

Orientalmotor

NEW
PRODUCTS

RoHS RoHS-Compliant
5 Phase Stepping Motor Unit

CRK Series

Type with Built-In Controller
24 VDC Microstep Drive



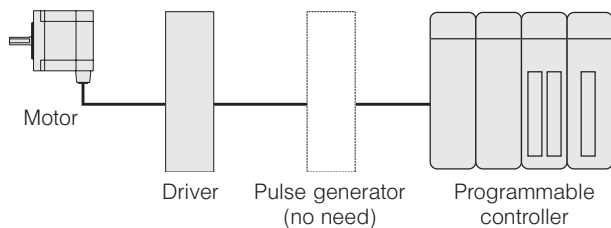
5 Phase Microstep Stepping Motor Unit with DC-Input and Integrated Controller. Two Control Methods Including I/O-Control can be selected.



Features

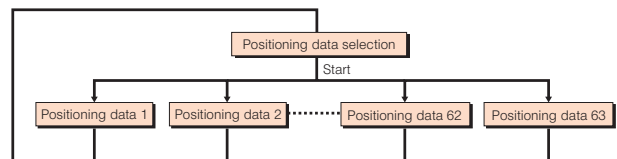
● Space-Saving, Less Wiring

The compact driver and the needlessness of a pulse generator make the device space-saving and the system simpler.



● Positioning Data of up to 63 Points

Up to 63 points of positioning data can be set in the driver. Each data can be set either in the incremental mode or in the absolute mode.



· The positioning data can be set with the control module OPX-2A (sold separately) or via RS-485 connection.

Three Operating Patterns

● Positioning Operation

The motor operation speed and movement distance are set in the positioning data and the operation is realized based on the selected positioning data. Continuous operation and sequential operation can be selected.

● Return to Home Operation

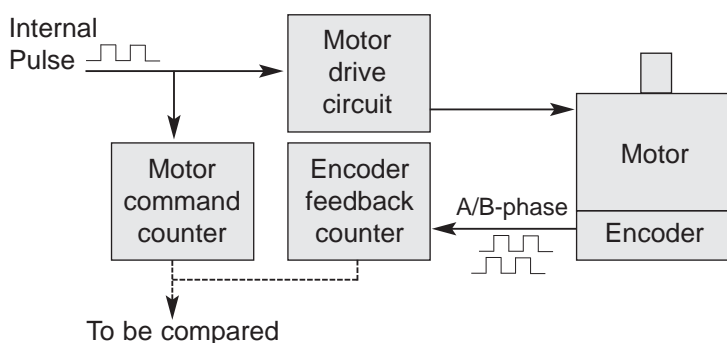
This function allows an easy return to home operation by using sensors.

● Speed Control Operation

With FWD signal input and RVS signal input the motor operates continuously. As the operation runs with the prior set positioning data, multi-speed operation can be realized by changing the data number.

Useful Functions

● STEP-OUT Output Function



● PLS-OUT Output Function

● Multi-axes Operation Function

● Sensor Input Function

● Teaching Function

· When a commanded position to the motor and a feedback position from the encoder are compared, and an abnormal deviation is detected, STEP-OUT (Misstep detection output) is turned on. Warning, or Alarm can be generated as well.

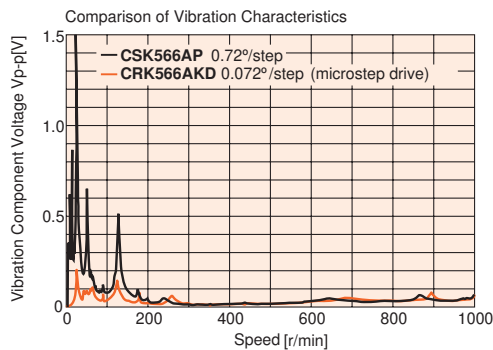
· The motor resolution need not correspond with the encoder resolution because the resolution is matched by the internal encoder electronic gear function.



Low Vibration, Low Noise

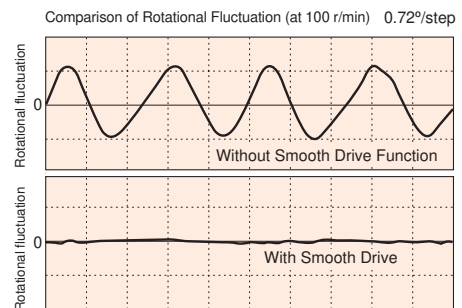
● Lower Vibration and Noise Achieved by Microstep Drive

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



● Smooth Drive Function for Enhanced Ease of Use

The Smooth Drive Function automatically controls operations via microstep drive, at the same travel distance and speed used in the full-step mode.



Compact Driver for DIN Rail Mounting

● Compact DC-Input Driver with Mounting Case

The driver has a compact size of 35 mm (width) x 100 mm (height) x 70 mm (depth) and therefore contributes to a space-saving control box and device.



● DIN Rail Mounting Possible

The driver is made for direct DIN rail mounting, screws are not necessary.



Lineup

The standard type and TH geared type are available with 42 mm and 60 mm frame size, in total 32 types are provided.

