Oriental motor

NEW PRODUCTS

RoHS RoHS-Compliant

5-Phase Stepping Motor and Driver Package

CRK Series

Built-In Controller Type (RS-485 Communication)

24 VDC Microstep Drive

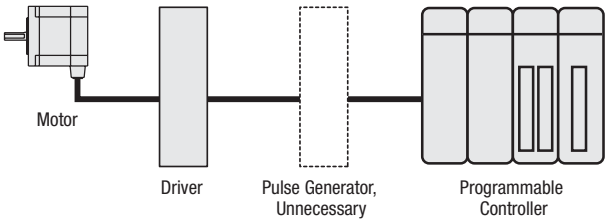
The 5 phase stepping motor and driver package CRK Series, designed for low vibration and low noise, now comes with a built-in controller function.
The new CRK series can also be controlled from a host controller via RS-485 communication in addition to I/O control.
Additionally, new encoder motors are now available that enables the monitoring of positioning information.

This 5-phase DC-input stepping motor and driver package adopts a microstep drive technology. The driver incorporates the stored-data type controller function.
The motor and driver package comes with an encoder motor that allows position information to be monitored.
Either I/O control or RS-485 communication can be selected for the purpose of controlling the motor.

Compact Driver with Built-in Controller Function

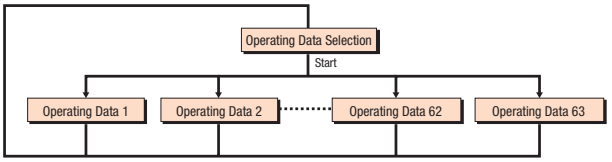
●Space Saving and Reduced Wiring

As no pulse generator is needed and employing a compact design for its driver, it is easier to design your equipment with a smaller space and achieve a simpler system.



●Up to 63 Points of Operating Data

Up to 63 points of positioning data can be set in the driver. The desired data can be set in the incremental mode (relative distance specification) or absolute mode (absolute position specification) separately for each data.



●Operating data can be set using the control module **OPX-2A** (sold separately), the data setting software **MEXE02** (sold separately) or RS-485 communication.

Three Operating Patterns

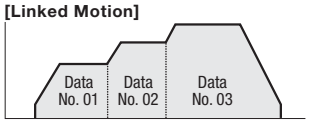
●Positioning Operation

Set the desired motor operating speed or travel amount for each operating data, select a given operating data, and operate the motor according to the selected operating data.

◇Linked Motion

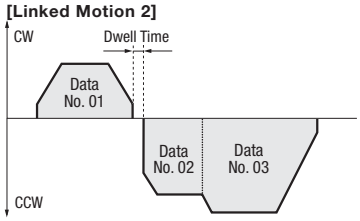
If “Linked Motion” is set for the target operating data, consecutive positioning operations can be performed based on the current data and subsequent data numbers that follow, simply by inputting the START signal just once.

[Linked Motion]



If data No. 01 is selected, positioning will be performed continuously for No. 01 to 03 without stopping the motor.

[Linked Motion 2]



Select data No. 01 and input the START signal, and the motor will perform the operation specified by data No. 01. Thereafter, the motor will stop for the dwell time* you have set, and will then perform the operations specified by data No. 02 and No. 03. You can also link operating data of different rotating directions.

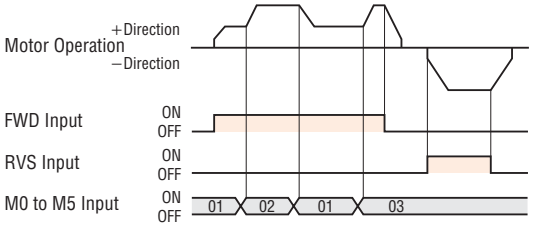
*The dwell time refers to the time the motor waits before it starts the next positioning operation.

◇Sequential Operation

When “sequential positioning” of operating data is set to “enable”, positioning operation is performed to the next operation every time a START input signal is given.

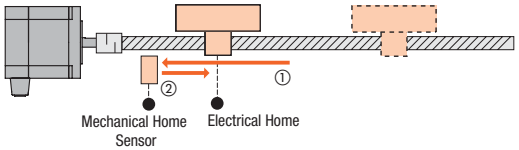
●Speed Control Operation

The motor operates continuously while the FWD or RVS input is ON. Because the motor operates according to the speed that is pre-set under each operation data number, you can perform an operation where the motor changes its speed to multiple levels, simply by changing the data number sequentially.



●Return-to-Home Operation

The product comes with a return-to-home operation function, meaning that home detection can easily be performed by wiring a sensor.



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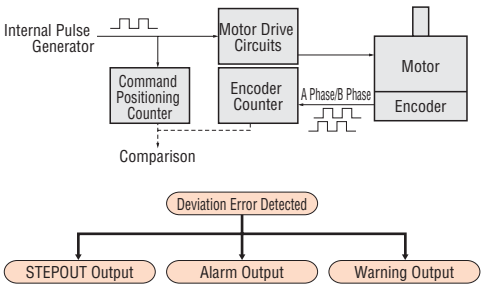
Detection of Deviation Error (New encoder motors now available)

With the use of an encoder motor, a position displacement, etc., can be detected. This will contribute to the further improvement of your equipment's reliability.



●STEPOUT Output Function

Once the deviation between the position specified by the command from the driver and the value of the encoder counter reaches the set value (for deviation error), the STEPOUT signal will output. Accordingly, a position displacement resulting from a sudden change in the load can be detected.

●Alarm Output Function*

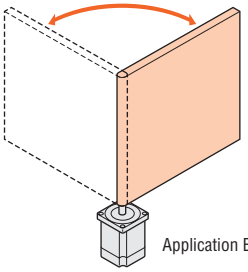
When a deviation error occurs, the "Overflow" alarm will be triggered and the motor will stop.

●Warning Output Function*

When a deviation error occurs, the "Overflow" warning will be triggered but the motor will continue its operation.

*You can set whether to output an alarm or a warning upon the generation of a deviation error, using a parameter.

●Application Example



The motor can detect a situation in which the door could not be operated to the normal position due to an obstruction, etc.

Application Example: Opening and shutting the door.

Useful Function

●PLS-OUT Output Function

◇Synchronized Operations

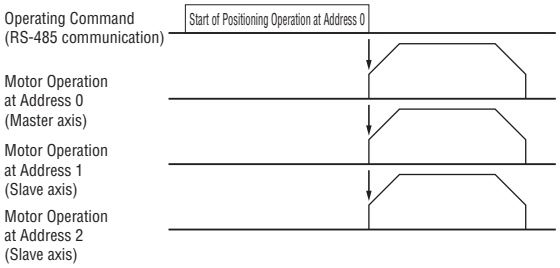
It is possible to output signals of the same number of pulses and same pulse speed as the command value. Accordingly, you can input the PLS-OUT signal and DIR-OUT signal (rotating-direction signal) to other drivers in order to drive the motors of different axes.

◇Position Counting Function

You can count the number of signals that were output in order to check the command position instructed to the motor.

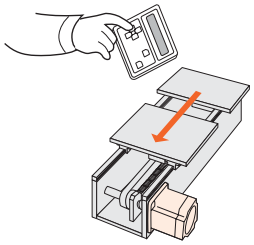
●Group Sending Function (RS-485 communication only)

Multiple axes can be linked via RS-485 communication to create a group, so that commands can be sent simultaneously to all axes comprising the group. You can also start these multiple axes at the same time or to perform the same operation.



●Teaching Function

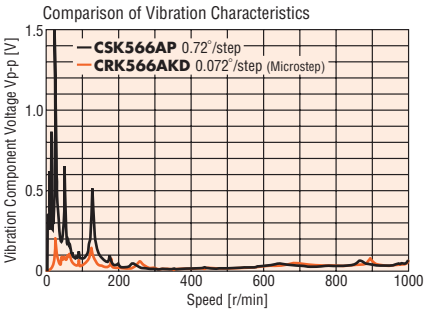
You can perform teaching using the control module **OPX-2A** (sold separately) or data setting software **MEXE02** (sold separately). Move the table to the desired position and store the applicable position data as positioning data.



Low Vibration and Low Noise

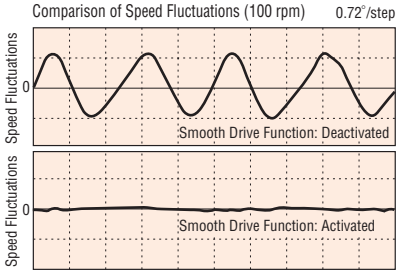
●Lower Vibration and Noise Achieved by Microstepping

The basic step angle of the motor can be divided into a maximum of 250 microstep angles without using any mechanical element such as a reduction gear.
As a result, vibration and noise are further reduced.



●Smooth Drive Function for Enhanced Ease of Use

The Smooth Drive Function automatically controls operations via microstepping at the same travel amount and speed used in the fullstep mode, without requiring the operator to change the pulse input settings.



High-Accuracy and High-Torque Motor

●High-Resolution Motor

◇Improved Stopping Accuracy

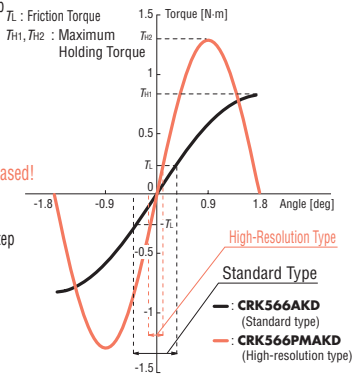
The positioning accuracy of a stepping motor is affected by the friction of the load.
The high-resolution type achieves high accuracy and reliability based on Oriental Motor's latest precision machining technology. The motor resolution is increased to double the level of a standard model to reduce the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

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

Resolution is increased!

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

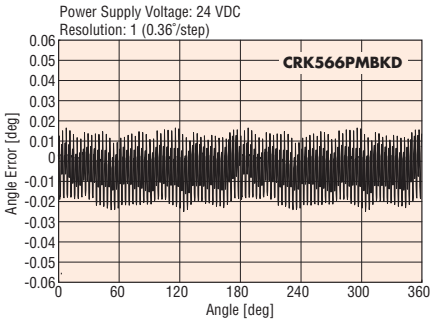
Comparison of Angle – Torque Characteristics



◇Stop Position Accuracy of 2 Arc Minutes (No load)

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

Static Angle Characteristics

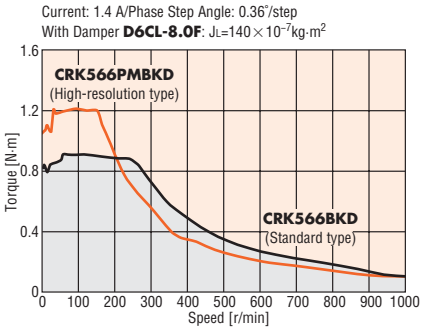


●High-Torque Motor

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

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

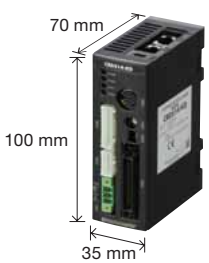
Comparison of Speed – Torque Characteristics



Compact Driver for Installation on DIN Rail

●Compact, Case-Type Driver of DC Power Supply Input

The driver has been designed with a compact size of 35 mm in width, 100 mm in height and 70 mm in depth. These dimensions will save space for your control panel and equipment.



●Installable on DIN Rail

The driver can be installed directly onto a DIN rail, with no mounting screws needed.

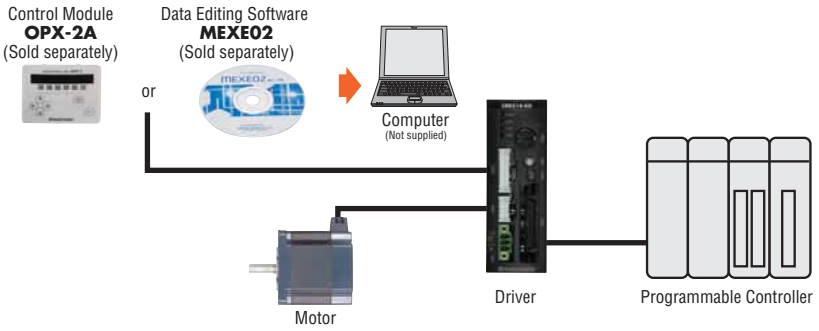
- The driver installation can only be supported with the use of a DIN rail.

Control Methods

The new **CRK** series can be controlled from a host controller via I/O control and RS-485 communication.

●I/O Control System

Operation is easy via I/O control.



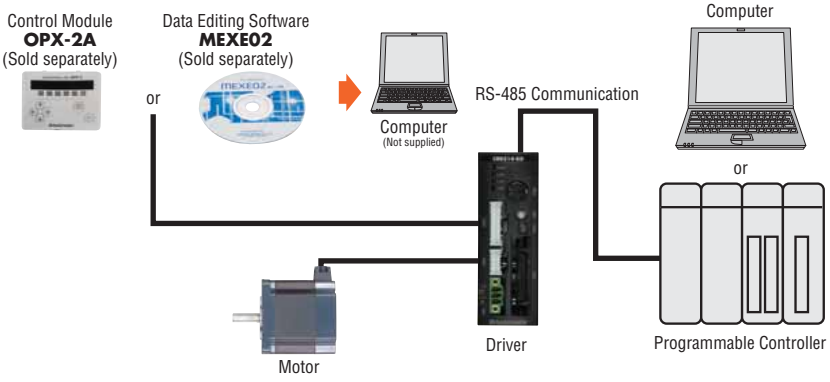
◇Data Setting and Operating Command

Operating Data and Parameter Setting	Operating Commands (START, STOP, etc)
Control Module (**OPX-2A**) or Data Editing Software (**MEXE02**)	I/O

●Either the control module (**OPX-2A**, sold separately) or the data setting software (**MEXE02**, sold separately) is needed in order to set operating data and parameters.

●RS-485 Communication System

You can set operating data and parameters or input operation commands via RS-485 communication. Up to 31 drivers can be connected to one host controller. You can also start multiple axes at the same time.
The Modbus RTU protocol is supported, so each driver can be connected with ease using a programmable controller.



◇Data Setting and Operating Command

Operating Data and Parameter Setting	Operating Commands (START, STOP, etc)
Control Module (**OPX-2A**), Data Editing Software (**MEXE02**) or RS-485 Communication	I/O or RS-485 Communication

●The START input, STOP input, FWD input, RVS input and other operating commands can also be controlled via I/Os.
●The teaching function and test function can be implemented with the control module (**OPX-2A**) or the data setting software (**MEXE02**).

Wide Variety

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

Type		Features	□20 mm	□28 mm (□30 mm)	□42 mm	□60 mm	Driver
High-Resolution Type		A high-torque motor offering higher positioning accuracy with the basic step angle set to 0.36°/step, or half the basic step angle of the standard type.					
High-Torque Type		A high-torque motor generating high torque of approx. 1.3 to 1.5 times the level achieved by the standard type.					
High-Torque Type with Encoder		The high-torque motor comes pre-assembled with an encoder. This combination enhances reliability.					
Standard Type		The basic model in the **CRK** Series offering an optimal balance of torque, low vibration and low noise.					
Standard Type with Electromagnetic Brake		A motor combines with power-off activated type electromagnetic brake.					
Standard Type with Encoder		The standard motor comes pre-assembled with an encoder. This combination enhances reliability.					
Low Backlash	**TH** Geared Type	A geared motor achieving both low backlash and low cost.					
Non-Backlash	**PN** Geared Type	A high-accuracy geared motor achieving a backlash of 3 arc minutes or less. It also provides high strength and wide gear ratios.					
	Harmonic Geared Type	A high-accuracy, backlash-free geared motor adopting a newly developed harmonic gear. It ensures high strength in a compact body.					

Characteristics Comparison for Geared Motors

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

Note:

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

Linear Actuators

The driver can also be combined with a linear-motion motor, in which the motor employs a built-in thrust bearing mechanism with a ball screw incorporated.
For details, please contact the nearest Oriental Motor sales office.

RoHS-Compliant

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

RoHS (Restriction of Hazardous Substances) Directive:
Directive on restriction of the use of certain hazardous substances in electrical and electronic equipment (2002/95/EC).
The RoHS Directive prohibits the use of six chemical substances in electrical and electronic products sold in the EU member states. The six controlled substances are: lead, hexavalent chromium, cadmium, mercury and two specific brominated flame-retardants (PBB and PBDE) .

CE Marking

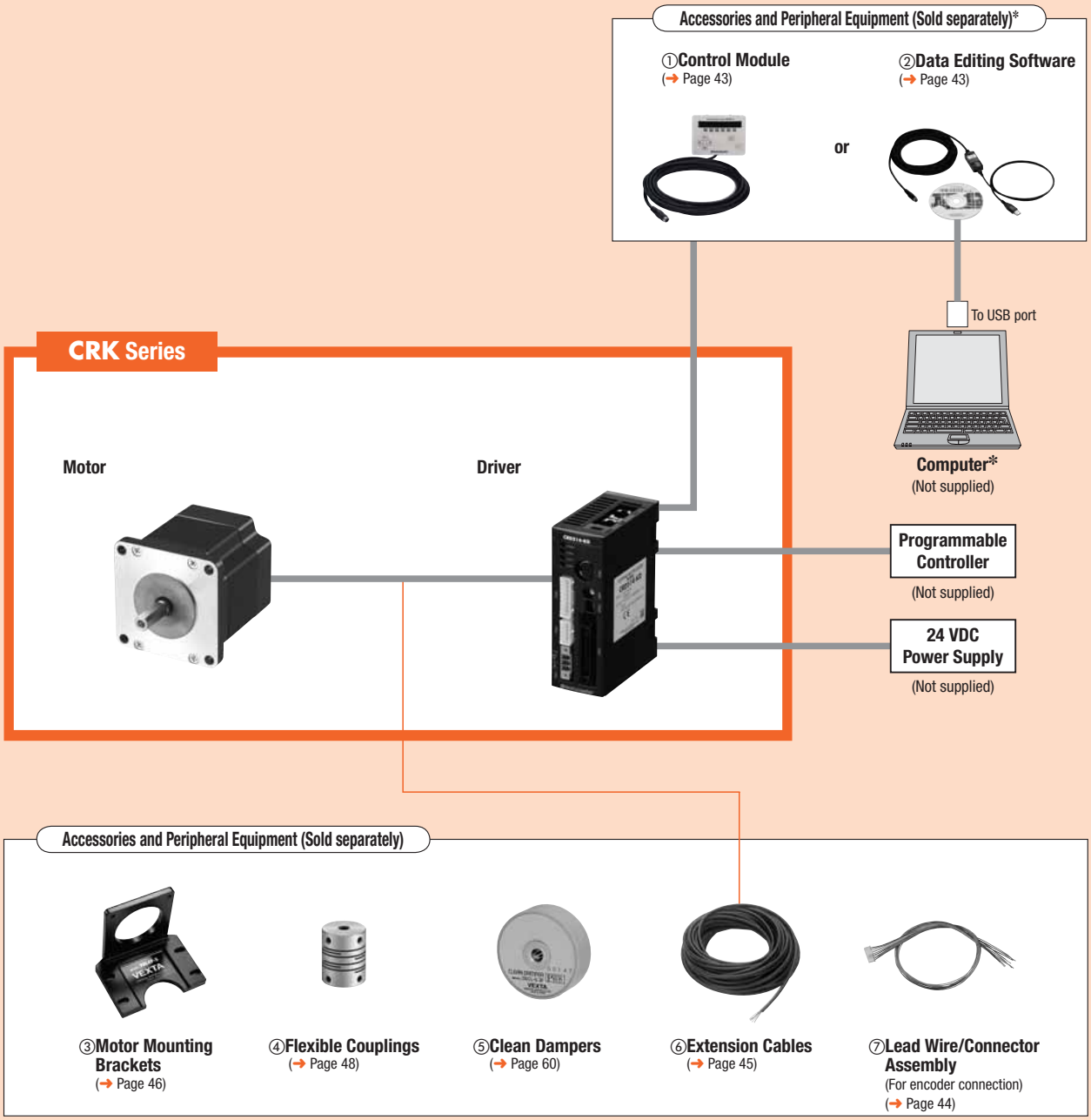
The CE marking certifies compliance with the EMC Directive.

● The EMC value changes according to the wiring and layout. Therefore, the final EMC level must be checked with the motor/driver incorporated in the equipment.

System Configuration

I/O Control or RS-485 Communication

*Required for the operation of I/O control.



No.	Product Name	Overview	Page
①	Control Module	With this control module, various data setting, editing, operating, and digital display are possible. Communication cable of 0.5 m is included.	43
②	Data Editing Software	With this software, various data setting, editing, operating, and digital display are possible on a personal computer. PC interface cable of 5 m and USB cable of 0.5 m are included.	43
③	Motor Mounting Brackets	Dedicated mounting bracket for the motor.	46
④	Flexible Couplings	Coupling that connects the motor shaft to the driven shaft.	48
⑤	Clean Dampers	Dedicated damper for suppressing stepping motor vibration.	60
⑥	Extension Cables	Cable for extending the wiring distance between the motor and driver.	45
⑦	Lead Wire/Connector Assembly (For encoder connection)	Lead wire with a connector crimped for connector-coupled motors (0.6 m).	44

Example of System Configuration

CRK Series		Control Module	Extension Cable [5 m]	Motor Mounting Bracket	Flexible Coupling	Clean Damper
CRK566BKD	+	OPX-2A	CC05PK5	PAL2P-5	MC250808S	D6CL-8.0F

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

Product Number Code

High-Resolution Type, High-Torque Type, High-Torque Type with Encoder, Standard Type, Standard Type with Electromagnetic Brake, Standard Type with Encoder

CRK 5 2 3 H P M A □ K D

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

①	Series	**CRK**: **CRK** Series
②	**5**: 5-Phase	
③	Motor Frame Size	**1**: 20 mm **2**: 28 mm **4**: 42 mm **6**: 60 mm
④	Motor Case Length	
⑤	Motor Specification	**H**: High Speed (0.75 A/phase)
⑥	Motor Classification	
⑦	Motor Type	**M**: High Resolution
⑧	Motor Shaft Type	**A**: Single Shaft, **B**: Double Shaft, **R**: With Encoder
⑨	Electromagnetic Brake	Blank: Without Electromagnetic Brake, **M**: With Electromagnetic Brake Type
⑩	Power Supply Input	**K**: 24 VDC
⑪	Driver Type	**D**: Built-In Controller Type

Geared Type

CRK 5 2 3 P A K D - N 7.2

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①	Series	**CRK**: **CRK** Series
②	**5**: 5-Phase	
③	Motor Frame Size	**1**: 20 mm **2**: 28 mm (30 mm) **4**: 42 mm **6**: 60 mm
④	Motor Case Length	
⑤	Motor Classification	
⑥	Motor Shaft Type	**A**: Single Shaft, **B**: Double Shaft
⑦	Power Supply Input	**K**: 24 VDC
⑧	Driver Type	**D**: Built-In Controller Type
⑨	Gearhead Type	**T**: **TH** Geared Type, **N**: **PN** Geared Type, **H**: Harmonic Geared Type
⑩	Gear Ratio	

Product Line

High-Resolution Type

Model (Single shaft)	Model (Double shaft)
CRK523PMAKD	**CRK523PMBKD**
CRK524PMAKD	**CRK524PMBKD**
CRK525PMAKD	**CRK525PMBKD**
CRK523HPMAKD	**CRK523HPMBKD**
CRK524HPMAKD	**CRK524HPMBKD**
CRK525HPMAKD	**CRK525HPMBKD**
CRK544PMAKD	**CRK544PMBKD**
CRK546PMAKD	**CRK546PMBKD**
CRK564PMAKD	**CRK564PMBKD**
CRK566PMAKD	**CRK566PMBKD**
CRK569PMAKD	**CRK569PMBKD**

High-Torque Type

Model (Single shaft)	Model (Double shaft)
CRK513PAKD	**CRK513PBKD**
CRK523PAKD	**CRK523PBKD**
CRK525PAKD	**CRK525PBKD**
CRK523HPAKD	**CRK523HPBKD**
CRK525HPAKD	**CRK525HPBKD**
CRK544PAKD	**CRK544PBKD**
CRK546PAKD	**CRK546PBKD**

High-Torque Type with Encoder

Model (Single shaft)
CRK544PRKD
CRK546PRKD

Standard Type

Model (Single shaft)	Model (Double shaft)
CRK543AKD	**CRK543BKD**
CRK544AKD	**CRK544BKD**
CRK545AKD	**CRK545BKD**
CRK564AKD	**CRK564BKD**
CRK566AKD	**CRK566BKD**
CRK569AKD	**CRK569BKD**

Standard Type with Electromagnetic Brake

Model (Single shaft)
CRK543AMKD
CRK544AMKD
CRK545AMKD
CRK564AMKD
CRK566AMKD
CRK569AMKD

Standard Type with Encoder

Model (Single shaft)
CRK543RKD
CRK544RKD
CRK545RKD
CRK564RKD
CRK566RKD
CRK569RKD

TH Geared Type

Model (Single shaft)	Model (Double shaft)
CRK523PAKD-T7.2	**CRK523PBKD-T7.2**
CRK523PAKD-T10	**CRK523PBKD-T10**
CRK523PAKD-T20	**CRK523PBKD-T20**
CRK523PAKD-T30	**CRK523PBKD-T30**
CRK543AKD-T3.6	**CRK543BKD-T3.6**
CRK543AKD-T7.2	**CRK543BKD-T7.2**
CRK543AKD-T10	**CRK543BKD-T10**
CRK543AKD-T20	**CRK543BKD-T20**
CRK543AKD-T30	**CRK543BKD-T30**
CRK564AKD-T3.6	**CRK564BKD-T3.6**
CRK564AKD-T7.2	**CRK564BKD-T7.2**
CRK564AKD-T10	**CRK564BKD-T10**
CRK564AKD-T20	**CRK564BKD-T20**
CRK564AKD-T30	**CRK564BKD-T30**

PN Geared Type

Model (Single shaft)	Model (Double shaft)
CRK523PAKD-N5	**CRK523PBKD-N5**
CRK523PAKD-N7.2	**CRK523PBKD-N7.2**
CRK523PAKD-N10	**CRK523PBKD-N10**
CRK544AKD-N5	**CRK544BKD-N5**
CRK544AKD-N7.2	**CRK544BKD-N7.2**
CRK544AKD-N10	**CRK544BKD-N10**
CRK566AKD-N5	**CRK566BKD-N5**
CRK566AKD-N7.2	**CRK566BKD-N7.2**
CRK566AKD-N10	**CRK566BKD-N10**
CRK564AKD-N25	**CRK564BKD-N25**
CRK564AKD-N36	**CRK564BKD-N36**
CRK564AKD-N50	**CRK564BKD-N50**

Harmonic Geared Type

Model (Single shaft)	Model (Double shaft)
CRK513PAKD-H50	**CRK513PBKD-H50**
CRK513PAKD-H100	**CRK513PBKD-H100**
CRK523PAKD-H50	**CRK523PBKD-H50**
CRK523PAKD-H100	**CRK523PBKD-H100**

Model (Single shaft)	Model (Double shaft)
CRK543AKD-H50	**CRK543BKD-H50**
CRK543AKD-H100	**CRK543BKD-H100**
CRK564AKD-H50	**CRK564BKD-H50**
CRK564AKD-H100	**CRK564BKD-H100**

The following items are included in each product.

