Oriental motor

NEW PRODUCTS

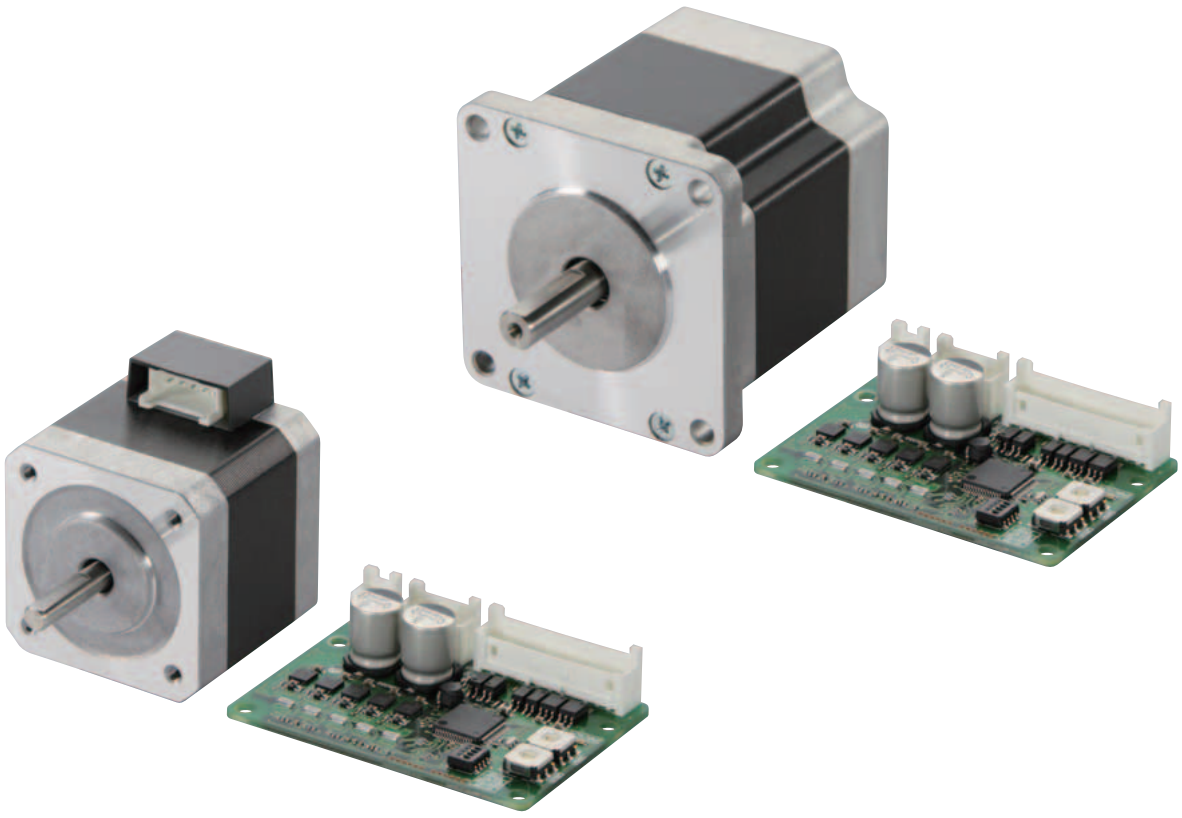
1.8°, 0.72° and 0.36°
Stepper Motor and Driver Package

CVK Series

DC Input

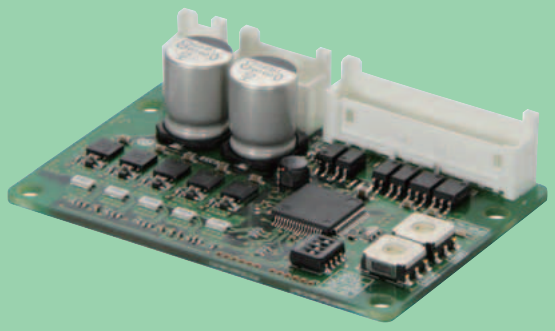
Compact, standardized drivers, combined with
performance driven high torque stepper motors, for the optimum results.

20 mm, 28 mm, 35 mm, 42 mm, 56.4 mm or 60 mm
(0.79 in.) (1.10 in.) (1.38 in.) (1.65 in.) (2.22 in.) (2.36 in.)



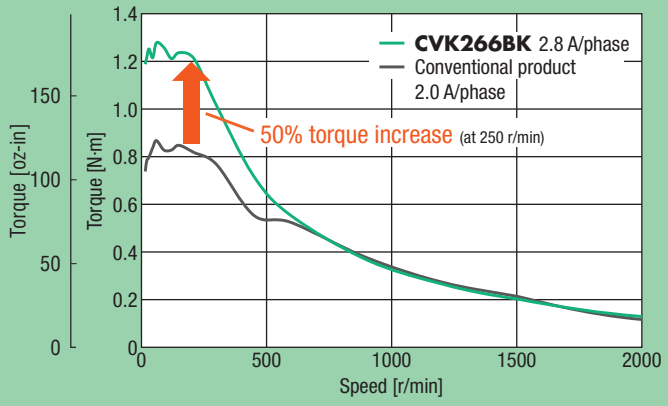
1.8° Stepper Motor

1.8° motor and driver packages now have the highest torque in the low-speed range. With Oriental Motor's higher current stepper motors and superior microstepping performance, low vibration is achieved throughout the speed range.



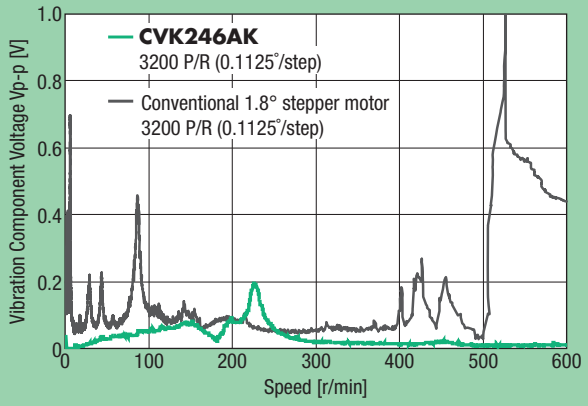
Revisions to the motor winding design and a high-efficiency driver circuit design allow for significant torque increases in the low-speed range. In particular, torque in the 250 r/min range has been increased by 50% compared to conventional products allowing for quicker moves. Vibration and noise have been greatly reduced compared to conventional 1.8° stepper motor performance.

●Comparison of 1.8° Stepper Motor Torque Characteristics



The maximum holding torque has increased with a bipolar winding.

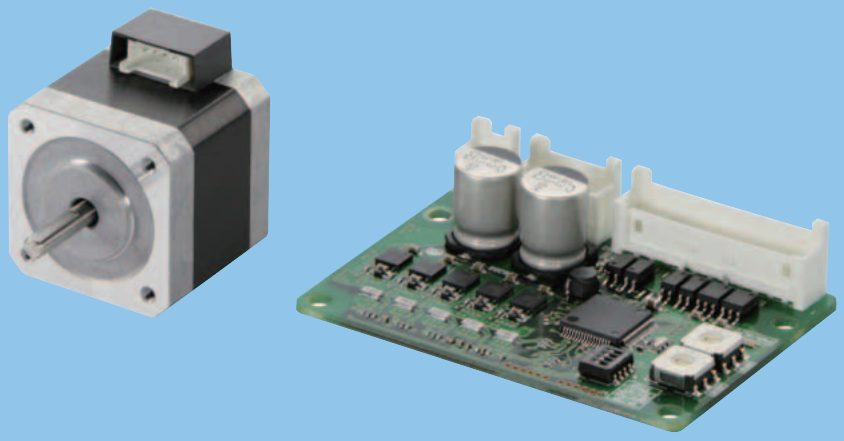
●Comparison of 1.8° Stepper Motor Vibration Characteristics



The vibration characteristics have been significantly improved across all speed ranges with the fully digital-controlled microstep driver.

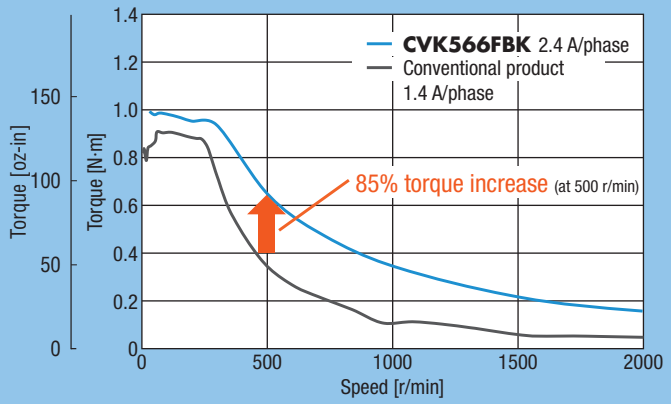
0.72° and 0.36° Stepper Motor

0.72° and 0.36° motor and driver packages have higher torque in the upper speed ranges. With Oriental Motor's motor technology and microstepping performance, even greater positional accuracy, lower vibration and noise are achieved.



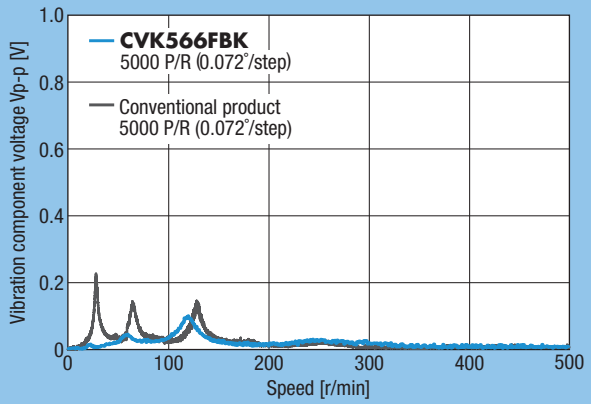
Through revisions to the motor winding design and a high-efficiency driver circuit design, the performance of 0.72°/0.36° stepper motors has been brought to their full potential, resulting in significant increases in torque in all speed ranges. Torque in the 500 r/min range has increased by 85% compared to conventional products. In addition, the fully digital-controlled microstep driver has further improved the low vibration and noise reduction factors.

●Comparison of 0.72°/0.36° Stepper Motor Torque Characteristics



By adopting a higher current motor winding specification, the usage range is now much wider.

●Comparison of 0.72°/0.36° Stepper Motor Vibration Characteristics

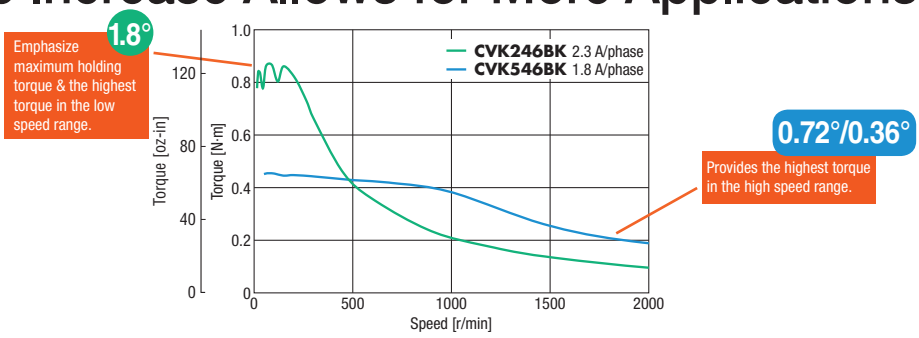


Lower vibration and further noise reductions have been achieved through the use of a fully digital-controlled microstep driver.