● Standard Type

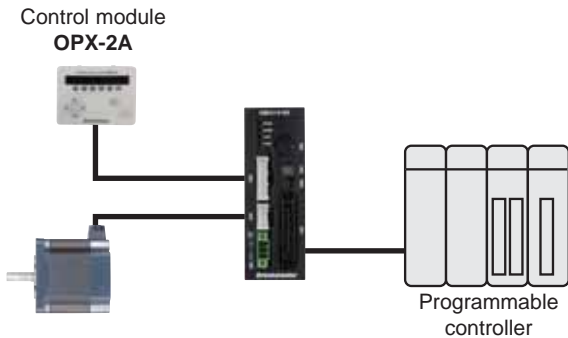


● TH Geared Type



Two control methods

● I/O controlled system

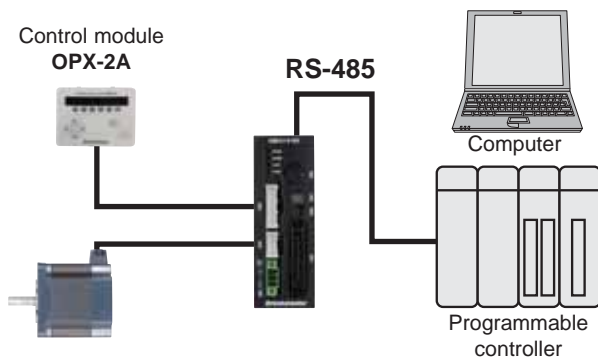


I/O control

Setting and input method of operation command

| Setting of operation command and parameter | Operation command (START, STOP, etc.) |
|--|---------------------------------------|
| Control module (OPX-2A) | I/O |

● RS-485 controlled system



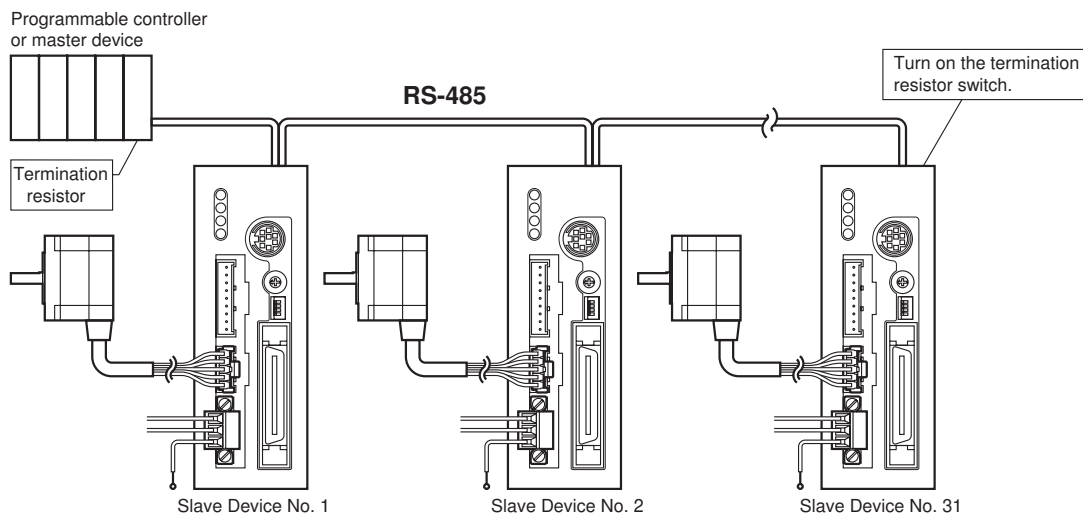
RS-485 control

Setting and input method of operation command

| Setting of operation command and parameter | Operation command (START, STOP, etc.) |
|---|---------------------------------------|
| Control module (OPX-2A) RS-485 communication | I/O RS-485 communication |

RS-485 communication - Example of system configuration

● Connection example



- Up to 31 units can be connected to a host master.
- Operation data and parameter can be set by the RS-485 communication and OPX-2A.
- Both the I/O and the RS-485 communication can be used for inputting the operation command.

Example:

STOP input ⇨ I/O control

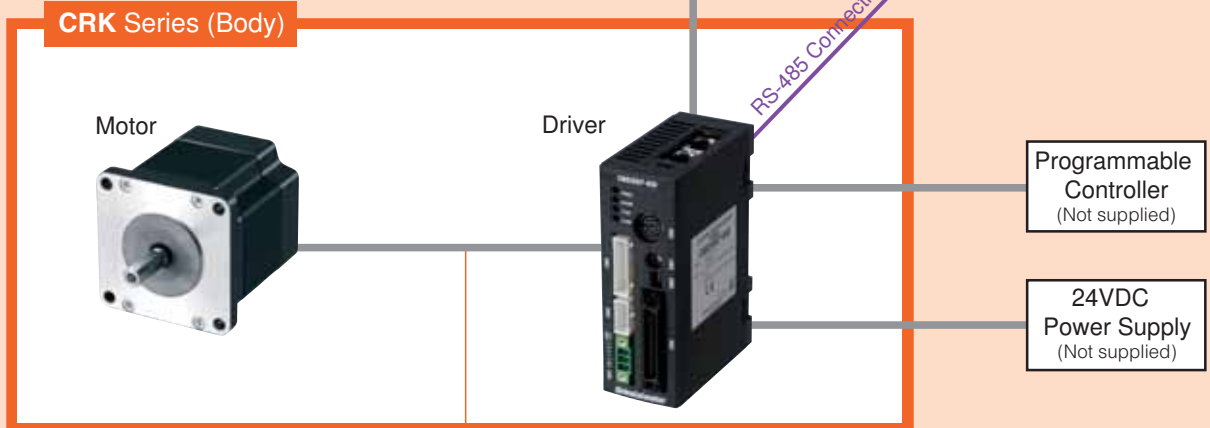
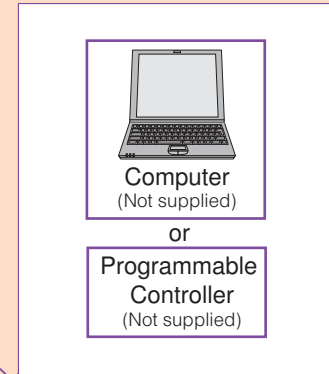
START input ⇨ RS-485 communication control