Motor, Driver, Power connector, Cable/connector assembly for CN2, Lead wire/connector assembly for CN4, Varistor *1, Lead wire/connector assembly for CN5 *2, Lead wire/connector assembly for motor *3, Operating Manual

*1 Electrical magnetic brake type only

*2 Encoder type only

*3 Connector-coupled motor type only

High-Resolution Type Motor Frame Size 28 mm

Specifications RoHS

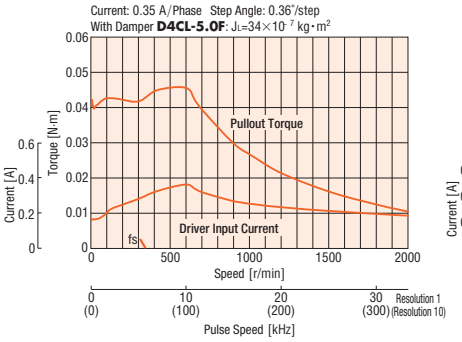
Model			CRK523PMAKD*	CRK524PMAKD*	CRK525PMAKD*	CRK523HPMAKD*	CRK524HPMAKD*	CRK525HPMAKD*
	Double Shaft		CRK523PMBKD*	CRK524PMBKD*	CRK525PMBKD*	CRK523HPMBKD*	CRK524HPMBKD*	CRK525HPMBKD*
Maximum Holding Torque		N·m	0.042	0.061	0.09	0.038	0.061	0.081
Rotor Inertial Moment		J: kg·m^2	9×10^{-7}	13×10^{-7}	19×10^{-7}	9×10^{-7}	13×10^{-7}	19×10^{-7}
Rated Current		A/Phase	0.35			0.75		
Basic Step Angle			0.36°					
Power Supply Input			24 VDC±10% 0.7 A			24 VDC±10% 1.4 A		
Excitation Mode			Microstep					
Mass	Motor	kg	0.11	0.15	0.2	0.11	0.15	0.2
	Driver	kg	0.2					
Dimension No.	Motor		2					
	Driver		22					

How to read specifications table ➜ See below

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

Speed - Torque Characteristics fs: Maximum Starting Frequency

CRK523PMAKD/CRK523PMBKD



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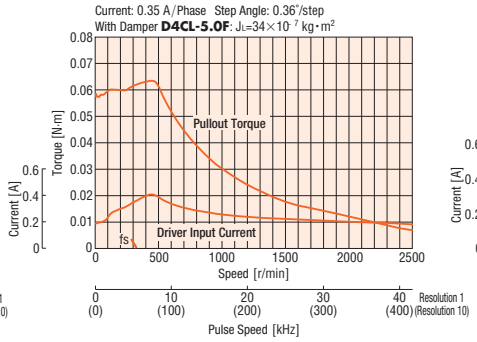
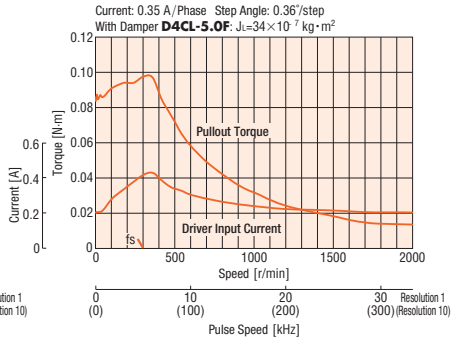


CRK525PMAKD/CRK525PMBKD



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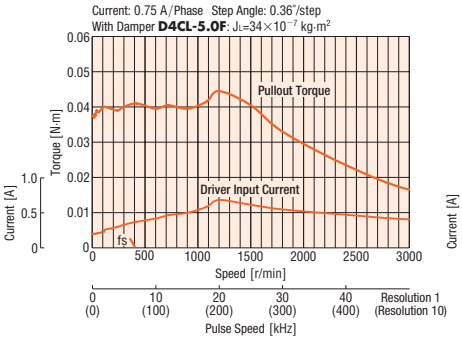

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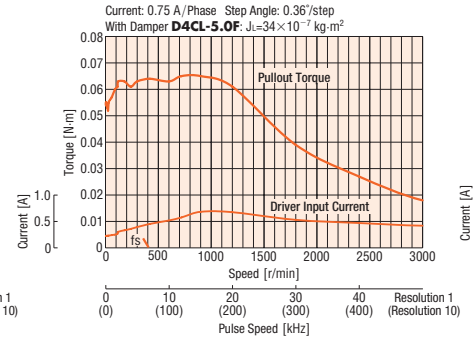

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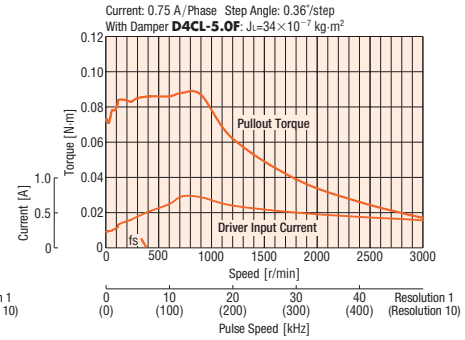


Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

How to Read Specifications Table

Maximum Holding Torque	: The holding torque (5-phase: 5-phase excitation) is the maximum holding power (torque) the stepping motor has when power (rated current) is being supplied but the motor is not rotating (with consideration given to the permissible strength of the gear when applicable). At motor standstill, the driver's automatic current cutback function reduces the maximum holding torque by approximately 50%.
Permissible Torque	: The permissible torque represents the torque value limited by the mechanical strength of the gear when operated at a constant speed. For the types excluding **PN** and harmonic geared types, the total torque including acceleration/deceleration torque should not exceed this value.
Maximum Torque	: This is the maximum torque that can be used instantaneously (for a short time). During acceleration/deceleration, the motor can be operated up to this value. (**PN** geared, harmonic geared type only)
Angular Transmission Error	: Angular transmission error is the difference between the theoretical angle of rotation of the output shaft, as calculated from the input pulse count, and actual angle of rotation. (**PN** geared type only)

High-Resolution Type Motor Frame Size 42 mm, 60 mm

Specifications RoHS

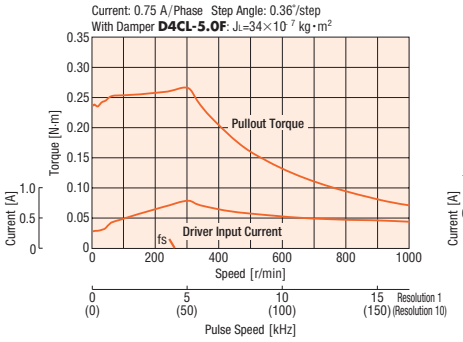
Model			CRK544PMAKD*	CRK546PMAKD*	CRK564PMAKD*	CRK566PMAKD*	CRK569PMAKD*
	Single Shaft		CRK544PMAKD*	CRK546PMAKD*	CRK564PMAKD*	CRK566PMAKD*	CRK569PMAKD*
	Double Shaft		CRK544PMBKD*	CRK546PMBKD*	CRK564PMBKD*	CRK566PMBKD*	CRK569PMBKD*
Maximum Holding Torque		N·m	0.24	0.42	0.78	1.3	2.3
Rotor Inertial Moment		J: kg·m^2	60×10^{-7}	121×10^{-7}	310×10^{-7}	490×10^{-7}	970×10^{-7}
Rated Current		A/Phase	0.75		1.4		
Basic Step Angle			0.36°				
Power Supply Input			24 VDC±10% 1.4 A		24 VDC±10% 2.5 A		
Excitation Mode			Microstep				
Mass	Motor	kg	0.3	0.5	0.65	0.87	1.5
	Driver	kg	0.2				
Dimension No.	Motor		3		4		
	Driver		22				

How to read specifications table ➜ Page 10

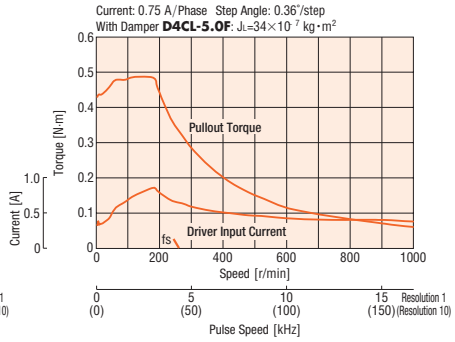
*Motor lead wire/connector assembly (0.6 m) is included with the connector-coupled motor and driver package.

Speed - Torque Characteristics fs: Maximum Starting Frequency

CRK544PMAKD/CRK544PMBKD



CRK546PMAKD/CRK546PMBKD



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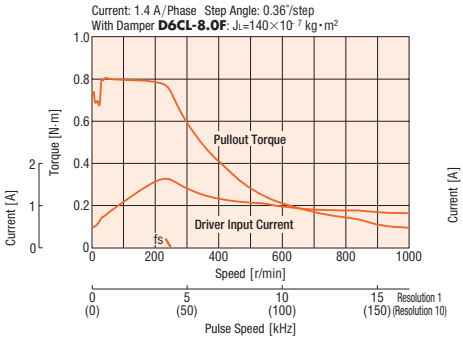
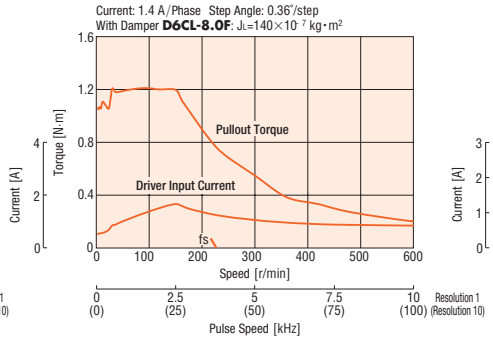
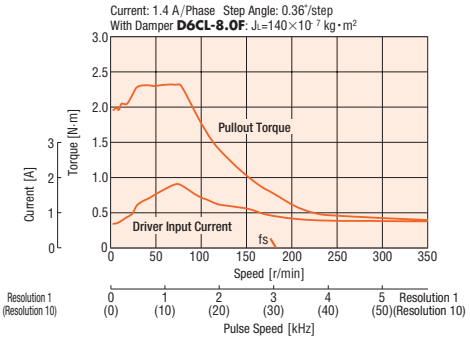


CRK566PMAKD/CRK566PMBKD



CRK569PMAKD/CRK569PMBKD



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

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

Specifications RoHS

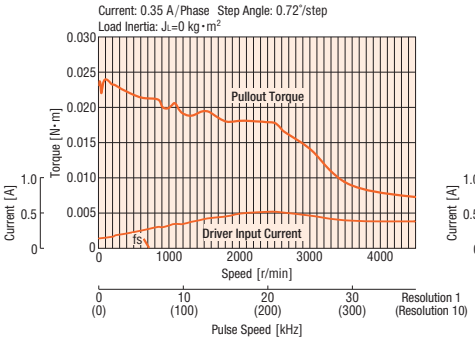
Model			CRK513PAKD*	CRK523PAKD*	CRK525PAKD*	CRK523HPAKD*	CRK525HPAKD*
	Single Shaft / Double Shaft		CRK513PBKD*	CRK523PBKD*	CRK525PBKD*	CRK523HPBKD*	CRK525HPBKD*
Maximum Holding Torque		N·m	0.0231	0.048	0.078	0.041	0.073
Rotor Inertial Moment		J: kg·m^2	1.6×10^{-7}	9×10^{-7}	18×10^{-7}	9×10^{-7}	18×10^{-7}
Rated Current		A/Phase	0.35			0.75	
Basic Step Angle			0.72°				
Power Supply Input			24 VDC±10% 0.7 A			24 VDC±10% 1.4 A	
Excitation Mode			Microstep				
Mass	Motor	kg	0.05	0.11	0.2	0.11	0.2
	Driver	kg	0.2				
Dimension No.	Motor		1	2			
	Driver		22				

How to read specifications table ➜ Page 10

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

Speed - Torque Characteristics fs: Maximum Starting Frequency

CRK513PAKD/CRK513PBKD



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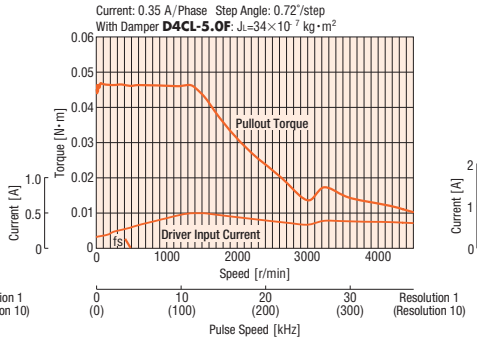

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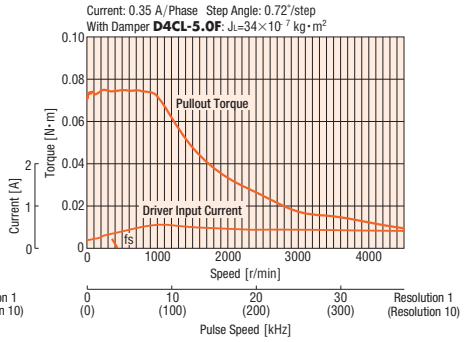
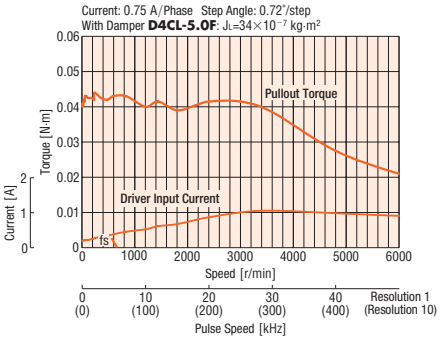
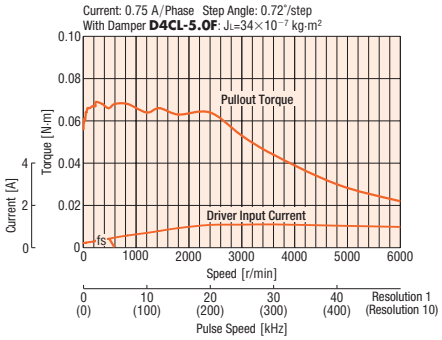


CRK523HPAKD/CRK523HPBKD



CRK525HPAKD/CRK525HPBKD



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

High-Torque Type Motor Frame Size 42 mm

Specifications RoHS

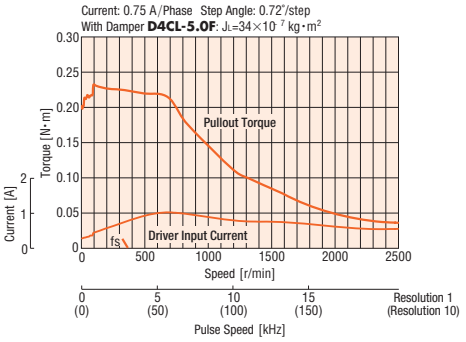
Model			CRK544PAKD* / CRK544PBKD*	CRK546PAKD* / CRK546PBKD*
Maximum Holding Torque		N·m	0.24	0.42
Rotor Inertial Moment		J: kg·m^2	57×10^{-7}	114×10^{-7}
Rated Current		A/Phase	0.75	
Basic Step Angle			0.72°	
Power Supply Input			24 VDC±10% 1.4 A	
Excitation Mode			Microstep	
Mass	Motor	kg	0.3	0.5
	Driver	kg	0.2	
Dimension No.	Motor		3	
	Driver		22	

How to read specifications table ➜ Page 10

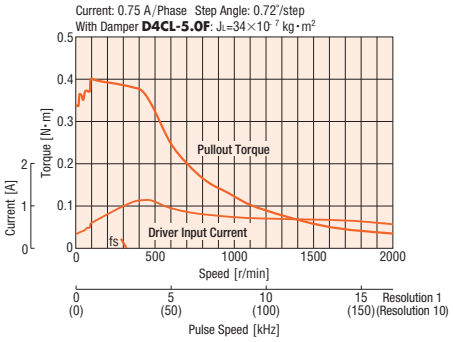
*Motor lead wire/connector assembly (0.6 m) is included with the connector-coupled motor and driver package.

Speed - Torque Characteristics fs: Maximum Starting Frequency

CRK544PAKD/CRK544PBKD



CRK546PAKD/CRK546PBKD



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

High-Torque Type with Encoder Motor Frame Size 42 mm

Specifications RoHS

CE

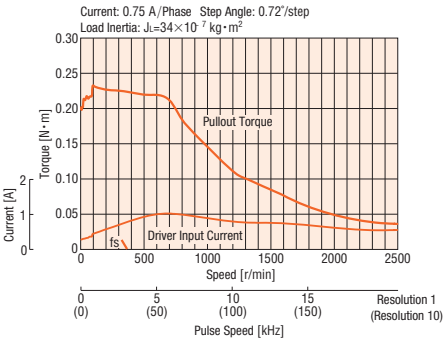
Model	Single Shaft		CRK544PRKD*	CRK546PRKD*
Maximum Holding Torque		N·m	0.24	0.42
Rotor Inertial Moment		J: kg·m^2	57×10^{-7}	114×10^{-7}
Rated Current		A/Phase	0.75	
Basic Step Angle			0.72°	
Power Supply Input			24 VDC±10% 1.4 A	
Excitation Mode			Microstep	
Mass	Motor	kg	0.36	0.56
	Driver	kg	0.2	
Dimension No.	Motor		5	
	Driver		22	

How to read specifications table ➜ Page 10

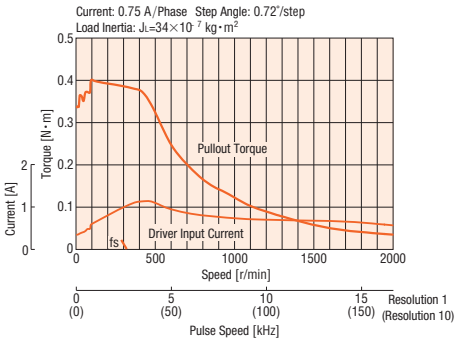
*Motor lead wire/connector assembly (0.6 m) is included with the connector-coupled motor and driver package.

Speed - Torque Characteristics fs: Maximum Starting Frequency

CRK544PRKD



CRK546PRKD



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C. (Keep the temperature of the encoder case under 80°C.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

Standard Type Motor Frame Size 42 mm, 60 mm

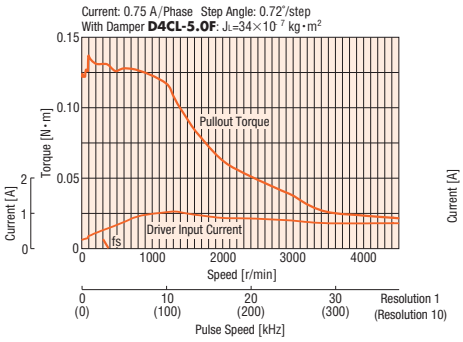
Specifications RoHS

Model			CRK543AKD / CRK543BKD	CRK544AKD / CRK544BKD	CRK545AKD / CRK545BKD	CRK564AKD / CRK564BKD	CRK566AKD / CRK566BKD	CRK569AKD / CRK569BKD
Maximum Holding Torque		N·m	0.13	0.18	0.24	0.42	0.83	1.66
Rotor Inertial Moment		J: kg·m^2	35×10^{-7}	54×10^{-7}	68×10^{-7}	175×10^{-7}	280×10^{-7}	560×10^{-7}
Rated Current		A/Phase	0.75			1.4		
Basic Step Angle			0.72°					
Power Supply Input			24 VDC±10% 1.4 A			24 VDC±10% 2.5 A		
Excitation Mode			Microstep					
Mass	Motor	kg	0.25	0.3	0.4	0.6	0.8	1.3
	Driver	kg	0.2					
Dimension No.	Motor		6			7		
	Driver		22					

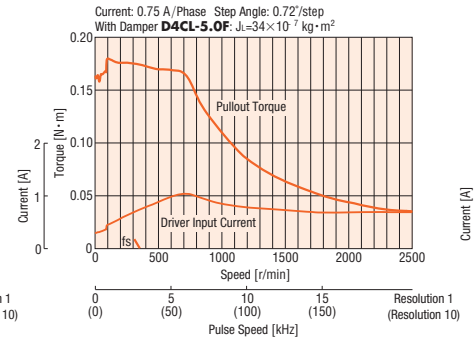
How to read specifications table ➜ Page 10

Speed - Torque Characteristics fs: Maximum Starting Frequency

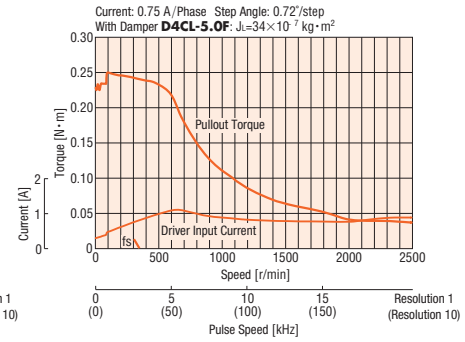
CRK543AKD/CRK543BKD



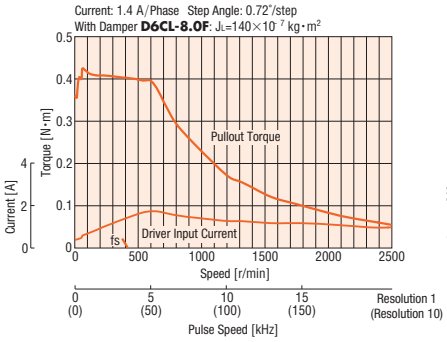
CRK544AKD/CRK544BKD



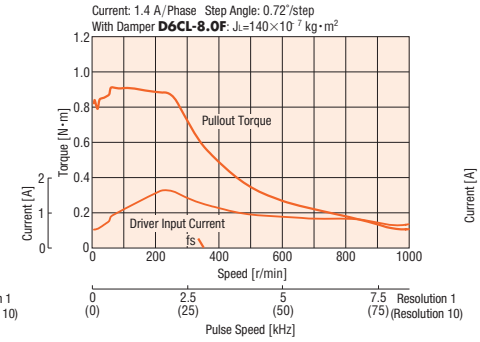
CRK545AKD/CRK545BKD



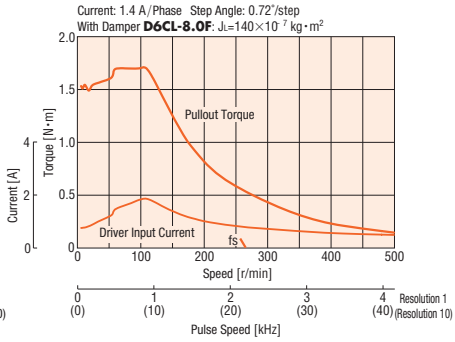
CRK564AKD/CRK564BKD



CRK566AKD/CRK566BKD



CRK569AKD/CRK569BKD



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

Standard Type with Electromagnetic Brake Motor Frame Size 42 mm, 60 mm

Specifications RoHS

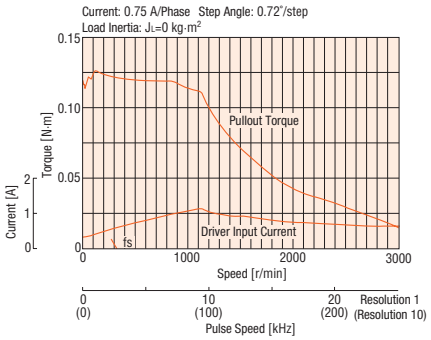
CE

Model	Single Shaft		CRK543AMKD	CRK544AMKD	CRK545AMKD	CRK564AMKD	CRK566AMKD	CRK569AMKD
Maximum Holding Torque		N·m	0.13	0.18	0.24	0.42	0.83	1.66
Rotor Inertial Moment		J: kg·m^2	50×10^{-7}	69×10^{-7}	83×10^{-7}	335×10^{-7}	440×10^{-7}	720×10^{-7}
Rated Current		A/Phase	0.75			1.4		
Basic Step Angle			0.72°					
Power Supply Input			24 VDC±10% 1.4 A			24 VDC±10% 2.5 A		
Excitation Mode			Microstep					
Electromagnetic Brake	Type		Power Off Activated Type					
	Power Supply Voltage		24 VDC±5%					
	Power Supply Current	A	0.08			0.25		
	Static Friction Torque	N·m	0.22			0.8		
	Brake Activate Time	ms	20					
	Brake Release Time	ms	30					
	Time Rating		Continuous					
Mass	Motor	kg	0.37	0.42	0.52	0.9	1.1	1.6
	Driver	kg	0.2					
Dimension No.	Motor		8			9		
	Driver		22					

How to read specifications table ➜ Page 10

Speed - Torque Characteristics fs: Maximum Starting Frequency

CRK543AMKD



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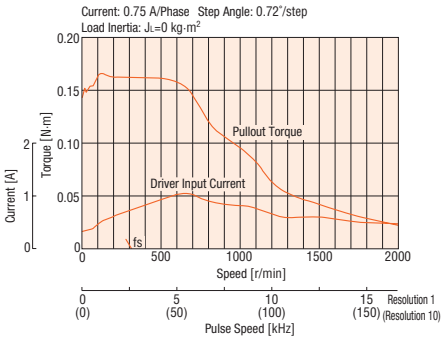

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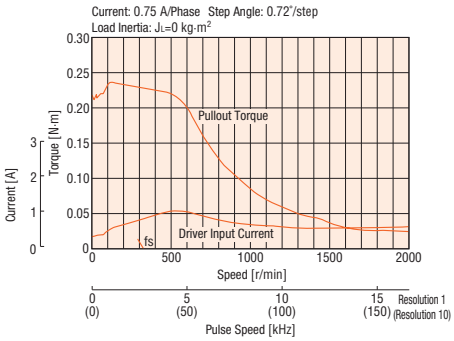

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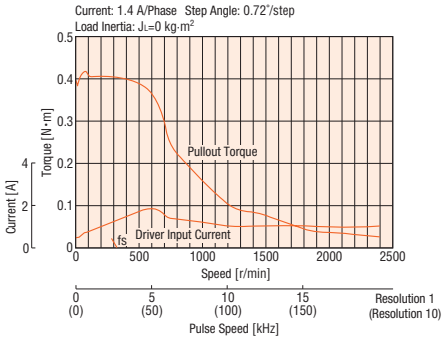
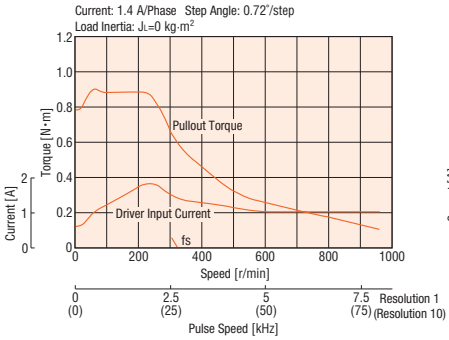
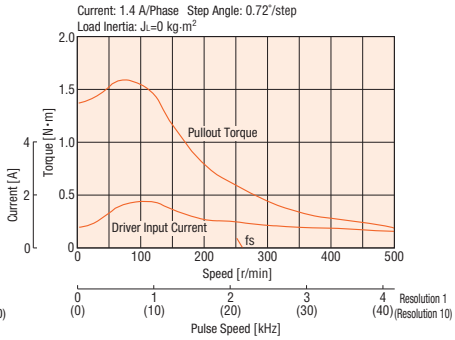


CRK566AMKD



CRK569AMKD



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

Standard Type with Encoder Motor Frame Size 42 mm, 60 mm

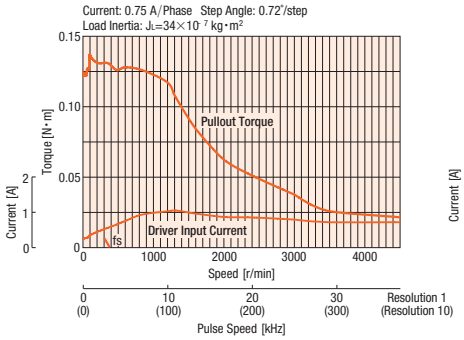
Specifications RoHS

Model			CRK543RKD	CRK544RKD	CRK545RKD	CRK564RKD	CRK566RKD	CRK569RKD
Maximum Holding Torque		N·m	0.13	0.18	0.24	0.42	0.83	1.66
Rotor Inertial Moment		J: kg·m^2	40×10^{-7}	59×10^{-7}	73×10^{-7}	185×10^{-7}	290×10^{-7}	570×10^{-7}
Rated Current		A/Phase	0.75			1.4		
Basic Step Angle			0.72°					
Power Supply Input			24 VDC±10% 1.4 A			24 VDC±10% 2.5 A		
Excitation Mode			Microstep					
Mass	Motor	kg	0.31	0.36	0.46	0.7	0.9	1.4
	Driver	kg	0.2					
Dimension No.	Motor		10			11		
	Driver		22					

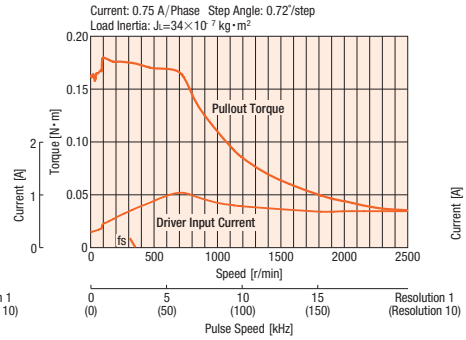
How to read specifications table ➜ Page 10

Speed - Torque Characteristics fs: Maximum Starting Frequency

CRK543RKD



CRK544RKD



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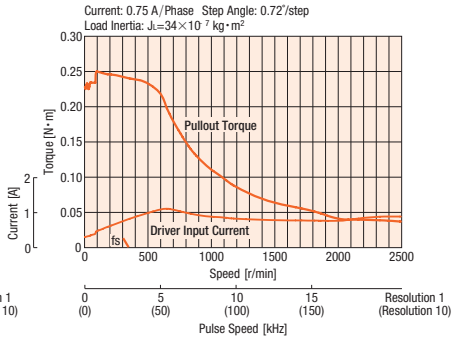

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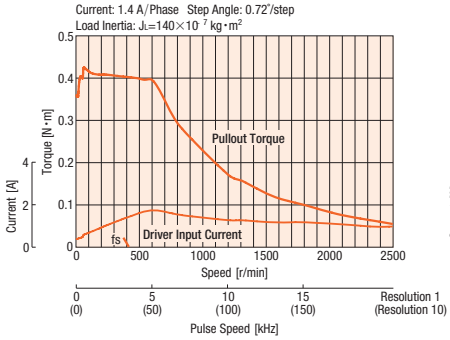

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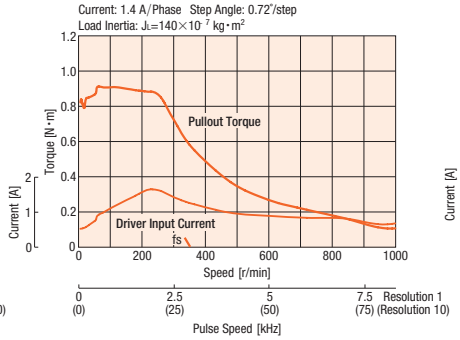

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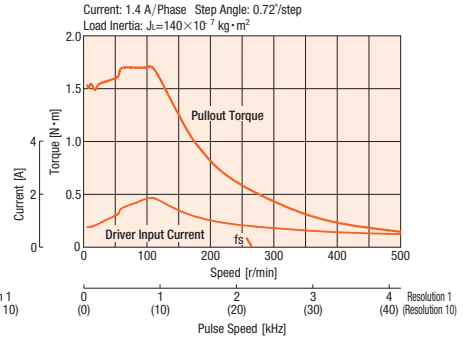


Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C. (Keep the temperature of the encoder case under 80°C.)
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 28 mm

Specifications RoHS

CE

Model		CRK523PAKD-T7.2*	CRK523PAKD-T10*	CRK523PAKD-T20*	CRK523PAKD-T30*
	Double Shaft	CRK523PBKD-T7.2*	CRK523PBKD-T10*	CRK523PBKD-T20*	CRK523PBKD-T30*
Maximum Holding Torque	N·m	0.2	0.3	0.4	0.5
Rotor Inertial Moment	J: kg·m^2	9×10^{-7}			
Rated Current	A/Phase	0.35			
Basic Step Angle		0.1°	0.072°	0.036°	0.024°
Gear Ratio		1:7.2	1:10	1:20	1:30
Permissible Torque	N·m	0.2	0.3	0.4	0.5
Backlash	arc minute (degrees)	60 (1°)			
Permissible Speed Range	r/min	0～416	0～300	0～150	0～100
Power Supply Input		24 VDC±10% 0.7 A			
Excitation Mode		Microstep			
Mass	Motor kg	0.17			
	Driver kg	0.2			
Dimension No.	Motor	12			
	Driver	22			

How to read specifications table ➜ Page 10

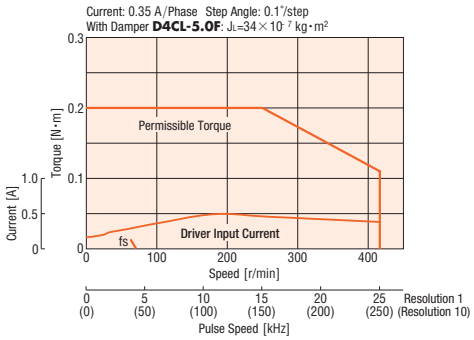
✻Motor lead wire/connector assembly (0.6 m) is included with the connector-coupled motor and driver package.