Superior Performance with 1.8° or 0.72°/0.36° Stepper Motor and Driver Packages

A Significant Torque Increase Allows for More Applications

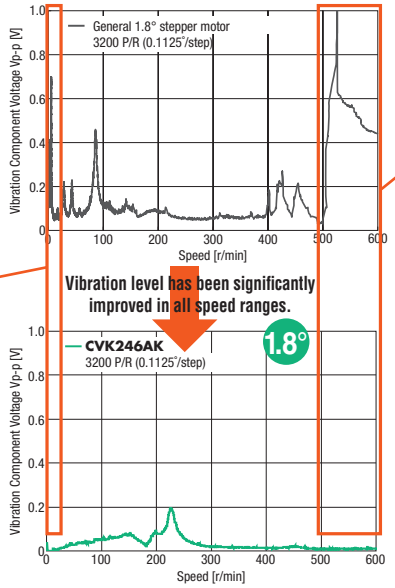
The maximum holding torque in the low-speed range is achieved with the 1.8° motor and driver packages through the use of a high motor current design and specification. The speed range has increased considerably with the 0.72°/0.36° packages.



Low Vibration with Full-Time Microstepping

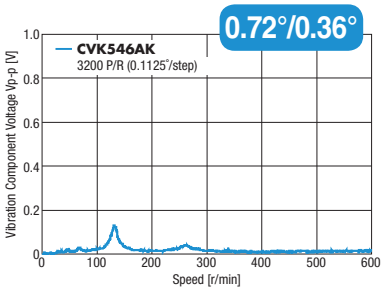
Low vibration and noise reduction have been achieved across all speed ranges by significantly improving the vibration level with the use of a fully digital-controlled full-time microstep driver. The **CVK** Series 0.72°/0.36° stepper motor has further improved vibration characteristic.

●Reduced Step Vibration
The new smooth drive control with higher current control increases the basic step angle to a maximum resolution of 2048. As a result, a reduction in step vibration in the low-speed range is achieved.



●Vibration Suppression Control
Common vibration that occurs in the mid-speed range has been suppressed. This enables more stable torque characteristics.

CVK Series
Vibration characteristics for 0.72°/0.36° stepper motors have been further improved.



For High Positioning Accuracy Use a 0.72°/0.36° Stepper Motor

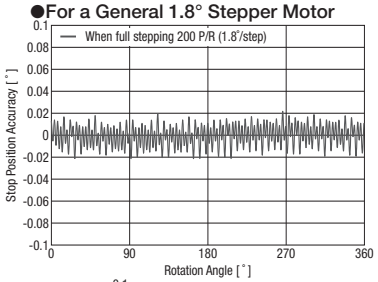
In general, stopping accuracy tends to be lower during microstep operation* than full step operation and this effect is more noticeable in a 1.8° motor. In this situation, using a **CVK** Series 0.72°/0.36° stepper motor enables a higher positioning accuracy.

*Max. resolution 125000 P/R

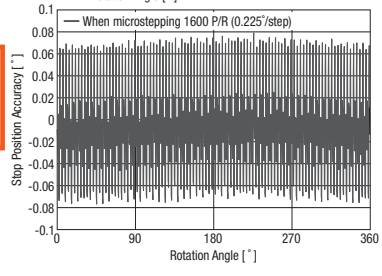
●Stopping Accuracy

0.72° stepper motor standard type	±0.05° (±3 min)
0.36° stepper motor high-resolution type	±0.034° (±2 min)

●For a General 1.8° Stepper Motor

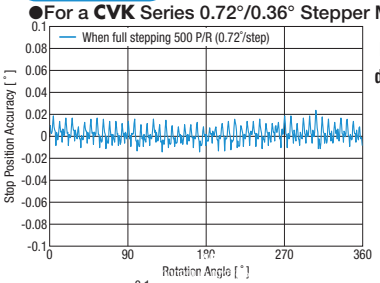


Microstepping reduces stopping accuracy.



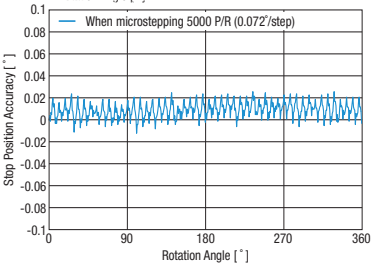
0.72°/0.36°

●For a **CVK** Series 0.72°/0.36° Stepper Motor



Microstepping does not reduce stopping accuracy.

CVK Series
High positioning accuracy is now possible with 0.72°/0.36° stepper motors

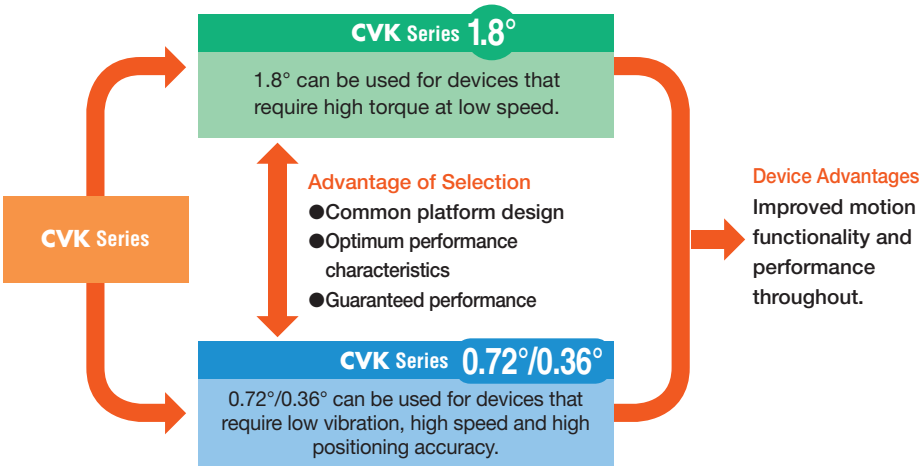


Common Driver Installation and Wiring Allow for the Desired Performance.

There's a Wide Choice with 1.8° and 0.72°/0.36° Stepper Motors

The size, installation and I/O connectors for the **CVK** Series 1.8° and 0.72°/0.36° motor and driver packages are the same. Because of this, it is easy to evaluate and select the proper package for the requirement.

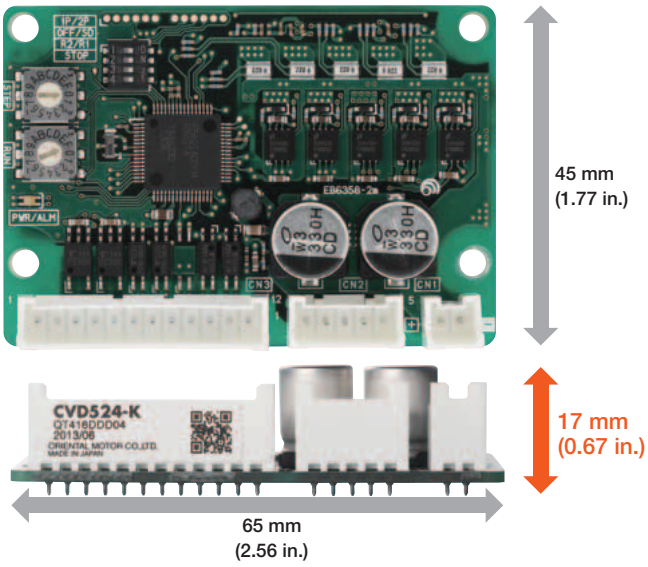
∗The driver for a 1.8° stepper motor and the driver for a 0.72°/0.36° stepper motor are not interchangeable. Each motor type has a dedicated driver. Use the Step Angle Setting Switch (page 20) to set the proper resolution without changing your controller's pulse output.



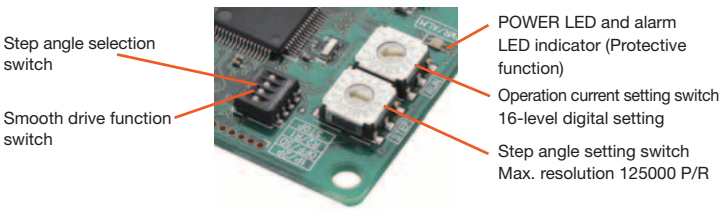
High-Performance Driver in the Industry's Smallest Size Class

●Small and light driver contributes to space saving
●Protective function can detect driver abnormalities early
●Smooth drive microstepping function allows for a smooth operation
●Operation current can be set with a digital switch

Actual Size



●Name and function of each driver component



1.8° and 0.72°/0.36° Stepper Motor Packages are Similarly Priced

In addition to improving the performance and function of the **CVK** Series, prices have been revised as well. Now, the price difference between a 1.8° and a 0.72°/0.36° stepper motor is minimal.

●Comparison Between a 1.8° and a 0.72°/0.36° Stepper Motor Packages:

The **CVK** Series is a stepper motor and driver package designed for guaranteed performance. The motor product line-up includes a 1.8°, 0.72° or 0.36° stepper motor and driver with virtually identical frame sizes. The drivers are compatible in terms of functionality, operation method and installation. Furthermore, the prices of the 1.8° and 0.72°/0.36° stepper motor and driver packages are similar, making them both affordable and attractive.

● Select the optimal performance package to suit the desired specification.

Product Number

CVK 5 6 4 F M A K

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Series Name	**CVK**: **CVK** Series
②	**2**: 1.8° Stepper Motor **5**: 0.72°/0.36° Stepper Motor	
③	Motor Frame Size	**1**: 20 mm (0.79 in.) **2**: 28 mm (1.10 in.) **3**: 35 mm (1.38 in.) **4**: 42 mm (1.65 in.) **6**: 56.4 mm (2.22 in.); 60 mm (2.36 in.) when the motor classification is "**F**"
④	Motor Case Length	
⑤	Motor Classification	**F**: Motor frame size 60 mm (2.36 in.)
⑥	Motor Type	**M**: High resolution type None: Standard type
⑦	Configuration	**A**: Single shaft **B**: Double shaft
⑧	Power-Supply Voltage	**K**: 24 VDC

Product Line and List Price

●1.8° Stepper Motor and Driver Package

Type	Product Name (Single Shaft)	List Price	Product Name (Double Shaft)	List Price
Standard	**CVK213AK**	$195.00	**CVK213BK**	$197.00
	CVK223AK	$189.00	**CVK223BK**	$191.00
	CVK225AK	$199.00	**CVK225BK**	$201.00
	CVK233AK	$178.00	**CVK233BK**	$180.00
	CVK235AK	$185.00	**CVK235BK**	$187.00
	CVK243AK	$178.00	**CVK243BK**	$180.00
	CVK244AK	$179.00	**CVK244BK**	$181.00
	CVK245AK	$185.00	**CVK245BK**	$187.00
	CVK246AK	$187.00	**CVK246BK**	$189.00
	CVK264AK*	$186.00	**CVK264BK***	$188.00
	CVK266AK*	$192.00	**CVK266BK***	$194.00
	CVK268AK*	$208.00	**CVK268BK***	$210.00
	CVD228-K / PKP264D28AA-L	$186.00	**CVD228-K / PKP264D28BA-L**	$188.00
	CVD228-K / PKP266D28AA-L	$192.00	**CVD228-K / PKP266D28BA-L**	$194.00
	CVD228-K / PKP268D28AA-L	$208.00	**CVD228-K / PKP268D28BA-L**	$210.00

*Front shaft is ϕ8 mm (0.3150 in.). For ϕ6.35 mm (1/4 in.) shaft, use the **CVD228-K** / **PKP26**□ type.

