CRK543BP-H100**
CRK564AP-H50	**CRK564BP-H50**
CRK564AP-H100	**CRK564BP-H100**

The following items are included in each product.
Motor, Parallel Key*1, Driver, Driver Connector, Motor Lead Wire/Connector Assembly*2, Operating Manual
*1 Only for the products with a key slot on the output shaft
*2 Only for connector-coupled motor

High-Resolution Type Motor Frame Size 28 mm, 42 mm

Specifications RoHS

Model		CRK523PMAP* / CRK523PMBP*	CRK524PMAP* / CRK524PMBP*	CRK525PMAP* / CRK525PMBP*	CRK544PMAP* / CRK544PMBP*	CRK546PMAP* / CRK546PMBP*
Maximum Holding Torque	N·m	0.042	0.061	0.09	0.24	0.42
Rotor Inertia	J: kg·m²	9×10^{-7}	13×10^{-7}	19×10^{-7}	60×10^{-7}	121×10^{-7}
Rated Current	A/Phase	0.35			0.75	
Basic Step Angle		0.36°				
Power Source		24 VDC±10% 0.7 A			24 VDC±10% 1.4 A	
Excitation Mode		Microstep				
Mass	Motor kg	0.11	0.15	0.2	0.3	0.5
	Driver kg	0.04				
Dimension No.	Motor	2			3	
	Driver	18				

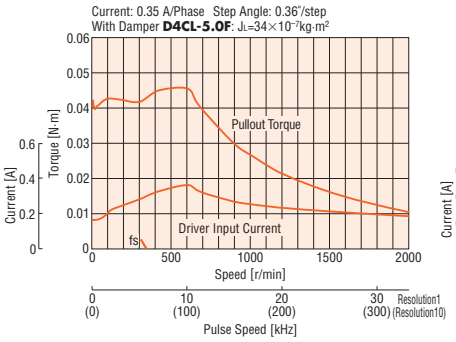
How to read specifications table ➜ Page C-10

*Motor lead wire/connector assembly (0.6 m) is included with the motor and driver package of connector-coupled type.

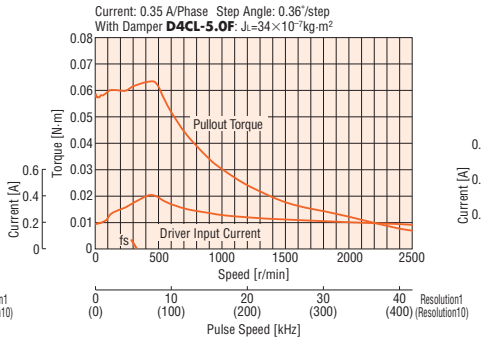
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

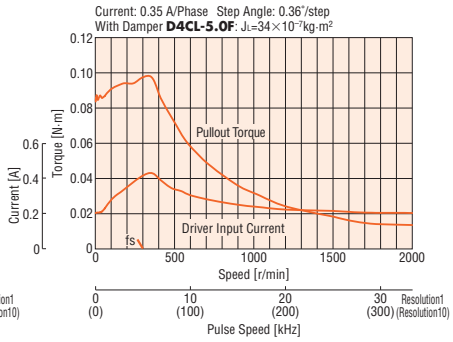
CRK523PMAP/CRK523PMBP



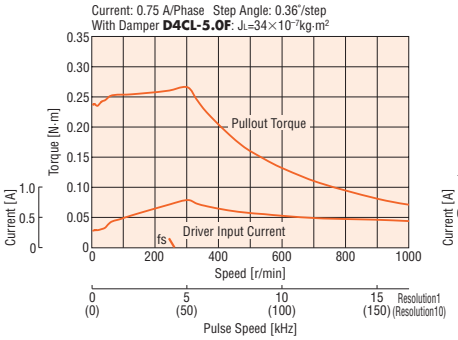
CRK524PMAP/CRK524PMBP



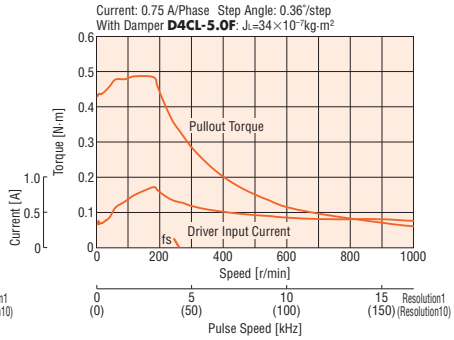
CRK525PMAP/CRK525PMBP



CRK544PMAP/CRK544PMBP



CRK546PMAP/CRK546PMBP



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

High-Resolution Type Motor Frame Size 60 mm

Specifications RoHS

Model		CRK564PMAP* / CRK564PMBP*	CRK566PMAP* / CRK566PMBP*	CRK569PMAP* / CRK569PMBP*
Maximum Holding Torque	N·m	0.78	1.3	2.3
Rotor Inertia	J: kg·m²	320×10⁻⁷	500×10⁻⁷	1100×10⁻⁷
Rated Current	A/Phase	1.4		
Basic Step Angle		0.36°		
Power Source		24 VDC±10% 2.5 A		
Excitation Mode		Microstep		
Mass	Motor kg	0.65	0.87	1.5
	Driver kg	0.04		
Dimension No.	Motor	4		
	Driver	18		

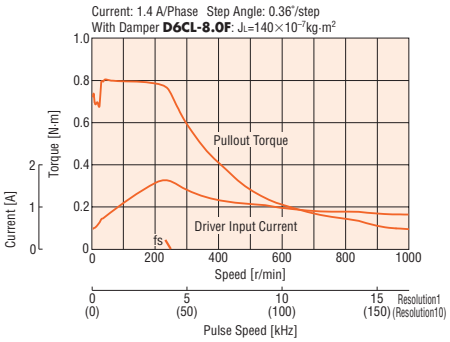
How to read specifications table ➜ Page C-10

*Motor lead wire/connector assembly (0.6 m) is included with the motor and driver package of connector-coupled type.

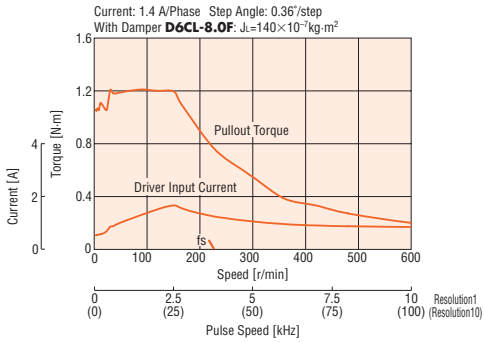
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

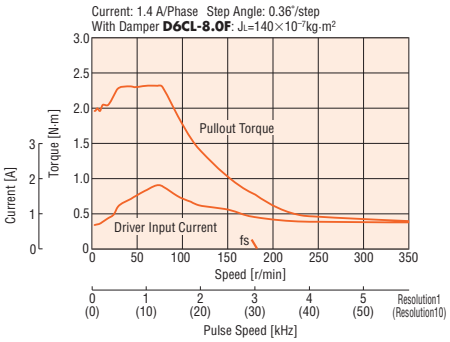
CRK564PMAP/CRK564PMBP



CRK566PMAP/CRK566PMBP



CRK569PMAP/CRK569PMBP



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

High-Torque Type Motor Frame Size 20 mm, 28 mm, 42 mm

Specifications RoHS

Model		CRK513PAP* / CRK513PBP*	CRK523PAP* / CRK523PBP*	CRK525PAP* / CRK525PBP*	CRK544PAP* / CRK544PBP*	CRK546PAP* / CRK546PBP*
Maximum Holding Torque	N·m	0.0231	0.048	0.078	0.24	0.42
Rotor Inertia	J: kg·m²	2.6×10^{-7}	9×10^{-7}	18×10^{-7}	57×10^{-7}	114×10^{-7}
Rated Current	A/Phase	0.35			0.75	
Basic Step Angle		0.72°				
Power Source		24 VDC±10% 0.7 A			24 VDC±10% 1.4 A	
Excitation Mode		Microstep				
Mass	Motor kg	0.05	0.11	0.2	0.3	0.5
	Driver kg	0.04				
Dimension No.	Motor	1	2		3	
	Driver	18				

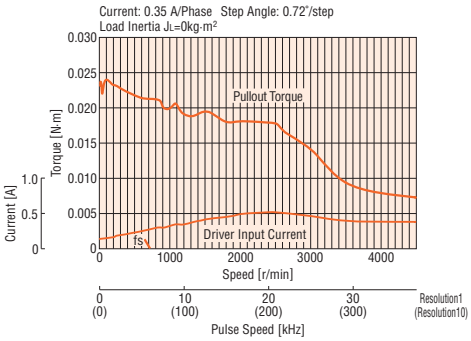
How to read specifications table ➜ Page C-10

*Motor lead wire/connector assembly (0.6 m) is included with the motor and driver package of connector-coupled type.

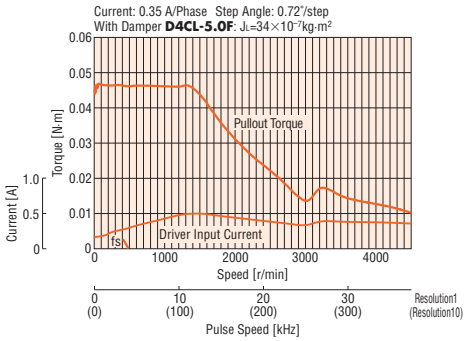
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

CRK513PAP/CRK513PBP



CRK523PAP/CRK523PBP



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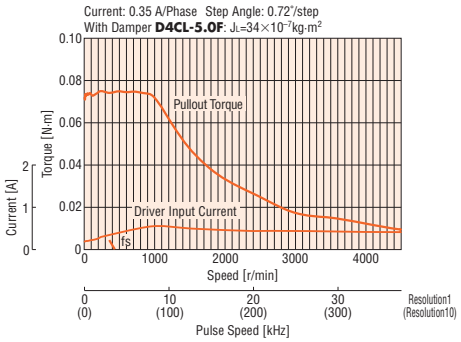

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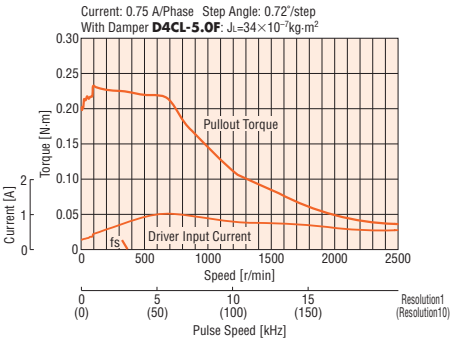

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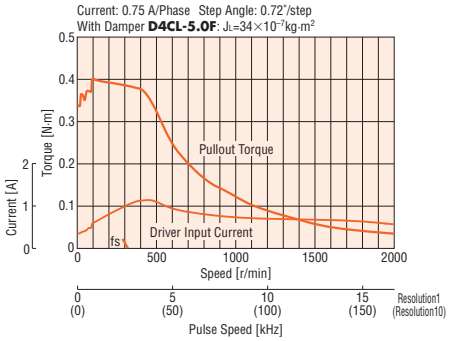


- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

Standard Type Motor Frame Size 42 mm, 60 mm

Specifications RoHS

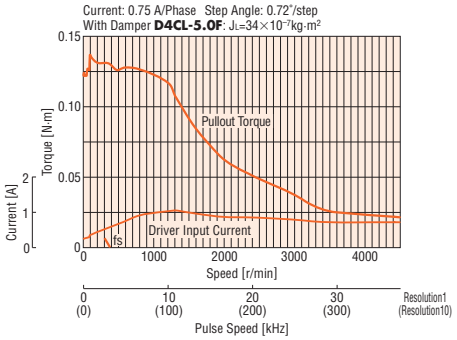
Model		CRK543AP / CRK543BP	CRK544AP / CRK544BP	CRK545AP / CRK545BP	CRK564AP / CRK564BP	CRK566AP / CRK566BP	CRK569AP / CRK569BP
Maximum Holding Torque	N·m	0.13	0.18	0.24	0.42	0.83	1.66
Rotor Inertia	J: kg·m²	35×10^{-7}	54×10^{-7}	68×10^{-7}	175×10^{-7}	280×10^{-7}	560×10^{-7}
Rated Current	A/Phase	0.75			1.4		
Basic Step Angle		0.72°					
Power Source		24 VDC±10% 1.4 A			24 VDC±10% 2.5 A		
Excitation Mode		Microstep					
Mass	Motor kg	0.21	0.27	0.35	0.6	0.8	1.3
	Driver kg	0.04					
Dimension No.	Motor	5			6		
	Driver	18					

How to read specifications table ➜ Page C-10

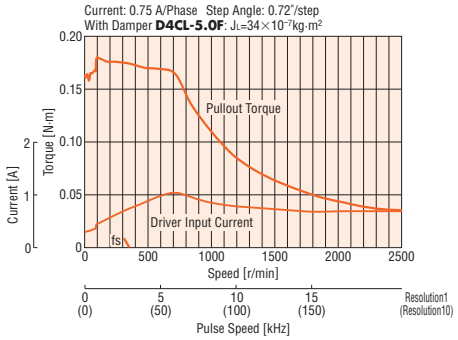
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

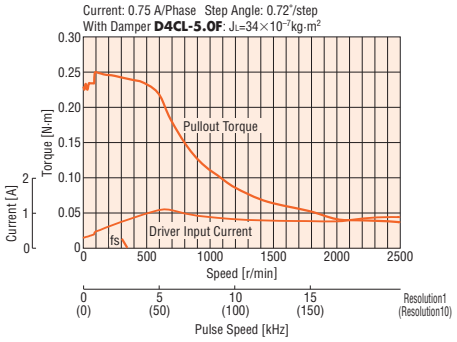
CRK543AP/CRK543BP



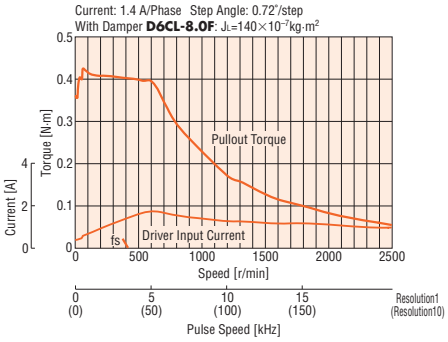
CRK544AP/CRK544BP



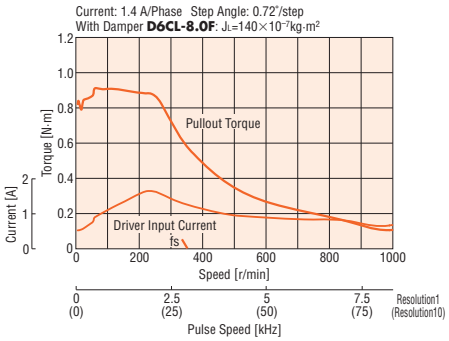
CRK545AP/CRK545BP



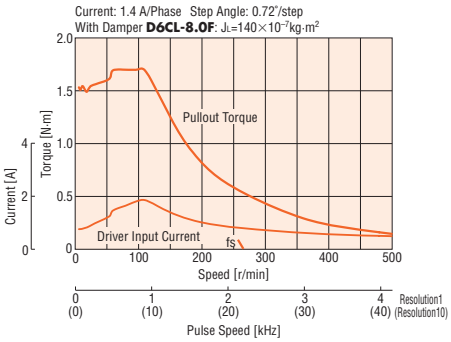
CRK564AP/CRK564BP



CRK566AP/CRK566BP



CRK569AP/CRK569BP



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 28 mm

Specifications RoHS

Model		CRK523PAP-T7.2* / CRK523PBP-T7.2*	CRK523PAP-T10* / CRK523PBP-T10*	CRK523PAP-T20* / CRK523PBP-T20*	CRK523PAP-T30* / CRK523PBP-T30*
Maximum Holding Torque	N·m	0.2	0.3	0.4	0.5
Rotor Inertia	J: kg·m²	9×10^{-7}			
Rated Current	A/Phase	0.35			
Basic Step Angle		0.1°	0.072°	0.036°	0.024°
Gear Ratio		1 : 7.2	1 : 10	1 : 20	1 : 30
Permissible Torque	N·m	0.2	0.3	0.4	0.5
Backlash	arc minute (degrees)	60 (1°)			
Permissible Speed Range	r/min	0～416	0～300	0～150	0～100
Power Source		24 VDC±10% 0.7 A			
Excitation Mode		Microstep			
Mass	Motor kg	0.17			
	Driver kg	0.04			
Dimension No.	Motor	7			
	Driver	18			

How to read specifications table ➜ Page C-10

*Motor lead wire/connector assembly (0.6 m) is included with the motor and driver package of connector-coupled type.

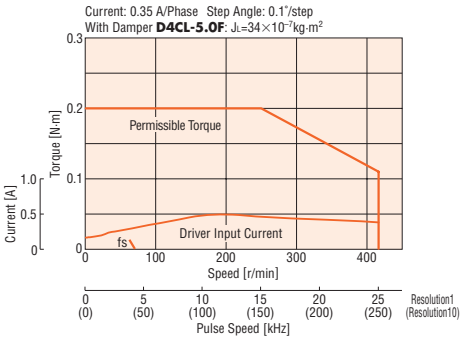
Note:

- Direction of rotation of the motor and that of the gear output shaft are the opposite for the gear ratios 1:7.2 and 1:10. It is the same for 1:20 and 1:30 gear ratios.

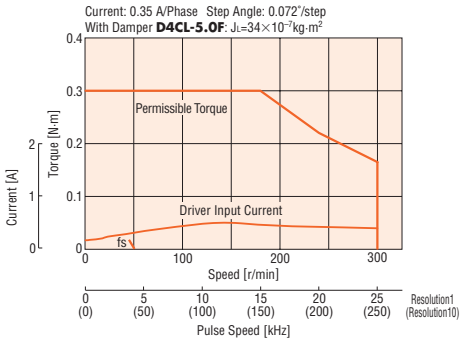
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

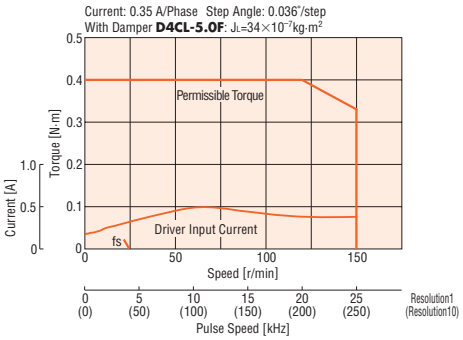
CRK523PAP-T7.2/CRK523PBP-T7.2



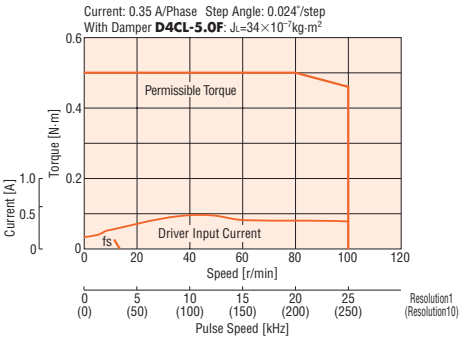
CRK523PAP-T10/CRK523PBP-T10



CRK523PAP-T20/CRK523PBP-T20



CRK523PAP-T30/CRK523PBP-T30



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 42 mm

Specifications RoHS

Model		CRK543AP-T3.6	CRK543AP-T7.2	CRK543AP-T10	CRK543AP-T20	CRK543AP-T30
	Double Shaft	CRK543BP-T3.6	CRK543BP-T7.2	CRK543BP-T10	CRK543BP-T20	CRK543BP-T30
Maximum Holding Torque	N·m	0.35	0.7	1	1.5	
Rotor Inertia	J: kg·m²	35×10^{-7}				
Rated Current	A/Phase	0.75				
Basic Step Angle		0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio		1 : 3.6	1 : 7.2	1 : 10	1 : 20	1 : 30
Permissible Torque	N·m	0.35	0.7	1	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		24 VDC±10% 1.4 A				
Excitation Mode		Microstep				
Mass	Motor kg	0.35				
	Driver kg	0.04				
Dimension No.	Motor	8				
	Driver	18				

How to read specifications table ➜ Page C-10

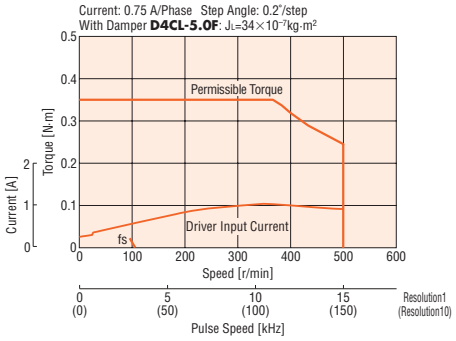
Note:

- Direction of rotation of the motor and that of the gear output shaft are the same for the gear ratios 1:3.6, 1:7.2 and 1:10. It is the opposite for 1:20 and 1:30 gear ratios.