Note:

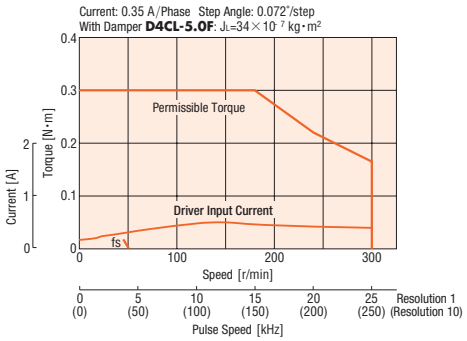
●Direction of rotation of the motor and that of the gear output shaft are the opposite for the gear ratios 1:7.2 and 1:10. It is the same for 1:20 and 1:30 gear ratios.

Speed - Torque Characteristics fs: Maximum Starting Frequency

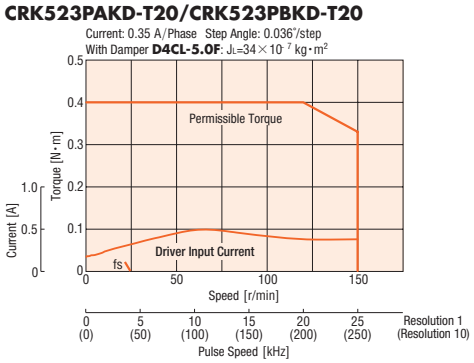
CRK523PAKD-T7.2/CRK523PBKD-T7.2



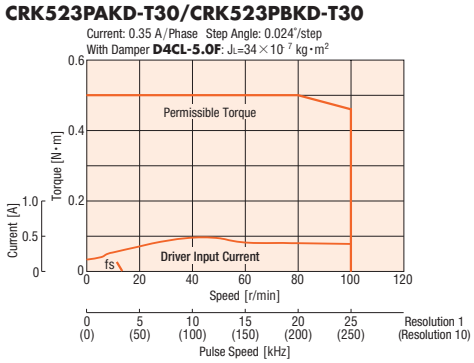
CRK523PAKD-T10/CRK523PBKD-T10



CRK523PAKD-T20/CRK523PBKD-T20



CRK523PAKD-T30/CRK523PBKD-T30



Notes:

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

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

TH Geared Type Motor Frame Size 42 mm

Specifications RoHS

Model		CRK543AKD-T3.6	CRK543AKD-T7.2	CRK543AKD-T10	CRK543AKD-T20	CRK543AKD-T30
	Double Shaft	CRK543BKD-T3.6	CRK543BKD-T7.2	CRK543BKD-T10	CRK543BKD-T20	CRK543BKD-T30
Maximum Holding Torque	N·m	0.35	0.7	1	1.5	
Rotor Inertial Moment	J: kg·m^2	35×10^{-7}				
Rated Current	A/Phase	0.75				
Basic Step Angle		0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio		1:3.6	1:7.2	1:10	1:20	1:30
Permissible Torque	N·m	0.35	0.7	1	1.5	
Backlash	arc minute (degrees)	45 (0.75°)	25 (0.417°)		15 (0.25°)	
Permissible Speed Range	r/min	0~500	0~250	0~180	0~90	0~60
Power Supply Input		24 VDC±10% 1.4 A				
Excitation Mode		Microstep				
Mass	Motor kg	0.35				
	Driver kg	0.2				
Dimension No.	Motor	13				
	Driver	22				

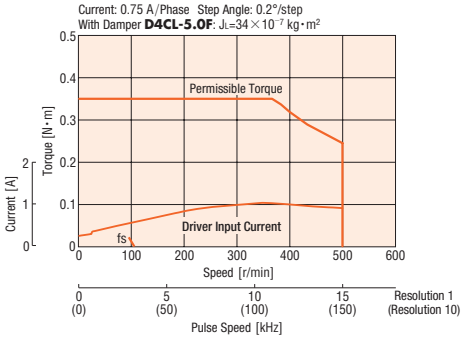
How to read specifications table ➜ Page 10

Note:

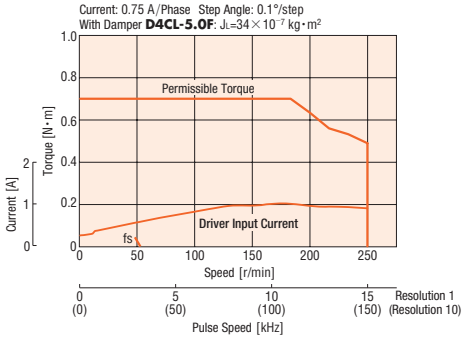
- Direction of rotation of the motor and that of the gear output shaft are the same for the gear ratios 1:3.6, 1:7.2 and 1:10. It is the opposite for 1:20 and 1:30 gear ratios.

Speed - Torque Characteristics fs: Maximum Starting Frequency

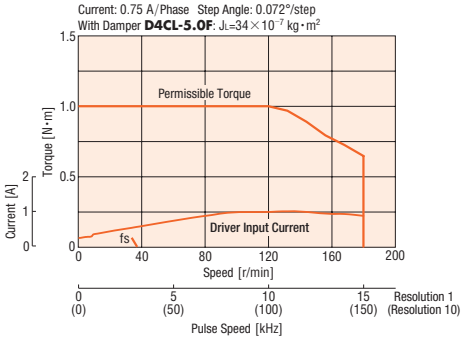
CRK543AKD-T3.6/CRK543BKD-T3.6



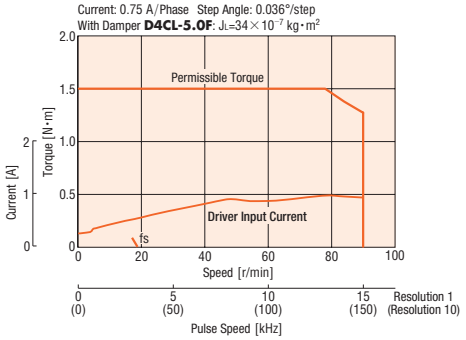
CRK543AKD-T7.2/CRK543BKD-T7.2



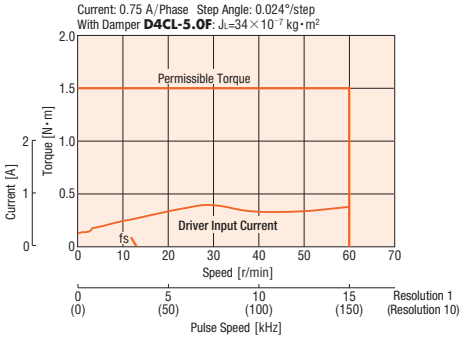
CRK543AKD-T10/CRK543BKD-T10



CRK543AKD-T20/CRK543BKD-T20



CRK543AKD-T30/CRK543BKD-T30



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 60 mm

Specifications RoHS

Model		CRK564AKD-T3.6	CRK564AKD-T7.2	CRK564AKD-T10	CRK564AKD-T20	CRK564AKD-T30
	Double Shaft	CRK564BKD-T3.6	CRK564BKD-T7.2	CRK564BKD-T10	CRK564BKD-T20	CRK564BKD-T30
Maximum Holding Torque	N·m	1.25	2.5	3	3.5	4
Rotor Inertial Moment	J: kg·m^2	175×10^{-7}				
Rated Current	A/Phase	1.4				
Basic Step Angle		0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio		1:3.6	1:7.2	1:10	1:20	1:30
Permissible Torque	N·m	1.25	2.5	3	3.5	4
Backlash	arc minute (degrees)	35 (0.584°)	15 (0.25°)		10 (0.167°)	
Permissible Speed Range	r/min	0～500	0～250	0～180	0～90	0～60
Power Supply Input		24 VDC±10% 2.5 A				
Excitation Mode		Microstep				
Mass	Motor kg	0.95				
	Driver kg	0.2				
Dimension No.	Motor	14				
	Driver	22				

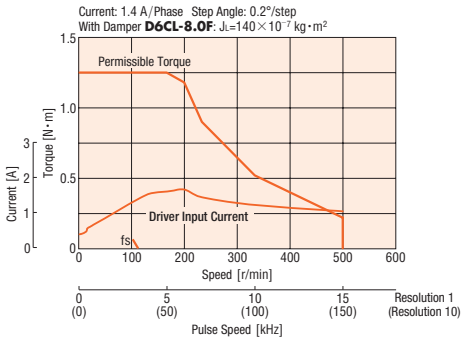
How to read specifications table ➜ Page 10

Note:

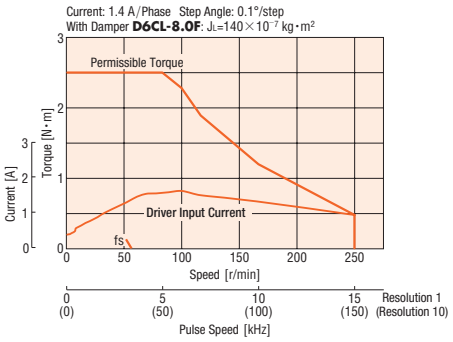
- Direction of rotation of the motor and that of the gear output shaft are the same for the gear ratios 1:3.6, 1:7.2 and 1:10. It is the opposite for 1:20 and 1:30 gear ratios.

Speed - Torque Characteristics fs: Maximum Starting Frequency

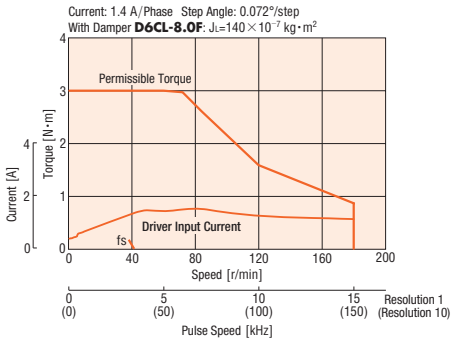
CRK564AKD-T3.6/CRK564BKD-T3.6



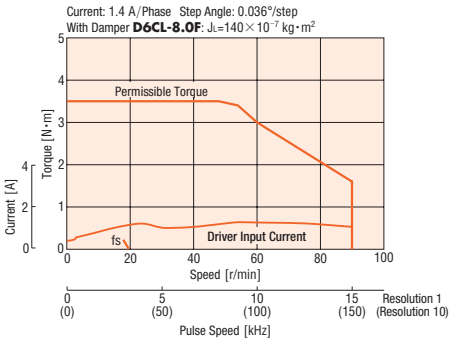
CRK564AKD-T7.2/CRK564BKD-T7.2



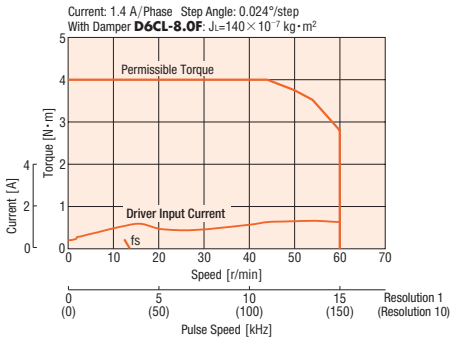
CRK564AKD-T10/CRK564BKD-T10



CRK564AKD-T20/CRK564BKD-T20



CRK564AKD-T30/CRK564BKD-T30



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

PN Geared Type Motor Frame Size 28 mm, 42 mm

Specifications RoHS

Model		CRK523PAKD-N5※1	CRK523PAKD-N7.2※1	CRK523PAKD-N10※1	CRK544AKD-N5	CRK544AKD-N7.2	CRK544AKD-N10
	Double Shaft	CRK523PBKD-N5※1	CRK523PBKD-N7.2※1	CRK523PBKD-N10※1	CRK544BKD-N5	CRK544BKD-N7.2	CRK544BKD-N10
Maximum Holding Torque	N·m	0.2	0.3	0.4	0.8	1.2	1.5
Rotor Inertial Moment	J: kg·m^2	9×10^{-7}			54×10^{-7}		
Rated Current	A/Phase	0.35			0.75		
Basic Step Angle		0.144°	0.1°	0.072°	0.144°	0.1°	0.072°
Gear Ratio		1:5	1:7.2	1:10	1:5	1:7.2	1:10
Permissible Torque	N·m	0.2	0.3	0.4	0.8	1.2	1.5
Maximum Torque※2	N·m	0.5			1.5	2	
Backlash	arc minute (degrees)	3 (0.05°)			2 (0.034°)		
Angular Transmission Error	arc minute (degrees)	6 (0.1°)					
Permissible Speed Range	r/min	0～600	0～416	0～300	0～600	0～416	0～300
Power Supply Input		24 VDC±10% 0.7 A			24 VDC±10% 1.4 A		
Excitation Mode		Microstep					
Mass	Motor kg	0.25			0.56		
	Driver kg	0.2					
Dimension No.	Motor	15			16		
	Driver	22					

How to read specifications table ➜ Page 10

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

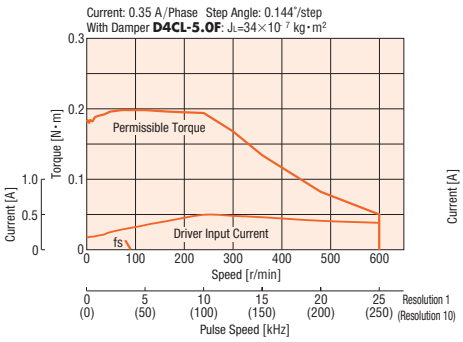
※2 The value of the maximum torque is for gear. See the speed - torque characteristics for output torque of the geared motor.

Note:

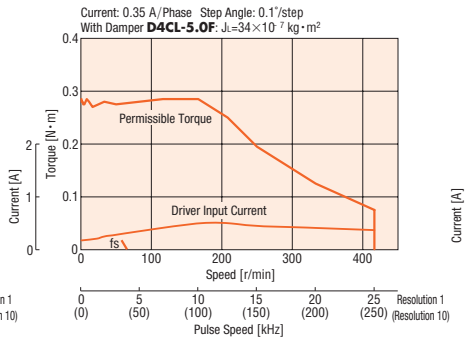
●Direction of rotation of the motor and that of the gear output shaft are the same.

Speed - Torque Characteristics fs: Maximum Starting Frequency

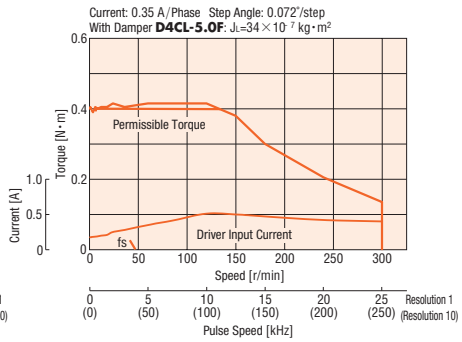
CRK523PAKD-N5/CRK523PBKD-N5



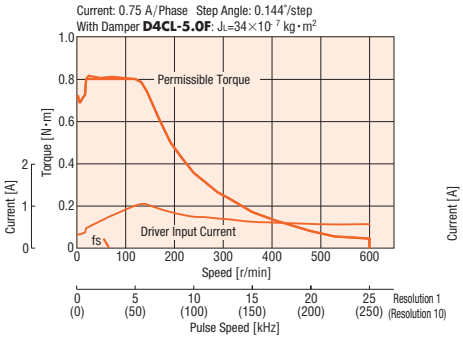
CRK523PAKD-N7.2/CRK523PBKD-N7.2



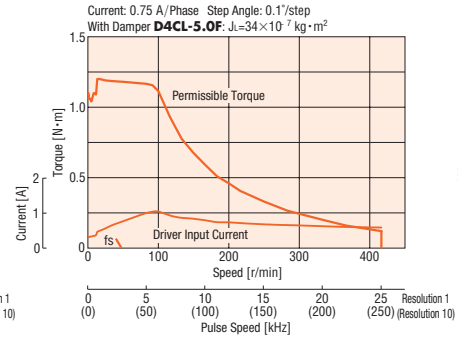
CRK523PAKD-N10/CRK523PBKD-N10



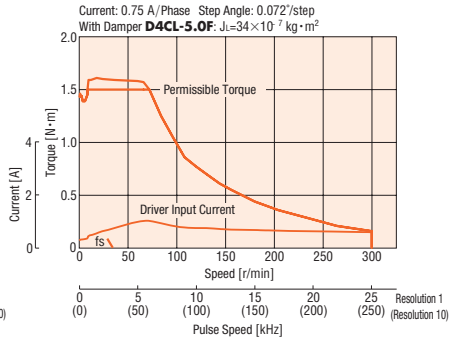
CRK544AKD-N5/CRK544BKD-N5



CRK544AKD-N7.2/CRK544BKD-N7.2



CRK544AKD-N10/CRK544BKD-N10



Notes:

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

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

PN Geared Type Motor Frame Size 60 mm

Specifications RoHS

Model			CRK566AKD-N5	CRK566AKD-N7.2	CRK566AKD-N10	CRK564AKD-N25	CRK564AKD-N36	CRK564AKD-N50
	Double Shaft		CRK566BKD-N5	CRK566BKD-N7.2	CRK566BKD-N10	CRK564BKD-N25	CRK564BKD-N36	CRK564BKD-N50
Maximum Holding Torque		N·m	3.5	4	5	8		
Rotor Inertial Moment		J: kg·m^2	280×10^{-7}			175×10^{-7}		
Rated Current		A/Phase	1.4					
Basic Step Angle			0.144°	0.1°	0.072°	0.0288°	0.02°	0.0144°
Gear Ratio			1:5	1:7.2	1:10	1:25	1:36	1:50
Permissible Torque		N·m	3.5	4	5	8		
Maximum Torque*		N·m	7	9	11	16	20	
Backlash		arc minute (degrees)	2 (0.034°)			3 (0.05°)		
Angular Transmission Error		arc minute (degrees)	5 (0.084°)					
Permissible Speed Range		r/min	0～600	0～416	0～300	0～120	0～83	0～60
Power Supply Input			24 VDC±10% 2.5 A					
Excitation Mode			Microstep					
Mass	Motor	kg	1.5					
	Driver	kg	0.2					
Dimension No.	Motor		17					
	Driver		22					

How to read specifications table ➜ Page 10

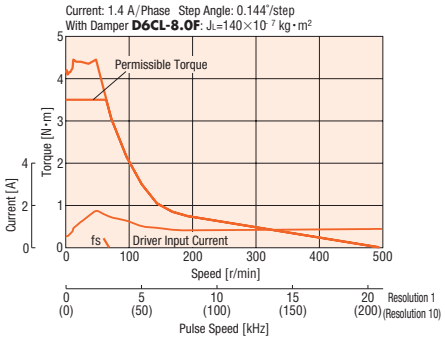
*The value of the maximum torque is for gear. See the speed - torque characteristics for output torque of the geared motor.

Note:

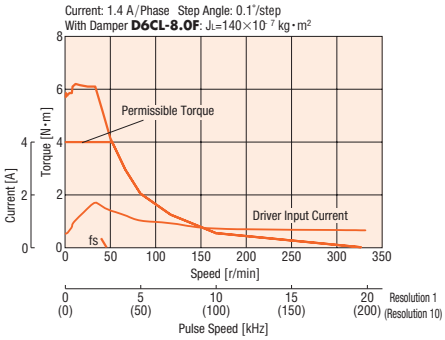
●Direction of rotation of the motor and that of the gear output shaft are the same.

Speed - Torque Characteristics fs: Maximum Starting Frequency

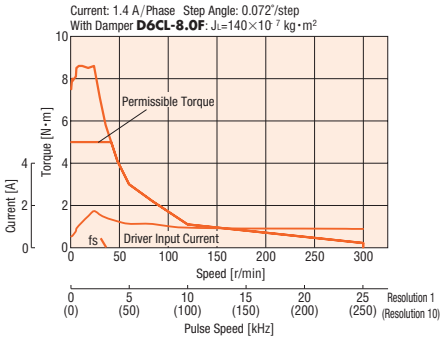
CRK566AKD-N5/CRK566BKD-N5



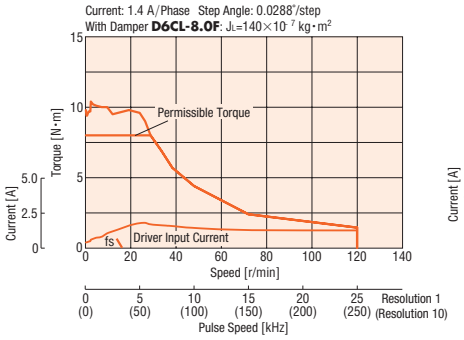
CRK566AKD-N7.2/CRK566BKD-N7.2



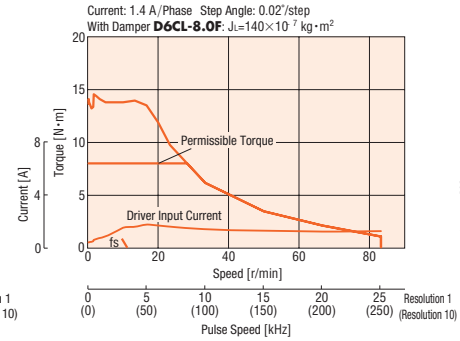
CRK566AKD-N10/CRK566BKD-N10



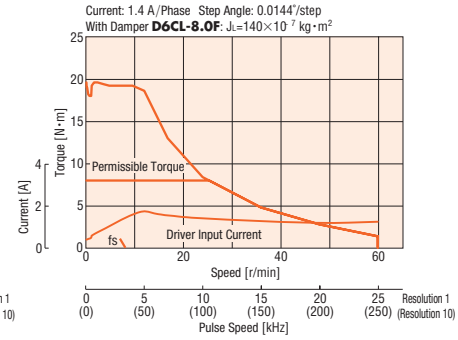
CRK564AKD-N25/CRK564BKD-N25



CRK564AKD-N36/CRK564BKD-N36



CRK564AKD-N50/CRK564BKD-N50



Notes:

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

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

Harmonic Geared Type Motor Frame Size 20 mm, 30 mm

Specifications RoHS

Model		CRK513PAKD-H50*1	CRK513PAKD-H100*1	CRK523PAKD-H50*1	CRK523PAKD-H100*1
	Double Shaft	CRK513PBKD-H50*1	CRK513PBKD-H100*1	CRK523PBKD-H50*1	CRK523PBKD-H100*1
Maximum Holding Torque	N·m	0.4	0.6	1.8	2.4
Rotor Inertial Moment	J: kg·m^2	3.1×10^{-7}		12×10^{-7}	
Rated Current	A/Phase	0.35		0.75	
Basic Step Angle		0.0144°	0.0072°	0.0144°	0.0072°
Gear Ratio		1:50	1:100	1:50	1:100
Permissible Torque	N·m	0.4	0.6	1.8	2.4
Maximum Torque*2	N·m	0.9	1.4	3.3	4.8
Lost Motion (Load Torque)	arc minute	2 max. (±0.02 N·m)	2 max. (±0.03 N·m)	1.5 max. (±0.09 N·m)	1.5 max. (±0.12 N·m)
Permissible Speed Range	r/min	0~90	0~45	0~70	0~35
Power Supply Input		24 VDC±10% 0.7 A		24 VDC±10% 1.4 A	
Excitation Mode		Microstep			
Mass	Motor kg	0.08		0.2	
	Driver kg	0.2			
Dimension No.	Motor	18		19	
	Driver	22			

How to read specifications table ➜ Page 10

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

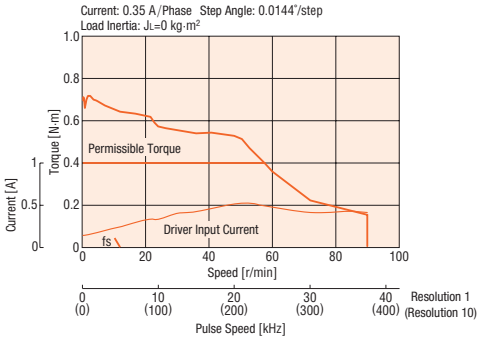
*2 The value of the maximum torque is for gear. See the speed - torque characteristics for output torque of the geared motor.

Notes:

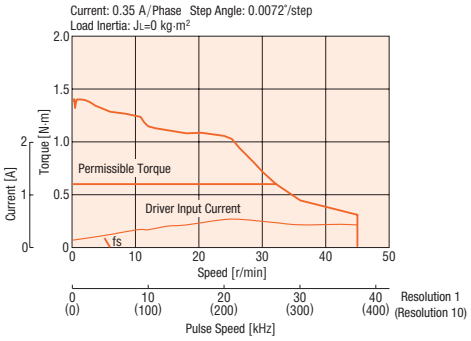
- The inertia represents a sum of the inertia of the harmonic gear converted to a motor shaft value, and the rotor inertia.
- Direction of rotation of the motor and that of the gear output shaft are the opposite.

