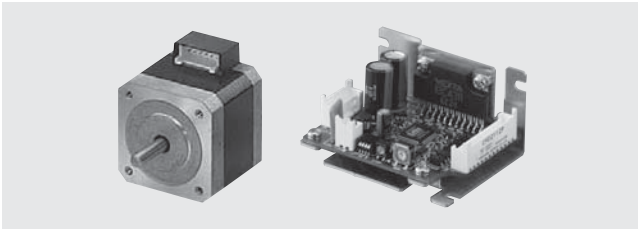
RoHS RoHS-Compliant

2-Phase Stepping Motor and Driver Package

CMK Series

●Additional Information●
Technical reference ➜ Page F-1

The **CMK** Series is a motor and driver package consisting of a 2-phase stepping motor and 24 VDC input micro step driver, allowing for a reduction in the size of your equipment and in vibration.



Features

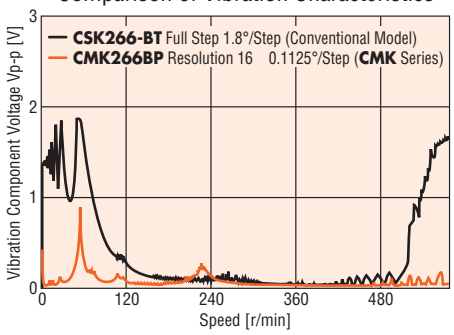
●Achieving Low Vibration and Noise in the Microstep Drive

The newly designed compact DC board-level driver achieves microstep drive in a compact, lightweight body. The 2-phase stepping motor's basic step angle (1.8˚/step) is divided by a maximum of 16 resolutions (0.1125˚/step) without the use of a reduction mechanism or other mechanical elements, which contributes to the reduction in noise and vibration of your equipment.

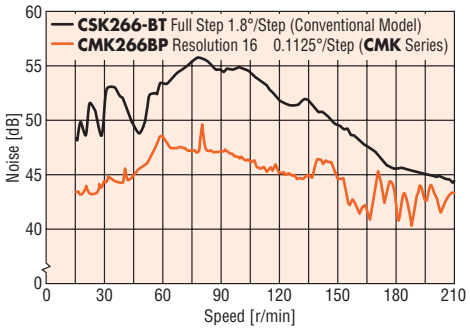
Microstep/Step	Resolution	Step Angle
1	200	1.8˚
2	400	0.9˚
4	800	0.45˚
8	1600	0.225˚
16	3200	0.1125˚

(At basic step angle 1.8˚/step)

Comparison of Vibration Characteristics



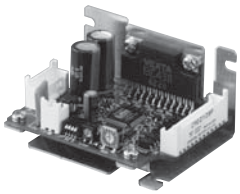
Comparison of Noise Characteristics



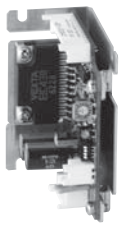
●Full Range of Driver Functions

- Five preset step angles
- Operating current can easily be set with a digital switch
- 1-pulse/2-pulse input mode switching
- Power LED
- Connector with lock (by MOLEX)

◇Easy-to-Install Heat Sink Shape



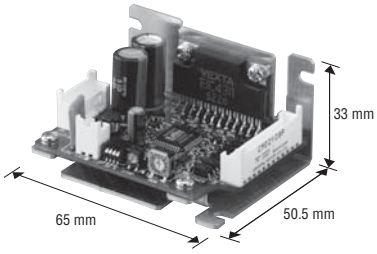
Horizontal Installation



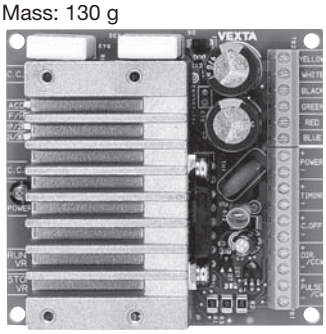
Vertical Installation

●One of the Smallest Drivers in the Industry Adopting a Microstep Driver

The driver of the **CMK** Series is one of the smallest, lightest drivers in the industry adopting a microstep driver. The driver is 62% lighter and has 41% less install area (based on horizontal installation) compared to our conventional model. This product contributes to downsizing of your equipment.



Mass: 130 g



Conventional Model (CSD2120-T)

Mass: 50 g

New Product (CMD21□□P)

Comparison with a conventional driver

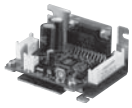
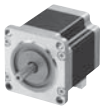
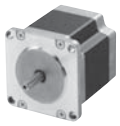
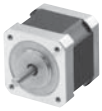
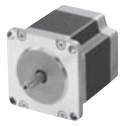
◇Mass: **62**% less

◇Install area: **41** % less (based on horizontal installation)

◇Volume: **41** % less (the conventional driver includes a 5 mm spacer for installation.)

Wide Variety

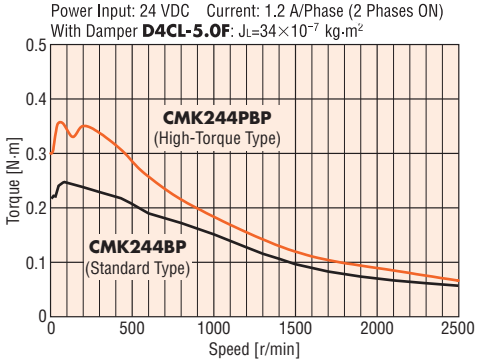
The **CMK** Series motor and driver package comes in five frame sizes of 28 to 60 mm as well as four motor types.

Type	Features	□28 mm	□35 mm	□42 mm	□50 mm	□56.4/60 mm	Driver
High-Torque Type	The high-torque motor realized higher torque of approx. 1.5 times compared with the conventional standard type motor.						
Standard Type	The basic model offering a good balance of torque and low vibration/noise characteristics.						
High-Resolution Type	High-torque motor offering higher positioning accuracy with the basic step angle set to 0.9°/step, which is just half the basic step angle of the standard type motor.						
SH Geared Type	These geared types are effective for reduction, increasing torque, higher resolution and suppressing vibration. Eight gear ratios are available.						

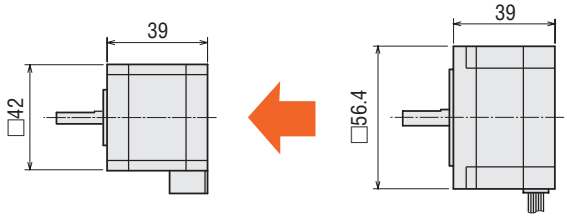
High-Torque Type

The high-torque type adopts new technology and design. This motor produces higher torque of approximately 1.5 times the level achieved by a conventional standard type motor.

Comparison of Speed–Torque Characteristics



Providing torque equivalent to a motor of the next larger frame size, the high-torque type allows for a reduction in the size of your equipment.

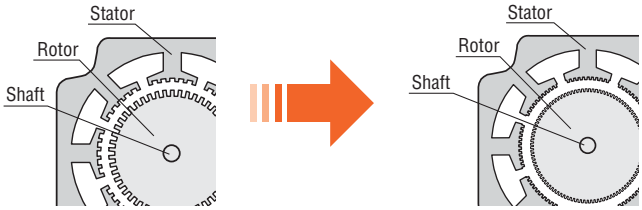


High-Torque Type	Type	Standard Type
CMK244PAP	Model	**CMK264AP**
0.39 N·m	Maximum Holding Torque	0.36 N·m

The motor also adopts a connector coupling system for easy installation.

High-Resolution Type

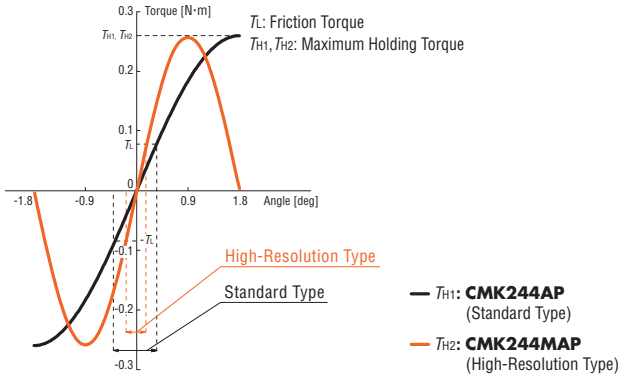
The basic step angle is 0.9°, which is half that of the standard type. 400 steps per rotation is possible. This motor achieves high resolution, low vibration and improved stopping accuracy.



Standard Type (50 Teeth) High-Resolution Type (100 Teeth)

The small basic step angle allows the torque to pick up quickly while minimizing the negative effect of friction load.

Comparison of Angle–Torque Characteristics



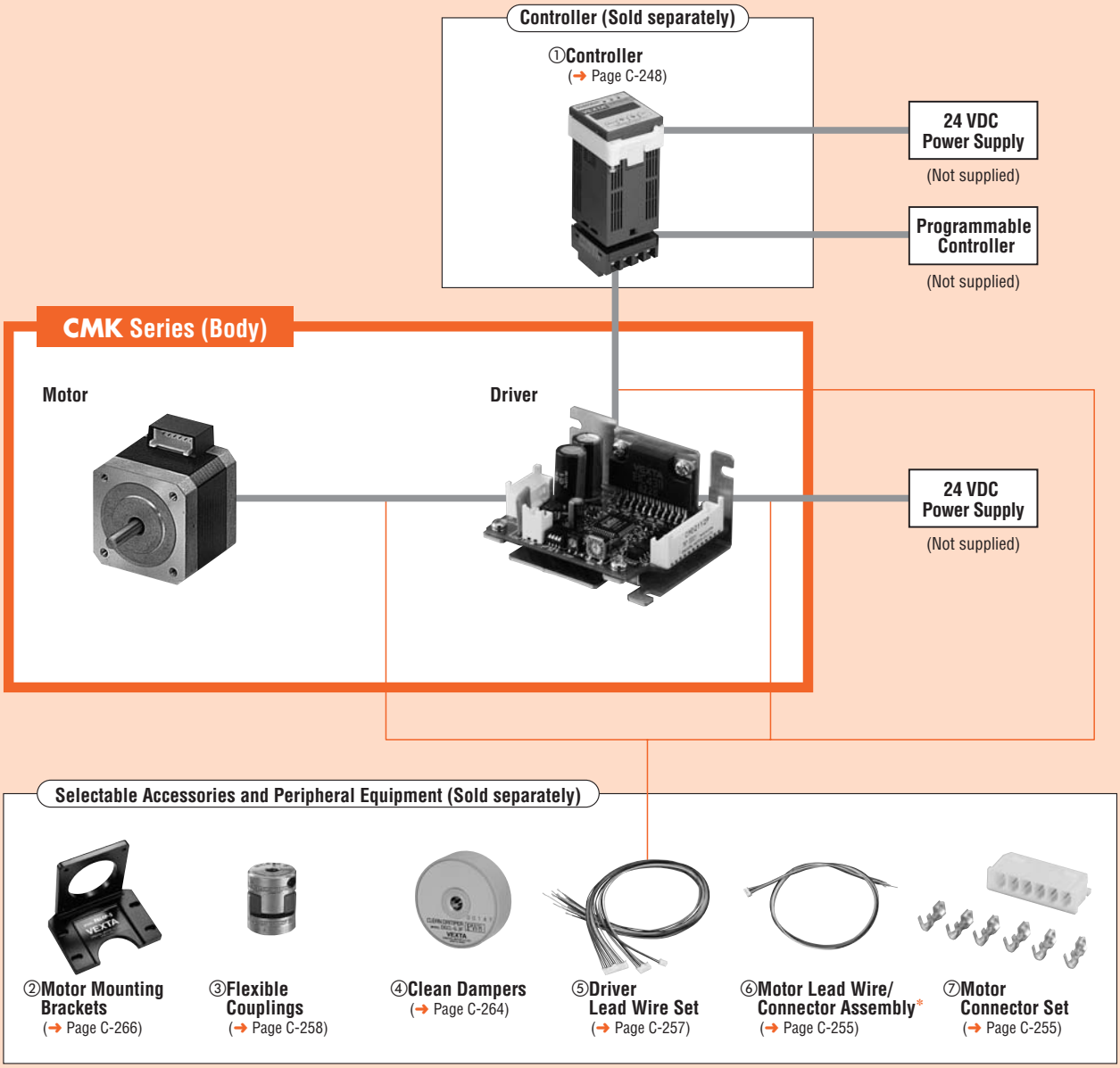
RoHS-Compliant

The **CMK** 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

System Configuration

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



*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)				
CMK Series	+	Controller	Motor Mounting Bracket	Flexible Coupling	Clean Damper	Driver Lead Wire Set (0.6 m)
CMK244PBP		SG8030JY-U	PALOP	MCS140506	D4CL-5.0F	LCS01CMK2

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

Product Number Code

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

CMK 2 4 6 P A P

① ② ③ ④ ⑤ ⑥ ⑦

①	Series	**CMK**: **CMK** Series
②	**2**: 2-Phase	
③	Motor Frame Size	**2**: 28 mm **3**: 35 mm **4**: 42 mm **5**: 50 mm **6**: 56.4 mm
④	Motor Case Length	
⑤	Motor Type	**P**: High-Torque Type Blank: Standard Type **M**: High-Resolution Type
⑥	Shaft Type	**A**: Single Shaft **B**: Double Shaft
⑦	Signal I/O Mode	**P**: Photocoupler

SH Geared Type

CMK 2 6 4 A P - SG 10

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Series	**CMK**: **CMK** Series
②	**2**: 2-Phase	
③	Motor Frame Size	**2**: 28 mm **4**: 42 mm **6**: 60 mm
④	Motor Case Length	
⑤	Shaft Type	**A**: Single Shaft **B**: Double Shaft
⑥	Signal I/O Mode	**P**: Photocoupler
⑦	Gearhead Type	**SG**: **SH** Geared Type
⑧	Gear Ratio	

Product Line

High-Torque Type

Model (Single Shaft)	Model (Double Shaft)
CMK223PAP	**CMK223PBP**
CMK224PAP	**CMK224PBP**
CMK225PAP	**CMK225PBP**
CMK233PAP	**CMK233PBP**
CMK235PAP	**CMK235PBP**
CMK244PAP	**CMK244PBP**
CMK246PAP	**CMK246PBP**

The following items are included in each product.
Motor, Driver, Driver Connector, Motor Lead Wire/Connector Assembly, Operating Manual