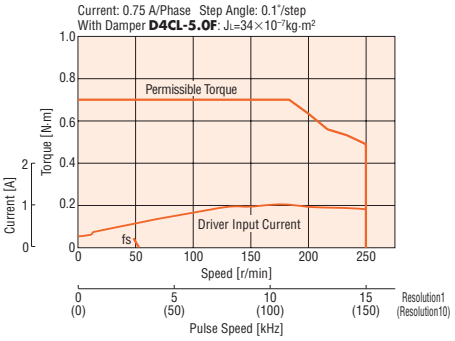
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

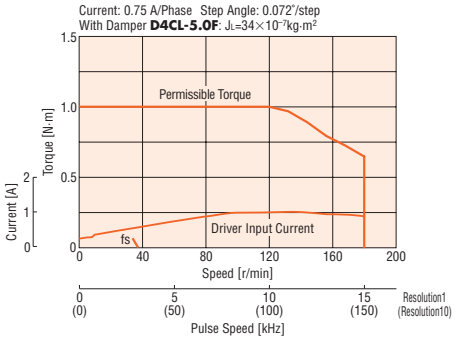
CRK543AP-T3.6/CRK543BP-T3.6



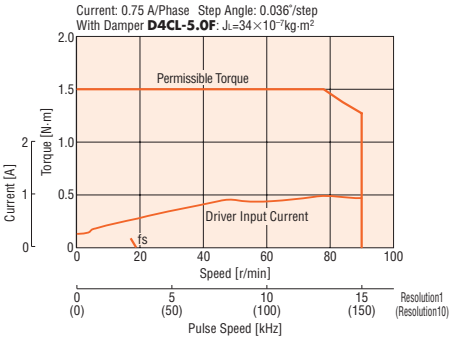
CRK543AP-T7.2/CRK543BP-T7.2



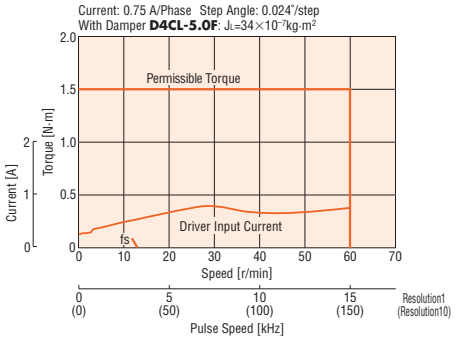
CRK543AP-T10/CRK543BP-T10



CRK543AP-T20/CRK543BP-T20



CRK543AP-T30/CRK543BP-T30



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 60 mm

Specifications RoHS

Model	Single Shaft	CRK564AP-T3.6	CRK564AP-T7.2	CRK564AP-T10	CRK564AP-T20	CRK564AP-T30
	Double Shaft	CRK564BP-T3.6	CRK564BP-T7.2	CRK564BP-T10	CRK564BP-T20	CRK564BP-T30
Maximum Holding Torque	N·m	1.25	2.5	3	3.5	4
Rotor Inertia	J: kg·m²	175×10^{-7}				
Rated Current	A/Phase	1.4				
Basic Step Angle		0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio		1 : 3.6	1 : 7.2	1 : 10	1 : 20	1 : 30
Permissible Torque	N·m	1.25	2.5	3	3.5	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		24 VDC±10% 2.5 A				
Excitation Mode		Microstep				
Mass	Motor kg	0.95				
	Driver kg	0.04				
Dimension No.	Motor	9				
	Driver	18				

How to read specifications table ➜ Page C-10

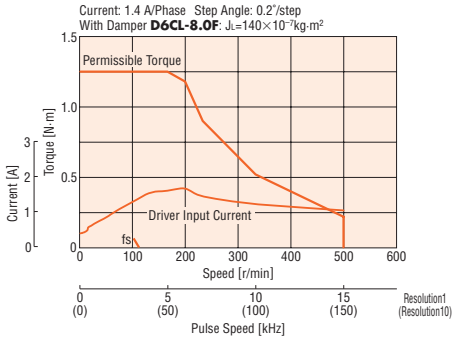
Note:

- Direction of rotation of the motor and that of the gear output shaft are the same for the gear ratios 1:3.6, 1:7.2 and 1:10. It is the opposite for 1:20 and 1:30 gear ratios.

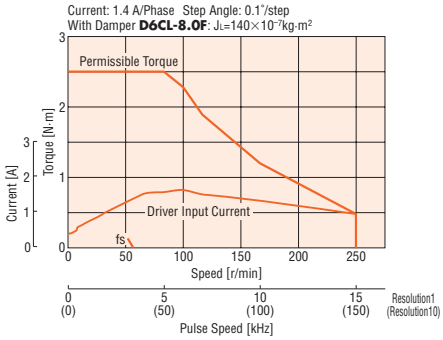
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

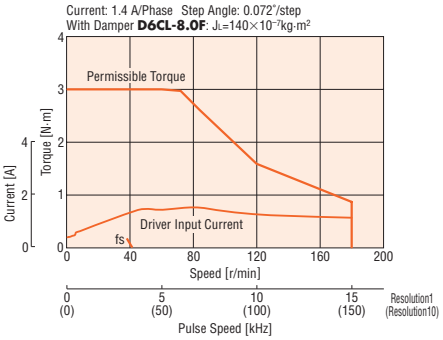
CRK564AP-T3.6/CRK564BP-T3.6



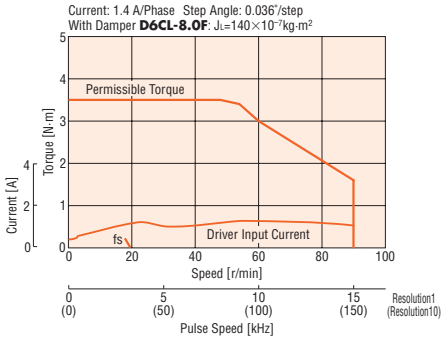
CRK564AP-T7.2/CRK564BP-T7.2



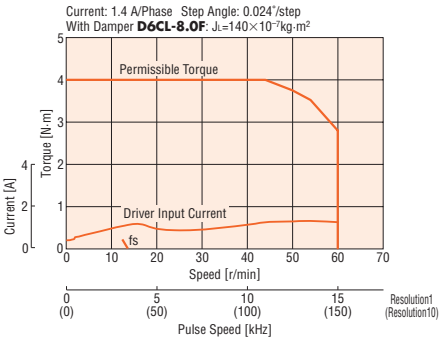
CRK564AP-T10/CRK564BP-T10



CRK564AP-T20/CRK564BP-T20



CRK564AP-T30/CRK564BP-T30



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

PL Geared Type Motor Frame Size 42 mm

Specifications RoHS

Model		CRK545AP-P5	CRK545AP-P7.2	CRK545AP-P10	CRK543AP-P25	CRK543AP-P36	CRK543AP-P50
	Double Shaft	CRK545BP-P5	CRK545BP-P7.2	CRK545BP-P10	CRK543BP-P25	CRK543BP-P36	CRK543BP-P50
Maximum Holding Torque	N·m	1	1.5		2.5	3	
Rotor Inertia	J: kg·m²	68×10^{-7}			35×10^{-7}		
Rated Current	A/Phase	0.75					
Basic Step Angle		0.144°	0.1°	0.072°	0.0288°	0.02°	0.0144°
Gear Ratio		1 : 5	1 : 7.2	1 : 10	1 : 25	1 : 36	1 : 50
Permissible Torque	N·m	1	1.5		2.5	3	
Backlash	arc minute (degrees)	35 (0.58°)					
Permissible Speed Range	r/min	0～360	0～250	0～180	0～72	0～50	0～36
Power Source		24 VDC±10% 1.4 A					
Excitation Mode		Microstep					
Mass	Motor kg	0.58			0.55		
	Driver kg	0.04					
Dimension No.	Motor	10					
	Driver	18					

How to read specifications table ➜ Page C-10

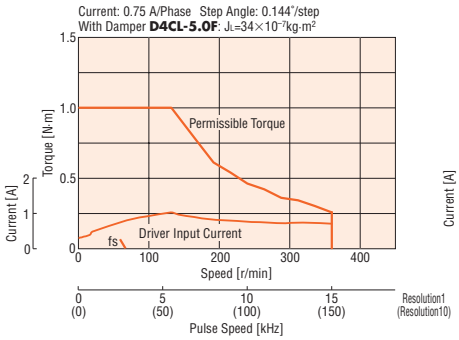
Note:

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

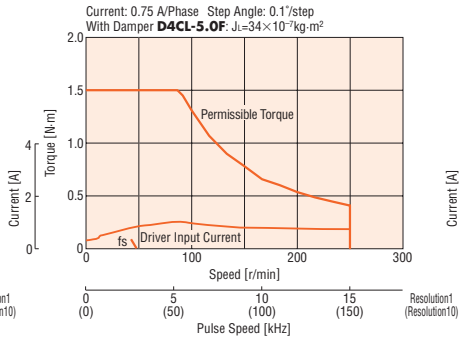
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

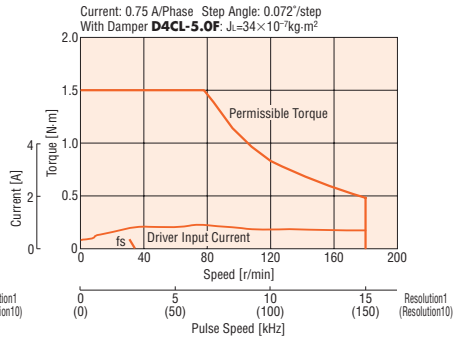
CRK545AP-P5/CRK545BP-P5



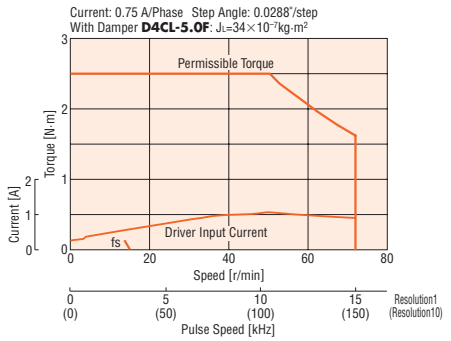
CRK545AP-P7.2/CRK545BP-P7.2



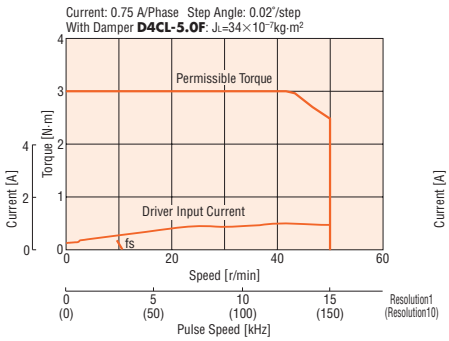
CRK545AP-P10/CRK545BP-P10



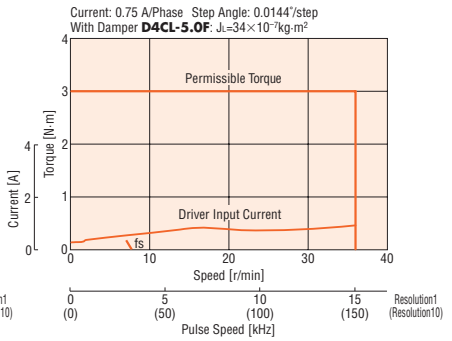
CRK543AP-P25/CRK543BP-P25



CRK543AP-P36/CRK543BP-P36



CRK543AP-P50/CRK543BP-P50



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

PL Geared Type Motor Frame Size 60 mm

Specifications RoHS

Model		CRK566AP-P5	CRK566AP-P7.2	CRK566AP-P10	CRK564AP-P25	CRK564AP-P36	CRK564AP-P50
	Double Shaft	CRK566BP-P5	CRK566BP-P7.2	CRK566BP-P10	CRK564BP-P25	CRK564BP-P36	CRK564BP-P50
Maximum Holding Torque	N·m	3.5	4	5	8		
Rotor Inertia	J: kg·m²	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		1 : 5	1 : 7.2	1 : 10	1 : 25	1 : 36	1 : 50
Permissible Torque	N·m	3.5	4	5	8		
Backlash	arc minute (degrees)	20 (0.33°)					
Permissible Speed Range	r/min	0～360	0～250	0～180	0～72	0～50	0～36
Power Source		24 VDC±10% 2.5 A					
Excitation Mode		Microstep					
Mass	Motor kg	1.3			1.4		
	Driver kg	0.04					
Dimension No.	Motor	11					
	Driver	18					

How to read specifications table ➜ Page C-10

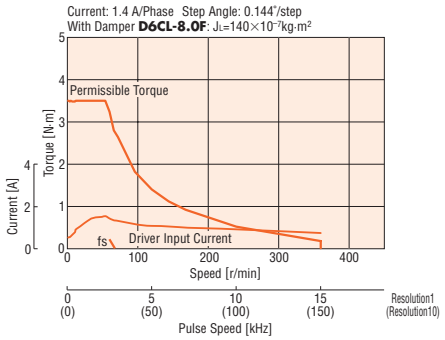
Note:

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

Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

CRK566AP-P5/CRK566BP-P5



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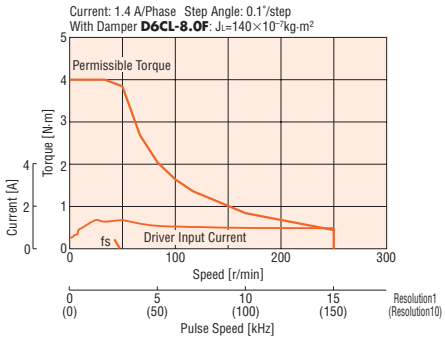
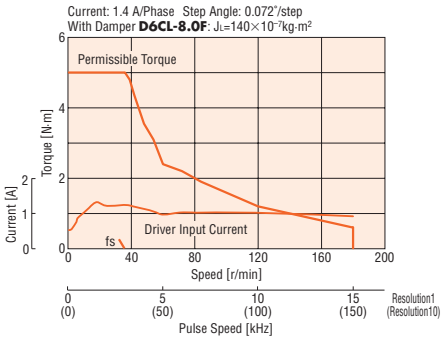


CRK566AP-P10/CRK566BP-P10



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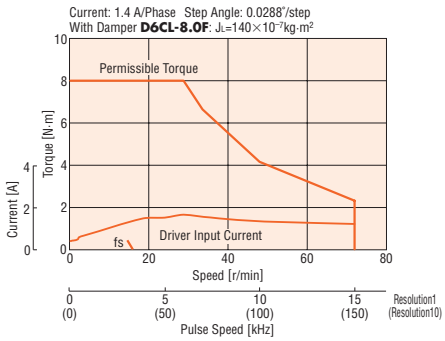
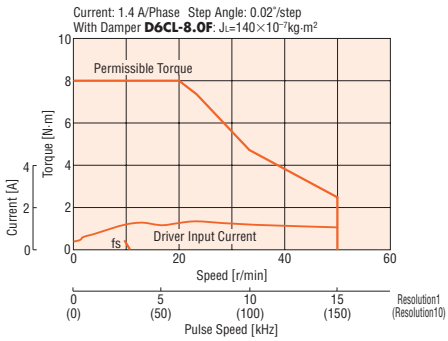
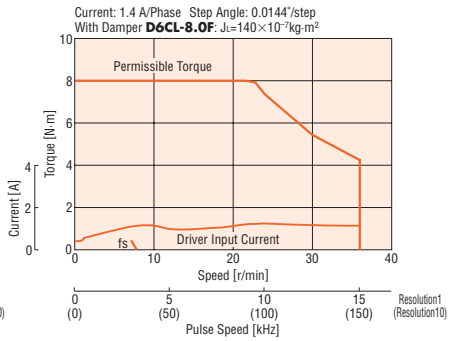


CRK564AP-P36/CRK564BP-P36



CRK564AP-P50/CRK564BP-P50



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

PN Geared Type Motor Frame Size 28 mm, 42 mm

Specifications RoHS

Model		CRK523PAP-N5*1	CRK523PAP-N7.2*1	CRK523PAP-N10*1	CRK544AP-N5	CRK544AP-N7.2	CRK544AP-N10
	Double Shaft	CRK523PBP-N5*1	CRK523PBP-N7.2*1	CRK523PBP-N10*1	CRK544BP-N5	CRK544BP-N7.2	CRK544BP-N10
Maximum Holding Torque	N·m	0.2	0.3	0.4	0.8	1.2	1.5
Rotor Inertia	J: kg·m²	9×10^{-7}			54×10^{-7}		
Rated Current	A/Phase	0.35			0.75		
Basic Step Angle		0.144°	0.1°	0.072°	0.144°	0.1°	0.072°
Gear Ratio		1 : 5	1 : 7.2	1 : 10	1 : 5	1 : 7.2	1 : 10
Permissible Torque	N·m	0.2	0.3	0.4	0.8	1.2	1.5
Maximum Torque*2	N·m	0.5			1.5	2	
Backlash	arc minute (degrees)	3 (0.05°)			2 (0.034°)		
Angular Transmission Error	arc minute (degrees)	6 (0.1°)					
Permissible Speed Range	r/min	0~600	0~416	0~300	0~600	0~416	0~300
Power Source		24 VDC±10% 0.7 A			24 VDC±10% 1.4 A		
Excitation Mode		Microstep					
Mass	Motor kg	0.25			0.56		
	Driver kg	0.04					
Dimension No.	Motor	12			13		
	Driver	18					

How to read specifications table ➜ Page C-10

*1 Motor lead wire/connector assembly (0.6 m) is included with the motor and driver package of connector-coupled type.

*2 The value of maximum torque is for gear. For output torque for geared motor, see the speed – torque characteristics.

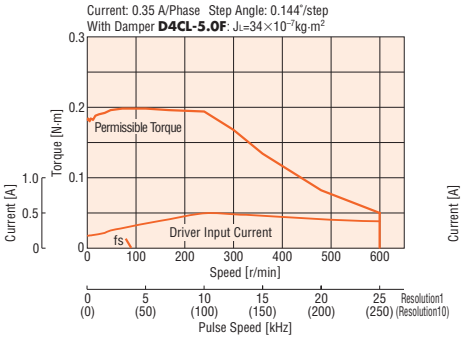
Note:

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

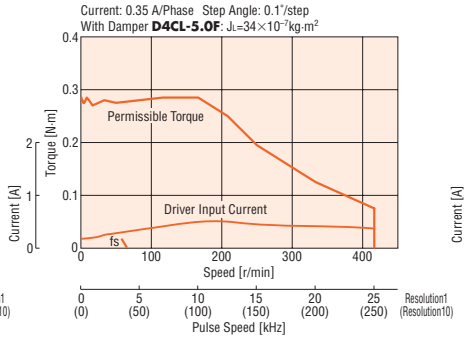
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

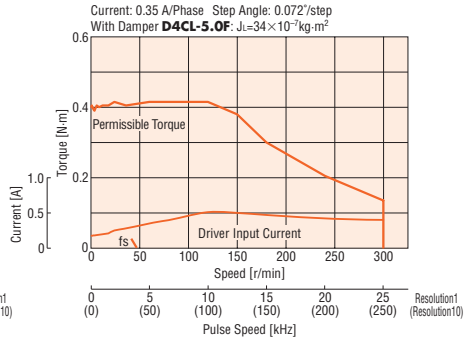
CRK523PAP-N5/CRK523PBP-N5



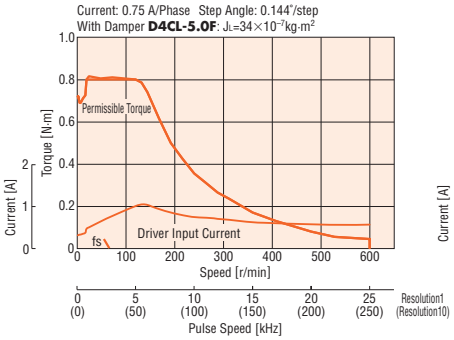
CRK523PAP-N7.2/CRK523PBP-N7.2



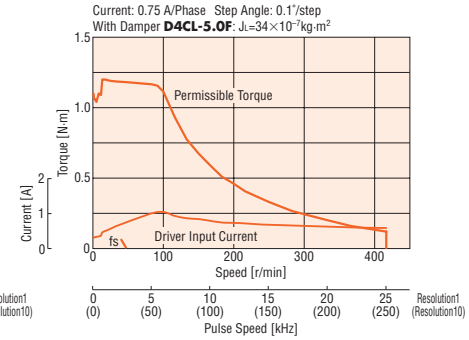
CRK523PAP-N10/CRK523PBP-N10



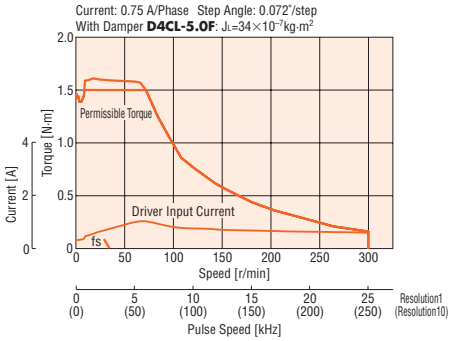
CRK544AP-N5/CRK544BP-N5



CRK544AP-N7.2/CRK544BP-N7.2



CRK544AP-N10/CRK544BP-N10



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

PN Geared Type Motor Frame Size 60 mm

Specifications RoHS

Model		CRK566AP-N5	CRK566AP-N7.2	CRK566AP-N10	CRK564AP-N25	CRK564AP-N36	CRK564AP-N50
	Double Shaft	CRK566BP-N5	CRK566BP-N7.2	CRK566BP-N10	CRK564BP-N25	CRK564BP-N36	CRK564BP-N50
Maximum Holding Torque	N·m	3.5	4	5	8		
Rotor Inertia	J: kg·m²	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		1 : 5	1 : 7.2	1 : 10	1 : 25	1 : 36	1 : 50
Permissible Torque	N·m	3.5	4	5	8		
Maximum Torque*	N·m	7	9	11	16	20	
Backlash	arc minute (degrees)	2 (0.034°)			3 (0.05°)		
Angular Transmission 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		24 VDC±10% 2.5 A					
Excitation Mode		Microstep					
Mass	Motor kg	1.5					
	Driver kg	0.04					
Dimension No.	Motor	14					
	Driver	18					