Speed - Torque Characteristics fs: Maximum Starting Frequency

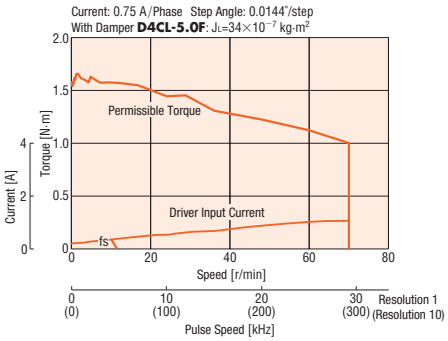
CRK513PAKD-H50/CRK513PBKD-H50



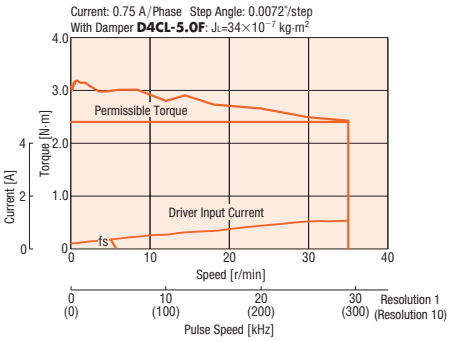
CRK513PAKD-H100/CRK513PBKD-H100



CRK523PAKD-H50/CRK523PBKD-H50



CRK523PAKD-H100/CRK523PBKD-H100



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- In order to prevent degradation of the gear grease in harmonic gear, keep the temperature of the gear case under 70°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

Harmonic Geared Type Motor Frame Size 42 mm, 60 mm

Specifications RoHS

Model			CRK543AKD-H50	CRK543AKD-H100	CRK564AKD-H50	CRK564AKD-H100
	Single Shaft / Double Shaft		CRK543BKD-H50	CRK543BKD-H100	CRK564BKD-H50	CRK564BKD-H100
Maximum Holding Torque		N·m	3.5	5	5.5	8
Rotor Inertial Moment		J: kg·m^2	52×10^{-7}		210×10^{-7}	
Rated Current		A/Phase	0.75		1.4	
Basic Step Angle			0.0144°	0.0072°	0.0144°	0.0072°
Gear Ratio			1:50	1:100	1:50	1:100
Permissible Torque		N·m	3.5	5	5.5	8
Maximum Torque*		N·m	8.3	11	18	28
Lost Motion (Load Torque)		arc minute	1.5 max. (±0.16 N·m)	1.5 max. (±0.2 N·m)	0.7 max. (±0.28 N·m)	0.7 max. (±0.39 N·m)
Permissible Speed Range		r/min	0～70	0～35	0～70	0～35
Power Supply Input			24 VDC±10% 1.4 A		24 VDC±10% 2.5 A	
Excitation Mode			Microstep			
Mass	Motor	kg	0.46		1.08	
	Driver	kg	0.2			
Dimension No.	Motor		20		21	
	Driver		22			

How to read specifications table ➜ Page 10

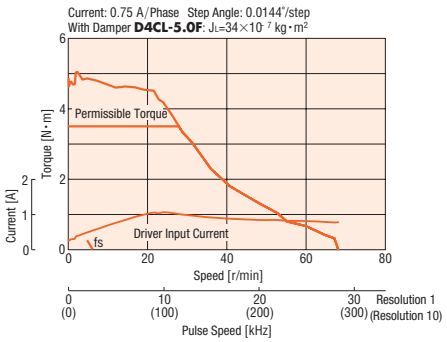
*The value of the maximum torque is for gear. See the speed - torque characteristics for output torque of the geared motor.

Notes:

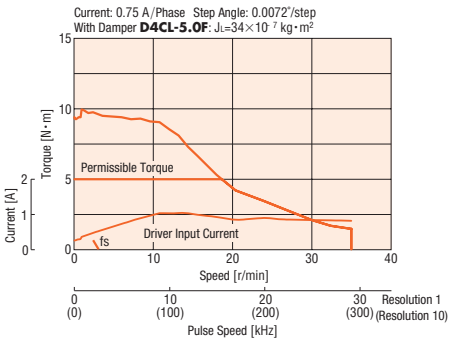
- The inertia represents a sum of the inertia of the harmonic gear converted to a motor shaft value, and the rotor inertia.
- Direction of rotation of the motor and that of the gear output shaft are the opposite.

Speed - Torque Characteristics fs: Maximum Starting Frequency

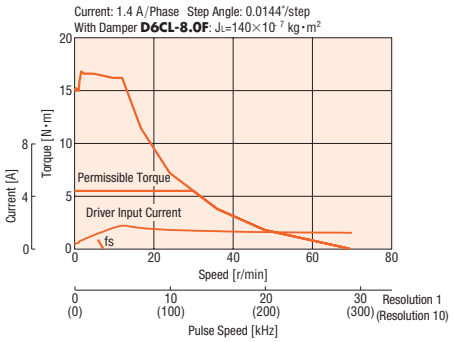
CRK543AKD-H50/CRK543BKD-H50



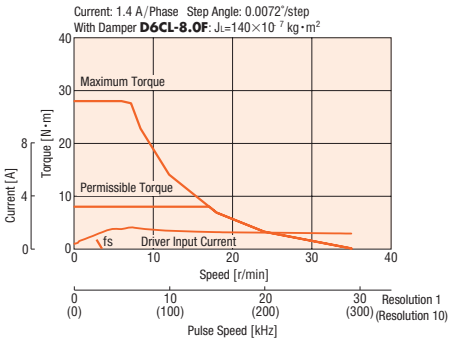
CRK543AKD-H100/CRK543BKD-H100



CRK564AKD-H50/CRK564BKD-H50



CRK564AKD-H100/CRK564BKD-H100



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep temperature of the motor case under 100°C.
- In order to prevent degradation of the gear grease in harmonic gear, keep the temperature of the gear case under 70°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

Driver Specifications

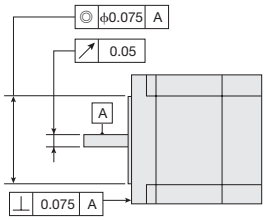
Protective Functions		When the following protective functions are activated, an alarm signal is output and the motor will coast to a stop. Overheat, Overvoltage, Overflow, ±LS both side active, Reverse limit sensor connection, Home seeking error, Home seeking offset error, No HOMES, TIM / Z / SLIT input error, Hardware overtravel, Software overtravel, Invalid operation data, RS-485 communication error, RS-485 communication timeout, EEPROM error
Input Signals		Photocoupler input, Input resistance: 4.4 kΩ, Input signal voltage: 21.6 to 26.4 V (START, ALM-RST, AWO, STOP, M0, M1, M2, M3, M4, M5, HOME/P-PRESET, FWD, RVS, +LS, −LS, HOMES, SLIT) Line Receiver Input (ENC-A, ENC-B): Input frequency: 100 kHz max., Counting range: −2 147 483 648 to +2 147 483 647 pulse, Counting mode: 90° phase difference input, multiplied by 1, Interface: Differential line receiver (26C32 or equivalent) Line Receiver Input (ENC-Z): Input width: 1 ms or more, Interface: Differential line receiver (26C32 or equivalent)
Output Signals		Photocoupler, Open-collector output (ALM, MOVE, OUT1, OUT2, OUT3, OUT4): External use condition: 26.4 VDC maximum, 20 mA maximum Line driver output (PLS-OUT, DIR-OUT): External use condition: Connect a terminal resistor of 100 Ω or more between the driver and the input of the line receiver. Interface: Differential line receiver (26C31 or equivalent)
Positioning Data	Setting Mode	Incremental (relative distance specification) mode/Absolute (absolute position specification) mode
	Number of setting data	63
Positioning Control	Mode	Sequential positioning, Data-select positioning
	Position setting range	−8 388 608 to +8 388 607 Steps
	Starting speed setting range	1 to 500 000 Hz
	Operating speed setting range	1 to 500 000 Hz
	Acceleration/Deceleration rate setting range	0.001 to 1000 ms/kHz
Operating Function		Positioning Operation (Single, Linked and Sequential Operation), Speed Control Operation, Home Seeking Operation
Return-to-Mechanical Home Operation		Return-to-home operation is performed from the entire range using mechanical position detection signals (+LS, –LS, HOMELS)
Communication Control Mode		RS-485 Serial Communication from Programmable Controller (Master Device)
Communication Setting Method		Setting by RS-485 Serial Communications Data Transmit
Communication Specifications ①	Protocol	Modbus Protocol (Modbus RTU Mode)
	Electrical Characteristics	In conformance with EIA-485 Use a twisted pair cable (TIA/EIA-568B CAT5e or higher is recommended) and keep the total wiring distance including extension to 50 m or less.
	Transmission Mode	Half Duplex
	Baud Rate	9600 bps/19200 bps/38400 bps/57600 bps/115200 bps
	Physical Layer	Asynchronous Communication (Data length: 8 bits, Stop Bit: 1bit/2 bit, Parity: Non/Even/Odd)
Communication Specifications ②	Protocol	GW Protocol Ver. 1 (Oriental Motor's original protocol)
	Electrical Characteristics	In conformance with EIA-485 Use a twisted pair cable (TIA/EIA-568B CAT5e or higher is recommended) and keep the total wiring distance including extension to 50 m or less.
	Transmission Mode	Half Duplex
	Baud Rate	9600 bps/19200 bps/38400 bps/57600 bps/115200 bps/250000 bps/312500 bps/625000 bps
	Physical Layer	Asynchronous Communication (Data length: 8 bits, Stop Bit: 1 bit/2 bit, Parity: Non)
Connection Pattern		Up to 31 drivers can be connected to one programmable controller (master device).
Other Functions		Motor Direction Setting Function, Motor Resolution Setting Function (16 Levels), Stepout Detection Function, Encoder Electronic Gear Setting Function, Operating Current Setting Function (5 to 100%), Standstill Current Setting Function (5 to 50%), Hardware Overtravel Function, Software Overtravel Function, AWO Input Logic Setting Function, Stop Input Logic Setting Function, LS Input Logic Setting Function, HOMES Input Logic Setting Function, SLIT Input Logic Setting Function, Area Output Function, Group Sending Function (RS-485 Communication only), OUT1 to 4 Output Setting Function (AREA, TIM, READY, WNG, HOME-P, ZSG, R-OUT1, R-OUT2, R-OUT3, R-OUT4, O.H. , STEPOUT), Teaching Function, Test Function, Warning Output Function (Overflow, Overheat, Overvoltage, RS-485 Communication Error)

General Specifications

Item		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.	100 MΩ or more when 500 VDC megger is applied between the following places under normal ambient temperature and humidity. FG Terminal - Power Supply Input Terminal
Dielectric Strength		Sufficient to withstand 1.5 kVAC at 50 Hz or 60 Hz applied between the windings and the case for 1 minute under normal ambient temperature and humidity. ✻1.0 kVAC for **CRK54**□ 0.5 kVAC for **CRK513P**, **CRK52**□**PM**, **CRK52**□**P**, **CRK54**□**PM**, **CRK54**□**P**	Sufficient to withstand the following for 1 minute under normal ambient temperature and humidity: FG Terminal - Power Supply Input Terminal, 500 VAC, 50 Hz or 60 Hz
Operating Environment	Ambient Temperature	−10 to +50˚C (non-freezing): High-resolution type, High-torque type, Standard type, **TH**, **PN** geared type 0 to +40˚C (non-freezing): Harmonic geared type	0 to +40˚C (non-freezing)
	Ambient Humidity	85% or less (non-condensing)	
	Atmosphere	No corrosive gases, dust, water or oil	
Temperature Rise		Temperature rise of the windings are 80˚C or less measured by the resistance change method. (at rated current, at standstill, five phases energized)	–
Stop Position Accuracy✻1		±3 arc minutes (±0.05˚), **CRK513P**: ±10 arc minutes (±0.17˚) High-resolution type: ±2 arc minutes (±0.034˚)	–
Shaft Runout		0.05 T.I.R. (mm)✻4	–
Radial Play✻2		0.025 mm maximum of 5 N	–
Axial Play✻3		0.075 mm maximum of 10 N	–
Concentricity		0.075 T.I.R. (mm)✻4	–
Perpendicularity		0.075 T.I.R. (mm)✻4	–

Encoder Specifications

Resolution	500 P/R
Output Type	Incremental
Output Signal	3 Channel
Voltage	5 VDC±5%
Current	140 mA
Output Circuit Type	Line Driver



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

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

Permissible Overhung Load and Permissible Thrust Load

Unit = N

Type	Model	Permissible Overhung Load (Distance from Shaft End mm)					Permissible Thrust Load
		0	5	10	15	20	
High-Resolution Type High-Torque Type	**CRK513P**□**KD**	12	15	–	–	–	The permissible thrust load shall be no greater than the motor mass.
	CRK52□**PM**□**KD** **CRK52**□**HPM**□**KD** **CRK52**□**P**□**KD** **CRK52**□**HP**□**KD**	25	34	52	–	–	
High-Torque Type with Encoder Standard Type Standard Type with Electromagnetic Brake	**CRK54**□□**KD** **CRK54**□**PM**□**KD** **CRK54**□**P**□**KD** **CRK54**□**PRKD** **CRK54**□**AMKD** **CRK54**□**RKD**	20	25	34	52	–	
	CRK56□**PM**□**KD**	90	100	130	180	270	
Standard Type with Encoder	**CRK56**□□**KD** **CRK56**□**AMKD** **CRK56**□**RKD**	63	75	95	130	190	
TH Geared Type	**CRK523P**□**KD-T**■	15	17	20	23	–	10
	CRK543□**KD-T**■	10	14	20	30	–	15
	CRK564□**KD-T**■	70	80	100	120	150	40
PN Geared Type	**CRK523P**□**KD-N**■	45	60	80	100	–	20
	CRK544□**KD-N**■	100	120	150	190	–	100
	CRK566□**KD-N5**	200	220	250	280	320	100
	CRK566□**KD-N7.2, 10**	250	270	300	340	390	100
	CRK564□**KD-N**■	330	360	400	450	520	100
Harmonic Geared Type	**CRK513P**□**KD-H**■	50	75	–	–	–	60
	CRK523P□**KD-H**■	110	135	175	250	–	140
	CRK543□**KD-H**■	180	220	270	360	510	220
	CRK564□**KD-H**■	320	370	440	550	720	450

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

Dimensions (Unit = mm)

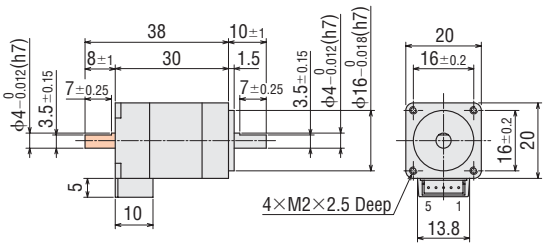
Motor

◇High-Resolution Type, High-Torque Type

1 □20 mm

Model	Motor Model	Mass kg
CRK513PAKD	PK513PA	0.05
CRK513PBKD	PK513PB	

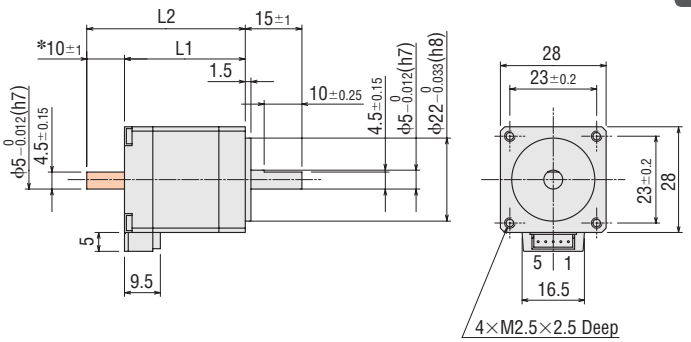
Motor lead wire/connector assembly of 0.6 m is included with the package.
UL Style 3265, AWG24
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page 44
●Applicable Connector
Connector housing: 51065-0500 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)



2 □28 mm

Model	Motor Model	L1	L2	Mass kg
CRK523□P□AKD	PK523□P□A	32	–	0.11
CRK523□P□BKD	PK523□P□B		42	
CRK524□PMAKD	PK524□PMA	40	–	0.15
CRK524□PMBKD	PK524□PMB		50	
CRK525□P□AKD	PK525□P□A	51.5	–	0.2
CRK525□P□BKD	PK525□P□B		61.5	

Motor lead wire/connector assembly of 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 44
●Applicable Connector
Connector housing: 51065-0500 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)

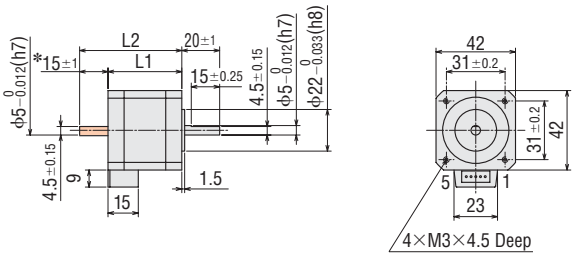


✻The length of machining on the double shaft model is 10±0.25.

3 □42 mm

Model	Motor Model	L1	L2	Mass kg
CRK544P□AKD	PK544P□A	39	–	0.3
CRK544P□BKD	PK544P□B		54	
CRK546P□AKD	PK546P□A	59	–	0.5
CRK546P□BKD	PK546P□B		74	

Motor lead wire/connector assembly of 0.6 m is included with the package.
UL Style 3265, AWG22
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page 44
●Applicable Connector
Connector housing: 51103-0500 (MOLEX)
Contact: 50351-8100 (MOLEX)
Crimp tool: 57295-5000 (MOLEX)

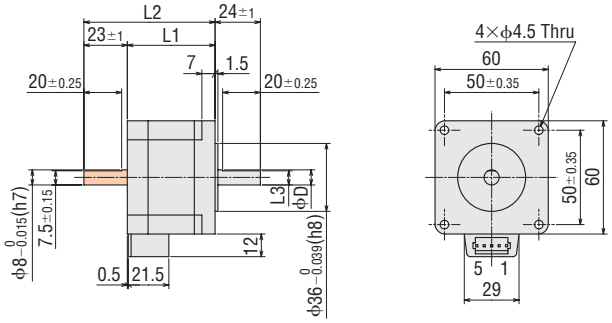


✻The length of machining on the double shaft model is 15±0.25.

4 □60 mm

Model	Motor Model	L1	L2	L3	ϕD	Mass kg
CRK564PMAKD	PK564PMA	46.5	–	7.5±0.15	8 0 -0.015	0.65
CRK564PMBKD	PK564PMB		69.5			
CRK566PMAKD	PK566PMA	56	–			0.87
CRK566PMBKD	PK566PMB		79			
CRK569PMAKD	PK569PMA	87	–	9.5±0.15	10 0 -0.015	1.5
CRK569PMBKD	PK569PMB		110			

Motor lead wire/connector assembly of 0.6 m is included with the package.
UL Style 3266, AWG22
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page 44
●Applicable Connector
Connector housing: 51144-0500 (MOLEX)
Contact: 50539-8100 (MOLEX)
Crimp tool: 57189-5000 (MOLEX)



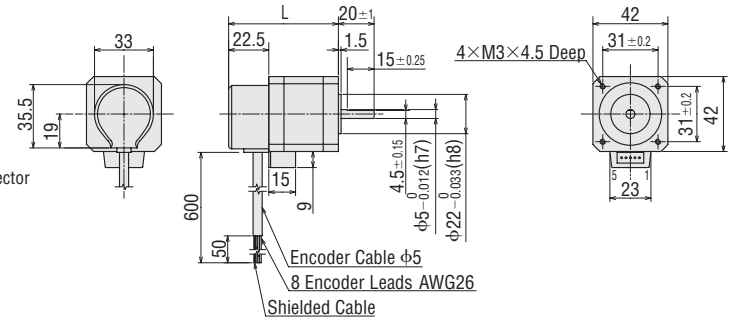
●Enter **H** in the box (□) within the model name in the case of high-speed type (0.75 A/phase).
Enter **M** in the box (▣) within the model name in the case of high-resolution type.
●These dimensions are for the double shaft models. For the single shaft models, ignore the ▭ areas.

◇High-Torque Type with Encoder

5 □42 mm

Model	Motor Model	L	Mass kg
CRK544PRKD	PK544PA-R23L	61.5	0.36
CRK546PRKD	PK546PA-R23L	81.5	0.56

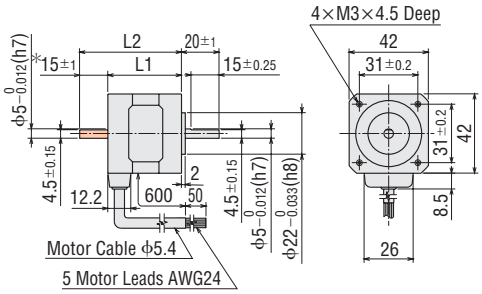
Motor lead wire/connector assembly of 0.6 m is included with the package.
UL Style 3265, AWG22
If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately.
➜ Page 44
●Applicable Connector
Connector housing: 51103-0500 (MOLEX)
Contact: 50351-8100 (MOLEX)
Crimp tool: 57295-5000 (MOLEX)



◇Standard Type

6 □42 mm

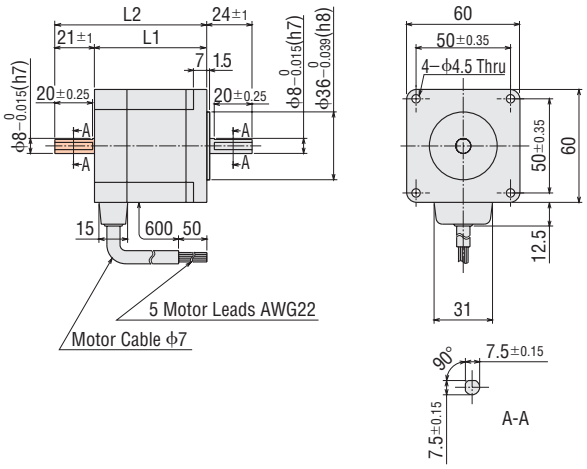
Model	Motor Model	L1	L2	Mass kg
CRK543AKD	PK543AW	33	–	0.25
CRK543BKD	PK543BW		48	
CRK544AKD	PK544AW	39	–	0.3
CRK544BKD	PK544BW		54	
CRK545AKD	PK545AW	47	–	0.4
CRK545BKD	PK545BW		62	



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

7 □60 mm

Model	Motor Model	L1	L2	Mass kg
CRK564AKD	PK564AW	48.5	–	0.6
CRK564BKD	PK564BW		69.5	
CRK566AKD	PK566AW	59.5	–	0.8
CRK566BKD	PK566BW		80.5	
CRK569AKD	PK569AW	89	–	1.3
CRK569BKD	PK569BW		110	

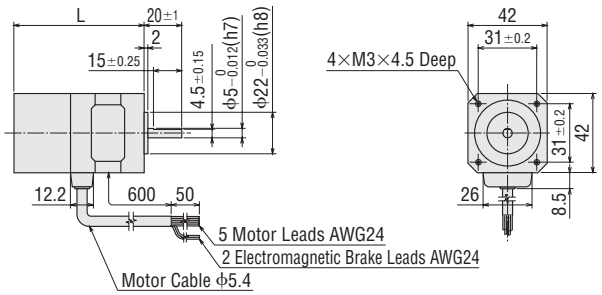


●These dimensions are for the double shaft models. For the single shaft models, ignore the areas.

◇Standard Type with Electromagnetic Brake

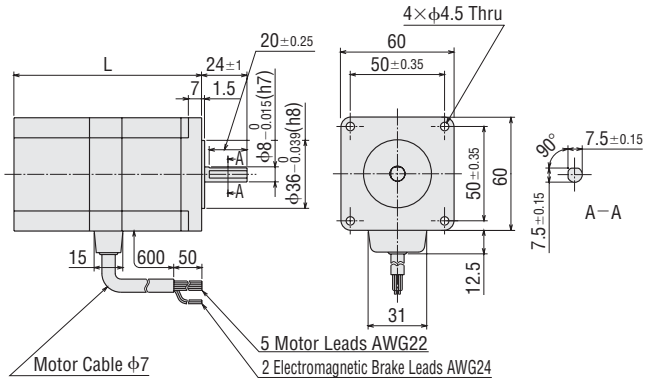
8 □42 mm

Model	Motor Model	L	Mass kg
CRK543AMKD	PK543AWM	63	0.37
CRK544AMKD	PK544AWM	69	0.42
CRK545AMKD	PK545AWM	77	0.52



9 □60 mm

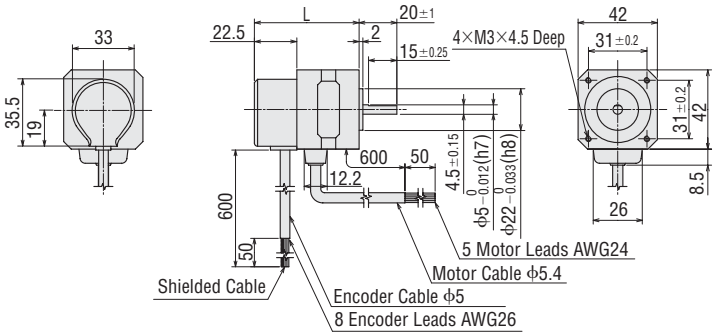
Model	Motor Model	L	Mass kg
CRK564AMKD	PK564AWM	88.5	0.9
CRK566AMKD	PK566AWM	99.5	1.1
CRK569AMKD	PK569AWM	129	1.6



◇Standard Type with Encoder

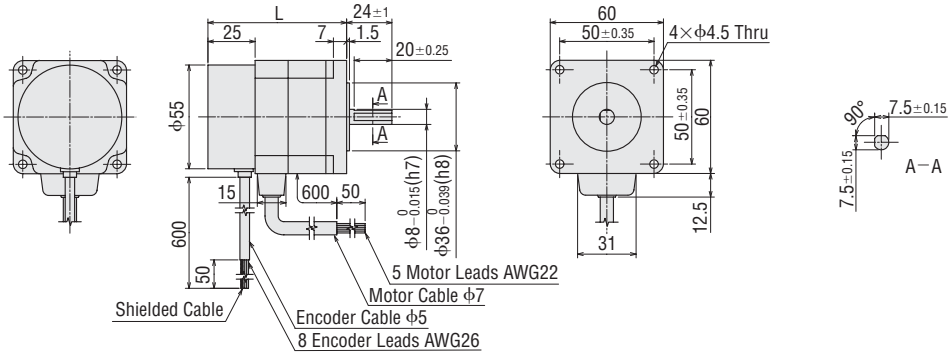
10 □42 mm

Model	Motor Model	L	Mass kg
CRK543RKD	PK543AW-R23L	55.5	0.31
CRK544RKD	PK544AW-R23L	61.5	0.36
CRK545RKD	PK545AW-R23L	69.5	0.46



11 □60 mm

Model	Motor Model	L	Mass kg
CRK564RKD	PK564AW-R23L	73.5	0.7
CRK566RKD	PK566AW-R23L	84.5	0.9
CRK569RKD	PK569AW-R23L	114	1.4



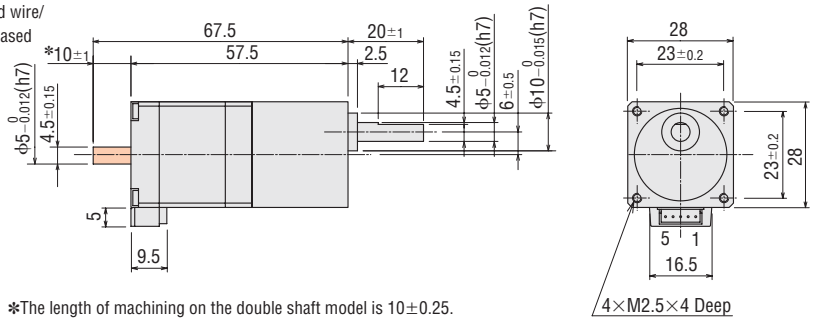
◇TH Geared Type

12 □28 mm

Model	Motor Model	Gear Ratio	Mass kg
CRK523PAKD-T□	PK523PA-T□	**7.2, 10, 20, 30**	0.17
CRK523PBKD-T□	PK523PB-T□		

Motor lead wire/connector assembly of 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 44

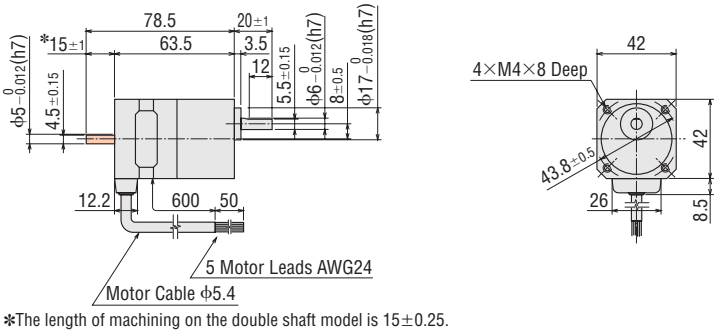
- Applicable Connector
  Connector housing: 51065-0500 (MOLEX)
  Contact: 50212-8100 (MOLEX)
  Crimp tool: 57176-5000 (MOLEX)



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

13 □42 mm

Model	Motor Model	Gear Ratio	Mass kg
CRK543AKD-T□	PK543AW-T□	**3.6, 7.2, 10, 20, 30**	0.35
CRK543BKD-T□	PK543BW-T□		



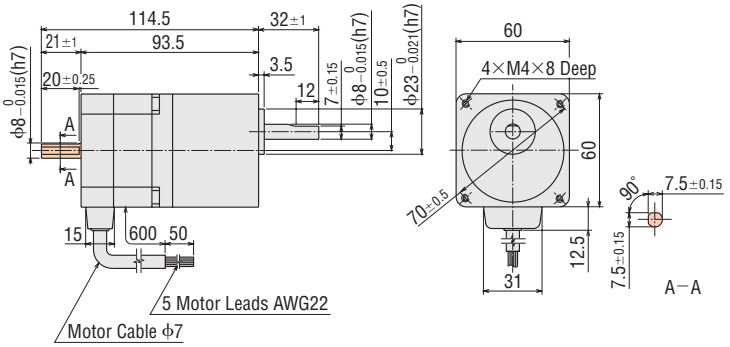
*The length of machining on the double shaft model is 15±0.25.