Standard Type

Model (Single Shaft)	Model (Double Shaft)
CMK243AP	**CMK243BP**
CMK244AP	**CMK244BP**
CMK245AP	**CMK245BP**
CMK256AP	**CMK256BP**
CMK258AP	**CMK258BP**
CMK264AP	**CMK264BP**
CMK266AP	**CMK266BP**
CMK268AP	**CMK268BP**

The following items are included in each product.
Motor, Driver, Driver Connector, Operating Manual

High-Resolution Type

Model (Single Shaft)	Model (Double Shaft)
CMK243MAP	**CMK243MBP**
CMK244MAP	**CMK244MBP**
CMK245MAP	**CMK245MBP**
CMK264MAP	**CMK264MBP**
CMK266MAP	**CMK266MBP**
CMK268MAP	**CMK268MBP**

The following items are included in each product.
Motor, Driver, Driver Connector, Motor Lead Wire/Connector Assembly, Operating Manual

SH Geared Type

Model (Single Shaft)	Model (Double Shaft)
CMK223AP-SG7.2	**CMK223BP-SG7.2**
CMK223AP-SG9	**CMK223BP-SG9**
CMK223AP-SG10	**CMK223BP-SG10**
CMK223AP-SG18	**CMK223BP-SG18**
CMK223AP-SG36	**CMK223BP-SG36**
CMK243AP-SG3.6	**CMK243BP-SG3.6**
CMK243AP-SG7.2	**CMK243BP-SG7.2**
CMK243AP-SG9	**CMK243BP-SG9**
CMK243AP-SG10	**CMK243BP-SG10**
CMK243AP-SG18	**CMK243BP-SG18**
CMK243AP-SG36	**CMK243BP-SG36**
CMK243AP-SG50	**CMK243BP-SG50**
CMK243AP-SG100	**CMK243BP-SG100**
CMK264AP-SG3.6	**CMK264BP-SG3.6**
CMK264AP-SG7.2	**CMK264BP-SG7.2**
CMK264AP-SG9	**CMK264BP-SG9**
CMK264AP-SG10	**CMK264BP-SG10**
CMK264AP-SG18	**CMK264BP-SG18**
CMK264AP-SG36	**CMK264BP-SG36**
CMK264AP-SG50	**CMK264BP-SG50**
CMK264AP-SG100	**CMK264BP-SG100**

The following items are included in each product.
Motor, Driver, Driver Connector, Motor Lead Wire/Connector Assembly*, Mounting Screws for Motor, Operating Manual
*Only for connector-coupled motor

High-Torque Type Motor Frame Size 28 mm

Specifications RoHS

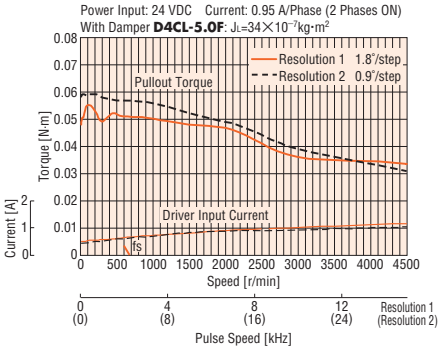
Model			CMK223PAP* / CMK223PBP*	CMK224PAP* / CMK224PBP*	CMK225PAP* / CMK225PBP*
Maximum Holding Torque		N·m	0.05	0.075	0.09
Rotor Inertia		J: kg·m²	9×10^{-7}	12×10^{-7}	18×10^{-7}
Rated Current		A/Phase	0.95		
Basic Step Angle			1.8°		
Power Source			24 VDC±10% 1.5 A		
Excitation Mode			Microstep		
Mass	Motor	kg	0.11	0.14	0.2
	Driver	kg	0.05		
Dimension No.	Motor		1		
	Driver		10		

How to read specifications table ➜ Page C-10

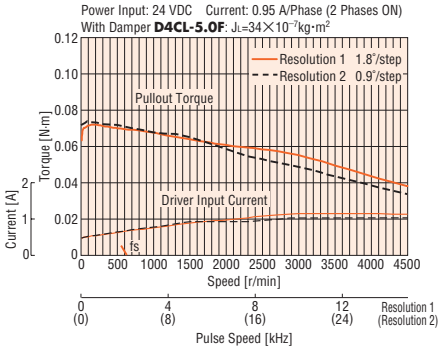
*Motor lead wire/connector assembly of 0.6 m is included with the motor and driver package of connector coupled type.

Speed – Torque Characteristics **How to read speed – torque characteristics** ➜ Page C-10

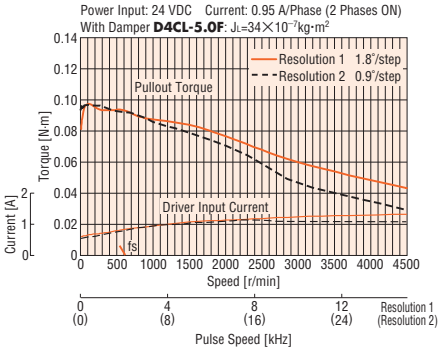
CMK223PAP/CMK223PBP



CMK224PAP/CMK224PBP



CMK225PAP/CMK225PBP



- The pulse input circuit responds to approximately 100 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.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 40%.

High-Torque Type Motor Frame Size 35 mm, 42 mm

Specifications RoHS

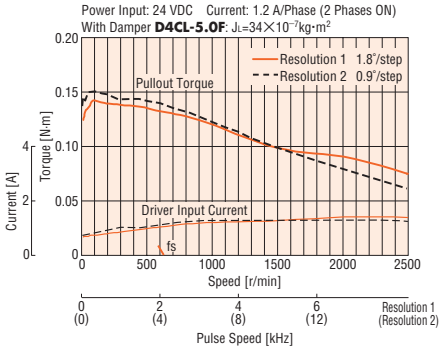
Model			CMK233PAP* / CMK233PBP*	CMK235PAP* / CMK235PBP*	CMK244PAP* / CMK244PBP*	CMK246PAP* / CMK246PBP*
Maximum Holding Torque		N·m	0.16	0.3	0.39	0.75
Rotor Inertia		J: kg·m²	24×10⁻⁷	50×10⁻⁷	57×10⁻⁷	114×10⁻⁷
Rated Current		A/Phase	1.2			
Basic Step Angle			1.8°			
Power Source			24 VDC±10% 1.7 A			
Excitation Mode			Microstep			
Mass	Motor	kg	0.18	0.285	0.3	0.5
	Driver	kg	0.05			
Dimension No.	Motor		2		3	
	Driver		10			

How to read specifications table ➜ Page C-10

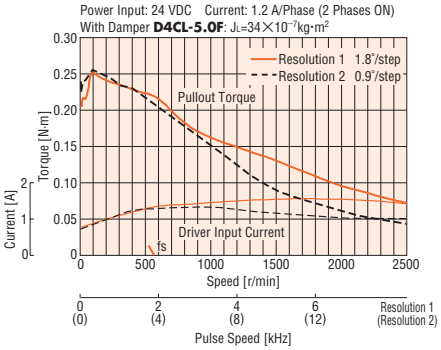
✻Motor lead wire/connector assembly of 0.6 m is included with the motor and driver package of connector coupled type.

Speed – Torque Characteristics **How to read speed – torque characteristics** ➜ Page C-10

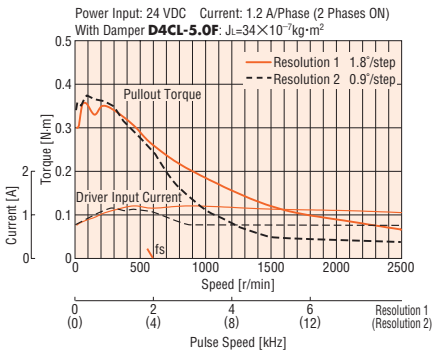
CMK233PAP/CMK233PBP



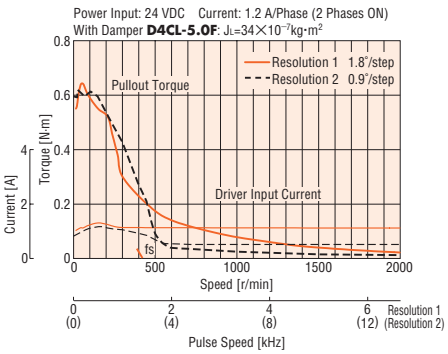
CMK235PAP/CMK235PBP



CMK244PAP/CMK244PBP



CMK246PAP/CMK246PBP



- The pulse input circuit responds to approximately 100 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.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 40%.

Standard Type Motor Frame Size 42 mm, 50 mm

Specifications RoHS

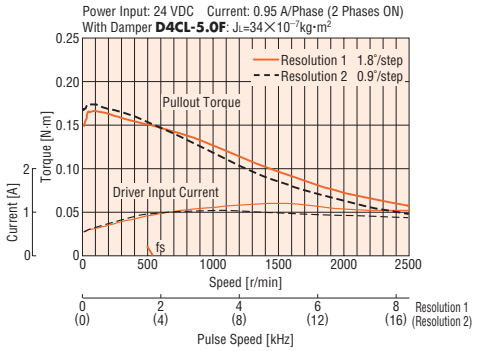
Model	Single Shaft	CMK243AP	CMK244AP	CMK245AP	CMK256AP	CMK258AP
	Double Shaft	CMK243BP	CMK244BP	CMK245BP	CMK256BP	CMK258BP
Maximum Holding Torque	N·m	0.16	0.26	0.32	0.56	1.2
Rotor Inertia	J: kg·m²	35×10^{-7}	54×10^{-7}	68×10^{-7}	230×10^{-7}	420×10^{-7}
Rated Current	A/Phase	0.95	1.2		2	
Basic Step Angle		1.8°				
Power Source		24 VDC±10% 1.5 A	24 VDC±10% 1.7 A		24 VDC±10% 2.9 A	
Excitation Mode		Microstep				
Mass	Motor kg	0.21	0.27	0.35	0.53	0.89
	Driver kg	0.05				
Dimension No.	Motor	4			5	
	Driver	10				

How to read specifications table ➜ Page C-10

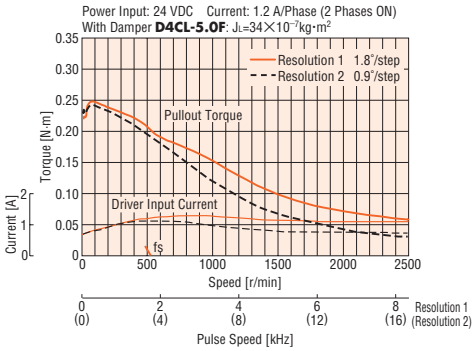
Speed – Torque Characteristics

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

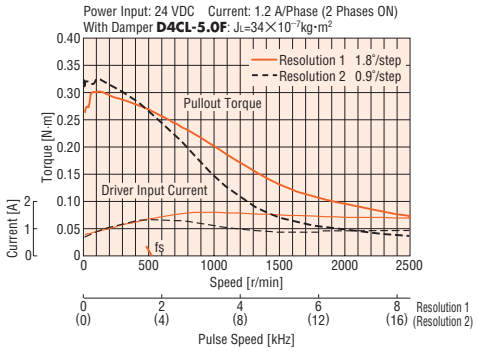
CMK243AP/CMK243BP



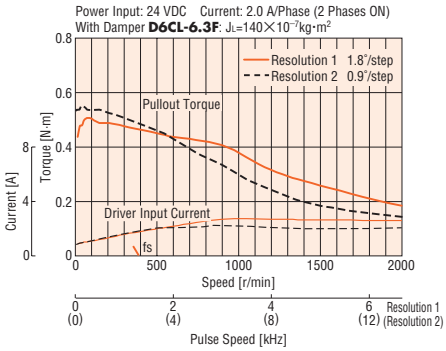
CMK244AP/CMK244BP



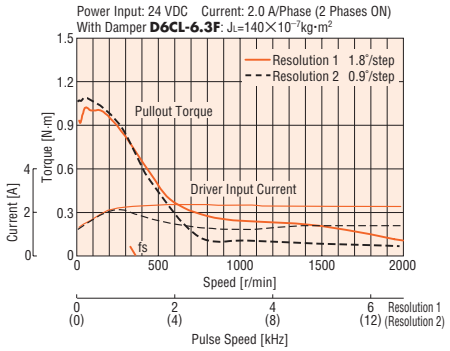
CMK245AP/CMK245BP



CMK256AP/CMK256BP



CMK258AP/CMK258BP



- The pulse input circuit responds to approximately 100 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.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 40%.

Standard Type Motor Frame Size 56.4 mm

Specifications RoHS

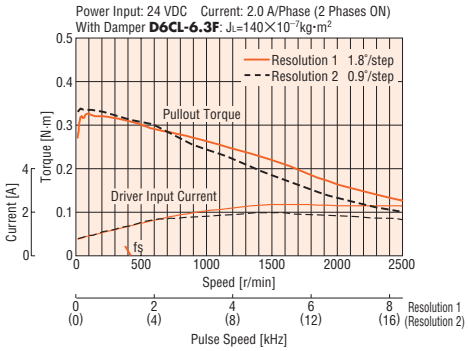
Model			CMK264AP	CMK266AP	CMK268AP
	Double Shaft		CMK264BP	CMK266BP	CMK268BP
Maximum Holding Torque		N·m	0.36	0.82	1.35
Rotor Inertia		J: kg·m²	120×10⁻⁷	300×10⁻⁷	480×10⁻⁷
Rated Current		A/Phase	2		
Basic Step Angle			1.8°		
Power Source			24 VDC±10% 2.9 A		
Excitation Mode			Microstep		
Mass	Motor	kg	0.45	0.7	1
	Driver	kg	0.05		
Dimension No.	Motor		6		
	Driver		10		

How to read specifications table ➜ Page C-10

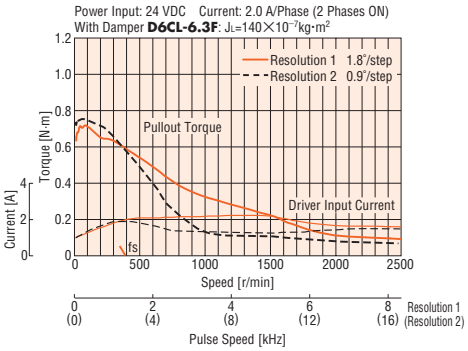
Speed – Torque Characteristics

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

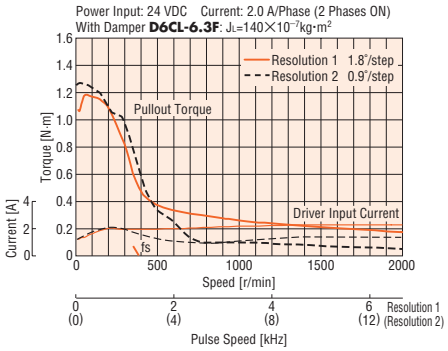
CMK264AP/CMK264BP



CMK266AP/CMK266BP



CMK268AP/CMK268BP



● The pulse input circuit responds to approximately 100 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.

