ORIENTAL MOTOR GENERAL CATALOGUE

B

2-Phase Stepping Motors

2-Phase Stepping Motors

High-Torque PK Type

Features of the PK High-Torque 2-Phase Stepping Motors

Stepping motors are capable of highly precise and reliable operation without the use of position detectors. Motor operation is controlled directly through pulse signals, whereby the current flowing through the motor's windings is switched with each pulse signal input, causing the motor to rotate in steps at fixed angles.

1. Wide Variety

Six frame sizes are available in a range from 28mm to 85mm. In addition to the standard type, we offer **P** type (High response), **J** type (High inertia capability), **M** type (High resolution) and **SH** geared type. The coil also comes in various specifications.

2. High Torque

This high torque of the **PK** series motor makes it possible to drive large equipment and is effective for equipment downsizing and for keeping heat generation low.

3. Low Vibration

The **PK** series motors do more than provide high torque: they were also designed to achieve smooth operations. This makes **PK** series motors the ideal choice for micro-step driving.

4. Low Audible Noise

The **PK** series motor was designed to produce low audible noise.

Variations

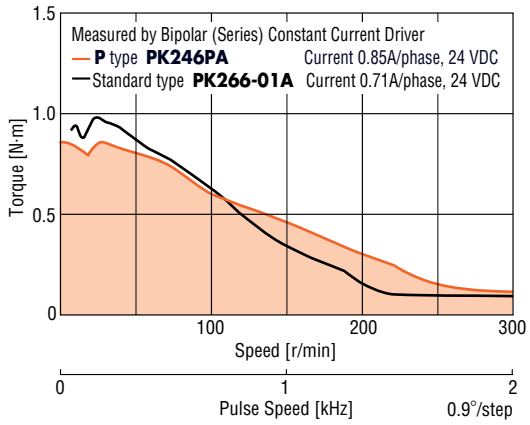
Type \ Size	Motor Frame Size (mm)					
	□28	□35	□42	□56.4	□60	□85
Standard Type	—	—	○	○	—	○
Standard Terminal Box Type	—	—	—	—	—	○
P Type (High Response)	○	○	○	—	—	—
J Type (High Inertia Capability)	—	—	—	—	○	—
M Type (High Resolution)	—	—	○	○	—	—
SH Geared Type	○	—	○	○*1	—	○*2

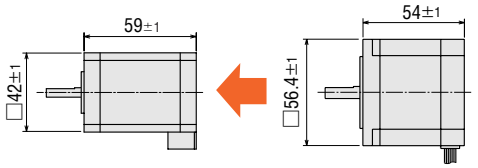
*1 Gearhead frame size is □60mm
*2 Gearhead frame size is □90mm

P Type (High Response)

High torque

This type combines high torque and a compact body. Three frame sizes, 28 mm, 35 mm and 42 mm, are available. Each specification provides torque equivalent to a motor of the next higher class, supporting high-torque operation even in the high-speed range.
For example, **P** type **PK246PA** (motor frame size □42mm) has the same holding torque as the standard type **PK266-01A** (motor frame size □56.4mm). You can choose smaller size motor to attain the same torque. It contributes to miniaturizing and making equipment lightweight.





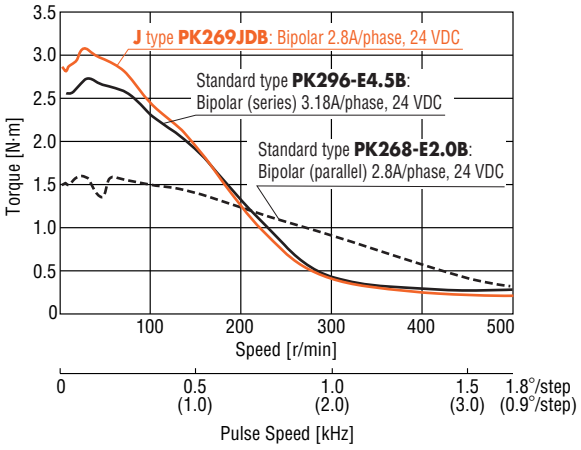
	P type	**Type**	Standard type
	PK246PA	**Model**	**PK266-01A**
	0.93 N·m	**Holding Torque**	1.17 N·m
	114×10^{-7} kg·m^2	**Rotor Inertia**	300×10^{-7} kg·m^2

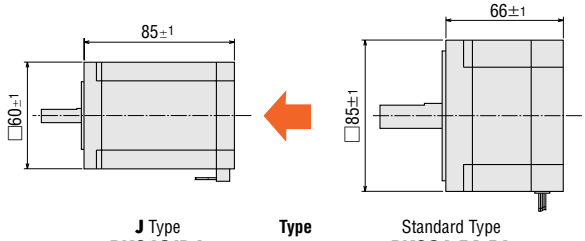
J Type (High Inertia Capability)

Ideal for driving loads subject to large inertia.
A large rotor size means the rotor's inertia is large, as well. Motor response improves as the ratio of the equipment's external inertia and rotor inertia decreases and the generated torque increases. Therefore, if the total inertia of the setup is large, the **J** type is the best choice, since it offers high power and large rotor inertia.

High Torque

The **J** type provides, on average, 1.5 times higher torque than the standard type.
With the rotor size larger, the rotor is composed of permanent magnets, its higher torque is successfully realized.
Our skillful winding technology makes it possible to maximize the rotor space.



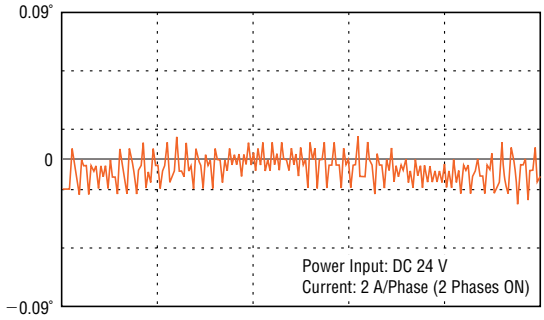


	J Type	**Type**	Standard Type
	PK269JDA	**Model**	**PK296-E4.5A**
	3.10 N•m	**Holding Torque**	3.10 N•m

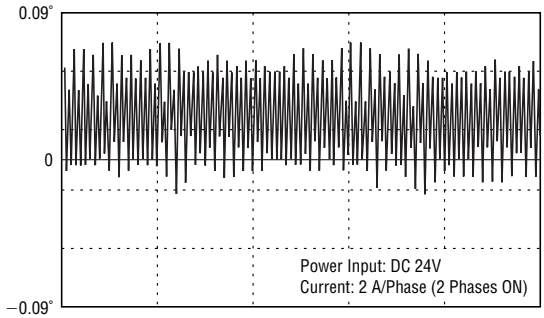
High Positioning Accuracy

The **J** type has dramatically improved accuracy, with a static angle error ±0.034° (standard type: ±0.05°). The **J** type is better at overcoming external load forces, providing your equipment with more accurate positioning and stability.

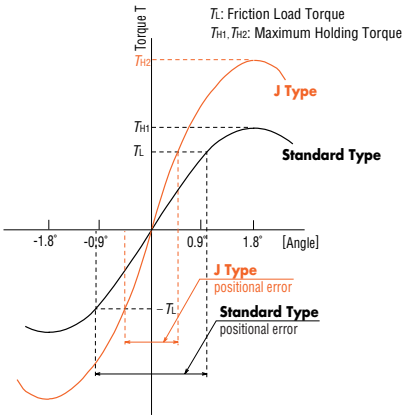
J Type



Standard Type



Angle-Torque Characteristics



All equipment has friction load, and the motor stops when the motor output torque and friction load torque are balanced. As shown in the characteristics above, the larger the output torque per step angle, the less the motor is influenced by friction load, so positioning accuracy is improved. Stop positioning displacement by external force does not occur as often.

M Type (High Resolution)

The 2-phase, high resolution stepping motor has half the step angle of the standard stepping motor. The **M** Type increases motor resolution from 200 steps/revolution to 400 steps/revolution. If an even smaller step-angle is needed, half-step driving and micro-step driving are other options. Such options, however, do not improve accuracy. The excitation coil of the 2-phase, high resolution stepping motor is located in exactly the same position, the number of rotor teeth is twice as many as standard stepping motors. Other structures are exactly the same as the standard motors.

●Please refer to page B-14 for more installation.

SH Geared Type

Incorporating **SH** gears with high permissible torque, these models offer the full benefit of geared motors' deceleration capability, delivering high resolution, high torque and smooth low-speed rotation. With performance like this , **SH** geared type can easily satisfy the requirements of various kinds of low-speed positioning applications.

Smooth Rotation at Low Speeds

When operated independently, motors develop high rotational vibration at low speeds, which makes step-like motion more noticeable. Reducing motor speed by means of the gear unit results in much smoother low-speed rotation.

Six Reduction Gear Ratios

Gear units in the **SH** geared type are available in six different reduction gear ratios : 1:3.6, 1 : 7.2, 1 : 9, 1 : 10, 1 : 18, 1 : 36. The low ratios of these units can greatly facilitate speed control of the 2-phase stepping motors.

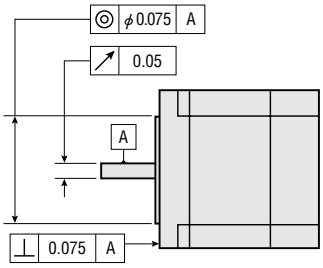
∗ **PK223-SG** type has five gear ratios except 1:3.6.

Ideal for High Inertia Drive

The stepping motor itself can drive the inertia of 10 times the rotor inertia. The geared type can drive this inertia multiple by the square of the speed reduction ratio. Therefore, the geared type is suitable for driving a inertial body.

General Specifications

Item	Specifications
Shaft Runout	0.05 T.I.R (mm)*1
Perpendicularity	0.075 T.I.R (mm)*1
Concentricity	0.075 T.I.R (mm)*1
Shaft Raadial Play*2	0.025 mm Maximum of 5 N
Shaft Axial Play*3	0.075 mm Maximum of 10 N
Stop position Accuracy*4	±0.05° (**J** type: ±0.034°)
Insulation Resistance	100 MΩ or more under normal ambient temperature and humidity when the megger reading between the windings and frame is DC500 V.
Dielectric Strength	Under normal ambient temperature and humidity, sufficient to withstand 1 kV (0.5 kV*5, 1.5 kV*6) at 50 Hz applied between the windings and the case for one minute following a period of continuous operation.
Insulation Class	Class B (130˚C)
Temperature Rise	80˚C or less as measured by the Resistance Change method when 2 phases are excited at rated voltage at rest.
Ambient Temperature Range	−10˚C～+50˚C



*1 T.I.R (Total Indicator Reading): It refers to the total dial gage reading when the measurement section is rotated 1 revolution centered on the reference axis center.

*2 Radial Play: It refers to the displacement in shaft position in the radial direction when a 5 N load is placed vertically on the motor shaft tip.

*3 Axial Play: It refers to the displacement in shaft position in the axial direction when a 10 N load is placed on the motor shaft in the axial direction.

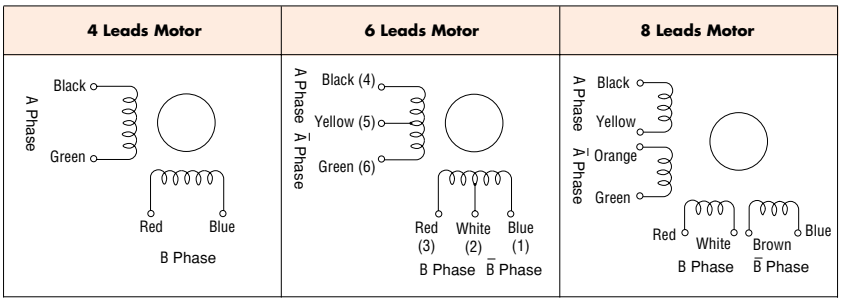
*4 Stop position Accuracy: This value is for full step with no load. (The value changed with size of load.)

*5 For motors with a motor size of 42 mm×42 mm or less, 50 Hz, 0.5 kV for 1 minute.

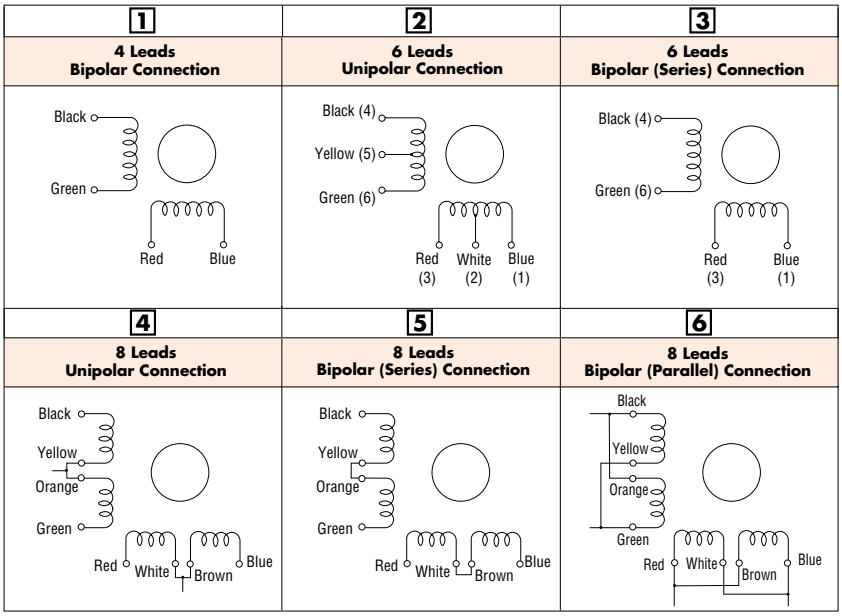
*6 For standard terminal box type motors with a motor size of 85 mm × 85 mm, 50 Hz, 1.5 kV for 1 minute.

Wirings and Connections

Motor Wirings



Wirings Connection Diagram



Notes on Characteristic Diagrams

The speed-torque characteristics featured in this catalogue are as measured on a constant-current driver.

The actual characteristics will vary depending on the driver used. Please use these diagrams only for reference purposes when selecting a motor.