- Enter the gear ratio in the box (□) within the model name.
- These dimensions are for the double shaft models. For the single shaft models, ignore the ▭ areas.

◇**TH** Geared Type

14 □60 mm

Model	Motor Model	Gear Ratio	Mass kg
CRK564AKD-T□	PK564AW-T□	**3.6, 7.2, 10, 20, 30**	0.95
CRK564BKD-T□	PK564BW-T□		



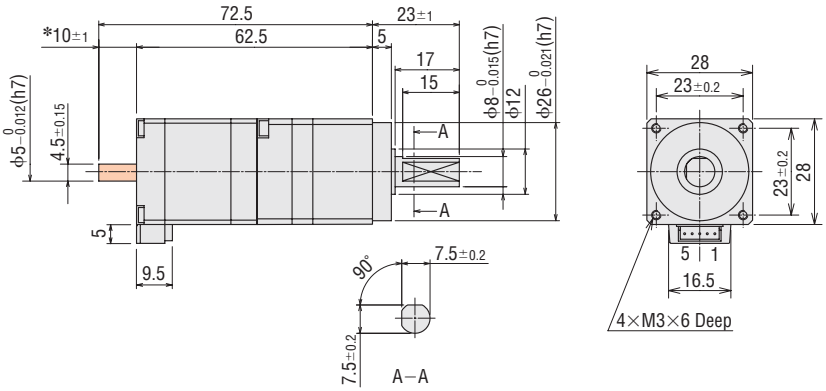
◇**PN** Geared Type

15 □28 mm

Model	Motor Model	Gear Ratio	Mass kg
CRK523PAKD-N□	PK523PA-N□	**5, 7.2, 10**	0.25
CRK523PBKD-N□	PK523PB-N□		

Motor lead wire/connector assembly of 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 44

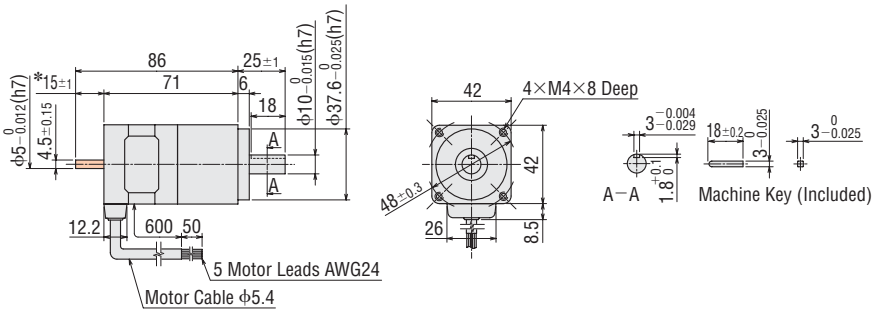
●Applicable Connector
Connector housing: 51065-0500 (MOLEX)
Contact: 50212-8100 (MOLEX)
Crimp tool: 57176-5000 (MOLEX)



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

16 □42 mm

Model	Motor Model	Gear Ratio	Mass kg
CRK544AKD-N□	PK544AW-N□	**5, 7.2, 10**	0.56
CRK544BKD-N□	PK544BW-N□		



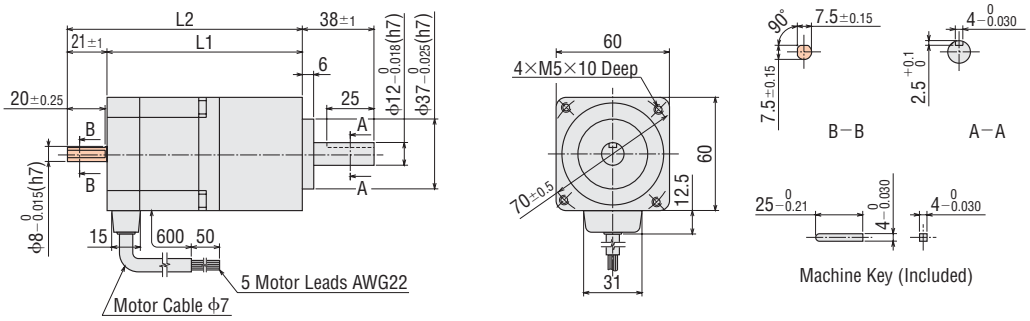
✻The length of machining on the double shaft model is 15±0.25.

●Enter the gear ratio in the box (□) within the model name.
●These dimensions are for the double shaft models. For the single shaft models, ignore the ▭ areas.

◇**PN** Geared Type

17 □60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass kg
CRK566AKD-N□	PK566AW-N□	**5, 7.2, 10**	103.5	–	1.5
CRK566BKD-N□	PK566BW-N□			124.5	
CRK564AKD-N□	PK564AW-N□	**25, 36, 50**	108.5	–	1.5
CRK564BKD-N□	PK564BW-N□			129.5	



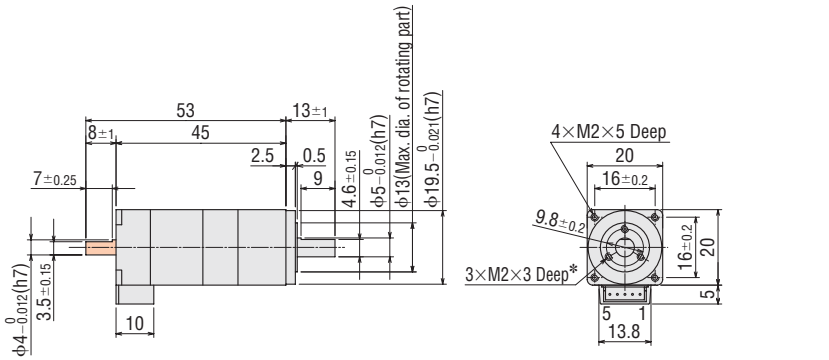
◇Harmonic Geared Type

18 □20 mm

Model	Motor Model	Gear Ratio	Mass kg
CRK513PAKD-H□	PK513PA-H□S	**50, 100**	0.08
CRK513PBKD-H□	PK513PB-H□S		

Motor lead wire/connector assembly of 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 44

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



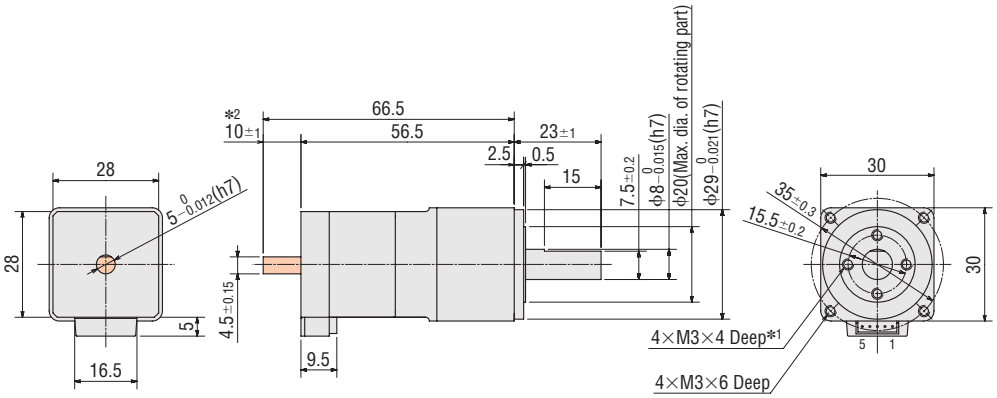
*The position of the machining on the output shaft [ϕ5] relative to the screw holes position on a maximum diameter of ϕ13 on the rotating part is arbitrary.

19 □30 mm

Model	Motor Model	Gear Ratio	Mass kg
CRK523PAKD-H□	PK523HPA-H□S	**50, 100**	0.2
CRK523PBKD-H□	PK523HPB-H□S		

Motor lead wire/connector assembly of 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 44

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



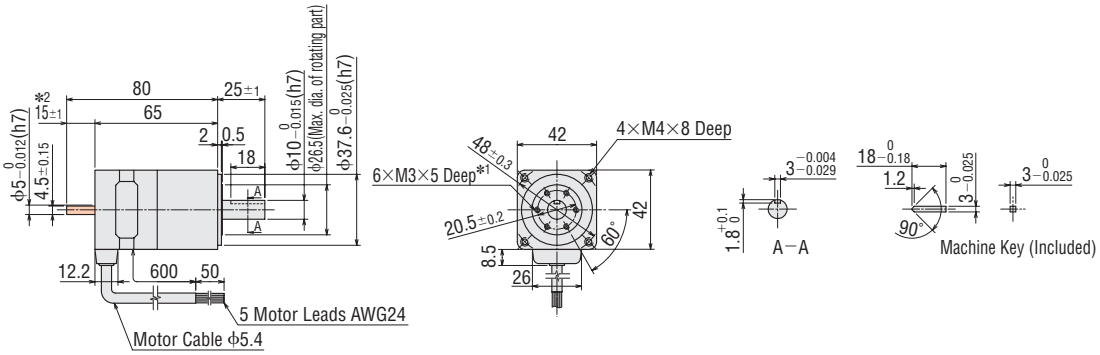
*1 The position of the machining on the output shaft [ϕ8] relative to the screw holes position on a maximum diameter of ϕ20 on the rotating part is arbitrary.
*2 The length of machining on the double shaft model is 10±0.25.

●Enter the gear ratio in the box (□) within the model name.
●These dimensions are for the double shaft models. For the single shaft models, ignore the ▭ areas.

◇Harmonic Geared Type

20 □42 mm

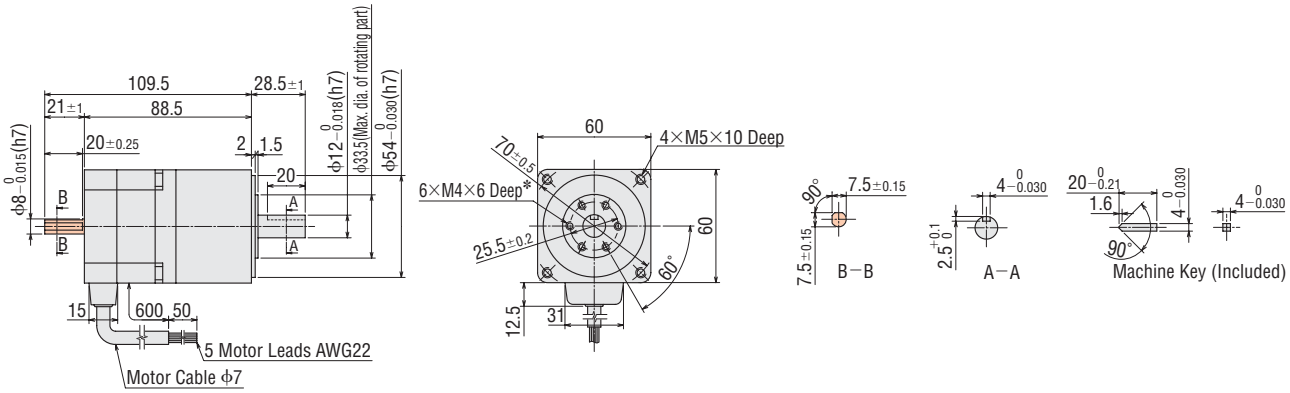
Model	Motor Model	Gear Ratio	Mass kg
CRK543AKD-H□	PK543AW-H□S	**50, 100**	0.46
CRK543BKD-H□	PK543BW-H□S		



*1 The position of the key slot on the output shaft [ϕ10] relative to the screw holes position on a maximum diameter of ϕ26.5 on the rotating part is arbitrary.
*2 The length of machining on the double shaft model is 15±0.25.

21 □60 mm

Model	Motor Model	Gear Ratio	Mass kg
CRK564AKD-H□	PK564AW-H□S	**50, 100**	1.08
CRK564BKD-H□	PK564BW-H□S		



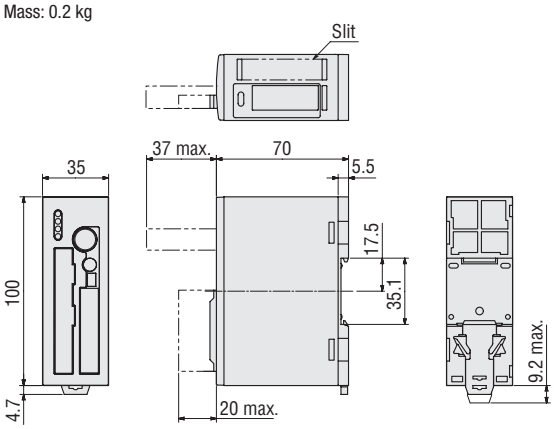
*The position of the key slot on the output shaft [ϕ12] relative to the screw holes position on a maximum diameter of ϕ33.5 on the rotating part is arbitrary.

- Enter the gear ratio in the box (□) within the model name.
- These dimensions are for the double shaft models. For the single shaft models, ignore the ▭ areas.

●Driver

22 Driver Model: CRD503-KD, CRD507-KD, CRD507H-KD, CRD514-KD

Mass: 0.2 kg

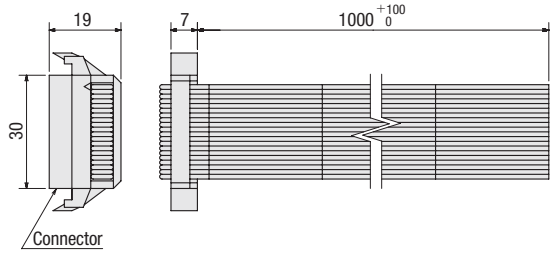


- Accessories (included)

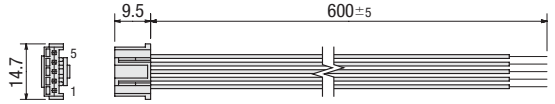
Power Connector (CN1)
Connector: MC1,5/3-STF-3, 5 (PHOENIX CONTACT Inc.)
Cable/Connector Assembly (CN2, Length: 1 m)
Connector: FX2B-40SA-1.27R (HIROSE ELECTRIC CO., LTD)
Lead Wire/Connector Assembly (For Motor Connection) (CN4, Length: 0.6 m)
Connector housing: 51103-0500 (MOLEX)
Contact: 50351-8100 (MOLEX)
Applicable crimp tool: 57295-5000 (MOLEX)
Lead Wire/Connector Assembly (For Encoder Connection) (CN5, Length: 0.6 m)*
Connector housing: 51103-0900 (MOLEX)
Contact: 50351-8000 (MOLEX)
Applicable crimp tool: 57295-5000 (MOLEX)
*Encoder Type Only

- If you are purchasing only a driver for maintenance purpose, etc., lead wire/connector assembly (for motor connection), cable/connector assembly and power connector will be supplied.

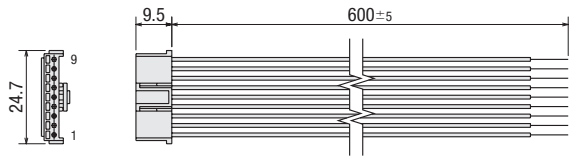
◇Cable/Connector Assembly



◇Lead Wire/Connector Assembly (For motor connection, CN4)

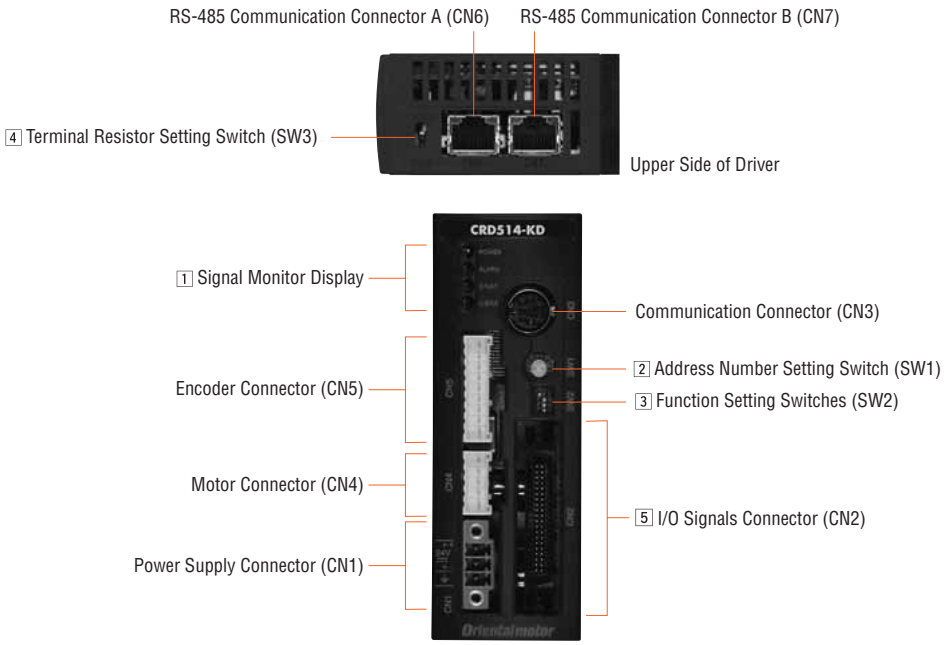


◇Lead Wire/Connector Assembly (For encoder connection, CN5)



Connection and Operation

Names and Functions of Driver Parts



1 Signal Monitor Displays

◇LED Displays

Indication	Color	Function	Description
POWER	Green	Power Display	This LED is lit while the main power is input.
ALARM	Red	Alarm Display	This LED will blink when a protective function is triggered.
C-DAT	Green	Communication Display	This LED will blink or illuminates steadily when the driver is communicating with the master station.
C-ERR	Red	Communication Error Display	This LED will illuminate when a RS-485 communication error occurs.

◇Alarm Type

No. of ALARM LED Blinks	Function	Cause
2	Overheat	The internal temperature of the driver exceeded 85°C.
3	Overvoltage	The internal voltage exceeded the permissible value.
4	Overflow*	The deviation between the encoder counter value and command position reached the stepout detection band.
7	±LS Both Sides Active	Both the +LS and −LS signals were detected.
	Reverse Limit Sensor Connection	The LS opposite to the operating direction has detected during a return-to-home operation.
	Home Seeking Error	Return-to-home operation did not complete normally.
	No HOMES	The HOMES is not detected at a position between +LS and −LS during return-to-home operation in 3-sensor mode.
	TIM, Z*, SLIT Input Error	None of the SLIT input, TIM output and ZSG output could be detected during return-to-home operation.
	Hardware Overtravel	A +LS or −LS signal was detected.
	Software Overtravel	A software limit was reached.
	Home Seeking Offset Error	A limit sensor signal was detected during offset movement as part of return-to-home operation.
	Invalid Operation Data	Operation data was invalid.
	RS-485 Communication Error	A RS-485 communication error had been detected three times consecutively.
	RS-485 Communication Timeout	The time set in the applicable parameter has elapsed, and yet the communication could not be established with the host system.
9	EEPROM Error	The stored data was damaged.

*This function is available when you use encoder type.

2 Address Number Setting Switch (SW1)

Indication	Switch Name	Function
SW1	Address Number Setting Switch	Use this LED when controlling the system via RS-485 communication. Set the address number of RS-485 communication. (Factory setting: 0)

3 Function Setting Switches (SW2)

Display	Pin No.	Function
SW2	1	Set the baud rate of RS-485 communication.
	2	
	3	
	4	Set the address of RS-485 communication. (ON: Master device of general purpose)

◇Baud Rate Setting of RS-485 Communication

Pin No. \ Baud Rate	9600 bps	19200 bps	38400 bps	57600 bps	115200 bps	250000 bps	312500 bps	625000 bps
1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
3	OFF	OFF	OFF	OFF	ON	ON	ON	ON

4 Terminal Resistor Setting Switch (SW3)

Display	Switch Name	Function
SW3	Terminal Resistor Setting Switch	Turn the terminal resistor setting switch ON and set the terminal resistor (120 Ω) for RS-485 communication. OFF: Disabled ON: Enabled

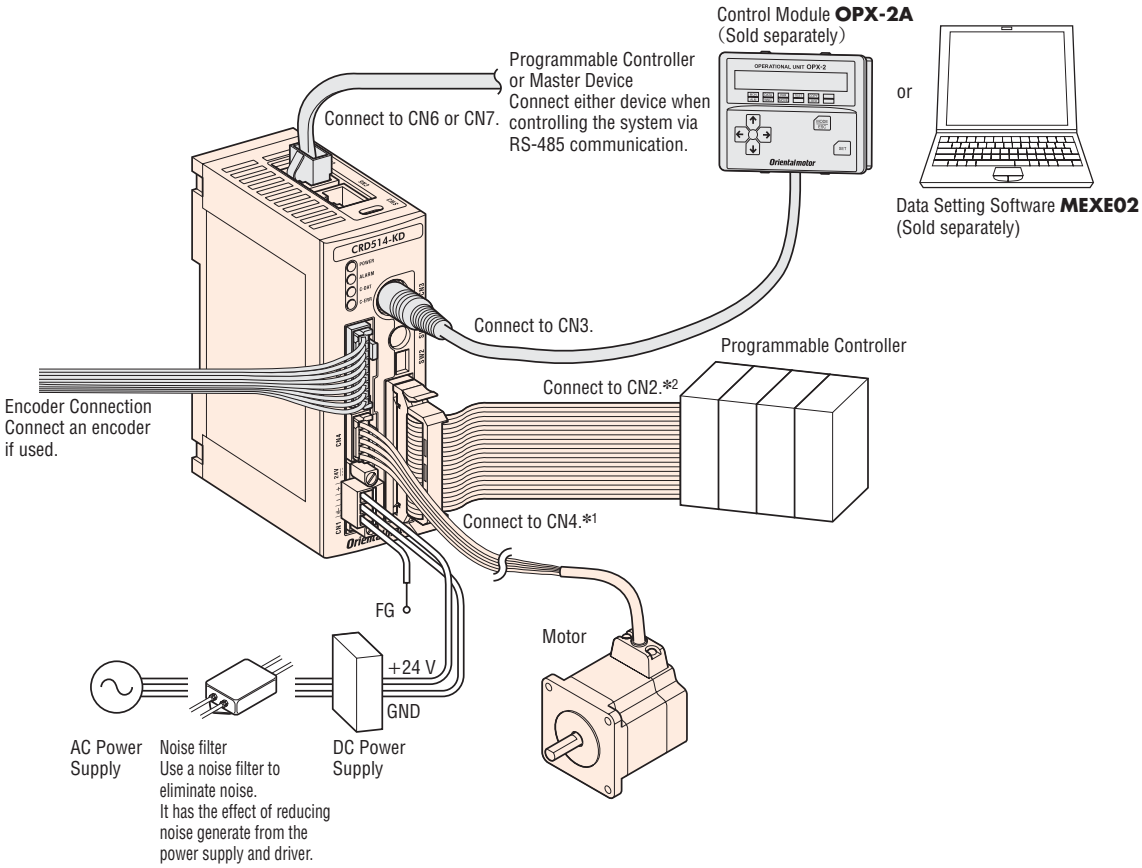
5 I/O Signals Connector (CN2, 40 pins)

Display	Input/Output	Pin No.	Signal Name	Description
CN2	Input	A1	IN-COM0	Input Common
		A2	START	Start Input
		A3	ALM-RST	Alarm Reset Input
		A4	AWO	All Windings Off Input
		A5	STOP	Stop Input
		A6	M0	Data Selection Input
		A7	M1	
		A8	M2	
		A9	M3	
		A10	M4	
		A11	M5	
		A12	HOME/P-PRESET	Return-to-Home/Position Preset Input
		A13	FWD	Forward Input
		A14	RVS	Reverse Input
		A15	+LS	+ Limit Sensor Input
		A16	−LS	− Limit Sensor Input
		A17	HOMES	Mechanical Home Sensor Input
		A18	SLIT	Slit Sensor Input
		A19	–	–
		A20	IN-COM1	Sensor Input Common
	Output	B1	MOVE+	Motor Moving Output
		B2	MOVE−	
		B3	ALM+	Alarm Output
		B4	ALM−	
		B5	OUT1+	Control Output 1* (Initial Value: AREA)
		B6	OUT1−	
		B7	OUT2+	Control Output 2* (Initial Value: READY)
		B8	OUT2−	
		B9	OUT3+	Control Output 3* (Initial Value: WNG)
		B10	OUT3−	
		B11	OUT4+	Control Output 4* (Initial Value: HOME-P)
		B12	OUT4−	
		B13	–	–
		B14	–	–
		B15	PLS-OUT+	Pulse Output (Line Driver Output)
		B16	PLS-OUT−	
		B17	DIR-OUT+	Direction Output (Line Driver Output)
		B18	DIR-OUT−	
		B19	GND	GND
		B20	–	–

*These settings can be changed using the “OUT1 signal mode selection” to “OUT4 signal mode selection” parameters.

●Connection Diagram

◇Connection to Peripheral Equipment



*1 Lead wire/connector assembly (0.6 m) is included with the motor/driver package or driver only.
*2 Cable/connector assembly (1 m) is included with the motor/driver package or driver only.

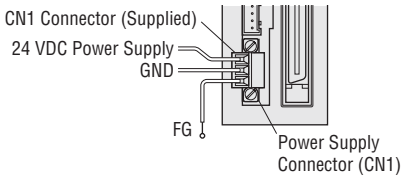
◇Connecting the Power Supply

Use the CN1 connector to connect the power supply cable (AWG22: 0.3 mm^2) to the power supply connector (CN1) on the driver.

Pay attention to polarity when connecting the power supply. Connecting the power supply in reverse polarity may damage the driver.

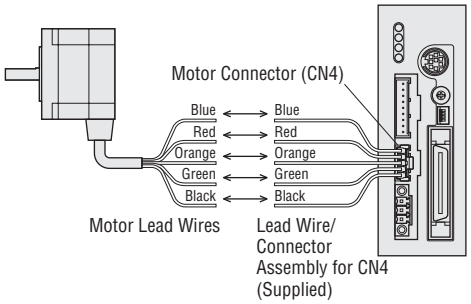
Use a power supply that can supply sufficient input current. When power supply capacity is insufficient, a decrease in motor output can cause the following malfunctions:

- Motor does not rotate properly at high speed (insufficient torque).
- Slow motor startup and stopping.



◇Connecting the Motor

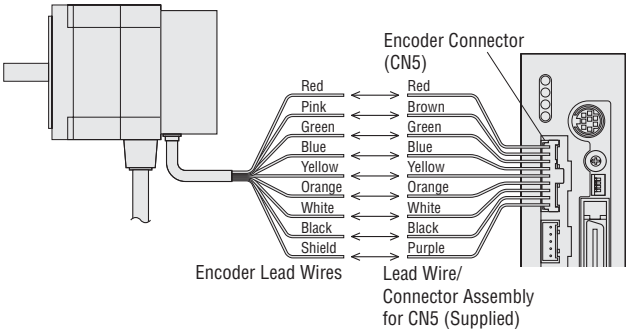
Use the lead wire/connector assembly for CN4, connect the motor to the motor connector (CN4) on the driver. The customer must provide the terminal block, connectors and other items needed to interconnect the leads.



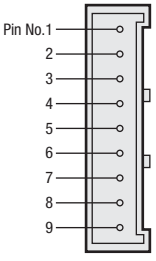
◇Connecting the Encoder

Use the lead wire/connector assembly for CN5, connect the encoder to the encoder connector (CN5) on the driver.