● The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 40%.

High-Resolution Type Motor Frame Size 42 mm, 56.4 mm

Specifications RoHS

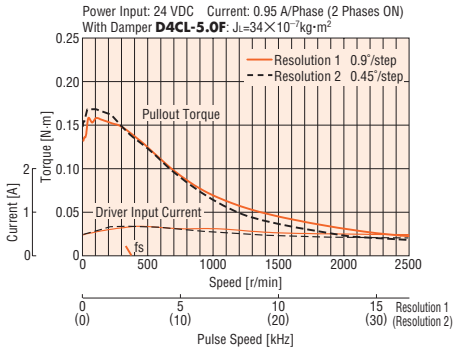
Model		CMK243MAP	CMK244MAP	CMK245MAP	CMK264MAP	CMK266MAP	CMK268MAP
	Double Shaft	CMK243MBP	CMK244MBP	CMK245MBP	CMK264MBP	CMK266MBP	CMK268MBP
Maximum Holding Torque	N·m	0.16	0.26	0.32	0.37	0.9	1.35
Rotor Inertia	J: kg·m²	35×10^{-7}	54×10^{-7}	68×10^{-7}	120×10^{-7}	300×10^{-7}	480×10^{-7}
Rated Current	A/Phase	0.95	1.2		2		
Basic Step Angle		0.9°					
Power Source		24 VDC±10% 1.5 A	24 VDC±10% 1.7 A		24 VDC±10% 2.9 A		
Excitation Mode		Microstep					
Mass	Motor kg	0.24	0.3	0.37	0.45	0.7	1
	Driver kg	0.05					
Dimension No.	Motor	4			6		
	Driver	10					

How to read specifications table ➜ Page C-10

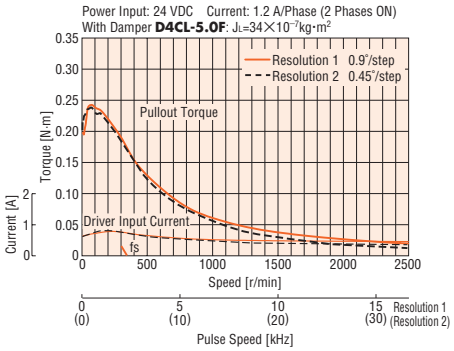
Speed – Torque Characteristics

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

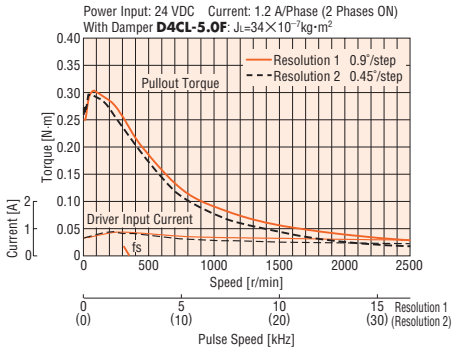
CMK243MAP/CMK243MBP



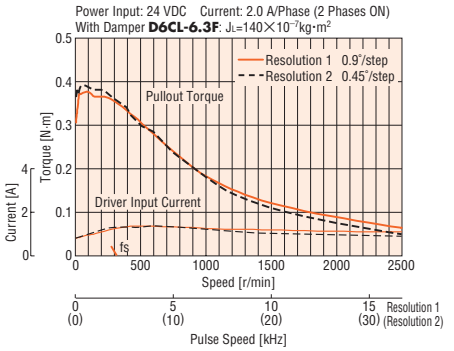
CMK244MAP/CMK244MBP



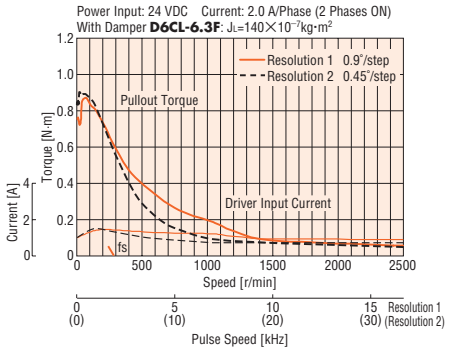
CMK245MAP/CMK245MBP



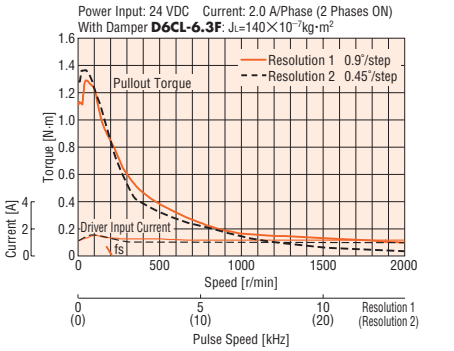
CMK264MAP/CMK264MBP



CMK266MAP/CMK266MBP



CMK268MAP/CMK268MBP



- The pulse input circuit responds to approximately 100 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.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 40%.

SH Geared Type Motor Frame Size 28 mm

Specifications RoHS

Model			CMK223AP-SG7.2*	CMK223AP-SG9*	CMK223AP-SG10*	CMK223AP-SG18*	CMK223AP-SG36*
	Double Shaft		CMK223BP-SG7.2*	CMK223BP-SG9*	CMK223BP-SG10*	CMK223BP-SG18*	CMK223BP-SG36*
Maximum Holding Torque		N·m	0.3			0.4	
Rotor Inertia		J: kg·m²	9×10^{-7}				
Rated Current		A/Phase	0.95				
Basic Step Angle			0.25°	0.2°	0.18°	0.1°	0.05°
Gear Ratio			1: 7.2	1: 9	1: 10	1: 18	1: 36
Permissible Torque		N·m	0.3			0.4	
Permissible Speed Range		r/min	0~250	0~200	0~180	0~100	0~50
Power Source			24 VDC±10% 1.5 A				
Excitation Mode			Microstep				
Mass	Motor	kg	0.16				
	Driver	kg	0.05				
Dimension No.	Motor		7				
	Driver		10				

How to read specifications table ➜ Page C-10

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

●Backlash value is approximately 1 to 2°.

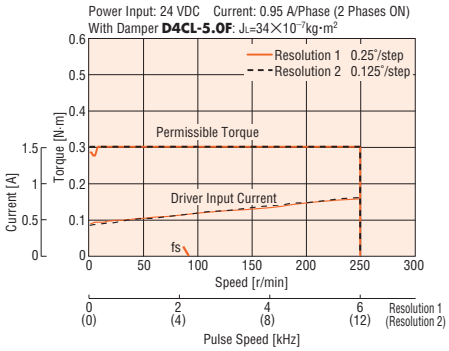
Note:

●Direction of rotation of the motor and that of the gear output shaft are the same for gear ratios 1:7.2 and 1:36. It is the opposite for 1:9, 1:10 and 1:18 gear ratios.

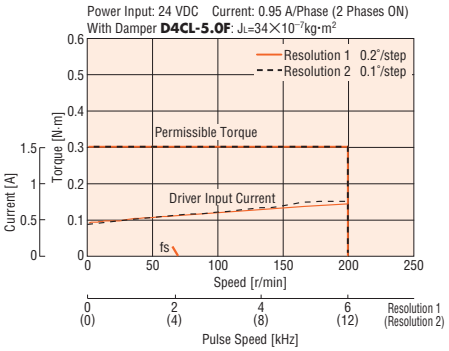
Speed – Torque Characteristics

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

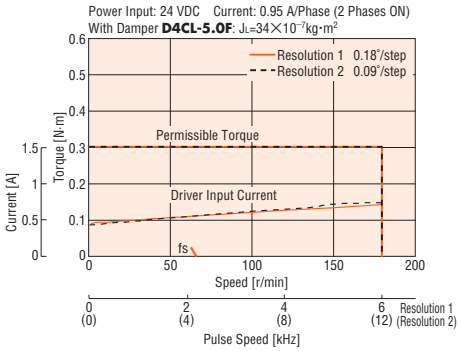
CMK223AP-SG7.2/CMK223BP-SG7.2



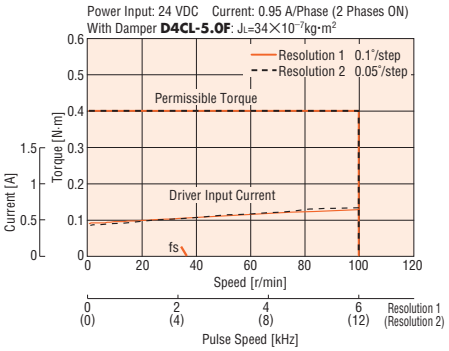
CMK223AP-SG9/CMK223BP-SG9



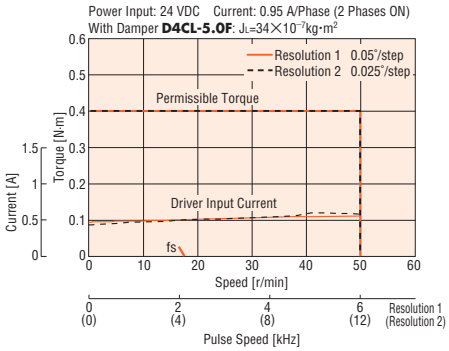
CMK223AP-SG10/CMK223BP-SG10



CMK223AP-SG18/CMK223BP-SG18



CMK223AP-SG36/CMK223BP-SG36



●The pulse input circuit responds to approximately 100 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.

●The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 40%.

SH Geared Type Motor Frame Size 42 mm

Specifications RoHS

Model	Single Shaft / Double Shaft	CMK243AP-SG3.6 / CMK243BP-SG3.6	CMK243AP-SG7.2 / CMK243BP-SG7.2	CMK243AP-SG9 / CMK243BP-SG9	CMK243AP-SG10 / CMK243BP-SG10
Maximum Holding Torque	N·m	0.2	0.4	0.5	0.56
Rotor Inertia	J: kg·m^2	35×10^{-7}			
Rated Current	A/Phase	0.95			
Basic Step Angle		0.5°	0.25°	0.2°	0.18°
Gear Ratio		1: 3.6	1: 7.2	1: 9	1: 10
Permissible Torque	N·m	0.2	0.4	0.5	0.56
Permissible Speed Range	r/min	0～500	0～250	0～200	0～180
Power Source		24 VDC±10% 1.5 A			
Excitation Mode		Microstep			
Mass	Motor kg	0.35			
	Driver kg	0.05			
Dimension No.	Motor	8			
	Driver	10			

Model	Single Shaft / Double Shaft	CMK243AP-SG18 / CMK243BP-SG18	CMK243AP-SG36 / CMK243BP-SG36	CMK243AP-SG50 / CMK243BP-SG50	CMK243AP-SG100 / CMK243BP-SG100
Maximum Holding Torque	N·m	0.8			
Rotor Inertia	J: kg·m^2	35×10^{-7}			
Rated Current	A/Phase	0.95			
Basic Step Angle		0.1°	0.05°	0.036°	0.018°
Gear Ratio		1: 18	1: 36	1: 50	1: 100
Permissible Torque	N·m	0.8			
Permissible Speed Range	r/min	0～100	0～50	0～36	0～18
Power Source		24 VDC±10% 1.5 A			
Excitation Mode		Microstep			
Mass	Motor kg	0.35			
	Driver kg	0.05			
Dimension No.	Motor	8			
	Driver	10			

How to read specifications table ➜ Page C-10

- Backlash value is approximately 1 to 2°.

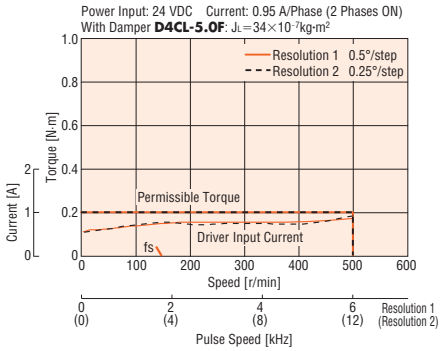
Note:

- Direction of rotation of the motor and that of the gear output shaft are the same for gear ratios 1: 3.6, 1: 7.2, 1: 9, 1: 10, 1: 50 and 1: 100. It is the opposite for 1:18 and 1:36 gear ratios.