You must also conduct a thorough evaluation with the actual driver to be used.

Product Specifications (Bipolar Series)

Frame Size 28 mm PK22□

Type	Model Single Shaft Double Shaft	Basic Step Angle	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Mass kg	page
P Type (High Response)	**PK223PA** **PK223PB**	1.8°	0.065	0.67	3.8	5.6	4	9×10^{-7}	0.11	B-202
	PK224PA **PK224PB**		0.097		4.6	6.8	4.8	12×10^{-7}	0.14	
	PK225PA **PK225PB**		0.11		6.2	9.2	5.6	18×10^{-7}	0.2	
SH Geared Type	**PK223PA-SG7.2** **PK223PB-SG7.2**	0.25°	0.3	0.67	3.8	5.6	4	9×10^{-7}	0.16	B-204
	PK223PA-SG9 **PK223PB-SG9**	0.2°					4			
	PK223PA-SG10 **PK223PB-SG10**	0.18°					4			
	PK223PA-SG18 **PK223PB-SG18**	0.1°	0.4				4			
	PK223PA-SG36 **PK223PB-SG36**	0.05°					4			

∗ The value given for holding torque is the value when operated with rated voltage and 2-phase excitation.

Frame Size 35 mm PK23□

Type	Model Single Shaft Double Shaft	Basic Step Angle	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Mass kg	page
P Type (High Response)	**PK233PA** **PK233PB**	1.8°	0.2	0.85	4.6	5.4	5.6	24×10^{-7}	0.18	B-206
	PK235PA **PK235PB**		0.37		5.8	6.8	8	50×10^{-7}	0.285	

∗ The value given for holding torque is the value when operated with rated voltage and 2-phase excitation.

Frame Size 42 mm PK24□

Type	Model Single Shaft Double Shaft	Basic Step Angle	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Mass kg	page
Standard Type	**PK243-01A** **PK243-01B**	1.8°	0.2	0.67	5.6	8.4	10	35×10^{-7}	0.21	B-208
	PK243-02A **PK243-02B**			0.28	13	48	60			
	PK243-03A **PK243-03B**			0.22	17	77	84			
	PK244-01A **PK244-01B**		0.33	0.85	5.6	6.6	12.8	54×10^{-7}	0.27	
	PK244-02A **PK244-02B**			0.57	8.6	15	26.8			
	PK244-03A **PK244-03B**			0.28	17	60	120			
	PK245-01A **PK245-01B**		0.43	0.85	5.6	6.6	11.2	68×10^{-7}	0.35	
	PK245-02A **PK245-02B**			0.57	8.6	15	28.4			
	PK245-03A **PK245-03B**			0.28	17	60	100			
P Type (High Response)	**PK244PA** **PK244PB**	1.8°	0.48	0.85	6.8	8	15.6	57×10^{-7}	0.3	B-212
	PK246PA **PK246PB**		0.93	0.85	10	12	26	114×10^{-7}	0.5	
M Type (High Resolution)	**PK243M-01A** **PK243M-01B**	0.9°	0.2	0.67	5.6	8.4	15.2	35×10^{-7}	0.24	B-214
	PK243M-02A **PK243M-02B**			0.42	8.4	20	38.8			
	PK243M-03A **PK243M-03B**			0.22	17	77	136			
	PK244M-01A **PK244M-01B**		0.31	0.85	5.6	6.6	17.2	54×10^{-7}	0.3	
	PK244M-02A **PK244M-02B**			0.57	8.6	15	38.8			
	PK244M-03A **PK244M-03B**			0.28	17	60	152			
	PK245M-01A **PK245M-01B**		0.38	0.85	5.6	6.6	15.6	68×10^{-7}	0.37	
	PK245M-02A **PK245M-02B**			0.57	8.6	15	39.6			
	PK245M-03A **PK245M-03B**			0.28	17	60	128			
SH Geared Type	**PK243A1-SG3.6** **PK243B1-SG3.6**	0.5°	0.2	0.67	5.6	8.4	10	35×10^{-7}	0.35	B-218
	PK243A1-SG7.2 **PK243B1-SG7.2**	0.25°	0.4							
	PK243A1-SG9 **PK243B1-SG9**	0.2°	0.5							
	PK243A1-SG10 **PK243B1-SG10**	0.18°	0.56							
	PK243A1-SG18 **PK243B1-SG18**	0.1°	0.8							
	PK243A1-SG36 **PK243B1-SG36**	0.05°	0.8							

Frame Size 56.4 mm PK26□ (Frame size of **SH** geared type is 60mm)

Type	Model Single Shaft Double Shaft	Basic Step Angle	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Mass kg	page
Standard Type	**PK264-01A** **PK264-01B**	1.8°	0.48	0.71	8.1	11.4	21.6	120×10^{-7}	0.45	B-220
	PK264-02A **PK264-02B**			1.4	3.9	2.8	5.6			
	PK264-03A **PK264-03B**			2.1	2.6	1.26	2.4			
	PK264-E2.0A **PK264-E2.0B**			1.4	3.9	2.8	5.6			
	PK266-01A **PK266-01B**		1.17	0.71	11	14.8	40	300×10^{-7}	0.7	
	PK266-02A **PK266-02B**			1.4	5	3.6	10			
	PK266-03A **PK266-03B**			2.1	3.2	1.5	4.4			
	PK266-E2.0A **PK266-E2.0B**			1.4	5	3.6	10			
	PK268-01A **PK268-01B**		1.75	0.71	12	17.2	56	480×10^{-7}	1	
	PK268-02A **PK268-02B**			1.4	6.3	4.5	14.4			
	PK268-03A **PK268-03B**			2.1	4.2	2	6.4			
	PK268-E2.0A **PK268-E2.0B**			1.4	6.3	4.5	14.4			
M Type (High Resolution)	**PK264M-01A** **PK264M-01B**	0.9°	0.48	0.71	8.1	11.4	26	120×10^{-7}	0.45	B-225
	PK264M-02A **PK264M-02B**			1.4	3.9	2.8	6.8			
	PK264M-03A **PK264M-03B**			2.1	2.6	1.26	3			
	PK264M-E2.0A **PK264M-E2.0B**			1.4	3.9	2.8	6.8			
	PK266M-01A **PK266M-01B**		1.17	0.71	11	14.8	50.8	300×10^{-7}	0.7	
	PK266M-02A **PK266M-02B**			1.4	5	3.6	12.8			
	PK266M-03A **PK266M-03B**			2.1	3.2	1.5	5.8			
	PK266M-E2.0A **PK266M-E2.0B**			1.4	5	3.6	12.8			
	PK268M-01A **PK268M-01B**		1.75	0.71	12	17.2	77.6	480×10^{-7}	1	
	PK268M-02A **PK268M-02B**			1.4	6.3	4.5	19.2			
	PK268M-03A **PK268M-03B**			2.1	4.2	2	8.4			
	PK268M-E2.0A **PK268M-E2.0B**			1.4	6.3	4.5	19.2			
SH Geared Type	**PK264AE-SG3.6** **PK264BE-SG3.6**	0.5°	1	1.4	3.9	2.8	5.6	120×10^{-7}	0.75	B-230
	PK264AE-SG7.2 **PK264BE-SG7.2**	0.25°	2							
	PK264AE-SG9 **PK264BE-SG9**	0.2°	2.5							
	PK264AE-SG10 **PK264BE-SG10**	0.18°	2.7							
	PK264AE-SG18 **PK264BE-SG18**	0.1°	3							
	PK264AE-SG36 **PK264BE-SG36**	0.05°	4							

Frame Size 60 mm PK26□J

Type	Model Single Shaft Double Shaft	Basic Step Angle	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Mass kg	page
J Type (High Inertia Capability)	**PK264JDA** **PK264JDB**	1.8°	1.06	2.8	2.1	0.73	1.8	280×10⁻⁷	0.6	B-232
	PK264JA **PK264JB**		1.06	1.4	4.1	2.92	7.2			
	PK266JDA **PK266JDB**		1.75	2.8	2.8	1	3.05	450×10⁻⁷	0.83	
	PK266JA **PK266JB**		1.75	1.4	5.6	4	12.2			
	PK267JDA **PK267JDB**		2.2	2.8	3.4	1.2	3.54	570×10⁻⁷	1.02	
	PK267JA **PK267JB**		2.2	1.4	6.7	4.8	14.2			
	PK269JDA **PK269JDB**		3.1	2.8	4.2	1.49	5.7	900×10⁻⁷	1.43	
	PK269JA **PK269JB**		3.1	1.4	8.3	5.96	22.8			

∗ The value given for holding torque is the value when operated with rated voltage and 2-phase excitation.

Frame Size 85 mm PK29□ (Frame size of **SH** geared type is 90mm)

Type	Model Single Shaft Double Shaft	Basic Step Angle	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Mass kg	page
Standard Type	**PK296-E4.5A** **PK296-E4.5B**	1.8°	3.1	3.18	2.8	0.96	6	1400×10⁻⁷	1.7	B-236
	PK299-E4.5A **PK299-E4.5B**		6.2	3.18	3.9	1.32	10	2700×10⁻⁷	2.8	
	PK2913-E4.0A **PK2913-E4.0B**		9.3	2.8	5.3	1.94	16.8	4000×10⁻⁷	3.8	
Standard (Terminal Box Type)	**PK296-E4.5T**	1.8°	3.1	3.18	2.8	0.96	6	1400×10⁻⁷	2.1	B-236
	PK299-E4.5T		6.2	3.18	3.9	1.32	10	2700×10⁻⁷	3.2	
	PK2913-E4.0T		9.3	2.8	5.3	1.94	16.8	4000×10⁻⁷	4.3	
SH Geared Type	**PK296AE-SG3.6** **PK296BE-SG3.6**	0.5°	2.5	2.1	2	0.96	6.0	1400×10⁻⁷	2.8	B-240
	PK296AE-SG7.2 **PK296BE-SG7.2**	0.25°	5							
	PK296AE-SG9 **PK296BE-SG9**	0.2°	6.3							
	PK296AE-SG10 **PK296BE-SG10**	0.18°	7							
	PK296AE-SG18 **PK296BE-SG18**	0.1°	9							
	PK296AE-SG36 **PK296BE-SG36**	0.05°	12							

P Type (High Response)

□28mm

Step Angle 1.8°

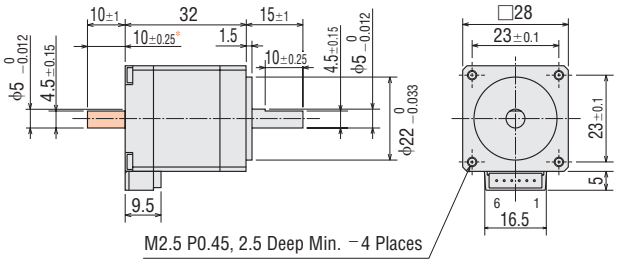
Specifications

Model Single Shaft Double Shaft	Connection Type	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK223PA	Bipolar (Series)	0.065	0.67	3.8	5.6	4	9×10^{-7}	6	3
PK223PB	Unipolar	0.05	0.95	2.66	2.8	1			2
PK224PA	Bipolar (Series)	0.097	0.67	4.6	6.8	4.8	12×10^{-7}	6	3
PK224PB	Unipolar	0.075	0.95	3.2	3.4	1.2			2
PK225PA	Bipolar (Series)	0.11	0.67	6.2	9.2	5.6	18×10^{-7}	6	3
PK225PB	Unipolar	0.09	0.95	4.4	4.6	1.4			2

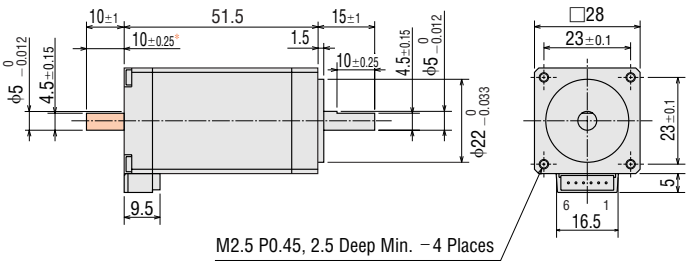
●Degree of Protection: IP30

Dimensions unit: mm

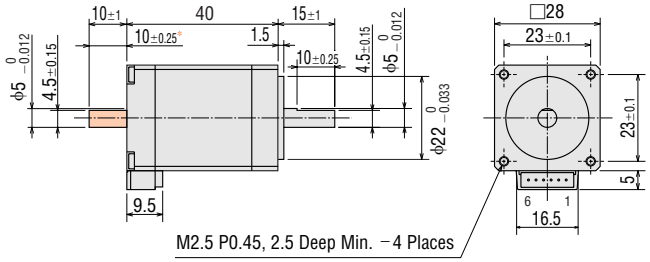
●**PK223PA** (Single Shaft) Mass 0.11 kg
●**PK223PB** (Double Shaft) Mass 0.11 kg



●**PK225PA** (Single Shaft) Mass 0.2 kg
●**PK225PB** (Double Shaft) Mass 0.2 kg



●**PK224PA** (Single Shaft) Mass 0.14 kg
●**PK224PB** (Double Shaft) Mass 0.14 kg



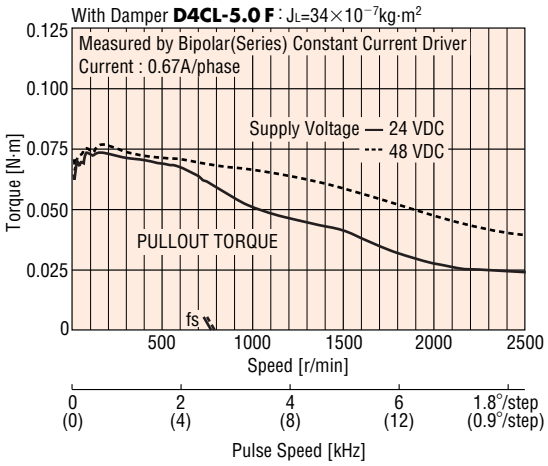
*10±0.25 indicates the length of milling on motor shaft.