How to read specifications table ➜ Page C-10

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

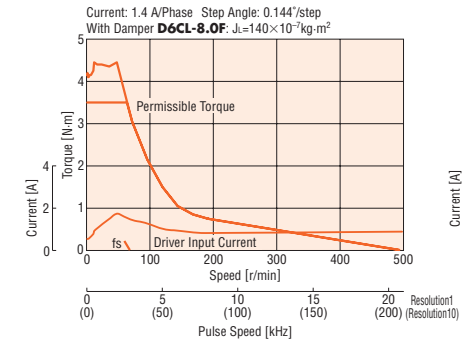
Note:

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

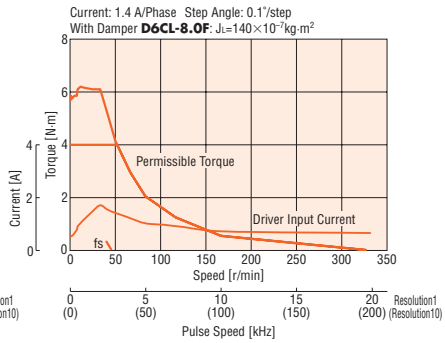
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

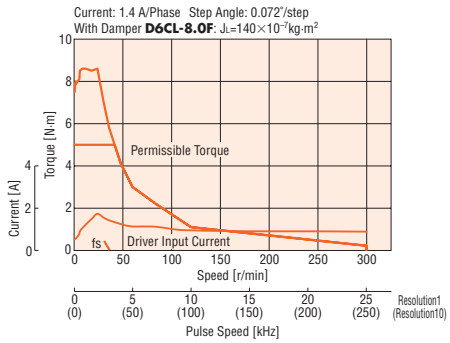
CRK566AP-N5/CRK566BP-N5



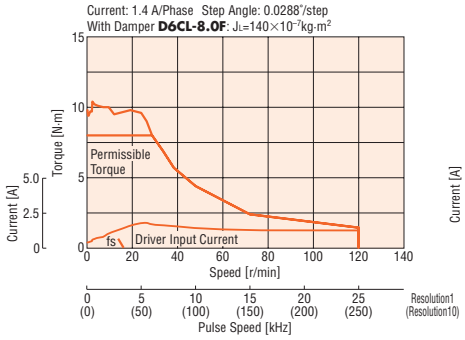
CRK566AP-N7.2/CRK566BP-N7.2



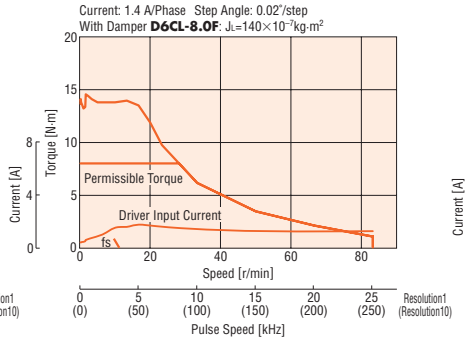
CRK566AP-N10/CRK566BP-N10



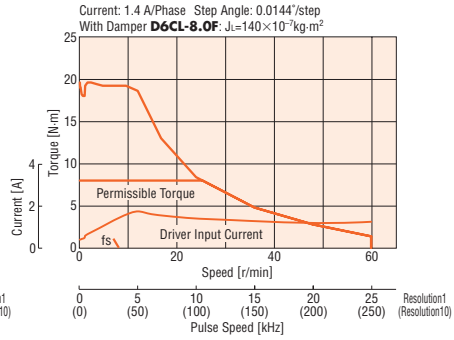
CRK564AP-N25/CRK564BP-N25



CRK564AP-N36/CRK564BP-N36



CRK564AP-N50/CRK564BP-N50



● The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

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

● The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

Harmonic Geared Type Motor Frame Size 20 mm, 42 mm, 60 mm

Specifications RoHS

Model		CRK513PAP-H50※1	CRK513PAP-H100※1	CRK543AP-H50	CRK543AP-H100	CRK564AP-H50	CRK564AP-H100
	Single Shaft / Double Shaft	CRK513PBP-H50※1	CRK513PBP-H100※1	CRK543BP-H50	CRK543BP-H100	CRK564BP-H50	CRK564BP-H100
Maximum Holding Torque	N·m	0.4	0.6	3.5	5	5.5	8
Rotor Inertia	J: kg·m²	3.1×10^{-7}		52×10^{-7}		210×10^{-7}	
Rated Current	A/Phase	0.35		0.75		1.4	
Basic Step Angle		0.0144°	0.0072°	0.0144°	0.0072°	0.0144°	0.0072°
Gear Ratio		1 : 50	1 : 100	1 : 50	1 : 100	1 : 50	1 : 100
Permissible Torque	N·m	0.4	0.6	3.5	5	5.5	8
Maximum Torque※2	N·m	0.9	1.4	8.3	11	18	28
Lost Motion (Load Torque)	arc minute	2 max. (±0.02 N·m)	2 max. (±0.03 N·m)	1.5 max. (±0.16 N·m)	1.5 max. (±0.2 N·m)	0.7 max. (±0.28 N·m)	0.7 max. (±0.39 N·m)
Permissible Speed Range	r/min	0～90	0～45	0～70	0～35	0～70	0～35
Power Source		24 VDC±10% 0.7 A		24 VDC±10% 1.4 A		24 VDC±10% 2.5 A	
Excitation Mode		Microstep					
Mass	Motor kg	0.08		0.46		1.08	
	Driver kg	0.04					
Dimension No.	Motor	15		16		17	
	Driver	18					

How to read specifications table ➜ Page C-10

※1 Motor lead wire/connector assembly (0.6 m) is included with the motor and driver package of connector-coupled type.

※2 The value of maximum torque is for gear. For output torque for geared motor, see the speed – torque characteristics.

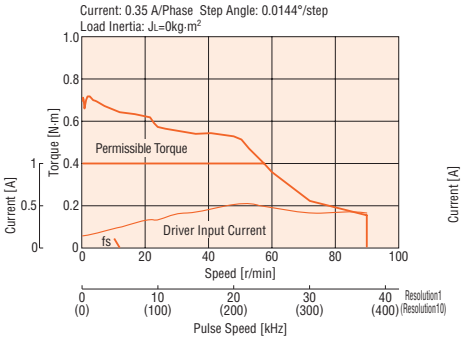
Notes:

- The inertia represents a sum of the inertia of 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.

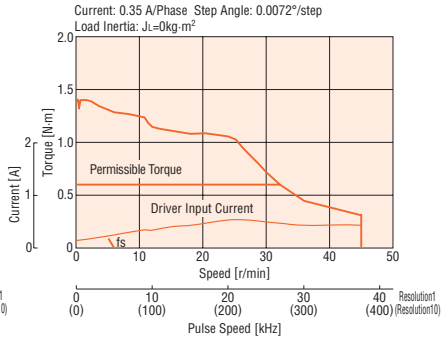
Speed – Torque Characteristics

How to read speed – torque characteristics ➜ Page C-10

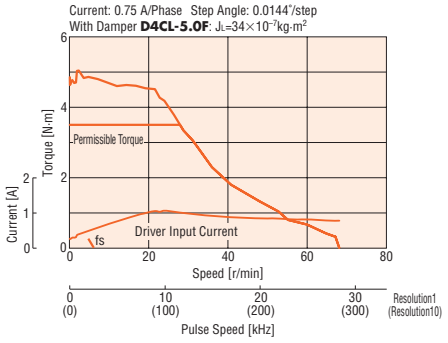
CRK513PAP-H50/CRK513PBP-H50



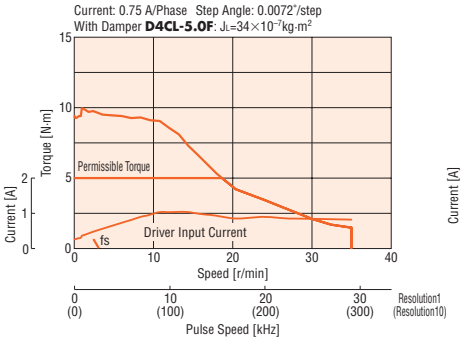
CRK513PAP-H100/CRK513PBP-H100



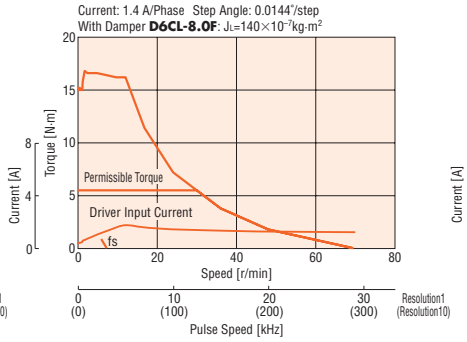
CRK543AP-H50/CRK543BP-H50



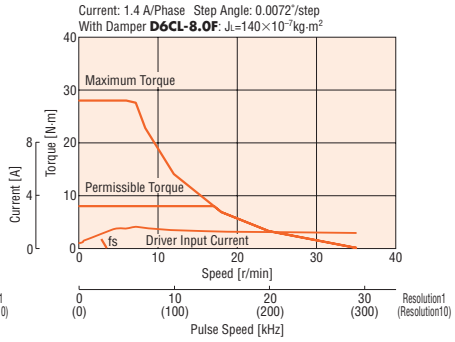
CRK543AP-H100/CRK543BP-H100



CRK564AP-H50/CRK564BP-H50



CRK564AP-H100/CRK564BP-H100



- The pulse input circuit responds to approximately 500 kHz with a pulse duty of 50%.

Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA Standards as the motor is recognized as insulation class A.)
- In order to prevent fatigue of the gear grease in the harmonic gear, keep the temperature of the gear case under 70°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

Common to Each Type

Driver Specifications

Input Signals	Input Mode	Photocoupler input, Input resistance: 220 Ω, Input current: 10～20 mA Photocoupler ON: +4.5～5.25 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: 1 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: 500 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: 1 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: 500 kHz (when the pulse duty is 50%)
	All Windings Off Signal	When in the "photocoupler ON" state, the output current to the motor is cut off and the motor shaft can be rotated manually. When in the "photocoupler OFF" state, the output current is supplied to the motor.
	Step Angle Select Signal	Step angle specified by DATA1 when photocoupler OFF, Step angle specified by DATA2 when photocoupler ON
	Current Cutback Release Signal	When in the "photocoupler ON" state, the automatic current cutback function will not be activated even after the motor stops. When in the "photocoupler OFF" state, the automatic current cutback function will be activated after the motor stops (after approx. 100 ms).
Output Signals	Output Mode	Photocoupler, Open-collector output, External use condition: 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) Example) 0.72°/step (1 Resolution): Signal is output every 10 pulses. 0.072°/step (10 Resolution): Signal is output every 100 pulses.
Functions		Automatic current cutback, Step angle switch, Pulse input mode switch, Smooth drive, All windings off, Excitation timing
Cooling Method		Natural ventilation

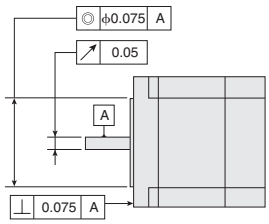
General Specifications

Specifications		Motor	Driver
Insulation Class		Class B (130°C) [Recognized as class A (105°C) by UL Standard]	—
Insulation Resistance		100 MΩ or more when 500 VDC megger is applied between the windings and the case under normal ambient temperature and humidity.	—
Dielectric Strength		Sufficient to withstand 1.5 kV* at 50 Hz or 60 Hz applied between the windings and the case for 1 minute under normal temperature and humidity. *1.0 kV for **CRK54**□ 0.5 kV for **CRK513P**, **CRK52**□**PM**, **CRK52**□**P**, **CRK54**□**PM**, **CRK54**□**P**	—
Operating Environment (In Operation)	Ambient Temperature	−10～+50°C (non-freezing): High-resolution type, High-torque type, Standard type, **TH**, **PL**, **PN** geared type 0～+40°C (non-freezing): Harmonic geared type	0～+40°C (non-freezing)
	Ambient Humidity	85% or less (non-condensing)	
	Atmosphere	No corrosive gases, dust, water or oil	
Temperature Rise		Temperature rise of the windings are 80°C or less measured by the resistance change method. (at rated current, at standstill, five phases energized)	—
Stop Position Accuracy*1		±3 arc minutes (±0.05°), **CRK513P**: ±10 arc minutes (±0.17°) High-resolution type: ±2 arc minutes (±0.034°)	—
Shaft Runout		0.05 T.I.R. (mm)*4	—
Radial Play*2		0.025 mm maximum of 5 N	—
Axial Play*3		0.075 mm maximum of 10 N	—
Concentricity		0.075 T.I.R. (mm)*4	—
Perpendicularity		0.075 T.I.R. (mm)*4	—

*1 This value is for full step under no load. (The value changes with the size of the load.)
*2 Radial Play: Displacement in shaft position in the radial direction, when a 5 N load is applied in the vertical direction to the tip of the motor's shaft.
*3 Axial Play: Displacement in shaft position in the axial direction, when a 10 N load is applied to the motor's shaft in the axial direction.
*4 T.I.R. (Total Indicator Reading): The total dial gauge reading when the measurement section is rotated one revolution centered on the reference axis center.

Note:

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



Permissible Overhung Load and Permissible Thrust Load

Unit = N

Type	Model	Permissible Overhung Load Distance from Shaft End (mm)					Permissible Thrust Load
		0	5	10	15	20	
High-Resolution Type High-Torque Type Standard Type	**CRK513P□P**	12	15	–	–	–	The permissible thrust load shall be no greater than the motor mass.
	CRK523PM□P **CRK524PM□P** **CRK525PM□P** **CRK523P□P** **CRK525P□P**	25	34	52	–	–	
	CRK544PM□P **CRK546PM□P** **CRK544P□P** **CRK546P□P** **CRK543□P** **CRK544□P** **CRK545□P**	20	25	34	52	–	
	CRK564PM□P **CRK566PM□P** **CRK569PM□P**	90	100	130	180	270	
	CRK564□P **CRK566□P** **CRK569□P**	63	75	95	130	190	
TH Geared Type	**CRK523P□P-T7.2** **CRK523P□P-T10** **CRK523P□P-T20** **CRK523P□P-T30**	15	17	20	23	–	10
	CRK543□P-T3.6 **CRK543□P-T7.2** **CRK543□P-T10** **CRK543□P-T20** **CRK543□P-T30**	10	14	20	30	–	15
	CRK564□P-T3.6 **CRK564□P-T7.2** **CRK564□P-T10** **CRK564□P-T20** **CRK564□P-T30**	70	80	100	120	150	40
PL Geared Type	**CRK545□P-P5** **CRK545□P-P7.2** **CRK545□P-P10**	73	84	100	123	–	50
	CRK543□P-P25 **CRK543□P-P36** **CRK543□P-P50**	109	127	150	184	–	50
	CRK566□P-P5	200	220	250	280	320	100
	CRK566□P-P7.2 **CRK566□P-P10**	250	270	300	340	390	100
	CRK564□P-P25 **CRK564□P-P36** **CRK564□P-P50**	330	360	400	450	520	100
PN Geared Type	**CRK523P□P-N5** **CRK523P□P-N7.2** **CRK523P□P-N10**	45	60	80	100	–	20
	CRK544□P-N5 **CRK544□P-N7.2** **CRK544□P-N10**	100	120	150	190	–	100
	CRK566□P-N5	200	220	250	280	320	100
	CRK566□P-N7.2 **CRK566□P-N10**	250	270	300	340	390	100
	CRK564□P-N25 **CRK564□P-N36** **CRK564□P-N50**	330	360	400	450	520	100
Harmonic Geared Type	**CRK513P□P-H50** **CRK513P□P-H100**	50	75	–	–	–	60
	CRK543□P-H50 **CRK543□P-H100**	180	220	270	360	510	220
	CRK564□P-H50 **CRK564□P-H100**	320	370	440	550	720	450

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

Dimensions (Unit = mm)

Motor

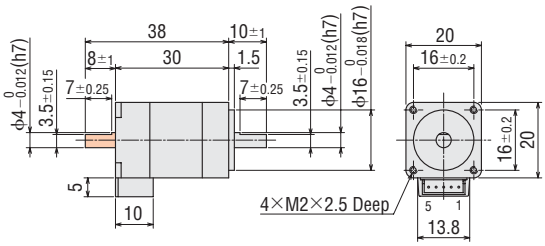
◇High-Torque Type

1 □20 mm

Model	Motor Model	Mass (kg)
CRK513PAP	PK513PA	0.05
CRK513PBP	PK513PB	

Each package model comes with a motor lead wire/connector assembly (0.6 m) (UL Style 3265, AWG24).
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page C-255

● Applicable Connector
Connector housing: 51065-0500 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)



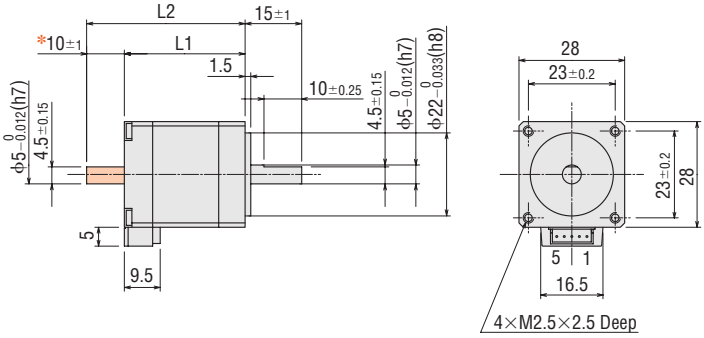
◇High-Resolution Type, High-Torque Type

2 □28 mm

Model	Motor Model	L1	L2	Mass (kg)
CRK523P□AP	PK523P□A	32	–	0.11
CRK523P□BP	PK523P□B		42	
CRK524PMAP	PK524PMA	40	–	0.15
CRK524PMBP	PK524PMB		50	
CRK525P□AP	PK525P□A	51.5	–	0.2
CRK525P□BP	PK525P□B		61.5	

● Enter **M** in the box (□) within the model name in the case of high-resolution type.
Each package model comes with a motor leadwire/connector assembly (0.6 m) (UL Style 3265, AWG24).
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page C-255

● Applicable Connector
Connector housing: 51065-0500 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)



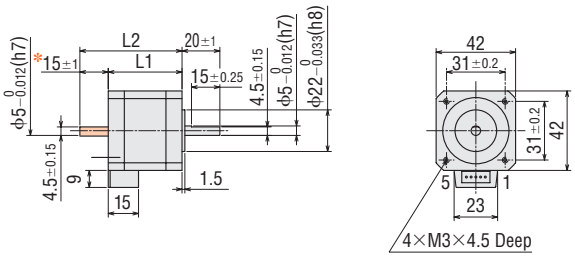
✻The length of machining on double shaft model is 10±0.25.

3 □42 mm

Model	Motor Model	L1	L2	Mass (kg)
CRK544P□AP	PK544P□A	39	–	0.3
CRK544P□BP	PK544P□B		54	
CRK546P□AP	PK546P□A	59	–	0.5
CRK546P□BP	PK546P□B		74	

● Enter **M** in the box (□) within the model name in the case of high-resolution type.
Each package model comes with a motor lead wire/connector assembly (0.6 m) (UL Style 3265, AWG22).
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page C-255

● Applicable Connector
Connector housing: 51103-0500 (MOLEX)
Contact: 50351-8100 (MOLEX)
Crimp tool: 57295-5000 (MOLEX)



✻The length of machining on double shaft model is 15±0.25.

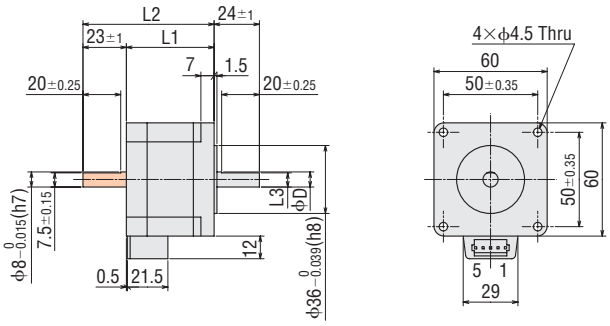
◇High-Resolution Type

4 □60 mm

Model	Motor Model	L1	L2	L3	ϕD	Mass (kg)
CRK564PMAP	PK564PMA	46.5	–	7.5±0.15	8 $^{0}_{-0.015}$	0.65
CRK564PMBP	PK564PMB		69.5			
CRK566PMAP	PK566PMA	56	–			0.87
CRK566PMBP	PK566PMB		79			
CRK569PMAP	PK569PMA	87	–	9.5±0.15	10 $^{0}_{-0.015}$	1.5
CRK569PMBP	PK569PMB		110			

Each package model comes with a motor lead wire/connector assembly (0.6 m) (UL Style 3266, AWG22).
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page C-255

● Applicable Connector
Connector housing: 51144-0500 (MOLEX)
Contact: 50539-8100 (MOLEX)
Crimp tool: 57189-5000 (MOLEX)

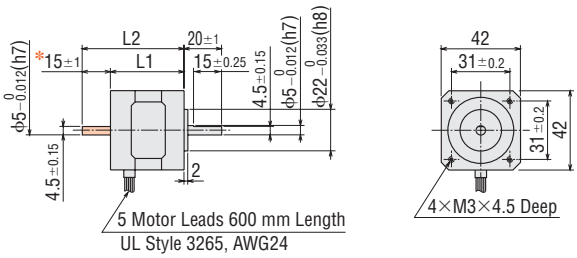


● These dimensions are for double shaft models. For single shaft models, ignore the orange (□) areas.