●0.72°/0.36° Stepper Motor and Driver Package

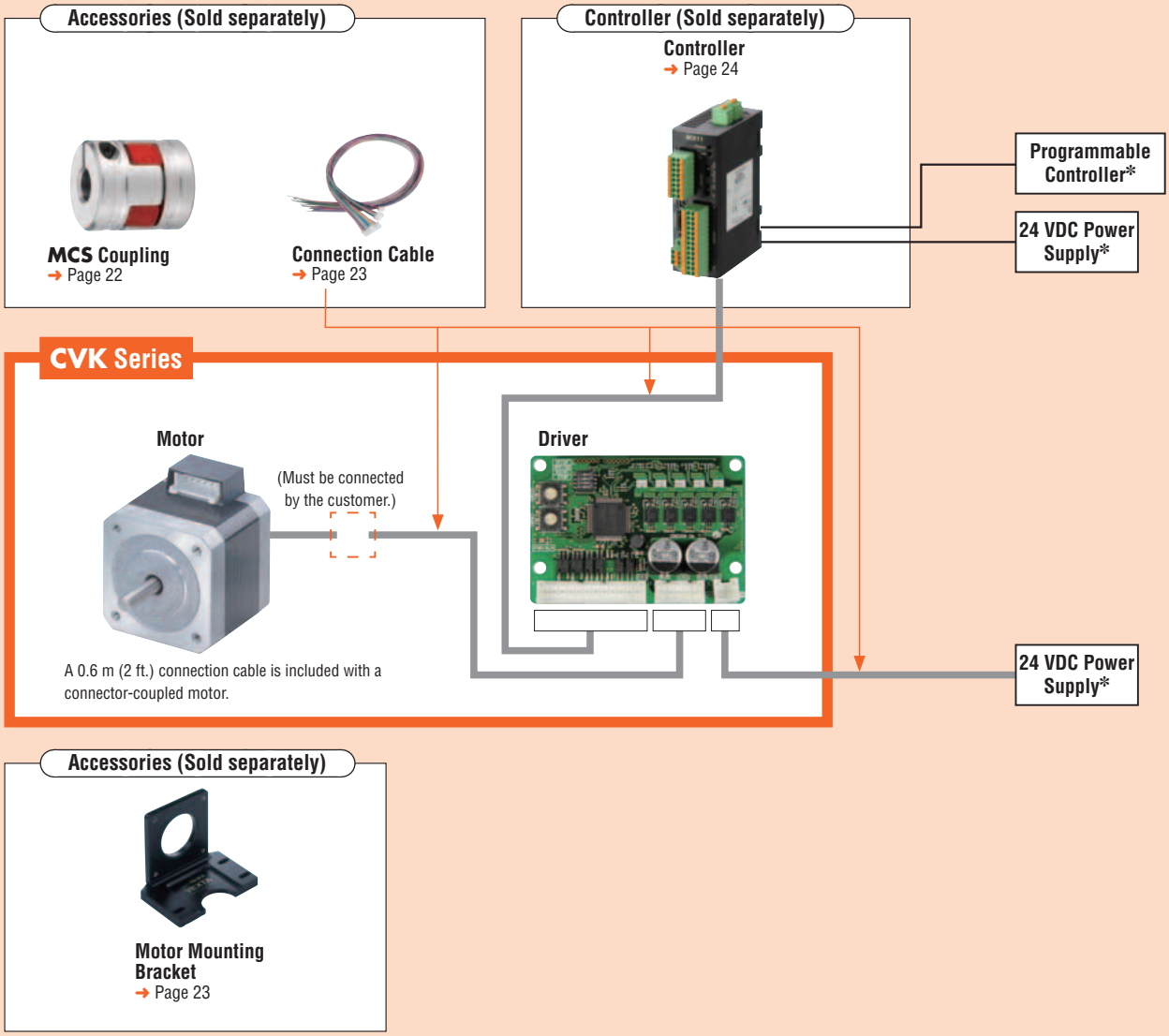
Type	Product Name (Single Shaft)	List Price	Product Name (Double Shaft)	List Price
Standard	**CVK523AK**	$204.00	**CVK523BK**	$206.00
	CVK525AK	$214.00	**CVK525BK**	$216.00
	CVK544AK	$194.00	**CVK544BK**	$196.00
	CVK546AK	$202.00	**CVK546BK**	$204.00
	CVK564FAK	$201.00	**CVK564FBK**	$203.00
	CVK566FAK	$207.00	**CVK566FBK**	$209.00
	CVK569FAK	$230.00	**CVK569FBK**	$233.00
High Resolution	**CVK544MAK**	$194.00	**CVK544MBK**	$196.00
	CVK546MAK	$202.00	**CVK546MBK**	$204.00
	CVK564FMAK	$201.00	**CVK564FMBK**	$203.00
	CVK566FMAK	$207.00	**CVK566FMBK**	$209.00
	CVK569FMAK	$230.00	**CVK569FMBK**	$233.00

The following items are included with each product.
Motor, Driver, Driver Connectors, Connection Cable[1], Operating Manual
1. Only for connector-coupled motor.

System Configuration

An example of a system configuration with the **SCX11** controller shown below.

*Not supplied



●**System Configuration Price Example**

CVK Series		Sold Separately			
		Controller	Motor Mounting Bracket	Flexible Coupling	Connection Cable Set 0.6 m (0.2 ft.)
CVK243AK	+	**SCX11**	**PALOP**	**MCS140505**	**LCS01CVK2**
$178.00		$349.00	$13.00	$46.00	$29.00

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

1.8° Stepper Motor and Driver Package

Frame Sizes: 20 mm (0.79 in.), 28 mm (1.10 in.)
Standard Type

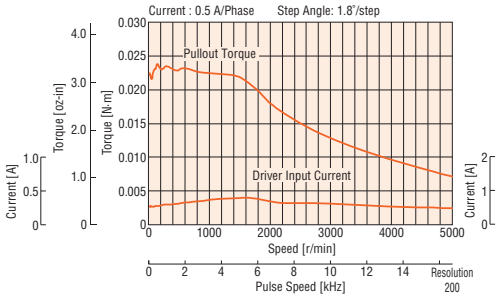
Specifications

Product Name		CVK213AK / CVK213BK	CVK223AK* / CVK223BK*	CVK225AK* / CVK225BK*
Max. Holding Torque	N·m (oz-in)	0.02 (2.8)	0.095 (13.4)	0.19 (26)
Holding Torque at Motor Standstill	N·m (oz-in)	0.01 (1.42)	0.047 (6.6)	0.095 (13.4)
Rotor Inertia	J: kg·m^2 (oz-in^2)	1.6×10^{-7} (0.0088)	9×10^{-7} (0.049)	18×10^{-7} (0.98)
Rated Current	A/Phase	0.5	1.5	
Basic Step Angle		1.8°		
Power-Supply Voltage		24 VDC±10% 0.5 A	24 VDC±10% 1.3 A	
Excitation Mode		Microstep		

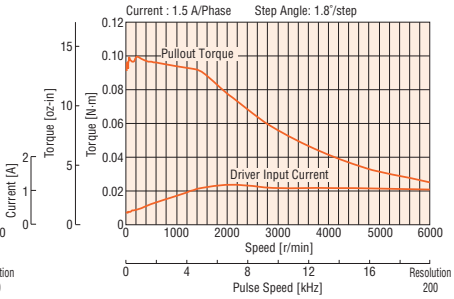
*A 0.6 m (2 ft.) connection cable is included with a connector-coupled motor.

Speed - Torque Characteristics

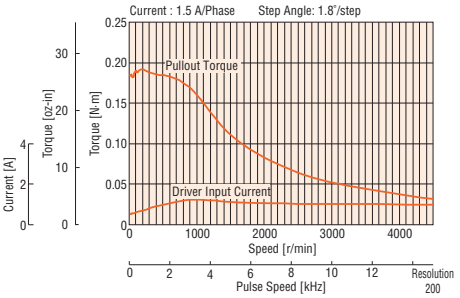
CVK213AK/CVK213BK



CVK223AK/CVK223BK



CVK225AK/CVK225BK



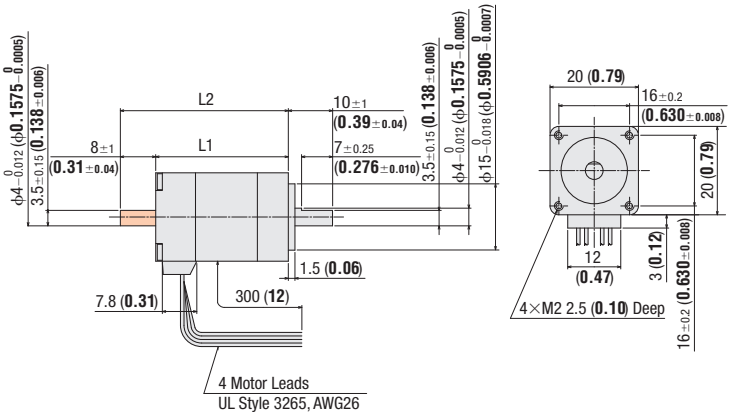
- The pulse input circuit responds up to 1 MHz with a pulse duty of 50%.

Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature under 100°C (212°F).

Dimensions unit = mm (in.)

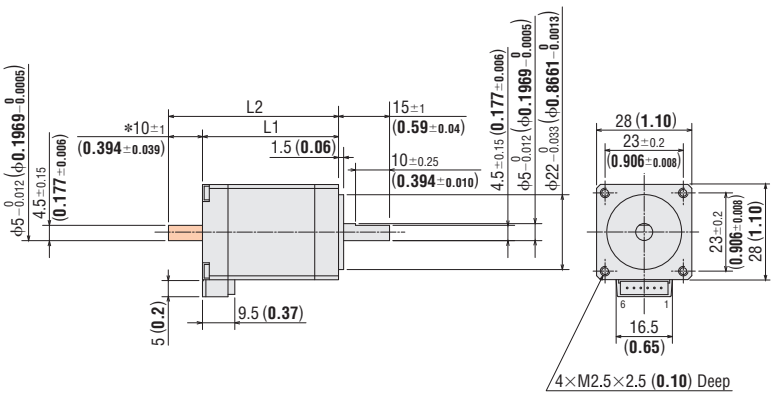
Product Name	Motor Product Name	L1	L2	Mass kg (lb.)	CAD
CVK213AK	PKP213D05A	30 (1.18)	–	0.05 (0.11)	B1143
CVK213BK	PKP213D05B		38 (1.50)		



- These dimensions are for double shaft products. For single shaft products, ignore the ▭ areas.
- Back shaft of double shaft products have a flat the whole length.

Product Name	Motor Product Name	L1	L2	Mass kg (lb.)	CAD
CVK223AK	PKP223D15A2	32 (1.26)	–	0.11 (0.24)	B1144
CVK223BK	PKP223D15B2		42 (1.65)		
CVK225AK	PKP225D15A2	51.5 (2.03)	–	0.2 (0.44)	B1145
CVK225BK	PKP225D15B2		61.5 (2.42)		

- A 0.6 m (2 ft.) motor connection cable is included with each package : **LC2B06A**
- Motor Applicable Connector
  Connector Housing: 51065-0600 (Molex)
  Contact: 50212-8100 (Molex)
  Crimp Tool: 63819-0500 (Molex)



* The length of machining on the double shaft product is 10±0.25 (0.394±0.010).

- These dimensions are for double shaft products. For single shaft products, ignore the ▭ areas.

0.72°/0.36° Stepper Motor and Driver Package

Frame Size: 28 mm (1.10 in.)
Standard Type

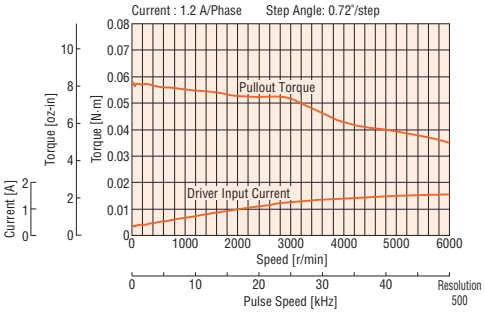
Specifications

Product Name		CVK523AK / CVK523BK	CVK525AK / CVK525BK
Max. Holding Torque	N·m (oz-in)	0.052 (7.3)	0.091 (12.9)
Holding Torque at Motor Standstill	N·m (oz-in)	0.026 (3.6)	0.045 (6.3)
Rotor Inertia	J: kg·m^2 (oz-in^2)	9×10^{-7} (0.049)	18×10^{-7} (0.098)
Rated Current	A/Phase	1.2	
Basic Step Angle		0.72°	
Power-Supply Voltage		24 VDC±10% 1.7 A	
Excitation Mode		Microstep	

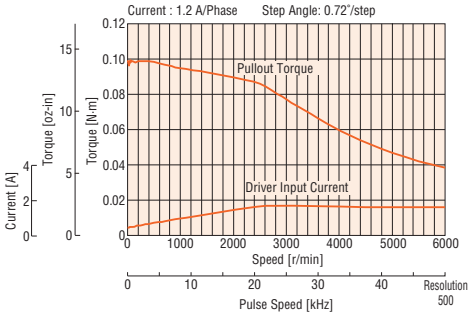
● A 0.6 m (2 ft.) connection cable is included.