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

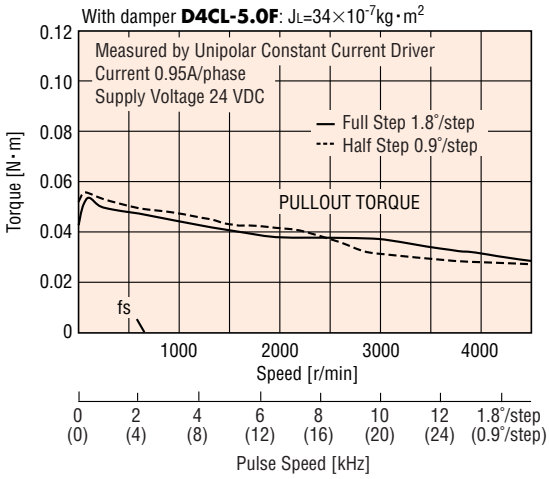
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

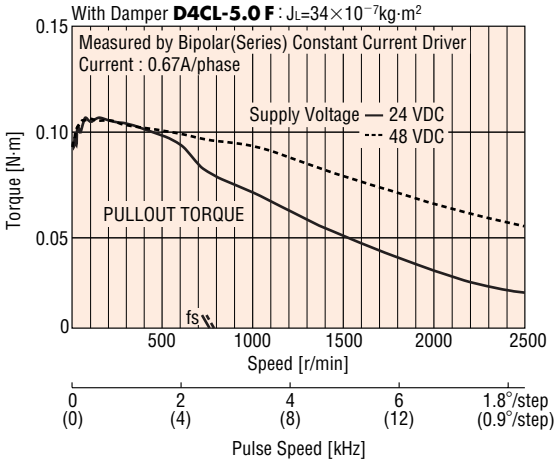
●PK223PB Bipolar (Series)



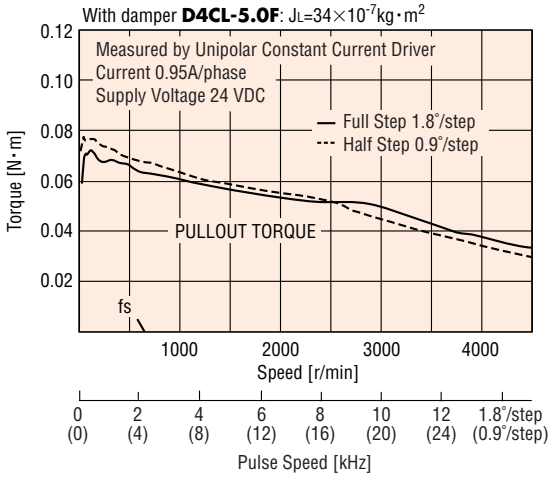
●PK223PB Unipolar



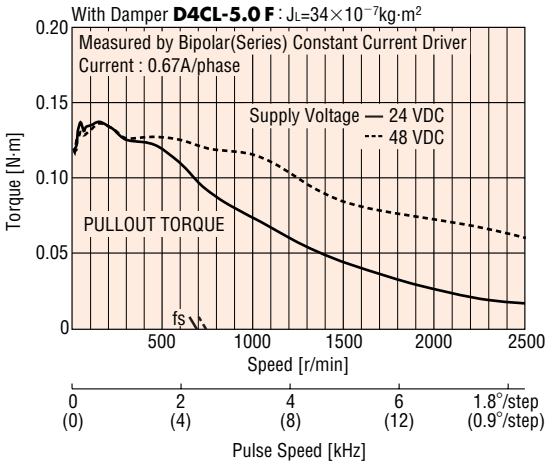
●PK224PB Bipolar (Series)



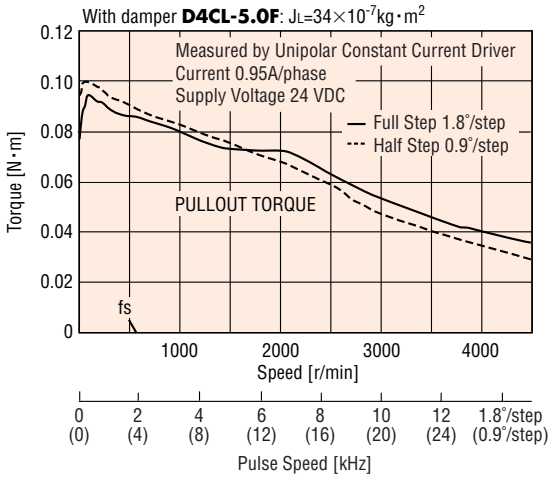
●PK224PB Unipolar



●PK225PB Bipolar (Series)



●PK225PB Unipolar



Optional Cable (Sold separately)

These connector cables make it easy to connect the **P** type motor. The crimped connectors eliminate the need for assembly. There are two cable lengths to choose from.

Model	Cable Length (mm)	Number of Leads	Leads Specifications	
			UL Style No.	AWG No.
LC2U06A	600	6 Leads	3265	24
LC2U10A	1000			

SH Geared Type

□28mm

Specifications

●Motor Specifications

Model Single Shaft Double Shaft	Connection Type	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK223PA-SG□	Bipolar (Series)	0.67	3.8	5.6	4	9×10^{-7}	6	3
PK223PB-SG□	Unipolar	0.95	2.66	2.8	1			2

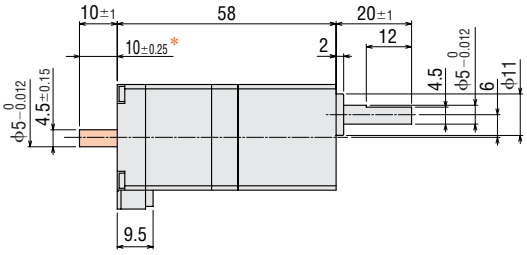
∗Enter the gear ratio in the box (□) within the model name.
●Degree of Protection: IP30

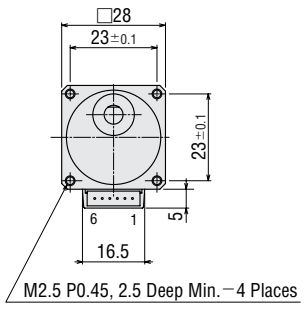
●Gearmotor Specifications

Model Single Shaft Double Shaft	Gear Ratio	Holding Torque N·m	Step Angle	Permissible Speed r/min	Permissible Thrust Load N	Permissible Overhung Load (at 10mm from shaft end) N
PK223PA-SG7.2 **PK223PB-SG7.2**	1:7.2	0.3	0.25°	250	10	20
PK223PA-SG9 **PK223PB-SG9**	1:9	0.3	0.2°	200	10	20
PK223PA-SG10 **PK223PB-SG10**	1:10	0.3	0.18°	180	10	20
PK223PA-SG18 **PK223PB-SG18**	1:18	0.4	0.1°	100	10	20
PK223PA-SG36 **PK223PB-SG36**	1:36	0.4	0.05°	50	10	20

Dimensions unit: mm

●**PK223PA-SG□** (Single Shaft) Mass 0.16 kg
●**PK223PB-SG□** (Double Shaft) Mass 0.16 kg





Mounting Screws (included)
M2.5 P0.45 8mm long : 4 pieces

∗10±0.25 indicates the length of milling on motor shaft.

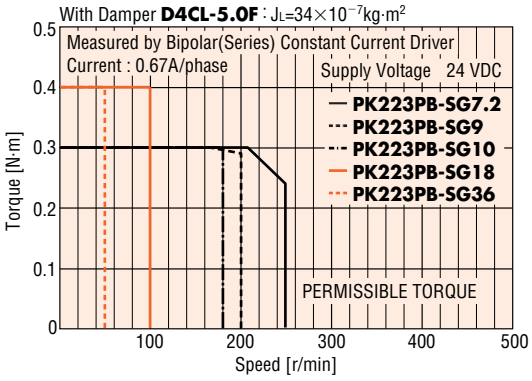
●This dimension is for double shaft models. For single shaft, ignore the colored area.

Applicable Connector
The following housing and contacts must be purchased separately.
Housing: 51065-0600 (MOLEX)
Contact: 50212-8XXX (MOLEX)

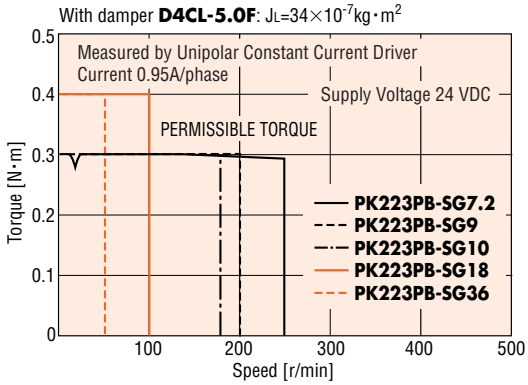
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

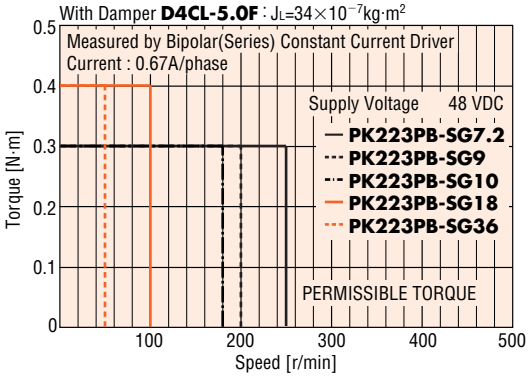
●**PK223PB-SG**□ Bipolar (Series) 24 VDC



●**PK223PB-SG**□ Unipolar



●**PK223PB-SG**□ Bipolar (Series) 48 VDC



Optional Cable (Sold separately)

These connector cables make it easy to connect the **P** type motor. The crimped connectors eliminate the need for assembly. There are two cable lengths to choose from.

Model	Cable Length (mm)	Number of Leads	Leads Specifications	
			UL Style No.	AWG No.
LC2U06A	600	6 Leads	3265	24
LC2U10A	1000			

P Type (High Response)

□35mm

Step Angle 1.8°

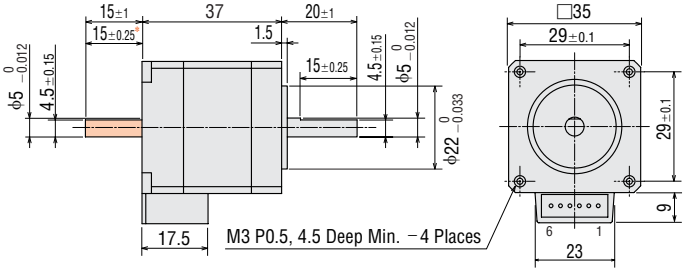
Specifications

Model Single Shaft Double Shaft	Connection Type	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK233PA	Bipolar (Series)	0.2	0.85	4.6	5.4	5.6	24×10^{-7}	6	3
PK233PB	Unipolar	0.16	1.2	3.24	2.7	1.4			2
PK235PA	Bipolar (Series)	0.37	0.85	5.8	6.8	8	50×10^{-7}	6	3
PK235PB	Unipolar	0.3	1.2	4.08	3.4	2			2

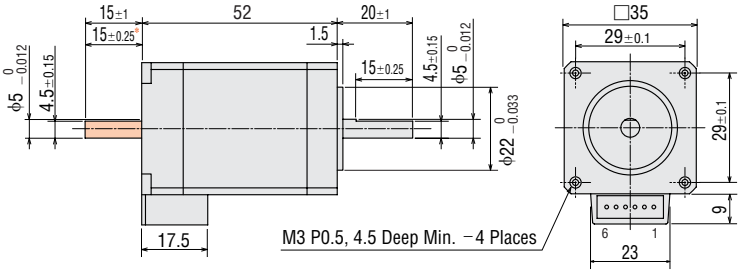
●Degree of Protection: IP30

Dimensions unit: mm

●**PK233PA** (Single Shaft) Mass 0.18 kg
●**PK233PB** (Double Shaft) Mass 0.18 kg



●**PK235PA** (Single Shaft) Mass 0.285 kg
●**PK235PB** (Double Shaft) Mass 0.285 kg



✻15±0.25 indicates the length of milling on motor shaft.

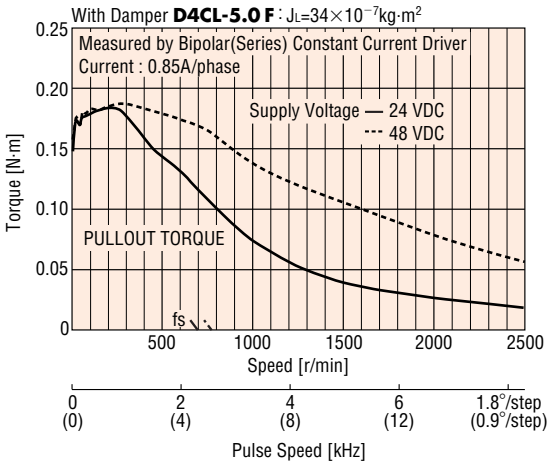
●These dimensions are for double shaft models. For single shaft, ignore the colored areas.