◇Standard Type

5 □42 mm

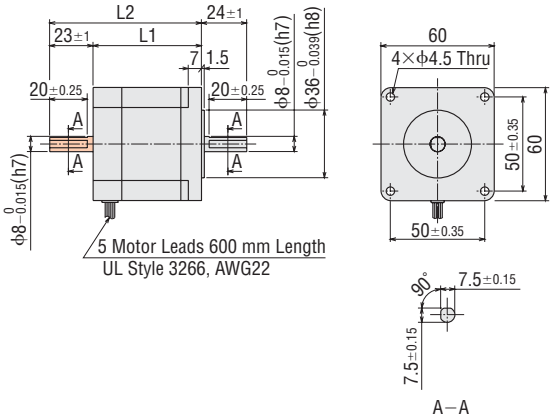
Model	Motor Model	L1	L2	Mass (kg)
CRK543AP	PK543NAW	33	–	0.21
CRK543BP	PK543NBW		48	
CRK544AP	PK544NAW	39	–	0.27
CRK544BP	PK544NBW		54	
CRK545AP	PK545NAW	47	–	0.35
CRK545BP	PK545NBW		62	



*The length of machining on double shaft model is 15±0.25.

6 □60 mm

Model	Motor Model	L1	L2	Mass (kg)
CRK564AP	PK564NAW	46.5	–	0.6
CRK564BP	PK564NBW		69.5	
CRK566AP	PK566NAW	57.5	–	0.8
CRK566BP	PK566NBW		80.5	
CRK569AP	PK569NAW	87	–	1.3
CRK569BP	PK569NBW		110	



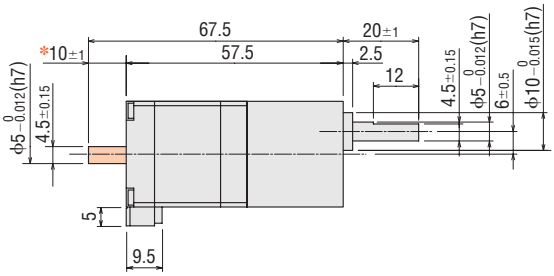
◇TH Geared Type

7 □28 mm

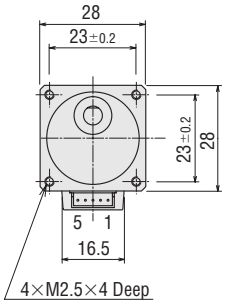
Model	Motor Model	Gear Ratio	Mass (kg)
CRK523PAP-T□	PK523PA-T□	**7.2**, **10**, **20**, **30**	0.17
CRK523PBP-T□	PK523PB-T□		

●Enter the gear ratio in the box (□) within the model name.
Each package model comes with a motor lead wire/connector assembly (0.6 m) (UL Style 3265, AWG24).
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page C-255

●Applicable Connector
Connector housing: 51065-0500 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)



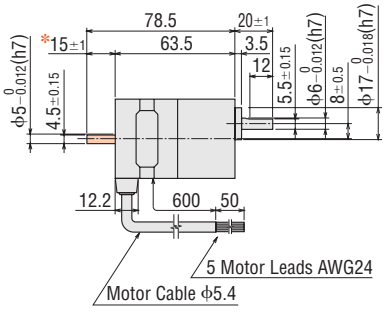
*The length of machining on double shaft model is 10±0.25.

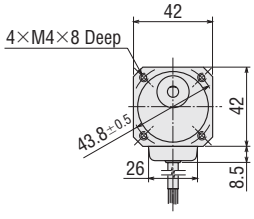


8 □42 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CRK543AP-T□	PK543AW-T□	**3.6**, **7.2**, **10**, **20**, **30**	0.35
CRK543BP-T□	PK543BW-T□		

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





*The length of machining on double shaft model is 15±0.25.

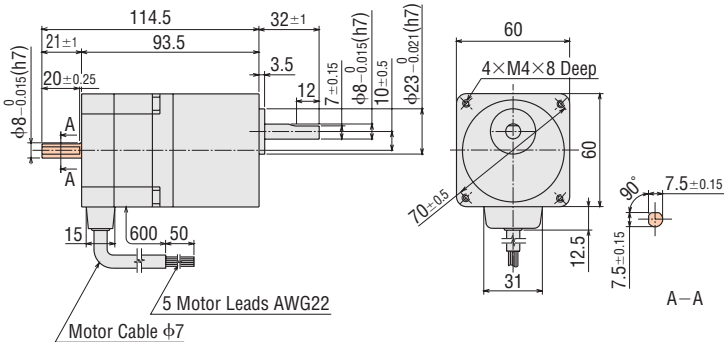
●These dimensions are for double shaft models. For single shaft models, ignore the orange (□) areas.

◇TH Geared Type

9 □60 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CRK564AP-T□	PK564AW-T□	**3.6**, **7.2**, **10**, **20**, **30**	0.95
CRK564BP-T□	PK564BW-T□		

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

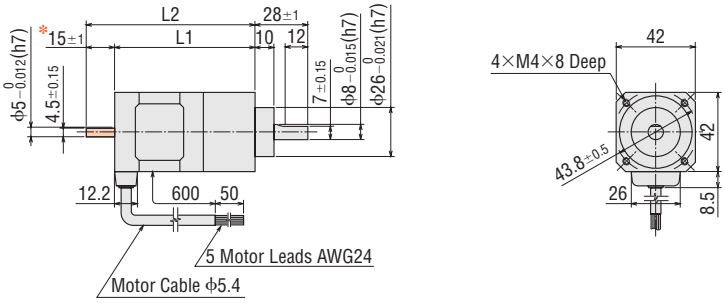


◇PL Geared Type

10 □42 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
CRK545AP-P□	PK545AW-P□	**5**, **7.2**, **10**	74.5	–	0.58
CRK545BP-P□	PK545BW-P□			89.5	
CRK543AP-P□	PK543AW-P□	**25**, **36**, **50**	84	–	0.55
CRK543BP-P□	PK543BW-P□			99	

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

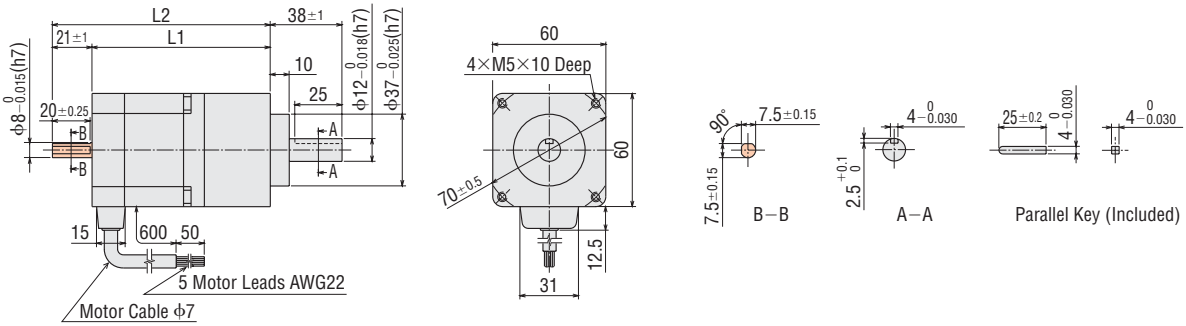


✻ The length of machining on double shaft model is 15±0.25.

11 □60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
CRK566AP-P□	PK566AW-P□	**5**, **7.2**, **10**	94.5	–	1.3
CRK566BP-P□	PK566BW-P□			115.5	
CRK564AP-P□	PK564AW-P□	**25**, **36**, **50**	108.5	–	1.4
CRK564BP-P□	PK564BW-P□			129.5	

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



● These dimensions are for double shaft models. For single shaft models, ignore the orange (□) areas.

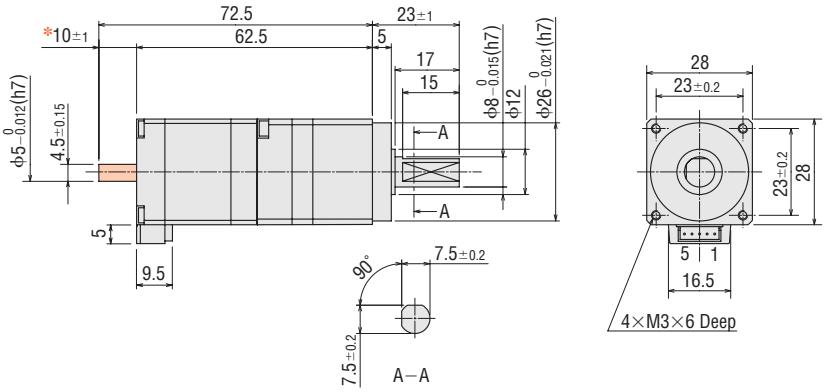
◇**PN** Geared Type

12 □28 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CRK523PAP-N□	PK523PA-N□	**5**, **7.2**, **10**	0.25
CRK523PBP-N□	PK523PB-N□		

● Enter the gear ratio in the box (□) within the model name.
Each package model comes with a motor lead wire/connector assembly (0.6 m) (UL Style 3265, AWG24).
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page C-255

● Applicable Connector
Connector housing: 51065-0500 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)

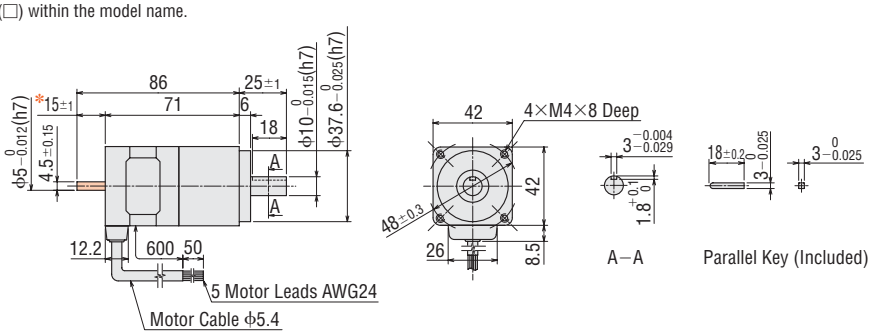


*The length of machining on double shaft model is 10±0.25.

13 □42 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CRK544AP-N□	PK544AW-N□	**5**, **7.2**, **10**	0.56
CRK544BP-N□	PK544BW-N□		

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

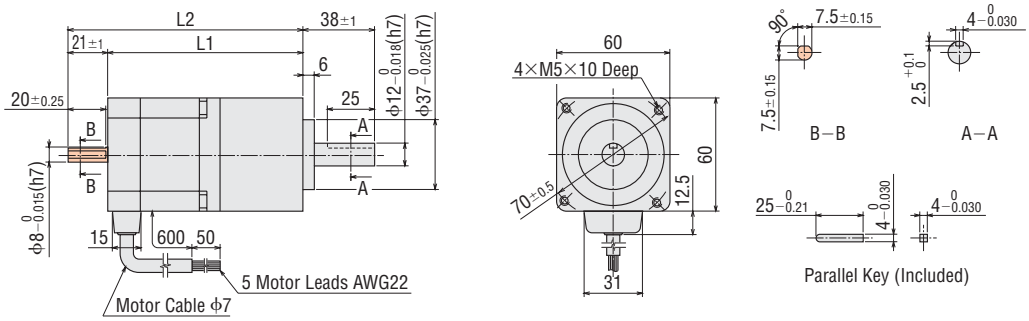


*The length of machining on double shaft model is 15±0.25.

14 □60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
CRK566AP-N□	PK566AW-N□	**5**, **7.2**, **10**	103.5	–	1.5
CRK566BP-N□	PK566BW-N□			124.5	
CRK564AP-N□	PK564AW-N□	**25**, **36**, **50**	108.5	–	1.5
CRK564BP-N□	PK564BW-N□			129.5	

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



● These dimensions are for double shaft models. For single shaft models, ignore the orange (□) areas.

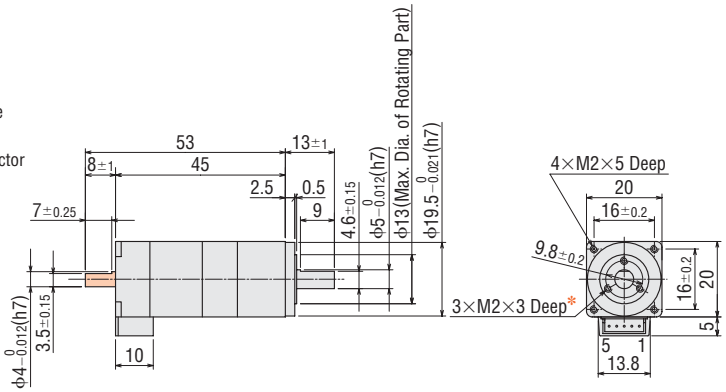
◇Harmonic Geared Type

15 □20 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CRK513PAP-H□	PK513PA-H□S	**50**, **100**	0.08
CRK513PBP-H□	PK513PB-H□S		

●Enter the gear ratio in the box (□) within the model name.
Each package model comes with a motor lead wire/connector assembly (0.6 m) (UL Style 3265, AWG24).
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page C-255

●Applicable Connector
Connector housing: 51065-0500 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)

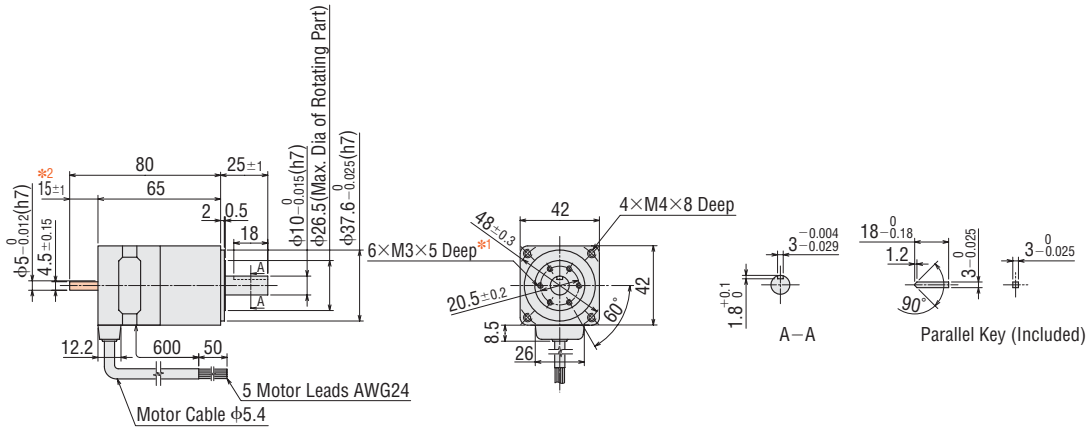


*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

16 □42 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CRK543AP-H□	PK543AW-H□S	**50**, **100**	0.46
CRK543BP-H□	PK543BW-H□S		

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

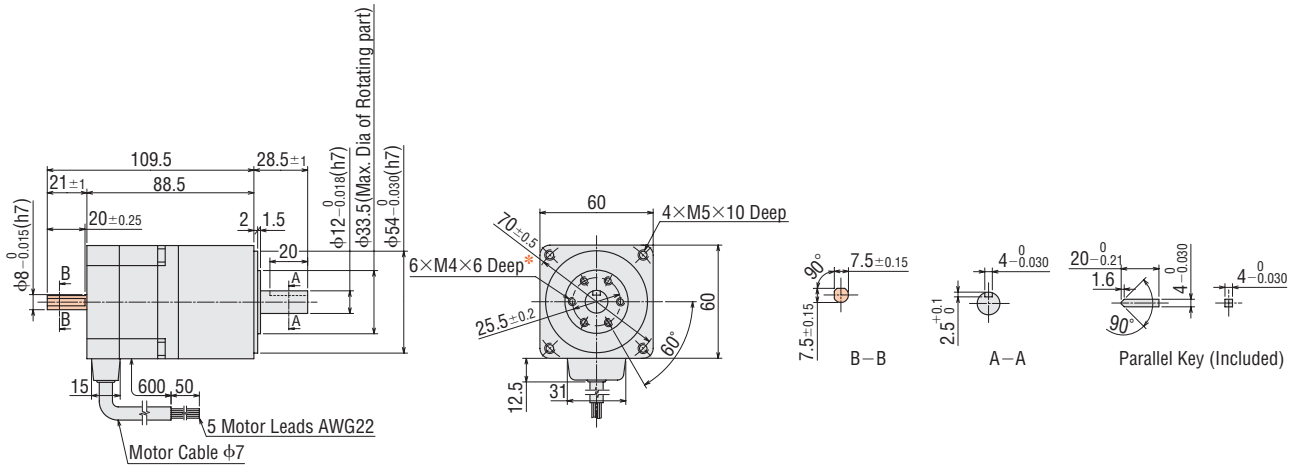


*1 The position of the output shaft relative to the screw holes position on the rotating part is arbitrary.
*2 The length of machining on double shaft model is 15±0.25.

17 □60 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CRK564AP-H□	PK564AW-H□S	**50**, **100**	1.08
CRK564BP-H□	PK564BW-H□S		

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

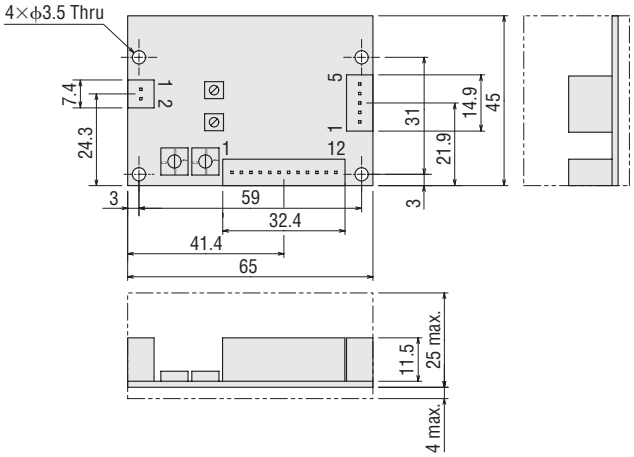


*The position of the output shaft relative to the screw holes position on the rotating part is arbitrary.

●These dimensions are for double shaft models. For single shaft models, ignore the orange (□) areas.

Driver

18 Driver Model: CRD5103P, CRD5107P, CRD5114P
Mass: 0.04 kg



● Connector Housing (Included)
51103-0200 (MOLEX)
51103-1200 (MOLEX)
51103-0500 (MOLEX)

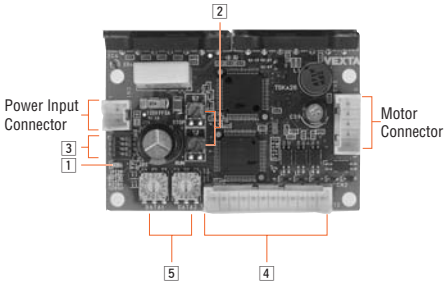
● Contact (Included)
50351-8100 (MOLEX)

Note:

● Be sure to use the included connector for signal and motor and power supply. When assembling the connectors, use the hand-operated crimp tool [57295-5000 (MOLEX)].
The crimp tool is not provided with the package. It must be purchased separately.
Driver lead wire set crimped with connector (sold separately) is available.
Driver lead wire set ➜ Page C-257

Connection and Operation

Names and Functions of Driver Parts



1 Power Input Display

Color	Function	When Activated
Green	Power Supply Indication	Lights when power is on.

2 Current Adjustment Potentiometers

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

3 Function Select Switches

Indication	Switch Name	Function
1P/2P	Pulse Input Mode Switch	Switches between 1-pulse input and 2-pulse input.
OFF/SD	Smooth Drive Function Switch	Enables or disables the smooth drive function.
R2/R1	Resolution Select Switch	Switches the base step angle between R1 and R2.

4 Input/Output Signals

Indication	Input/Output	Pin No.	Signal Name	Function
CN2	Input Signal	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	This signal is used to turn off the output current to the motor so that the motor shaft can be rotated manually.
		6		
		7	Step Angle Select Signal	Switches to step angle set in DATA1 and DATA2.
		8		
		9	Current Cutback Release Signal	This signal is used to disable the automatic current cutback function.
		10		
	Output Signal	11	Excitation Timing Signal	The signal is output every time the excitation sequence returns to the initial stage "0."
		12		

5 Step Angle Setting Switch

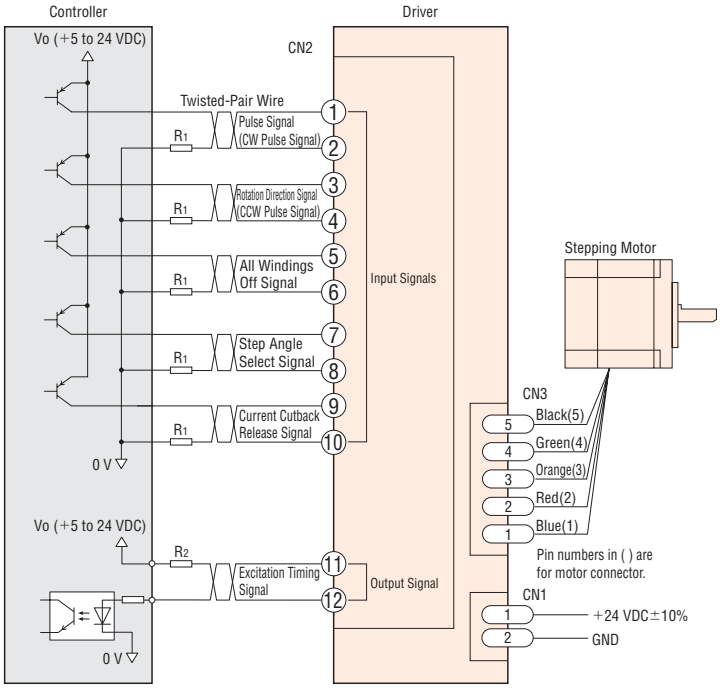
Indication	Signal Name	Function
DATA1	Step Angle Setting Switch	Each switch can be set to the desired step angle from the 16 step angles.
DATA2		

R1				R2			
DATA1 DATA2	Microstep/ Step 1	Resolution 1	Step Angle 1	DATA1 DATA2	Microstep/ Step 2	Resolution 2	Step Angle 2
0	1	500	0.72°	0	×2.5	200	1.8°
1	2	1000	0.36°	1	×1.25	400	0.9°
2	2.5	1250	0.288°	2	1.6	800	0.45°
3	4	2000	0.18°	3	2	1000	0.36°
4	5	2500	0.144	4	3.2	1600	0.225°
5	8	4000	0.09°	5	4	2000	0.18°
6	10	5000	0.072°	6	6.4	3200	0.1125°
7	20	10 000	0.036°	7	10	5000	0.072°
8	25	12 500	0.0288°	8	12.8	6400	0.05625°
9	40	20 000	0.018°	9	20	10 000	0.036°
A	50	25 000	0.0144°	A	25.6	12 800	0.028125°
B	80	40 000	0.009°	B	40	20 000	0.018°
C	100	50 000	0.0072°	C	50	25 000	0.0144°
D	125	62 500	0.00576°	D	51.2	25 600	0.0140625°
E	200	100 000	0.0036°	E	100	50 000	0.0072°
F	250	125 000	0.00288°	F	102.4	51 200	0.00703125°

Notes:

- The step angle is calculated by dividing the basic step angle by the number of microstep. The above figures are based on a basic step angle of 0.72°.
- With the high-resolution type, the basic step angle and resolution are 0.36° and 1000 (microstep/step: 1), respectively.
- If you are using a geared type, the step angle divided by the gear ratio becomes the actual step angle.
- The number of microstep that can be switched by the C/S (step angle select) signal is limited to those selected in step angles 1 and 2.
- Do not change the C/S signal input or step angle setting switch while the motor is operating. It may cause the motor to misstep and stop.