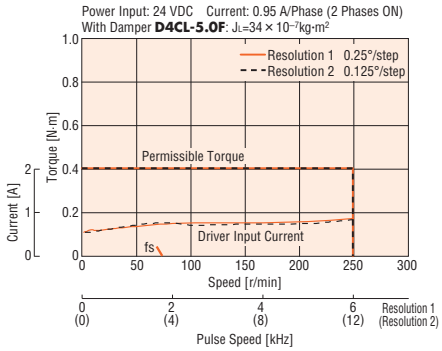
Speed – Torque Characteristics

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

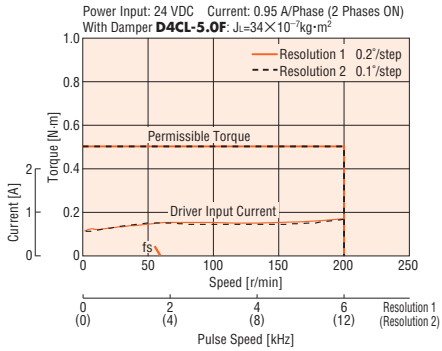
CMK243AP-SG3.6/CMK243BP-SG3.6



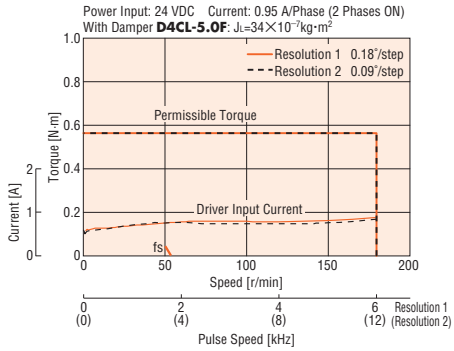
CMK243AP-SG7.2/CMK243BP-SG7.2



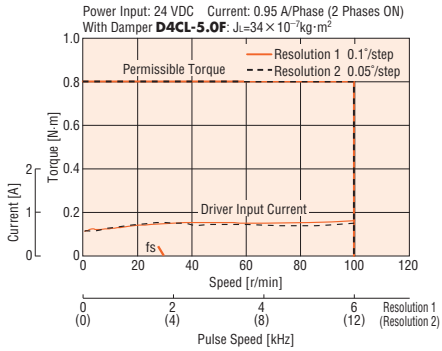
CMK243AP-SG9/CMK243BP-SG9



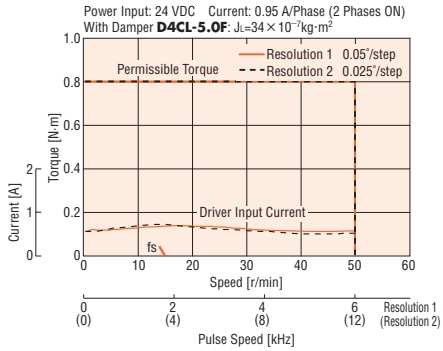
CMK243AP-SG10/CMK243BP-SG10



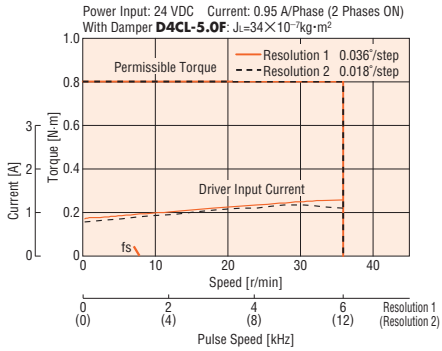
CMK243AP-SG18/CMK243BP-SG18



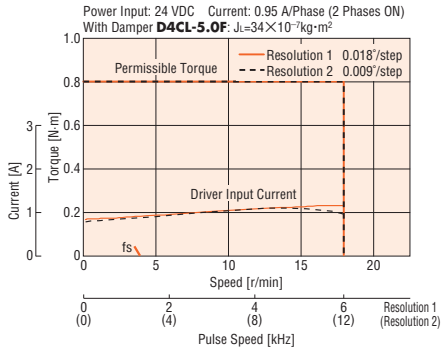
CMK243AP-SG36/CMK243BP-SG36



CMK243AP-SG50/CMK243BP-SG50



CMK243AP-SG100/CMK243BP-SG100



- The pulse input circuit responds to approximately 100 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.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 40%.

SH Geared Type Motor Frame Size 60 mm

Specifications RoHS

Model	Single Shaft / Double Shaft		CMK264AP-SG3.6 / CMK264BP-SG3.6	CMK264AP-SG7.2 / CMK264BP-SG7.2	CMK264AP-SG9 / CMK264BP-SG9	CMK264AP-SG10 / CMK264BP-SG10
Maximum Holding Torque		N·m	1	2	2.5	2.7
Rotor Inertia		J: kg·m²	120×10^{-7}			
Rated Current		A/Phase	2			
Basic Step Angle			0.5°	0.25°	0.2°	0.18°
Gear Ratio			1: 3.6	1: 7.2	1: 9	1: 10
Permissible Torque		N·m	1	2	2.5	2.7
Permissible Speed Range		r/min	0～500	0～250	0～200	0～180
Power Source			24 VDC±10% 2.9 A			
Excitation Mode			Microstep			
Mass	Motor	kg	0.75			
	Driver	kg	0.05			
Dimension No.	Motor		9			
	Driver		10			

Model	Single Shaft / Double Shaft		CMK264AP-SG18 / CMK264BP-SG18	CMK264AP-SG36 / CMK264BP-SG36	CMK264AP-SG50 / CMK264BP-SG50	CMK264AP-SG100 / CMK264BP-SG100
Maximum Holding Torque		N·m	3	4		
Rotor Inertia		J: kg·m²	120×10^{-7}			
Rated Current		A/Phase	2			
Basic Step Angle			0.1°	0.05°	0.036°	0.018°
Gear Ratio			1: 18	1: 36	1: 50	1: 100
Permissible Torque		N·m	3	4		
Permissible Speed Range		r/min	0～100	0～50	0～36	0～18
Power Source			24 VDC±10% 2.9 A			
Excitation Mode			Microstep			
Mass	Motor	kg	0.75			
	Driver	kg	0.05			
Dimension No.	Motor		9			
	Driver		10			

How to read specifications table ➜ Page C-10

- Backlash value is approximately 1 to 2°.

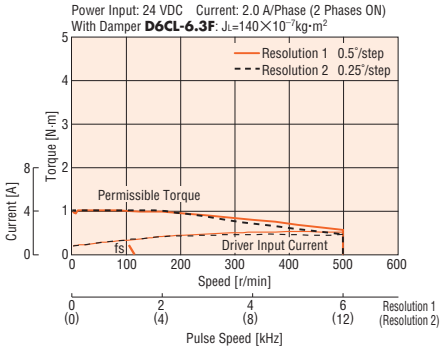
Note:

- Direction of rotation of the motor and that of the gear output shaft are the same for gear ratios 1:3.6, 1:7.2, 1:9, 1:10, 1:50 and 1:100. It is the opposite for 1:18 and 1:36 gear ratios.

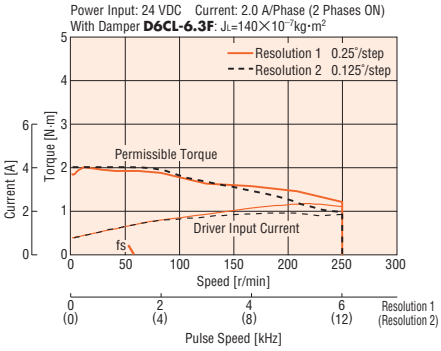
Speed – Torque Characteristics

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

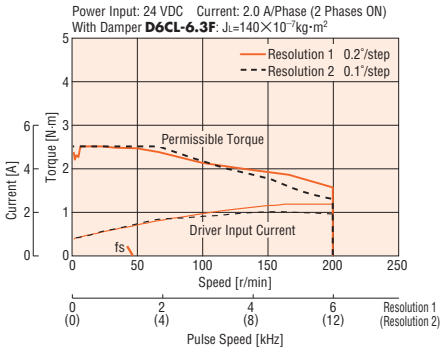
CMK264AP-SG3.6/CMK264BP-SG3.6



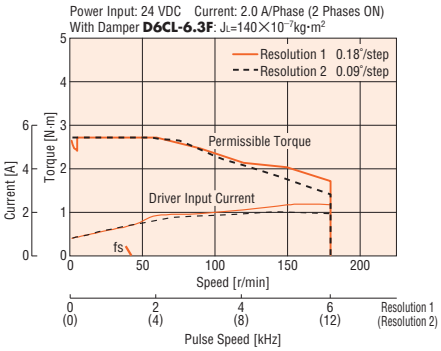
CMK264AP-SG7.2/CMK264BP-SG7.2



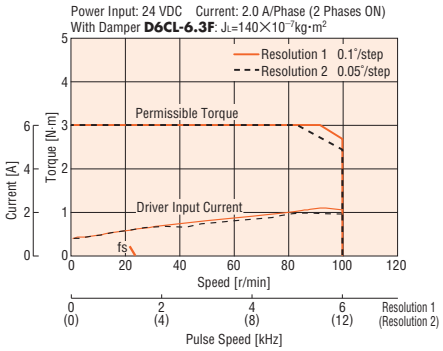
CMK264AP-SG9/CMK264BP-SG9



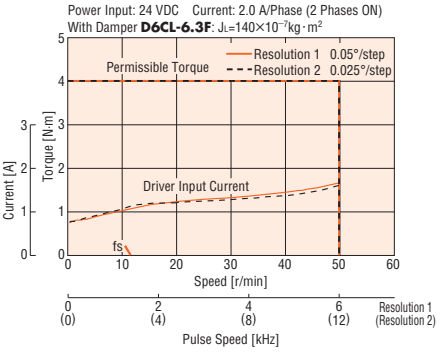
CMK264AP-SG10/CMK264BP-SG10



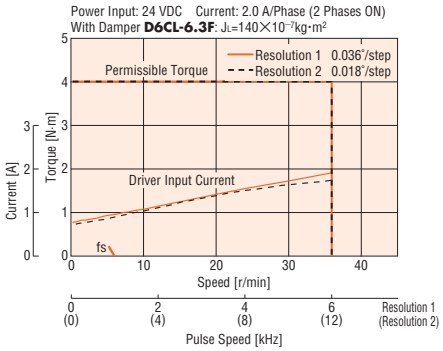
CMK264AP-SG18/CMK264BP-SG18



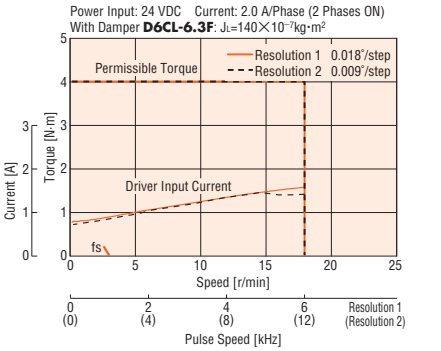
CMK264AP-SG36/CMK264BP-SG36



CMK264AP-SG50/CMK264BP-SG50



CMK264AP-SG100/CMK264BP-SG100



- The pulse input circuit responds to approximately 100 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.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 40%.

Driver Specifications

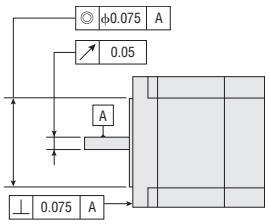
Input Signal	Input Mode	Photocoupler input Pulse (CW pulse) signal/Rotation direction (CCW pulse) signal: Input resistance 200 Ω, Input current 5～20 mA Photocoupler ON: +3～5.25 V Photocoupler OFF: 0～+1 V (Voltage between terminals) All windings off signal/Step angle select signal/Automatic current cutback release signal: Input resistance 3.3 kΩ, Input current 1 mA (5 VDC)/8 mA (24 VDC) Photocoupler ON: +4.5～26.4 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: 5 μs minimum; Pulse rise/fall: 2 μs maximum Pulse duty: 50% and below The motor moves one step when the pulse input is switched from ON to OFF. Maximum input pulse frequency: 100 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: 5 μs minimum; Pulse rise/fall: 2 μs maximum Pulse duty: 50% and below The motor moves one step when the pulse input is switched from ON to OFF. Maximum input pulse frequency: 100 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 to the motor is turned on.
	Step Angle Select Signal	When in the "photocoupler ON" state, the motor operates at the basic step angle regardless of the settings of the step angle setting switches. When in the "photocoupler OFF" state, the motor operates at the step angle set by the step angle setting switches.
	Automatic 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 Signal	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). • High-torque type, standard type Example) 1.8°/step (resolution 1): signal output every 4 pulses 0.45°/step (resolution 4): signal output every 16 pulses • High-resolution type Example) 0.9°/step (resolution 1): signal output every 4 pulses 0.225°/step (resolution 4): signal output every 16 pulses • **SH** geared type (gear ratio 1:18) Example) 0.1°/step (resolution 1): signal output every 4 pulses 0.025°/step (resolution 4): signal output every 16 pulses
Function		Automatic current cutback, Step angle select, Pulse input mode switch, All windings off, Excitation timing
Cooling Method		Natural ventilation

General Specifications

Specifications		Motor	Driver
Insulation Class		Class B (130°C)	–
Insulation Resistance		100 MΩ or more when 500 VDC megger is applied between the windings and the case under normal ambient temperature and humidity.	–
Dielectric Strength		Sufficient to withstand 1.0 kV at 50 Hz or 60 Hz applied between the windings and the case for 1 minute under normal ambient temperature and humidity. (0.5 kV for models with frame size 42 mm or smaller)	–
Operating Environment (In Operation)	Ambient Temperature	−10～+50°C (non-freezing)	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 windings are 80°C or less measured by the resistance change method (at rated voltage, at standstill, two phases energized)	–
Stop Position Accuracy*1		±3 arc minutes (±0.05°)	–
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-Torque Type	**CMK223P□P** **CMK224P□P** **CMK225P□P**	25	34	52	–	–	The permissible thrust load shall be no greater than the motor mass.
	CMK233P□P **CMK235P□P**	20	25	34	52	–	
	CMK244P□P **CMK246P□P**	20	25	34	52	–	
Standard Type	**CMK243□P** **CMK244□P** **CMK245□P**	20	25	34	52	–	
	CMK256□P **CMK258□P**	54	67	89	130	–	
	CMK264□P **CMK266□P** **CMK268□P**	54	67	89	130	–	
High-Resolution Type	**CMK243M□P** **CMK244M□P** **CMK245M□P**	20	25	34	52	–	
	CMK264M□P **CMK266M□P** **CMK268M□P**	54	67	89	130	–	
SH Geared Type	**CMK223□P-SG7.2** **CMK223□P-SG9** **CMK223□P-SG10** **CMK223□P-SG18** **CMK223□P-SG36**	15	17	20	23	–	10
	CMK243□P-SG3.6 **CMK243□P-SG7.2** **CMK243□P-SG9** **CMK243□P-SG10** **CMK243□P-SG18** **CMK243□P-SG36** **CMK243□P-SG50** **CMK243□P-SG100**	10	15	20	30	–	15
	CMK264□P-SG3.6 **CMK264□P-SG7.2** **CMK264□P-SG9** **CMK264□P-SG10**	30	40	50	60	70	30
	CMK264□P-SG18 **CMK264□P-SG36** **CMK264□P-SG50** **CMK264□P-SG100**	80	100	120	140	160	

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

Dimensions (Unit = mm)

Motor

◇High-Torque Type

1 □28 mm

Model	Motor Model	L1	L2	Mass (kg)
CMK223PAP	PK223PA	32	—	0.11
CMK223PBP	PK223PB		42	
CMK224PAP	PK224PA	40	—	0.14
CMK224PBP	PK224PB		50	
CMK225PAP	PK225PA	51.5	—	0.2
CMK225PBP	PK225PB		61.5	