Applicable Connector
The following housing and contacts must be purchased separately.
Housing: 51103-0600 (MOLEX) or 51102-0600 (MOLEX)
Contact: 50351-8XXX (MOLEX)

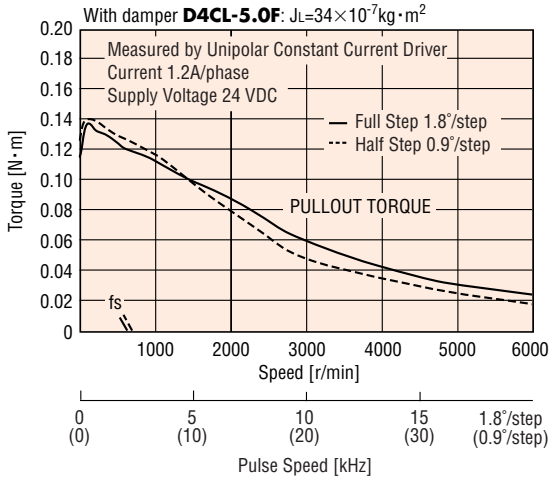
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

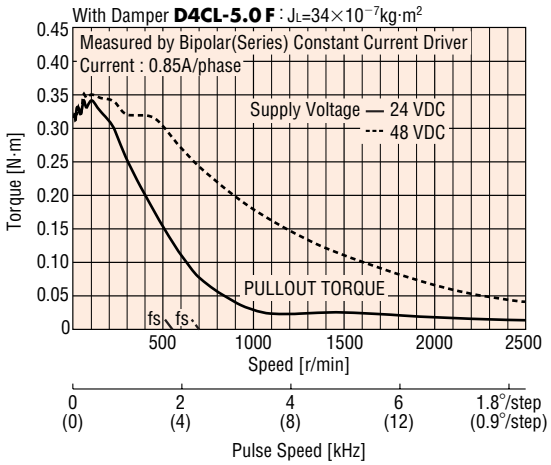
●PK233PB Bipolar (Series)



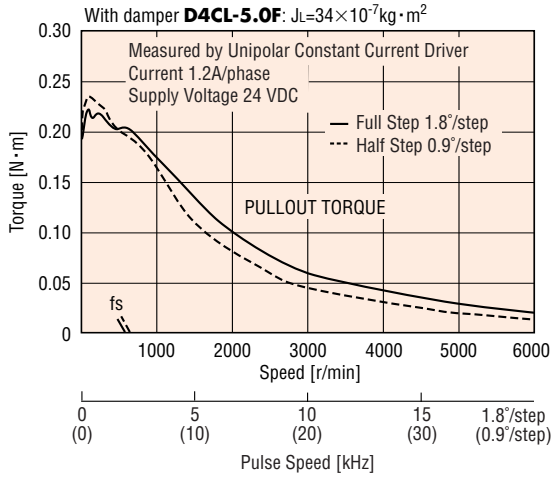
●PK233PB Unipolar



●PK235PB Bipolar (Series)



●PK235PB Unipolar



Optional Cable (Sold separately)

These connector cables make it easy to connect the **P** type motor. The crimped connectors eliminate the need for assembly. There are two cable lengths to choose from.

Model	Cable Length (mm)	Number of Leads	Leads Specifications	
			UL Style No.	AWG No.
LC2U06B	600	6 Leads	3265	24
LC2U10B	1000			

Standard Type

□42mm

Step Angle 1.8°

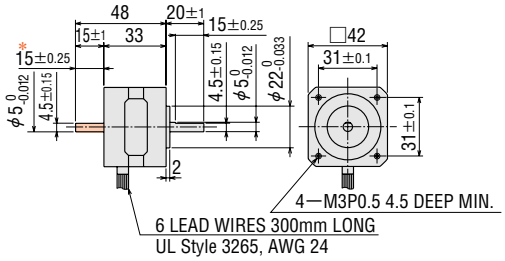
Specifications

Model Single Shaft Double Shaft	Connection Type	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK243-01A	Bipolar (Series)	0.2	0.67	5.6	8.4	10	35×10^{-7}	6	3
PK243-01B	Unipolar	0.16	0.95	4	4.2	2.5			2
PK243-02A	Bipolar (Series)	0.2	0.28	13	48	60	35×10^{-7}	6	3
PK243-02B	Unipolar	0.16	0.4	9.6	24	15			2
PK243-03A	Bipolar (Series)	0.2	0.22	17	77	84	35×10^{-7}	6	3
PK243-03B	Unipolar	0.16	0.31	12	38.5	21			2
PK244-01A	Bipolar (Series)	0.33	0.85	5.6	6.6	12.8	54×10^{-7}	6	3
PK244-01B	Unipolar	0.26	1.2	4	3.3	3.2			2
PK244-02A	Bipolar (Series)	0.33	0.57	8.6	15	26.8	54×10^{-7}	6	3
PK244-02B	Unipolar	0.26	0.8	6	7.5	6.7			2
PK244-03A	Bipolar (Series)	0.33	0.28	17	60	120	54×10^{-7}	6	3
PK244-03B	Unipolar	0.26	0.4	12	30	30			2
PK245-01A	Bipolar (Series)	0.43	0.85	5.6	6.6	11.2	68×10^{-7}	6	3
PK245-01B	Unipolar	0.32	1.2	4	3.3	2.8			2
PK245-02A	Bipolar (Series)	0.43	0.57	8.6	15	28.4	68×10^{-7}	6	3
PK245-02B	Unipolar	0.32	0.8	6	7.5	7.1			2
PK245-03A	Bipolar (Series)	0.43	0.28	17	60	100	68×10^{-7}	6	3
PK245-03B	Unipolar	0.32	0.4	12	30	25			2

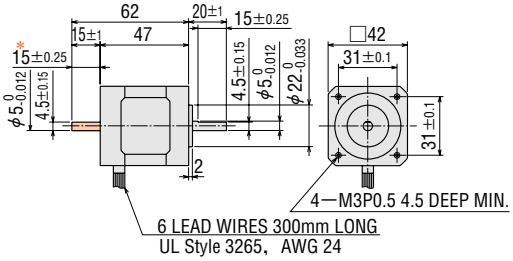
●Degree of Protection: IP30

Dimensions unit: mm

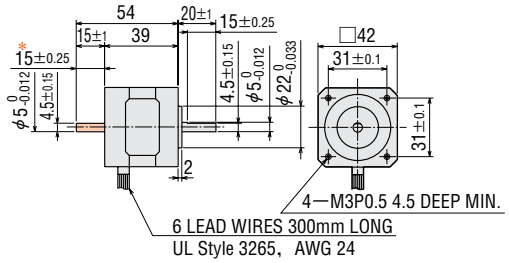
●**PK243-0□A** (Single Shaft) Mass 0.21 kg
●**PK243-0□B** (Double Shaft) Mass 0.21 kg



●**PK245-0□A** (Single Shaft) Mass 0.35 kg
●**PK245-0□B** (Double Shaft) Mass 0.35 kg



●**PK244-0□A** (Single Shaft) Mass 0.27 kg
●**PK244-0□B** (Double Shaft) Mass 0.27 kg



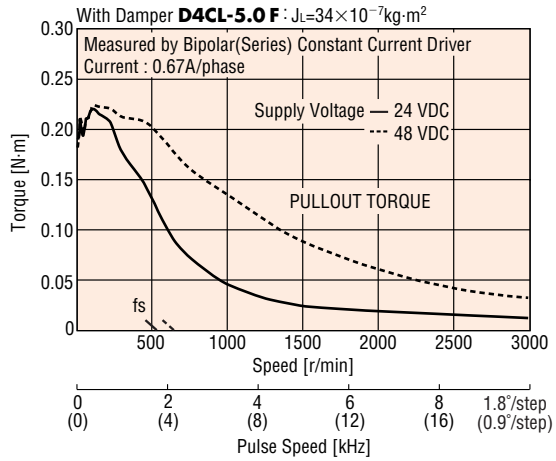
※15±0.25 indicates the length of milling on motor shaft.

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

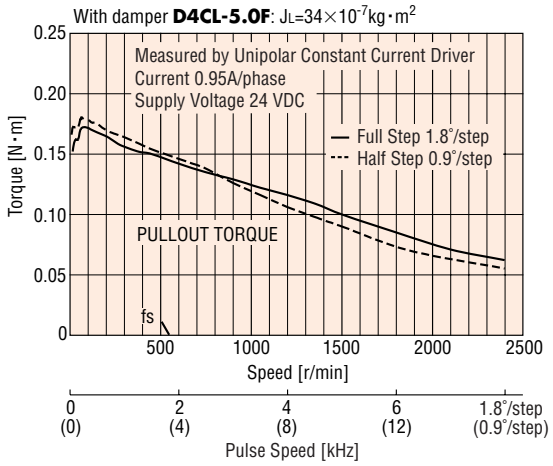
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

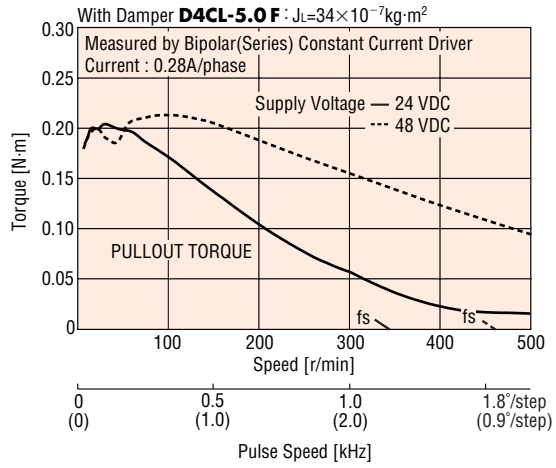
●PK243-01B Bipolar (Series)



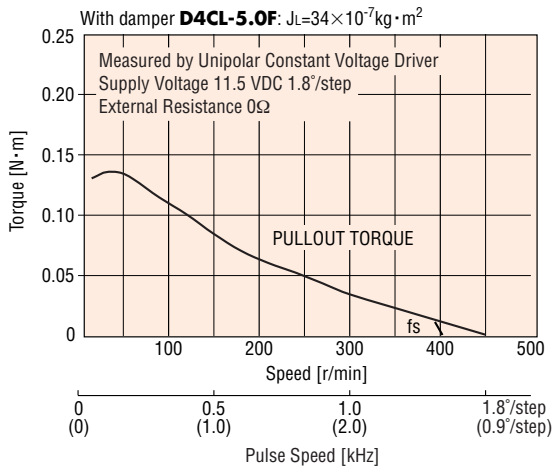
●PK243-01B Unipolar



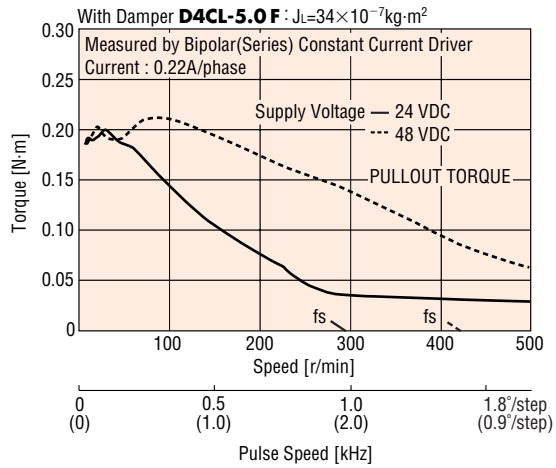
●PK243-02B Bipolar (Series)



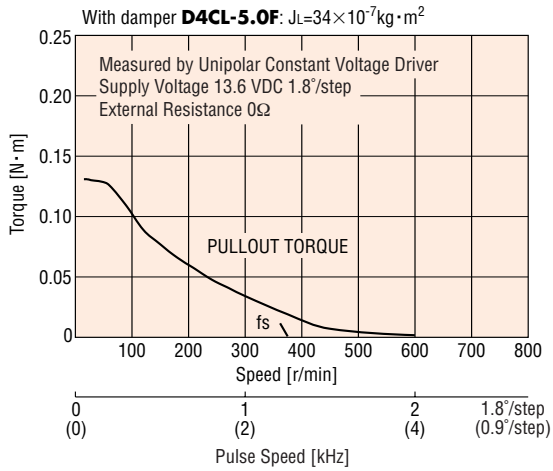
●PK243-02B Unipolar



●PK243-03B Bipolar (Series)



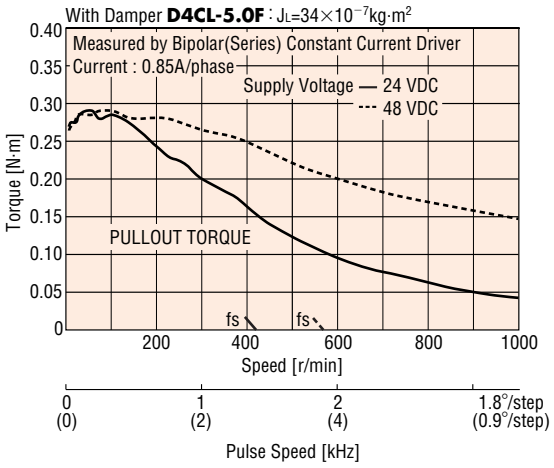
●PK243-03B Unipolar



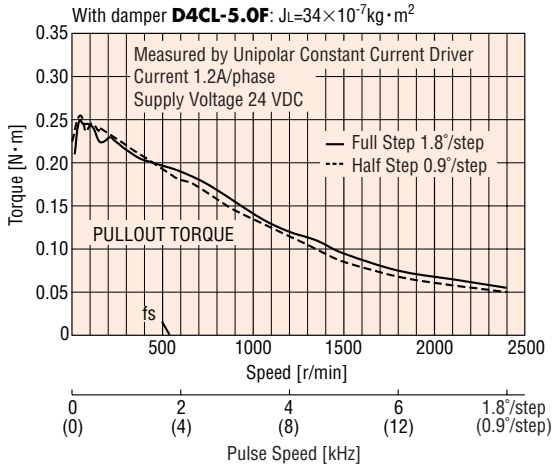
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

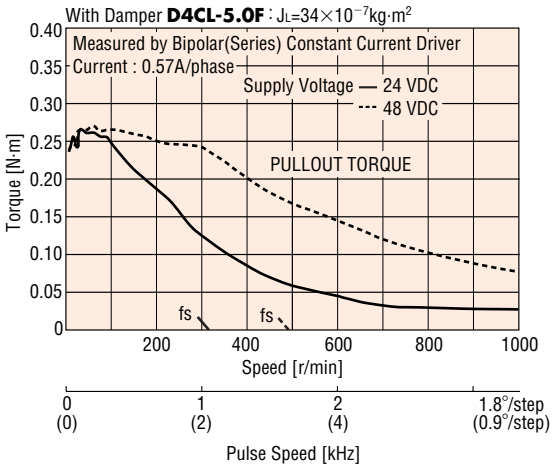
●PK244-01B Bipolar (Series)