Connection Diagrams



Description of Input/Output Signals

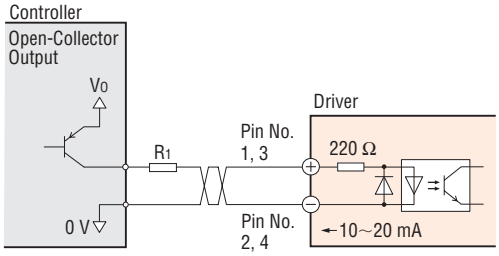
Indication of Input/Output Signal "ON""OFF"

Input (Output) "ON" indicates that the current is sent into the photocoupler (transistor) inside the driver. Input (Output) "OFF" indicates that the current is not sent into the photocoupler (transistor) inside the driver.
The input/output remains "OFF" if nothing is connected.

Photocoupler OFF ON

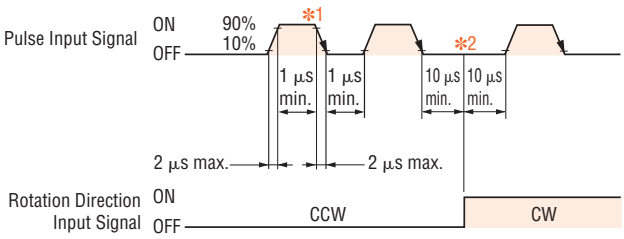
Pulse (CW) and Rotation Direction (CCW) Input Signal

◇Input Circuit and Sample Connection

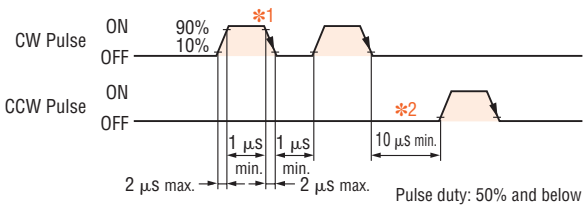


◇Pulse Waveform Characteristics

• 1-Pulse Input Mode



• 2-Pulse Input Mode



Pulse duty: 50% and below

*1 The shaded area indicates when the photocoupler diode is ON. The motor moves when the photocoupler state changes from ON to OFF.

*2 The minimum interval time when changing rotation direction 10 µs is shown as a response time of circuit. This value varies greatly depending on the motor type and load inertia.

◇Connecting Input Signal

Keep the input signal voltage to 5 VDC. When the voltage is equal to 5 VDC, the external resistor R_1 is not necessary. When the voltage is above 5 VDC, connect R_1 as shown in the diagram to keep the input current to 20 mA or below.
When 5 VDC or more is applied without the external resistor, the internal components may be damaged.
Example) If V_0 is 24 VDC, R_1 must be 1.5 to 2.2 kΩ, 0.5 W or more.

◇Connecting Output Signal

Keep the output signal voltage and current 5 VDC or below and 10 mA or below, respectively. If these specifications are exceeded, the internal components may be damaged. Check the specifications of the connected equipment. When the current is above 10 mA, connect the external resistor R_2 as shown in the diagram to keep it to 10 mA or below.

◇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.
- Slow motor startup and stopping.

◇Notes on Wiring

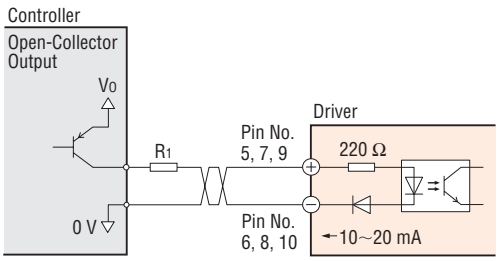
- Use twisted-pair wires [AWG24 to 22 (0.2 to 0.3 mm²)] with a length of 2 m or less for the signal lines.
- Note that as the length of the pulse signal line increases, the maximum transmission frequency decreases. **Technical reference** ➜ Page F-46
- Use AWG22 (0.3 mm²) cables for the power supply lines. When assembling the connectors, use the hand-operated crimp tool for contact or the crimped driver lead wire set cable (sold separately). The crimp tool is not provided with the package. It must be purchased separately.
- Signal lines should be kept at least 2 cm away from power lines (power supply lines and motor lines). Do not bind the signal line and power line together.
- If noise generated by the motor cables or power supply cables causes a problem, try shielding the cables or insert ferrite cores in the cables.
- Incorrect connection of DC power input will lead to driver damage. Make sure that the polarity is correct before turning power on.

◇Pulse Signal Characteristics

- Keep the pulse signal at the "photocoupler OFF" state when no pulses are being input.
- In 1-pulse input mode, leave the pulse signal at rest ("photocoupler OFF") when changing rotation directions.
- In 2-pulse input mode, do not input a CW pulse and CCW pulse simultaneously.

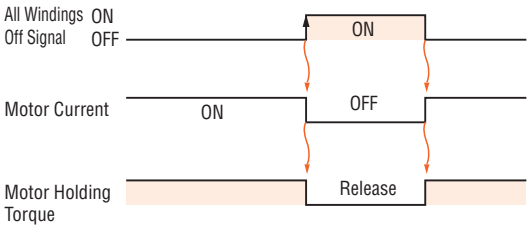
All Windings Off (A.W.OFF) Input Signal
Step Angle Select (C/S) Input Signal
Current Cutback Release (C.D.INH) Input Signal

◇Input Circuit and Sample Connection



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

- Inputting this signal puts the motor in a non-excitation (free) state.
- This signal is used to move the motor shaft with external force or perform positioning manually. The photocoupler must be "OFF" when the motor is operating.



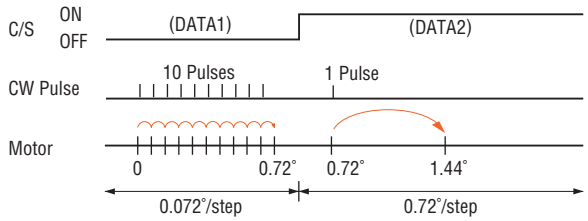
The shaded area indicates that the motor provides holding torque in proportion to standstill current set by STOP switch.

- Switching the "All Windings Off" (A.W.OFF) signal from "photocoupler ON" to "photocoupler OFF" does not alter the excitation sequence. When the motor shaft is manually adjusted with the "A.W.OFF" signal input, the shaft will shift up to ±3.6° (Geared type: ±3.6°/gear ratio) from the position set after the "A.W.OFF" signal is released.

◇Step Angle Select (C/S) Input Signal

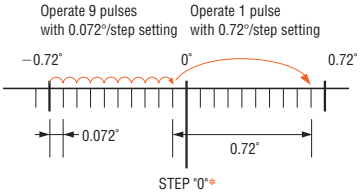
- You may select two step angles with the step angle setting switches DATA1 and DATA2.
- When the signal is at "photocoupler OFF," a step angle set by DATA1 is selected; at "photocoupler ON," DATA2 is selected.

Example: Changing the step angle from 0.072° to 0.72°.



- 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.
- When the "Excitation Timing" signal is used, adjust the number of pulses so that the motor can operate with angles that are multiples of 7.2°. The "Excitation Timing" signal output may become impossible for some combinations of step angles.

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.



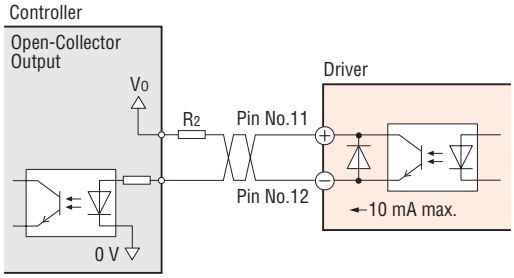
*"Excitation Timing" signal is only output at step "0" sequence.

◇Current Cutback Release (C.D.INH) Input Signal

- When this signal is in the "photocoupler ON" state, the automatic current cutback function is disabled. When this signal is in the "photocoupler OFF" state, the automatic current cutback function will be activated after the motor stops (after approx. 100 ms).
- The photocoupler must be "OFF" except when the running current is adjusted.

Excitation Timing (TIMING) Output Signal

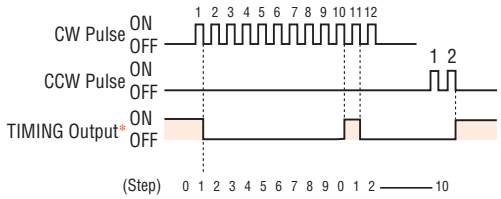
◇Output Circuit and Sample Connection



- 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 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 (basic step angle 0.72°).
  Microstep/step 1: Signal is output once every 10 pulses.
  Microstep/step 10: Signal is output once every 100 pulses.

Timing chart at 0.72°/step (microstep/step 1)

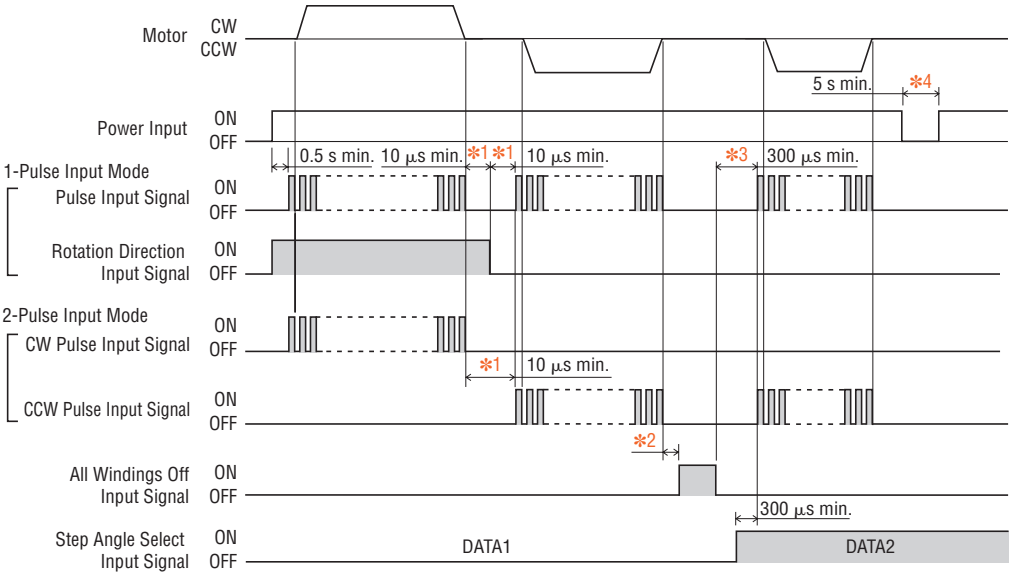
*When connected as shown in the sample connection, the signal will be "photocoupler ON" at step "0."



Note:

- When power is turned ON, the excitation sequence is reset to step "0" and the "Excitation Timing" signal is output.

●Timing Chart



The ▭ section indicates that the photocoupler diode is emitting light.

*1 Switching time to change direction (1-pulse input mode), and switching time to change CW, CCW pulse (2-pulse input mode) 10 µs 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 pulse signal immediately after switching the "All Windings Off" signal to the "photocoupler OFF" state. The motor may not start.
*4 Wait at least 5 seconds before turning on the power again.

■Adjusting the Current

●Adjusting the Motor Current

Use the "RUN" potentiometer to decrease the current and suppress the temperature rise in the motor/driver, or when there is sufficient motor torque and you want to suppress vibration by lowering the current.
Use the "STOP" potentiometer to readjust the current at motor standstill in relation to the holding-brake force of the motor.

Factory settings

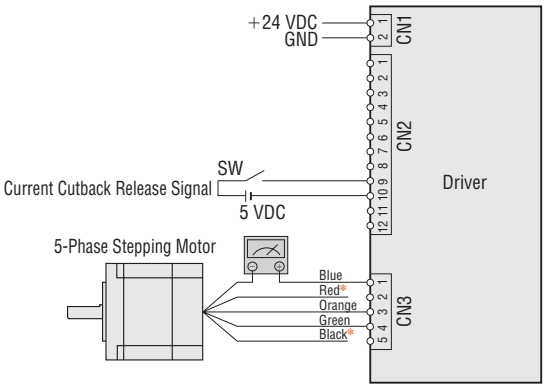
Running current: Rated current

Current at motor standstill: Approx. 50% of rated current

Follow the procedure below to adjust the motor current.

◇Connecting an Ammeter

Connect a DC ammeter as illustrated below.
Connect a DC ammeter in series to the blue motor lead wire and motor connector pin No. 1. Set all driver input signals to the "photocoupler OFF" state.
Do not connect the red motor lead wire to connector pin No. 2, and black motor lead wire to connector pin No. 5.



Note:

- Do not input pulse signals.
- ✻Electric shock may result if the red and black motor lead wires contact each other. Insulate these motor lead wires to prevent electric shock.

◇Adjusting the Motor Running Current

To adjust the motor running current, follow the procedure below:

1. Set the current cutback release signal to the "photocoupler ON" state. Keep other signals in the "photocoupler OFF" state.
2. Turn on the power to the driver.
3. Use the "RUN" potentiometer to adjust the motor's running current.
4. When the power is turned on, the value measured by the ammeter represents the total current in two phases through the blue motor lead wire. The current for one phase is equivalent to one-half the ammeter value. (Example: To set the current to 1.0 A/phase, adjust the current level until the ammeter reads 2.0 A.)
5. When the running current has been adjusted, set the current cutback release signal to the "photocoupler OFF" state.

Notes:

- Be sure to use the motor at the rated current or below.
- Adjusting the running current will also change the current at standstill.

◇Adjusting the Current at Motor Standstill

To adjust the current at motor standstill, follow the procedure below:

1. Set the current cutback release signal to the "photocoupler OFF" state. Keep other signals in the "photocoupler OFF" state.
2. Turn on the power to the driver.
3. Use the "STOP" potentiometer to adjust the motor current at standstill.
4. When the power is turned on, the value measured by the ammeter represents the total current in two phases through the blue motor lead wire. The current for one phase is equivalent to one-half the ammeter value. (Example: To set the current to 1.0 A/phase, adjust the current level until the ammeter reads 2.0 A.)

$$\text{Holding Torque [N·m]} = \frac{\text{Maximum Holding Torque [N·m]} \times \text{Current at Standstill [A]}}{\text{Motor Rated Current [A]}}$$

Notes:

- Always set the running current first, turn off the driver power and turn it back on, and then set the current at standstill. Setting the running current after current at standstill may change the current setting at standstill.
- Setting the current at motor standstill too low may affect the starting of the motor or the position-holding action.

List of Motor and Driver Combinations

Model names for motor and driver combinations are shown below.

Type	Model	Motor Model	Driver Model
High-Resolution Type	**CRK523PMAP**	PK523PMA*	CRD5103P
	CRK523PMBP	PK523PMB*	
	CRK524PMAP	PK524PMA*	
	CRK524PMBP	PK524PMB*	
	CRK525PMAP	PK525PMA*	
	CRK525PMBP	PK525PMB*	
	CRK544PMAP	PK544PMA*	CRD5107P
	CRK544PMBP	PK544PMB*	
	CRK546PMAP	PK546PMA*	
	CRK546PMBP	PK546PMB*	
	CRK564PMAP	PK564PMA*	CRD5114P
	CRK564PMBP	PK564PMB*	
	CRK566PMAP	PK566PMA*	
	CRK566PMBP	PK566PMB*	
	CRK569PMAP	PK569PMA*	
	CRK569PMBP	PK569PMB*	
High-Torque Type	**CRK513PAP**	PK513PA*	CRD5103P
	CRK513PBP	PK513PB*	
	CRK523PAP	PK523PA*	
	CRK523PBP	PK523PB*	
	CRK525PAP	PK525PA*	
	CRK525PBP	PK525PB*	
	CRK544PAP	PK544PA*	CRD5107P
	CRK544PBP	PK544PB*	
	CRK546PAP	PK546PA*	
	CRK546PBP	PK546PB*	
Standard Type	**CRK543AP**	PK543NAW	
	CRK543BP	PK543NBW	
	CRK544AP	PK544NAW	
	CRK544BP	PK544NBW	
	CRK545AP	PK545NAW	
	CRK545BP	PK545NBW	
	CRK564AP	PK564NAW	CRD5114P
	CRK564BP	PK564NBW	
	CRK566AP	PK566NAW	
	CRK566BP	PK566NBW	
	CRK569AP	PK569NAW	
	CRK569BP	PK569NBW	
TH Geared Type	**CRK523PAP-T7.2**	PK523PA-T7.2*	CRD5103P
	CRK523PBP-T7.2	PK523PB-T7.2*	
	CRK523PAP-T10	PK523PA-T10*	
	CRK523PBP-T10	PK523PB-T10*	
	CRK523PAP-T20	PK523PA-T20*	
	CRK523PBP-T20	PK523PB-T20*	
	CRK523PAP-T30	PK523PA-T30*	
	CRK523PBP-T30	PK523PB-T30*	
	CRK543AP-T3.6	PK543AW-T3.6	CRD5107P
	CRK543BP-T3.6	PK543BW-T3.6	
	CRK543AP-T7.2	PK543AW-T7.2	
	CRK543BP-T7.2	PK543BW-T7.2	
	CRK543AP-T10	PK543AW-T10	
	CRK543BP-T10	PK543BW-T10	
	CRK543AP-T20	PK543AW-T20	
	CRK543BP-T20	PK543BW-T20	
	CRK543AP-T30	PK543AW-T30	
	CRK543BP-T30	PK543BW-T30	
	CRK564AP-T3.6	PK564AW-T3.6	CRD5114P
	CRK564BP-T3.6	PK564BW-T3.6	
	CRK564AP-T7.2	PK564AW-T7.2	
	CRK564BP-T7.2	PK564BW-T7.2	
	CRK564AP-T10	PK564AW-T10	
	CRK564BP-T10	PK564BW-T10	
	CRK564AP-T20	PK564AW-T20	
	CRK564BP-T20	PK564BW-T20	
	CRK564AP-T30	PK564AW-T30	
	CRK564BP-T30	PK564BW-T30	

Type	Model	Motor Model	Driver Model
PL Geared Type	**CRK545AP-P5**	PK545AW-P5	CRD5107P
	CRK545BP-P5	PK545BW-P5	
	CRK545AP-P7.2	PK545AW-P7.2	
	CRK545BP-P7.2	PK545BW-P7.2	
	CRK545AP-P10	PK545AW-P10	
	CRK545BP-P10	PK545BW-P10	
	CRK543AP-P25	PK543AW-P25	
	CRK543BP-P25	PK543BW-P25	
	CRK543AP-P36	PK543AW-P36	
	CRK543BP-P36	PK543BW-P36	
	CRK543AP-P50	PK543AW-P50	
	CRK543BP-P50	PK543BW-P50	
	CRK566AP-P5	PK566AW-P5	CRD5114P
	CRK566BP-P5	PK566BW-P5	
	CRK566AP-P7.2	PK566AW-P7.2	
	CRK566BP-P7.2	PK566BW-P7.2	
	CRK566AP-P10	PK566AW-P10	
	CRK566BP-P10	PK566BW-P10	
	CRK564AP-P25	PK564AW-P25	
	CRK564BP-P25	PK564BW-P25	
	CRK564AP-P36	PK564AW-P36	
	CRK564BP-P36	PK564BW-P36	
	CRK564AP-P50	PK564AW-P50	
	CRK564BP-P50	PK564BW-P50	
PN Geared Type	**CRK523PAP-N5**	PK523PA-N5*	CRD5103P
	CRK523PBP-N5	PK523PB-N5*	
	CRK523PAP-N7.2	PK523PA-N7.2*	
	CRK523PBP-N7.2	PK523PB-N7.2*	
	CRK523PAP-N10	PK523PA-N10*	
	CRK523PBP-N10	PK523PB-N10*	
	CRK544AP-N5	PK544AW-N5	CRD5107P
	CRK544BP-N5	PK544BW-N5	
	CRK544AP-N7.2	PK544AW-N7.2	
	CRK544BP-N7.2	PK544BW-N7.2	
	CRK544AP-N10	PK544AW-N10	
	CRK544BP-N10	PK544BW-N10	
	CRK566AP-N5	PK566AW-N5	CRD5114P
	CRK566BP-N5	PK566BW-N5	
	CRK566AP-N7.2	PK566AW-N7.2	
	CRK566BP-N7.2	PK566BW-N7.2	
	CRK566AP-N10	PK566AW-N10	
	CRK566BP-N10	PK566BW-N10	
	CRK564AP-N25	PK564AW-N25	
	CRK564BP-N25	PK564BW-N25	
	CRK564AP-N36	PK564AW-N36	
	CRK564BP-N36	PK564BW-N36	
	CRK564AP-N50	PK564AW-N50	
	CRK564BP-N50	PK564BW-N50	
Harmonic Geared Type	**CRK513PAP-H50**	PK513PA-H50S*	CRD5103P
	CRK513PBP-H50	PK513PB-H50S*	
	CRK513PAP-H100	PK513PA-H100S*	
	CRK513PBP-H100	PK513PB-H100S*	
	CRK543AP-H50	PK543AW-H50S	CRD5107P
	CRK543BP-H50	PK543BW-H50S	
	CRK543AP-H100	PK543AW-H100S	
	CRK543BP-H100	PK543BW-H100S	
	CRK564AP-H50	PK564AW-H50S	CRD5114P
	CRK564BP-H50	PK564BW-H50S	
	CRK564AP-H100	PK564AW-H100S	
	CRK564BP-H100	PK564BW-H100S	

*If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately. They are available as accessories.