Speed - Torque Characteristics

CVK523AK/CVK523BK



CVK525AK/CVK525BK



● The pulse input circuit responds up to 1 MHz with a pulse duty of 50%.

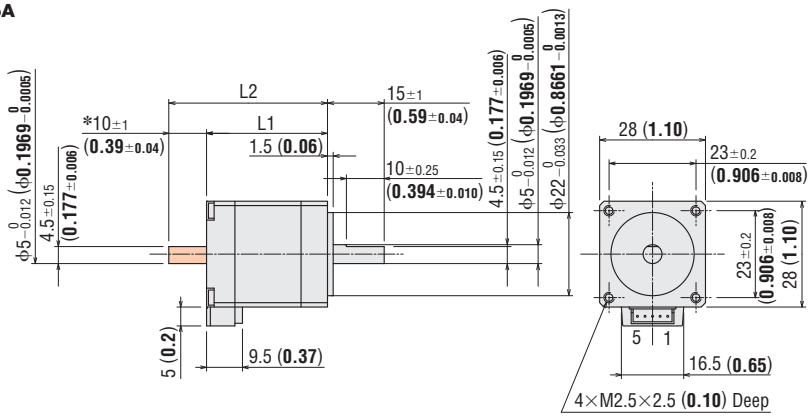
Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature under 100°C (212°F).

Dimensions unit = mm (in.)

Product Name	Motor Product Name	L1	L2	Mass kg (lb.)	CAD
CVK523AK	PKP523N12A	32 (1.26)	–	0.11 (0.24)	B1146
CVK523BK	PKP523N12B		42 (1.65)		
CVK525AK	PKP525N12A	51.5 (2.03)	–	0.2 (0.44)	B1147
CVK525BK	PKP525N12B		61.5 (2.42)		

● A 0.6 m (2 ft.) motor connection cable is included with each package : **LC5N06A**
● Applicable Connector
Connector housing: 51065-0500 (Molex)
Contact: 50212-8100 (Molex)
Crimp tool: 57176-5000 (Molex)



*The length of machining on the double shaft product is 10±0.25 (0.394±0.010).

1.8° Stepper Motor and Driver Package

Frame Size: 35 mm (1.38 in.), 42 mm (1.65 in.)
Standard Type

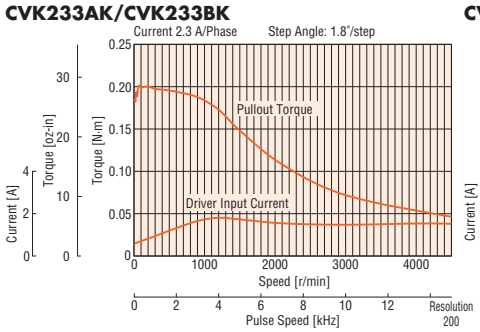
Specifications

Product Name	Single Shaft / Double Shaft	CVK233AK / CVK233BK	CVK235AK / CVK235BK	CVK243AK / CVK243BK	CVK244AK / CVK244BK	CVK245AK / CVK245BK	CVK246AK / CVK246BK
Max. Holding Torque	N·m (oz-in)	0.2 (28)	0.37 (52)	0.35 (49)	0.48 (68)	0.58 (82)	0.93 (132)
Holding Torque at Motor Standstill	N·m (oz-in)	0.1 (14.2)	0.19 (26)	0.18 (25)	0.24 (34)	0.29 (41)	0.47 (66)
Rotor Inertia	J: kg·m^2 (oz-in^2)	24×10^{-7} (0.131)	50×10^{-7} (0.27)	36×10^{-7} (0.197)	57×10^{-7} (0.31)	83×10^{-7} (0.45)	114×10^{-7} (0.62)
Rated Current	A/Phase	2.3					
Basic Step Angle		1.8°					
Power-Supply Voltage		24 VDC±10% 2.0 A					
Excitation Mode		Microstep					

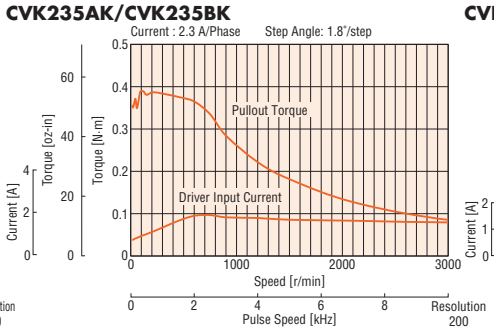
● A 0.6 m (2 ft.) connection cable is included.

Speed - Torque Characteristics

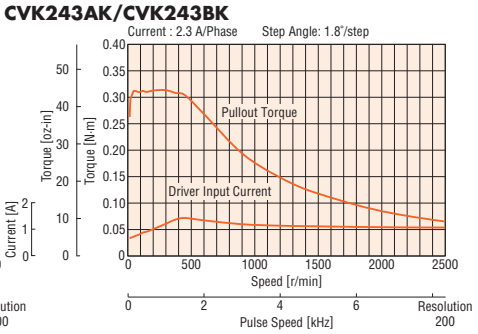
CVK233AK/CVK233BK



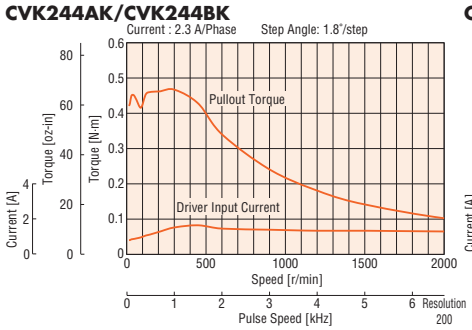
CVK235AK/CVK235BK



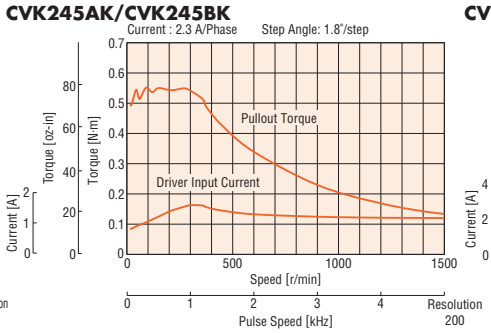
CVK243AK/CVK243BK



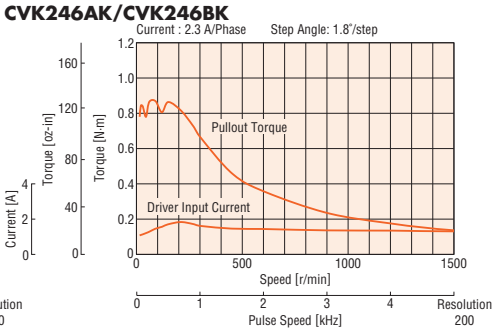
CVK244AK/CVK244BK



CVK245AK/CVK245BK



CVK246AK/CVK246BK



● The pulse input circuit responds up to 1 MHz with a pulse duty of 50%.

Note

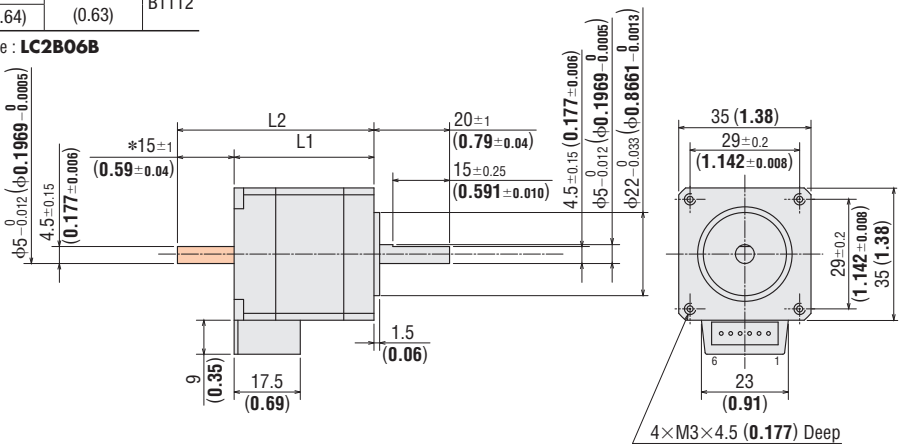
● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature under 100°C (212°F).

Dimensions Unit = mm (in.)

Product Name	Motor Product Name	L1	L2	Mass kg (lb.)	CAD
CVK233AK	PKP233D23A	37 (1.46)	–	0.18 (0.4)	B1111
CVK233BK	PKP233D23B		52 (2.05)		
CVK235AK	PKP235D23A	52 (2.05)	–	0.285 (0.63)	B1112
CVK235BK	PKP235D23B		67 (2.64)		

● A 0.6 m (2 ft.) motor connection cable is included with each package : **LC2B06B**

● Motor Applicable Connector
Connector Housing: 51103-0600 (Molex)
Contact: 50351-8100 (Molex)
Crimp Tool: 63811-8100 (Molex)



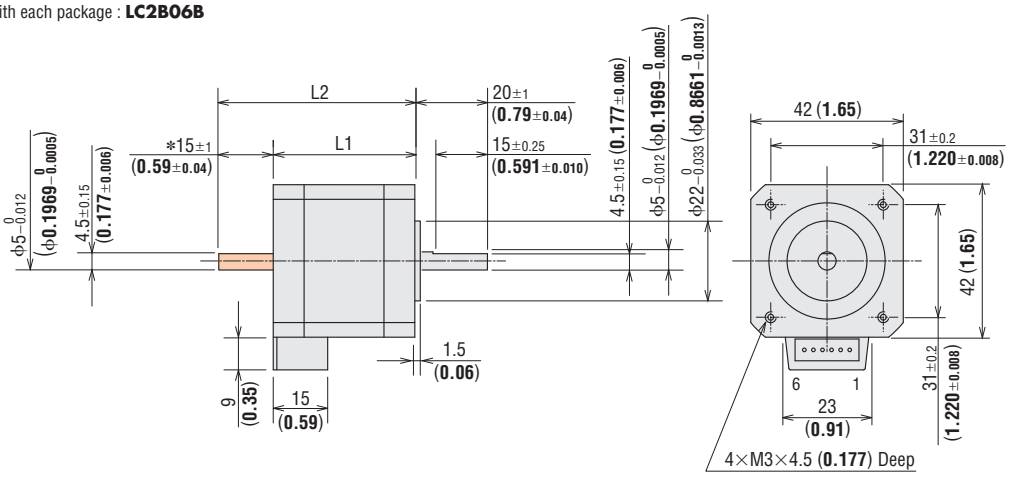
✻ The length of machining on the double shaft product is 15±0.25 (0.591±0.010).

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

Product Name	Motor Product Name	L1	L2	Mass kg (lb.)	CAD
CVK243AK	PKP243D23A	33 (1.30)	–	0.25 (0.55)	B1113
CVK243BK	PKP243D23B		48 (1.89)		
CVK244AK	PKP244D23A	39 (1.54)	–	0.3 (0.66)	B1114
CVK244BK	PKP244D23B		54 (2.13)		
CVK245AK	PKP245D23A	47 (1.85)	–	0.39 (0.86)	B1115
CVK245BK	PKP245D23B		62 (2.44)		
CVK246AK	PKP246D23A	59 (2.32)	–	0.5 (1.1)	B1116
CVK246BK	PKP246D23B		74 (2.91)		

● A 0.6 m (2 ft.) motor connection cable is included with each package : **LC2B06B**

● Applicable Connector
Connector Housing: 51065-0600 (Molex)
Contact: 50212-8100 (Molex)
Crimp Tool: 63819-0500 (Molex)



✻ The length of machining on the double shaft product is 15±0.25 (0.591±0.010).