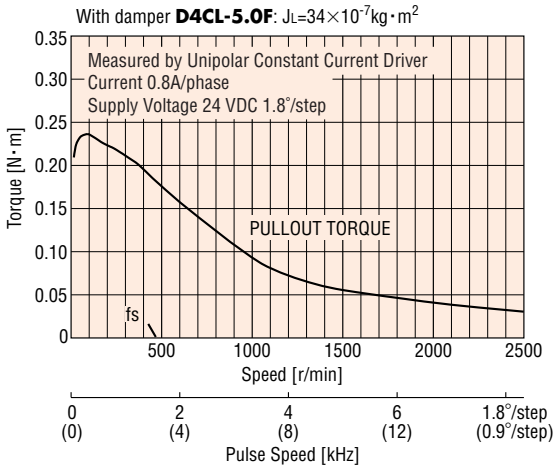
●PK244-01B Unipolar



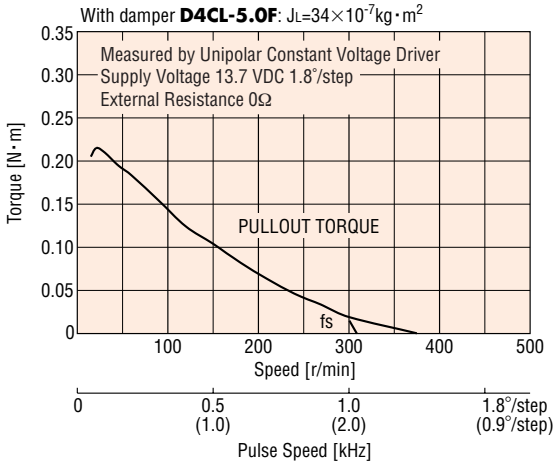
●PK244-02B Bipolar (Series)



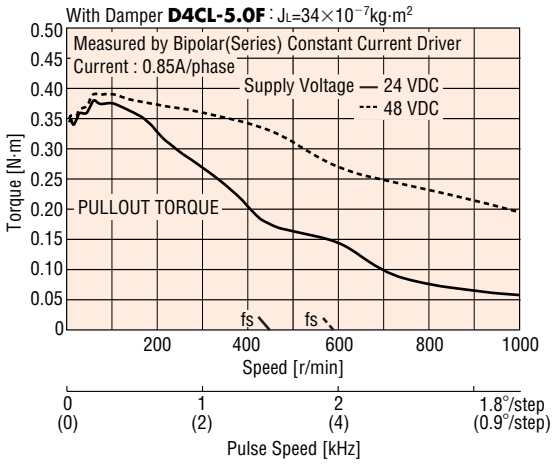
●PK244-02B Unipolar



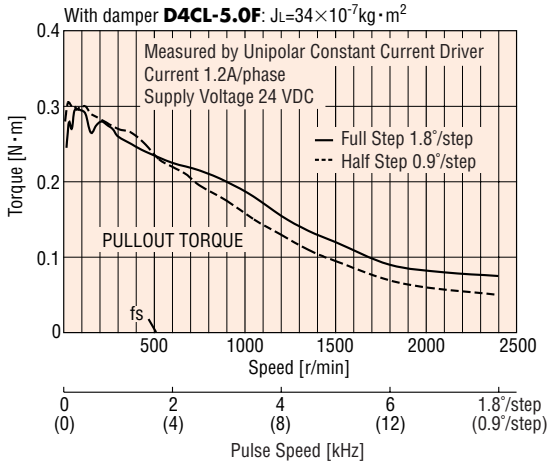
●PK244-03B Unipolar



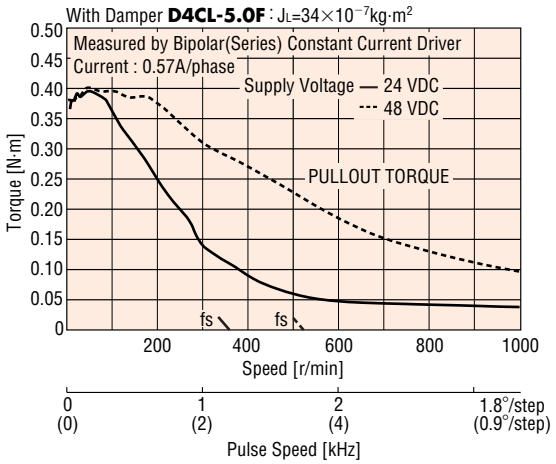
●PK245-01B Bipolar (Series)



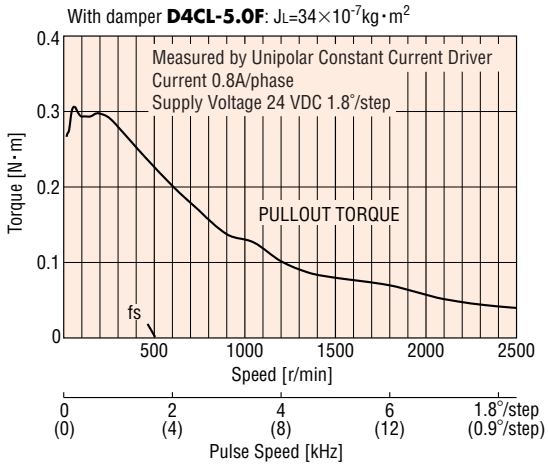
●PK245-01B Unipolar



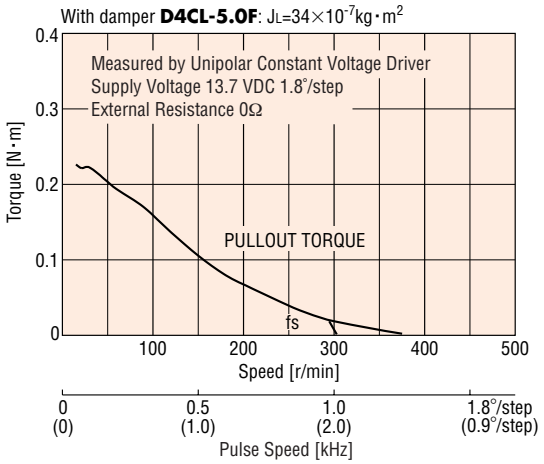
●PK245-02B Bipolar (Series)



●PK245-02B Unipolar



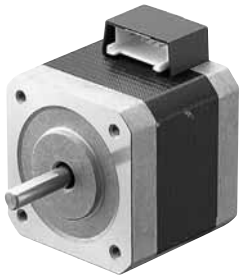
●PK245-03B Unipolar



P Type (High Response)

□42mm

Step Angle 1.8°



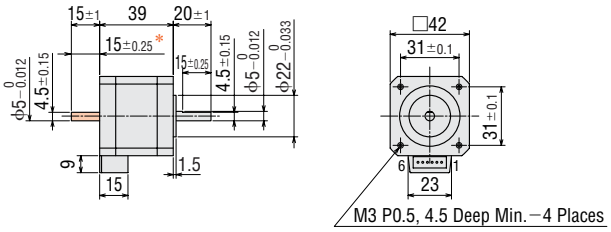
Specifications

Model Single Shaft Double Shaft	Connection Type	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK244PA	Bipolar (Series)	0.48	0.85	6.8	8	15.6	57×10^{-7}	6	3
PK244PB	Unipolar	0.39	1.2	4.8	4	3.9			2
PK246PA	Bipolar (Series)	0.93	0.85	10	12	26	114×10^{-7}	6	3
PK246PB	Unipolar	0.75	1.2	7.2	6	6.5			2

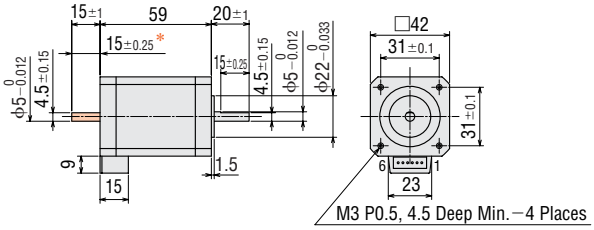
●Degree of Protection: IP30

Dimensions unit: mm

●**PK244PA** (Single Shaft) Mass 0.3 kg
●**PK244PB** (Double Shaft) Mass 0.3 kg



●**PK246PA** (Single Shaft) Mass 0.5 kg
●**PK246PB** (Double Shaft) Mass 0.5 kg



*15±0.25 indicates the length of milling on motor shaft.

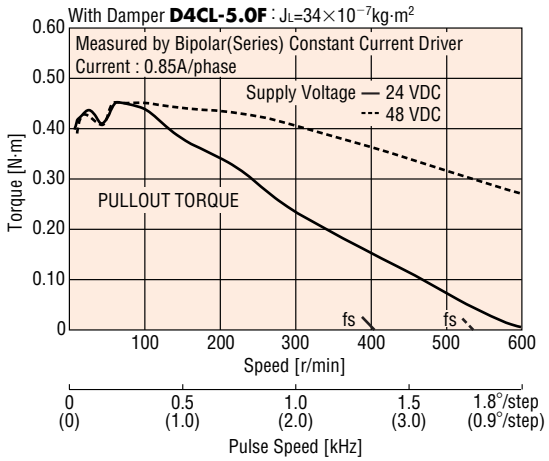
● These dimensions are for double shaft models. For single shaft, ignore the colored areas.

Applicable Connector
The following housing and contacts must be purchased separately.
Housing: 51103-0600 (MOLEX) or 51102-0600 (MOLEX)
Contact: 50351-8XXX (MOLEX)

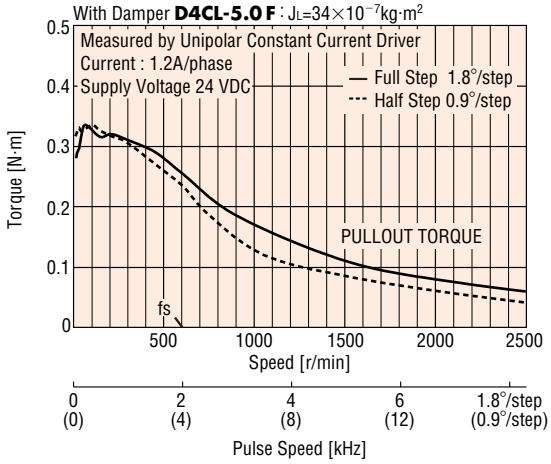
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

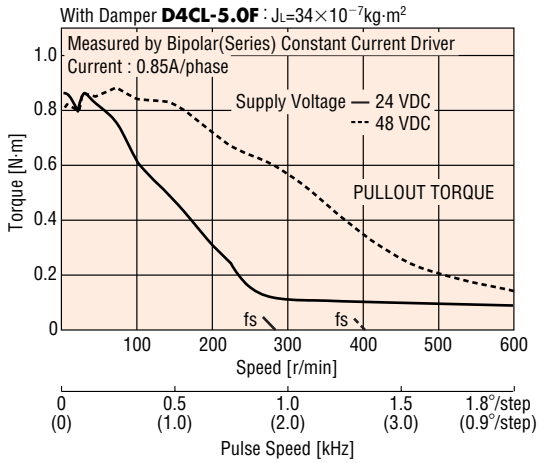
●PK244PB Bipolar (Series)



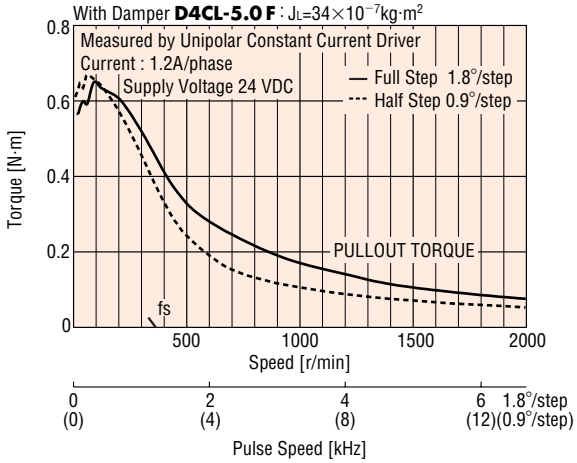
●PK244PB Unipolar



●PK246PB Bipolar (Series)



●PK246PB Unipolar



Optional Cable (Sold separately)

These connector cables make it easy to connect the **P** type motor. The crimped connectors eliminate the need for assembly. There are two cable lengths to choose from.