Motor lead wire/connector assembly, motor connector set ➜ Page C-255

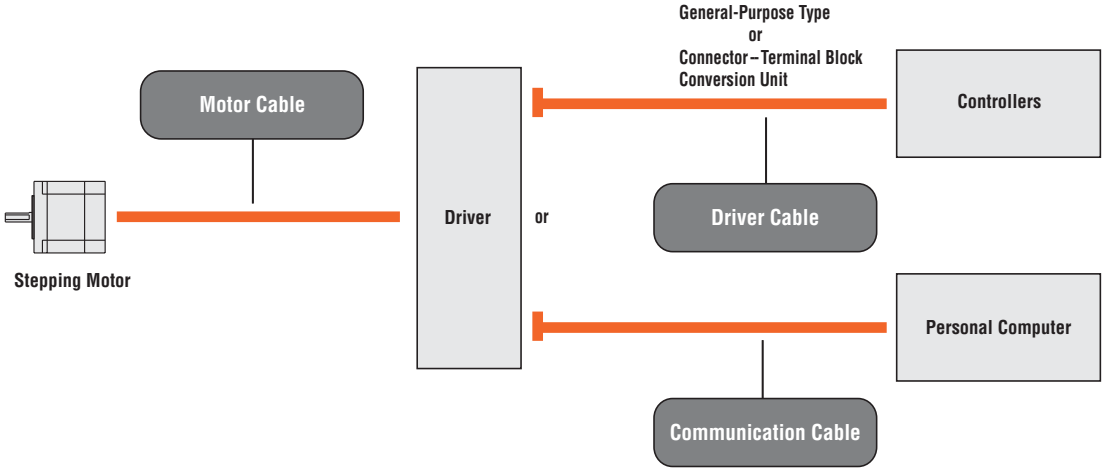
Stepping Motors

Accessories

Cables

Various cables provide convenient connection between a motor, driver and controller.

Type of Cables



Motor Cables

These cables are available to extend the distance between the motor and the driver for αSTEP and **RK** Series, or connect a high-torque type motor to a driver.

Cable Name	Page	Applicable Product
Extension Cables Extension Cables for Electromagnetic Brake Motor	C-253 [1]	αSTEP
Flexible Extension Cables Flexible Extension Cables for Electromagnetic Brake Motor	C-253 [2]	
Motor Cables for IP65 Rated Motor Flexible Motor Cables for IP65 Rated Motor	C-254 [3]	
Extension Cables	C-254 [4]	**RK** Series
Motor Cable	C-254 [5]	**RK** Series 2-Phase **PK** Series
Motor Lead Wire/Connector Assembly*	C-255 [6]	**CRK** Series **CMK** Series 2-Phase **PK** Series
Motor Connector Set*	C-255 [7]	**CRK** Series **CMK** Series 2-Phase **PK** Series

*Only for connector-coupled motors

Communication Cable

This cable is used to connect personal computer and the αSTEP **AS** Series built-in controller (stored program) package through an RS-232C connection.

Cable Name	Page	Applicable Product
Communicaiton Cable	C-257 [4]	αSTEP **AS** Series Built-In Controller (Stored Program) Package

Driver Cables

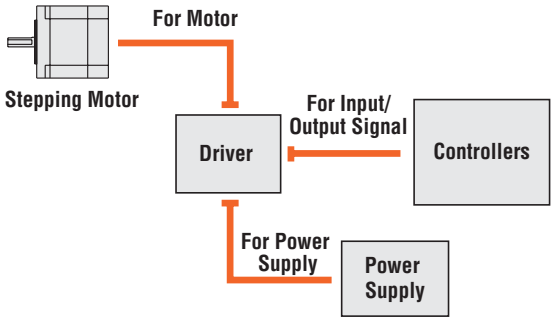
Use these cables to connect the driver of the αSTEP or **RK** Series to a controller.
Choose the general-purpose type to be combined with a connector appropriate for the specific controller used, or the connector-terminal block conversion unit that permits connection between the driver and host controller using a terminal block.

Cable Name	Page	Applicable Product
Driver Cables General-Purpose Type	C-256 [1]	αSTEP **RK** Series
Connector–Terminal Block Conversion Unit	C-256 [2]	αSTEP **RK** Series

Lead wire set is available for connection between DC input driver and motor, controller, and power supply. As driver side of the cable is crimped with connector, easy connection is possible.

Cable Name	Page	Applicable Product
Driver Lead Wire Set	C-257 [3]	**CRK** Series **CMK** Series

The driver lead wire set includes three lead wire/connector assemblies (for motor, input/output signal and power supply).



Motor Cables

1 Extension Cables (RoHS) Extension Cables for Electromagnetic Brake Motor (RoHS) (For αSTEP)

These cables are used to connect αSTEP motors and drivers.

Product Line

●Extension Cables

Model	Length L (m)
CC01AIP	1
CC02AIP	2
CC03AIP	3
CC05AIP	5
CC07AIP	7
CC10AIP	10
CC15AIP	15
CC20AIP	20

●Extension Cables for Electromagnetic Brake Motor

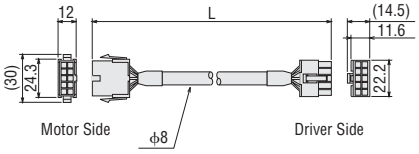
Model	Length L (m)
CC01AIPM	1
CC02AIPM	2
CC03AIPM	3
CC05AIPM	5
CC07AIPM	7
CC10AIPM	10
CC15AIPM	15
CC20AIPM	20

Notes:

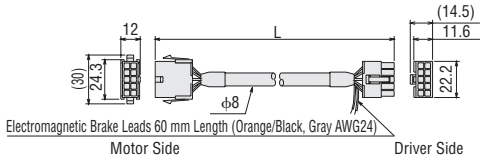
- Electromagnetic brake models must use an extension cable for an electromagnetic brake motor. But for electromagnetic brake motor with motor frame size □42 mm, use an extension cable for standard motor.
- **ASC** Series cannot use extension cables of 15 m and 20 m.

Dimensions (Unit = mm)

●For Standard Motor



●For Electromagnetic Brake Motor



2 Flexible Extension Cables (RoHS) Flexible Extension Cables for Electromagnetic Brake Motor (RoHS) (For αSTEP)

Theses flexible extension cables are used between αSTEP motors and drivers. We recommend this cable when the motor is installed on a moving section and the cable is bent and flexed.

Product Line

●Flexible Extension Cables

Model	Length L (m)
CC01SAR	1
CC02SAR	2
CC03SAR	3
CC05SAR	5
CC07SAR	7
CC10SAR	10

●Flexible Extension Cables for Electromagnetic Brake Motor

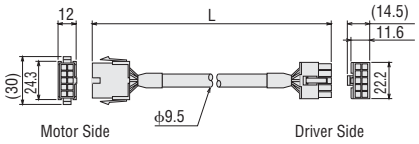
Model	Length L (m)
CC01SARM2	1
CC02SARM2	2
CC03SARM2	3
CC05SARM2	5
CC07SARM2	7
CC10SARM2	10

Note:

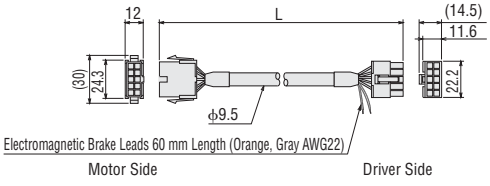
- For electromagnetic brake motor with motor frame size □42 mm, use a flexible extension cable for standard motor.

Dimensions (Unit = mm)

●For Standard Motor

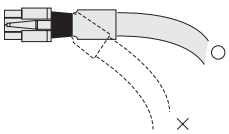


●For Electromagnetic Brake Motor

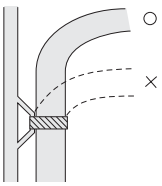


◇Notes on Use of a Flexible Extension Cable

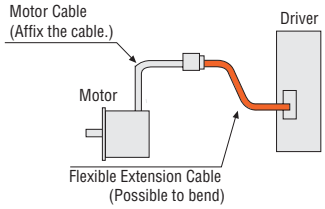
①Do not allow the cable to bend at the cable connector.



②Keep the bending radius to 60 mm or more.



③The motor cable is not a flexible cable. If the motor cable is to be bent, bend it at the flexible extension cable.



3 Motor Cables for IP65 Rated Motor RoHS Flexible Motor Cables for IP65 Rated Motor RoHS (For αSTEP)

These motor cables must be used for connection between the αSTEP **AS** Series IP65 rated motor and the driver.
Any IP65 rated motor cannot be driven without these cables.
One end of the cable connects to the metal connector on the motor, while the other end connects to the driver.
Use a flexible motor cable if the motor is installed on a moving part and its cable will be flexed.

Product Line

●Motor Cables for IP65 Rated Motor

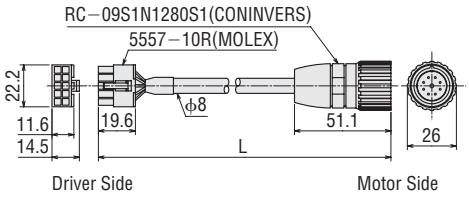
Model	Length L (m)
CC01AST	1
CC02AST	2
CC03AST	3
CC05AST	5
CC07AST	7
CC10AST	10
CC15AST	15
CC20AST	20

●Flexible Motor Cables for IP65 Rated Motor

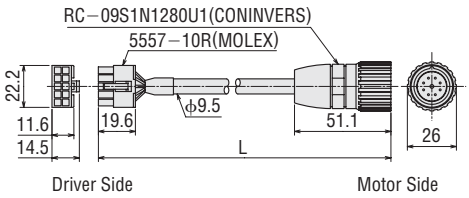
Model	Length L (m)
CC01SAR2	1
CC02SAR2	2
CC03SAR2	3
CC05SAR2	5
CC07SAR2	7
CC10SAR2	10

Dimensions (Unit = mm)

●Motor Cables for IP65 Rated Motor



●Flexible Motor Cables for IP65 Rated Motor



4 Extension Cables RoHS (For RK Series)

These extension cables are used between **RK** Series motors and dedicated drivers (except for electromagnetic brake type). They come in three lengths: 5 m, 10 m and 20 m.

Product Line

Model	Length (m)	Conductors
CC05PK5	5	5
CC10PK5	10	
CC20PK5	20	

- Conductor configuration: 5
- Conductor size: AWG22 (0.3 mm²)
- Finished outer diameter: ϕ7.2 mm
- Cable rating: 105°C
- Outer casing: Oil-resistant, heat-resistant, non-migrating vinyl

Note:

- These extension cables are only for the **RK** Series. Do not use them on other stepping motor and driver packages (such as **CRK** Series or **CMK** Series).

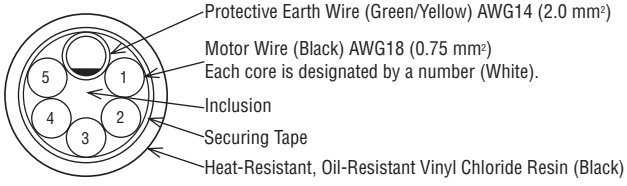
5 Motor Cable RoHS (For IP65 Rated Motor of RK Series and 2-Phase PK Series)

A cable for connection between the IP65 rated motor and driver (with protective earth wire)

Product Line

Model	Length (m)	Conductors
CC03PKT	3	6

- Conductor configuration: 6
- Conductor size: Motor wire AWG18 (0.75 mm²), protective earth wire AWG14 (2.0 mm²)
- Finished outer diameter: ϕ12 mm
- Cable rating: 105°C 600 V
- Outer casing: Heat-resistant, oil-resistant vinyl chloride resin
- Applicable standards: UL 758 (AWM) VW-1, UL Style 2586



6 Motor Lead Wire/Connector Assembly RoHS

These lead wires with connectors are available for connection with the connector-coupled motor, eliminating the need for assembling a connector. (A motor lead wire/connector assembly of 0.6 m is included with the connector-coupled motor packages.)

Product Line

Model	Applicable Product	Applicable Motor Model	Length (m)
LC5N06A	**CRK513P□P** **CRK513P□P-H■** **CRK52□P□P**	PK513P□ PK513P□-H■S PK52□P□	0.6
LC5N10A	**CRK52□PM□P** **CRK523P□P-T■** **CRK523P□P-N■**	PK52□PM□ PK523P□-T■ PK523P□-N■	1
LC5N06B	**CRK54□P□P**	PK54□P□	0.6
LC5N10B	**CRK54□PM□P**	PK54□PM□	1
LC5N06C	**CRK56□PM□P**	PK56□PM□	0.6
LC5N10C			1
LC2U06A	**CMK22□P□P**	PK22□P□	0.6
LC2U10A	**CMK223□P-SG■**	PK223P□-SG■	1
LC2U06B	**CMK23□P□P**	PK23□P□	0.6
LC2U10B	**CMK24□P□P**	PK24□P□	1

● Enter the motor case length in the box (□) within the model name.
Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name.
Enter the gear ratio in the box (■) within the model name.

7 Motor Connector Set RoHS

This photograph shows **CS5N30B**.

A set of connector housings and contacts for use with connector-coupled motors.
Each package contains enough housings and contacts for 30 motors.

Product Line

Model	Applicable Product	Applicable Motor Model
CS5N30A	**CRK513P□P** **CRK513P□P-H■** **CRK52□P□P** **CRK52□PM□P** **CRK523P□P-T■** **CRK523P□P-N■**	PK513P□ PK513P□-H■S PK52□P□ PK52□PM□ PK523P□-T■ PK523P□-N■
CS5N30B	**CRK54□P□P** **CRK54□PM□P**	PK54□P□ PK54□PM□
CS5N30C	**CRK56□PM□P**	PK56□PM□
CS2U30A	**CMK22□P□P** **CMK223□P-SG■**	PK22□P□ PK223P□-SG■
CS2U30B	**CMK23□P□P** **CMK24□P□P**	PK23□P□ PK24□P□

● Enter the motor case length in the box (□) within the model name.
Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name.
Enter the gear ratio in the box (■) within the model name.

Specifications

Model	Connector Housing	Contact	Applicable Crimp Tool	Manufacturer	Applicable Cable
CS5N30A	51065-0500	50212-8100	57176-5000	MOLEX	AWG30~24 (0.05~0.2 mm²) Outer Sheath Diameter: ϕ1.4 mm max. Strip Length: 1.3~1.8 mm
CS5N30B	51103-0500	50351-8100	57295-5000		AWG28~22 (0.08~0.3 mm²) Outer Sheath Diameter: ϕ1.15~1.8 mm Strip Length: 2.3~2.8 mm
CS5N30C	51144-0500	50539-8100	57189-5000		AWG24~18 (0.2~0.75 mm²) Outer Sheath Diameter: ϕ1.4~3 mm Strip Length: 3~3.5 mm
CS2U30A	51065-0600	50212-8100	57176-5000		AWG30~24 (0.05~0.2 mm²) Outer Sheath Diameter: ϕ1.4 mm max. Strip Length: 1.3~1.8 mm
CS2U30B	51103-0600	50351-8100	57295-5000		AWG28~22 (0.08~0.3 mm²) Outer Sheath Diameter: ϕ1.15~1.8 mm Strip Length: 2.3~2.8 mm

Note:
● The crimp tool is not provided with the package. It must be purchased separately.

Driver Cables

1 General-Purpose Type RoHS

This is a shielded cable equipped with, at one end of the cable, the half-pitch connector that snaps into the driver for αSTEP and **RK** Series.

Notes:

- Note that as the length of the pulse signal line between the driver and controller increases, the maximum transmission frequency decreases.
  Technical reference ➜ Page F-46
- Install a connector that matches the controller you are using to the other end of the cable.

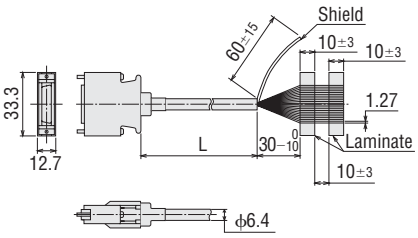
Product Line

Model	Length L (m)	Applicable Connector
CC20D1-1	1	**AS** Series Built-In Controller (Stored Program) Package CN5 (20 Pins), **RK** Series CN1 (20 Pins)
CC20D2-1	2	
CC36D1-1	1	**AS** Series Pulse Input Package CN4 (36 Pins), **AS** Series Built-In Controller (Stored Program) Package CN4 (36 Pins), **ASC** Series CN3 (36 Pins)
CC36D2-1	2	

Dimensions (Unit = mm)

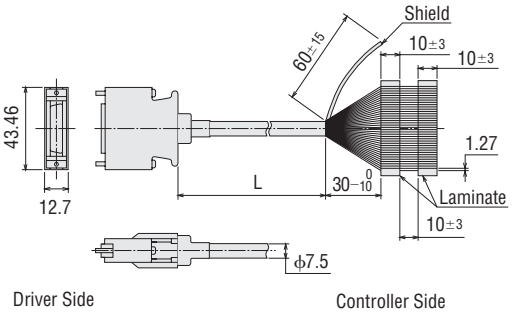
CC20D1-1, CC20D2-1

Conductor: AWG28 (0.08 mm²)



CC36D1-1, CC36D2-1

Conductor: AWG28 (0.08 mm²)



2 Connector – Terminal Block Conversion Unit RoHS

A conversion unit that connects a driver to a host controller using a terminal block.

- With a signal name plate for easy, one-glance identification of driver signal names
- DIN-rail mountable
- Cable length: 1 m

CC20T1

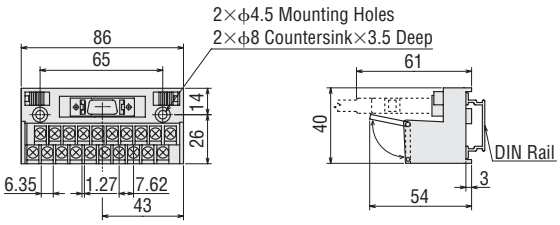
CC36T1

Product Line

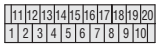
Model	Length (m)	Applicable Connector
CC20T1	1	**AS** Series Built-In Controller (Stored Program) Package CN5 (20 Pins), **RK** Series CN1 (20 Pins)
CC36T1		**AS** Series Pulse Input Package CN4 (36 Pins), **AS** Series Built-In Controller (Stored Program) Package CN4 (36 Pins), **ASC** Series CN3 (36 Pins)

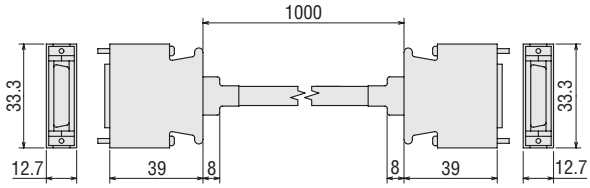
Dimensions (Unit = mm)

CC20T1

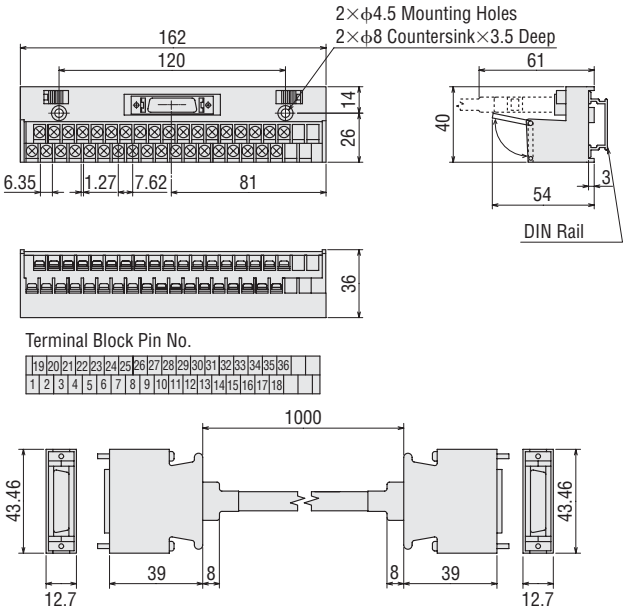


Terminal Block Pin No.