System Configuration

For I/O Control



For RS-485 Connection



| No. | Product Name | Overview |
|-----|---|--|
| ① | Control Module | This Control Module lets you set various data (edit, monitor, operate) and comes with a communication cable (5 m). |
| ② | Motor Mounting Brackets | Dedicated mounting bracket for the motor. |
| ③ | Flexible Couplings | Coupling that connects the motor shaft to the driven shaft. |
| ④ | Clean Dampers | Dedicated damper for suppressing stepping motor vibration. |
| ⑤ | Extension Cables | Cable for extending the wiring distance between the motor and driver (5 m, 10 m). |
| ⑥ | Lead Wire with Connector (For encoder connection) | Lead wire with Connector. Cable to connect the encoder with the driver (0.6 m). |

Example of System Configuration

For I/O Control:

| | | | | | | |
|------------|----------------|---|----------------------|------------------------|-------------------|--------------|
| CRK Series | Control Module | + | Extension Cable (5m) | Motor Mounting Bracket | Flexible Coupling | Clean Damper |
| CRK566BKD | OPX-2A | | CC05PK5 | PAL2P-5 | MCS300808 | D6CL-8.0F |

For RS-485 Connection:

| | | | | | | |
|------------|----------------|---|----------------------|------------------------|-------------------|--------------|
| CRK Series | Control Module | + | Extension Cable (5m) | Motor Mounting Bracket | Flexible Coupling | Clean Damper |
| CRK566BKD | OPX-2A | | CC05PK5 | PAL2P-5 | MCS300808 | D6CL-8.0F |

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

Product Number Code

CRK 5 6 4 A K D – T 10

- ①
- ②
- ③
- ④
- ⑤
- ⑥
- ⑦
- ⑧
- ⑨

| | | |
|---|--------------------|---|
| ① | Series | CRK Series |
| ② | 5: 5-phase | |
| ③ | Motor Frame Size | 4: 42 mm 6: 60 mm |
| ④ | Motor Case Length | |
| ⑤ | Motor Shaft Type | A: Single shaft B: Double shaft |
| ⑥ | Power Supply Input | K: DC24V |
| ⑦ | Driver Type | D: Stored data type |
| ⑧ | Gearhead Type | None: Standard type T: TH geared type |
| ⑨ | Gear Ratio | |

Standard Type Motor Frame Size **42 mm, 60 mm**

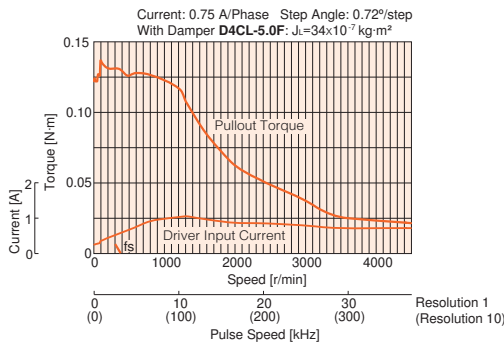
Specifications **(RoHS)**



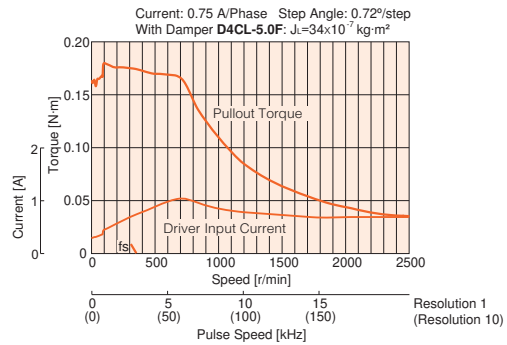
| | Single Shaft Double Shaft | CRK543AKD | CRK544AKD | CRK545AKD | CRK564AKD | CRK566AKD | CRK569AKD |
|------------------------|------------------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|
| | | CRK543BKD | CRK544BKD | CRK545BKD | CRK564BKD | CRK566BKD | CRK569BKD |
| Maximum Holding Torque | N·m | 0.13 | 0.18 | 0.24 | 0.42 | 0.83 | 1.66 |
| Rotor Inertia | 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 Source | | 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 | 1 | | | 2 | | |
| | Driver | 5 | | | | | |