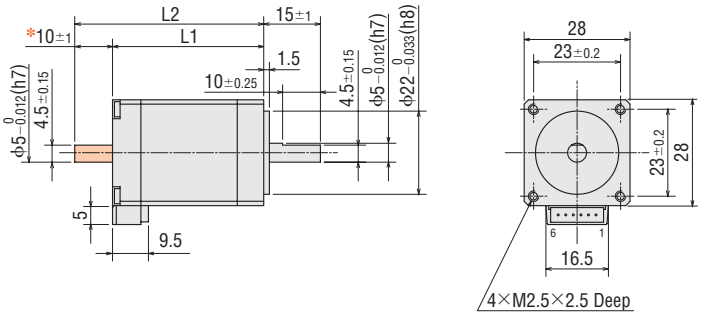
Motor lead wire/connector assembly (0.6 m) is included with the package. UL Style 3265, AWG24

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: 51065-0600 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)



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

2 □35 mm

Model	Motor Model	L1	L2	Mass (kg)
CMK233PAP	PK233PA	37	—	0.18
CMK233PBP	PK233PB		52	
CMK235PAP	PK235PA	52	—	0.285
CMK235PBP	PK235PB		67	

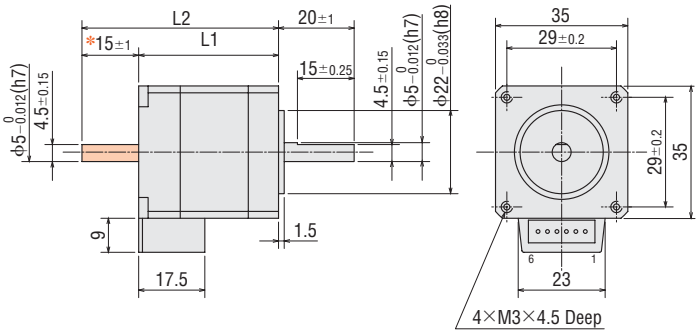
Motor lead wire/connector assembly (0.6 m) is included with the package. UL Style 3265, AWG24

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: 51103-0600 (MOLEX)
Contact: 50351-8100 (MOLEX)
Crimp tool: 57295-5000 (MOLEX)



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

3 □42 mm

Model	Motor Model	L1	L2	Mass (kg)
CMK244PAP	PK244PA	39	—	0.3
CMK244PBP	PK244PB		54	
CMK246PAP	PK246PA	59	—	0.5
CMK246PBP	PK246PB		74	

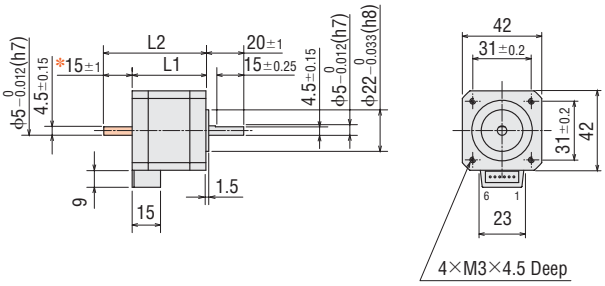
Motor lead wire/connector assembly (0.6 m) is included with the package. UL Style 3265, AWG24

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: 51103-0600 (MOLEX)
Contact: 50351-8100 (MOLEX)
Crimp tool: 57295-5000 (MOLEX)



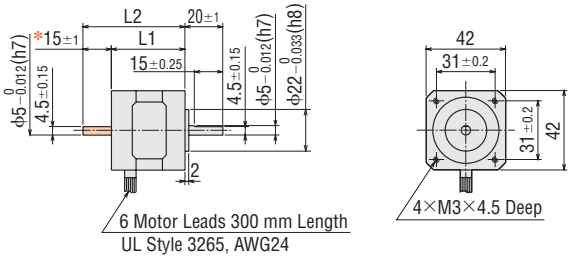
✻The length of machining on double shaft model is 15±0.25.

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

◇Standard Type, High-Resolution Type

4 □42 mm

Model	Motor Model	L1	L2	Mass (kg)
CMK243AP	PK243-01A	33	–	0.21
CMK243MAP	PK243MA			0.24
CMK243BP	PK243-01B		48	0.21
CMK243MBP	PK243MB			0.24
CMK244AP	PK244-01A	39	–	0.27
CMK244MAP	PK244MA			0.3
CMK244BP	PK244-01B		54	0.27
CMK244MBP	PK244MB			0.3
CMK245AP	PK245-01A	47	–	0.35
CMK245MAP	PK245MA			0.37
CMK245BP	PK245-01B		62	0.35
CMK245MBP	PK245MB			0.37

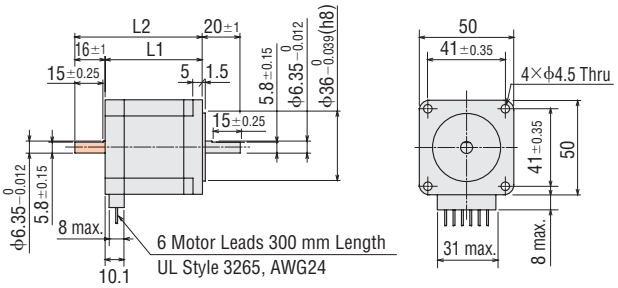


*The length of machining on double shaft model is 15±0.25.

◇Standard Type

5 □50 mm

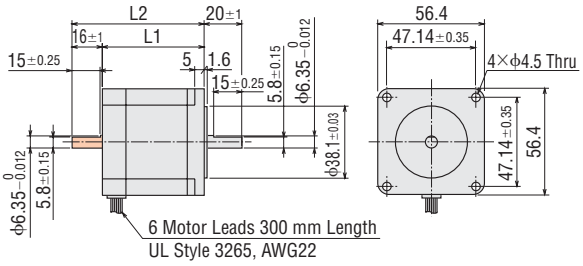
Model	Motor Model	L1	L2	Mass (kg)
CMK256AP	PK256-02A	51.5	–	0.53
CMK256BP	PK256-02B		67.5	
CMK258AP	PK258-02A	81	–	0.89
CMK258BP	PK258-02B		97	



◇Standard Type, High-Resolution Type

6 □56.4 mm

Model	Motor Model	L1	L2	Mass (kg)
CMK264AP	PK264-02A	39	–	0.45
CMK264MAP	PK264MA			
CMK264BP	PK264-02B		55	
CMK264MBP	PK264MB			
CMK266AP	PK266-02A	54	–	0.7
CMK266MAP	PK266MA			
CMK266BP	PK266-02B		70	
CMK266MBP	PK266MB			
CMK268AP	PK268-02A	76	–	1.0
CMK268MAP	PK268MA			
CMK268BP	PK268-02B		92	
CMK268MBP	PK268MB			



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

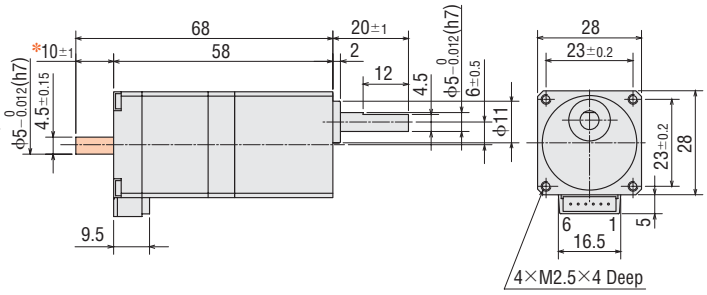
◇SH Geared Type

7 □28 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CMK223AP-SG□	PK223PA-SG□	**7.2**, **9**, **10**, **18**, **36**	0.16
CMK223BP-SG□	PK223PB-SG□		

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

Motor lead wire/connector assembly (0.6 m) is included with the package. 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
● Screws (Included)
M2.5 Length 8 mm ··· 4 Pieces
● Applicable Connector
Connector housing: 51065-0600 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)



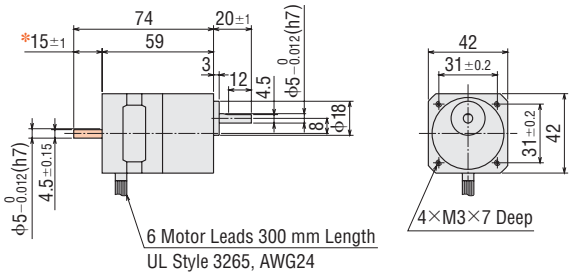
✻The length of machining on double shaft model is 10±0.25.

8 □42 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CMK243AP-SG□	PK243A1-SG□	**3.6**, **7.2**, **9**, **10**, **18**, **36**, **50**, **100**	0.35
CMK243BP-SG□	PK243B1-SG□		

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

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



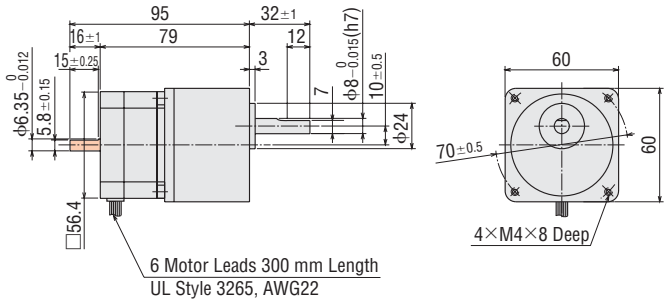
✻The length of machining on double shaft model is 15±0.25.

9 □60 mm

Model	Motor Model	Gear Ratio	Mass (kg)
CMK264AP-SG□	PK264A2-SG□	**3.6**, **7.2**, **9**, **10**, **18**, **36**, **50**, **100**	0.75
CMK264BP-SG□	PK264B2-SG□		

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

● Screws (Included)
M4 Length 15 mm ··· 4 Pieces

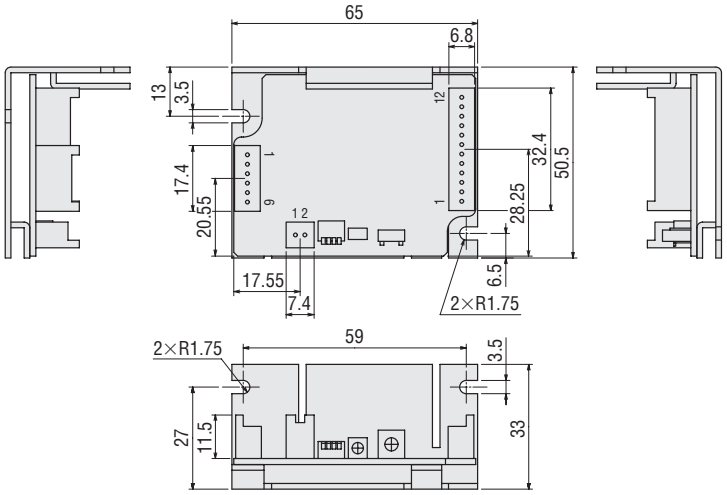


● These dimensions are for double shaft models. For single shaft models, ignore the orange (□) areas.

●Driver

⑩Driver Model: CMD2109P, CMD2112P, CMD2120P

Mass: 0.05 kg



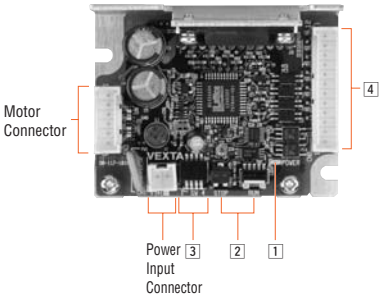
- Connector Housing (Included)
  51103-0200 (MOLEX)
  51103-1200 (MOLEX)
  51103-0600 (MOLEX)
- Contact (Included)
  50351-8100 (MOLEX)

Note:

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

Indication	Switch Name	Function
RUN	Motor run current switch	For adjusting the motor running current
STOP	Motor stop current potentiometer	For adjusting the current at motor standstill

3 Function Select Switch

Indication	Switch Name	Function
1	Pulse input mode switch	Switches between 1-pulse input and 2-pulse input.
2, 3, 4	Step angle setting switch	These switches can be set to the desired resolution from the five resolution levels.

Step Angle Setting Switch

SW-2	SW-3	SW-4	Microstep/Step	Resolution	Step Angle
OFF	OFF	OFF	1	200	1.8°
OFF	OFF	ON	2	400	0.9°
OFF	ON	OFF	4	800	0.45°
OFF	ON	ON	8	1600	0.225°
ON	OFF	OFF	16	3200	0.1125°

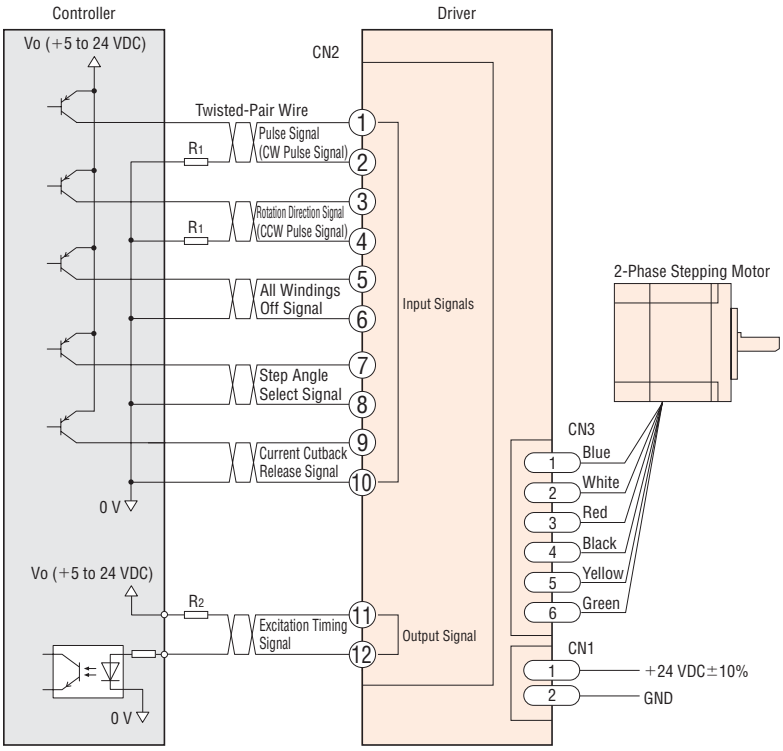
Notes:

- Use of any setting other than the combinations listed in the table will automatically set the microstep to "1" and the motor will operate at the basic step angle.
- 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 1.8°.
- With the high-resolution type, the basic step angle and resolution are 0.9°, 400 (microstep/step: 1).
- The step angle set with the step angle setting switches will become effective when the "Step Angle Select" (CS) signal input is OFF.
- Do not change the CS (step angle select) signal input or step angle setting switch while the motor is operating. It may cause the motor to misstep and stop. Change the step angle setting switches, when the "Step Angle Select" signal input is OFF and the "Excitation Timing" signal output is ON.