Model	Cable Length (mm)	Number of Leads	Leads Specifications	
			UL Style No.	AWG No.
LC2U06B	600	6 Leads	3265	24
LC2U10B	1000			

M Type (High Resolution)

□42mm

Step Angle 0.9°

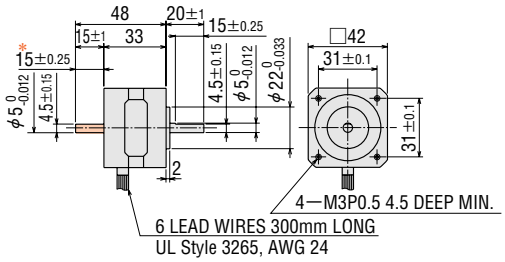
Specifications

Model Single Shaft Double Shaft	Connection Type	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK243M-01A	Bipolar (Series)	0.2	0.67	5.6	8.4	15.2	35×10^{-7}	6	3
PK243M-01B	Unipolar	0.16	0.95	4	4.2	3.8			2
PK243M-02A	Bipolar (Series)	0.2	0.42	8.4	20	38.8	35×10^{-7}	6	3
PK243M-02B	Unipolar	0.16	0.6	6	10	9.7			2
PK243M-03A	Bipolar (Series)	0.2	0.22	17	77	136	35×10^{-7}	6	3
PK243M-03B	Unipolar	0.16	0.31	12	38.5	34			2
PK244M-01A	Bipolar (Series)	0.31	0.85	5.6	6.6	17.2	54×10^{-7}	6	3
PK244M-01B	Unipolar	0.26	1.2	4	3.3	4.3			2
PK244M-02A	Bipolar (Series)	0.31	0.57	8.6	15	38.8	54×10^{-7}	6	3
PK244M-02B	Unipolar	0.26	0.8	6	7.5	9.7			2
PK244M-03A	Bipolar (Series)	0.31	0.28	17	60	152	54×10^{-7}	6	3
PK244M-03B	Unipolar	0.26	0.4	12	30	38			2
PK245M-01A	Bipolar (Series)	0.38	0.85	5.6	6.6	15.6	68×10^{-7}	6	3
PK245M-01B	Unipolar	0.32	1.2	4	3.3	3.9			2
PK245M-02A	Bipolar (Series)	0.38	0.57	8.6	15	39.6	68×10^{-7}	6	3
PK245M-02B	Unipolar	0.32	0.8	6	7.5	9.9			2
PK245M-03A	Bipolar (Series)	0.38	0.28	17	60	128	68×10^{-7}	6	3
PK245M-03B	Unipolar	0.32	0.4	12	30	32			2

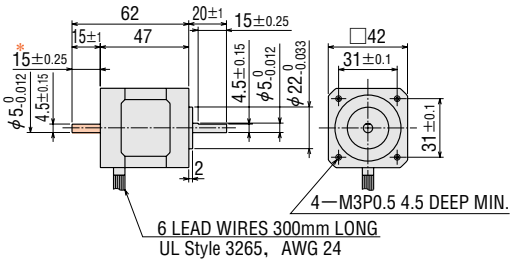
●Degree of Protection: IP30

Dimensions unit: mm

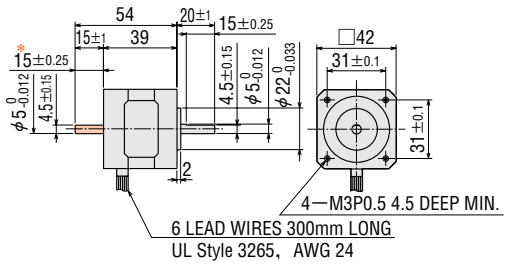
●**PK243M-0□A** (Single Shaft) Mass 0.24 kg
●**PK243M-0□B** (Double Shaft) Mass 0.24 kg



●**PK245M-0□A** (Single Shaft) Mass 0.37 kg
●**PK245M-0□B** (Double Shaft) Mass 0.37 kg



●**PK244M-0□A** (Single Shaft) Mass 0.3 kg
●**PK244M-0□B** (Double Shaft) Mass 0.3 kg



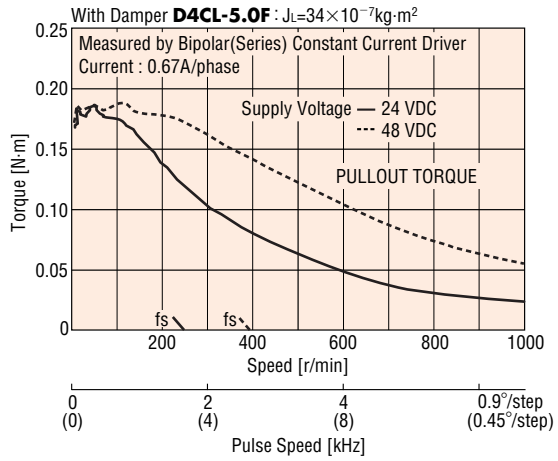
✻15±0.25 indicates the length of milling on motor shaft.

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

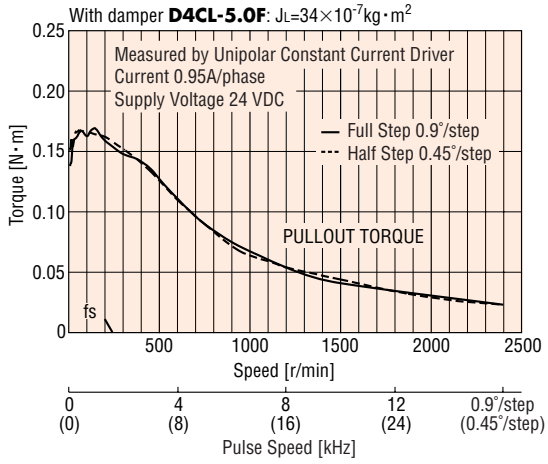
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

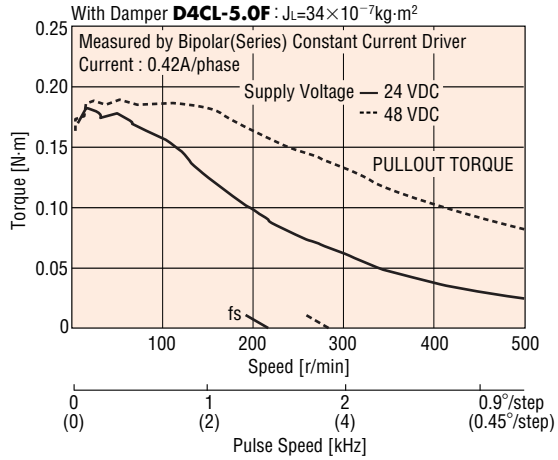
●PK243M-01B Bipolar (Series)



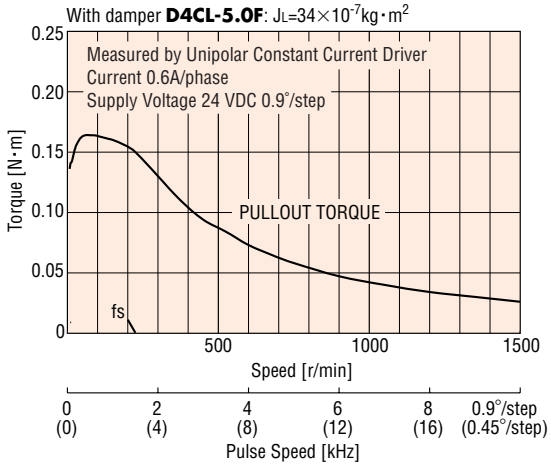
●PK243M-01B Unipolar



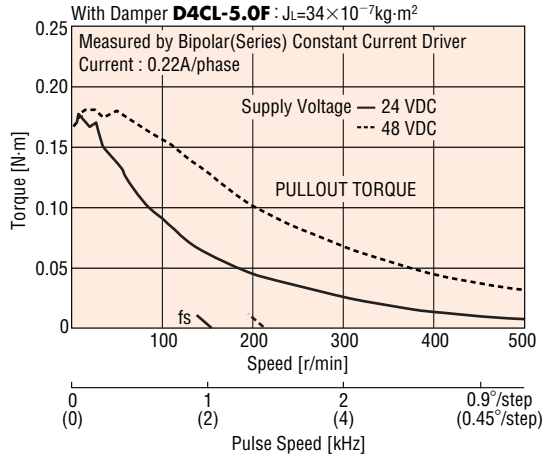
●PK243M-02B Bipolar (Series)



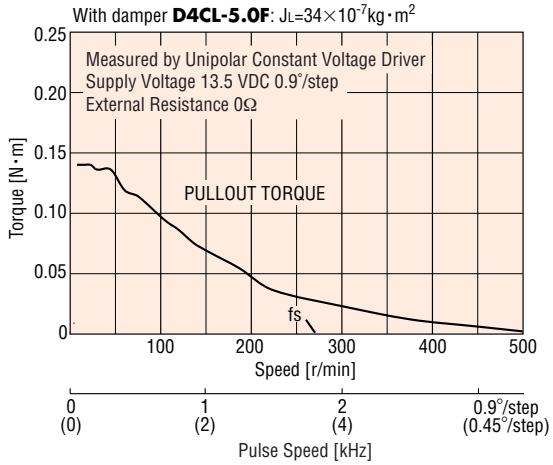
●PK243M-02B Unipolar



●PK243M-03B Bipolar (Series)



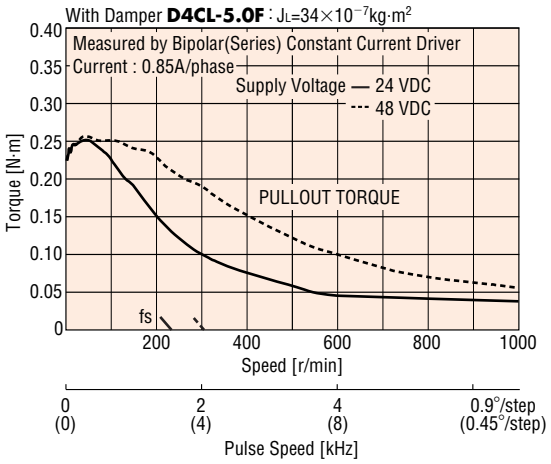
●PK243M-03B Unipolar



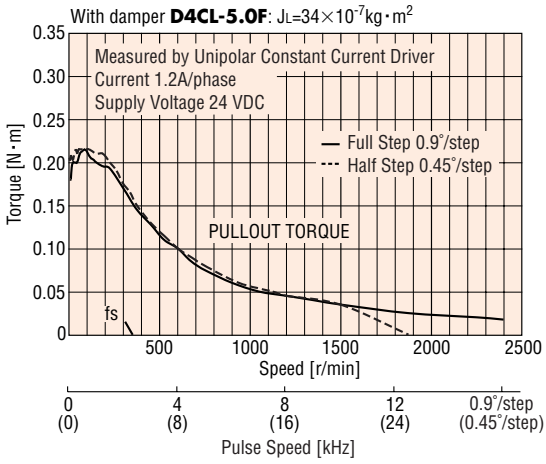
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

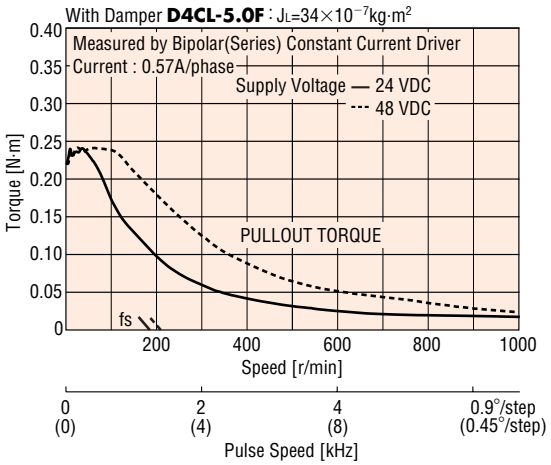
●PK244M-01B Bipolar (Series)



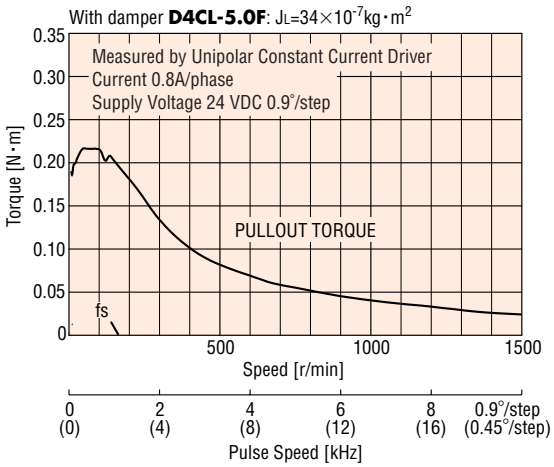
●PK244M-01B Unipolar



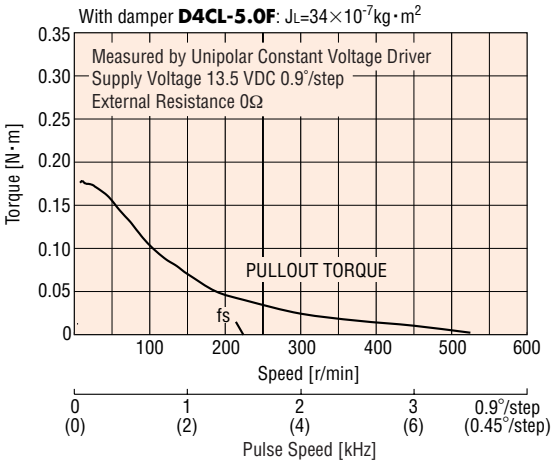
●PK244M-02B Bipolar (Series)



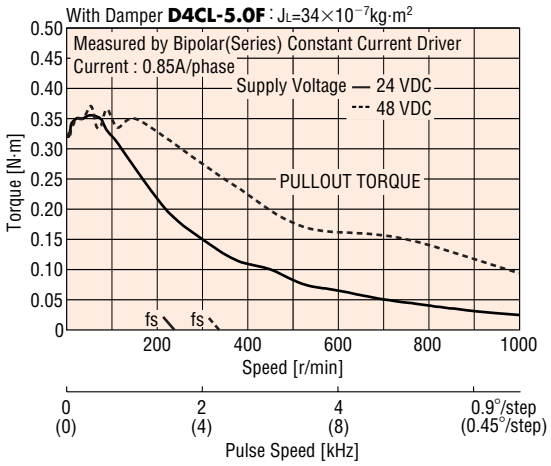
●PK244M-02B Unipolar



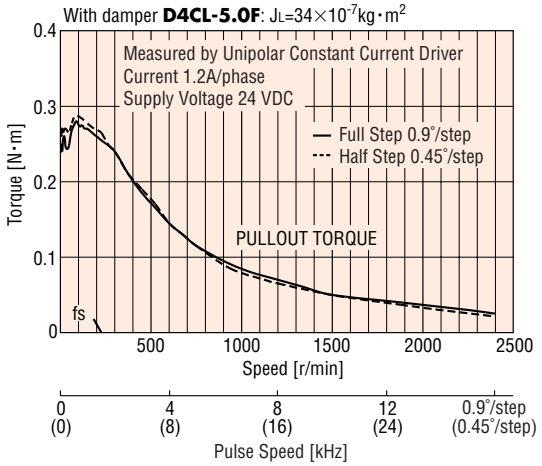
●PK244M-03B Unipolar



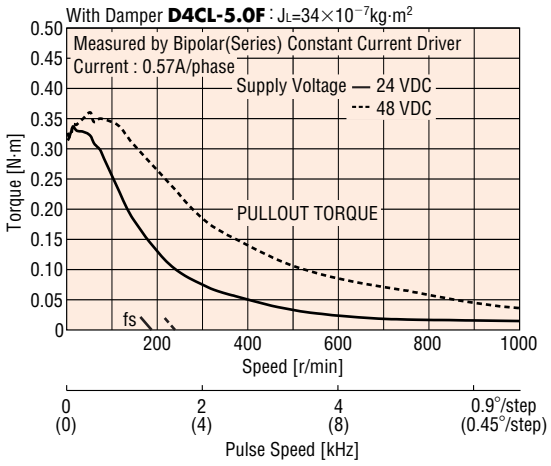
●PK245M-01B Bipolar (Series)