Speed - Torque Characteristics fs: Starting Frequency

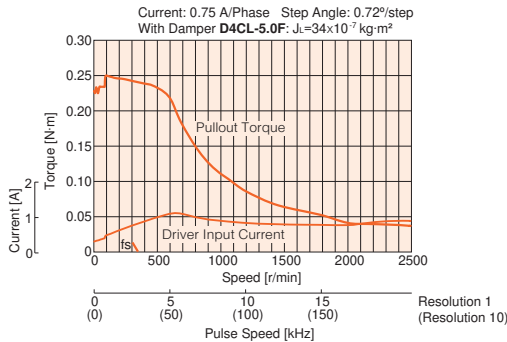
CRK543AKD/CRK543BKD



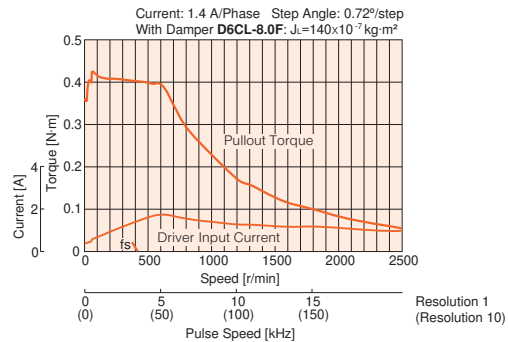
CRK544AKD/CRK544BKD



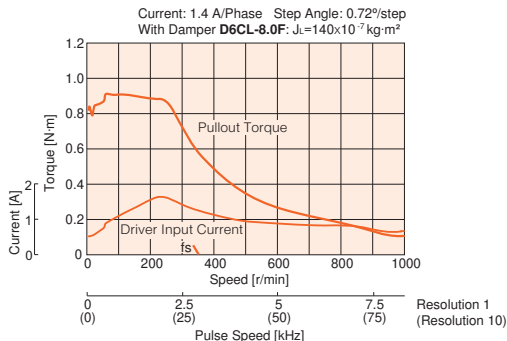
CRK545AKD/CRK545BKD



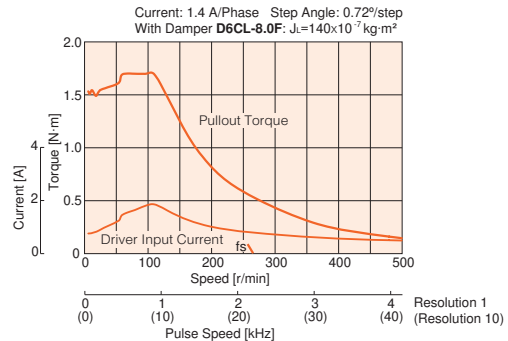
CRK564AKD/CRK564BKD



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 the temperature of the motor case under 100°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50 %.

TH Geared Type Motor Frame Size 42 mm

● Specifications **RoHS**



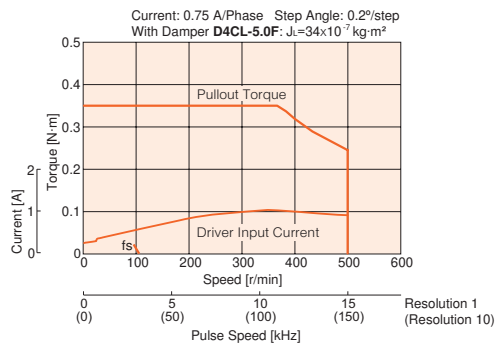
| | | Single Shaft | CRK543AKD-T3.6 | CRK543AKD-T7.2 | CRK543AKD-T10 | CRK543AKD-T20 | CRK543AKD-T30 |
|-------------------------|---------------------|--------------|---------------------|----------------|---------------|---------------|---------------|
| | | Double Shaft | CRK543BKD-T3.6 | CRK543BKD-T7.2 | CRK543BKD-T10 | CRK543BKD-T20 | CRK543BKD-T30 |
| Maximum Holding Torque | N·m | | 0.35 | 0.7 | 1 | 1.5 | |
| Rotor Inertia | J: g·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 | degrees | | 0.75° | 0.417° | | | 0.25° |
| Permissible Speed Range | r/min | | 0~500 | 0~250 | 0~180 | 0~90 | 0~60 |
| Power Source | | | 24 VDC±10% 1.4 A | | | | |
| Excitation Mode | | | Microstep | | | | |
| Mass | Motor | kg | 0.35 | | | | |
| | Driver | kg | 0.2 | | | | |
| Dimension No. | Motor | | 3 | | | | |
| | Driver | | 5 | | | | |

Notes:

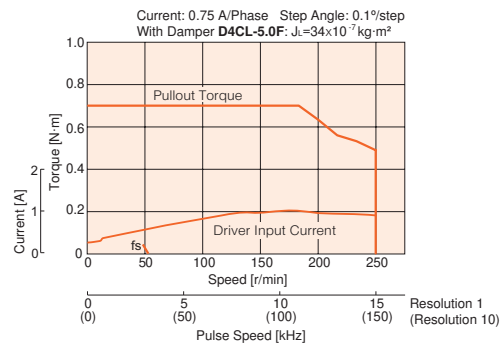
· Direction of rotation of the motor and that of the gear output shaft are the same for the gear ratios 1:3.6, 1:7.2 and 1:10. It is the opposite for 1:20 and 1:30 gear ratios.

