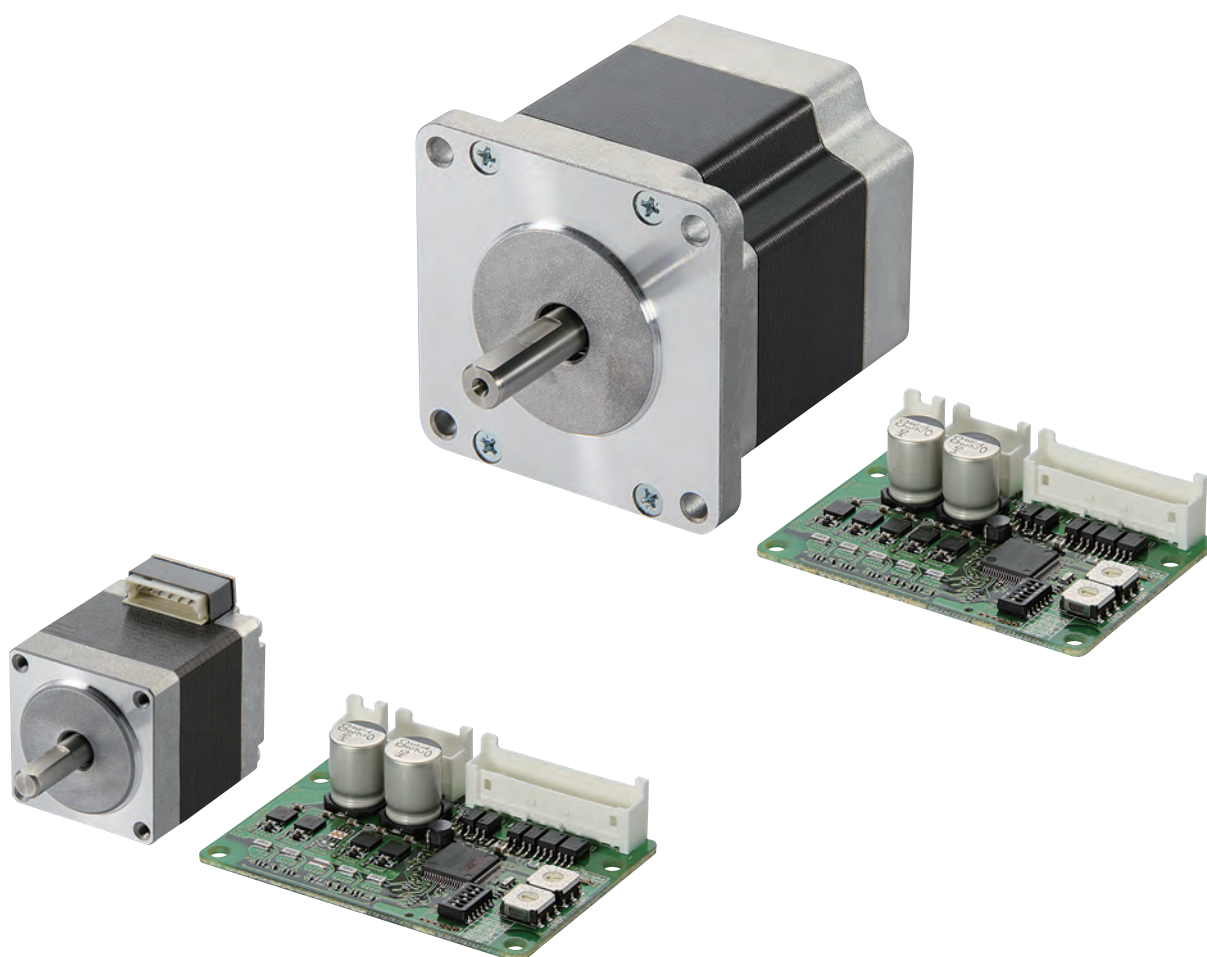


2-Phase/5-Phase Stepping Motor and Driver Packages  
DC Power-Supply Input  
**CVK Series**

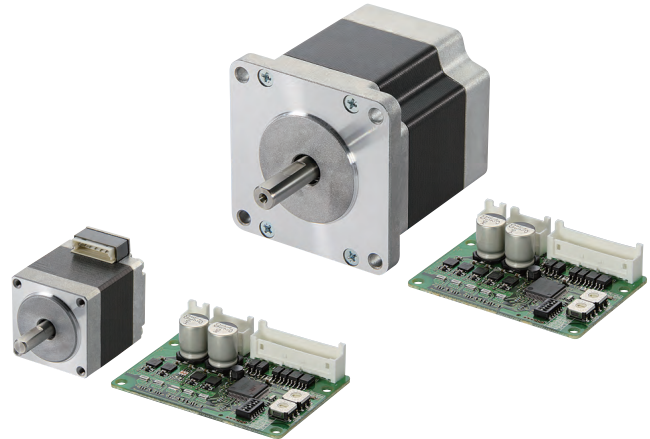


Flexible choice of 2-Phase and 5-Phase Stepping Motors.

Enhanced compatibility while utilizing both 2-Phase and 5-Phase characteristics.

Most suitable motor selection according to intended use.

Now offered at affordable prices.



## Features

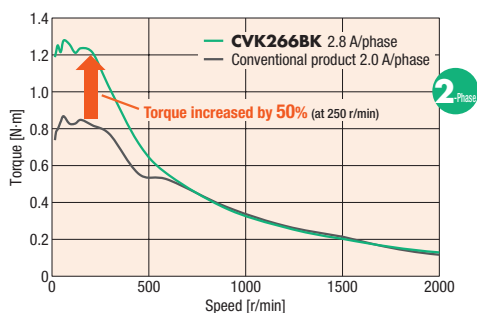
### 2-Phase/5-Phase CVK Series with improved basic performance

#### ● 2-Phase Motor with higher torque and less vibration in low speed regions

High current are now possible by revised motor winding design and the highly efficient design of the drive circuit, significantly increasing the torque in low speed regions. Especially the torque at around 250 r/min is higher by 50% than that of the conventional product. In addition, this product causes lesser vibration and noise than typical 2-Phase stepping motors. This is the 2-Phase stepping motor with improved overall basic performance.

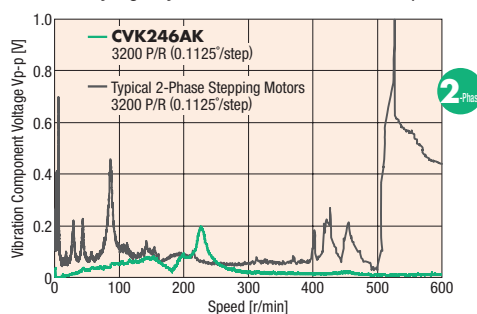
##### ◇ Higher torque in low speed regions

The excitation maximum holding torque has increased by bipolar wire connection.



##### ◇ Low vibration

The vibration characteristic has been largely improved in all the speed regions with the fully digitally controlled full-time micro-step driver.

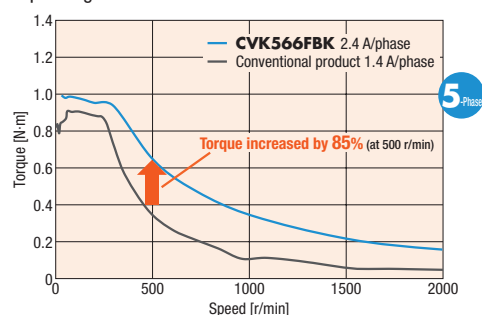


#### ● 5-Phase Motor with higher torque and low vibration/ noise in all speed regions

The characteristics of the 5-Phase motor has been maximized by the revised motor winding design and the highly efficient design of the drive circuit, significantly increasing the torque in all the speed regions. This product has higher torques by 85% at around 500 r/min than the conventional product. With the fully digitally controlled full-time micro-step driver, this high-performance 5-Phase stepping motor unit has been further improved in the low vibration/ noise characteristics of the conventional products.

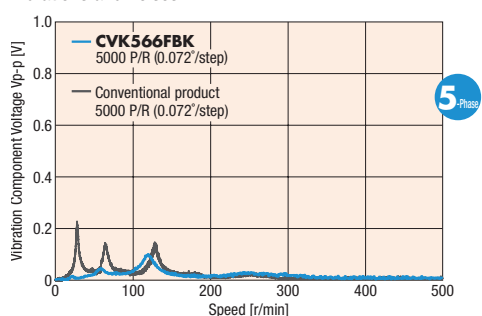
##### ◇ Higher torque in all speed regions

The motor winding has been made suitable for high currents, significantly expanding the area of use.



##### ◇ Lower vibration and noise

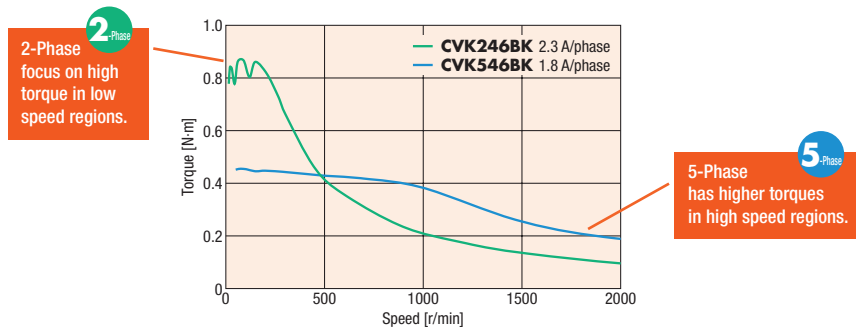
Using the fully digitally controlled full-time micro-step driver has further reduced vibrations and noises.



## 2-Phase Motor focus higher torque with low speed while 5-Phase Motor focus on higher accuracy positioning.

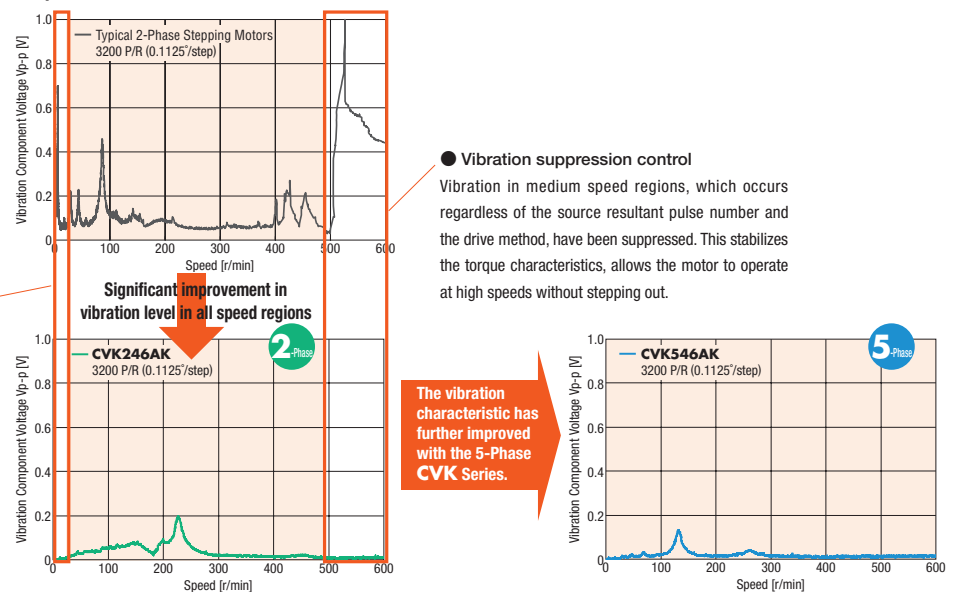
### More application can be used with the significant increase in torques.