4 Input/Output Signal

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 OFF: CCW, Photocoupler ON: CW (The motor will rotate in the CCW direction when in 2-pulse input mode.)
		4		
		5	All windings off signal	Cuts the output current to the motor and allows the motor shafts to be rotated by external force.
		6		
		7	Step angle select signal	The motor will operate at the basic step angle regardless of the settings of the step angle setting switches.
		8		
		9	Automatic current cutback release signal	This signal is used to disable the automatic current cutback function.
		10		
	Output signal	11	Excitation timing signal	Outputs signals when the excitation sequence is at STEP "0."
		12		

Connection Diagrams



◇Input Signal Connection

● Pulse (CW) Signal/Rotation Direction (CCW) Signal

Signals can be connected directly when 5 VDC is supplied. When the voltage exceeds 5 VDC, connect the external resistor to keep input current at 20 mA or less.

When 5 VDC or more is applied without the external resistor, the internal components get damaged.

Example: If the voltage is 24 VDC, connect a resistor (R_1) of 1.5 to 2.2 kΩ and 0.5 W or more.

● All Windings Off Signal/Step Angle Select Signal/Automatic Current Cutback Release Signal

Signals can be connected directly when 5 to 24 VDC is supplied.

◇Output Signal Connection

Use the output signal at 24 VDC or less and 10 mA or less. If these specifications are exceeded, the internal components may get damaged. Check the specification of the connected equipment. If the current exceeds 10 mA, connect the external resistor R_2.

◇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 of AWG24 to 22 (0.2 to 0.3 mm²) and 2 m or less in length 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 wires of AWG22 (0.3 mm²) for power supply lines. When assembling the connectors, use the hand-operated crimp tool or driver lead wire set crimped with connector (sold separately). The crimp tool is not included 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 run the signal lines in the same duct as power lines or bundle them together.
● If noise generated by the motor cable or power supply cable causes a problem, try shielding the cables or insert ferrite cores.
● Incorrect connection of DC power input will lead to driver (circuit) damage. Make sure that the polarity is correct before turning power on.

Description of Input/Output Signals

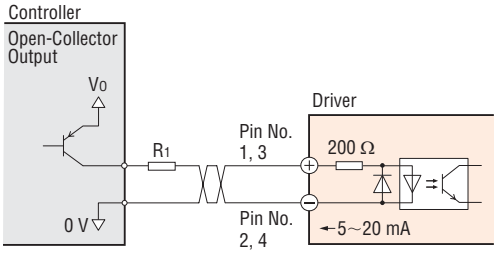
Indication of Input/Output Signal "ON""OFF"

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

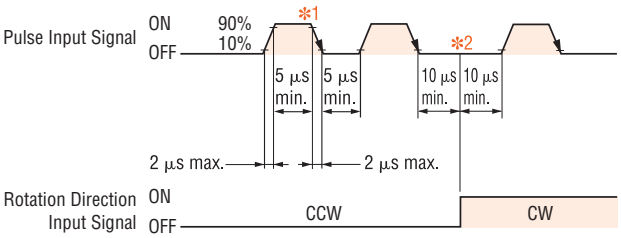
Pulse (CW) and Rotation Direction (CCW) Input Signal

◇Input Circuit and Sample Connection

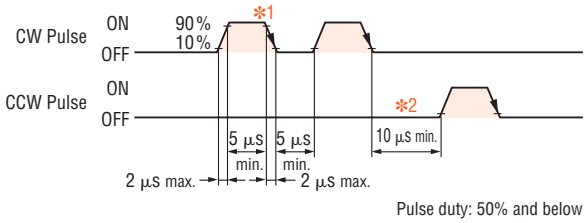


◇Pulse Waveform Characteristics

• 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.

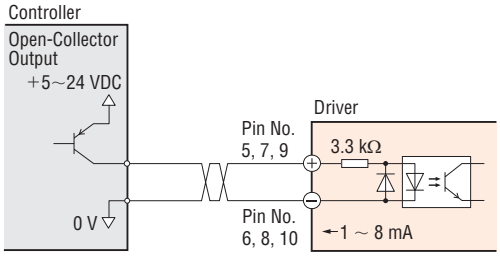
*2 The minimum interval time when changing rotation direction 10 µs is shown as a response time of circuit. This value varies greatly depending on the motor type and load inertia.

◇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 ("OFF") when changing rotation directions.
● In 2-pulse input mode, do not input a CW pulse and CCW pulse simultaneously.

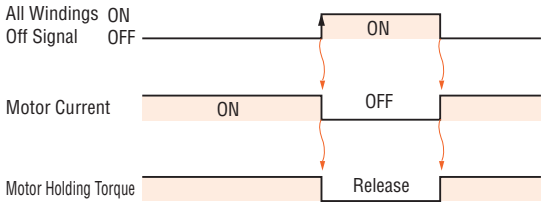
All Windings Off (AWO)/Step Angle Select (CS)/Automatic Current Cutback Release (ACDOFF) Input Signal

◇Input Circuit and Sample Connection



◇All Windings Off (AWO) Input Signal

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



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

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

◇Step Angle Select (CS) Input Signal

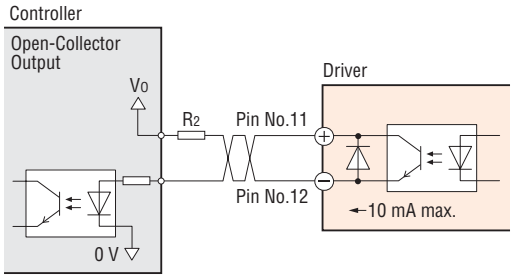
- When this signal input is "ON," the motor will operate at the basic step angle regardless of the settings of the step angle setting switches. When the signal input is "OFF," the motor will operate at the step angle set with the step angle setting switches.
- To change the step angle, do so when the "Excitation Timing" signal output is "ON" and the motor is at standstill.

◇Automatic Current Cutback Release (ACDOFF) 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" when the motor is operating.

Excitation Timing (TIM) Output Signal

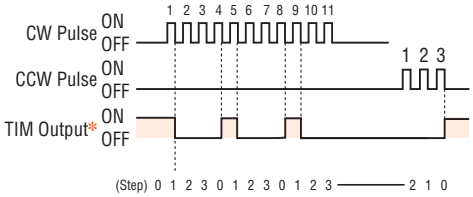
◇Output Circuit and Sample Connection



- The "Excitation Timing" signal is output to indicate when the motor excitation 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° (3.6° for high-resolution type) rotation of the motor output shaft.
  Microstep/step 1: Signal is output once every 4 pulses.
  Microstep/step 4: Signal is output once every 16 pulses.

Timing chart at 1.8°/step (microstep/step 1)

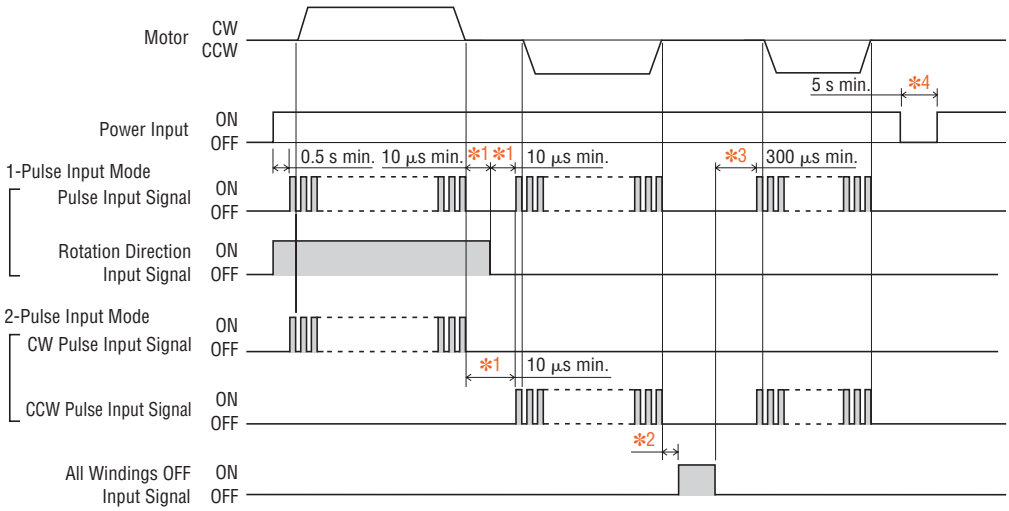
*When connected as shown in the sample connection, the signal will be "photocoupler ON" at step "0."



Notes:

- When power is turned on, the excitation sequence is reset to step "0" and the "Excitation Timing" signal will be output.
- When operating the motor using the "Excitation Timing" signal output, make sure the motor output shaft stops at an integral multiple of 7.2° (3.6° for high-resolution type).

●Timing Chart



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

∗1 The minimum switching time to change rotation 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 "photocoupler OFF." The motor may not start.
∗4 Wait at least five seconds before turning on the power again.

■List of Motor and Driver Combinations

Model names for motor and driver combinations are shown below.

Type	Model	Motor Model	Driver Model
High-Torque Type	**CMK223PAP**	PK223PA*	CMD2109P
	CMK223PBP	PK223PB*	
	CMK224PAP	PK224PA*	
	CMK224PBP	PK224PB*	
	CMK225PAP	PK225PA*	
	CMK225PBP	PK225PB*	
	CMK233PAP	PK233PA*	CMD2112P
	CMK233PBP	PK233PB*	
	CMK235PAP	PK235PA*	
	CMK235PBP	PK235PB*	
	CMK244PAP	PK244PA*	
	CMK244PBP	PK244PB*	
	CMK246PAP	PK246PA*	
	CMK246PBP	PK246PB*	
Standard Type	**CMK243AP**	PK243-01A	CMD2109P
	CMK243BP	PK243-01B	
	CMK244AP	PK244-01A	CMD2112P
	CMK244BP	PK244-01B	
	CMK245AP	PK245-01A	
	CMK245BP	PK245-01B	
	CMK256AP	PK256-02A	CMD2120P
	CMK256BP	PK256-02B	
	CMK258AP	PK258-02A	
	CMK258BP	PK258-02B	
	CMK264AP	PK264-02A	
	CMK264BP	PK264-02B	
	CMK266AP	PK266-02A	
	CMK266BP	PK266-02B	
	CMK268AP	PK268-02A	
	CMK268BP	PK268-02B	
High-Resolution Type	**CMK243MAP**	PK243MA	CMD2109P
	CMK243MBP	PK243MB	
	CMK244MAP	PK244MA	CMD2112P
	CMK244MBP	PK244MB	
	CMK245MAP	PK245MA	
	CMK245MBP	PK245MB	
	CMK264MAP	PK264MA	CMD2120P
	CMK264MBP	PK264MB	
	CMK266MAP	PK266MA	
	CMK266MBP	PK266MB	
	CMK268MAP	PK268MA	
	CMK268MBP	PK268MB	

Type	Model	Motor Model	Driver Model
SH Geared Type	**CMK223AP-SG7.2**	PK223PA-SG7.2*	CMD2109P
	CMK223BP-SG7.2	PK223PB-SG7.2*	
	CMK223AP-SG9	PK223PA-SG9*	
	CMK223BP-SG9	PK223PB-SG9*	
	CMK223AP-SG10	PK223PA-SG10*	
	CMK223BP-SG10	PK223PB-SG10*	
	CMK223AP-SG18	PK223PA-SG18*	
	CMK223BP-SG18	PK223PB-SG18*	
	CMK223AP-SG36	PK223PA-SG36*	
	CMK223BP-SG36	PK223PB-SG36*	
	CMK243AP-SG3.6	PK243A1-SG3.6	
	CMK243BP-SG3.6	PK243B1-SG3.6	
	CMK243AP-SG7.2	PK243A1-SG7.2	
	CMK243BP-SG7.2	PK243B1-SG7.2	
	CMK243AP-SG9	PK243A1-SG9	
	CMK243BP-SG9	PK243B1-SG9	
	CMK243AP-SG10	PK243A1-SG10	
	CMK243BP-SG10	PK243B1-SG10	
	CMK243AP-SG18	PK243A1-SG18	
	CMK243BP-SG18	PK243B1-SG18	
	CMK243AP-SG36	PK243A1-SG36	
	CMK243BP-SG36	PK243B1-SG36	
	CMK243AP-SG50	PK243A1-SG50	
	CMK243BP-SG50	PK243B1-SG50	
	CMK243AP-SG100	PK243A1-SG100	
	CMK243BP-SG100	PK243B1-SG100	
	CMK264AP-SG3.6	PK264A2-SG3.6	CMD2120P
	CMK264BP-SG3.6	PK264B2-SG3.6	
	CMK264AP-SG7.2	PK264A2-SG7.2	
	CMK264BP-SG7.2	PK264B2-SG7.2	
	CMK264AP-SG9	PK264A2-SG9	
	CMK264BP-SG9	PK264B2-SG9	
	CMK264AP-SG10	PK264A2-SG10	
	CMK264BP-SG10	PK264B2-SG10	
	CMK264AP-SG18	PK264A2-SG18	
	CMK264BP-SG18	PK264B2-SG18	
	CMK264AP-SG36	PK264A2-SG36	
	CMK264BP-SG36	PK264B2-SG36	
	CMK264AP-SG50	PK264A2-SG50	
	CMK264BP-SG50	PK264B2-SG50	
	CMK264AP-SG100	PK264A2-SG100	
	CMK264BP-SG100	PK264B2-SG100	

∗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. Accessory motor lead wire/connector assembly and motor connector set are available.
➜ Page C-255