●Example of standard type with encoder



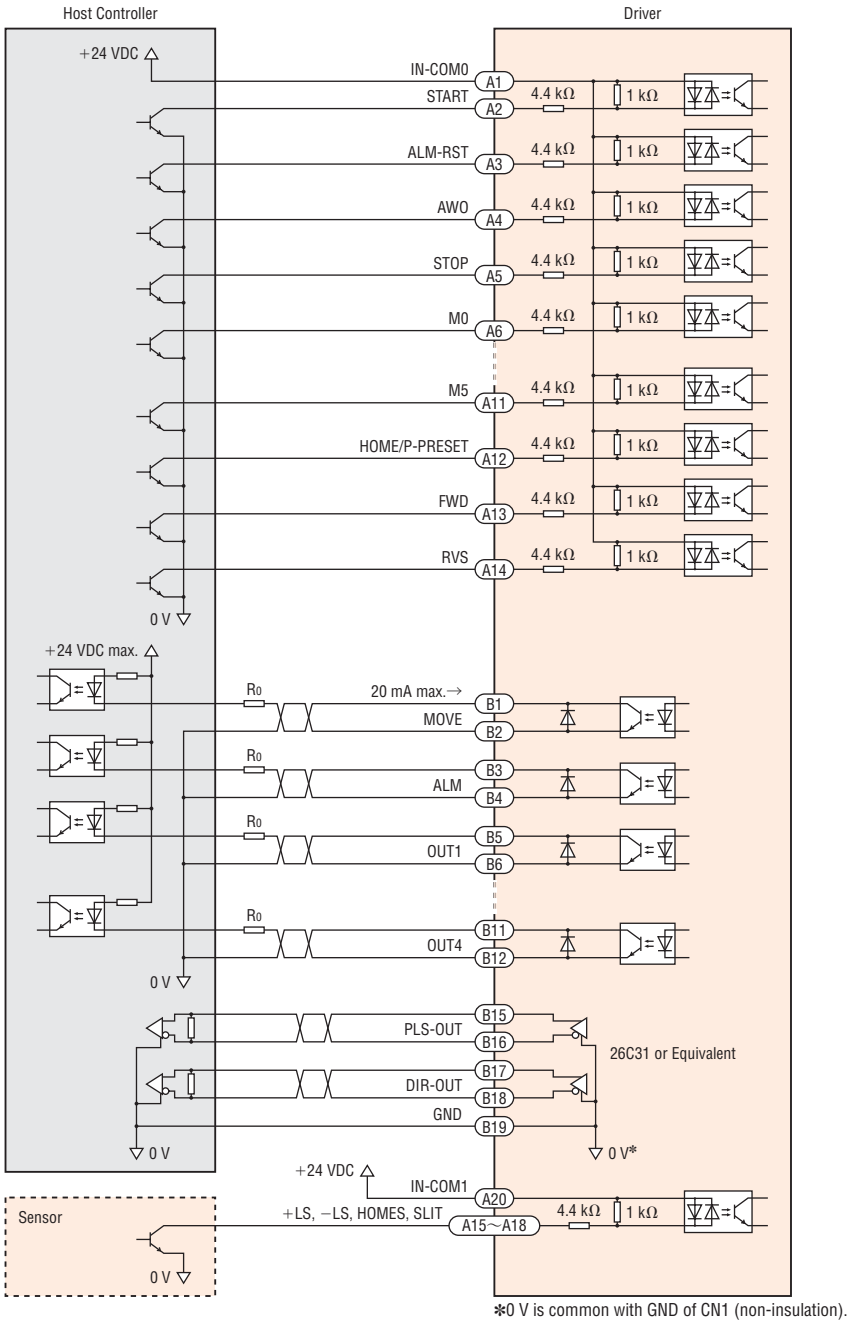
●CN5 Pin Assignments



Pin No.	Signal Name	Description	Encoder Lead Wire Color
1	ENC-A+	Encoder input A-phase (Line receiver)	Red
2	ENC-A−		Pink
3	ENC-B+	Encoder input B-phase (Line receiver)	Green
4	ENC-B−		Blue
5	ENC-Z+	Encoder input Z-phase (Line receiver)	Yellow
6	ENC-Z−		Orange
7	+5 VDC OUT	+5 VDC power supply output for encoder	White
8	GND	GND	Black
9	SHIELD	Shield (Connect to GND)	Shield

◇Connecting to a Host Controller

●Connecting to a Current Sink Output Circuit

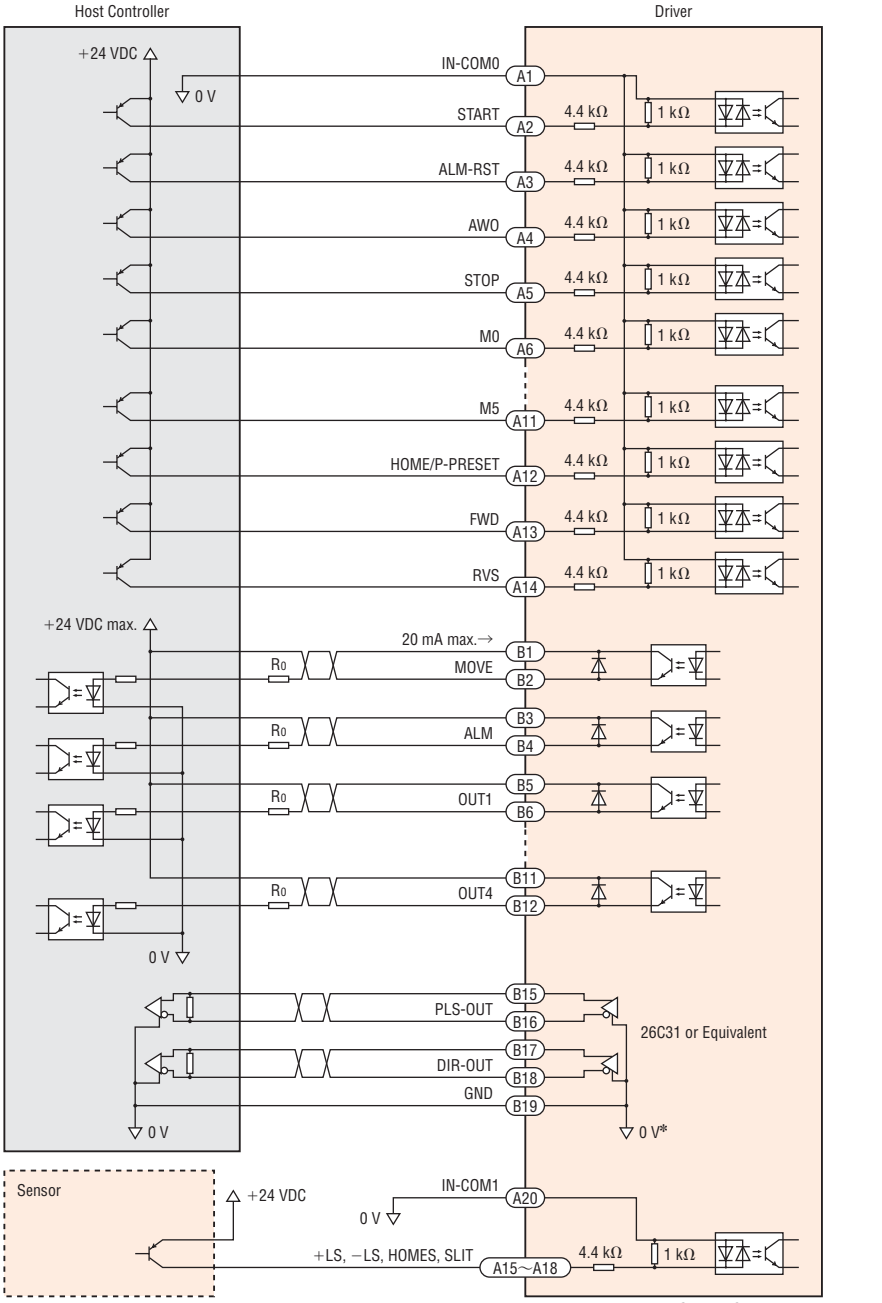


✻0 V is common with GND of CN1 (non-insulation).

Notes:

- Use a cable/connector assembly (included) for input/output signals. The cable should be as short as possible.
- Use the input signals at 24 VDC. If this specification is exceeded, the internal components may be damaged.
- Use the output signals at 24 VDC or less and 20 mA or less. If these specifications are exceeded, the internal components may be damaged. Check the specification of the connected equipment. When the current exceeds 20 mA, connect the external resistor R_0.
- Connect a terminal resistor of 100 Ω or more between the input of the line receiver terminals.
- Provide a minimum distance of 200 mm between the signal lines and power lines (AC lines, motor lines and other large-current circuits). Do not run the signal lines in the same duct as power lines or bundle them with power lines.
- If noise generated by the motor and power cables causes a problem, shield the cables or insert the ferrite cores in the cables.

●Connecting to a Current Source Output Circuit



✻0 V is common with GND of CN1 (non-insulation).

Notes:

- Use a cable/connector assembly (included) for input/output signals. The cable should be as short as possible.
- Use the input signals at 24 VDC. If this specification is exceeded, the internal components may be damaged.
- Use the output signals at 24 VDC or less and 20 mA or less. If these specifications are exceeded, the internal components may be damaged. Check the specification of the connected equipment. When the current exceeds 20 mA, connect the external resistor R_O.
- Connect a terminal resistor of 100 Ω or more between the input of the line receiver terminals.
- Provide a minimum distance of 200 mm between the signal lines and power lines (AC lines, motor lines and other large-current circuits). Do not run the signal lines in the same duct as power lines or bundle them with power lines.
- If noise generated by the motor and power cables causes a problem, shield the cables or insert the ferrite cores in the cables.

●Description of Input/Output Signals

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

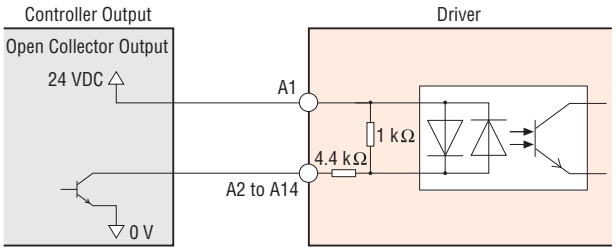
Input (output) "ON" indicates that the current is sent into the photocoupler (transistor) inside the driver. Input (output) "OFF" indicates that the current is not sent into the photocoupler (transistor) inside the driver. The input/output remains "OFF" if nothing is connected.

Photocoupler OFF ON

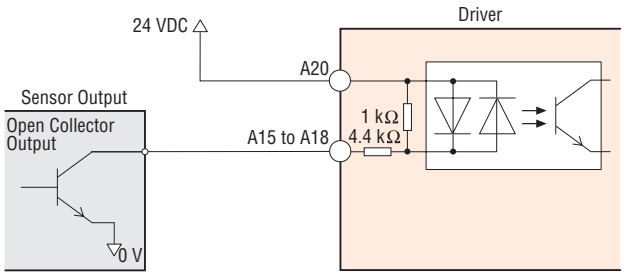
Input Signals

◇Input Circuit and Sample Connection

- ●Start (START) Input
- ●Stop (STOP) Input
- ●All Windings Off (AWO) Input
- ●Alarm-Reset (ALM-RST) Input
- ●Data-Select (M0 to M5) Input
- ●Forward (FWD) Input
- ●Reverse (RVS) Input
- ●Return-to-Mechanical Home (HOME)/Position-Preset (P-PRESET) Input



- ●Mechanical Home Sensor (HOMES) Input
- ●+ Limit Sensor (+LS) Input
- ●− Limit Sensor (−LS) Input
- ●Slit Sensor (SLIT) Input



◇Start (START) Input: Pin No. A2

Turn the START input from OFF to ON to start positioning operation.

◇Stop (STOP) Input: Pin No. A5

The STOP input is used to stop the operating motor (factory setting: normally closed).
Turn the STOP input to ON to start motor operation. You can switch the input logic by parameter setting. And you can set a desired stopping operation as follows.

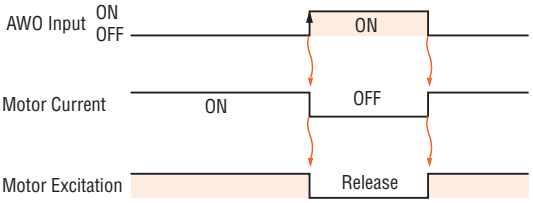
- ●Immediate stop ·····The motor will stop immediately regardless of the specified deceleration rate.
- ●Deceleration stop ·····The motor will stop according to the specified deceleration rate (initial value).
- ●Immediate stop + Motor is not excited ·····The motor will stop immediately regardless of the specified deceleration rate, after which the motor excitation will be turned off.
- ●Deceleration stop + Motor is not excited ·····The motor will stop according to the specified deceleration rate, after which the motor excitation will be turned off.

Note:

- ●If the STOP input is normally closed, be sure to turn this input ON when operating the motor.

◇All Windings Off (AWO) Input: Pin No. A4

This signal is used to cut off the motor current (factory setting: normally open).
When the AWO input is turned ON, the motor current will be cut off and the motor will lose its holding torque.
When the AWO input is turned OFF, current will be supplied to the motor and holding torque will be restored.
You can switch the input logic by parameter setting.



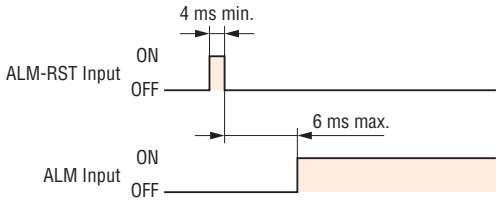
The Motor has holding power in proportion to the current at motor standstill.

Note:

- ●When operating the motor, be sure to turn the AWO input "OFF."

◇Alarm-Reset (ALM-RST) Input: Pin No. A3

This signal is used to reset the alarm that has been generated by the driver's protective function. Input an ACL signal once after removing the cause that has triggered the protective function.



- ●Overvoltage, RS-485 communication error and EEPROM error cannot be reset with the ALM-RST input. To reset these alarms, the power must be cycled.

◇Data Select (M0 to M5) Input: Pin No. A6 to A11

Select a desired operation data number for positioning operation or continuous operation based on a combination of ON/OFF states of M0 to M5 inputs.

◇Forward (FWD) Input: Pin No. A13

When the FWD input turns ON, the motor will perform continuous operation in the + direction.

◇Reverse (RVS) Input: Pin No. A14

When the RVS input turns ON, the motor will perform continuous operation in the − direction.

◇Return-to-Mechanical Home (HOME)/ Position-Preset (P-PRESET) Input: Pin No. A12

Factory setting is HOME input. Switch between HOME input and P-PRESET input using the “HOME/P-PRESET input switching” parameter.

HOME Input (Factory setting)

The return-to-home operation starts when the HOME input turns ON.

P-PRESET Input

When the P-PRESET input is turned ON, the value in the “preset position” parameter will be overwritten by the command position.

◇Mechanical Home Sensor (HOMES) Input: Pin No. A17
＋ Limit Sensor (+LS) Input: Pin No. A15
－ Limit Sensor (−LS) Input: Pin No. A16

HOMES Input

This input detects the mechanical home position when a return-to-home operation is executed in the 3-sensor mode. You can switch the input logic for HOMES input by parameter setting.

●The factory setting of this command is normally open.

+LS Input, −LS Input

They are used to detect the home during return-to-home operation.

You can switch the input logics for +LS input and −LS input by parameter setting.

●The factory setting of this command is normally open.

●Return-to-Mechanical Home Operation
When a +LS or −LS is detected, the motor operates in the direction opposite that of the detected limit.

●Positioning and Speed Control Operation
When a +LS or −LS is detected, the driver's protective function (hardware overtravel) is activated. As a result, the alarm (ALM) output is turned OFF and the motor stops.

◇Slit Sensor (SLIT) Input: Pin No. A18

This signal is used to detect the home using a slit disc, etc.

When detecting the home, use of the SLIT input in addition to the HOMES input and ±LS inputs will increase the accuracy of home detection.

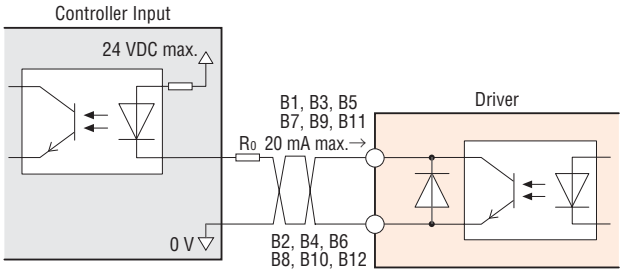
You can switch the input logic for SLIT input by parameter setting.

●The factory setting of this command is normally open.

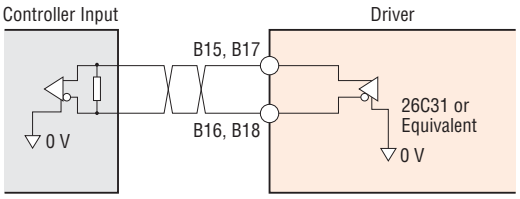
Output Signals

◇Output Circuit and Sample Connection

●Control Output 1 (OUT1) to Control Output 4 (OUT4)
●Motor Operating (MOVE) Output
●Alarm (ALM) Output



●Pulse (PLS-OUT) Output
●Direction (DIR-OUT) Output



●Be sure to connect pin No. B19 of the driver to the GND.

◇Motor Operating (MOVE) Output: Pin No. B1, B2

The MOVE output becomes ON while operating the motor or return-to-home operation.

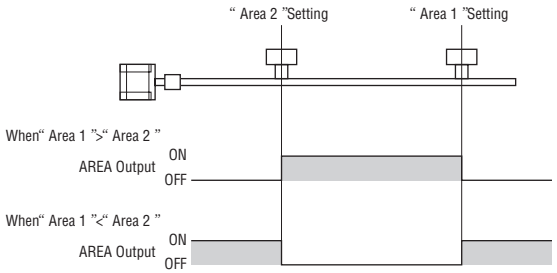
◇Control Output 1 (OUT1) to Control Output 4 (OUT4): Pin No. B5 to B12

The OUT1 through OUT4 outputs can be used as output ports for general signals. The following output signals can be assigned.

●Area (AREA) Output *Default for OUT1 output
●Ready (READY) Output *Default for OUT2 output
●Warning (WNG) Output *Default for OUT3 output
●Return-to-Home Complete (HOME-P) Output
*Default for OUT4 output
●Timing (TIM) Output
●Z Phase (ZSG) Output
●Misstep Detection (STEPOUT) Output
●Remote Output 1 (R-OUT1)
●Remote Output 2 (R-OUT2)
●Remote Output 3 (R-OUT3)
●Remote Output 4 (R-OUT4)
●Overheat (O. H.) Output

AREA Output

This signal will be output when the motor output shaft is inside the area set by the “area 1” and “area 2” parameters.



READY Output
This signal will be output when the driver becomes ready. Start operation after the READY output has turned ON.

WNG Output
This signal is output when a warning generates. However, the operation will continue.
You can change the warning condition by parameter setting.

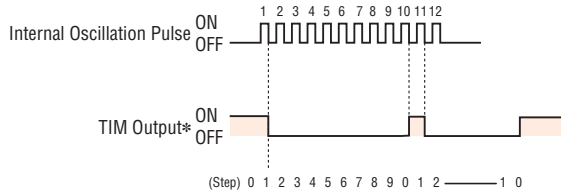
HOME-P Output
This signal is output upon completion of return-to-home.

TIM Output
This signal turns ON when the motor is at its excitation home.
If the base step angle of the motor is 0.72°, the TIM output will turn ON every time the motor moves by 7.2° from its excitation home in synchronization with the internal oscillation pulse.

Microsteps/step 1: Signal is output once every 10 pulses.
Microsteps/step 10: Signal is output once every 100 pulses.

Timing Chart 0.72°/step (Microsteps/step 1)

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



Note:
- When power is turned ON, the excitation sequence is reset to step "0" and the "TIM" signal is output.

ZSG Output
The ZSG output signal is output when the ENC-Z input signal is input from the encoder.
Normally the ENC-Z input signal is input every time the motor output shaft turns one revolution.

Note:
- This signal is used when an encoder is connected.

STEPOUT Output
This signal becomes effective when an encoder is connected, and a deviation error occurs.
This signal will be output when the deviation between the encoder counter value and driver command position reaches the value set by parameter.

R-OUT1, 2, 3, 4 Output
These signals are general outputs. These signals are used when the system is controlled via RS-485 communication.

O. H. Output
The "Overheat" signal is output to protect the driver from heat damage. The O.H. output is turned “OFF” automatically when the internal temperature of the driver is recovered.

◇Alarm (ALM) Output: Pin No. B3, B4
When an alarm generates, the ALM output will turn OFF. At the same time, the ALARM LED of the driver will blink and the motor will stop.
Set the host controller so that it will stop motor operation commands upon detection of an OFF status of the ALM output.
You can check the cause of the alarm by counting the number of times the ALARM LED blinks.

◇Pulse (PLS-OUT) Output: Pin No. B15, B16
The PLS-OUT output is used to output the driver’s internal oscillation pulses. The number of pulses to be output corresponds to the commanded travel. The pulse frequency corresponds to the operating speed.

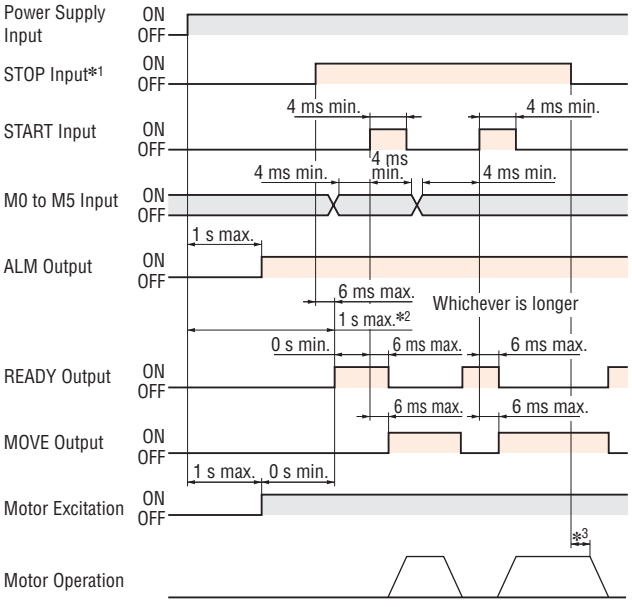
Note:
- When connecting to a line receiver, be sure to connect a terminal resistor of 100 Ω or more between the line receiver inputs.

◇Direction (DIR-OUT) Output: Pin No. B17, B18
The DIR-OUT output is used to output the driver’s internal direction command.

Note:
- When connecting to a line receiver, be sure to connect a terminal resistor of 100 Ω or more between the line receiver inputs.

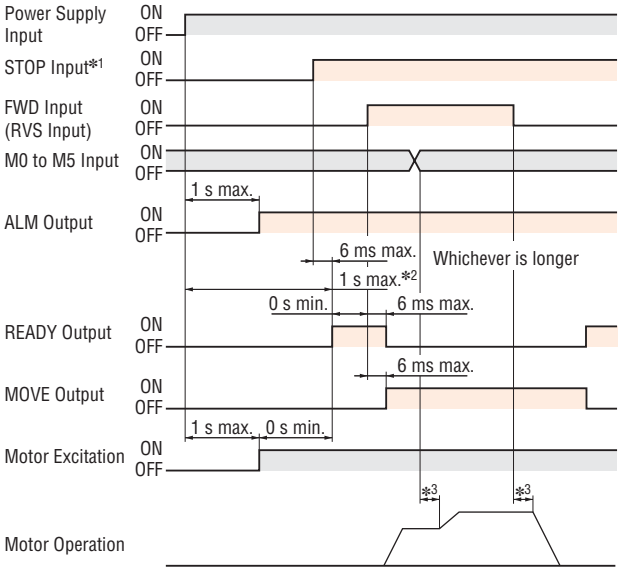
Timing Charts
When the power is turned on and the STOP input is turned ON (normally closed), the READY output will turn ON and input of the START or FWD (RVS) input signal will become possible.

◇Positioning Operation



✻1 When the STOP input logic is normally closed (factory setting).
✻2 If the "stepout detection" parameter is set to "enable," this period becomes 1.5 s or less.
✻3 The specific time varies depending on the command speed.

◇Speed Control Operation



✻1 When the STOP input logic is normally closed (factory setting).
✻2 If the "stepout detection" parameter is set to "enable," this period becomes 1.5 s or less.
✻3 The specific time varies depending on the command speed.

List of Motor and Driver Combinations

Model names for motor and driver combinations are shown below.

Type	Model	Motor Model	Driver Model
High-Resolution Type	**CRK523PMAKD**	PK523PMA*	CRD503-KD
	CRK523PMBKD	PK523PMB*	
	CRK524PMAKD	PK524PMA*	
	CRK524PMBKD	PK524PMB*	
	CRK525PMAKD	PK525PMA*	
	CRK525PMBKD	PK525PMB*	
	CRK523HPMAKD	PK523HPMA*	CRD507H-KD
	CRK523HPMBKD	PK523HPMB*	
	CRK524HPMAKD	PK524HPMA*	
	CRK524HPMBKD	PK524HPMB*	
	CRK525HPMAKD	PK525HPMA*	
	CRK525HPMBKD	PK525HPMB*	
	CRK544PMAKD	PK544PMA*	CRD507-KD
	CRK544PMBKD	PK544PMB*	
	CRK546PMAKD	PK546PMA*	
	CRK546PMBKD	PK546PMB*	
	CRK564PMAKD	PK564PMA*	CRD514-KD
	CRK564PMBKD	PK564PMB*	
	CRK566PMAKD	PK566PMA*	
	CRK566PMBKD	PK566PMB*	
	CRK569PMAKD	PK569PMA*	
	CRK569PMBKD	PK569PMB*	
High-Torque Type	**CRK513PAKD**	PK513PA*	CRD503-KD
	CRK513PBKD	PK513PB*	
	CRK523PAKD	PK523PA*	
	CRK523PBKD	PK523PB*	
	CRK525PAKD	PK525PA*	
	CRK525PBKD	PK525PB*	
	CRK523HPAKD	PK523HPA*	CRD507H-KD
	CRK523HPBKD	PK523HPB*	
	CRK525HPAKD	PK525HPA*	
	CRK525HPBKD	PK525HPB*	
	CRK544PAKD	PK544PA*	CRD507-KD
	CRK544PBKD	PK544PB*	
	CRK546PAKD	PK546PA*	
	CRK546PBKD	PK546PB*	
High-Torque Type with Encoder	**CRK544PRKD**	PK544PA-R23L*	CRD507-KD
	CRK546PRKD	PK546PA-R23L*	
Standard Type	**CRK543AKD**	PK543AW	CRD507-KD
	CRK543BKD	PK543BW	
	CRK544AKD	PK544AW	
	CRK544BKD	PK544BW	
	CRK545AKD	PK545AW	
	CRK545BKD	PK545BW	
	CRK564AKD	PK564AW	CRD514-KD
	CRK564BKD	PK564BW	
	CRK566AKD	PK566AW	
	CRK566BKD	PK566BW	
	CRK569AKD	PK569AW	
	CRK569BKD	PK569BW	
Standard Type with Electromagnetic Brake	**CRK543AMKD**	PK543AWM	CRD507-KD
	CRK544AMKD	PK544AWM	
	CRK545AMKD	PK545AWM	
	CRK564AMKD	PK564AWM	CRD514-KD
	CRK566AMKD	PK566AWM	
	CRK569AMKD	PK569AWM	
Standard Type with Encoder	**CRK543RKD**	PK543AW-R23L	CRD507-KD
	CRK544RKD	PK544AW-R23L	
	CRK545RKD	PK545AW-R23L	
	CRK564RKD	PK564AW-R23L	CRD514-KD
	CRK566RKD	PK566AW-R23L	
	CRK569RKD	PK569AW-R23L	

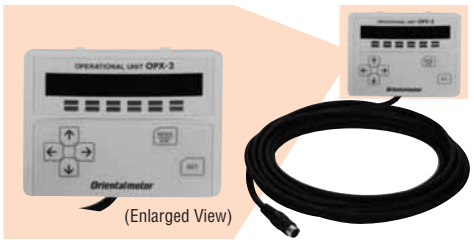
Type	Model	Motor Model	Driver Model
TH Geared Type	**CRK523PAKD-T7.2**	PK523PA-T7.2*	CRD503-KD
	CRK523PBKD-T7.2	PK523PB-T7.2*	
	CRK523PAKD-T10	PK523PA-T10*	
	CRK523PBKD-T10	PK523PB-T10*	
	CRK523PAKD-T20	PK523PA-T20*	
	CRK523PBKD-T20	PK523PB-T20*	
	CRK523PAKD-T30	PK523PA-T30*	
	CRK523PBKD-T30	PK523PB-T30*	
	CRK543AKD-T3.6	PK543AW-T3.6	CRD507-KD
	CRK543BKD-T3.6	PK543BW-T3.6	
	CRK543AKD-T7.2	PK543AW-T7.2	
	CRK543BKD-T7.2	PK543BW-T7.2	
	CRK543AKD-T10	PK543AW-T10	
	CRK543BKD-T10	PK543BW-T10	
	CRK543AKD-T20	PK543AW-T20	
	CRK543BKD-T20	PK543BW-T20	
	CRK543AKD-T30	PK543AW-T30	
	CRK543BKD-T30	PK543BW-T30	
	CRK564AKD-T3.6	PK564AW-T3.6	CRD514-KD
	CRK564BKD-T3.6	PK564BW-T3.6	
	CRK564AKD-T7.2	PK564AW-T7.2	
	CRK564BKD-T7.2	PK564BW-T7.2	
	CRK564AKD-T10	PK564AW-T10	
	CRK564BKD-T10	PK564BW-T10	
	CRK564AKD-T20	PK564AW-T20	
	CRK564BKD-T20	PK564BW-T20	
	CRK564AKD-T30	PK564AW-T30	
	CRK564BKD-T30	PK564BW-T30	
PN Geared Type	**CRK523PAKD-N5**	PK523PA-N5*	CRD503-KD
	CRK523PBKD-N5	PK523PB-N5*	
	CRK523PAKD-N7.2	PK523PA-N7.2*	
	CRK523PBKD-N7.2	PK523PB-N7.2*	
	CRK523PAKD-N10	PK523PA-N10*	
	CRK523PBKD-N10	PK523PB-N10*	
	CRK544AKD-N5	PK544AW-N5	CRD507-KD
	CRK544BKD-N5	PK544BW-N5	
	CRK544AKD-N7.2	PK544AW-N7.2	
	CRK544BKD-N7.2	PK544BW-N7.2	
	CRK544AKD-N10	PK544AW-N10	
	CRK544BKD-N10	PK544BW-N10	
	CRK566AKD-N5	PK566AW-N5	CRD514-KD
	CRK566BKD-N5	PK566BW-N5	
	CRK566AKD-N7.2	PK566AW-N7.2	
	CRK566BKD-N7.2	PK566BW-N7.2	
	CRK566AKD-N10	PK566AW-N10	
	CRK566BKD-N10	PK566BW-N10	
	CRK564AKD-N25	PK564AW-N25	
	CRK564BKD-N25	PK564BW-N25	
	CRK564AKD-N36	PK564AW-N36	
	CRK564BKD-N36	PK564BW-N36	
	CRK564AKD-N50	PK564AW-N50	
	CRK564BKD-N50	PK564BW-N50	
Harmonic Geared Type	**CRK513PAKD-H50**	PK513PA-H50S*	CRD503-KD
	CRK513PBKD-H50	PK513PB-H50S*	
	CRK513PAKD-H100	PK513PA-H100S*	
	CRK513PBKD-H100	PK513PB-H100S*	
	CRK523PAKD-H50	PK523HPA-H50S*	CRD507H-KD
	CRK523PBKD-H50	PK523HPB-H50S*	
	CRK523PAKD-H100	PK523HPA-H100S*	
	CRK523PBKD-H100	PK523HPB-H100S*	
	CRK543AKD-H50	PK543AW-H50S	CRD507-KD
	CRK543BKD-H50	PK543BW-H50S	
	CRK543AKD-H100	PK543AW-H100S	
	CRK543BKD-H100	PK543BW-H100S	
	CRK564AKD-H50	PK564AW-H50S	CRD514-KD
	CRK564BKD-H50	PK564BW-H50S	
	CRK564AKD-H100	PK564AW-H100S	
	CRK564BKD-H100	PK564BW-H100S	

*If you are purchasing only a motor for maintenance purpose, etc., motor lead wire/connector assembly and connector will not be supplied. They must be purchased separately. Accessories, motor lead wire/connector assembly and motor connector sets are available. ➜ Page 44

Accessories (Sold separately)

Control Module RoHS

Operating data setting, changing various parameters, and can be used as a monitor.