With application of high currents, the 2-Phase and 5-Phase **CVK** Series have greatly increased in the excitation maximum holding torque in low speed regions and mainly in high speed regions, respectively. From a wide range of speeds and torques, you can select a motor suitable for your intended use.



### Low vibration by full-time micro step

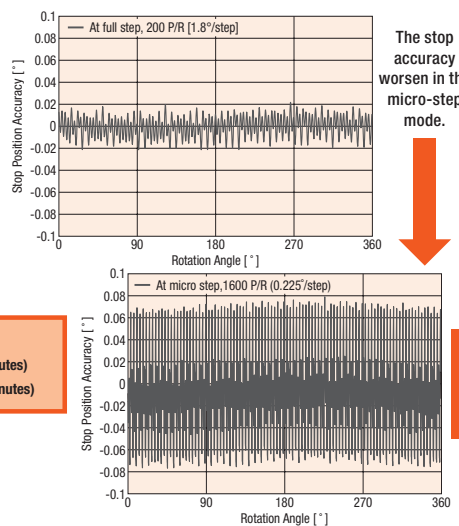
The vibration level has been greatly improved by the fully digitally controlled full-time micro-step drive driver, reducing vibrations and noises in all speed regions. The 5-Phase **CVK** Series has further excellent vibration characteristics.



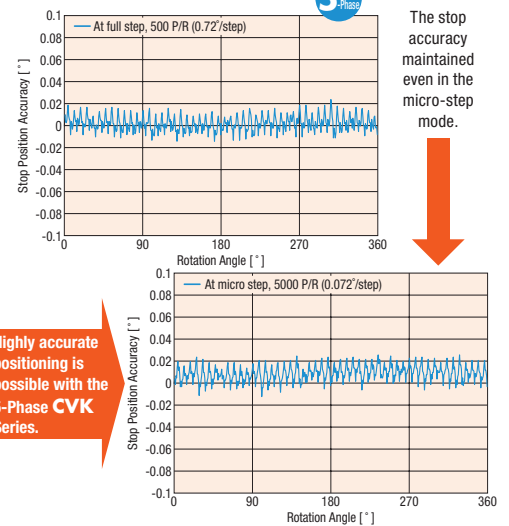
### 5-Phase Motor for highly accurate positioning

With the micro-step drive, the resolution can be increased up to 125000 P/R. Generally, the stopping accuracy is smaller under micro-step driving than under full-step driving. This is more obvious on the 2-Phase. Under micro-step driving, the 5-Phase **CVK** Series can provide more accurate positioning.

#### For a typical 2-Phase motor



#### For 5-Phase **CVK** Series



#### ● Stopping accuracy

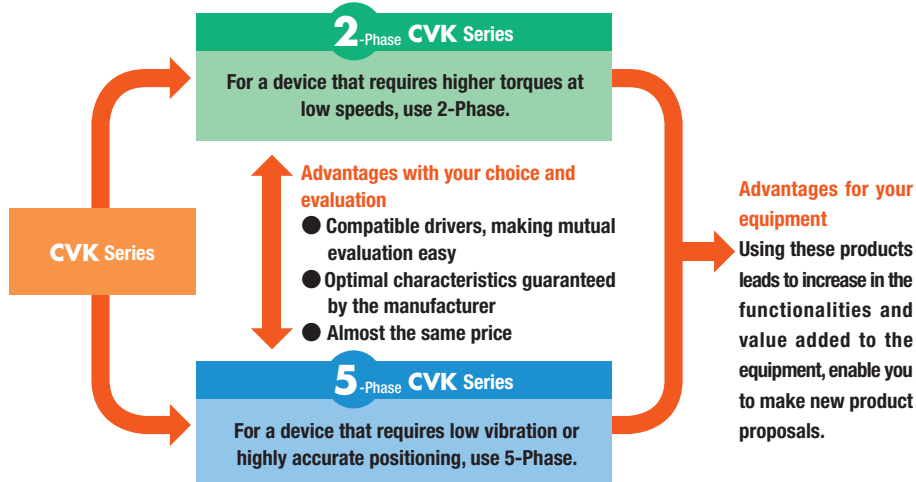
5-Phase Standard type motor	$\pm 0.05^\circ$ ( $\pm 3$ arcminutes)
5-Phase High resolution type motor	$\pm 0.034^\circ$ ( $\pm 2$ arcminutes)

## Flexibility of Choice: 2-Phase or 5-Phase

### ● Evaluation can be flexible: 2-Phase → 5-Phase and 5-Phase → 2-Phase

The drivers of the 2-Phase and 5-Phase **CVK** Series are similar in size, installation and I/O connector. This allows you to select 2-Phase or 5-Phase according to your requirement specifications. Both motors provide industry-top-class compactness and lightness.

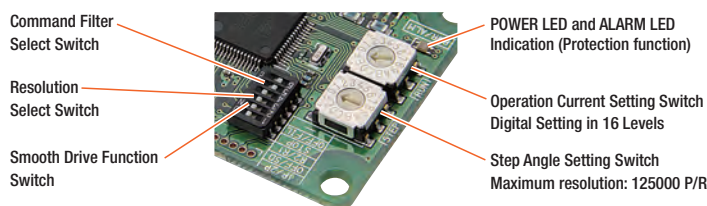
● 2-Phase Motor and 5-Phase Motor both uses respective dedicated drivers.



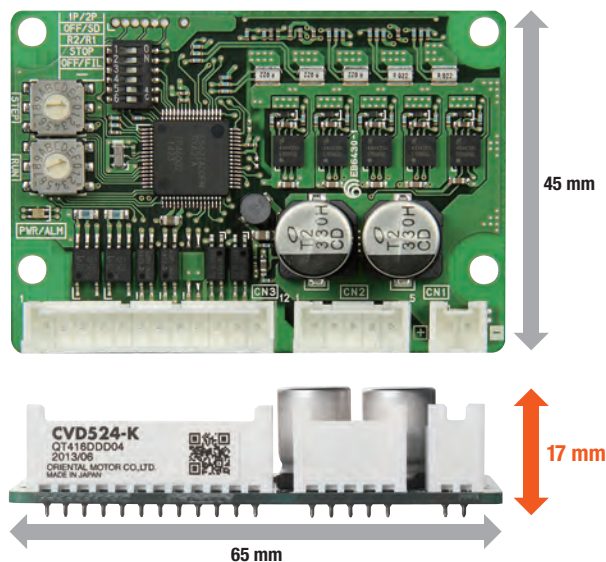
### ● Industry-top-class high-performance driver

- Compact and lightweight driver contributing to space saving
- Protection function that can early detect a problem with the driver
- Smooth drive function for smooth operation
- Operation current can be set with a digital switch

#### ● Functions and Names of Driver Parts



Actual size

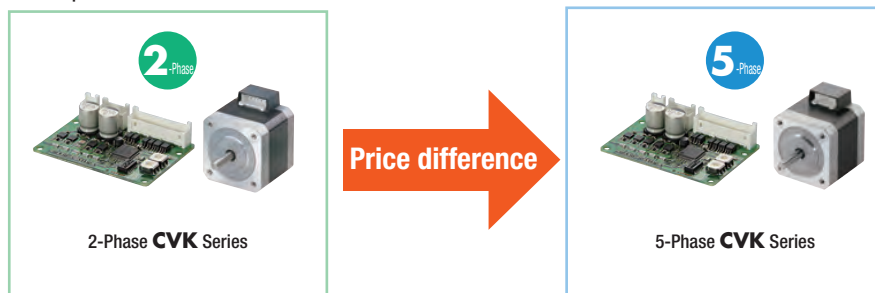










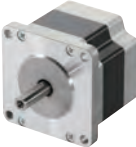




### ● The price of 2-Phase and 5-Phase are almost the same.

In the **CVK** Series, while the performance and functionality of the motors have been significantly increased, the prices have been revised. There is only slight price difference between the 2-Phase and the 5-Phase; Both of them are offered at affordable prices.

● For price and leadtime, please contact the nearest Oriental Motor sales office.

#### ● Comparison between 2-Phase and 5-Phase



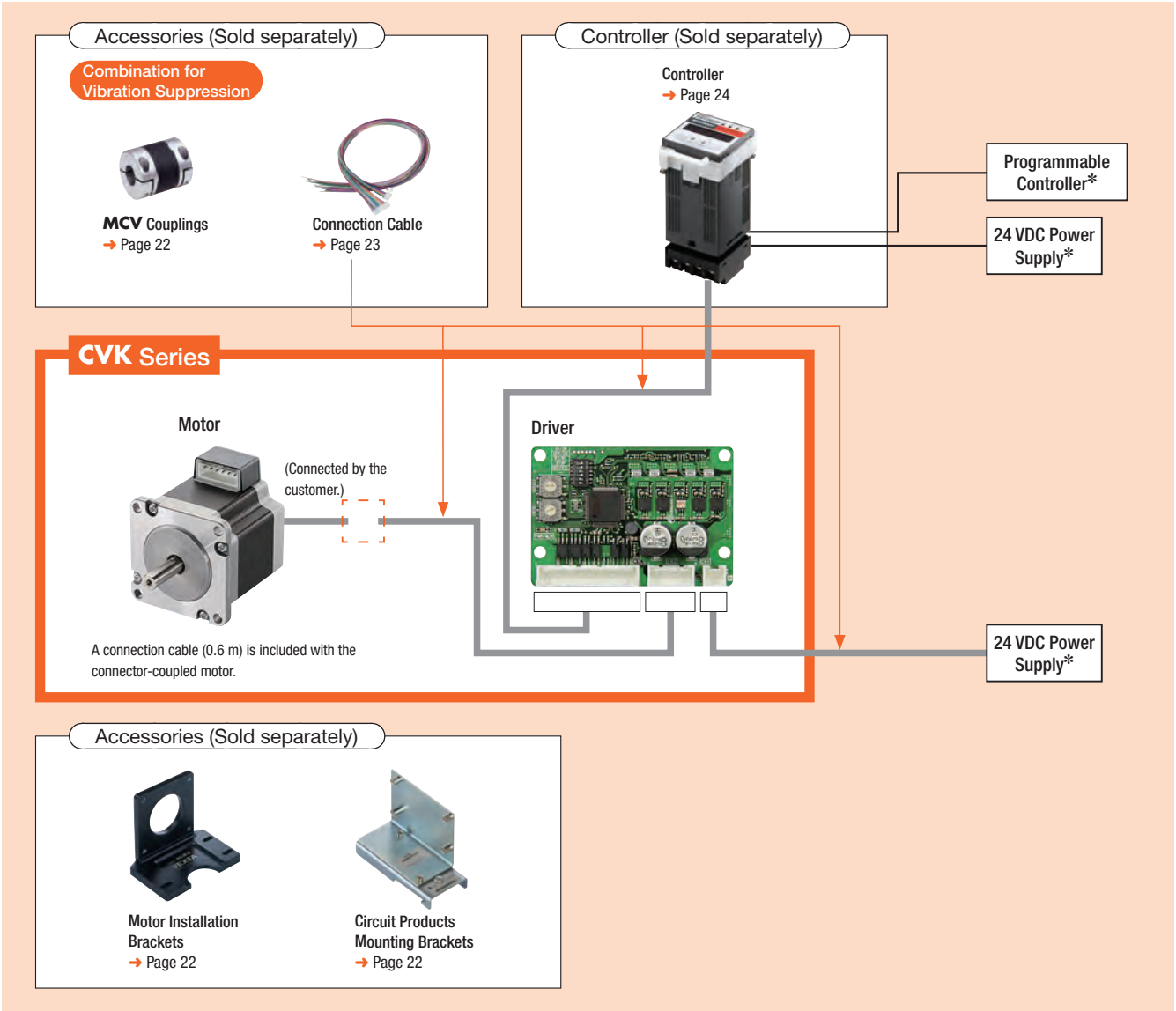
Type	2-Phase/5-Phase Basic Step Angle	Frame Size					Driver
		20 mm	28 mm	35 mm	42 mm	2-Phase : 56.4 mm 5-Phase : 60 mm	
Standard Type	2-Phase 1.8°/step						
	5-Phase 0.72°/step	—		—			
High-Resolution Type	5-Phase 0.36°/step	—	—	—			