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

0.72°/0.36° Stepper Motor and Driver Package

Frame Size: 42 mm (1.65 in.)
Standard / High Resolution Type

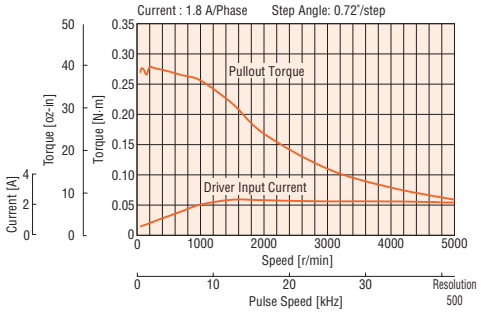
Specifications

Product Name	Single Shaft / Double Shaft	CVK544AK / CVK544BK	CVK546AK / CVK546BK	CVK544MAK / CVK544MBK	CVK546MAK / CVK546MBK
Max. Holding Torque	N·m (oz-in)	0.26 (36)	0.44 (62)	0.26 (36)	0.44 (62)
Holding Torque at Motor Standstill	N·m (oz-in)	0.13 (18.4)	0.22 (31)	0.13 (18.4)	0.22 (31)
Rotor Inertia	J: kg·m^2 (oz-in^2)	57×10^{-7} (0.31)	114×10^{-7} (0.62)	60×10^{-7} (0.33)	121×10^{-7} (0.66)
Rated Current	A/Phase	1.8			
Basic Step Angle		0.72°		0.36°	
Power-Supply Voltage		24 VDC±10% 2.8 A			
Excitation Mode		Microstep			

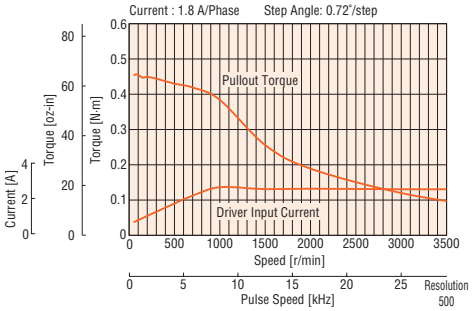
● A 0.6 m (2 ft.) connection cable is included.

Speed - Torque Characteristics

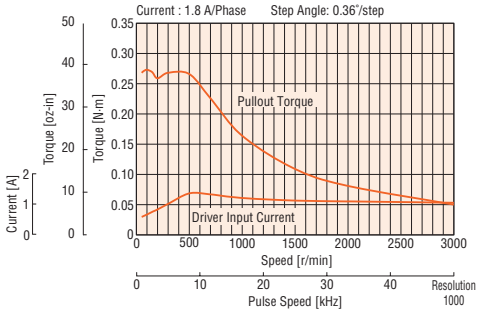
CVK544AK/CVK544BK



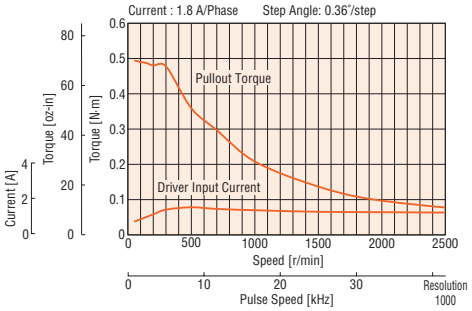
CVK546AK/CVK546BK



CVK544MAK/CVK544MBK



CVK546MAK/CVK546MBK



● The pulse input circuit responds up to 1 MHz with a pulse duty of 50%.

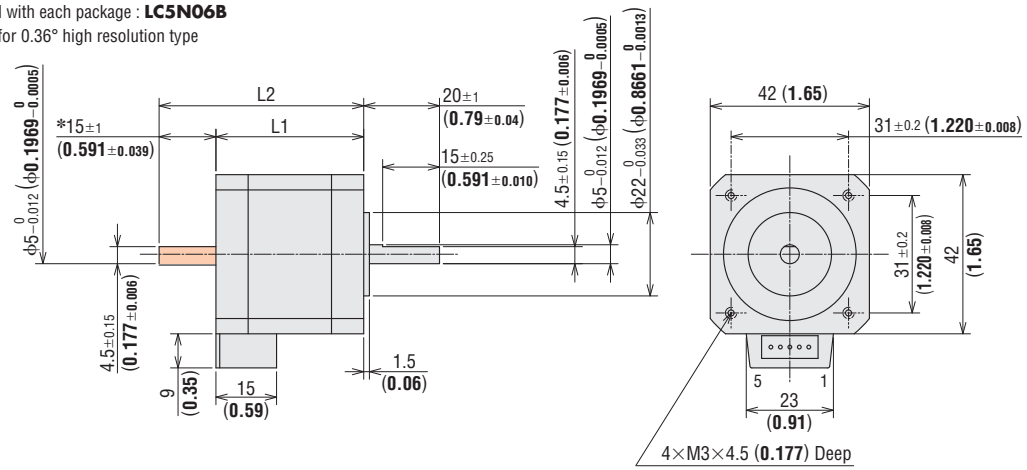
Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature under 100°C (212°F).

Dimensions Unit = mm (in.)

Product Name	Motor Product Name	L1	L2	Mass kg (lb.)	CAD
CVK544□AK	PKP544□N18A	39 (1.54)	–	0.3 (0.66)	B1120
CVK544□BK	PKP544□N18B		54 (2.13)		
CVK546□AK	PKP546□N18A	59 (2.32)	–	0.5 (1.1)	B1121
CVK546□BK	PKP546□N18B		74 (2.91)		

- A 0.6 m (2 ft.) motor connection cable is included with each package : **LC5N06B**
- Enter **M** in the box (□) within the product name for 0.36° high resolution type
- Applicable Connector
  Connector housing: 51103-0500 (Molex)
  Contact: 50351-8100 (Molex)
  Crimp tool: 57295-5000 (Molex)



*The length of machining on the double shaft product is 15±0.25 (0.591±0.010).

1.8° Stepper Motor and Driver Package

Frame Size: 56.4 mm (2.22 in.)
Standard Type

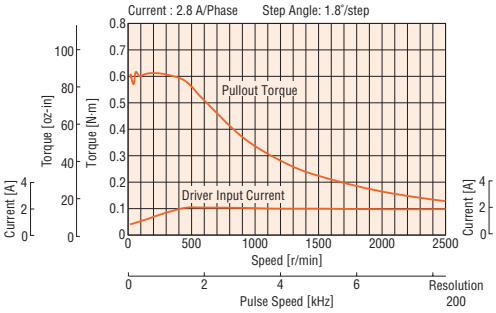
Specifications

Product Name	Single Shaft / Double Shaft	CVK264AK / CVK264BK	CVK266AK / CVK266BK	CVK268AK / CVK268BK
Max. Holding Torque	N·m (oz-in)	0.6 (85)	1.4 (198)	2.3 (320)
Holding Torque at Motor Standstil	N·m (oz-in)	0.3 (42)	0.7 (99)	1.15 (163)
Rotor Inertia	J: kg·m^2 (oz-in^2)	120×10^{-7} (0.66)	290×10^{-7} (1.59)	490×10^{-7} (2.7)
Rated Current	A/Phase	2.8		
Basic Step Angle		1.8°		
Power-Supply Voltage		24 VDC±10% 2.5 A		
Excitation Mode		Microstep		

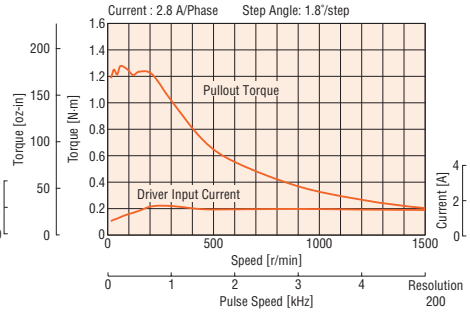
● A 0.6 m (2 ft.) connection cable is included.

Speed - Torque Characteristics

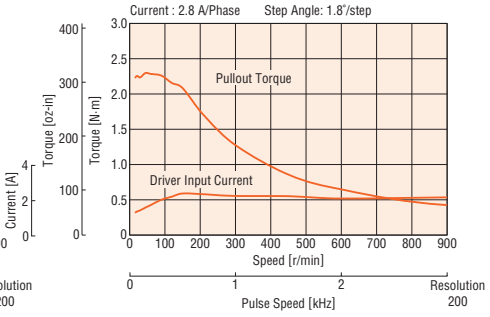
CVK264AK/CVK264BK



CVK266AK/CVK266BK



CVK268AK/CVK268BK



● The pulse input circuit responds up to 1 MHz with a pulse duty of 50%.

Note

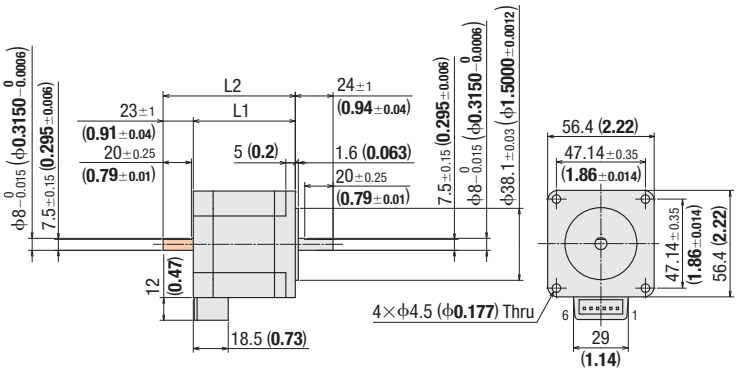
● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature under 100°C (212°F).

Dimensions Unit = mm (in.)

- ϕ8 mm (ϕ0.3150 in.) front shaft

Product Name	Motor Product Name	L1	L2	Mass kg (lb.)	CAD
CVK264AK	PKP264D28A	39 (1.54)	–	0.46 (1.01)	B1117
CVK264BK	PKP264D28B		62 (2.44)		
CVK266AK	PKP266D28A	54 (2.13)	–	0.73 (1.61)	B1118
CVK266BK	PKP266D28B		77 (3.03)		
CVK268AK	PKP268D28A	76 (2.99)	–	1.1 (2.4)	B1119
CVK268BK	PKP268D28B		99 (3.90)		

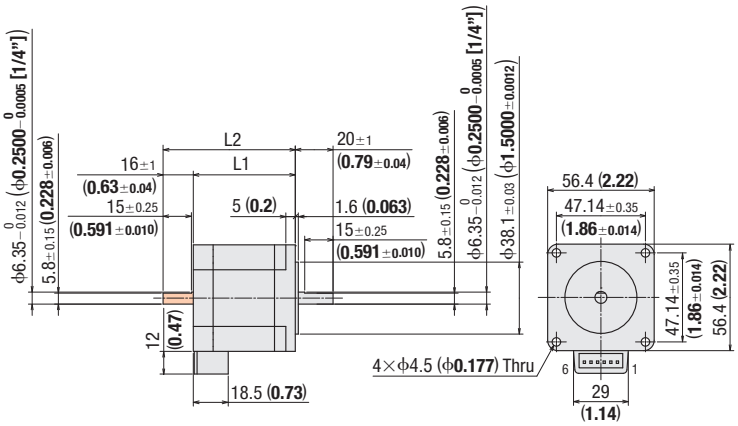
● A 0.6 m (2 ft.) motor connection cable is included with each package : **LC2B06B**



- ϕ6.35 mm (ϕ1/4 in.) front shaft
  Order driver and motor separately (No package)