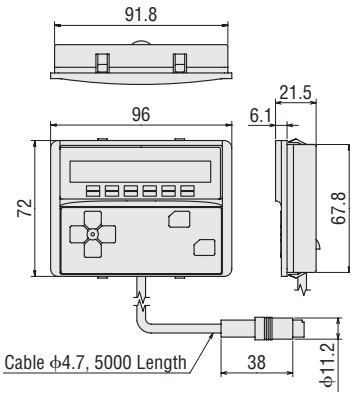
Product Line

Model
OPX-2A

Dimensions (Unit = mm)

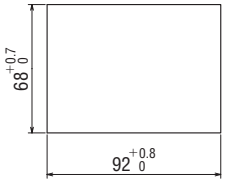
●Control Module

Mass: 0.25 kg



●Panel Cut-Out for Control Module

[Thickness of the mounting plate: 1 to 3 mm]



Data Setting Software RoHS

Operating data setting, changing various parameters, and can be used as a monitor on the computer.

Product Line

Model
MEXE02

PC interface cable of 5 m and USB cable of 0.5 m are included.

Required System Configuration

Operating System	Windows 2000 Professional Service Pack 4 or later Windows XP Home Edition Service Pack 2 or later Windows XP Professional Service Pack 2 or later Windows Vista Home Basic Service Pack 1 or later Windows Vista Home Premium Service Pack 1 or later Windows Vista Business Service Pack 1 or later Windows Vista Ultimate Service Pack 1 or later
CPU	Pentium III 800 MHz or more*1
Memory*1	Windows 2000 Professional : 448 MB or more Windows XP Home Edition, Professional : 512 MB or more Windows Vista Home Basic : 896 MB or more Windows Vista Home Premium : 1.4 GB or more Windows Vista Business : 1.4 GB or more Windows Vista Ultimate : 1.4 GB or more
Hard Disk Capacity	Available disk space of 30 MB or more*2*3
Disk Drive	CD-ROM Drive (for installation)
Serial Interface	USB 1.1 1 Port

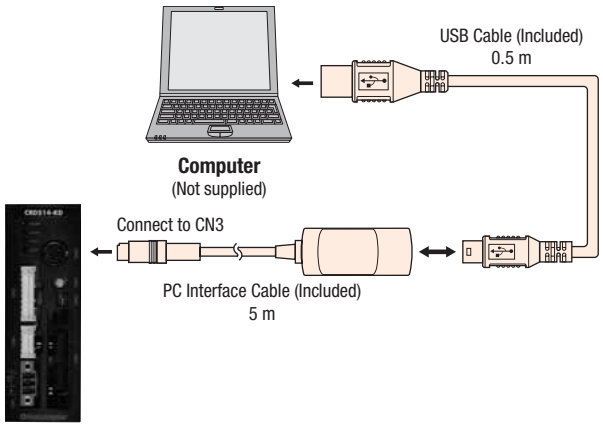
*1 Your operating system must support the CPU.

*2 It may increase by system configuration.

*3 For **MEXE02** to function, Microsoft .NET Framework 2.0 Service Pack 1 must be installed in your PC. Microsoft .NET Framework 2.0 Service Pack 1 will be installed automatically, if not already installed. Accordingly, a free hard disk space of up to 500 MB is required in addition to the hard disk capacity specified above.

●Windows and Windows Vista are a registered trademark of US Microsoft Corporation or its subsidiaries in the United States and other countries. Pentium is a registered trademark of Intel Corporation.

Connection between Computer and Driver



Cables

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

Lead Wire/Connector Assembly RoHS

For CN4 (Motor connector)

The lead wire with connector for connecting the motor and driver. Lead wire with connector assembly (0.6 m) is included with the motor/driver package or driver only.

For CN5 (Encoder connector)

The lead wire with connector for connecting the encoder and driver. Lead wire with connector assembly (0.6 m) is included with the motor with encoder and driver package.

For CN4

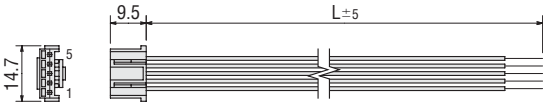
For CN5

Product Line

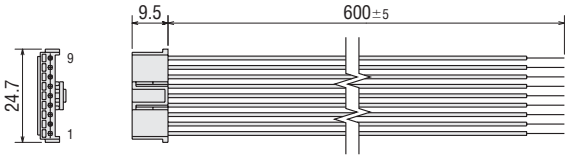
Model	Application	L mm	Conductor AWG
LC5N06B	For Motor Connection	600	22 (0.3 mm²)
LC5N10B		1000	
LC09A-006	For Encoder Connection	600	

Dimensions (Unit = mm)

●For CN4



●For CN5



For Connector-Coupled Motors 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 (0.6 m) is included with the motor and driver package for the connector-coupled types.

Product Line

Model	Applicable Model	Applicable Motor	Length m	Conductor AWG
LC5N06A	**CRK513P□KD**	PK513P□	0.6	24 (0.2 mm²)
	CRK513P□KD-H■	PK513P□-H■S		
	CRK52□P□KD	PK52□P□		
	CRK52□HP□KD	PK52□HP□		
	CRK52□PM□KD	PK52□PM□		
LC5N10A	**CRK52□HPM□KD**	PK52□HPM□	1	
	CRK523P□KD-T■	PK523P□-T■		
	CRK523P□KD-N■	PK523P□-N■		
	CRK523P□KD-H■	PK523HP□-H■S		
LC5N06B	**CRK54□P□KD**	PK54□P□	0.6	22 (0.3 mm²)
	CRK54□PRKD	PK54□PA-R23L		
LC5N10B	**CRK54□PM□KD**	PK54□PM□	1	
LC5N06C	**CRK56□PM□KD**	PK56□PM□	0.6	
LC5N10C			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.

Connector Sets for Motors RoHS

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

The photograph shows **CS5N30B**.

Product Line

Model	Applicable Model	Applicable Motor
CS5N30A	**CRK513P□KD**	PK513P□
	CRK513P□KD-H■	PK513P□-H■S
	CRK52□P□KD	PK52□P□
	CRK52□HP□KD	PK52□HP□
	CRK52□PM□KD	PK52□PM□
	CRK52□HPM□KD	PK52□HPM□
	CRK523P□KD-T■	PK523P□-T■
	CRK523P□KD-N■	PK523P□-N■
	CRK523P□KD-H■	PK523HP□-H■S
CS5N30B	**CRK54□P□KD**	PK54□P□
	CRK54□PRKD	PK54□PA-R23L
	CRK54□PM□KD	PK54□PM□
CS5N30C	**CRK56□PM□KD**	PK56□PM□

●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	CS5N30A	CS5N30B	CS5N30C
Connector housing	51065-0500	51103-0500	51144-0500
Contact	50212-8100	50351-8100	50539-8100
Applicable Crimp Tool	57176-5000	57295-5000	57189-5000
Manufacturer	MOLEX		
Applicable Cable	AWG30 to 24 (0.05 to 0.2 mm^2) Wire Insulation Diameter ϕ1.4 mm Strip Length 1.3 to 1.8 mm	AWG28 to 22 (0.08 to 0.3 mm^2) Wire Insulation Diameter ϕ1.15 to 1.8 mm Strip Length 2.3 to 2.8 mm	AWG24 to 18 (0.2 to 0.75 mm^2) Wire Insulation Diameterf ϕ1.4 to 3 mm Strip Length 3 to 3.5 mm

Note:
●Crimp tools are not included. Please provide separately.

Extension Cables RoHS

Cable for extending the wiring distance between the motor and driver.
Two lengths: 5 m and 10 m are available.

Product Line

Model	Length m	Conductors
CC05PK5	5	5
CC10PK5	10	

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

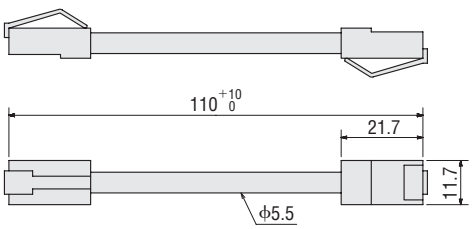
RS-485 Communication Cable RoHS

This cable with connector assemblies are available for use with the multi-axis operation to connect drivers.

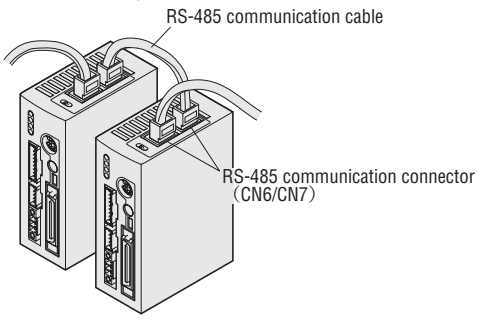
Product Line

Model	Length m
CC001-RS4	0.1

Dimensions (Unit = mm)



●Connection Example



Motor Mounting Brackets RoHS

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

Product Line

High-Resolution Type, High-Torque Type, High-Torque Type with Encoder, Standard Type with Encoder, Standard Type with Electromagnetic Brake, Standard Type

Material: Aluminum Alloy

Model	Applicable Product
PAF0P	**CRK54□P□KD** **CRK54□PM□KD** **CRK54□RKD**
PAL0P	**CRK54□PRKD** **CRK54□□KD** **CRK54□AMKD**
PAL2P-5	**CRK56□PM□KD** **CRK56□RKD** **CRK56□□KD** **CRK56□AMKD**

- 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.
- 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 **PAL0PA**)

Note:

- Not available for geared type.

Geared Type

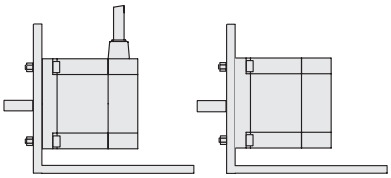
Material: Aluminum Alloy

Model	Applicable Product
SOL0B	**CRK543□KD-T■**
SOL2A	**CRK564□KD-T■**

- 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.
- The mounting bracket base is built with holes large enough to allow for alignment adjustments in the horizontal direction.
- Use the screws provided to install the **SOL2A**.
  Since mounting screws are not included with **SOL0B**, provide appropriate screws separately.

Motor Installation Direction

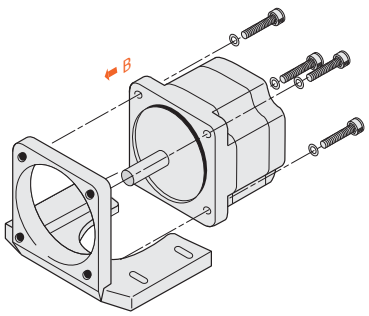
The motor cable comes out at right angles to the motor. Orient the motor so that the cable faces either upward or sideways.



Cable facing upward　Cable facing sideways

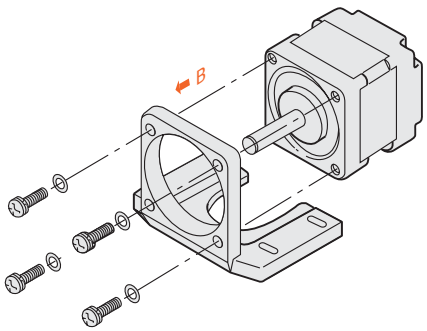
Mounting the Motor

1 PAL2P-5



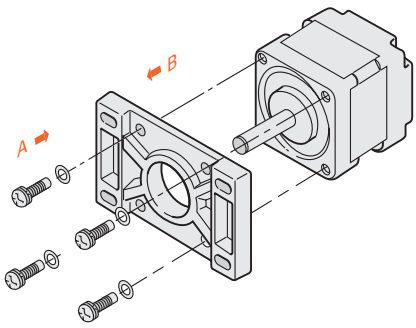
①Use the screws provided to secure the motor to the mounting bracket.
②Attach the motor from the direction shown by the arrow (B).

2 PAL0P, SOL0B, SOL2A



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

3 PAF0P

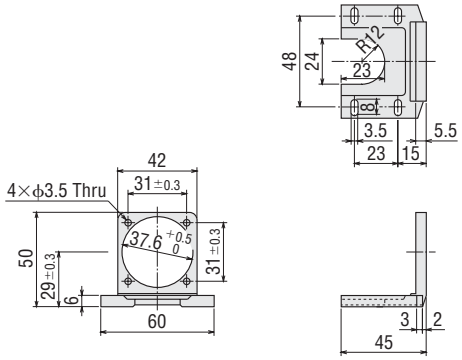


①Use the screws provided to secure the motor to the mounting bracket.
②Attach motor from the direction shown by either arrow (A) or arrow (B).

Dimensions (Unit = mm)

PAL0P

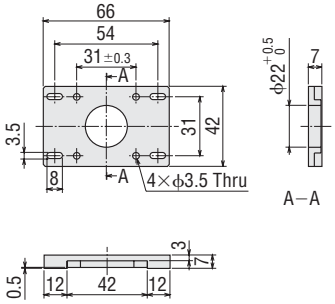
Mass: 35 g



●Screws (Included)
M3 Length 10 mm … 4 pieces

PAF0P

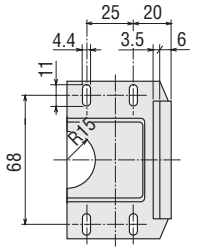
Mass: 30 g

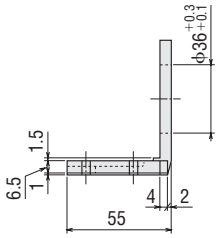


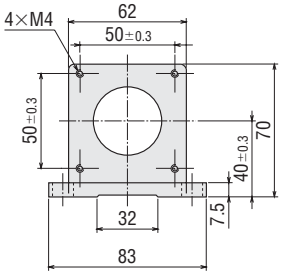
●Screws (Included)
M3 Length 7 mm … 4 pieces

PAL2P-5

Mass: 110 g



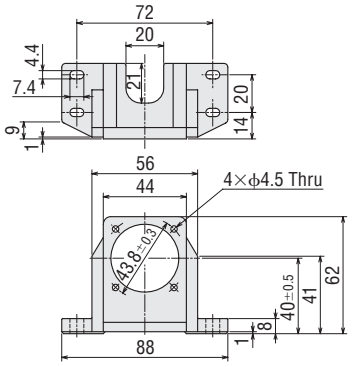


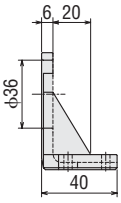


●Screws (Included)
M4 Length 12 mm … 4 pieces

SOL0B

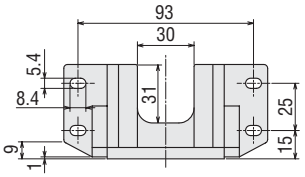
Mass: 85 g

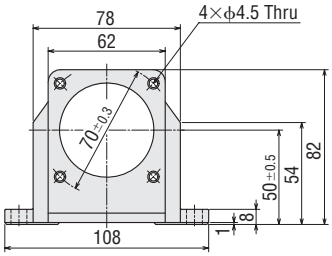


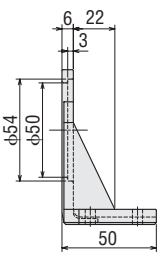


SOL2A

Mass: 120 g







●Screws (Included)
M4 Length 12 mm … 4 pieces

Flexible Couplings

A flexible coupling ideal for your motor is available.
Once you have decided on a motor/gear and the shaft diameter of the equipment to be connected, determine the proper flexible coupling to use.
All motor shaft diameters of stepping motor packages are available (including geared motors).

Selecting a Coupling

Motor Type / Coupling Type	High-Resolution Type, High-Torque Type, High-Torque Type with Encoder, Standard Type with Encoder, Standard Type with Electromagnetic Brake, Standard Type	Geared Type	Application
MC Couplings	◎	—	High-Accuracy Positioning
MCV Couplings	◎	—	High-Accuracy Positioning, Vibration Suppression
MCS Couplings	○	◎	High-Strength, High-Accuracy Positioning

Types and Features of Couplings

●MC Couplings

This slit-type one-piece coupling offering high torsional rigidity and low inertia is ideal for applications where high-speed positioning and responsive control are needed.

◇Features

- No Backlash
- Torsional rigidity is high, responsiveness excellent.
- Low Inertia
- Set screw type and clamp type are available.

●MCV Couplings

The rubber molding type coupling offering vibration suppression is ideal for applications where short time and high-accuracy positioning operation.

◇Features

- Vibration Suppression
- High Torque, High Response
- No Backlash
- All-in-one design structure to mold hub on both sides with rubber insulator.

●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.

◇Features

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

MC Couplings RoHS

These products are set screw and clamp type couplings for a stepping motor.


Set Screw Type


Clamp Type

Product Line

Set Screw Type

Model
MC12□S
MC16□S
MC20□S
MC25□S
MC32□S

Clamp Type

Model
MC12□C2
MC16□C2
MC20□C2
MC25□C2
MC32□C2

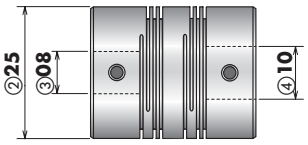
●Enter the inner diameter of coupling in the box (□) within the model name.

Product Number Code

MC 25 08 10 S

① ② ③ ④ ⑤

①	**MC** Couplings
②	Outer diameter of coupling
③	Inner Diameter d1 (Smaller side) (**06A** represents ϕ6.35 mm)
④	Inner Diameter d2 (Larger side) (**06A** represents ϕ6.35 mm)
⑤	Connection Method **S**: Set Screw Type **C2**: Clamp Type



●Enter the inner diameter d1 of smaller side, either motor shaft diameter or driven shaft diameter.
Enter the inner diameter d2 of larger side, either motor shaft diameter or driven shaft diameter.

Coupling Selection Table

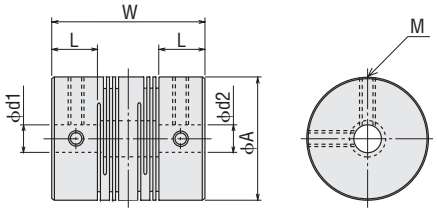
Model	Type	Motor Shaft Diameter mm		Driven Shaft Diameter mm								
				03	**04**	**05**	**06**	**06A**	**08**	**10**	**12**	**14**
				ϕ3	ϕ4	ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14
CRK513P□KD	**MC12**	**04**	ϕ4	○	◎	◎						
CRK523PM□KD, CRK523HPM□KD **CRK524PM□KD, CRK524HPM□KD** **CRK525PM□KD, CRK525HPM□KD** **CRK523P□KD, CRK523HP□KD** **CRK525P□KD, CRK525HP□KD**	**MC12**	**05**	ϕ5		◎	◎	○					
CRK543□KD **CRK544□KD, CRK544P□KD** **CRK545□KD, CRK544PM□KD** **CRK54□AMKD** **CRK543RKD, CRK544RKD** **CRK545RKD** **CRK544PRKD**	**MC16**	**05**	ϕ5		○	○	◎		○			
CRK546PM□KD, CRK546P□KD **CRK546PRKD**	**MC20**	**05**	ϕ5			○	◎		◎			
CRK564□KD, CRK564PM□KD **CRK566□KD, CRK566PM□KD** **CRK569□KD, CRK564RKD** **CRK56□AMKD** **CRK566RKD, CRK569RKD**	**MC25**	**08**	ϕ8				◎	◎	◎	◎	○	
CRK569PM□KD	**MC32**	**10**	ϕ10					◎	◎	◎	◎	◎

●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.

◎Common to set screw type and clamp type
○Only for set screw type

Set Screw Type

Dimensions



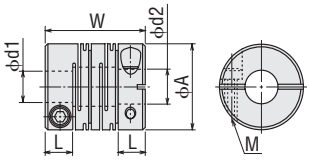
Specifications

Model	Dimensions						Normal Torque	Mass	Inertial Moment	Static Torsion Spring Constant	Permissible Eccentricity	Permissible Declination	Permissible End Play
	Outer Diameter ϕA	Length W	Shaft Hole Diameter d1H8	Shaft Hole Diameter d2H8	L	Screw Used							
	mm	mm	mm	mm	mm	M	N·m	g	kg·m^2	N·m/rad	mm	deg	mm
MC120304S	12	18.5	3	4	5	M2.5	0.4	3.7	0.83×10^{-7}	45	0.10	2	±0.3
MC120404S			4	4									
MC120405S			4	5									
MC120505S			5	5									
MC120506S			5	6									
MC160405S	16	23	4	5	6.5	M3	0.5	8.1	3.3×10^{-7}	80	0.10	2	±0.4
MC160406S			4	6									
MC160505S			5	5									
MC160506S			5	6									
MC160508S			5	8									
MC160606S			6	6									
MC160608S			6	8									
MC200505S	20	26	5	5	7.5	M3	1.0	14	9×10^{-7}	170	0.10	2	±0.4
MC200506S			5	6									
MC200508S			5	8									
MC200606S			6	6									
MC200606AS			6	6.35									
MC200608S			6	8									
MC200610S			6	10									
MC2006A08S			6.35	8									
MC200808S			8	8									
MC200810S			8	10									
MC250506S	25	31	5	6	8.5	M4	2.0	27	26×10^{-7}	380	0.15	2	±0.5
MC250606S			6	6									
MC250606AS			6	6.35									
MC250608S			6	8									
MC250610S			6	10									
MC2506A08S			6.35	8									
MC2506A10S			6.35	10									
MC250808S			8	8									
MC250810S			8	10									
MC250812S			8	12									
MC251010S			10	10									
MC251012S			10	12									
MC320606AS	32	41	6	6.35	12	M4	4.0	60	96×10^{-7}	500	0.15	2	±0.5
MC320608S			6	8									
MC3206A08S			6.35	8									
MC3206A10S			6.35	10									
MC320808S			8	8									
MC320810S			8	10									
MC320812S			8	12									
MC321010S			10	10									
MC321012S			10	12									
MC321014S			10	14									
MC321214S			12	14									
MC321414S			14	14									
MC321416S			14	16									

Clamp Type

Dimensions

MC12□C2, MC16□C2, MC20□C2, MC25□C2, MC32□C2



Specifications

Model	Dimensions						Normal Torque	Mass	Inertial Moment	Static Torsion Spring Constant	Permissible Eccentricity	Permissible Declination	Permissible End Play
	Outer Diameter ϕA	Length W	Shaft Hole Diameter d1H8	Shaft Hole Diameter d2H8	L	Screw Used							
	mm	mm	mm	mm	mm	M	N·m	g	kg·m^2	N·m/rad	mm	deg	mm
MC120404C2	12	18.5	4	4	5	M2	0.4	3.6	0.78×10^{-7}	45	0.10	2	±0.3
MC120405C2			4	5									
MC120505C2			5	5									
MC160506C2	16	23	5	6	6.5	M2.5	0.5	9.2	3.4×10^{-7}	80	0.10	2	±0.4
MC200506C2	20	26	5	6	7.5	M2.5	1.0	16	9.1×10^{-7}	170	0.10	2	±0.4
MC200508C2			5	8									
MC200606C2			6	6									
MC200606AC2			6	6.35									
MC200608C2			6	8									
MC2006A08C2			6.35	8									
MC200808C2			8	8									
MC250506C2	25	31	5	6	8.5	M3	2.0	28	26×10^{-7}	380	0.15	2	±0.5
MC250606C2			6	6									
MC250606AC2			6	6.35									
MC250608C2			6	8									
MC250610C2			6	10									
MC2506A08C2			6.35	8									
MC2506A10C2			6.35	10									
MC250808C2			8	8									
MC250810C2			8	10									
MC251010C2			10	10									
MC320606AC2	32	41	6	6.35	12	M4	4.0	64	97×10^{-7}	500	0.15	2	±0.5
MC320608C2			6	8									
MC3206A08C2			6.35	8									
MC3206A10C2			6.35	10									
MC320808C2			8	8									
MC320810C2			8	10									
MC320812C2			8	12									
MC321010C2			10	10									
MC321012C2			10	12									
MC321014C2			10	14									
MC321214C2			12	14									
MC321414C2			14	14									

MCV Couplings RoHS

These products are clamp type couplings for a stepping motor.

Product Line

Model
MCV15□
MCV19□
MCV25□
MCV30□

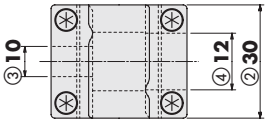
●Enter the inner diameter of coupling in the box (□) within the model name.

Product Number Code

MCV 30 10 12

① ② ③ ④

①	**MCV** Couplings
②	Outer diameter of coupling
③	Inner Diameter d1 (Smaller side)
④	Inner Diameter d2 (Larger side)



●Enter the inner diameter d1 of smaller side, either motor shaft diameter or driven shaft diameter.
Enter the inner diameter d2 of larger side, either motor shaft diameter or driven shaft diameter.

Coupling Selection Table

Model	Type	Motor Shaft Diameter mm		Driven Shaft Diameter mm									
				03	04	05	06	06A	08	10	12	14	15
				ϕ3	ϕ4	ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14	ϕ15
CRK513P□KD	**MCV15**	**04**	ϕ4		●	●	●						
CRK523PM□KD, CRK523HPM□KD **CRK524PM□KD, CRK524HPM□KD** **CRK525PM□KD, CRK525HPM□KD** **CRK523P□KD, CRK523HP□KD** **CRK525P□KD, CRK525HP□KD**	**MCV15**	**05**	ϕ5	●	●	●	●						
CRK543□KD **CRK544□KD, CRK544P□KD** **CRK545□KD, CRK544PM□KD** **CRK54□AMKD** **CRK543RKD, CRK544RKD** **CRK545RKD** **CRK544PRKD** **CRK546PM□KD, CRK546P□KD,** **CRK546PRKD**	**MCV19**	**05**	ϕ5			●	●		●				
CRK564□KD, CRK564PM□KD **CRK566□KD, CRK566PM□KD** **CRK569□KD, CRK564RKD** **CRK56□AMKD** **CRK566RKD, CRK569RKD**	**MCV25**	**08**	ϕ8			●	●	●	●	●	●		
CRK569PM□KD	**MCV30**	**10**	ϕ10						●	●	●	●	●

●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.