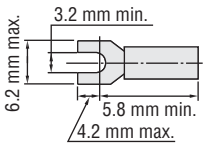




CC36T1



● Recommended Crimp Terminals
- Terminal screw size: M3
- Tightening torque: 1.2 N·m
- Applicable minimum lead wire: AWG22 (0.3 mm²)



3 Driver Lead Wire Set RoHS

As an accessory for DC input drivers, lead wires with a connector are available. Crimping is not necessary, and the connection with the motor, power supply, input/output signal is also easy. The driver lead wire set includes three lead wire/connector assemblies (for motor, power supply and input/output signal).

Product Line

Model	Applicable Product	Applicable Driver	Length (m)
LCS04SD5	**CRK** Series	CRD5103P CRD5107P CRD5114P	0.6
LCS01CMK2	**CMK** Series	CMD2109P CMD2112P CMD2120P	

4 Communication Cable FC04W5 RoHS

This cable is used to connect personal computer and the αSTEP **AS** Series built-in controller (stored program) driver through an RS-232C connection.

Cable Length: 5 m

Flexible Couplings RoHS

A flexible coupling ideal for your motor is available. Once you have decided on a motor and gear, you can select the recommended coupling easily.

Product Line

Model
MCS14□
MCS20□
MCS30□
MCS40□
MCS55□
MCS65□

● Enter the inner diameter of coupling in the box (□) within the model name.

Features of MCS Couplings

This three-piece coupling adopts an aluminum alloy hub and a resin spider. The simple construction ensures that the high torque generated by a geared motor can be transmitted reliably. The proper elasticity of the spider suppresses motor vibration.

Technical reference ➜ Page F-46

● High strength (usable for geared motor) has been realized.
● A spider (material: polyurethane) controls the vibration generated by the motor.
● No backlash

Product Number Code

MCS 30 08 12

① ② ③ ④

①	**MCS** Couplings
②	Outer Diameter of Coupling
③	Inner Diameter d1 (Smaller Side) (**F04** represents ϕ6.35 mm)
④	Inner Diameter d2 (Larger Side) (**F04** represents ϕ6.35 mm)

Coupling Selection Table

● *α*STEP

Model AS	Model ASC	Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm) ϕ4	ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14	ϕ15	ϕ16	ϕ18	ϕ20	ϕ25
–	**ASC34AK** **ASC36AK** **ASC46**□**K**	–	ϕ5	**MCS14**	●	●	●										
–	**ASC34AK-T**■	**7.2**, **10**, **20**, **30**															
–	**ASC46**□**K-T**■	**3.6**, **7.2**, **10**	ϕ6	**MCS20**		●	●	●	●	●							
–	**ASC34AK-N**■	**5**, **7.2**, **10**	ϕ8			●	●	●	●	●							
–	**ASC46**□**K-T**■	**20**, **30**	ϕ6	**MCS30**			●	●	●	●							
AS66□**CE** **AS66ACT** **AS66**□**CEP** **AS66ACTP** **AS69**□**CE** **AS69ACT** **AS69**□**CEP** **AS69ACTP**	**ASC66**□**K**	–	ϕ8				●	●	●	●	●						
AS66□**CE-T**■ **AS66**□**CEP-T**■	**ASC66**□**K-T**■	**3.6**, **7.2**															
–	**ASC34AK-H**■	**50**, **100**															
–	**ASC46**□**K-N**■	**7.2**, **10**	ϕ10				●	●	●	●	●	●					
AS98□**CE** **AS98ACT** **AS98**□**CEP** **AS98ACTP** **AS911ACE** **AS911ACT** **AS911ACEP** **AS911ACTP**	–	–	ϕ14							●	●	●		●			
AS66□**CE-T**■ **AS66**□**CEP-T**■	**ASC66**□**K-T**■	**10**, **20**, **30**	ϕ8	**MCS40**					●	●	●		●				
–	**ASC46**□**K-H**■	**50**, **100**	ϕ10						●	●	●		●				
AS66□**CE-P**■	–	**5**, **7.2**	ϕ12														
AS66□**CE-N**■ **AS66**□**CEP-N**■	**ASC66**□**K-N**■	**5**, **7.2**							●	●	●		●				
AS98□**CE-T**■ **AS98**□**CEP-T**■	–	**3.6**, **7.2**, **10**, **20**, **30**	ϕ12	**MCS55**							●	●	●	●			
AS66□**CE-P**■	–	**10**, **25**, **36**, **50**															
AS66□**CE-N**■ **AS66**□**CEP-N**■	**ASC66**□**K-N**■	**10**, **25**, **36**, **50**									●	●	●	●			
AS66□**CE-H**■ **AS66**□**CEP-H**■	**ASC66**□**K-H**■	**50**, **100**															

● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.
Enter the gear ratio in the box (■) within the model name.

Model		Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)												
AS	ASC				ϕ4	ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14	ϕ15	ϕ16	ϕ18	ϕ20	ϕ25
AS98□CE-P■	–	5, 7.2, 10, 25, 36, 50	ϕ18	MCS65													
AS98□CE-N■ AS98□CEP-N■	–	5, 7.2, 10, 25, 36, 50												●	●	●	●
AS98□CE-H■ AS98□CEP-H■	–	50, 100															

● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.
Enter the gear ratio in the box (■) within the model name.

●5-Phase Packages

Model		Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)												
RK	CRK				ϕ4	ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14	ϕ15	ϕ16	ϕ18	ϕ20	ϕ25
–	CRK513P□P	–	ϕ4	MCS14	●	●	●										
–	CRK513P□P-H■	50, 100	ϕ5														
–	CRK523PM□P CRK524PM□P CRK525PM□P CRK544PM□P CRK546PM□P CRK523P□P CRK525P□P CRK544P□P CRK546P□P CRK543□P CRK544□P CRK545□P	–			●	●	●										
–	CRK523P□P-T■	7.2, 10, 20, 30															
–	CRK543□P-T3.6	3.6	ϕ6		●	●	●										
–	CRK543□P-T■	7.2, 10	ϕ6	MCS20		●	●	●	●	●							
RK564□CE RK566□CE RK564ACT RK566ACT RK564AMCE RK566AMCE	CRK564□P CRK566□P	–	ϕ8			●	●	●	●	●							
–	CRK523P□P-N■	5, 7.2, 10															
–	CRK545□P-P5	5															
–	CRK544□P-N■	5, 7.2	ϕ10				●	●	●	●							
–	CRK543□P-T■	20, 30	ϕ6	MCS30			●	●	●	●							
RK569□CE RK569ACT RK569AMCE	CRK564PM□P CRK566PM□P CRK569□P	–	ϕ8				●	●	●	●	●						
RK564□CE-T■	CRK564□P-T■	3.6, 7.2															
–	CRK543□P-P25	25															
–	CRK545□P-P■	7.2, 10															
–	CRK569PM□P	–	ϕ10				●	●	●	●	●	●					
–	CRK544□P-N10	10															
RK596□CE RK596ACT RK596AMCE	–	–	ϕ14							●	●	●		●			
–	CRK543□P-P■	36, 50	ϕ8	MCS40					●	●	●		●				
RK564□CE-T■	CRK564□P-T■	10, 20, 30															
–	CRK543□P-H■	50, 100	ϕ10						●	●	●		●				
RK566□CE-P■	CRK566□P-P■	5, 7.2	ϕ12						●	●	●		●				
RK566□CE-N■	CRK566□P-N■																
RK596□CE-T■	–	3.6, 7.2, 10, 20, 30	ϕ12	MCS55													
RK564□CE-P■	CRK564□P-P■	25, 36, 50															
RK566□CE-P10	CRK566□P-P10	10									●	●	●	●			
RK564□CE-N■	CRK564□P-N■	25, 36, 50															
RK566□CE-N10	CRK566□P-N10	10															
RK564□CE-H■	CRK564□P-H■	50, 100															
RK599□CE RK5913□CE RK599ACT RK5913ACT RK599AMCE RK5913AMCE	–	–	ϕ14								●	●	●	●			
RK599□CE-P5 RK599□CE-N5	–	5	ϕ18										●	●	●	●	
RK596□CE-P■	–	25, 36, 50	ϕ18	MCS65													
RK599□CE-P■		7.2, 10															
RK596□CE-N■		25, 36, 50												●	●	●	●
RK599□CE-N■		7.2, 10															
RK596□CE-H■		50, 100															

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

●5-Phase Stepping Motors

5-Phase Stepping Motors PK	Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)									
				ϕ4	ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14	ϕ15	ϕ16
PK543-□, PK544-□, PK545-□	–	ϕ5	MCS14	●	●	●							
PK564-□E, PK566-□E	–	ϕ8	MCS20		●	●	●	●	●				
PK569-□E	–	ϕ8	MCS30			●	●	●	●	●			
PK596-□E	–	ϕ14							●	●	●		●
PK599-□E, PK5913-□E	–	ϕ14	MCS55							●	●	●	●

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

●2-Phase Packages, 2-Phase Stepping Motors

Model		2-Phase Stepping Motors PK	Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)									
CMK	CSK					ϕ4	ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14	ϕ15	ϕ16
CMK22□P□P CMK23□P□P CMK244P□P CMK24□M□P CMK24□□P	CSK24□-□T CSK24□M□T	PK22□P□ PK23□P□ PK24□-01□ PK24□-02□ PK24□-03□ PK24□M-01□ PK24□M-02□ PK24□M-03□	–	ϕ5	MCS14	●	●	●							
CMK223□P-SG□	–	PK223P□-SG□	7.2, 9, 10, 18, 36												
CMK243□P-SG□	–	–	3.6, 7.2, 9, 10, 18, 36, 50, 100												
–	CSK243□T-SG□	PK243□1-SG□	3.6, 7.2, 9, 10, 18, 36												
CMK246P□P	–	PK24□P□	–	ϕ5	MCS20		●	●	●	●					
CMK264M□P CMK266M□P CMK256□P CMK264□P CMK266□P	CSK264-□T CSK266-□T CSK264M□T CSK266M□T	PK256-02□ PK264-01□ PK264-02□ PK264-03□ PK264-E2.0□ PK266-01□ PK266-02□ PK266-03□ PK266-E2.0□ PK264M-01□ PK264M-02□ PK264M-03□ PK264M-E2.0□ PK266M-01□ PK266M-02□ PK266M-03□ PK266M-E2.0□ PK264DAT PK266DAT	–	ϕ6.35			●	●	●	●	●				
–	–	PK264JD□ PK264J□	–	ϕ8			●	●	●	●	●				
CMK264□P-SG□	CSK264□T-SG□	PK264□E-SG□	3.6, 7.2												
CMK268M□P CMK258□P CMK268□P	CSK268-□T CSK268M□T	PK258-02□ PK268-01□ PK268-02□ PK268-03□ PK268-E2.0□ PK268M-01□ PK268M-02□ PK268M-03□ PK268M-E2.0□ PK268DAT	–	ϕ6.35	MCS30			●	●	●	●				
–	–	PK266JD□ PK266J□ PK267JD□ PK267J□	–	ϕ8				●	●	●	●	●			
CMK264□P-SG□	–	–	9, 10, 18, 36, 50, 100												
–	CSK264□T-SG□	PK264□E-SG□	9, 10, 18, 36												
–	–	PK269JD□ PK269J□	–	ϕ8	MCS40					●	●	●		●	
–	–	PK296□E-SG□	3.6, 7.2, 9	ϕ12						●	●	●		●	
–	–	PK296□E-SG□	10, 18, 36	ϕ12	MCS55							●	●	●	●
–	–	PK299-E4.5□ PK2913-E4.0□ PK299EAT PK2913EAT	–	ϕ14								●	●	●	●

● Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name.
Enter the motor case length in the box (□) within the model name.
Enter the gear ratio in the box (■) within the model name.

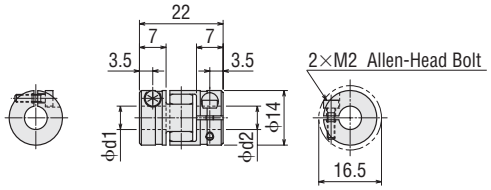
Specifications

Model	Dimensions					Normal Torque	Mass	Inertia	Static Torsion Spring Constant	Permissible Eccentricity	Permissible Declination	Permissible End Play
	Outer Diameter mm	Length mm	Axis Hole Diameter d1 H7 mm	Axis Hole Diameter d2 H7 mm	Key Slot Tolerance b/t mm	N·m	g	kg·m²	N·m/rad	mm	deg	mm
MCS140404	14	22	4	4	–	2.0	6.7	0.184×10^{-6}	22.9	0.06	0.9	+0.6 0
MCS140405			4	5								
MCS140406			4	6								
MCS140505			5	5								
MCS140506			5	6								
MCS140606			6	6								
MCS200505	20	30	5	5	–	5.0	19.8	1.059×10^{-6}	51.6	0.08	0.9	+0.8 0
MCS200506			5	6								
MCS2005F04			5	6.35								
MCS200508			5	8								
MCS200606			6	6								
MCS2006F04			6	6.35								
MCS200608			6	8								
MCS200610			6	10								
MCS20F04F04			6.35	6.35								
MCS20F0408			6.35	8								
MCS20F0410			6.35	10								
MCS200808			8	8								
MCS200810			8	10								
MCS201010			10	10								
MCS300606	30	35	6	6	–	12.5	44.6	6.057×10^{-6}	171.9	0.09	0.9	+1.0 0
MCS3006F04			6	6.35								
MCS300608			6	8								
MCS300610			6	10								
MCS30F04F04			6.35	6.35								
MCS30F0408			6.35	8								
MCS30F0410			6.35	10								
MCS300808			8	8								
MCS300810			8	10								
MCS300812			8	12								
MCS301010			10	10								
MCS301012			10	12								
MCS301014			10	14								
MCS301212			12	12								
MCS301214			12	14								
MCS301414			14	14								
MCS301416			14	16								
MCS400808	40	66	8	8	ϕ8 b: 2 ± 0.0125 t: $1^{+0.1}_{0}$	17.0	139	42.29×10^{-6}	859.5	0.06	0.9	+1.2 0
MCS400810			8	10								
MCS400812			8	12								
MCS400815			8	15								
MCS401010			10	10	ϕ10 b: 3 ± 0.0125 t: $1.4^{+0.1}_{0}$							
MCS401012			10	12								
MCS401015			10	15								
MCS401212			12	12	ϕ12 b: 4 ± 0.015 t: $1.8^{+0.1}_{0}$							
MCS401215			12	15								
MCS551212	55	78	12	12	ϕ14 b: 5 ± 0.015 t: $2.3^{+0.1}_{0}$	60.0	282	109.1×10^{-6}	2063	0.10	0.9	+1.4 0
MCS551214			12	14								
MCS551215			12	15	ϕ15 b: 5 ± 0.015 t: $2.3^{+0.1}_{0}$							
MCS551216			12	16								
MCS551414			14	14								
MCS551415			14	15	ϕ16 b: 5 ± 0.015 t: $2.3^{+0.1}_{0}$							
MCS551416			14	16								
MCS551518			15	18	ϕ18 b: 6 ± 0.015 t: $2.8^{+0.1}_{0}$							
MCS551618			16	18								
MCS551818			18	18								
MCS551820			18	20	ϕ20 b: 6 ± 0.015 t: $2.8^{+0.1}_{0}$							
MCS651618	65	90	16	18	ϕ25 b: 8 ± 0.018 t: $3.3^{+0.2}_{0}$	160.0	535	417.1×10^{-6}	3438	0.11	0.9	+1.5 0
MCS651818			18	18								
MCS651820			18	20								
MCS651825			18	25								

Dimensions (Unit = mm)

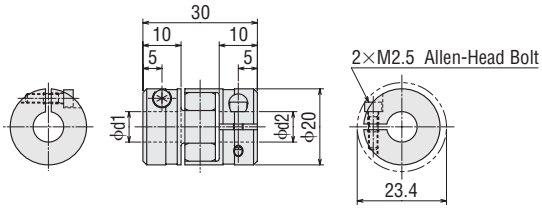
MCS14

Mass: 6.7 g



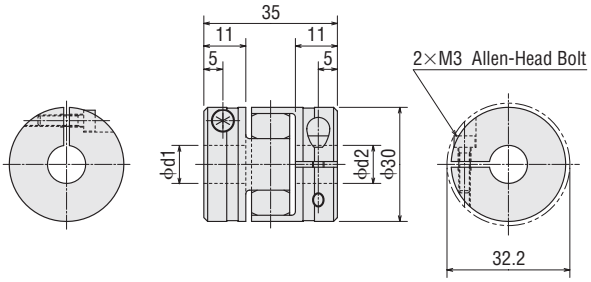
MCS20

Mass: 19.8 g



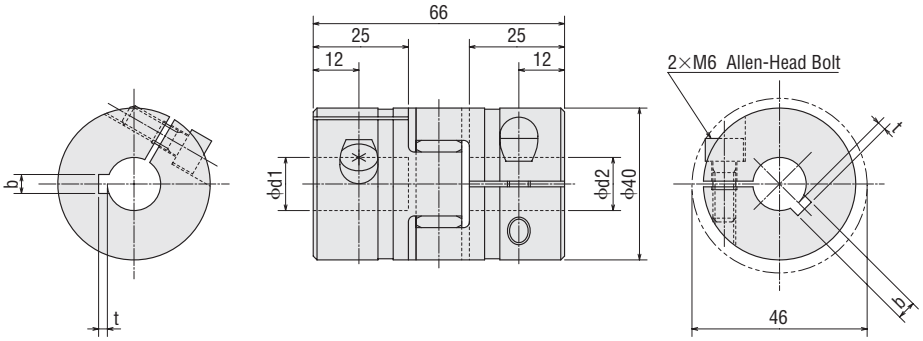
MCS30

Mass: 44.6 g



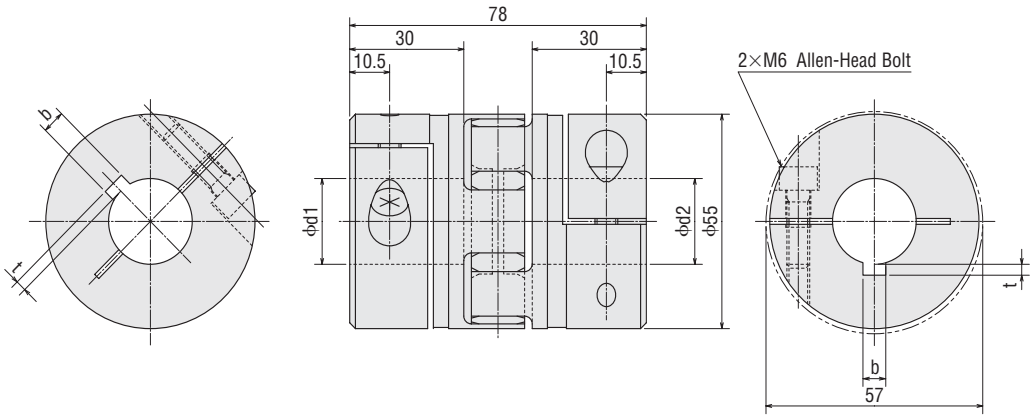
MCS40

Mass: 139 g



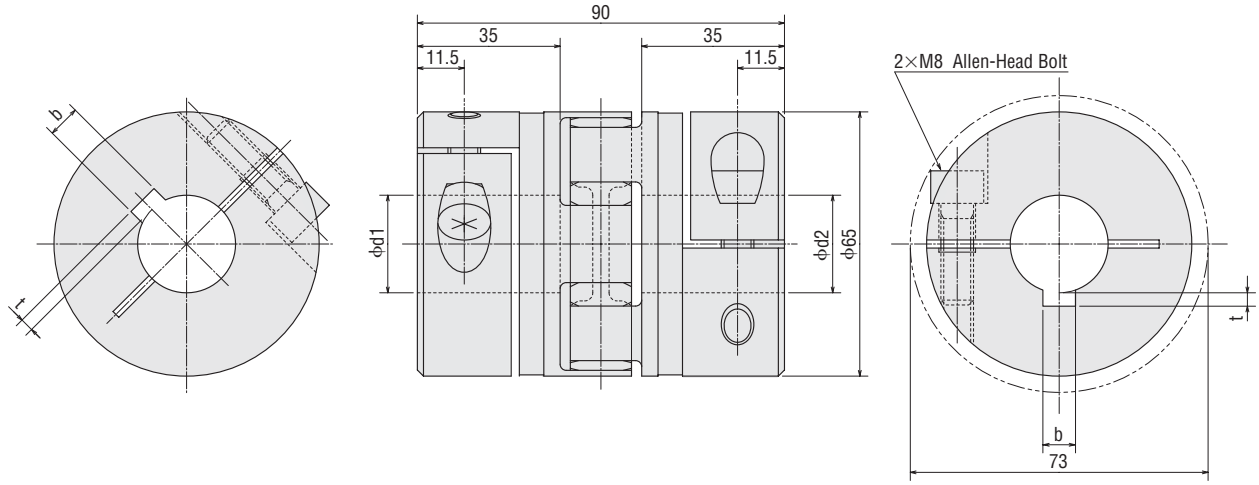
MCS55

Mass: 282 g



MCS65

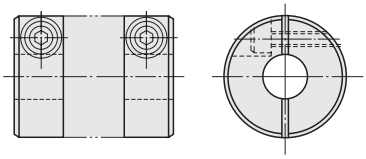
Mass: 535 g



Mounting to a Shaft

Clamp Type

Clamp couplings use the tightening force of the screw to compress the shaft hole diameter and thereby fasten the coupling to the shaft. This does not damage the shaft and is easy to mount and remove.



The following table shows the screw tightening torque. We recommend use of a torque wrench to fasten the coupling.