Motor Product Name	Driver Product Name	L1	L2	Mass kg (lb.)	CAD
PKP264D28AA-L	CVD228-K	39 (1.54)	–	0.46 (1.01)	B1028
PKP264D28BA-L			55 (2.17)		
PKP266D28AA-L		54 (2.13)	–	0.73 (1.61)	B1029
PKP266D28BA-L			70 (2.76)		
PKP268D28AA-L		76 (2.99)	–	1.1 (2.4)	B1030
PKP268D28BA-L			92 (3.62)		

● A 0.6 m (2 ft.) motor connection cable is included with motor: **LC2B06B**



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

0.72°/0.36° Stepper Motor and Driver Package

Frame Size: 60 mm (2.36 in.)
Standard / High Resolution Type

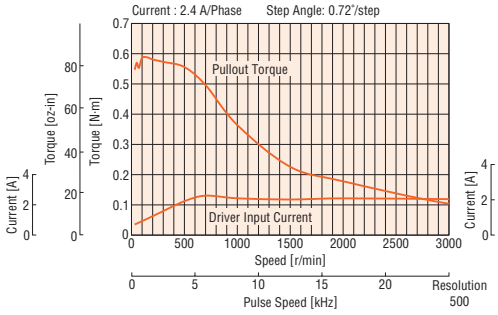
Specifications

Product Name							
	Single Shaft	CVK564FAK	CVK566FAK	CVK569FAK	CVK564FMAK*	CVK566FMAK*	CVK569FMAK*
	Double Shaft	CVK564FBK	CVK566FBK	CVK569FBK	CVK564FMBK*	CVK566FMBK*	CVK569FMBK*
Max. Holding Torque	N·m (oz-in)	0.55 (78)	0.95 (134)	1.7 (240)	0.78 (110)	1.25 (177)	2.3 (320)
Holding Torque at Motor Standstill	N·m (oz-in)	0.28 (39)	0.48 (68)	0.85 (120)	0.39 (55)	0.63 (89)	1.15 (163)
Rotor Inertia	J: kg·m^2 (oz-in^2)	175×10^{-7} (0.96)	280×10^{-7} (1.53)	560×10^{-7} (3.1)	310×10^{-7} (1.70)	490×10^{-7} (2.7)	970×10^{-7} (5.3)
Rated Current	A/Phase	2.4					
Basic Step Angle		0.72°			0.36°		
Power-Supply Voltage		24 VDC±10% 2.7 A					
Excitation Mode		Microstep					

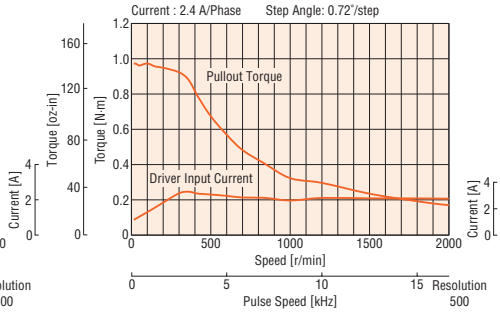
*A 0.6 m (2 ft.) connection cable is included with a connector-coupled motor.

Speed - Torque Characteristics

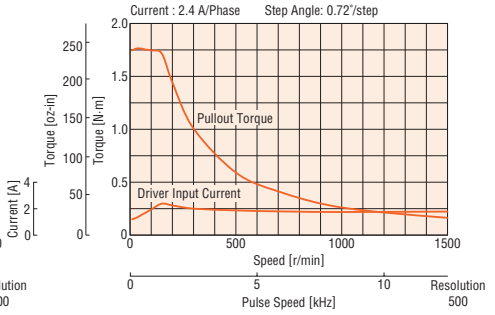
CVK564FAK/CVK564FBK



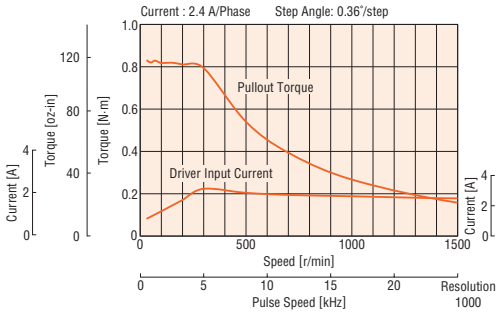
CVK566FAK/CVK566FBK



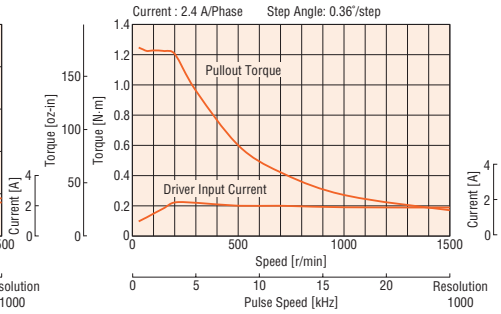
CVK569FAK/CVK569FBK



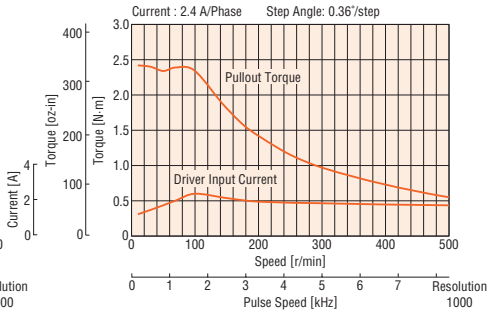
CVK564FMAK/CVK564FMBK



CVK566FMAK/CVK566FMBK



CVK569FMAK/CVK569FMBK



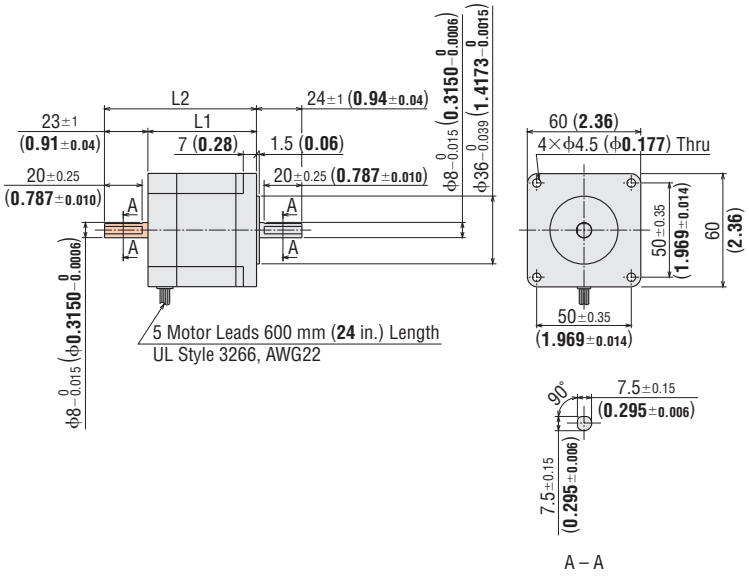
● The pulse input circuit responds up to 1 MHz with a pulse duty of 50%.

Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature under 100°C (212°F).

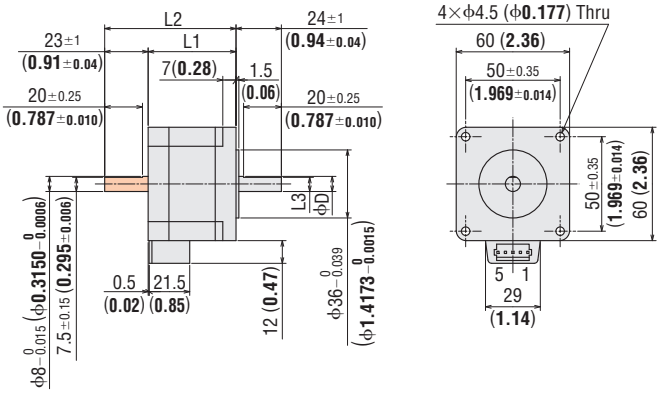
Dimensions Unit = mm (in.)

Product Name	Motor Product Name	L1	L2	Mass kg (lb.)	CAD
CVK564FAK	PKP564FN24AW	46.5 (1.83)	–	0.6 (1.32)	B1122
CVK564FBK	PKP564FN24BW		69.5 (2.74)		
CVK566FAK	PKP566FN24AW	57.5 (2.26)	–	0.8 (1.76)	B1123
CVK566FBK	PKP566FN24BW		80.5 (3.17)		
CVK569FAK	PKP569FN24AW	87 (3.43)	–	1.3 (2.9)	B1124
CVK569FBK	PKP569FN24BW		110 (4.33)		



Product Name	Motor Product Name	L1	L2	L3	ϕD	Mass kg (lb.)	CAD
CVK564FMAK	PKP564FMN24A	46.5 (1.83)	–	7.5±0.15 (0.295±0.006)	8 −0.015 0 (0.3150 −0.0006 0)	0.65 (1.43)	B1125
CVK564FMBK	PKP564FMN24B		69.5 (2.74)				
CVK566FMAK	PKP566FMN24A	56 (2.20)	–			0.87 (1.91)	B1126
CVK566FMBK	PKP566FMN24B		79 (3.11)				
CVK569FMAK	PKP569FMN24A	87 (3.43)	–	9.5±0.15 (0.374±0.006)	10 −0.015 0 (0.3937 −0.0006 0)	1.5 (3.3)	B1127
CVK569FMBK	PKP569FMN24B		110 (4.33)				

- A 0.6 m (2 ft.) motor connection cable is included with each package : **LC5N06C**
- Applicable Connector
  Connector housing: 51144-0500 (Molex)
  Contact: 50539-8100 (Molex)
  Crimp tool: 57189-5000 (Molex)



Driver Specifications

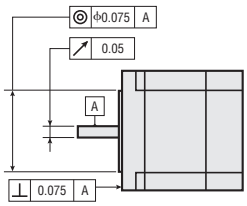
Max. Input Pulse Frequency	Line driver output by programmable controller: 1 MHz (When the pulse duty is 50%) Open-collector output by programmable controller: 250 kHz (When the pulse duty is 50%) Negative logic pulse input
Input Signal	Photocoupler input, input current 5～15 mA, input voltage, 3～5.25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

General Specifications

		Motor	Driver
Heat-Resistant Class		130 (B)	–
Insulation Resistance		In normal ambient temperature and humidity, the value measured using a 500 VDC megger between the windings and the case is 100 MΩ or higher.	–
Dielectric Strength		In normal ambient temperature and humidity, applying voltage between the windings and the case for one minute under the following conditions does not result in abnormalities. · **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 (+14～+122°F) (non-freezing)	0～+50°C (+32～+122°F) (non-freezing)
	Ambient Humidity	85% max. (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 (176°F) or less. (Based on in-house measurement conditions)	–
Stop Positioning Accuracy*1		Standard type: ±3 minutes (±0.05°) [For **PKP213**, it is ±5 minutes (±0.083°)] High-resolution type: ±2 minutes (±0.034°)	–
Shaft Runout		0.05 mm (0.002 in.) T.I.R*4	–
Radial Play*2		0.025 mm (0.001 in.) Max. Load 5 N (1.12 lb.)	–
Axial Play*3		0.075 mm (0.003 in.) Max. Load 10 N (2.2 lb.) For **PKP213**, the load is 1 N (0.225 lb.)	–
Concentricity of Installation Pilot to the Shaft		0.075 mm (0.003 in.) T.I.R*4	–
Perpendicularity of Installation Surface to the Shaft		0.075 mm (0.003 in.) T.I.R*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 (1.12 lb.) 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 (2.2 lb.) load [1N (0.225 lb.) in **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.