● The drivers are not common for 2-Phase and 5-Phase motors. These motors use respective dedicated drivers.

# System Configuration

An example of a system configuration with the **PG1200** controller is shown below.

\* Not supplied.



## System Configuration Example

CVK Series	Sold Separately			
	Controller	Motor Mounting Bracket	Flexible Couplings	Connection Cable Sets (0.6 m)
<b>CVK266AK</b>	<b>PG1200</b>	<b>PAL2P-2</b>	<b>MCV190808</b>	<b>LCS01CVK2</b>

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

# Product Number Code

## CVK 5 6 4 F M A K

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Series Name	<b>CVK: CVK Series</b>
②	<b>2:</b> 2-Phase <b>5:</b> 5-Phase	
③	Motor Frame Size	<b>1:</b> 20 mm <b>2:</b> 28 mm <b>3:</b> 35 mm <b>4:</b> 42 mm <b>6:</b> 56.4 mm (60 mm for the motor classification "F")
④	Motor Case Length	
⑤	Motor Classification	<b>F:</b> Motor Frame Size 60 mm
⑥	Motor Type	<b>M:</b> High-Resolution Type    None: Standard Type
⑦	Configuration	<b>A:</b> Single Shaft <b>B:</b> Double Shaft
⑧	Power Supply Input	<b>K:</b> 24 VDC

## Types

### 2-Phase Stepping Motor and Driver Packages

#### ◇ Standard Type

Product Name (Single Shaft)	Product Name (Double Shaft)
<b>CVK213AK</b>	<b>CVK213BK</b>
<b>CVK223AK</b>	<b>CVK223BK</b>
<b>CVK225AK</b>	<b>CVK225BK</b>
<b>CVK233AK</b>	<b>CVK233BK</b>
<b>CVK235AK</b>	<b>CVK235BK</b>
<b>CVK243AK</b>	<b>CVK243BK</b>
<b>CVK244AK</b>	<b>CVK244BK</b>
<b>CVK245AK</b>	<b>CVK245BK</b>
<b>CVK246AK</b>	<b>CVK246BK</b>
<b>CVK264AK</b>	<b>CVK264BK</b>
<b>CVK266AK</b>	<b>CVK266BK</b>
<b>CVK268AK</b>	<b>CVK268BK</b>

### 5-Phase Stepping Motor and Driver Packages

#### ◇ Standard Type

Product Name (Single Shaft)	Product Name (Double Shaft)
<b>CVK523AK</b>	<b>CVK523BK</b>
<b>CVK525AK</b>	<b>CVK525BK</b>
<b>CVK544AK</b>	<b>CVK544BK</b>
<b>CVK546AK</b>	<b>CVK546BK</b>
<b>CVK564FAK</b>	<b>CVK564FBK</b>
<b>CVK566FAK</b>	<b>CVK566FBK</b>
<b>CVK569FAK</b>	<b>CVK569FBK</b>

#### ◇ High-Resolution Type

Product Name (Single Shaft)	Product Name (Double Shaft)
<b>CVK544MAK</b>	<b>CVK544MBK</b>
<b>CVK546MAK</b>	<b>CVK546MBK</b>
<b>CVK564FMAK</b>	<b>CVK564FMBK</b>
<b>CVK566FMAK</b>	<b>CVK566FMBK</b>
<b>CVK569FMAK</b>	<b>CVK569FMBK</b>

The following items are included in each product.

Motor, Driver, Driver Connector, Connection Cable\*, Operating Manual

\*Only for connector-coupled motor.



# Frame Size 20 mm, 28 mm

## 2-Phase Stepping Motor and Driver Packages Standard Type

### Specifications

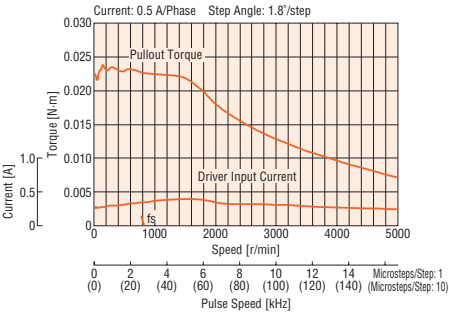


Product Name	Single Shaft	CVK213AK	CVK223AK*	CVK225AK*
	Double Shaft	CVK213BK	CVK223BK*	CVK225BK*
Excitation Maximum Holding Torque	N·m	0.02	0.095	0.19
Holding Torque at Motor Standstill	N·m	0.01	0.047	0.095
Rotor Inertial	J: kg·m <sup>2</sup>	1.6×10 <sup>-7</sup>	9×10 <sup>-7</sup>	18×10 <sup>-7</sup>
Rated Current	A/Phase	0.5	1.5	
Basic Step Angle		1.8°		
Power Supply Input		24 VDC±10% 0.5 A	24 VDC±10% 1.3 A	
Excitation Mode		Microstep		

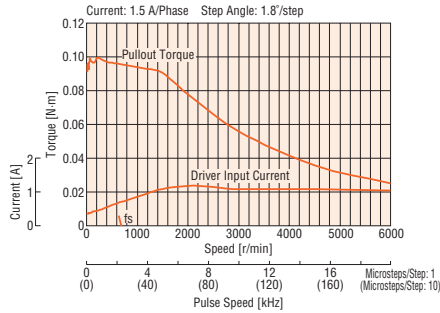
\*A connection cable (0.6 m) is included with the connector-coupled motor.

### Speed – Torque Characteristics (Reference values) fs: Maximum Self-starting Frequency

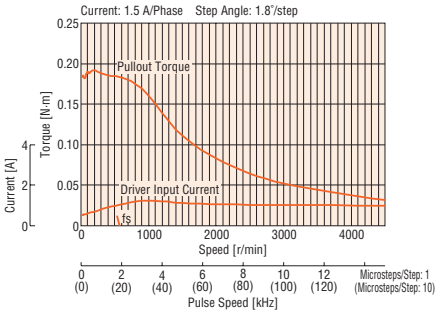
CVK213AK/CVK213BK



CVK223AK/CVK223BK



CVK225AK/CVK225BK



#### Note

- The Speed - Torque characteristics are the data measured under the Oriental Motor's measurement conditions. The characteristics may vary as the conditions change.
- Depending on the driving conditions, the motor may produce a considerable amount of heat. Be sure to keep the motor case temperature at 100°C or less.



# Frame Size 28 mm

## 5-Phase Stepping Motor and Driver Packages    Standard Type

Specifications

CE

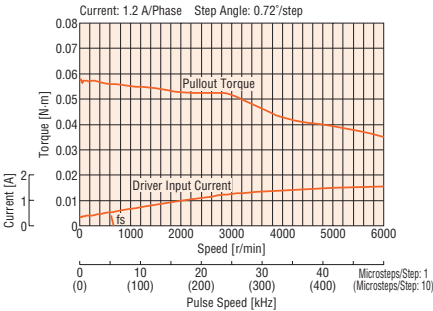
Product Name	Single Shaft	CVK523AK	CVK525AK
	Double Shaft	CVK523BK	CVK525BK
Excitation Maximum Holding Torque	N·m	0.052	0.091
Holding Torque at Motor Standstill	N·m	0.026	0.045
Rotor Inertial	J: kg·m <sup>2</sup>	9×10 <sup>-7</sup>	18×10 <sup>-7</sup>
Rated Current	A/Phase	1.2	
Basic Step Angle		0.72°	
Power Supply Input		24 VDC±10%    1.7 A	
Excitation Mode		Microstep	

● A connection cable (0.6 m) is included.

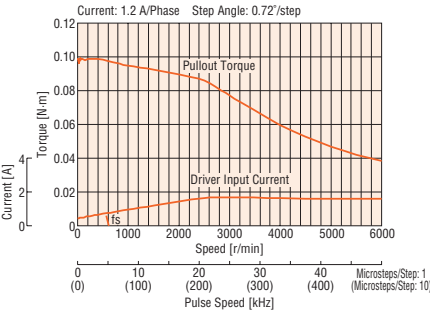
Speed – Torque Characteristics (Reference values)

fs: Maximum Self-starting Frequency

CVK523AK/CVK523BK



CVK525AK/CVK525BK



Note

- The Speed - Torque characteristics are the data measured under the Oriental Motor's measurement conditions. The characteristics may vary as the conditions change.
- Depending on the driving conditions, the motor may produce a considerable amount of heat. Be sure to keep the motor case temperature at 100°C or less.