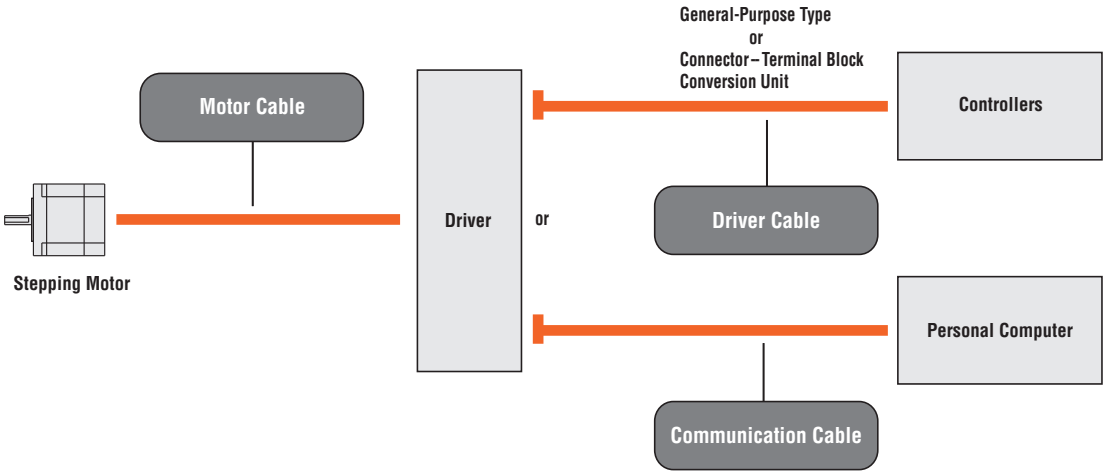
Stepping Motors

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

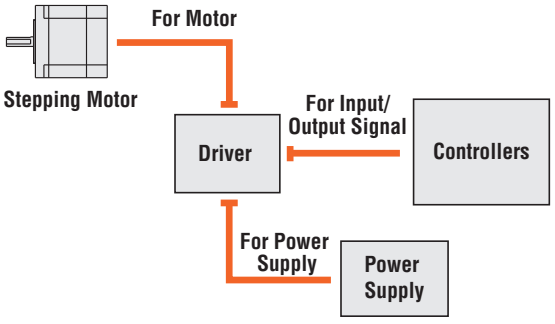
Use these cables to connect the driver of the αSTEP or **RK** Series to a controller.
Choose the general-purpose type to be combined with a connector appropriate for the specific controller used, or the connector-terminal block conversion unit that permits connection between the driver and host controller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

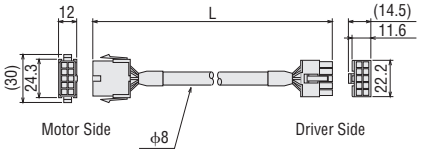
Model	Length L (m)
CC01AIPM	1
CC02AIPM	2
CC03AIPM	3
CC05AIPM	5
CC07AIPM	7
CC10AIPM	10
CC15AIPM	15
CC20AIPM	20

Notes:

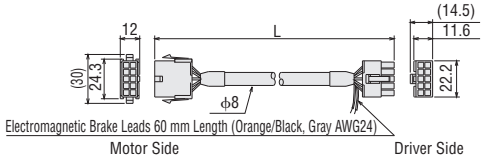
- Electromagnetic brake models must use an extension cable for an electromagnetic brake motor. But for electromagnetic brake motor with motor frame size □42 mm, use an extension cable for standard motor.
- **ASC** Series cannot use extension cables of 15 m and 20 m.

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

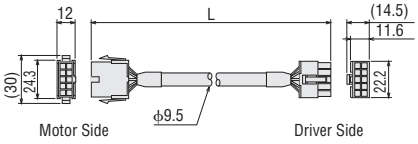
Model	Length L (m)
CC01SARM2	1
CC02SARM2	2
CC03SARM2	3
CC05SARM2	5
CC07SARM2	7
CC10SARM2	10

Note:

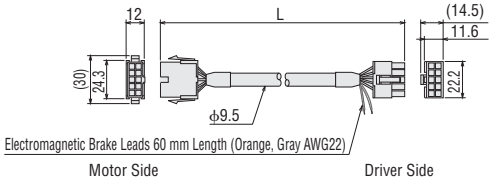
- For electromagnetic brake motor with motor frame size □42 mm, use a flexible extension cable for standard motor.

Dimensions (Unit = mm)

●For Standard Motor

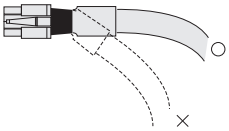


●For Electromagnetic Brake Motor

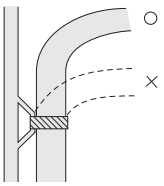


◇Notes on Use of a Flexible Extension Cable

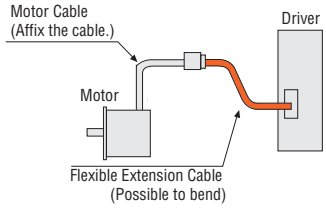
①Do not allow the cable to bend at the cable connector.



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

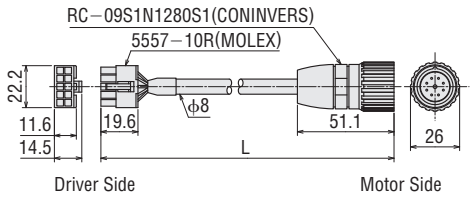
Model	Length L (m)
CC01AST	1
CC02AST	2
CC03AST	3
CC05AST	5
CC07AST	7
CC10AST	10
CC15AST	15
CC20AST	20

●Flexible Motor Cables for IP65 Rated Motor

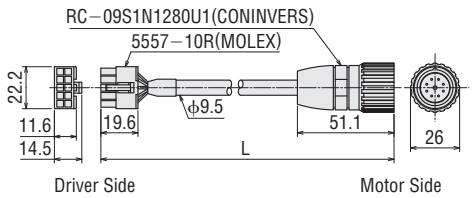
Model	Length L (m)
CC01SAR2	1
CC02SAR2	2
CC03SAR2	3
CC05SAR2	5
CC07SAR2	7
CC10SAR2	10

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).

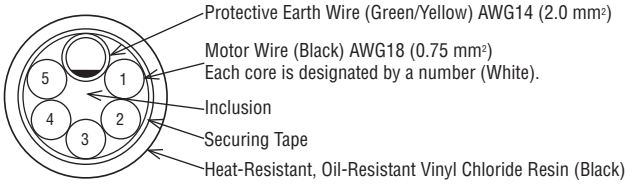
5 Motor Cable RoHS (For IP65 Rated Motor of RK Series and 2-Phase PK Series)

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.

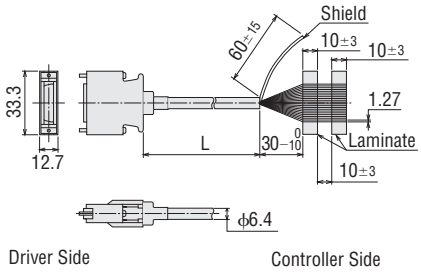
Product Line

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)

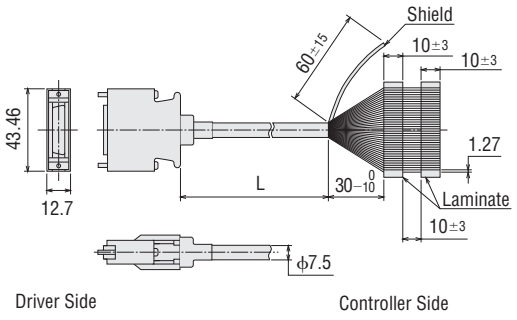
CC20D1-1, CC20D2-1

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

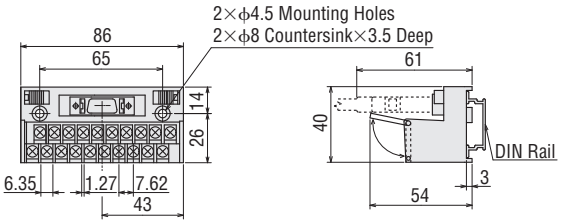
CC36T1

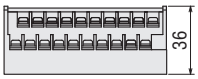
Product Line

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)

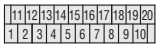
Dimensions (Unit = mm)

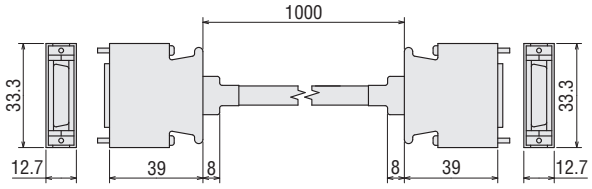
CC20T1



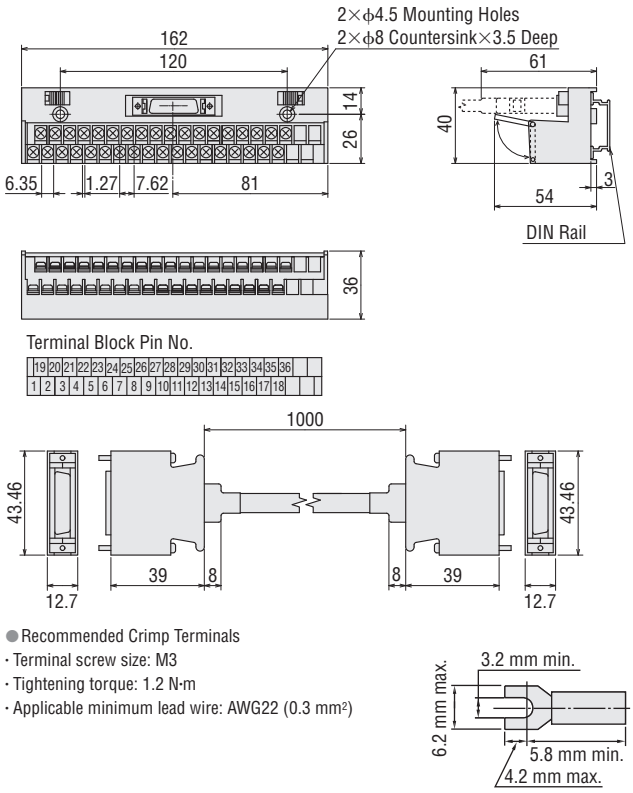


Terminal Block Pin No.





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

●αSTEP

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
–	**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.

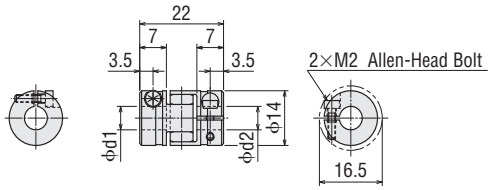
Specifications

Model	Dimensions					Normal Torque	Mass	Inertia	Static Torsion Spring Constant	Permissible Eccentricity	Permissible Declination	Permissible End Play
	Outer Diameter	Length	Axis Hole Diameter d1 H7	Axis Hole Diameter d2 H7	Key Slot Tolerance b/t							
	mm	mm	mm	mm	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	ϕ16 b: 5 ± 0.015 t: $2.3^{+0.1}_{0}$							
MCS551415			14	15								
MCS551416			14	16								
MCS551518			15	18	ϕ18 b: 6 ± 0.015 t: $2.8^{+0.1}_{0}$							
MCS551618			16	18								
MCS551818			18	18	ϕ20 b: 6 ± 0.015 t: $2.8^{+0.1}_{0}$							
MCS551820			18	20								
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)

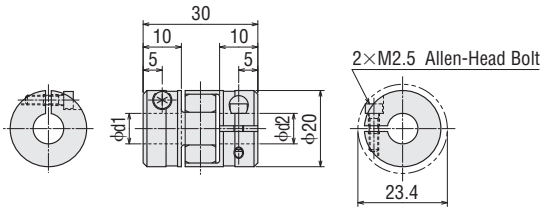
MCS14

Mass: 6.7 g



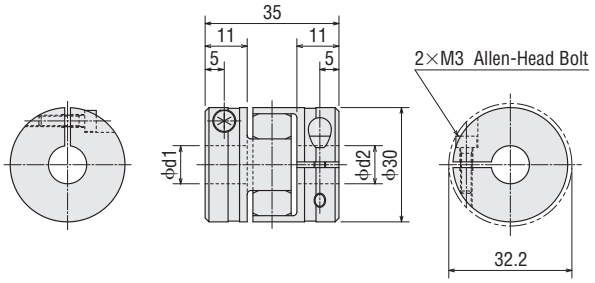
MCS20

Mass: 19.8 g



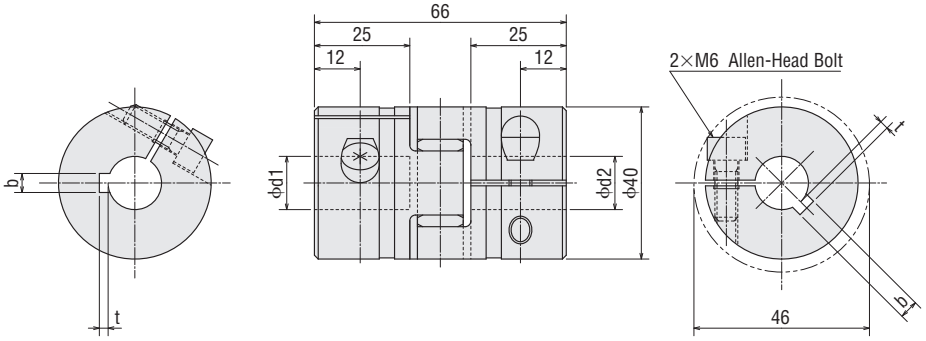
MCS30

Mass: 44.6 g



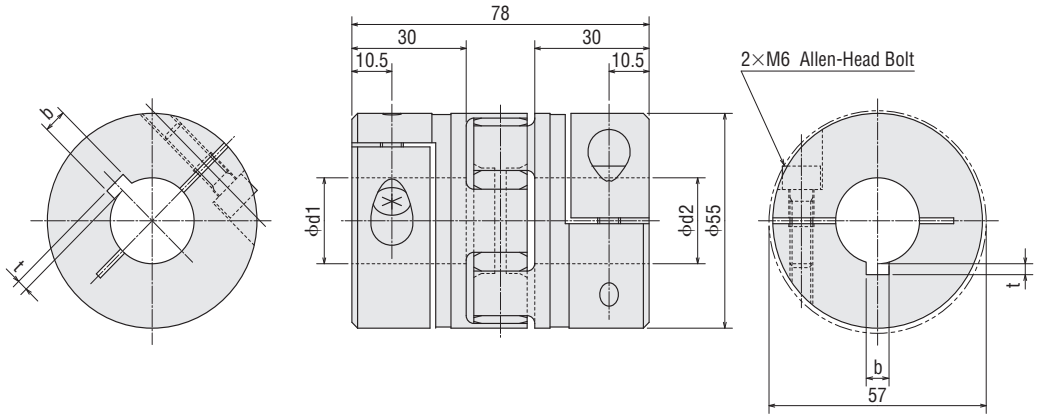
MCS40

Mass: 139 g



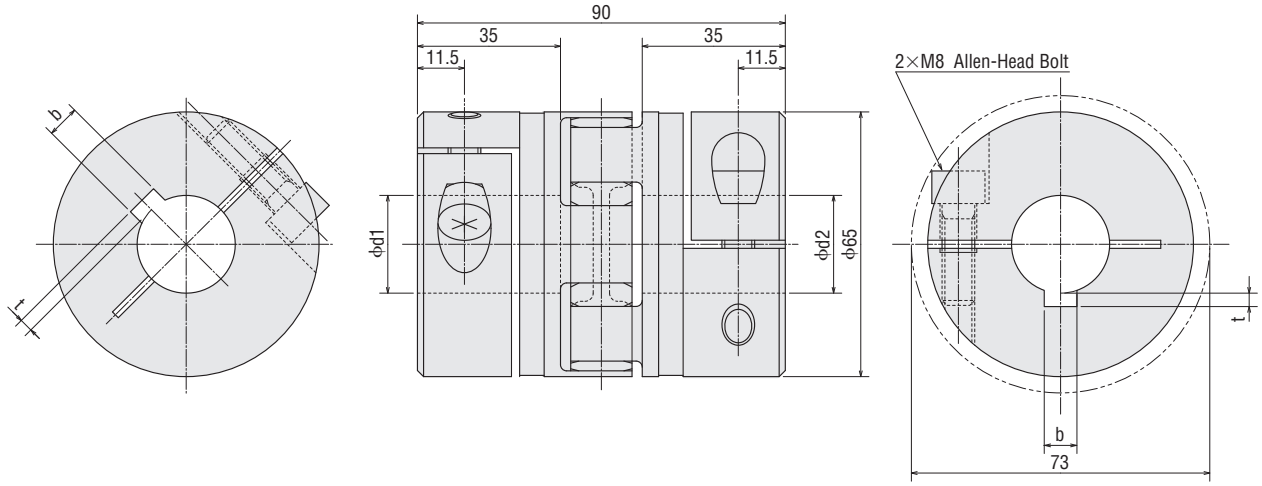
MCS55

Mass: 282 g



MCS65

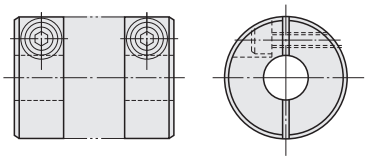
Mass: 535 g



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.