● Speed - Torque Characteristics fs: Starting Frequency

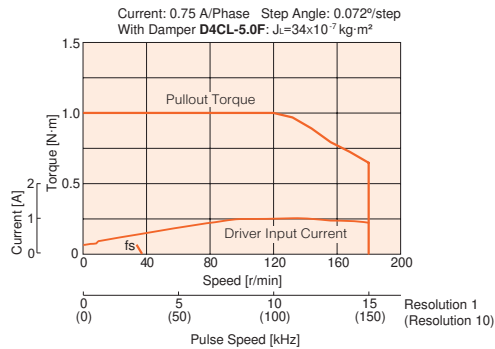
CRK543AKD-T3.6/CRK543BKD-T3.6



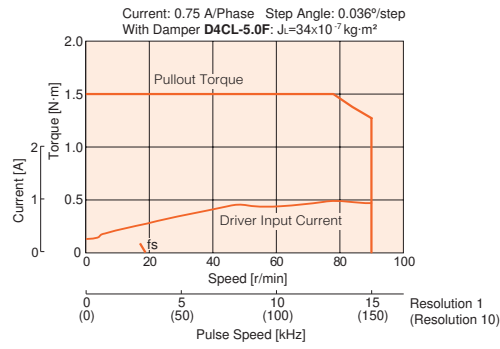
CRK543AKD-T7.2/CRK543BKD-T7.2



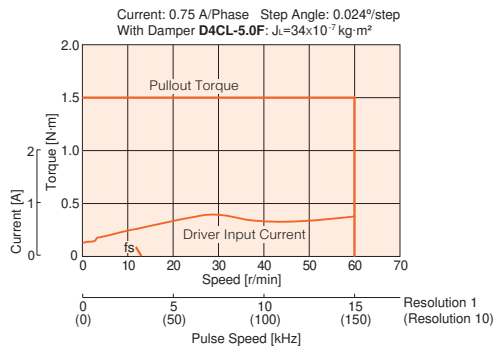
CRK543AKD-T10/CRK543BKD-T10



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 the temperature of the motor case under 100°C.
· The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50 %.

TH Geared Type Motor Frame Size 60 mm

● Specifications (RoHS)



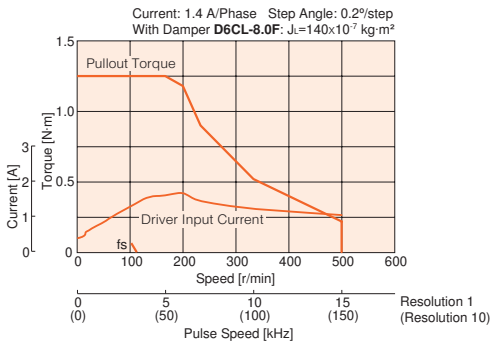
| | | Single Shaft | CRK564AKD-T3.6 | CRK564AKD-T7.2 | CRK564AKD-T10 | CRK564AKD-T20 | CRK564AKD-T30 |
|-------------------------|---------------------|--------------|----------------------|----------------|---------------|---------------|---------------|
| | | Double Shaft | CRK564BKD-T3.6 | CRK564BKD-T7.2 | CRK564BKD-T10 | CRK564BKD-T20 | CRK564BKD-T30 |
| Maximum Holding Torque | N·m | | 1.25 | 2.5 | 3 | 3.5 | 4 |
| Rotor Inertia | J: g·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 | degrees | | 0.584° | 0.25° | | 0.167° | |
| Permissible Speed Range | r/min | | 0~500 | 0~250 | 0~180 | 0~90 | 0~60 |
| Power Source | | | 24 VDC±10% 2.5 A | | | | |
| Excitation Mode | | | Microstep | | | | |
| Mass | Motor | kg | 0.95 | | | | |
| | Driver | kg | 0.2 | | | | |
| Dimension No. | Motor | | 4 | | | | |
| | Driver | | 5 | | | | |

Notes:

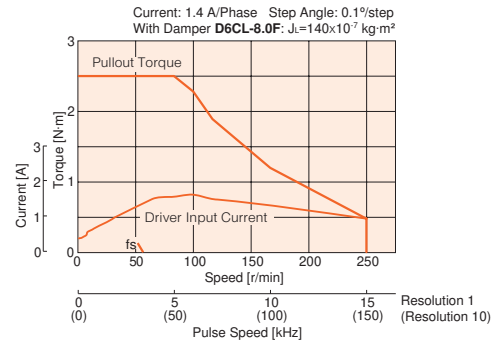
· Direction of rotation of the motor and that of the gear output shaft are the same for the gear ratios 1:3.6, 1:7.2 and 1:10. It is the opposite for 1:20 and 1:30 gear ratios.

● Speed - Torque Characteristics fs: Starting Frequency

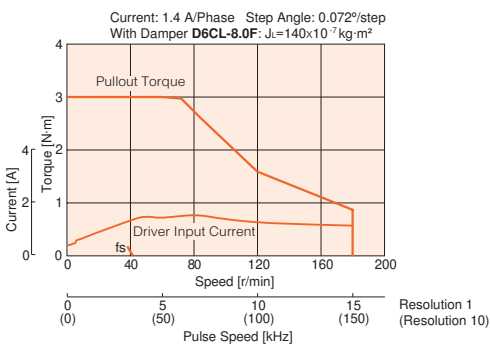
CRK564AKD-T3.6/CRK564BKD-T3.6



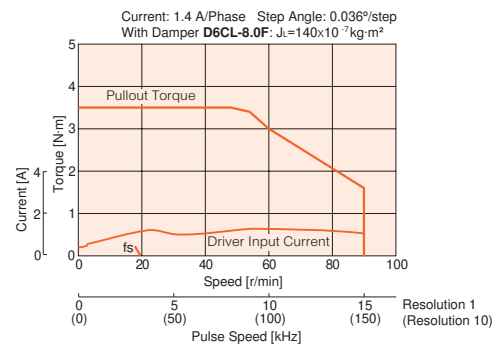
CRK564AKD-T7.2/CRK564BKD-T7.2



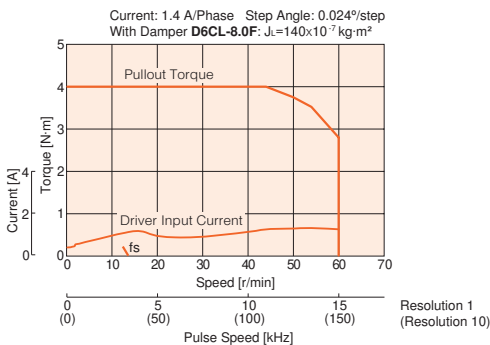
CRK564AKD-T10/CRK564BKD-T10



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 the temperature of the motor case under 100°C.
 · The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50 %.