# Frame Size 35 mm, 42 mm

## 2-Phase Stepping Motor and Driver Packages Standard Type

### Specifications

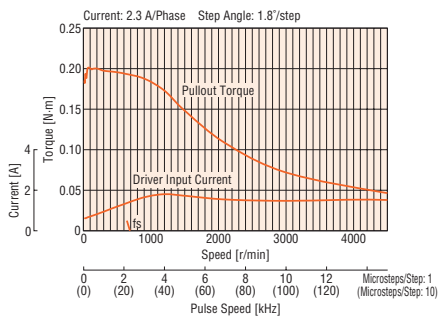


Product Name	Single Shaft	CVK233AK	CVK235AK	CVK243AK	CVK244AK	CVK245AK	CVK246AK
	Double Shaft	CVK233BK	CVK235BK	CVK243BK	CVK244BK	CVK245BK	CVK246BK
Excitation Maximum Holding Torque	N·m	0.2	0.37	0.35	0.48	0.58	0.93
Holding Torque at Motor Standstill	N·m	0.1	0.19	0.18	0.24	0.29	0.47
Rotor Inertial	J: kg·m <sup>2</sup>	$24 \times 10^{-7}$	$50 \times 10^{-7}$	$36 \times 10^{-7}$	$57 \times 10^{-7}$	$83 \times 10^{-7}$	$114 \times 10^{-7}$
Rated Current	A/Phase	2.3					
Basic Step Angle		1.8°					
Power Supply Input		24 VDC $\pm 10\%$ 2.0 A					
Excitation Mode		Microstep					

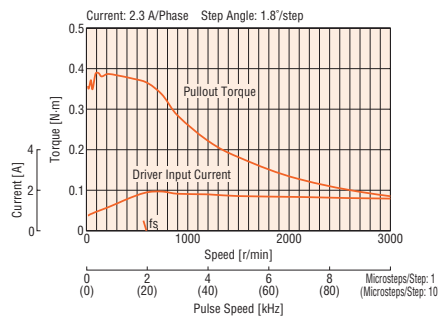
● A connection cable (0.6 m) is included.

### Speed – Torque Characteristics (Reference values) $f_s$ : Maximum Self-starting Frequency

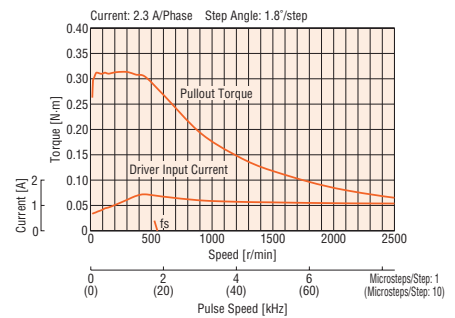
CVK233AK/CVK233BK



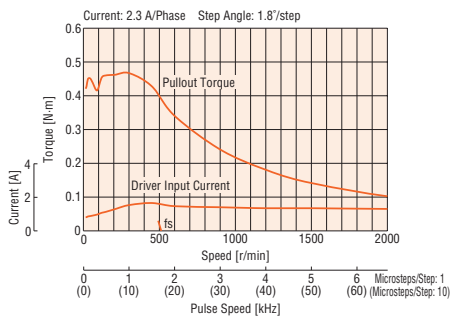
CVK235AK/CVK235BK



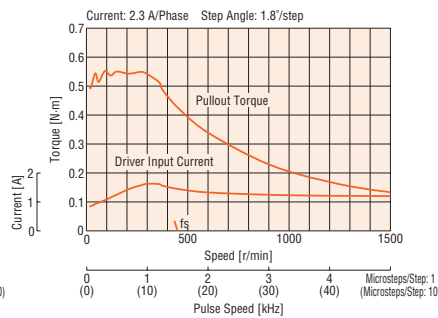
CVK243AK/CVK243BK



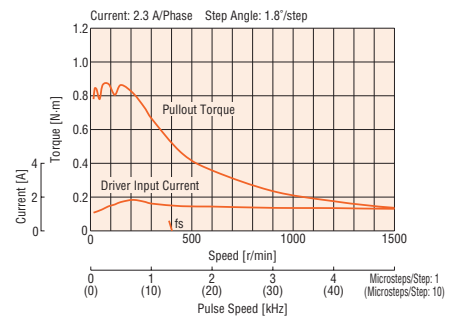
CVK244AK/CVK244BK



CVK245AK/CVK245BK



CVK246AK/CVK246BK



#### Note

- The Speed - Torque characteristics are the data measured under the Oriental Motor's measurement conditions. The characteristics may vary as the conditions change.
- Depending on the driving conditions, the motor may produce a considerable amount of heat. Be sure to keep the motor case temperature at 100°C or less.

# Frame Size 42 mm

## 5-Phase Stepping Motor and Driver Packages Standard Type/High-Resolution Type

Specifications

CE

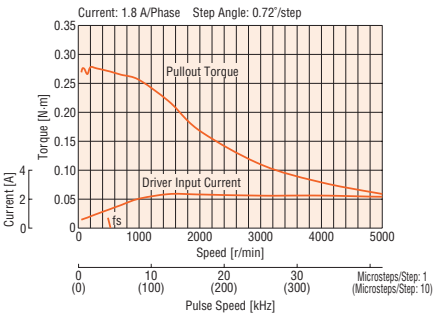
Product Name	Single Shaft	CVK544AK	CVK546AK	CVK544MAK	CVK546MAK
	Double Shaft	CVK544BK	CVK546BK	CVK544MBK	CVK546MBK
Excitation Maximum Holding Torque	N·m	0.26	0.44	0.26	0.44
Holding Torque at Motor Standstill	N·m	0.13	0.22	0.13	0.22
Rotor Inertial	J: kg·m <sup>2</sup>	57×10 <sup>-7</sup>	114×10 <sup>-7</sup>	60×10 <sup>-7</sup>	121×10 <sup>-7</sup>
Rated Current	A/Phase	1.8			
Basic Step Angle		0.72°		0.36°	
Power Supply Input		24 VDC±10% 2.8 A			
Excitation Mode		Microstep			

● A connection cable (0.6 m) is included.

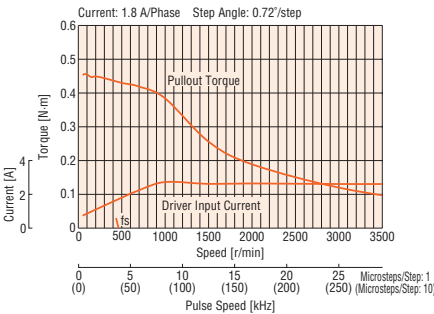
Speed – Torque Characteristics (Reference values)

fs: Maximum Self-starting Frequency

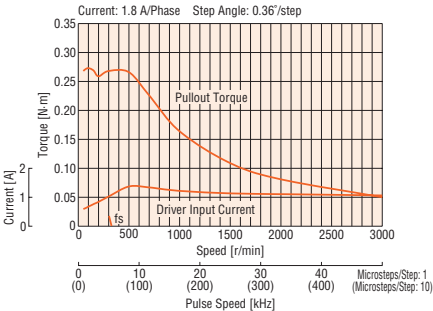
CVK544AK/CVK544BK



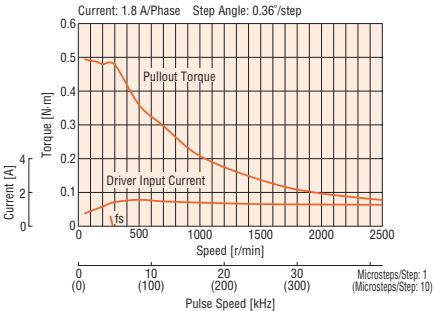
CVK546AK/CVK546BK



CVK544MAK/CVK544MBK



CVK546MAK/CVK546MBK



**Note**

- The Speed - Torque characteristics are the data measured under the Oriental Motor's measurement conditions. The characteristics may vary as the conditions change.
- Depending on the driving conditions, the motor may produce a considerable amount of heat. Be sure to keep the motor case temperature at 100°C or less.

# Frame Size 56.4 mm

## 2-Phase Stepping Motor and Driver Packages Standard Type

### Specifications

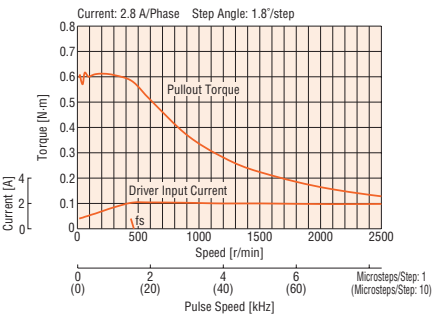


Product Name	Single Shaft	CVK264AK	CVK266AK	CVK268AK
	Double Shaft	CVK264BK	CVK266BK	CVK268BK
Excitation Maximum Holding Torque	N·m	0.6	1.4	2.3
Holding Torque at Motor Standstill	N·m	0.3	0.7	1.15
Rotor Inertial	J: kg·m <sup>2</sup>	120×10 <sup>-7</sup>	290×10 <sup>-7</sup>	490×10 <sup>-7</sup>
Rated Current	A/Phase	2.8		
Basic Step Angle		1.8°		
Power Supply Input		24 VDC±10% 2.5 A		
Excitation Mode		Microstep		

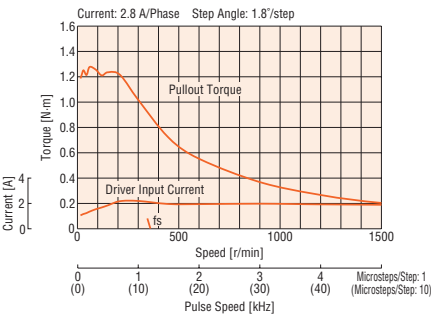
● A connection cable (0.6 m) is included.

### Speed – Torque Characteristics (Reference values) fs: Maximum Self-starting Frequency

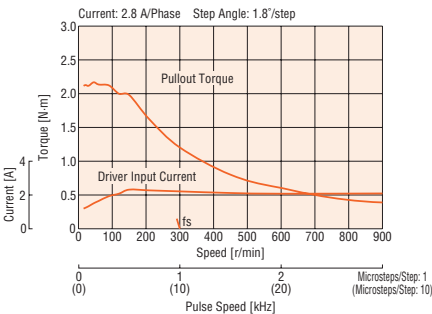
CVK264AK/CVK264BK



CVK266AK/CVK266BK



CVK268AK/CVK268BK



#### Note

- The Speed - Torque characteristics are the data measured under the Oriental Motor's measurement conditions. The characteristics may vary as the conditions change.
- Depending on the driving conditions, the motor may produce a considerable amount of heat. Be sure to keep the motor case temperature at 100°C or less.