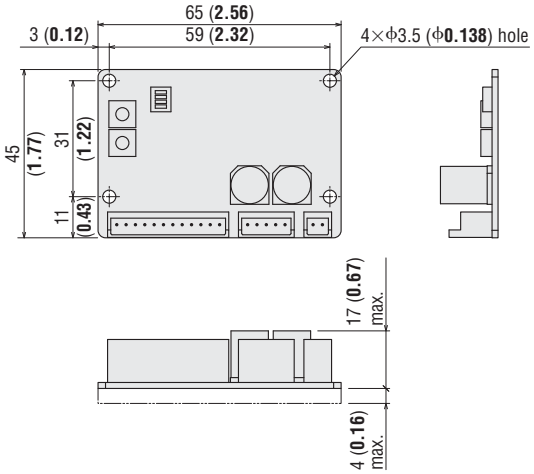
Permissible Radial Load and Permissible Axial Load

Unit = N (lb.)

Type	Motor Frame Size	Motor Product Name	Permissible Radial Load Distance from Shaft End in mm (in.) 0 [0]	5 [0.2]	10 [0.39]	15 [0.59]	20 [0.79]	Permissible Axial Load
Standard Type	20 mm (0.79 in.)	**PKP213**	12 (2.7)	15 (3.3)	–	–	–	Motor's self-weight max.
	28 mm (1.10 in.)	**PKP223**,**PKP225** **PKP523**,**PKP525**	25 (5.6)	34 (7.6)	52 (11.7)	–	–	
	35 mm (1.38 in.)	**PKP233** **PKP235**	20 (4.5)	25 (5.6)	34 (7.6)	52 (11.7)	–	
	42 mm (1.65 in.)	**PKP243** **PKP244** **PKP245** **PKP246** **PKP544** **PKP546**	20 (4.5)	25 (5.6)	34 (7.6)	52 (11.7)	–	
	56.4 mm (2.22 in.)	**PKP264** **PKP266** **PKP268**	61 (13.7)	73 (16.4)	90 (20)	110 (24)	160 (36)	
	60 mm (2.36 in.)	**PKP564** **PKP566** **PKP569**	63 (14.1)	75 (16.8)	95 (21)	130 (29)	190 (42)	
High-Resolution Type	42 mm (1.65 in.)	**PKP544** **PKP546**	20 (4.5)	25 (5.6)	34 (7.6)	52 (11.7)	–	
	60 mm (2.36 in.)	**PKP564** **PKP566** **PKP569**	90 (20)	100 (22)	130 (29)	180 (40)	270 (60)	

Driver Unit = mm (in.)

Driver Product Name: CVD205-K, CVD215-K, CVD223-K, CVD228-K, CVD512-K, CVD518-K, CVD524-K
Mass: 0.02 kg (0.71 oz)
CAD B1128

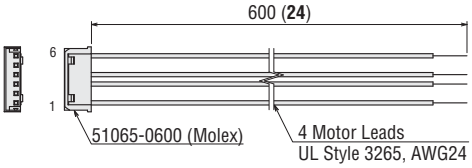


● Included
Connector housing: 51103-0200 (Molex)
51103-0500 (Molex)
51103-1200 (Molex)
Connector: 50351-8100 (Molex)

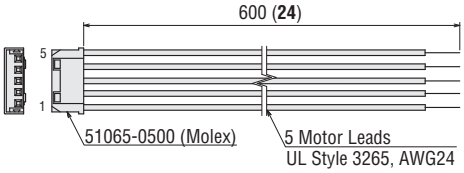
Cable for the Motor (Included) Unit = mm (in.)

	Frame Size	Product Name
1.8° Stepper Motor and Driver Package	28 mm (1.10)	**LC2B06A**
	35 mm (1.38), 42 mm (1.65)	**LC2B06B**
	56.4 mm (2.22)	**LC2B06C**
0.72°/0.36° Stepper Motor Package	28 mm (1.10)	**LC5N06A**
	42 mm (1.65)	**LC5N06B**
	60 mm (2.36)	**LC5N06C**

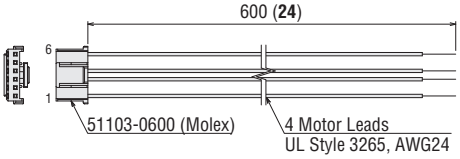
Product Name: **LC2B06A**



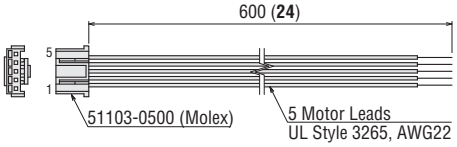
Product Name: **LC5N06A**



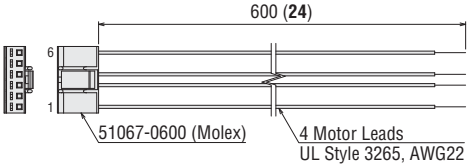
Product Name: **LC2B06B**



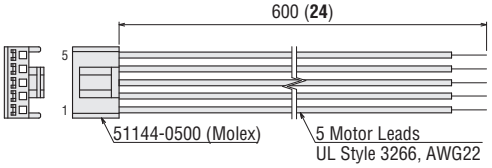
Product Name: **LC5N06B**



Product Name: **LC2B06C**



Product Name: **LC5N06C**



Information on Applicable Connectors Unit = mm (in.)

The applicable connectors for motors are shown in the table below.

	Frame Size	Connector Housing (Molex)	Contact (Molex)	Crimp Tool (Molex)
1.8° Stepper Motor and Driver Package	28 mm (1.10)	51065-0600	50212-8100	57176-5000
	35 mm (1.38), 42 mm (1.65)	51103-0600	50351-8100	57295-5000
	56.4 mm (2.22)	51067-0600	50217-9101	57189-5000 57190-5000
0.72°/0.36° Stepper Motor and Driver Package	28 mm (1.10)	51065-0500	50212-8100	57176-5000
	42 mm (1.65)	51103-0500	50351-8100	57295-5000
	60 mm (2.36)	51144-0500	50539-8100	57189-5000

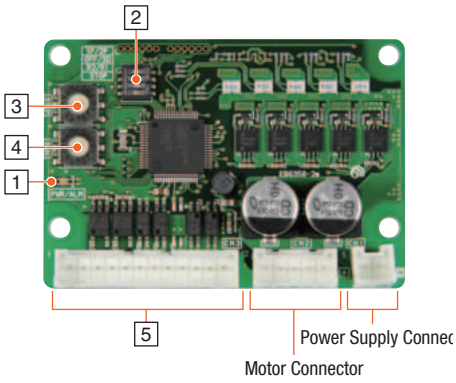
Connection and Operation

Names and Functions of Driver Parts

1 Signal Monitor Display

◇LED Indicator

Indication	Color	Function	Lighting Condition
PWR/ALM	Green	Power supply indicator	When the power supply is input
	Red	Alarm indication	Blinks when protective function is activated



◇Alarm Details

Blink Count	Function	Operating Condition
2	Overheat protection	The temperature of a driver's substrate has reached 85˚C (185˚F)
3	Overvoltage protection	The power supply voltage has exceeded the permissible value Large inertial load came to a sudden stop Large load has been raised and/or lowered
5	Overcurrent protection	Activated when an excessive current flows through the motor's output circuit
9	EEPROM abnormality	The saved data for the driver has been damaged
Lighting	CPU abnormality	The driver's CPU has malfunctioned

2 Function 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	Enables and disables the smooth drive function.
R2/R1	3	Sets the step angle in combination with the step angle setting switch
STOP	4	Switches the motor's standstill current between 25% and 50%.

3 Step Angle Setting Switch

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

Step Angle Setting Switch (STEP) Scale	R2/R1 Switch: When Turned ON (R1)		R2/R1 Switch: When Turned 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˚

● Compared to standard types, high-resolution types have twice the resolution and half of the step angle.
Example: When the R2/R1 switch is ON (R1) and the STEP switch is "0"
Resolution of high-resolution types: 500×2 = 1000
Step angle of high-resolution types: 0.72°/2 = 0.36°

4 Operation Current Setting Switch

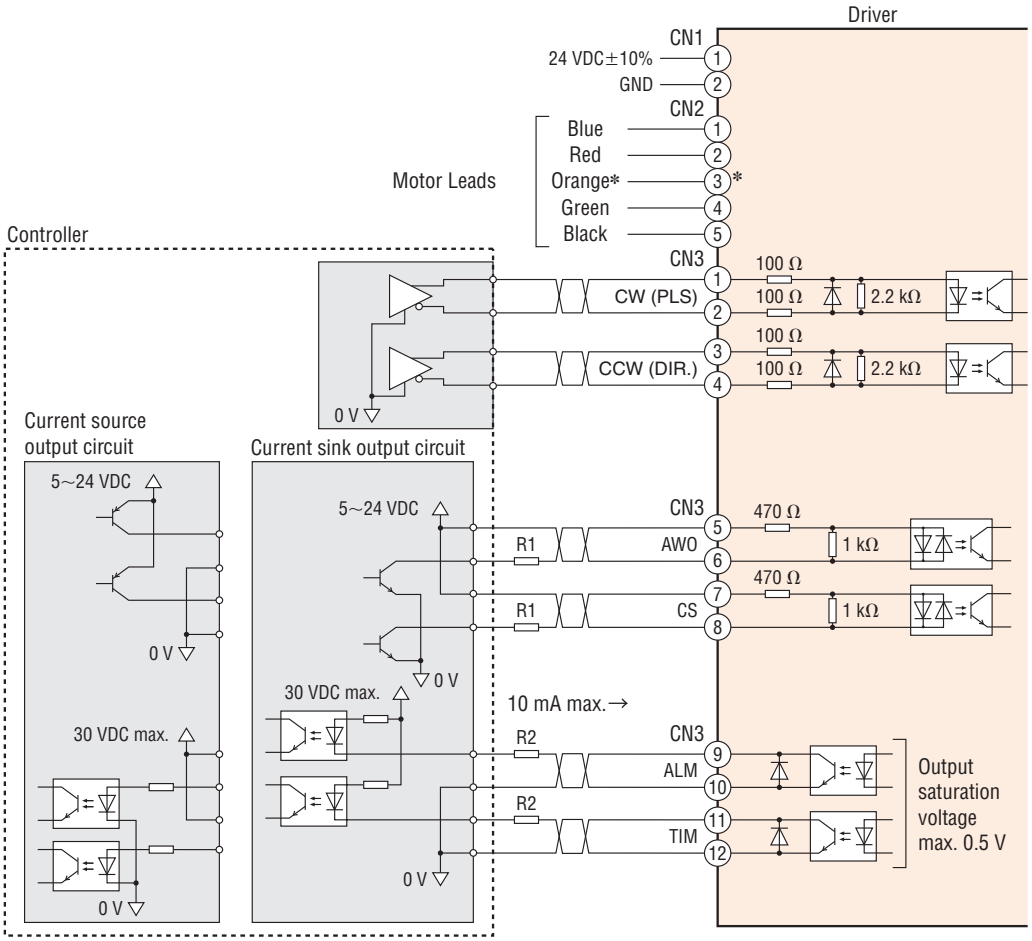
Indication	Function
RUN	Sets the motor's operating current.

5 I/O Signal Connector

Indication	Pin No.	I/O	Signal Name	Function
CN3	1	Input	CW+ (PLS+)	Motor will rotate in the CW direction. (Operation command pulse signal when 1-pulse input mode is used)
	2		CW− (PLS−)	
	3		CCW+ (DIR.+)	Motor will rotate in the CCW direction. (Rotation direction signal when 1-pulse input mode is used)
	4		CCW− (DIR.−)	
	5		AWO+	Switches the motor into its non-excitation state.
	6		AWO−	
	7		CS+	Switches the step angle.
	8		CS−	
	9	Output	ALM+	Output the alarm status for the driver (Normally closed contact)
	10		ALM−	
	11		TIM+	Motor's excitation state is output at step "0."
	12		TIM−	

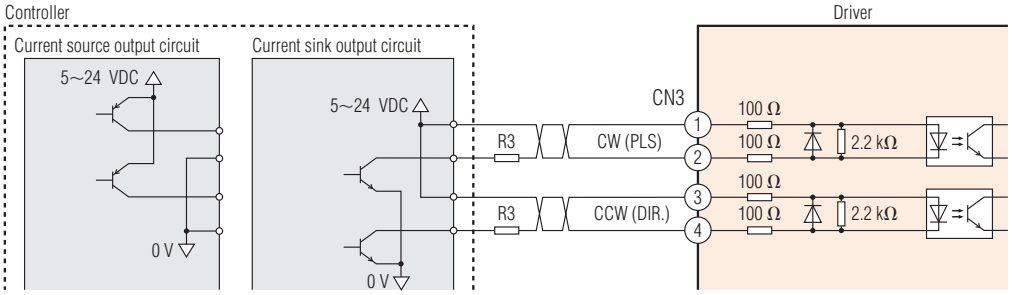
Connection Diagram

When the Pulse Input is the Line Driver



*Not available on a 1.8° stepper motor. Do not connect anything to Pin No.3.