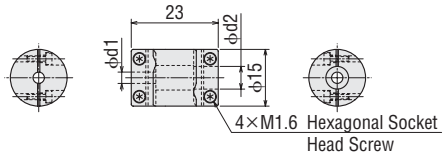
Specifications

Model	Dimensions					Normal Torque	Mass	Inertial Moment	Static Torsion Spring Constant	Permissible Eccentricity	Permissible Declination	Permissible End Play
	Outer Diameter ϕA	Length W	Shaft Hole Diameter d1H8	Shaft Hole Diameter d2H8	Screw Used							
	mm	mm	mm	mm	M	N·m	g	kg·m^2	N·m/rad	mm	deg	mm
MCV150305	15	23	3	5	M1.6	0.77	8	2.7×10^{-7}	43	0.15	1.5	±0.2
MCV150404			4	4								
MCV150405			4	5								
MCV150406			4	6								
MCV150505			5	5								
MCV150506			5	6								
MCV150606			6	6								
MCV190505	19	26	5	5	M2	1.47	14	8.4×10^{-7}	88	0.15	1.5	±0.2
MCV190506			5	6								
MCV190508			5	8								
MCV190606			6	6								
MCV190608			6	8								
MCV190808			8	8								
MCV250506	25	32	5	6	M2.5	2.8	28	30×10^{-7}	170	0.15	1.5	±0.2
MCV250508			5	8								
MCV2506A08			6.35	8								
MCV2506A10			6.35	10								
MCV250608			6	8								
MCV250610			6	10								
MCV250808			8	8								
MCV250810			8	10								
MCV250812			8	12								
MCV251010			10	10								
MCV251012			10	12								
MCV300808	30	36	8	8	M3	4.41	45	69×10^{-7}	220	0.2	1.5	±0.3
MCV300810			8	10								
MCV300812			8	12								
MCV300814			8	14								
MCV300815			8	15								
MCV301010			10	10								
MCV301012			10	12								
MCV301014			10	14								
MCV301015			10	15								
MCV301214			12	14								
MCV301414			14	14								
MCV301415			14	15								

Dimensions (Unit = mm)

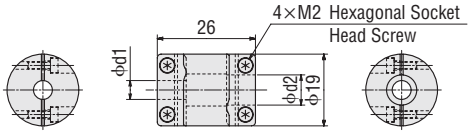
MCV15

Mass: 8 g



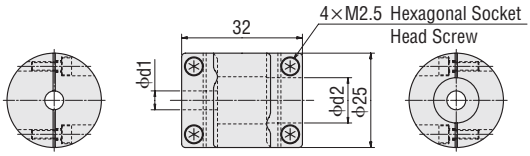
MCV19

Mass: 14 g



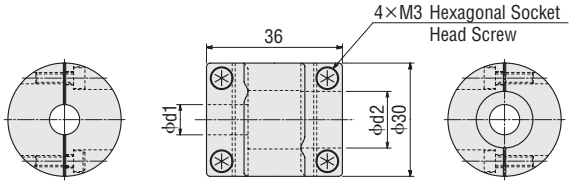
MCV25

Mass: 28 g



MCV30

Mass: 45 g



MCS Couplings RoHS

These products are clamp type couplings for a geard type of the stepping motor.

Product Line

Model
MCS14□
MCS20□
MCS30□
MCS40□
MCS55□

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

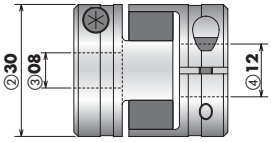
Product Number Code

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)

●Enter the inner diameter d1 of smaller side, either motor shaft diameter or driven shaft diameter.
Enter the inner diameter d2 of larger side, either motor shaft diameter or driven shaft diameter.



Coupling Selection Table

Geared Type	Model	Gear Ratio	Type	Motor Shaft Diameter mm		Driven Shaft Diameter mm												
						04	**05**	**06**	**F04**	**08**	**10**	**12**	**14**	**15**	**16**	**18**	**20**	**22**	**24**
						ϕ4	ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14	ϕ15	ϕ16	ϕ18	ϕ20	ϕ22	ϕ24
TH Geared Type	**CRK523P**□**KD-T**■	**7.2, 10 20, 30**	**MCS14**	**05**	ϕ5	●	●	●											
	CRK543□**KD-T**■	**3.6, 7.2, 10**	**MCS20**	**06**	ϕ6		●	●	●	●	●								
		20, 30	**MCS30**	**06**	ϕ6			●	●	●	●	●	●	●	●				
	CRK564□**KD-T**■	**3.6, 7.2**	**MCS30**	**08**	ϕ8			●	●	●	●	●	●	●	●				
		10, 20, 30	**MCS40**	**08**	ϕ8					●	●	●	●	●	●	●	●		
PN Geared Type	**CRK523P**□**KD-N**■	**5, 7.2, 10**	**MCS20**	**08**	ϕ8		●	●	●	●	●								
	CRK544□**KD-N**■	**5**	**MCS20**	**10**	ϕ10		●	●	●	●	●								
		7.2, 10	**MCS30**	**10**	ϕ10			●	●	●	●	●	●	●	●				
	CRK566□**KD-N**■	**5**	**MCS40**	**12**	ϕ12					●	●	●	●	●	●	●	●		
		7.2, 10	**MCS55**	**12**	ϕ12							●	●	●	●	●	●	●	●
	CRK564□**KD-N**■	**25, 36, 50**	**MCS55**	**12**	ϕ12							●	●	●	●	●	●	●	●
Harmonic Geared Type	**CRK513P**□**KD-H**■	**50, 100**	**MCS14**	**05**	ϕ5	●	●	●											
	CRK523P□**KD-H**■	**50, 100**	**MCS30**	**08**	ϕ8			●	●	●	●	●	●	●	●				
	CRK543□**KD-H**■	**50, 100**	**MCS40**	**10**	ϕ10					●	●	●	●	●	●	●	●		
	CRK564□**KD-H**■	**50, 100**	**MCS55**	**12**	ϕ12							●	●	●	●	●	●	●	●

●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	Dimensions					Normal Torque*	Mass	Inertial Moment	Static Torsion Spring Constant	Permissible Eccentricity	Permissible Declination	Permissible End Play
	Outer Diameter ϕA	Length W	Shaft Hole Diameter d1H7	Shaft Hole Diameter d2H7	Key Slot Tolerance b/t							
	mm	mm	mm	mm	mm	N·m	g	kg·m^2	N·m/rad	mm	deg	mm
MCS140404	14	22	4	4	–	2.0 (0.5)	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 (1.2)	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								
MCS200510			5	10								
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 (3.0)	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								
MCS300612			6	12								
MCS300614			6	14								
MCS300615			6	15								
MCS300616			6	16								
MCS30F04F04			6.35	6.35								
MCS30F0408			6.35	8								
MCS30F0410			6.35	10								
MCS300808			8	8								
MCS300810			8	10								
MCS300812			8	12								
MCS300814			8	14								
MCS300815			8	15								
MCS300816			8	16								
MCS301010			10	10								
MCS301012			10	12								
MCS301014			10	14								
MCS301015			10	15								
MCS301016			10	16								
MCS301212			12	12								
MCS301214			12	14								
MCS301414			14	14								
MCS301415			14	15								
MCS301416			14	16								

*Normal Torque of ( ) is the value that is included safety factor (4.2) by the load based on sizing.

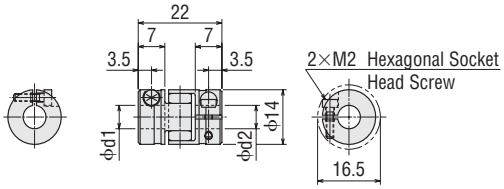
Model	Dimensions					Normal Torque*	Mass	Inertial Moment	Static Torsion Spring Constant	Permissible Eccentricity	Permissible Declination	Permissible End Play
	Outer Diameter ϕA	Length W	Shaft Hole Diameter d1H7	Shaft Hole Diameter d2H7	Key Slot Tolerance b/t							
	mm	mm	mm	mm	mm	N·m	g	kg·m^2	N·m/rad	mm	deg	mm
MCS400808	40	66	8	8	ϕ8 b : 2±0.0125 t : $1^{+0.1}_{0}$	17.0 (4.0)	139	42.29×10^{-6}	859.5	0.06	0.9	+1.2 0
MCS400810			8	10								
MCS400812			8	12								
MCS400814			8	14								
MCS400815			8	15								
MCS400816			8	16								
MCS400818			8	18								
MCS400820			8	20								
MCS401010			10	10								
MCS401012			10	12								
MCS401014			10	14	ϕ10 b : 3±0.0125 t : $1.4^{+0.1}_{0}$							
MCS401015			10	15								
MCS401016			10	16								
MCS401018			10	18	ϕ12 b : 4±0.015 t : $1.8^{+0.1}_{0}$							
MCS401020			10	20								
MCS401212			12	12								
MCS401214			12	14	ϕ14 b : 5±0.015 t : $2.3^{+0.1}_{0}$							
MCS401215			12	15								
MCS401216			12	16	ϕ15 b : 5±0.015 t : $2.3^{+0.1}_{0}$							
MCS401218			12	18								
MCS401220			12	20	ϕ16 b : 5±0.015 t : $2.3^{+0.1}_{0}$							
MCS551212	55	78	12	12		60.0 (14.3)	282	109.1×10^{-6}	2063	0.10	0.9	+1.4 0
MCS551214			12	14								
MCS551215			12	15	ϕ18 b : 6±0.015 t : $2.8^{+0.1}_{0}$							
MCS551216			12	16								
MCS551218			12	18								
MCS551220			12	20	ϕ20 b : 6±0.015 t : $2.8^{+0.1}_{0}$							
MCS551222			12	22								
MCS551224			12	24	ϕ22 b : 6±0.015 t : $2.8^{+0.1}_{0}$							
MCS551414			14	14								
MCS551415			14	15								
MCS551416			14	16	ϕ24 b : 8±0.018 t : $3.3^{+0.2}_{0}$							
MCS551418			14	18								
MCS551420			14	20	ϕ25 b : 8±0.018 t : $3.3^{+0.2}_{0}$							
MCS551422			14	22								
MCS551424			14	24								
MCS551518			15	18								
MCS551618			16	18								
MCS551818			18	18								
MCS551820			18	20								
MCS551822			18	22								
MCS551824			18	24								

*Normal Torque of ( ) is the value that is included safety factor (4.2) by the load based on sizing.

Dimensions (Unit = mm)

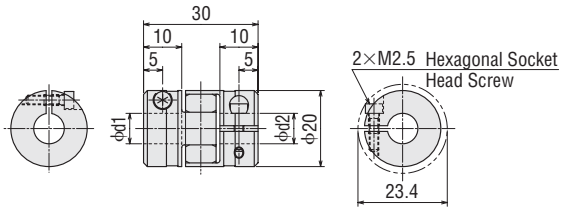
MCS14

Mass: 6.7 g



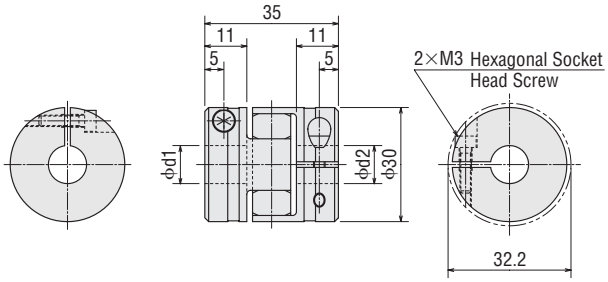
MCS20

Mass: 19.8 g



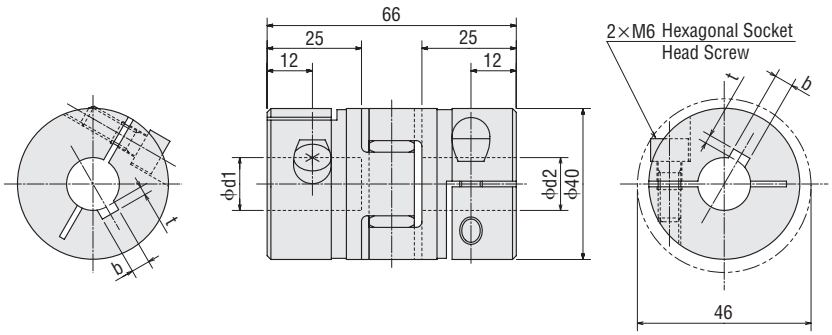
MCS30

Mass: 44.6 g



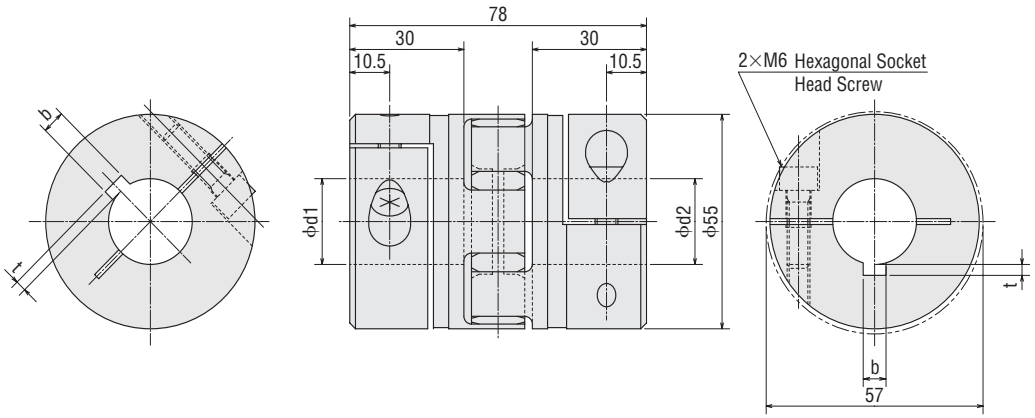
MCS40

Mass: 139 g



MCS55

Mass: 282 g



Mounting to a Shaft

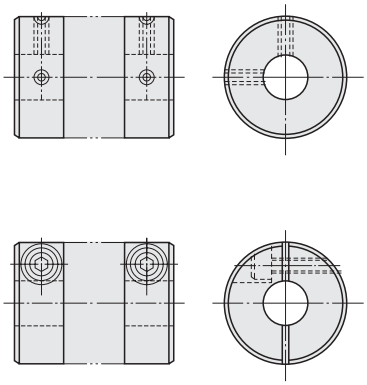
To mount a flexible coupling to a shaft, choose between set screw type or clamp type according to your application.

Set Screw Type

The set screw type adopts one of the most widely used fastener structures where screws are pushed into the shaft to fix the shaft. However, caution must be exercised because the shaft may be damaged due to direct contact with the screw tip, and removal of the coupling may become difficult. Since the motor shaft has the shaft flat, install the screw point in the surface of shaft flat perpendicularly.

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 using a torque wrench to fasten the coupling.

Type		MC12□C2	MC16□C2	MC20□C2	MC25□C2	MC32□C2
Tightening Torque	N·m	0.5	1	1	1.5	2.5

Type		MCV15	MCV19	MCV25	MCV30
Tightening Torque	N·m	0.25	0.5	1	1.5

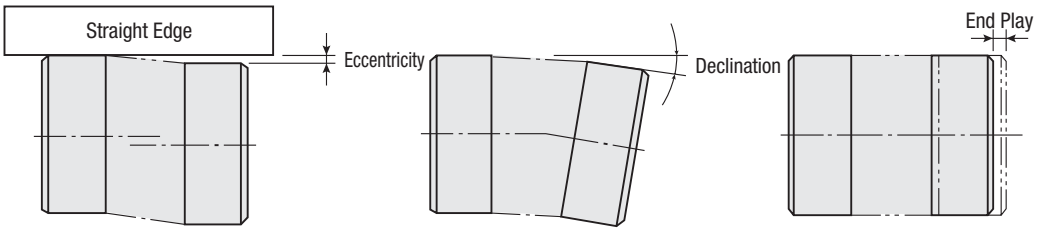
Type		MCS14	MCS20	MCS30	MCS40	MCS55
Tightening Torque	N·m	0.37	0.76	1.34	10.5	10.5

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:

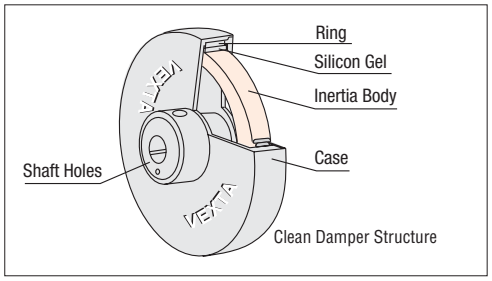
- When misalignment exceeds the permissible value or excessive torque is applied, the coupling's shape will deform, and service life is shortened.
- When the coupling emits a metallic sound during operation, stop operation immediately and ensure there is no misalignment, axis interference or loose screws.
- 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.



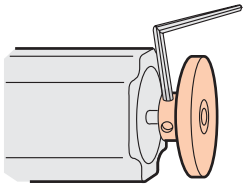
Product Line

Model	Inertial Moment kg·m^2	Mass g	Applicable Model
D4CL-5.0F	34×10^{-7}	24	**CRK52□PBKD** **CRK52□HPBKD** **CRK52□PMBKD** **CRK52□HPMBKD** **CRK523PBKD-T■** **CRK523PBKD-N■** **CRK523PBKD-H■** **CRK54□PBKD** **CRK54□PMBKD** **CRK54□BKD** **CRK543BKD-T■** **CRK544BKD-N■** **CRK543BKD-H■**
D6CL-8.0F	140×10^{-7}	61	**CRK56□PMBKD** **CRK56□BKD** **CRK564BKD-T■** **CRK56□BKD-N■** **CRK564BKD-H■**

Operating Temperature Range: −20 to +80℃

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

Installation of the Clean Damper



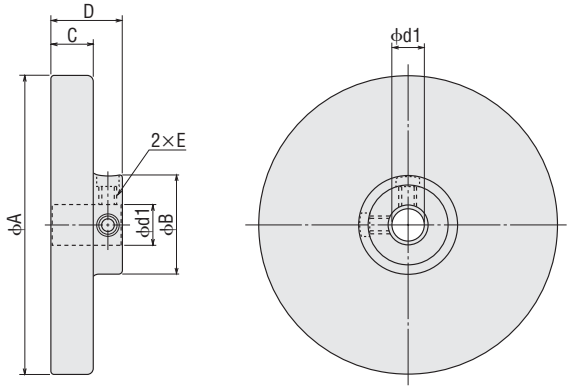
Point the mounting screws of the clean damper toward the motor case, fasten to the shaft and tighten the damper's mounting screws (two places) with a hexagonal wrench to secure it to the shaft.

Model	D4CL-5.0F	D6CL-8.0F
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)



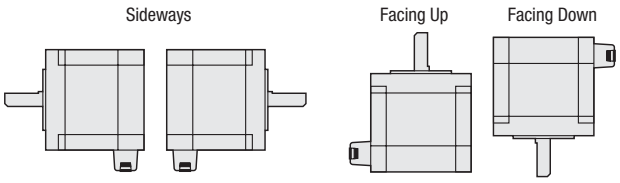
Model	ϕd1	ϕA	ϕB	C	D	E
D4CL-5.0F	$5^{+0.018}_{0}$	ϕ36±0.5	ϕ13±0.5	9±0.3	15±0.5	M3
D6CL-8.0F	$8^{+0.022}_{0}$	ϕ44.5±0.5	ϕ20±0.5	15±0.3	22±0.5	M4

Installation

Motor Installation

Mounting Direction

Motors can be mounted freely in any direction as shown below. Regardless of how the motor is mounted, take care not to apply an overhung load or thrust load on the shaft. Make sure the cable does not contact the mounting surface causing undesirable force on the cable.



Notes:

- Do not disassemble the motors.
- Do not apply any shock to the motor.

Installation Conditions

Install the motor in a location that meets the following conditions, or the product may be damaged.

- Indoors (This product is designed and manufactured to be installed within another device.)
- Ambient temperature: −10 to +50˚C (non-freezing)
  0 to +40˚C (non-freezing): Harmonic geared type
- Ambient humidity: 85% or less (non-condensing)
- Not exposed to explosive, flammable or corrosive gases
- Not exposed to direct sunlight
- Not exposed to dust
- Not exposed to water or oil
- A place where heat can escape easily
- Not exposed to continuous vibration or excessive impact

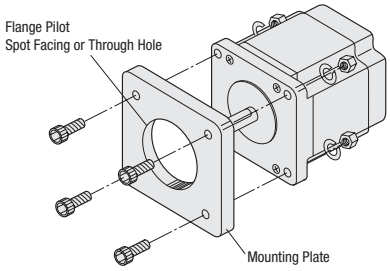
Notes:

- When installing the motor in an enclosed space such as a control box, or somewhere close to a heat-radiating object, vent holes should be used to prevent the motor from overheating.
- Do not install the motor in a location where a source of vibration will cause the motor to vibrate.

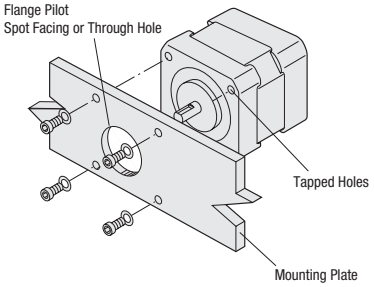
Mounting Method

Considering heat radiation and vibration isolation as much as possible, mount the motor tightly against a metal plane.

◇Mounting Method for Through Hole Type



◇Mounting Method for Tapped Hole Type



◇Thickness of the Mounting Plate for Through Hole Type

Model	Thickness of the Mounting Plate
CRK564□KD **CRK566□KD** **CRK569□KD** **CRK56□PM□KD** **CRK56□RKD** **CRK56□AMKD**	5 mm min.

- 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.

◇Thickness of the Mounting Plate for Tapped Hole Type

Model	Thickness of the Mounting Plate
CRK513P□KD	2 mm min.
CRK523P□KD, CRK525P□KD **CRK523HP□KD, CRK525HP□KD** **CRK523PM□KD, CRK524PM□KD** **CRK525PM□KD, CRK523HPM□KD** **CRK524HPM□KD, CRK525HPM□KD** **CRK54□AMKD** **CRK543□KD, CRK544□KD** **CRK54□PRKD** **CRK545□KD, CRK544P□KD** **CRK546P□KD, CRK544PM□KD** **CRK546PM□KD, CRK513P□KD-H■**	3 mm min.
CRK523P□KD-T■ **CRK523P□KD-N■**	4 mm min.
CRK523P□KD-H■ **CRK543□KD-T■, CRK544□KD-N■** **CRK543□KD-H■, CRK564□KD-T■**	5 mm min.
CRK564□KD-N■, CRK566□KD-N■ **CRK564□KD-H■**	8 mm min.

- 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.
  Enter the motor case length in the box (□) within the model name.

Driver Installation

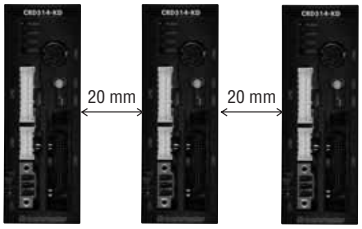
Installation Direction

Drivers are designed to dissipate heat through natural convection. Install the driver vertically as shown in the photograph.

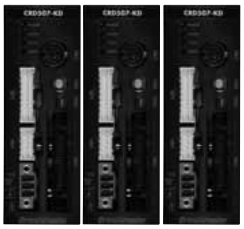
Using Multiple Axes

There must be a clearance of at least 50 mm in the horizontal and vertical directions respectively, between the driver and enclosure or other equipment.
When mounting two or more drivers, separate them by a space of at least 20 mm and 50 mm in the horizontal and vertical directions. However, you can install closely CRD503-KD, CRD507-KD and CRD507H-KD horizontally.

◇CRD514-KD

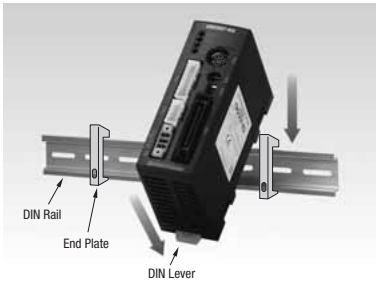


◇CRD503-KD, CRD507-KD, CRD507H-KD



Installation Method

- Use DIN rails with a width of 35 mm.
- Use end plate for fixing the driver.
- The DIN rail and end plate are not included.



Installation Conditions

Install the driver in a location that meets the following conditions, or the product may be damaged.

- Inside an enclosure installed indoors (with ventilation holes provided)
- Not exposed to an explosive atmosphere, toxic gases (sulfurized gas etc.) or liquids
- Not exposed to direct sunlight
- Not exposed to significant amounts of dust or iron powder
- Not exposed to water (rain, water droplets), oil (oil droplets) or other liquids
- Not exposed to air having high salt content
- Not exposed to continuous vibration or excessive impact
- Not subjected to significant electromagnetic noise caused by welding machines, power equipment etc.
- Not exposed to radioactive materials, magnetic field or vacuum conditions

This product is manufactured at a plant certified with the international standards **ISO 9001** (for quality assurance) and **ISO 14001** (for systems of environmental management).

Orientalmotor

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ORIENTAL MOTOR (EUROPA) GmbH

www.orientalmotor.de

European Headquarters and Düsseldorf Office
Schiessstraße 74
40549 Düsseldorf, Germany
Tel: +49-211-5206700 Fax: +49-211-52067099

Munich Office
Carl-von-Linde-Straße 42
85716 Unterschleißheim, Germany
Tel: +49-89-3181225-00 Fax: +49-89-3181225-25

Hamburg Office
Meckelfelder Weg 2
21079 Hamburg, Germany
Tel: +49-40-76910443 Fax: +49-40-76910445

Jena Office
Wildenbruchstraße 15
07745 Jena, Germany
Tel: +49-3641-675280 Fax: +49-3641-675288

Stuttgart Office
Tel: +49-7335-924853 Fax: +49-7335-924854

ORIENTAL MOTOR (UK) LTD.

www.oriental-motor.co.uk

Unit 5 Faraday Office Park
Rankine Road, Basingstoke
Hampshire RG24 8AH, U.K.
Tel: +44-1256-347090 Fax: +44-1256-347099

ORIENTAL MOTOR (FRANCE) SARL

www.orientalmotor.fr

France Headquarters
32, Avenue de l'ile Saint Martin
92737 Nanterre Cedex, France
Tel: +33-1 47 86 97 50 Fax: +33-1 47 82 45 16

Lyon Office
10, Allée des Sorbiers
69673 Bron Cedex, France
Tel: +33-4 78 41 15 02 Fax: +33-4 78 41 15 90

ORIENTAL MOTOR ITALIA s.r.l.

www.orientalmotor.it

Italy Headquarters
Via A. De Gasperi, 85
20017 Mazzo di Rho (MI), Italy
Tel: +39-2-93906346 Fax: +39-2-93906348

Bologna Office
Via mori, 6
40054 Prunaro di Budrio (BO), Italy
Tel: +39-51-6931249 Fax: +39-51-6929266

Verona Office
Piazza Roma, 3A
37066 Sommacampagna (VR), Italy
Tel: +39-45-8961049 Fax: +39-45-8971978

Customer Center (Support in German & English)

00800 22 55 66 22* Mon-Thu: 08:00-17:30 CET Friday: 08:00-16:00 CET
CA LL OM CC * Free Call Europe
Mail to: tech@orientalmotor.de

SINGAPORE ORIENTAL MOTOR PTE LTD

www.orientalmotor.com.sg

31 Kaki Bukit Road 3, #04-02/04
Techlink, Singapore 417818
Tel: +65-6745-7344 FAX: +65-6745-9405

ORIENTAL MOTOR (MALAYSIA) SDN. BHD.

www.orientalmotor.com.my

Headquarters & Kuala Lumpur Office
A-13-1, North Point Offices, Mid Valley City,
No. 1 Medan Syed Putra Utara 59200
Kuala Lumpur, Malaysia
Tel: +60-3-22875778 Fax: +60-3-22875528

Penang Office
Tel: +60-4-6423788 Fax: +60-4-6425788

ORIENTAL MOTOR (THAILAND) CO., LTD.

www.orientalmotor.co.th

900, 8th Floor Zone C, Tonson Tower,
Ploenchit Road, Lumpini, Pathumwan,
Bangkok 10330 Thailand
Tel: +66-2-251-1871 Fax: +66-2-251-1872

Customer Support Centre (Support in English & Chinese)

For Singapore: 1800-842 0280* * Free Call Mon-Fri: 09:00-17:30 Singapore Time
For Malaysia: 1800-806 161* * Free Call
For Other Countries: +65-6842-0280
Mail to: support@orientalmotor.com.sg

Japanese Customer Support Centre (Asia and Oceania Areas)

+65-6745-3008 Mon-Fri: 09:00-17:30 Singapore Time
Mail to: j-support@orientalmotor.com.sg

ORIENTAL MOTOR CO., LTD.

www.orientalmotor.co.jp

Headquarters
6-16-17 Ueno,
Taito-ku, Tokyo 110-8536, Japan
Tel: +81-3-3835-0684 Fax: +81-3-3835-1890

For more information please contact:

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