# Frame Size 60mm

## 5-Phase Stepping Motor and Driver Packages Standard Type/High-Resolution Type

### Specifications

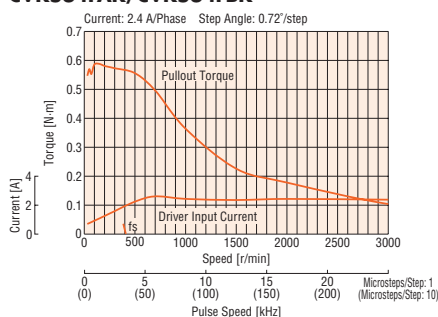


Product Name	Single Shaft	CVK564FAK	CVK566FAK	CVK569FAK	CVK564FMAK*	CVK566FMAK*	CVK569FMAK*
	Double Shaft	CVK564FBK	CVK566FBK	CVK569FBK	CVK564FMBK*	CVK566FMBK*	CVK569FMBK*
Excitation Maximum Holding Torque	N·m	0.55	0.95	1.7	0.78	1.25	2.3
Holding Torque at Motor Standstill	N·m	0.28	0.48	0.85	0.39	0.63	1.15
Rotor Inertial	J: kg·m <sup>2</sup>	175×10 <sup>-7</sup>	280×10 <sup>-7</sup>	560×10 <sup>-7</sup>	310×10 <sup>-7</sup>	490×10 <sup>-7</sup>	970×10 <sup>-7</sup>
Rated Current	A/Phase	2.4					
Basic Step Angle		0.72°			0.36°		
Power Supply Input		24 VDC±10% 2.7 A					
Excitation Mode		Microstep					

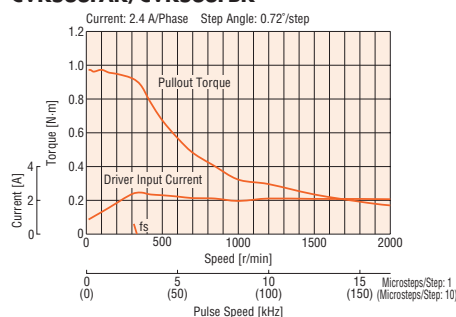
\*A connection cable (0.6 m) is included with the connector-coupled motor.

### Speed – Torque Characteristics (Reference values) fs: Maximum Self-starting Frequency

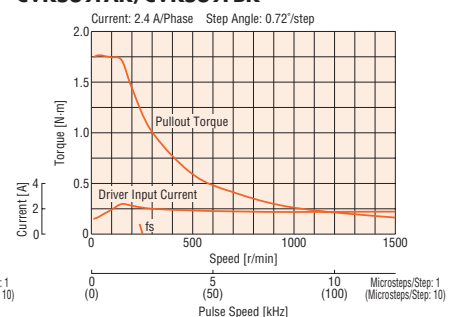
CVK564FAK/CVK564FBK



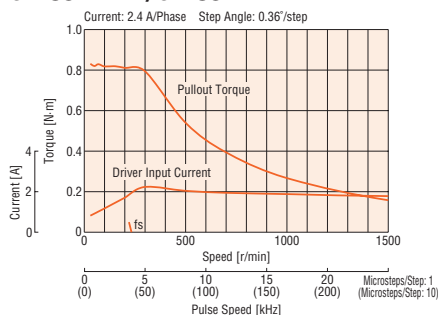
CVK566FAK/CVK566FBK



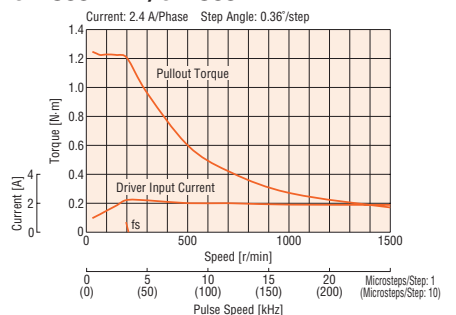
CVK569FAK/CVK569FBK



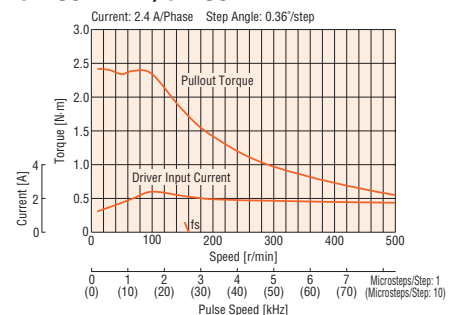
CVK564FMAK/CVK564FMBK



CVK566FMAK/CVK566FMBK



CVK569FMAK/CVK569FMBK



#### Note

- The Speed - Torque characteristics are the data measured under the Oriental Motor's measurement conditions. The characteristics may vary as the conditions change.
- Depending on the driving conditions, the motor may produce a considerable amount of heat. Be sure to keep the motor case temperature at 100°C or less.

## Driver Specifications

Max. Input Pulse Frequency	Line driver output by programmable controller: 1 MHz (When the pulse duty is 50%) Open-collector output by programmable controller: 250 kHz (When the pulse duty is 50%) Negative logic pulse input
Input Signals	Photocoupler input, Input current: 5~15 mA, Input voltage: 3~5.25 VDC (CW (PLS), CCW (DIR.)) Photocoupler input, Input current: 5~15 mA, Input voltage: 4.5~5.25 VDC (AWO, CS)
Output Signals	Photocoupler and Open-collector output External use condition: 30 VDC 10 mA or less (ALM, TIM)

## General Specifications

		Motor	Driver
Heat-Resistant Class		130 (B)	—
Insulation Resistance		The measured value is 100 M $\Omega$ or more when a 500 VDC megger is applied between the windings and the case under normal ambient temperature and humidity.	—
Dielectric Strength		No abnormality is recognized even by applying voltage between the windings and the case for 1 minute under normal ambient temperature and humidity. • PKP213, PKP22□, PKP23□, PKP24□, PKP52□, PKP54□: 0.5 kV 50/60 Hz • PKP26□: 1.0 kV 50/60 Hz • PKP56□: 1.5 kV 50/60 Hz	—
Operating Environment (In operation)	Ambient Temperature	−10~+50°C (Non-freezing)	0~+50°C (Non-freezing)
	Ambient Humidity	85% or less (Non-condensing)	
	Atmosphere	Use in an area without corrosive gases and dust. The product should not be exposed to water, oil or other liquids.	
Temperature Rise		Winding temperature rise is 80°C or less (Under the Oriental Motor's measurement conditions)	—
Stop Position Accuracy*1		Standard Type: $\pm 3$ minutes ( $\pm 0.05^\circ$ ) [For PKP213, $\pm 5$ minutes ( $\pm 0.083^\circ$ )] High-Resolution Type: $\pm 2$ minutes ( $\pm 0.034^\circ$ )	—
Shaft Runout		0.05T.I.R (mm)*4	—
Radial Play*2		0.025 mm Max. (5 N load)	—
Axial Play*3		0.075 mm Max. (Load: 10N) [1 N load for PKP213, 2.5 N load for PKP22□ and PKP52□]	—
Concentricity of Installation Pilot to the Shaft		0.075T.I.R (mm)*4	—
Perpendicularity of Installation Surface to the Shaft		0.075T.I.R (mm)*4	—

\*1 This value is for full step under no load. (The value changes with the size of the load.)

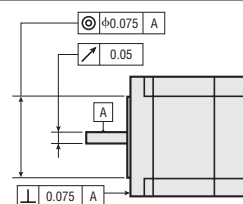
\*2 Radial Play: Displacement in shaft position in the radial direction when a 5 N load is applied in the vertical direction to the tip of the motor shaft.

\*3 Axial Play: Displacement in shaft position in the axial direction when a 10 N load (1 N for PKP213) is applied to the motor 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 a dielectric strength test while the motor and driver are connected.



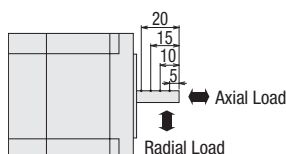
## Permissible Radial Load/Permissible Axial Load

Unit=N

Type	Motor Frame Size	Motor Product Name	Permissible Radial Load					Permissible Axial Load
			Distance from Shaft End mm					
			0	5	10	15	20	
Standard Type	20 mm	PKP213	12	15	—	—	—	3
	28 mm	PKP223, PKP225 PKP523, PKP525	25	34	52	—	—	5
	35 mm	PKP233, PKP235	20	25	34	52	—	10
	42 mm	PKP243, PKP244, PKP245, PKP246 PKP544, PKP546	20	25	34	52	—	10
	56.4 mm	PKP264, PKP266, PKP268	61	73	90	110	160	20
	60 mm	PKP564, PKP566, PKP569	63	75	95	130	190	20
High-Resolution Type	42 mm	PKP544, PKP546	20	25	34	52	—	10
	60 mm	PKP564, PKP566, PKP569	90	100	130	180	270	20

### Radial Load and Axial Load

Distance from Shaft End [mm]



## ■ Dimensions (Unit = mm)

### ● Motor

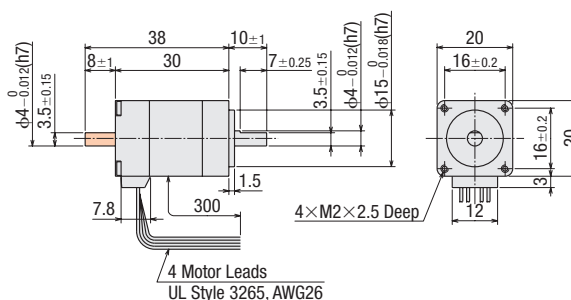
#### ◇ 2-Phase Stepping Motors

##### ● Standard Type

Frame Size 20 mm

2D & 3D CAD

Product Name	Motor Product Name	Mass kg	2D CAD
<b>CVK213AK</b>	PKP213D05A	0.05	B1143
<b>CVK213BK</b>	PKP213D05B		



● The back shaft side of all Double Shaft models is shaft flat.

##### ● Standard Type

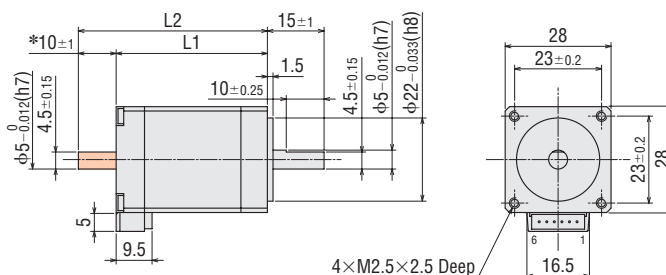
Frame Size 28 mm

2D & 3D CAD

Product Name	Motor Product Name	L1	L2	Mass kg	2D CAD
<b>CVK223AK</b>	PKP223D15A2	32	—	0.11	B1144
<b>CVK223BK</b>	PKP223D15B2		42		
<b>CVK225AK</b>	PKP225D15A2	51.5	—	0.2	B1145
<b>CVK225BK</b>	PKP225D15B2		61.5		

● If you are purchasing a package, a connection cable (0.6 m) is included.

Product Name: **LC2B06A**



\*The length of the shaft flat on the Double Shaft model is 10±0.25.