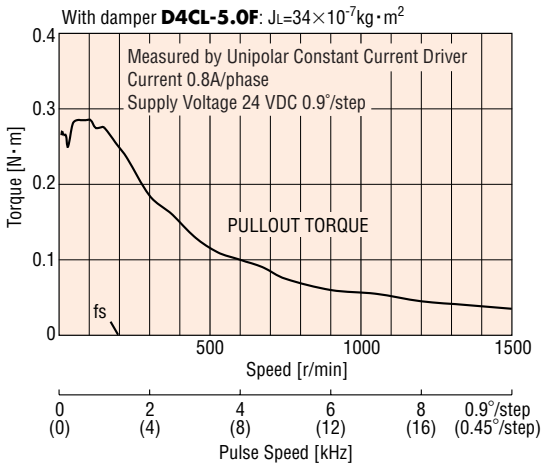
●PK245M-01B Unipolar



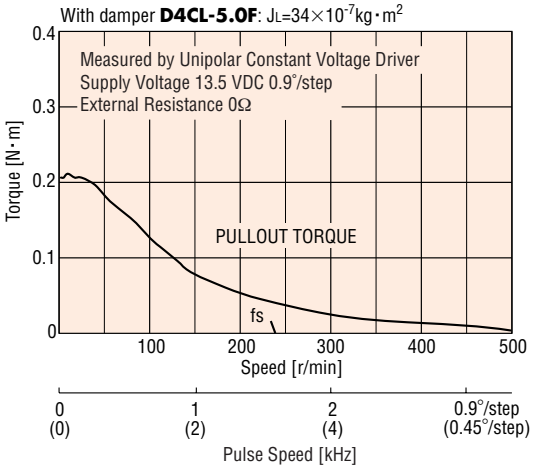
●PK245M-02B Bipolar (Series)



●PK245M-02B Unipolar



●PK245M-03B Unipolar



SH Geared Type

□42mm

Specifications

●Motor Specifications

Model Single Shaft Double Shaft	Connection Type	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK243A1-SG□	Bipolar (Series)	0.67	5.6	8.4	10	35×10^{-7}	6	3
PK243B1-SG□	Unipolar	0.95	4.0	4.2	2.5			2

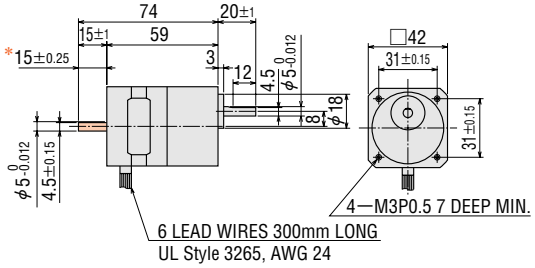
∗Enter the gear ratio in the box (□) within the model name.
●Degree of Protection: IP30

●Gearmotor Specifications

Model Single Shaft Double Shaft	Gear Ratio	Holding Torque N·m	Step Angle	Permissible Speed r/min	Permissible Thrust Load N	Permissible Overhung Load (at 10mm from shaft end) N
PK243A1-SG3.6 **PK243B1-SG3.6**	1:3.6	0.2	0.5°	500	15	20
PK243A1-SG7.2 **PK243B1-SG7.2**	1:7.2	0.4	0.25°	250	15	20
PK243A1-SG9 **PK243B1-SG9**	1:9	0.5	0.2°	200	15	20
PK243A1-SG10 **PK243B1-SG10**	1:10	0.56	0.18°	180	15	20
PK243A1-SG18 **PK243B1-SG18**	1:18	0.8	0.1°	100	15	20
PK243A1-SG36 **PK243B1-SG36**	1:36	0.8	0.05°	50	15	20

Dimensions unit: mm

●**PK243A1-SG□** (Single Shaft) Mass 0.35 kg
●**PK243B1-SG□** (Double Shaft) Mass 0.35 kg



Mounting Screws (included)
M3 P0.5 10mm long: 4 pieces

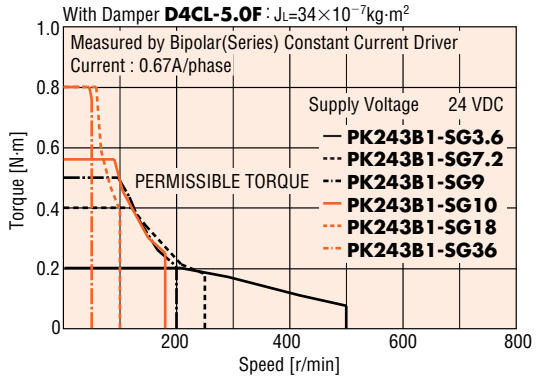
∗15±0.25 indicates the length of milling on motor shaft.

●This dimension is for double shaft models. For single shaft, ignore the colored area.

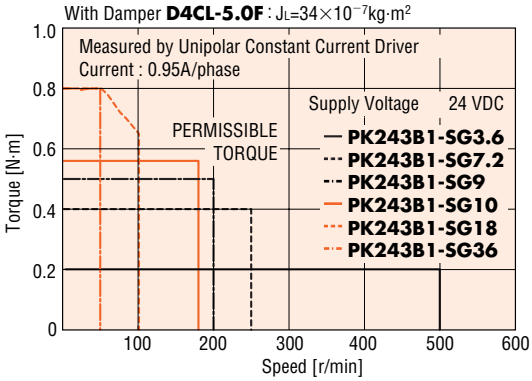
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

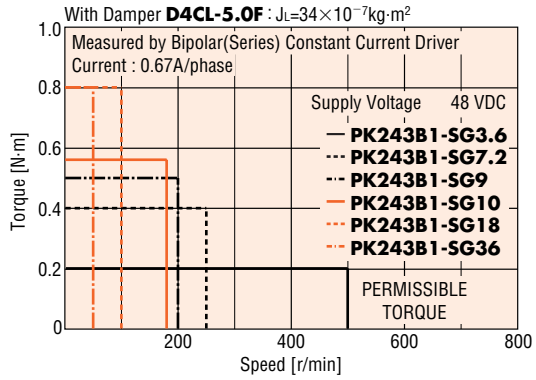
●PK243B1-SG□ Bipolar (Series) 24 VDC



●PK243B1-SG□ Unipolar



●PK243B1-SG□ Bipolar (Series) 48 VDC



Standard Type

□56.4mm

Step Angle 1.8°

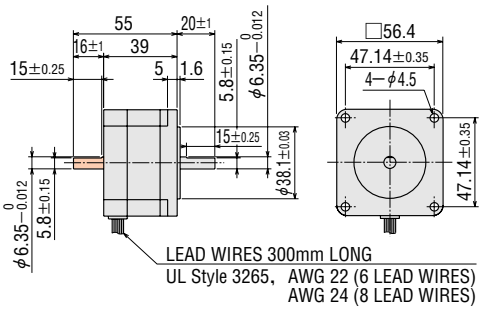
Specifications

Model Single Shaft Double Shaft	Connection Type	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK264-01A	Bipolar (Series)	0.48	0.71	8.1	11.4	21.6	120×10^{-7}	6	3
PK264-01B	Unipolar	0.39	1	5.7	5.7	5.4			2
PK264-02A	Bipolar (Series)	0.48	1.4	3.9	2.8	5.6	120×10^{-7}	6	3
PK264-02B	Unipolar	0.39	2	2.8	1.4	1.4			2
PK264-03A	Bipolar (Series)	0.48	2.1	2.6	1.26	2.4	120×10^{-7}	6	3
PK264-03B	Unipolar	0.39	3	1.9	0.63	0.6			2
PK264-E2.0A	Bipolar (Parallel)	0.48	2.8	1.96	0.7	1.4	120×10^{-7}	8	6
PK264-E2.0B	Bipolar (Series)	0.48	1.4	3.9	2.8	5.6			5
	Unipolar	0.39	2	2.8	1.4	1.4			4
PK266-01A	Bipolar (Series)	1.17	0.71	11	14.8	40	300×10^{-7}	6	3
PK266-01B	Unipolar	0.9	1	7.4	7.4	10			2
PK266-02A	Bipolar (Series)	1.17	1.4	5	3.6	10	300×10^{-7}	6	3
PK266-02B	Unipolar	0.9	2	3.6	1.8	2.5			2
PK266-03A	Bipolar (Series)	1.17	2.1	3.2	1.5	4.4	300×10^{-7}	6	3
PK266-03B	Unipolar	0.9	3	2.3	0.75	1.1			2
PK266-E2.0A	Bipolar (Parallel)	1.17	2.8	2.52	0.9	2.5	300×10^{-7}	8	6
PK266-E2.0B	Bipolar (Series)	1.17	1.4	5	3.6	10			5
	Unipolar	0.9	2	3.6	1.8	2.5			4
PK268-01A	Bipolar (Series)	1.75	0.71	12	17.2	56	480×10^{-7}	6	3
PK268-01B	Unipolar	1.35	1	8.6	8.6	14			2
PK268-02A	Bipolar (Series)	1.75	1.4	6.3	4.5	14.4	480×10^{-7}	6	3
PK268-02B	Unipolar	1.35	2	4.5	2.25	3.6			2
PK268-03A	Bipolar (Series)	1.75	2.1	4.2	2	6.4	480×10^{-7}	6	3
PK268-03B	Unipolar	1.35	3	3	1	1.6			2
PK268-E2.0A	Bipolar (Parallel)	1.75	2.8	3.16	1.13	3.6	480×10^{-7}	8	6
PK268-E2.0B	Bipolar (Series)	1.75	1.4	6.3	4.5	14.4			5
	Unipolar	1.35	2	4.5	2.25	3.6			4

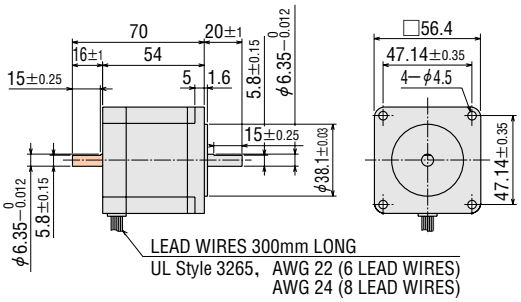
●Degree of Protection: IP30

Dimensions unit: mm

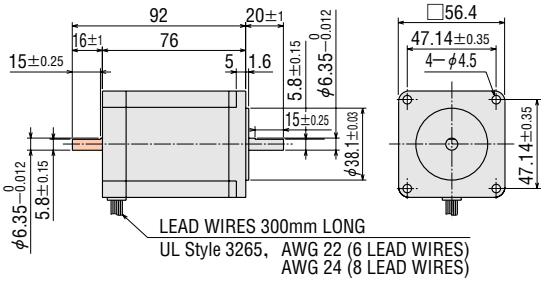
●**PK264-0□A, PK264-E2.0A** (Single Shaft) Mass 0.45 kg
●**PK264-0□B, PK264-E2.0B** (Double Shaft) Mass 0.45 kg



●**PK266-0□A, PK266-E2.0A** (Single Shaft) Mass 0.7 kg
●**PK266-0□B, PK266-E2.0B** (Double Shaft) Mass 0.7 kg



●**PK268-0□A, PK268-E2.0A** (Single Shaft) Mass 1 kg
●**PK268-0□B, PK268-E2.0B** (Double Shaft) Mass 1 kg

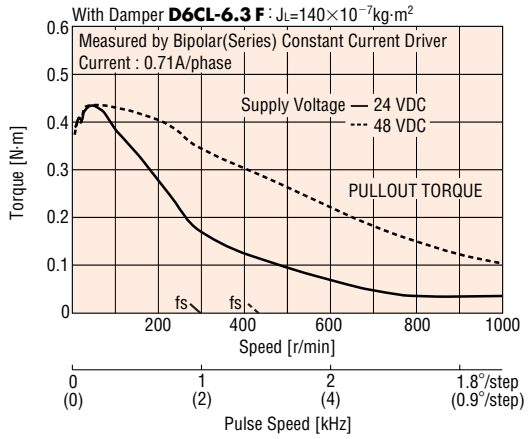


●These dimensions are for double shaft models. For single shaft, ignore the colored areas.