When the Pulse Input is the Open Collector



[Note on Wiring]

◇I/O Signal Connection

- Input signal
  Use 5 VDC for input signal.
  When applying a voltage that exceeds 5 VDC, connect an external resistor R1 so that the current is between 5~15 mA. (AWO, CS)
  When the pulse is input by an open collector and a voltage that exceeds 5 VDC for CW input and CCQ input is going to be applied, connect an external resistor R3 so that the current is between 7~20 mA.
- Output signal
  For output signal, please use 30 VDC, 10 mA or less. When the current value exceeds 10 mA, please connect an external resistor R2.
- Use a twisted-pair wire AWG24~22 (0.2~0.3 mm^2).
- Since the maximum transmissible frequency drops as the pulse line becomes longer, keep the wiring length as short as possible within 2 m (6.6 ft.).
- Provide a distance of 100 mm (3.94 in.) min. between the I/O signal lines and power lines (power supply lines, motor lines, etc.).

◇Power Supply Connection

- Use AWG22 (0.3 mm^2) wires.
- 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 AWG22 (0.3 mm^2) or thicker wires.

◇General

- A separate hand crimp tool is required to crimp the supplied power connector included and lead wire. Accessory connection cables (sold separately) are crimped lead wires.
- 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.

1.8° Stepper Motor and Driver Package

Type	Product Name	Motor Product Name	Driver Product Name
Standard Type	**CVK213□K**	PKP213D05□	CVD205-K
	CVK223□K	PKP223D15□2*	CVD215-K
	CVK225□K	PKP225D15□2*	
	CVK233□K	PKP233D23□*	CVD223-K
	CVK235□K	PKP235D23□*	
	CVK243□K	PKP243D23□*	
	CVK244□K	PKP244D23□*	
	CVK245□K	PKP245D23□*	
	CVK246□K	PKP246D23□*	
	CVK264□K	PKP264D28□*	CVD228-K
	CVK266□K	PKP266D28□*	
	CVK268□K	PKP268D28□*	

Type	Product Name	Motor Product Name	Driver Name
Standard	**CVD228-K / PKP264D28□A-L**	PKP264D28□A	CVD228-K
	CVD228-K / PKP266D28□A-L	PKP266D28□A	
	CVD228-K / PKP268D28□A-L	PKP268D28□A	

● Front motor shaft is ϕ6.35 mm (ϕ1/4 in.)

0.72°/0.36° Stepper Motor and Driver Package

Type	Product Name	Motor Product Name	Driver Product Name
Standard Type	**CVK523□K**	PKP523N12□*	CVD512-K
	CVK525□K	PKP525N12□*	
	CVK544□K	PKP544N18□*	CVD518-K
	CVK546□K	PKP546N18□*	
	CVK564F□K	PKP564FN24□W	CVD524-K
	CVK566F□K	PKP566FN24□W	
	CVK569F□K	PKP569FN24□W	
High-resolution Type	**CVK544M□K**	PKP544MN18□*	CVD518-K
	CVK546M□K	PKP546MN18□*	
	CVK564FM□K	PKP564FMN24□*	CVD524-K
	CVK566FM□K	PKP566FMN24□*	
	CVK569FM□K	PKP569FMN24□*	

● The □ contains either **A** (single shaft) or **B** (double shaft) to indicate the configuration.

✻Connection cables and connectors are not included when only a motor is purchased for maintenance, etc. They must be purchased separately.

Accessories

For more information, please check our website or contact our customer service center. **www.orientalmotor.com**

Flexible Coupling RoHS

Coupling Selection Table

Applicable Product			Coupling Type	Motor Shaft Diameter mm (in.)		Driven Shaft Diameter mm (in.)						
Type	Motor Frame Size	Applicable Motor				**04** ϕ4 (ϕ0.1575)	**05** ϕ5 (ϕ0.1969)	**06** ϕ6 (ϕ0.2362)	**F04** ϕ6.35 (ϕ0.2500)	**08** ϕ8 (ϕ0.3150)	**10** ϕ10 (ϕ0.3937)	**12** ϕ12 (ϕ0.4724)
High-Torque Type	20 mm (0.79 in.)	**PKP213**	**MCS14**	**04**	ϕ4 (ϕ0.1575)	●	●	●				
	28 mm (1.10 in.)	**PKP223 PKP523 PKP225 PKP525**	**MCS14**	**05**	ϕ5 (ϕ0.1969)	●	●	●				
	35 mm (1.38 in.)	**PKP233 PKP235**	**MCS14**	**05**	ϕ5 (ϕ0.1969)	●	●	●				
	42 mm (1.65 in.)	**PKP243 PKP244 PKP544**	**MCS14**	**05**	ϕ5 (ϕ0.1969)	●	●	●				
		PKP246 PKP546	**MCS20**	**05**	ϕ5 (ϕ0.1969)		●	●	●	●	●	
	56.4 mm (2.22 in.)	**PKP264***	**MCS20**	**F04**	ϕ6.35 (ϕ0.2500)		●	●	●	●	●	
		PKP266* PKP268*	**MCS30**	**F04**	ϕ6.35 (ϕ0.2500)			●	●	●	●	
	60 mm (2.36 in.)	**PKP564 PKP566**	**MCS20**	**08**	ϕ8 (ϕ0.3150)		●	●	●	●	●	
		PKP569	**MCS30**	**08**	ϕ8 (ϕ0.3150)		●	●	●	●	●	●

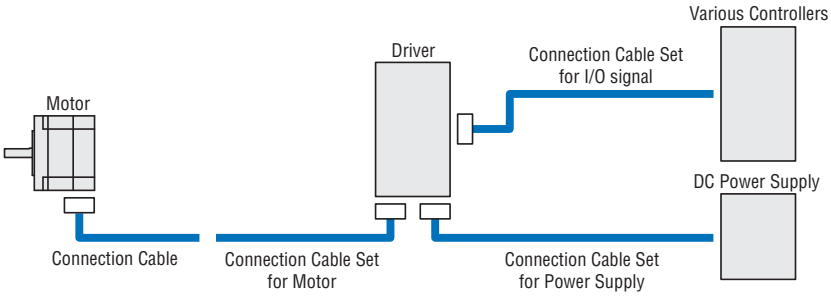
● The applicable motor products are listed such that the coupling can be determined.

● These couplings can also be used with a motor with an encoder.

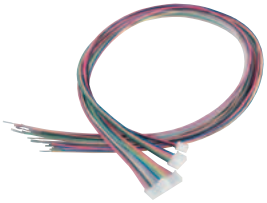
✻For 8 mm (0.3150 in.) front motor shaft, use **MCS2008**.

Cable

Cable System Configuration



Connection Cable Sets

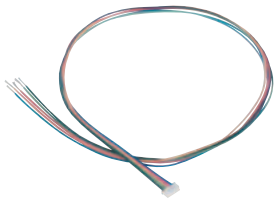


These are lead wires that come with connectors for the driver. They make connecting the motor, power supply, and I/O signal components easy. A connection cable set includes cables for the motor, cables for the power supply, and cables for the I/O signal.

Product Line and List Price

Product Name	Applicable Drivers	Length m (ft.)	Conductor AWG	List Price
LCS01CVK2	CVD205-K CVD215-K CVD223-K CVD228-K	0.6 (2)	22 (0.3 mm^2)	$29.00
LCS04SD5	CVD512-K CVD518-K CVD524-K			$27.00

Connection Cables



These crimped lead wire-type connection cables are convenient for connecting connector-coupled motors. Because they are already crimped, they eliminate the need for assembly. A 0.6 m (2 ft.) connection cable is included in connector-coupled motor and driver packages.

Product Line and List Price

Product Name	Applicable Motor	Length m (ft.)	Conductor AWG	List Price
LC2B06A	PKP223 PKP225	0.6 (2)	24 (0.2 mm^2)	$5.00
LC2B06B	PKP233 PKP235 PKP243 PKP244 PKP245 PKP246		24 (0.2 mm^2)	$5.00
LC2B06C	PKP264 PKP266 PKP268		22 (0.3 mm^2)	$5.00
LC5N06A	PKP523 PKP525	0.6 (2)	24 (0.2 mm^2)	$5.00
LC5N10A		1 (3.3)		$7.00
LC5N06B	PKP544 PKP546	0.6 (2)	22 (0.3 mm^2)	$7.00
LC5N10B		1 (3.3)		$10.00
LC5N06C	PKP564 PKP566 PKP569	0.6 (2)		$10.00
LC5N10C		1 (3.3)		$13.00

- The applicable motor products are listed such that the motor can be determined.

Motor Mounting Bracket

Mounting brackets are convenient for installation and securing a stepper motor.

Product Line and List Price

Material: Aluminum alloy

Product Name	List Price	Motor Frame Size	Applicable Product
PAF0P	$13.00	42 mm (1.15)	**CVK24** **CVK54**
PAL0P			
PAL2P-2	$17.00	56.4 mm (2.22)	**CVK26**
PAL2P-5		60 mm (2.36)	**CVK56**

- Names of applicable products contain characters that make product names identifiable.
- The mounting bracket base is built with holes large enough to allow for adjustments of belt tension after the motor is installed.
- These mounting brackets can fit to the pilot of the stepper motors. (Excluding **PAL0P**)

Controller

Universal Controller

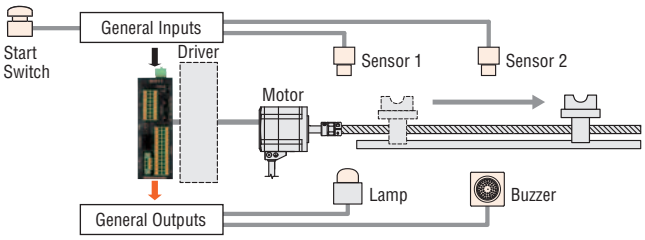
SCX11 RoHS

The **SCX11** Universal Controller is a highly functional and sophisticated controller, equipped with program editing and execution functions. The **SCX11** is also able to control the motor via various serial ports such as USB, RS-232C and CANopen. Use the **SCX11** to support Oriental Motor's Pulse Input Type drivers.

Features

- 100 Sequence Programs can be Stored
- Stored Program with GUI
- USB Connection to PC
- Various Interfaces for Operation
- External Encoder Input

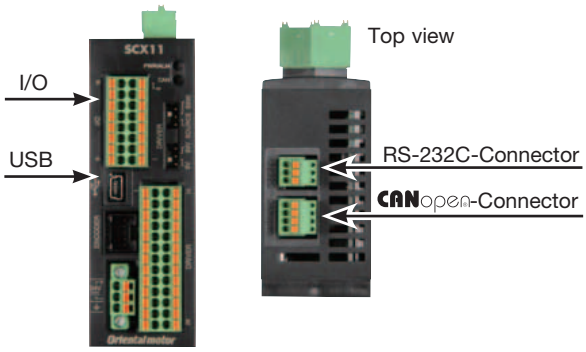
Stand Alone Operation Using Sensors and Switches



Product Line

Product Name	List Price
SCX11	$349.00

Various Interfaces for Operation



- Direct Command Operation via CANopen
- Operations Using a PC or PLC

Specifications are subject to change without notice. This catalog was published in August, 2014.

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