##### ● Standard Type

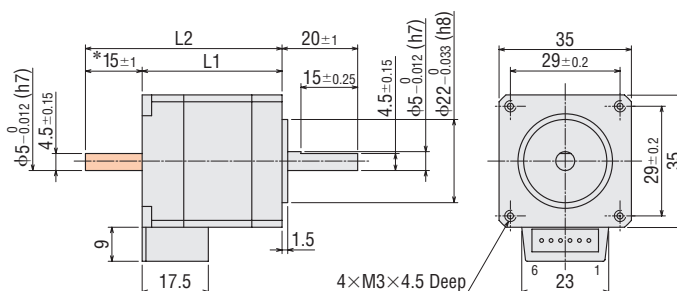
Frame Size 35 mm

2D & 3D CAD

Product Name	Motor Product Name	L1	L2	Mass kg	2D CAD
<b>CVK233AK</b>	PKP233D23A	37	—	0.18	B1111
<b>CVK233BK</b>	PKP233D23B		52		
<b>CVK235AK</b>	PKP235D23A	52	—	0.285	B1112
<b>CVK235BK</b>	PKP235D23B		67		

● If you are purchasing a package, a connection cable (0.6 m) is included.

Product Name: **LC2B06B**



\*The length of the shaft flat on the Double Shaft model is 15±0.25.

● These dimensions are for Double Shaft models. For Single Shaft models, ignore the shaft in the shaded areas.



Frame Size 42 mm

Product Name	Motor Product Name	L1	L2	Mass kg	2D CAD
<b>CVK243AK</b>	PKP243D23A	33	–	0.25	B1113
<b>CVK243BK</b>	PKP243D23B		48		
<b>CVK244AK</b>	PKP244D23A	39	–	0.3	B1114
<b>CVK244BK</b>	PKP244D23B		54		
<b>CVK245AK</b>	PKP245D23A	47	–	0.39	B1115
<b>CVK245BK</b>	PKP245D23B		62		
<b>CVK246AK</b>	PKP246D23A	59	–	0.5	B1116
<b>CVK246BK</b>	PKP246D23B		74		

Product Name: **LC2B06B**

Frame Size 56.4 mm

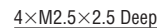
Product Name	Motor Product Name	L1	L2	Mass kg	2D CAD
<b>CVK264AK</b>	PKP264D28A	39	—	0.46	B1117
<b>CVK264BK</b>	PKP264D28B		62		
<b>CVK266AK</b>	PKP266D28A	54	—	0.73	B1118
<b>CVK266BK</b>	PKP266D28B		77		
<b>CVK268AK</b>	PKP268D28A	76	—	1.1	B1119
<b>CVK268BK</b>	PKP268D28B		99		

Product Name: **LC2B06C**

- Standard Type

**Frame Size 28 mm**

Product Name	Motor Product Name	L1	L2	Mass kg	2D CAD
<b>CVK523AK</b>	PKP523N12A	32	—	0.11	B1146
<b>CVK523BK</b>	PKP523N12B		42		
<b>CVK525AK</b>	PKP525N12A	51.5	—	0.2	B1147
<b>CVK525BK</b>	PKP525N12B		61.5		

Product Name: **LC5N06A**

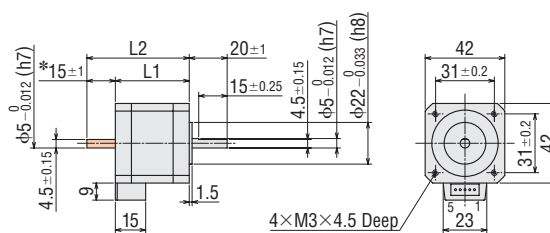
\*The length of the shaft flat on the Double Shaft model is  $10 \pm 0.25$ .

● These dimensions are for Double Shaft models. For Single Shaft models, ignore the shaft in the  shaded areas.

Frame Size 42 mm

Product Name	Motor Product Name	L1	L2	Mass kg	2D CAD
<b>CVK544□AK</b>	PKP544□N18A	39	—	0.3	B1120
<b>CVK544□BK</b>	PKP544□N18B		54		
<b>CVK546□AK</b>	PKP546□N18A	59	—	0.5	B1121
<b>CVK546□BK</b>	PKP546□N18B		74		

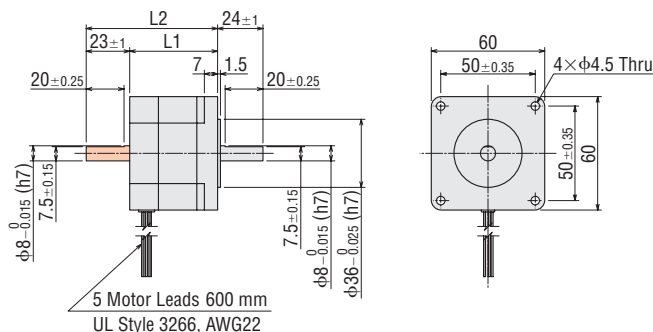
- For the High-Resolution Type, **M** is entered in the box ☐ located within the product name.



- Standard Type

Frame Size 60 mm

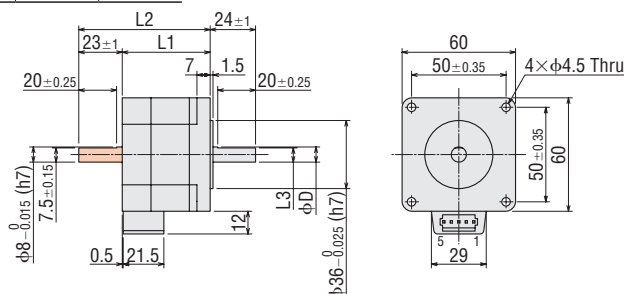
Product Name	Motor Product Name	L1	L2	Mass kg	2D CAD
<b>CVK564FAK</b>	PKP564FN24AW	46.5	–	0.6	B1122
<b>CVK564FBK</b>	PKP564FN24BW		69.5		
<b>CVK566FAK</b>	PKP566FN24AW	57.5	–	0.8	B1123
<b>CVK566FBK</b>	PKP566FN24BW		80.5		
<b>CVK569FAK</b>	PKP569FN24AW	87	–	1.3	B1124
<b>CVK569FBK</b>	PKP569FN24BW		110		



Frame Size 60 mm

Product Name	Motor Product Name	L1	L2	L3	φD	Mass kg	2D CAD
<b>CVK564FMAK</b>	PKP564FMN24A	46.5	—	7.5±0.15	8 <sup>0</sup> <sub>−0.015</sub>	0.65	B1125
<b>CVK564FMBK</b>	PKP564FMN24B		69.5				
<b>CVK566FMAK</b>	PKP566FMN24A	56	—			9.5±0.15	10 <sup>0</sup> <sub>−0.015</sub>
<b>CVK566FMBK</b>	PKP566FMN24B		79				
<b>CVK569FMAK</b>	PKP569FMN24A	87	—	9.5±0.15	10 <sup>0</sup> <sub>−0.015</sub>		
<b>CVK569FMBK</b>	PKP569FMN24B		110				

- Product Name:
- LC5N06C**



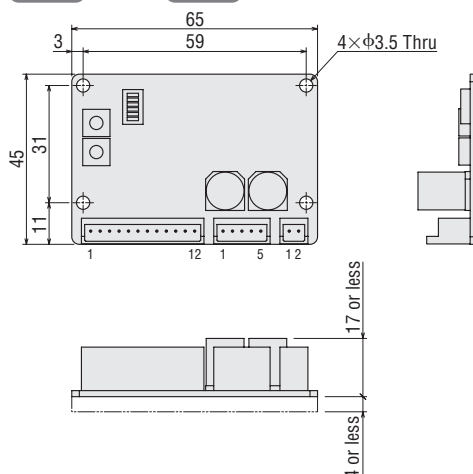
17

## Driver

Driver Product Name: CVD205-K, CVD215-K, CVD223-K, CVD228-K, CVD512-K, CVD518-K, CVD524-K

Mass: 0.02 kg

2D CAD B1128 3D CAD



## Accessory

Connector Housing: 51103-0200 (Molex)

51103-0500 (Molex)

51103-1200 (Molex)

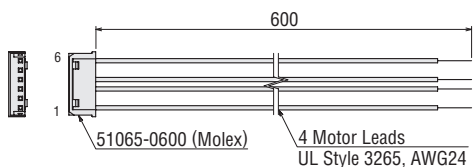
Contact: 50351-8100 (Molex)

## Connection Cable for Motor (Accessory)

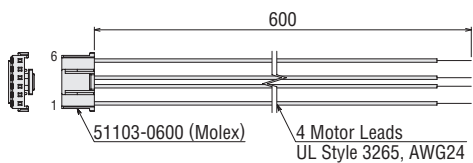
If you are purchasing a package, a connection cable (0.6 m) is included (Only for a connector-coupled motor).

	Frame Size	Product Name
2-Phase Stepping Motor and Driver Packages	28 mm	<b>LC2B06A</b>
	35 mm, 42 mm	<b>LC2B06B</b>
	56.4 mm	<b>LC2B06C</b>
5-Phase Stepping Motor and Driver Packages	28 mm	<b>LC5N06A</b>
	42 mm	<b>LC5N06B</b>
	60 mm	<b>LC5N06C</b>

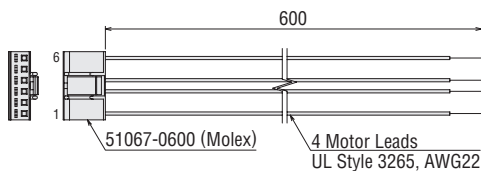
Product Name: **LC2B06A**



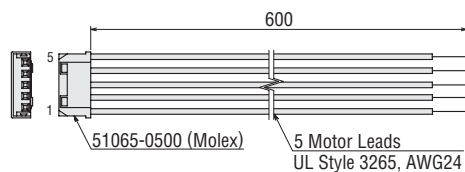
Product Name: **LC2B06B**



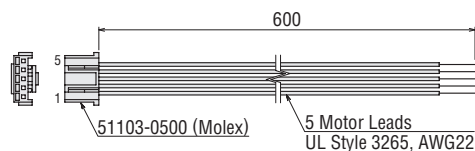
Product Name: **LC2B06C**



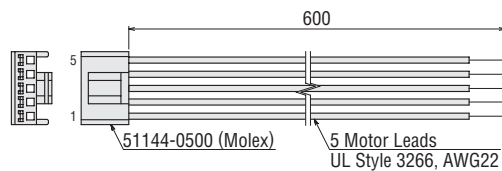
Product Name: **LC5N06A**



Product Name: **LC5N06B**



Product Name: **LC5N06C**



## Applicable Connector

The following table shows the applicable motor connectors.