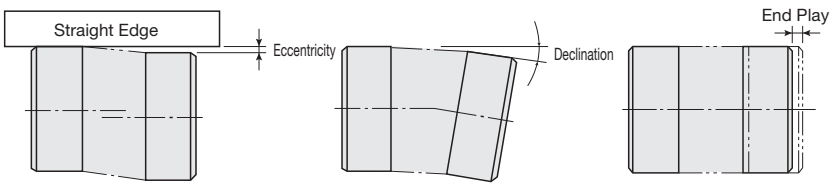
Type		MCS14	MCS20	MCS30	MCS40	MCS55	MCS65
Tightening Torque	N·m	0.37	0.76	1.34	10.5	10.5	25.0

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.

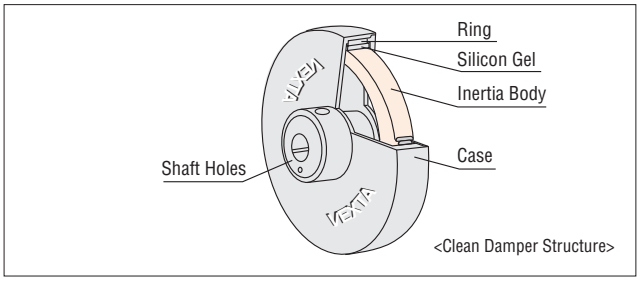


Notes:

- 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.



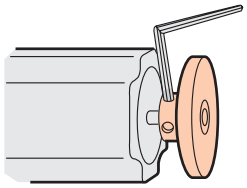
Features

- 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



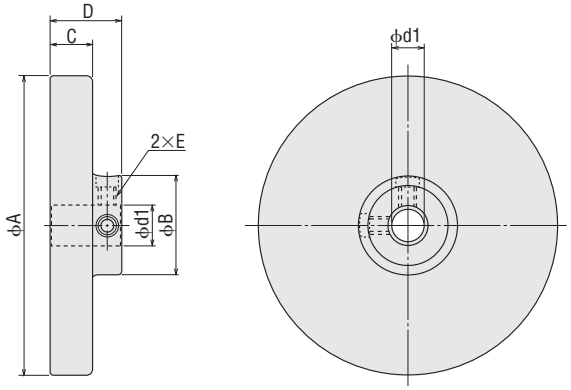
Point the mounting screws of the clean damper toward the motor case, fasten to the shaft and tighten the damper's mounting screws (two places) with an allen wrench to secure it to the shaft.

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

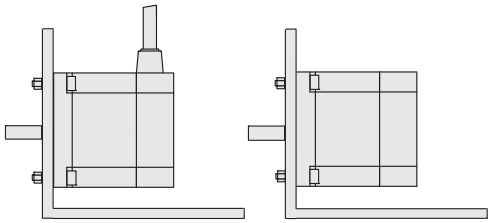
Material: Aluminum alloy

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

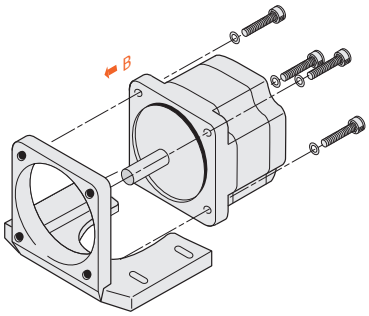
The motor cable comes out at right angles to the motor. Orientate the motor so that the cable faces either upwards or sideways.



Cable Facing Upward　　Cable Facing Sideways

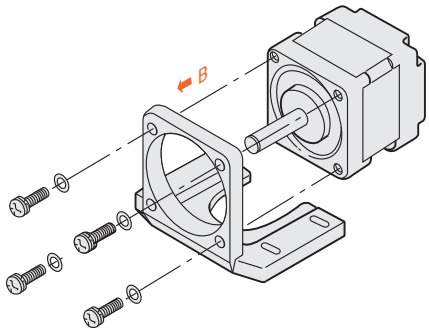
■Mounting the Motor

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

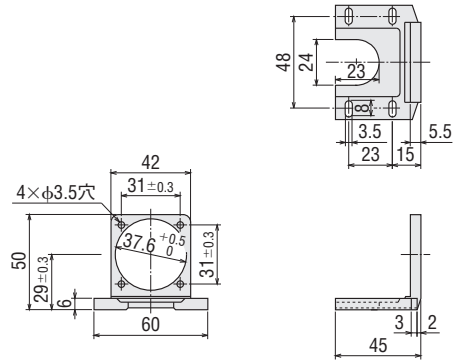


① Use the screws to secure the motor to the mounting bracket.
② Attach the motor from the direction shown by the arrow (B).

Dimensions (Unit = mm)

PAL0P

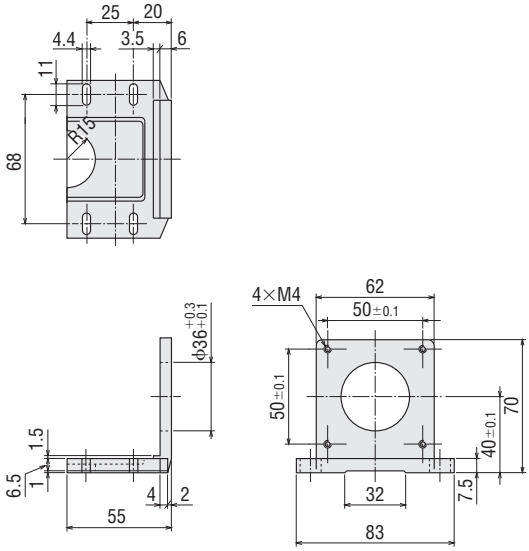
Mass: 35 g



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

PAL2P-5

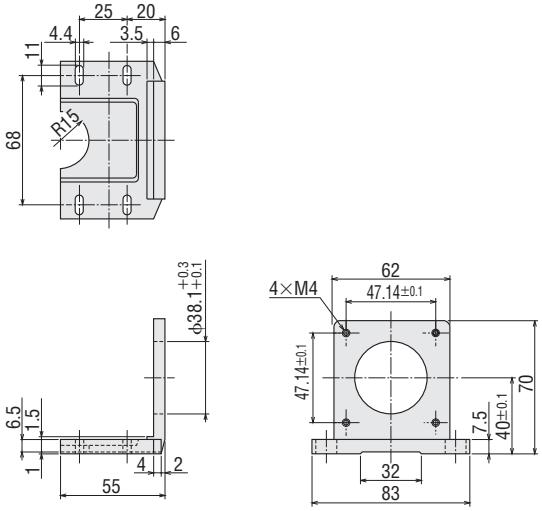
Mass: 110 g



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

PAL2P-2

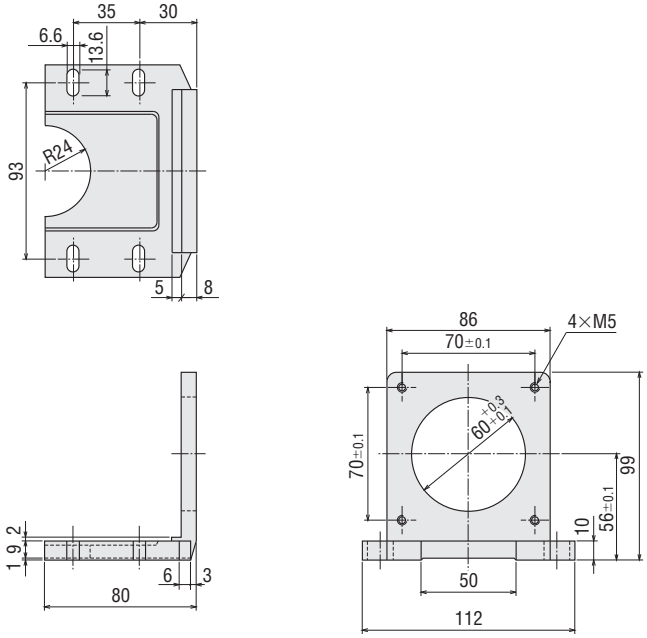
Mass: 110 g



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

PAL4P-5

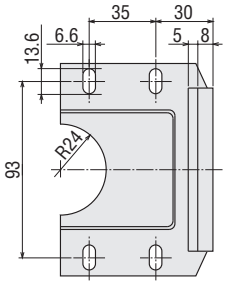
Mass: 250 g

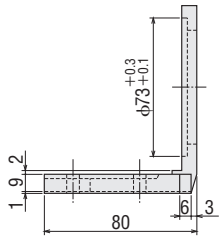


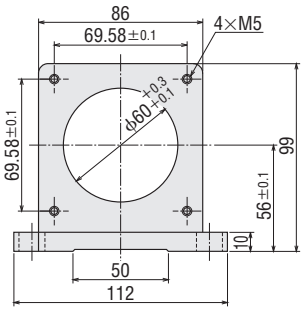
● Screws (Included)
M5 Length 16 mm ··· 4 Pieces

PAL4P-2

Mass: 250 g







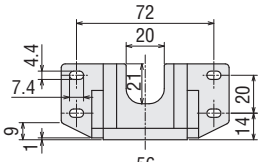
● Screws (Included)
M5 Length 16 mm ··· 4 Pieces

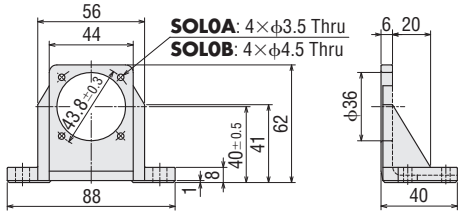
SOL0A

Mass: 85 g

SOL0B

Mass: 85 g



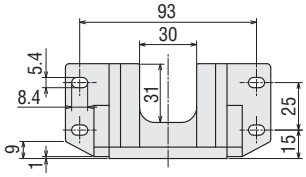


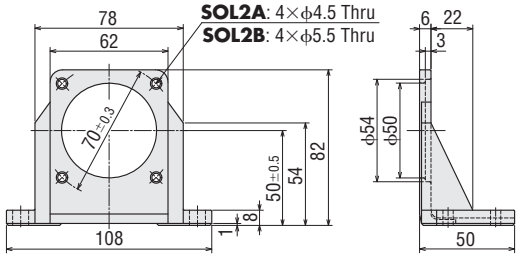
SOL2A

Mass: 120 g

SOL2B

Mass: 120 g





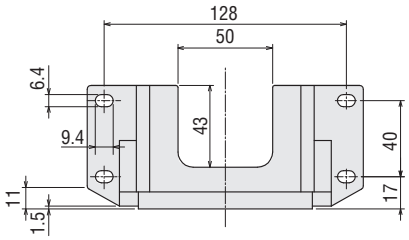
● Screws (Included)
M4 Length 12 mm ··· 4 Pieces (**SOL2A**)
M5 Length 15 mm ··· 4 Pieces (**SOL2B**)

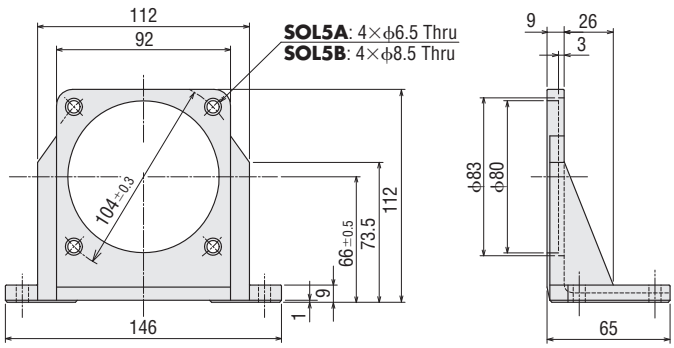
SOL5A

Mass: 270 g

SOL5B

Mass: 270 g



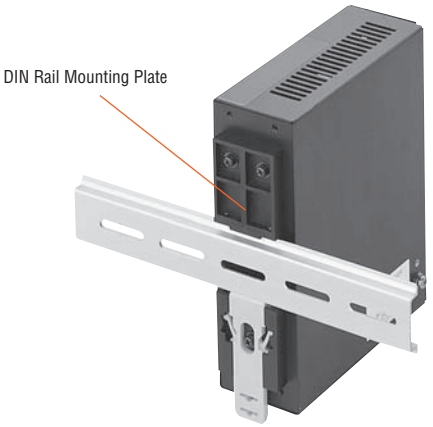


DIN Rail Mounting Plate RoHS

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