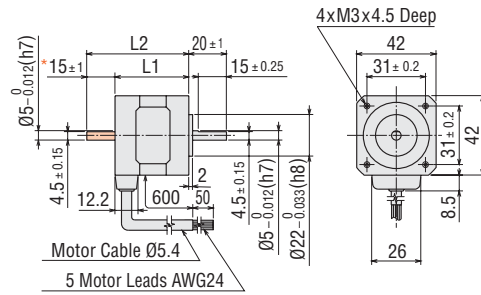
■ Dimensions (Unit = mm)

● Motor

Standard Type

1 □ 42 mm

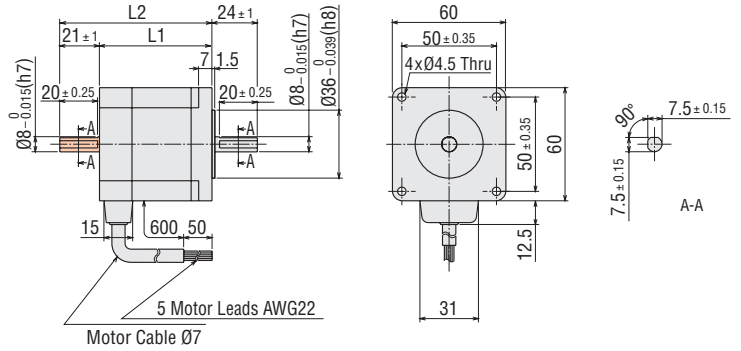
| Model | Motor Model | L1 | L2 | Mass (kg) |
|-----------|-------------|----|----|-----------|
| CRK543AKD | PK543AW | 33 | — | 0.25 |
| CRK543BKD | PK543BW | | 48 | |
| CRK544AKD | PK544AW | 39 | — | 0.3 |
| CRK544BKD | PK544BW | | 54 | |
| CRK545AKD | PK545AW | 47 | — | 0.4 |
| CRK545BKD | PK545BW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



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

2 □ 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 | |

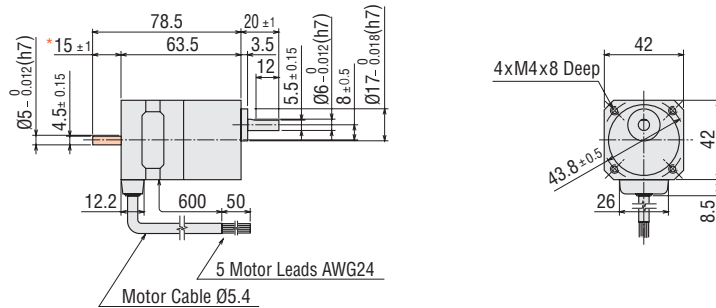


TH Geared Type

3 □ 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 □ | | |

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

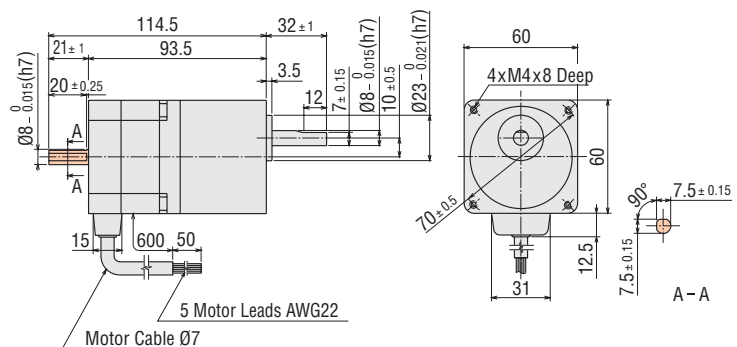


* The length of machining on double shaft model is 15 ± 0.25 mm.

4 □ 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 □ | | |

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



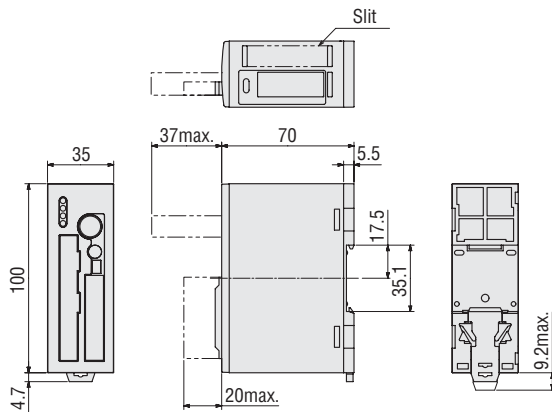
· These dimensions are for double shaft models. For single shaft models, ignore the orange areas.