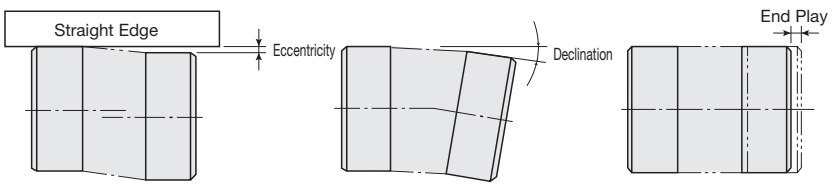
Type		MCS14	MCS20	MCS30	MCS40	MCS55	MCS65
Tightening Torque	N·m	0.37	0.76	1.34	10.5	10.5	25.0

Alignment Adjustment

Flexible couplings tolerate misalignment of the axis center and transfer rotational angle and torque, but produce vibration when the permissible value for misalignment is exceeded. This can dramatically shorten the coupling's service life. This requires alignment adjustment.

Misalignment of the axis center includes eccentricity (parallel error of both centers), declination (angular error of both centers) and end play (shaft movement in the axial direction). To keep misalignment within the permissible value, always check and adjust the alignment.

To increase the service life of the coupling, we recommend keeping misalignment below 1/3 of the permissible value.

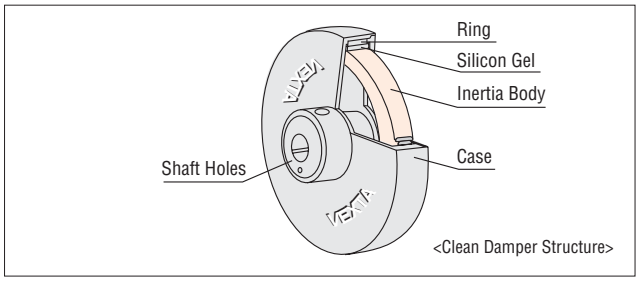


Notes:

- When misalignment exceeds the permissible value or excessive torque is applied, the coupling's shape will deform, and service life is shortened.
- When the coupling emits a metallic sound during operation, stop operation immediately and ensure there is no misalignment, axis interference or loose screws.
- When load changes are large, apply an adhesive to the coupling set screw to prevent it from loosening.

Clean Dampers RoHS

Mechanical dampers suppress stepping motor vibration and improve high-speed performance. An inertia body and silicon gel are hermetically sealed in a plastic case.



<Clean Damper Structure>

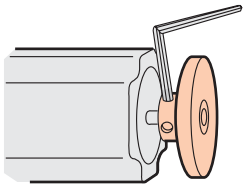
Features

- Excellent vibration absorption
  The doughnut-shaped internal inertia body and silicon gel absorb vibration. This feature enables a stable damping effect.
- Since there is no frictional dust as in conventional magnetic dampers, it can be used in environments where higher degrees of cleanness is needed.
- High reliability
- It holds up well in harsh environments and changes little with age because the silicon gel and plastic case used are heat resistant.
- Machine part is sealed hermetically in a plastic case. This ensures safety and doesn't generate noise.
- This clean damper is an accessory for double shaft types. It can be used with various geared motors of double shaft type.

Product Line

Model
D4CL-5.0F
D6CL-6.3F
D6CL-8.0F
D9CL-14F

Installation of the Clean Damper



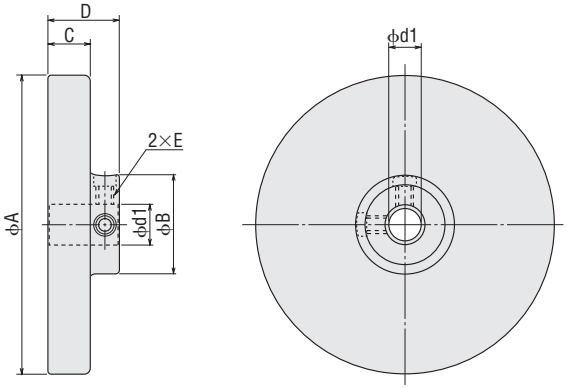
Point the mounting screws of the clean damper toward the motor case, fasten to the shaft and tighten the damper's mounting screws (two places) with an allen wrench to secure it to the shaft.

Model		D4CL-5.0F	D6CL-6.3F	D6CL-8.0F	D9CL-14F
Tightening Torque	N·m	0.4	1.5		

Notes:

- There are mounting screws with hexagonal holes in two damper locations, so tighten them both before running the motor.
- The damper rotates at the same speed as the motor shaft, so do not touch it while the motor is running.

Dimensions (Unit = mm)



Model	ϕd1	ϕA	ϕB	C	D	E
D4CL-5.0F	$5^{+0.018}_{0}$	ϕ36±0.5	ϕ13±0.5	9±0.3	15±0.5	M3
D6CL-6.3F	$6.35^{+0.022}_{0}$	ϕ44.5±0.5	ϕ20±0.5	15±0.3	22±0.5	M4
D6CL-8.0F	$8^{+0.022}_{0}$					
D9CL-14F	$14^{+0.027}_{0}$	ϕ79.5±0.5	ϕ26±0.5	11±0.3	19±0.5	M4

Clean Damper Selection Table

Model	Inertia kg·m²	Mass g	Applicable Product		
			RK	5-Phase Stepping Motors	2-Phase Stepping Motors
D4CL-5.0F	34×10^{-7}	24	–	**CRK52□PBP** **CRK52□PMBP** **CRK523PBP-T■** **CRK523PBP-N■** **CRK54□BP** **CRK54□PBP** **CRK54□PMBP** **CRK543BP-T■** **CRK54□BP-P■** **CRK544BP-N■** **CRK543BP-H■** **PK54□-B**	**CMK22□PBP** **CMK23□PBP** **CMK24□PBP** **CMK24□MBP** **CMK24□BP** **CMK223BP-SG■** **CMK243BP-SG■** **CSK243BT-SG■** **CSK24□-BT** **CSK24□MBT** **PK22□PB** **PK23□PB** **PK223PB-SG■** **PK243B1-SG■** **PK24□PB** **PK24□-01B** **PK24□-02B** **PK24□-03B** **PK24□M-01B** **PK24□M-02B** **PK24□M-03B**
D6CL-6.3F	140×10^{-7}	62	–	–	**CMK26□MBP** **CMK25□BP** **CMK26□BP** **CMK264BP-SG■** **CSK26□-BT** **CSK26□MBT** **CSK264BT-SG■** **PK25□-02B** **PK26□-01B** **PK26□-02B** **PK26□-03B** **PK26□-E2.0B** **PK26□M-01B** **PK26□M-02B** **PK26□M-03B** **PK26□M-E2.0B** **PK264BE-SG■**
D6CL-8.0F	140×10^{-7}	61	**RK56□BCE** **RK564BCE-T■** **RK56□BCE-P■** **RK56□BCE-N■** **RK564BCE-H■**	**CRK56□BP** **CRK56□PMBP** **CRK564BP-T■** **CRK56□BP-P■** **CRK56□BP-N■** **CRK564BP-H■** **PK56□-BE**	**PK26□JB** **PK26□JDB**
D9CL-14F	870×10^{-7}	105	**RK59□BCE** **RK596BCE-T■** **RK59□BCE-P■** **RK59□BCE-N■** **RK596BCE-H■**	**PK59□-BE**	**PK29□-E4.5B** **PK2913-E4.0B** **PK296BE-SG■**

Ambient Temperature: −20 to+80°C

● Enter the motor case length in the box (□) within the model name.
Enter the gear ratio in the box (■) within the model name.

Motor Mounting Brackets RoHS

Mounting brackets are convenient for installation and securing a stepping motor and geared stepping motor.

Product Line

Standard Type, High-Torque Type, High-Speed Type, High-Resolution Type

Material: Aluminum alloy

Model	Applicable Product				
	αSTEP	RK	CRK	5-Phase Stepping Motors	2-Phase Stepping Motors
PAL0P	**ASC46□K**	–	**CRK54■□P** **CRK54■P□P** **CRK54■PM□P**	**PK54■-□**	**CMK24■P□P** **CMK24■M□P** **CMK24■□P** **CSK24■-□T** **CSK24■M□T** **PK24■P□** **PK24■-01□** **PK24■-02□** **PK24■-03□** **PK24■M-01□** **PK24■M-02□** **PK24■M-03□**
PAL2P-5	**AS66□CE** **AS66ACT** **AS66□CEP** **AS66ACTP** **ASC66□K** **AS69□CE** **AS69ACT** **AS69□CEP** **AS69ACTP**	**RK56■□CE** **RK56■AMCE** **RK56■ACT**	**CRK56■□P** **CRK56■PM□P**	**PK56■-□E**	–
PAL2P-2	–	–	–	–	**CMK26■MP□** **CMK26■□P** **CSK26■-□T** **CSK26■M□T** **PK26■J□** **PK26■JD□** **PK26■-01□** **PK26■-02□** **PK26■-03□** **PK26■M-01□** **PK26■M-02□** **PK26■M-03□** **PK26■DAT** **PK26■-E2.0□** **PK26■M-E2.0□**
PAL4P-5	**AS98□CE** **AS98ACT** **AS98□CEP** **AS98ACTP** **AS911ACE** **AS911ACT** **AS911ACEP** **AS911ACTP**	**RK59■□CE** **RK59■AMCE** **RK59■ACT**	–	**PK59■-□E**	–
PAL4P-2	–	–	–	–	**PK29■EAT** **PK29■-E4.5□** **PK2913-E4.0□**

- Enter **A** (single shaft), **B** (double shaft) or **M** (electromagnetic brake) in the box (□) within the model name.
  Enter the motor case length in the box (■) within the model name.
- The mounting bracket base is built with holes large enough to allow for alignment adjustments in the horizontal direction.
- These mounting brackets can be perfectly fitted to the pilot of the stepping motors. (Except for **PAL0P**)

Note:

- They cannot be used with geared stepping motors.

●Geared Type

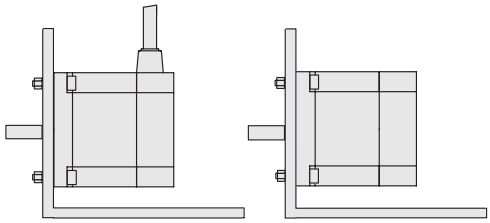
Material: Aluminum alloy

Model	Applicable Product			
	αSTEP	RK	CRK	2-Phase Stepping Motors
SOL0A	–	–	–	**CMK243□P-SG■** **CSK243□T-SG■** **PK243□1-SG■**
SOL0B	**ASC46□K-T■**	–	**CRK543□P-T■** **CRK545□P-P■** **CRK543□P-P■**	–
SOL2A	**AS66□CE-T■** **AS66□CEP-T■** **ASC66□K-T■**	**RK564□CE-T■**	**CRK564□P-T■**	**CMK264□P-SG■** **CSK264□T-SG■** **PK264□E-SG■**
SOL2B	**AS66□CE-P■**	**RK566□CE-P■** **RK564□CE-P■**	**CRK566□P-P■** **CRK564□P-P■**	–
SOL5A	–	–	–	**PK296□E-SG■**
SOL5B	**AS98□CE-T■** **AS98□CEP-T■** **AS98□CE-P■**	**RK596□CE-T■** **RK599□CE-P■** **RK596□CE-P■**	–	–

- Enter **A** (single shaft), **B** (double shaft) or **M** (electromagnetic brake) in the box (□) within the model name.
  Enter the gear ratio in the box (■) within the model name.
- Install **SOL2A** and **SOL2B** using the supplied screws.
  No screws are supplied for installing **SOL0A**, **SOL0B**, **SOL5A** and **SOL5B**. Appropriate screws must be purchased separately.

■Motor Installation Direction

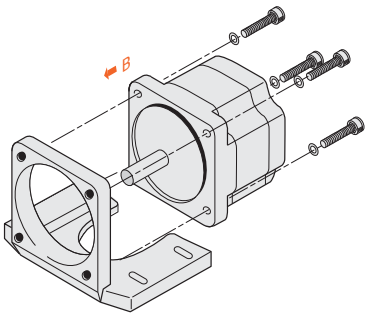
The motor cable comes out at right angles to the motor. Orientate the motor so that the cable faces either upwards or sideways.



Cable Facing Upward　　Cable Facing Sideways

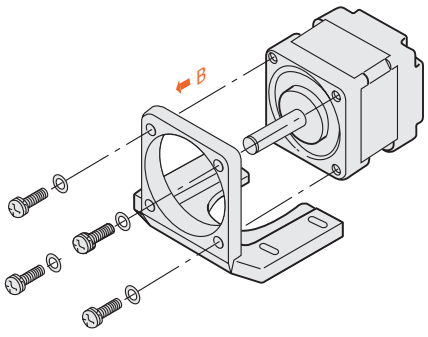
■Mounting the Motor

1 PAL2P-5, PAL2P-2, PAL4P-5, PAL4P-2



① Use the screws to secure the motor to the mounting bracket.
② Attach the motor from the direction shown by the arrow (B).

2 PAL0P, SOL0A, SOL0B, SOL2A, SOL2B, SOL5A, SOL5B

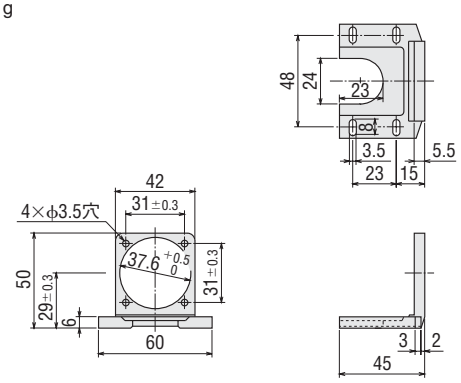


① Use the screws to secure the motor to the mounting bracket.
② Attach the motor from the direction shown by the arrow (B).

Dimensions (Unit = mm)

PAL0P

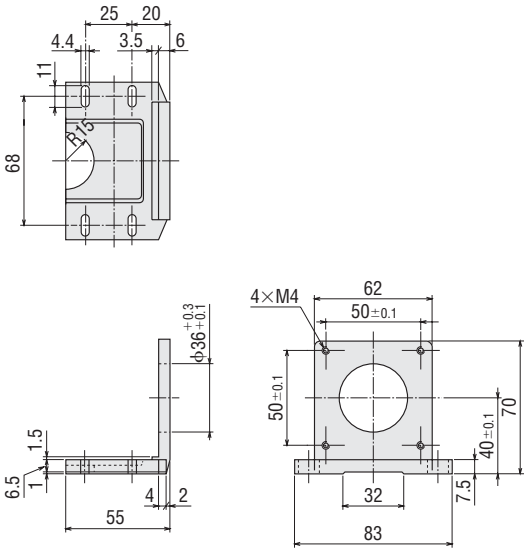
Mass: 35 g



● Screws (Included)
M3 Length 10 mm ··· 4 Pieces

PAL2P-5

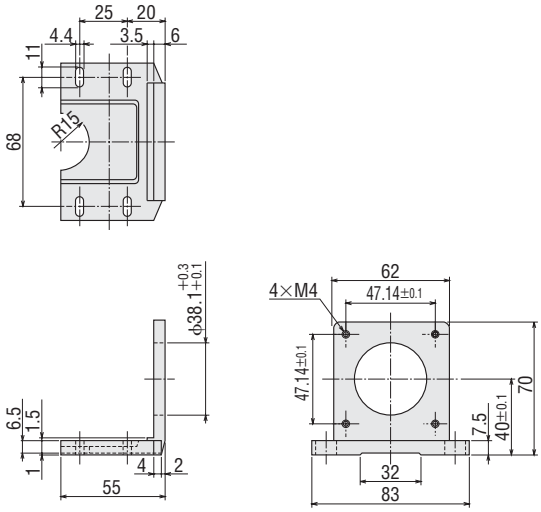
Mass: 110 g



● Screws (Included)
M4 Length 12 mm ··· 4 Pieces

PAL2P-2

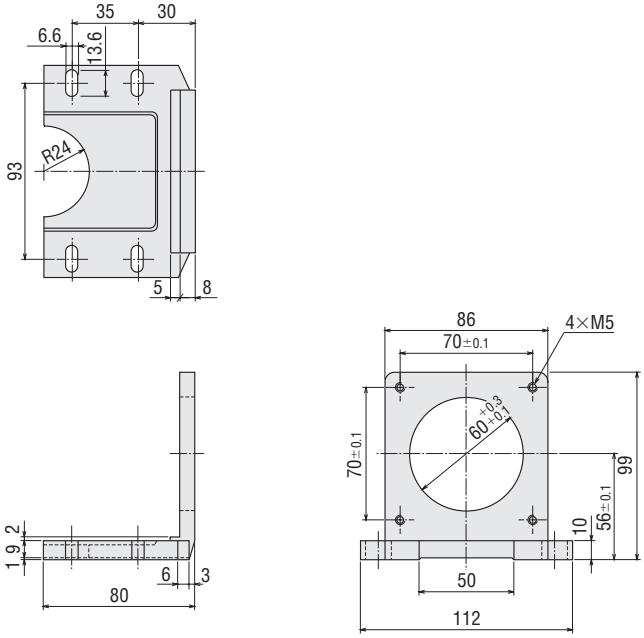
Mass: 110 g



● Screws (Included)
M4 Length 12 mm ··· 4 Pieces

PAL4P-5

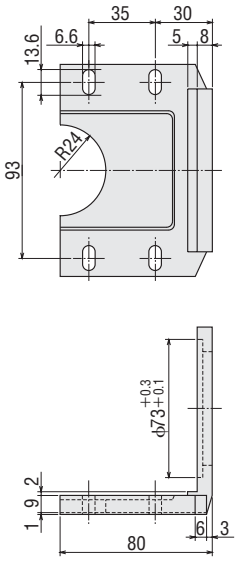
Mass: 250 g

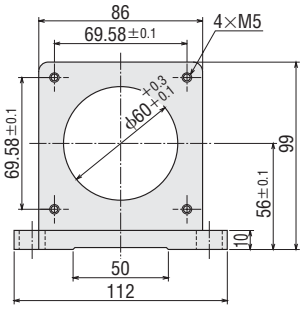


● Screws (Included)
M5 Length 16 mm ··· 4 Pieces

PAL4P-2

Mass: 250 g





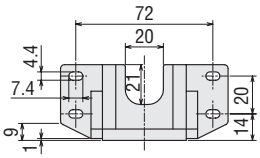
● Screws (Included)
M5 Length 16 mm ··· 4 Pieces

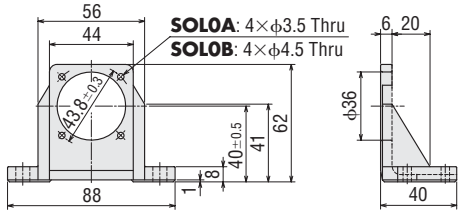
SOL0A

Mass: 85 g

SOL0B

Mass: 85 g



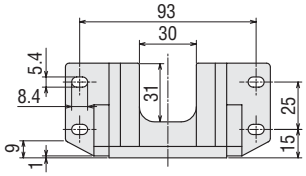


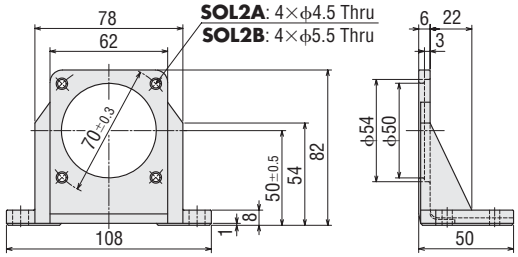
SOL2A

Mass: 120 g

SOL2B

Mass: 120 g





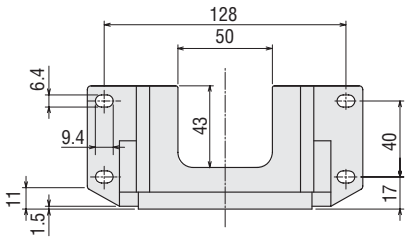
● Screws (Included)
M4 Length 12 mm ··· 4 Pieces (**SOL2A**)
M5 Length 15 mm ··· 4 Pieces (**SOL2B**)

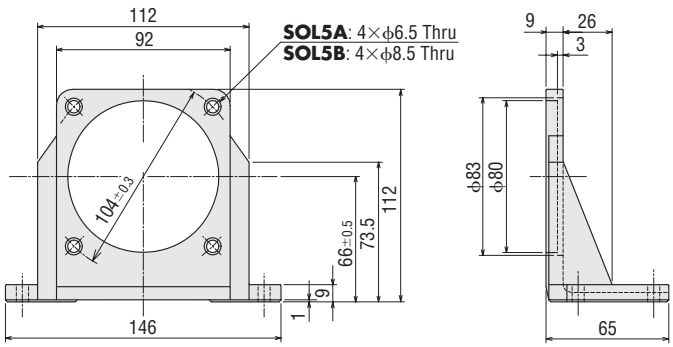
SOL5A

Mass: 270 g

SOL5B

Mass: 270 g



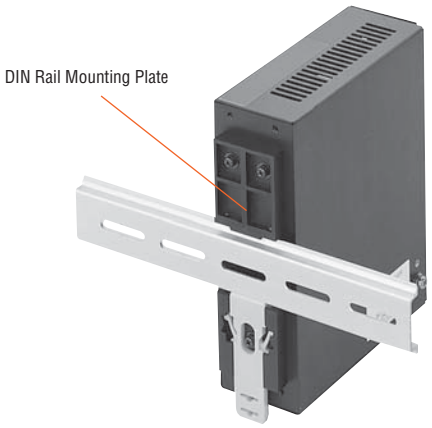


DIN Rail Mounting Plate RoHS

This installation plate is convenient for installing the driver of αSTEP **AS** Series on DIN rails with ease.

Product Line

Model	Applicable Product
PADP01	**AS** Series driver



Dimensions (Unit = mm)

PADP01

Mass: 20 g

● Screws (Included)
M3 Length 8 mm ··· 3 Pieces