	Frame Size	Connector Housing (Molex)	Contact (Molex)	Crimp Tool (Molex)
2-Phase Stepping Motor and Driver Packages	28 mm	51065-0600	50212-8100	57176-5000
	35 mm, 42 mm	51103-0600	50351-8100	57295-5000
	56.4 mm	51067-0600	50217-9101	57189-5000 57190-5000
5-Phase Stepping Motor and Driver Packages	28 mm	51065-0500	50212-8100	57176-5000
	42 mm	51103-0500	50351-8100	57295-5000
	60 mm	51144-0500	50539-8100	57189-5000

## Connection and Operation

### Names and Functions of Driver Parts

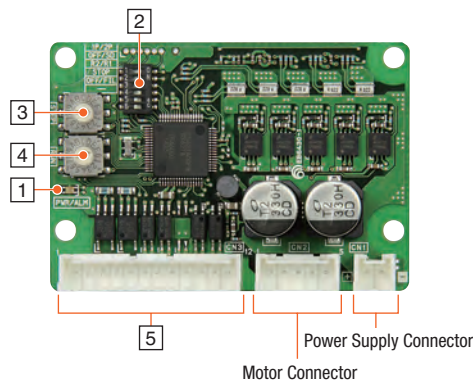
#### 1 Signal Monitor Indication

##### LED Indicators

Indication	Color	Function	Lighting Condition
PWR/ALM	Green	Power Supply Indication	When power is applied
	Red	Alarm Indication	When a protective function is activated (blinking)

##### Alarm Details

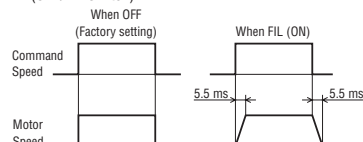
Blink Count	Function	Operating Condition
2	Overheat Protection	When the board temperature of the driver reaches 85°C
3	Overvoltage Protection	When the power supply voltage exceeds the permissible value When a large inertial load is suddenly stopped When a large load is lifted or lowered
5	Overcurrent Protection	When an excessive current flows through the motor output circuit
9	EEPROM Error	When the saved data for the driver is damaged
Lighting	CPU Error	When the driver's CPU malfunctions



#### 2 Function Setting Switch

Indication	No.	Function
1P/2P	1	Switches the pulse input mode between 1-pulse input mode and 2-pulse input mode.
OFF/SD	2	Switches the smooth drive function between enabled and disabled.
R2/R1	3	Sets the step angle in combination with step angle setting switch.
STOP	4	Switches the motor's standstill current to 25% or 50%.
OFF/FIL	5	Switches the command filter between enabled and disabled.
—	6	Not used.

● Difference in motor's responsiveness by the command filter (OFF/FIL switch)



#### 3 Step Angle Setting Switch

Indication	Function
STEP	Sets the motor's step angle in combination with R2/R1 Switch.

Step Angle Setting Switch (STEP) Scale	R2/R1 Switch: ON (R1)		R2/R1 Switch: OFF (R2)	
	Resolution (P/R)	Step Angle	Resolution (P/R)	Step Angle
0	500	0.72°	200	1.8°
1	1000	0.36°	400	0.9°
2	1250	0.288°	800	0.45°
3	2000	0.18°	1000	0.36°
4	2500	0.144°	1600	0.225°
5	4000	0.09°	2000	0.18°
6	5000	0.072°	3200	0.1125°
7	10000	0.036°	5000	0.072°
8	12500	0.0288°	6400	0.05625°
9	20000	0.018°	10000	0.036°
A	25000	0.0144°	12800	0.028125°
B	40000	0.009°	20000	0.018°
C	50000	0.0072°	25000	0.0144°
D	62500	0.00576°	25600	0.0140625°
E	100000	0.0036°	50000	0.0072°
F	125000	0.00288°	51200	0.00703125°

● The high-resolution type is twice the resolution and a half the step angle than the standard type.

Example: When the R2/R1 switch is ON (R1) and STEP switch is "0"  
Resolution of high-resolution type:  $500 \times 2 = 1000$   
Step angle of high-resolution type:  $0.72^\circ / 2 = 0.36^\circ$

#### 4 Running Current Setting Switch

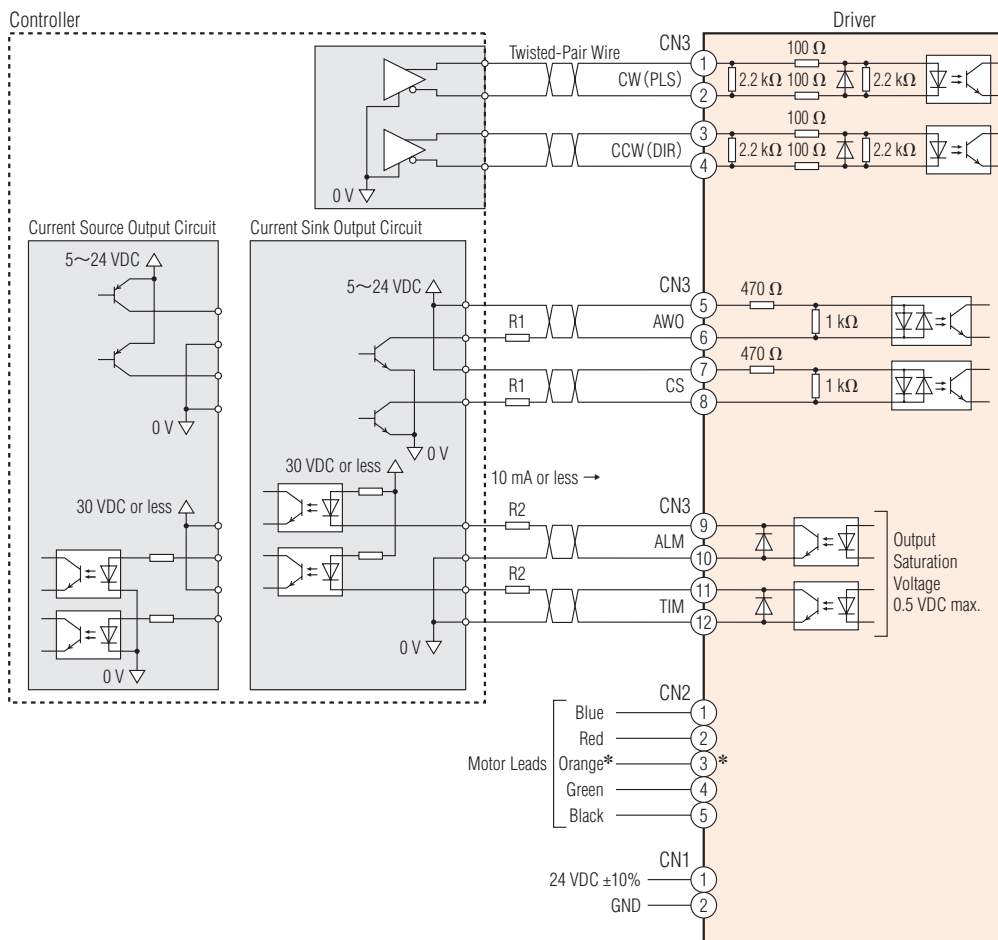
Indication	Function
RUN	Sets the motor's operating current.

#### 5 I/O Signals Connector

Indication	Pin No.	I/O	Signal Name	Function
CN3	1	Input	CW+ (PLS+)	The motor will rotate in the CW direction. (Operation command pulse signal when in 1-pulse input mode)
	2		CW- (PLS-)	
	3		CCW+ (DIR. +)	The motor will rotate in the CCW direction. (Rotation direction signal when in 1-pulse input mode)
	4		CCW- (DIR. -)	
	5		AWO+	Stops motor excitation.
	6		AWO-	
	7	Output	CS+	Switches the step angle.
	8		CS-	
	9		ALM+	Outputs the alarm status of the driver (Normal close).
	10		ALM-	
	11		TIM+	Output when the motor's excitation state is in the Step "0".
	12		TIM-	

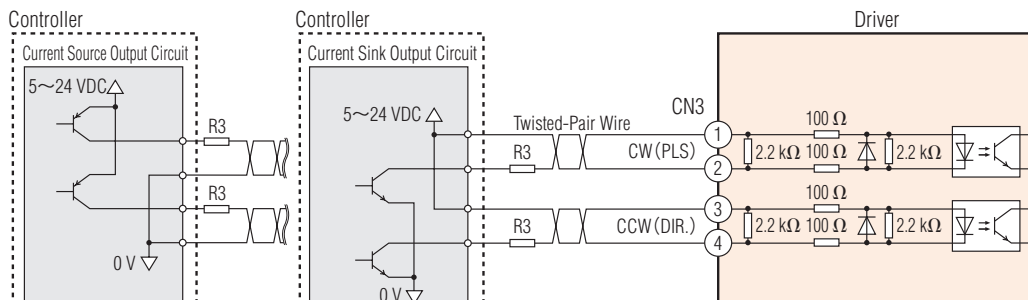
## Connection Diagram

### When the Pulse Input is the Line Driver



\*Not included with the 2-Phase stepping motor. Do not connect anything to Pin No.3.

### When the Pulse Input is Open Collector



## [Notes on Wiring]

### I/O Signal Connection

#### Input Signals

Use input signals at 5 VDC.

If voltage exceeding 5 VDC is applied, connect an external resistor R1 for the current to become 5~15 mA. (AWO, CS)

When the pulse input is open collector, if voltage exceeding 5 VDC is applied to the CW or CCW input, connect an external resistor R3 for the current to become 7~20 mA.

#### Output Signals

Use output signals at 30 VDC or less and 10 mA or less. If the current exceeds 10 mA, connect an external resistor R2.

#### Use twisted-pair cables of AWG24~22 (0.2~0.3 mm<sup>2</sup>).

#### Since the maximum transmissible frequency drops as the pulse line becomes longer, keep the wiring length as short as possible (within 2 m).

#### Provide a distance of 100 mm or longer between the I/O signal lines and power lines (power supply lines, motor lines, etc.).

### Power Supply Connection

#### Use wires of AWG22 (0.3 mm<sup>2</sup>).

#### Incorrect polarities of the DC power supply input will lead to driver damage. Make sure that the polarity is correct before turning the power on.

### Extension of Motor Cable

#### Use a wire of or thicker than AWG22 (0.3 mm<sup>2</sup>).

### General

#### A separate hand crimp tool is required to crimp the included connector and lead wire. The accessory connection cable set (sold separately) comes with all lead wires already crimped.

#### If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

## Motor and Driver Combinations

The product names for motor and driver combinations are shown below.