■ Dimensions (Unit = mm)

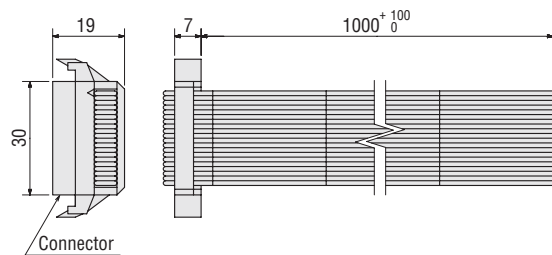
● Driver

⑤ Driver Model: CRD507-KD, CRD514-KD

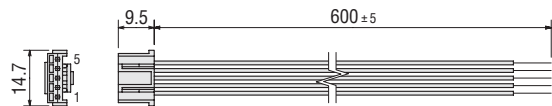
Mass: 0.2 kg



● Cable with Connector



● Lead Wire with Connector (For Motor Connection)



Power Supply Connector (CN1)

· Connector: MC1,5/3-STF-3,5 (PHOENIX CONTACT)

Cable with Connector (CN2, length: 1 m)

· Connector: FX2B-40SA-1.27R (HIROSE Electric)

Lead Wire with Connector (for motor connection) (CN4, length: 0.6 m)

· Connector Housing: 51103-0500 (MOLEX)

· Contact: 50351-8100 (MOLEX)

· Hand Crimper: 57295-5000 (MOLEX)

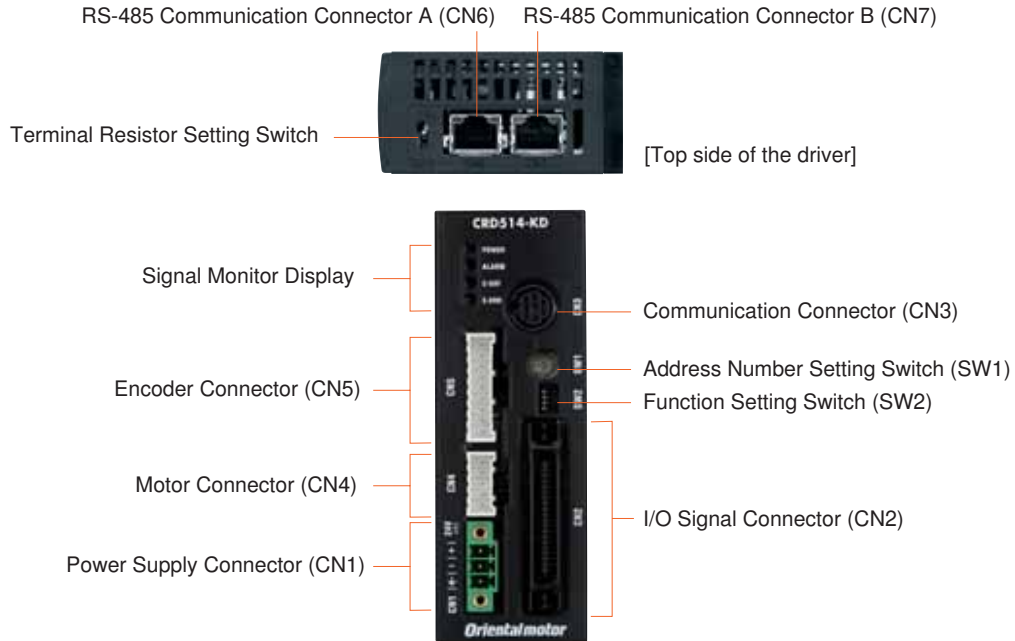
● In case of ordering only the driver for example for repair, the lead wire with connector, the cable with connector and the power supply connector are included.

■ Product Line

| Type | Motor Frame Size | Model | Motor Model | Driver Model |
|----------------|------------------|----------------|--------------|--------------|
| Standard Type | □ 42 mm | CRK543AKD | PK543AW | CRD507-KD |
| | | CRK543BKD | PK543BW | |
| | | CRK544AKD | PK544AW | |
| | | CRK544BKD | PK544BW | |
| | | CRK545AKD | PK545AW | |
| | □ 60 mm | CRK545BKD | PK545BW | CRD514-KD |
| | | CRK564AKD | PK564AW | |
| | | CRK564BKD | PK564BW | |
| | | CRK566AKD | PK566AW | |
| | | CRK566BKD | PK566BW | |
| TH Geared Type | □ 42 mm | 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 | | |
| | □ 60 mm | 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 | | | |

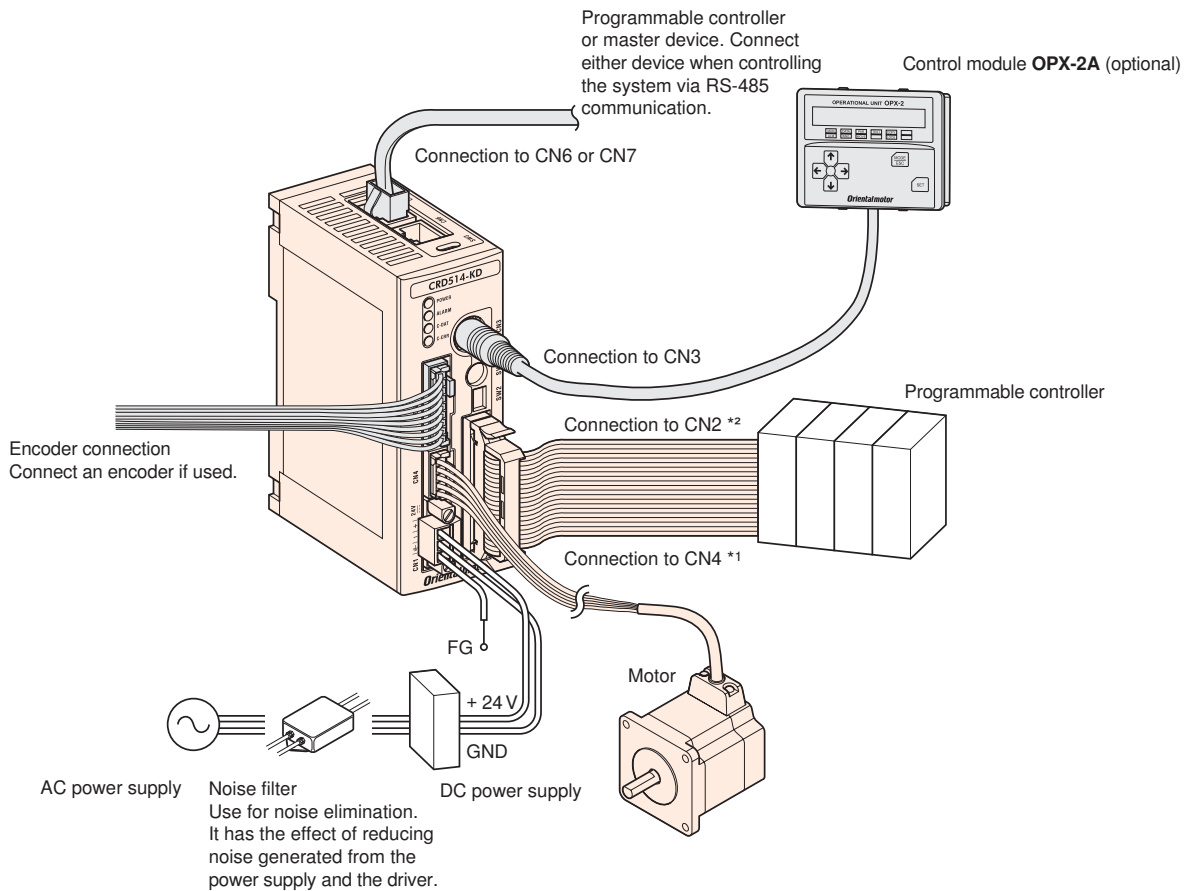
Connection and Operation

Names and Functions of Driver Parts



Connection Diagrams

Connection to Peripheral Equipment



*1 When ordering the unit or only the driver the 0.6 m lead wire with connector is included.

*2 When ordering the unit or only the driver the 1 m cable with connector is included.

Accessories (Sold separately)

Control Module (RoHS)

You can change the positioning data, various parameter and you can use it as a monitor.

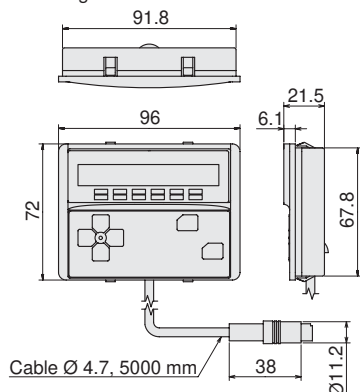
Product Line

| |
|---------------|
| Model |
| OPX-2A |

Dimensions (Unit = mm)

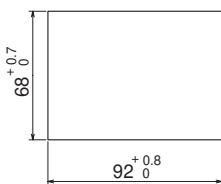
Control Module

Mass: 0.25 kg



Panel Cut-Out for Control

(Thickness of the mounting plate: 1-3 mm)



Lead Wire with Connector

For Motor Connection

Crimped lead wire for the connection of motor and driver. When ordering a unit, a 0.6 m lead wire with connector is included.

For Encoder Connection

Crimped lead wire for the connection of encoder and driver.

Product Line

| Model | Purpose | Length L (mm) | Conductor AWG |
|------------------|------------------------|---------------|------------------------------|
| LC5N06B | For motor connection | 600 | 22 (0.3 mm ²) |
| LC5N10B | | 1000 | |
| LC09A-006 | For encoder connection | 600 | |



For motor connection



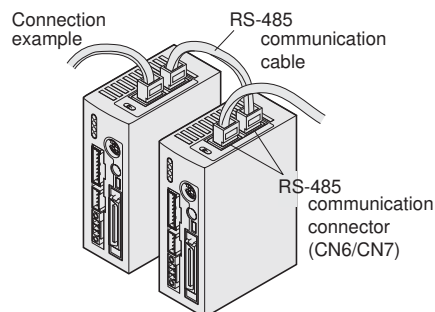
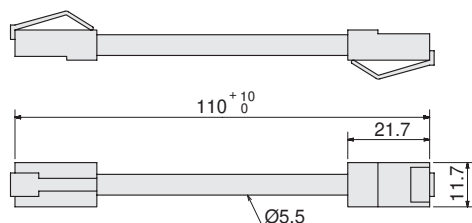
For encoder connection

RS-485 Communication Cable

Cable to connect the drivers in case of multi-axes operation.

Product Line

| Model | Length L (m) |
|------------------|--------------|
| CC001-RS4 | 0.1 |



· For more Accessories please check on page 5.

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).

Specifications are subject to change without notice.

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