### 2-Phase Stepping Motor and Driver Packages

Type	Product Name	Motor Product Name	Driver Product Name
Standard Type	<b>CVK213</b> <input type="checkbox"/> <b>K</b>	PKP213D05 <input type="checkbox"/>	CVD205-K
	<b>CVK223</b> <input type="checkbox"/> <b>K</b>	PKP223D15 <input type="checkbox"/> 2*	CVD215-K
	<b>CVK225</b> <input type="checkbox"/> <b>K</b>	PKP225D15 <input type="checkbox"/> 2*	CVD223-K
	<b>CVK233</b> <input type="checkbox"/> <b>K</b>	PKP233D23 <input type="checkbox"/> *	
	<b>CVK235</b> <input type="checkbox"/> <b>K</b>	PKP235D23 <input type="checkbox"/> *	
	<b>CVK243</b> <input type="checkbox"/> <b>K</b>	PKP243D23 <input type="checkbox"/> *	
	<b>CVK244</b> <input type="checkbox"/> <b>K</b>	PKP244D23 <input type="checkbox"/> *	
	<b>CVK245</b> <input type="checkbox"/> <b>K</b>	PKP245D23 <input type="checkbox"/> *	
	<b>CVK246</b> <input type="checkbox"/> <b>K</b>	PKP246D23 <input type="checkbox"/> *	CVD228-K
	<b>CVK264</b> <input type="checkbox"/> <b>K</b>	PKP264D28 <input type="checkbox"/> *	
	<b>CVK266</b> <input type="checkbox"/> <b>K</b>	PKP266D28 <input type="checkbox"/> *	
	<b>CVK268</b> <input type="checkbox"/> <b>K</b>	PKP268D28 <input type="checkbox"/> *	

### 5-Phase Stepping Motor and Driver Packages

Type	Product Name	Motor Product Name	Driver Product Name
Standard Type	<b>CVK523</b> <input type="checkbox"/> <b>K</b>	PKP523N12 <input type="checkbox"/> *	CVD512-K
	<b>CVK525</b> <input type="checkbox"/> <b>K</b>	PKP525N12 <input type="checkbox"/> *	CVD518-K
	<b>CVK544</b> <input type="checkbox"/> <b>K</b>	PKP544N18 <input type="checkbox"/> *	
	<b>CVK546</b> <input type="checkbox"/> <b>K</b>	PKP546N18 <input type="checkbox"/> *	
	<b>CVK564F</b> <input type="checkbox"/> <b>K</b>	PKP564FN24 <input type="checkbox"/> W	CVD524-K
	<b>CVK566F</b> <input type="checkbox"/> <b>K</b>	PKP566FN24 <input type="checkbox"/> W	
High-Resolution Type	<b>CVK569F</b> <input type="checkbox"/> <b>K</b>	PKP569FN24 <input type="checkbox"/> W	CVD518-K
	<b>CVK544M</b> <input type="checkbox"/> <b>K</b>	PKP544MN18 <input type="checkbox"/> *	
	<b>CVK546M</b> <input type="checkbox"/> <b>K</b>	PKP546MN18 <input type="checkbox"/> *	CVD524-K
	<b>CVK564FM</b> <input type="checkbox"/> <b>K</b>	PKP564FMN24 <input type="checkbox"/> *	
	<b>CVK566FM</b> <input type="checkbox"/> <b>K</b>	PKP566FMN24 <input type="checkbox"/> *	
	<b>CVK569FM</b> <input type="checkbox"/> <b>K</b>	PKP569FMN24 <input type="checkbox"/> *	

● Either **A** (Single Shaft) or **B** (Double Shaft) indicating the configuration is entered in the box ☐ located within the product name.

\*If you are purchasing only a motor for maintenance purposes, etc., the connection cable and connector are not be supplied with the motor. Please provide them separately.

Connection cables and motor connector sets are available as accessories. [Connection Cables](#) → Page 23, [Motor Connector Sets](#) → Page 23

# Accessories (Sold separately)

For details, check the Oriental Motor website or contact the Oriental Motor sales office. <http://www.orientalmotor.com.sg>

## Flexible Couplings

A flexible coupling ideal for **CVK** series is available.

Once you have decided on a type and/or applications of motor, you can select the recommended size of coupling easily.

All motor shaft diameters of stepping motor packages are available.

### MCV Couplings

This one-piece coupling is made with anti-vibration rubber molded between aluminum alloy hubs.



#### Types

Product Name
<b>MCV15</b> □
<b>MCV19</b> □
<b>MCV25</b> □

● A number indicating the coupling inner diameter is entered in the box □ located within the product name.

### MC Coupling

This is a slit-type one-piece coupling.



Set Screw Type



Clamp Type

#### Types

##### ◇ Set Screw Type

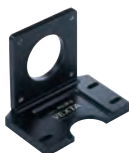
Product Name
<b>MC12</b> □ <b>S</b>
<b>MC16</b> □ <b>S</b>
<b>MC20</b> □ <b>S</b>
<b>MC25</b> □ <b>S</b>
<b>MC32</b> □ <b>S</b>

##### ◇ Clamp Type

Product Name
<b>MC12</b> □ <b>C2</b>
<b>MC16</b> □ <b>C2</b>
<b>MC20</b> □ <b>C2</b>
<b>MC25</b> □ <b>C2</b>
<b>MC32</b> □ <b>C2</b>

● A number indicating the coupling inner diameter is entered in the box □ located within the product name.

## Motor Installation Bracket



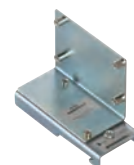
#### Types

Material: Aluminum alloy

Product Name	Motor Frame Size	Applicable Product
<b>PAF0P</b>	42 mm	<b>CVK24</b> <b>CVK54</b>
<b>PAL0P</b>		
<b>PAL2P-2</b>	56.4 mm	<b>CVK26</b>
<b>PAL2P-5</b>	60 mm	<b>CVK56</b>

- The product names of the applicable ones are described with text by which the product name can be identified.
- The installation bracket base is built with holes large enough to allow for adjustments of belt tension after a motor is installed.
- These installation brackets can be perfectly fitted to the pilot of the stepping motors. (excluding **PAL0P**)

## Circuit Products Mounting Brackets



Brackets for mounting a board-type driver on the DIN Rail.

#### Types

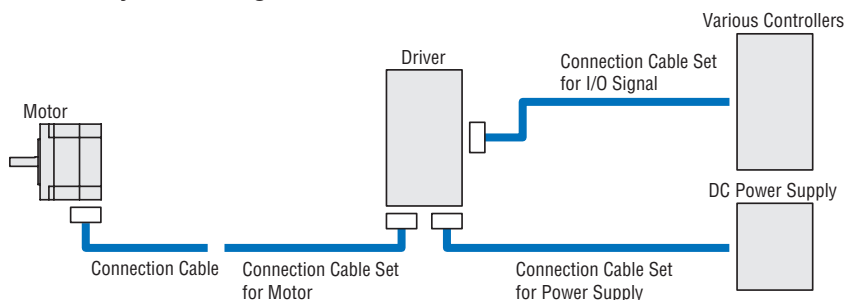
Material: SPCC Surface treatment: Trivalent chromate

Product Name	Applicable Drivers
<b>MADP01S1</b>	CVD205-K, CVD215-K CVD223-K, CVD228-K CVD512-K, CVD518-K CVD524-K



# Cable

## Cable System Configuration



## Connection Cable Sets

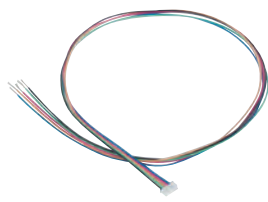


Lead wires with a connector for drivers are available. These lead wires allow for easy connection of the motor, power supply and input/output signals. A set of the connection cables includes a motor cable, a power cable and an I/O signal cable.

### Types

Product Name	Applicable Drivers	Length m	Conductor AWG
<b>LC501CVK2</b>	CVD205-K CVD215-K CVD223-K CVD228-K	0.6	22 (0.3 mm <sup>2</sup> )
<b>LC504SD5</b>	CVD512-K CVD518-K CVD524-K		

## Connection Cables



Lead wire type connection cables with a connector crimped, convenient for connector-coupled motors, are available. They save the effort for assembling the lead wire and connector. (A connection cable (0.6 m) is included with each connector-coupled motor and driver package.)

### Types

Product Name	Applicable Motor	Length m	Conductor AWG
<b>LC2B06A</b>	PKP223 PKP225	0.6	24 (0.2 mm <sup>2</sup> )
<b>LC2B06B</b>	PKP233 PKP235 PKP243 PKP244 PKP245 PKP246		24 (0.2 mm <sup>2</sup> )
<b>LC2B06C</b>	PKP264 PKP266 PKP268		22 (0.3 mm <sup>2</sup> )
<b>LC5N06A</b>	PKP523	0.6	24 (0.2 mm <sup>2</sup> )
<b>LC5N10A</b>	PKP525	1	
<b>LC5N06B</b>	PKP544	0.6	22 (0.3 mm <sup>2</sup> )
<b>LC5N10B</b>	PKP546	1	
<b>LC5N06C</b>	PKP564 PKP566	0.6	
<b>LC5N10C</b>	PKP569	1	

● The product names of the applicable motors are described with text by which the product name can be identified.

# Motor Connector Sets

A set of connector housings and contacts are for use with a connector-coupled motor. In addition to the set included in the product, use these extra sets as needed.

### Types

Product Name	Applicable Product
<b>CS2U30A</b>	<b>CVK223, CVK225</b>
<b>CS2U30B</b>	<b>CVK233, CVK235 CVK243, CVK244, CVK245, CVK246</b>
<b>CS5N30A</b>	<b>CVK523, CVK525</b>
<b>CS5N30B</b>	<b>CVK544, CVK546</b>
<b>CS5N30C</b>	<b>CVK564, CVK566, CVK569</b>

● Each package contains enough housings and contacts for 30 motors. Please specify the number of packages when ordering.

The price is for one package.

#### Note

● The crimp tool is not included. Please provide them separately.



This photograph shows **CS5N30B**.

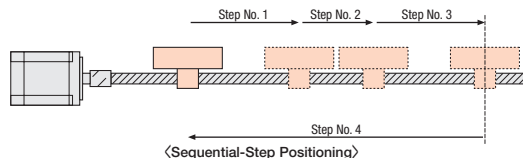
# Controller (Sold separately)

## Stored-Data Type Controller

### PG1200

All operations including data setting can easily be performed using the 4 touch pads on the panel. In addition, the number of signal lines is reduced to a minimum for easy operation and connection.

- Jerk Limiting Control Function for Suppressing Vibration of the Motor
- Sequential-Step Positioning Operation/External Signal Operation Possible
- Maximum Oscillation Frequency 200 kHz
- 1-Pulse Output/2-Pulse Output Mode Select Possible



Recessed Installation Model



DIN Rail Installation Model

## Product Line

### Sink Logic

Product Line	Product Name
DIN Rail Installation Model	<b>PG1200N-D</b>
Recessed Installation Model	<b>PG1200N-U</b>

### Source Logic

Product Line	Product Name
DIN Rail Installation Model	<b>PG1200P-D</b>
Recessed Installation Model	<b>PG1200P-U</b>



### Safety Precautions

- To ensure correct operation, carefully read the Operating Manual before using it.
- The products listed in this catalogue are for industrial use and for built-in component. Do not use for any other applications.

- The factories which manufacture the products listed in this catalogue have obtained Quality Management Systems ISO9001 and Environment Management Systems ISO14001.
- The content listed in this catalogue such as performance and specifications of the products are subject to change without notice for improvements.
- The price of all products listed in this catalogue does not include the consumption tax etc.
- For details of the products, please contact the nearest dealer, sales office or the following "Order Support Center" or "Customer Support Center".
- **Orientalmotor** is registered trademark or trademark of Oriental Motor in Japan and other countries.

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