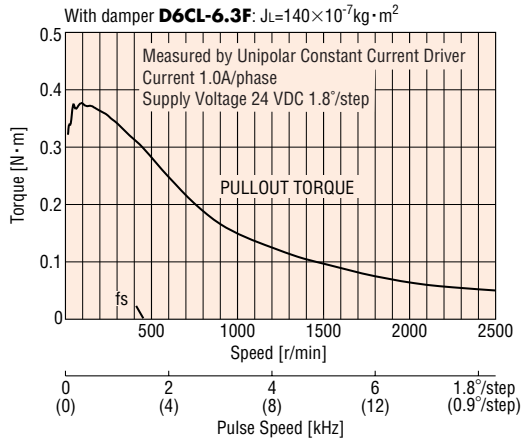
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

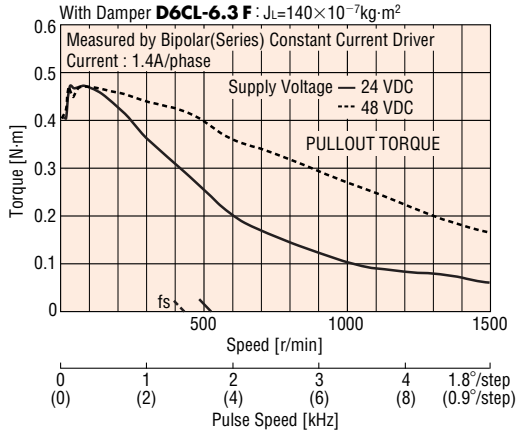
●PK264-01B Bipolar (Series)



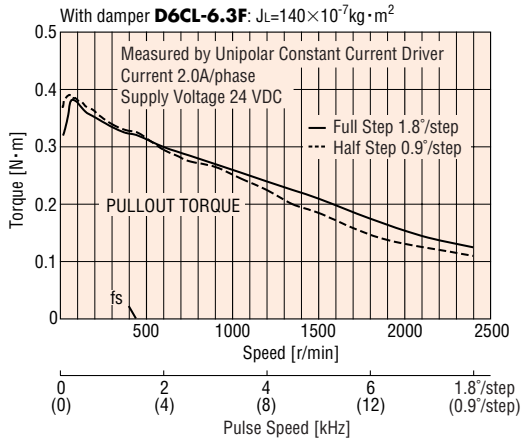
●PK264-01B Unipolar



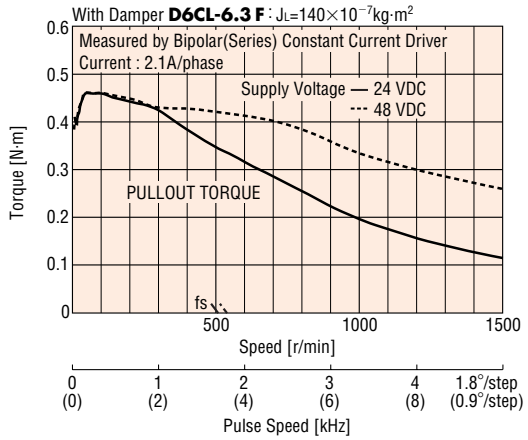
●PK264-02B Bipolar (Series)



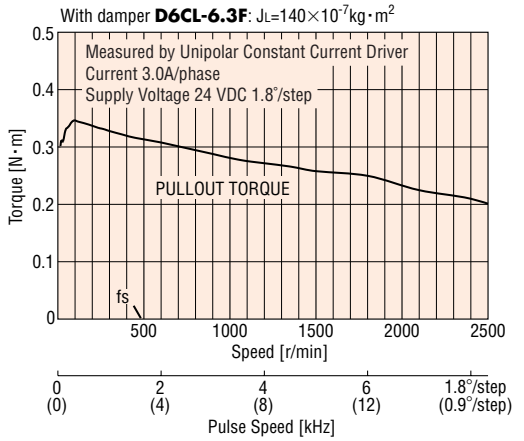
●PK264-02B Unipolar



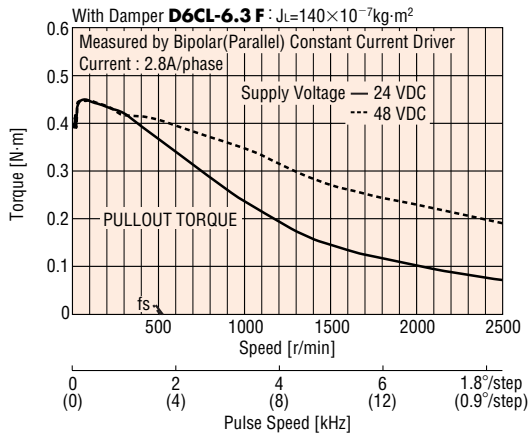
●PK264-03B Bipolar (Series)



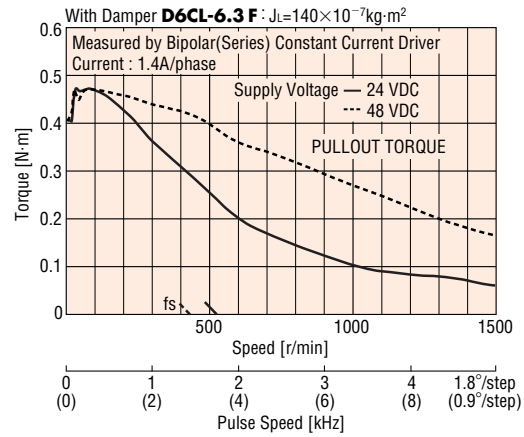
●PK264-03B Unipolar



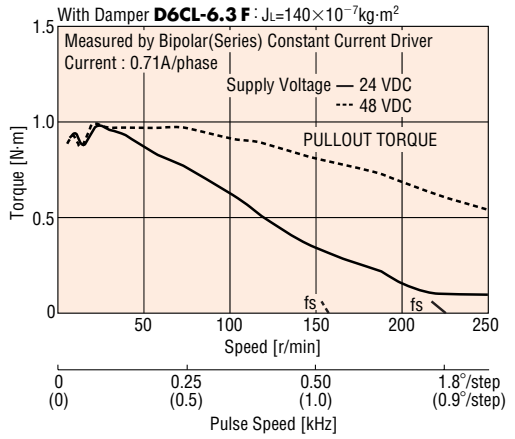
●PK264-E2.0B Bipolar (Parallel)



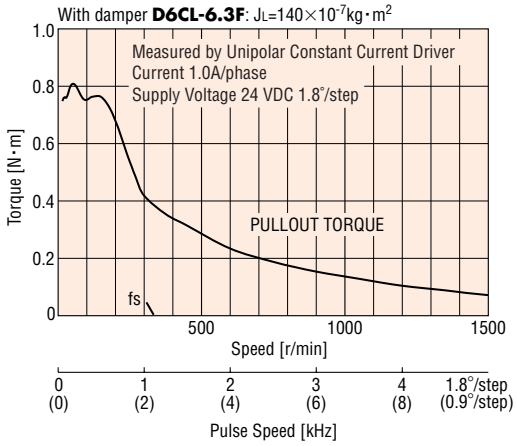
●PK264-E2.0B Bipolar (Series)



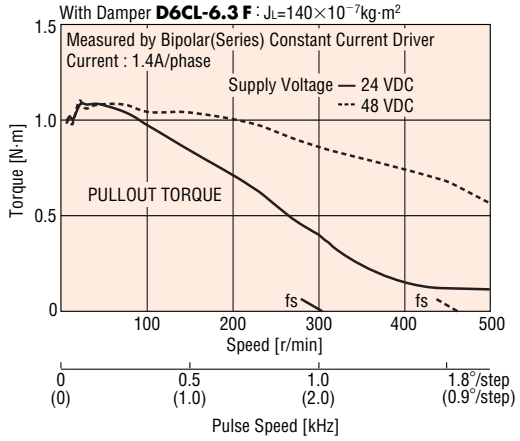
●PK266-01B Bipolar (Series)



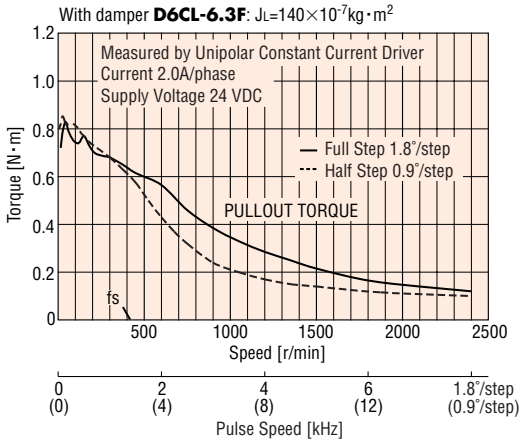
●PK266-01B Unipolar



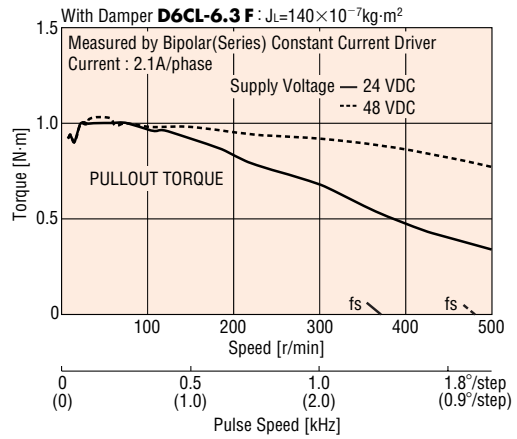
●PK266-02B Bipolar (Series)



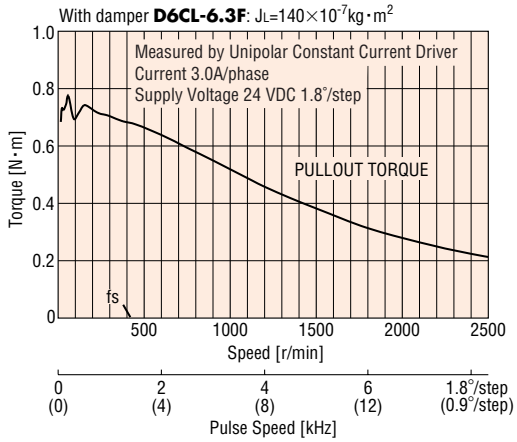
●PK266-02B Unipolar



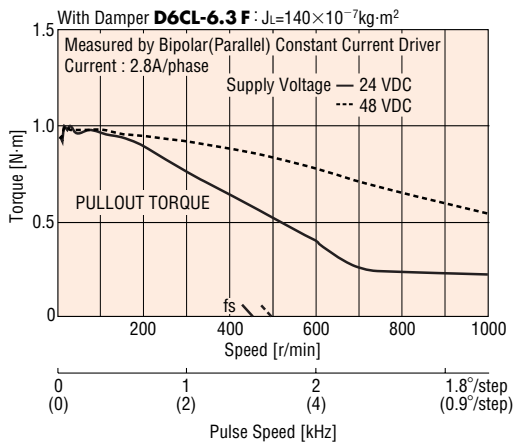
●PK266-03B Bipolar (Series)



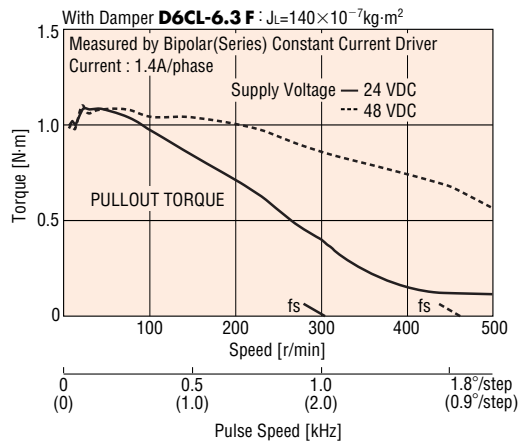
●PK266-03B Unipolar



●PK266-E2.0B Bipolar (Parallel)



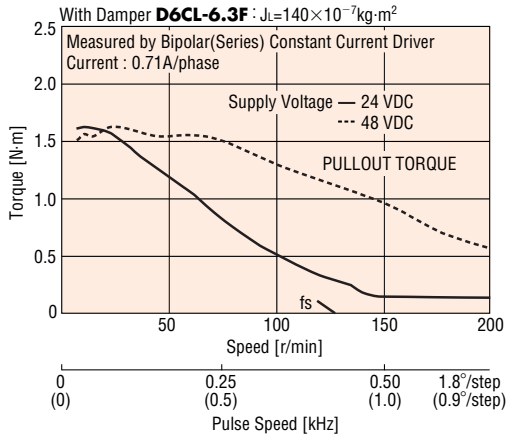
●PK266-E2.0B Bipolar (Series)



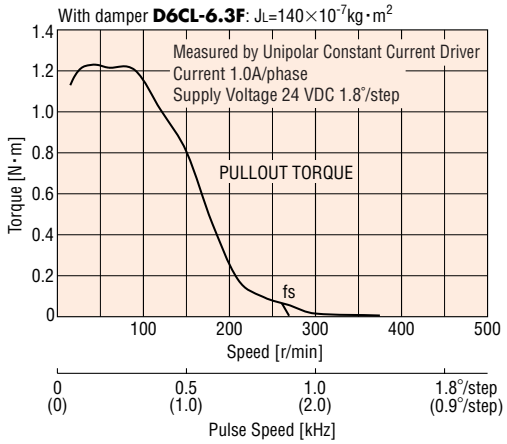
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

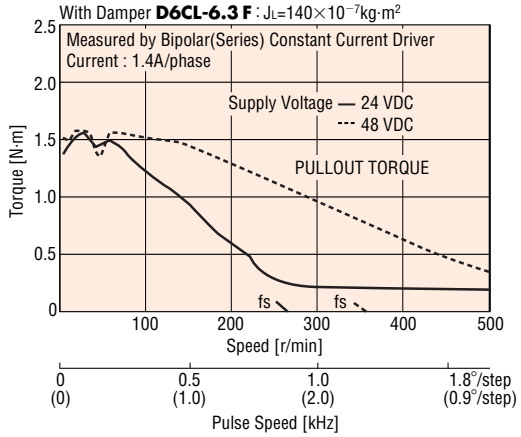
●PK268-01B Bipolar (Series)



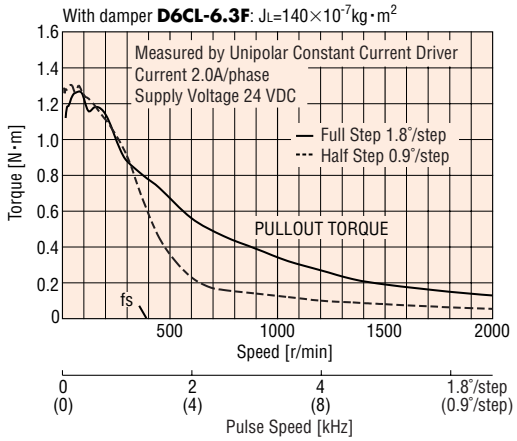
●PK268-01B Unipolar



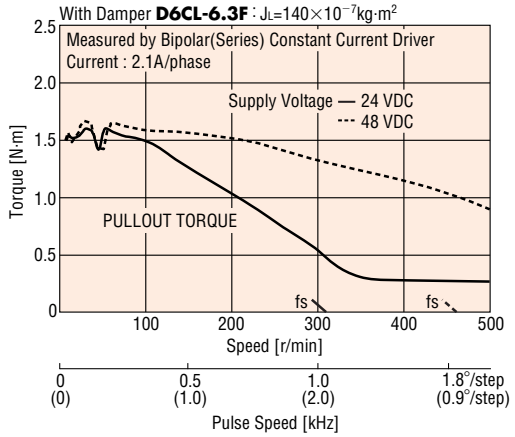
●PK268-02B Bipolar (Series)



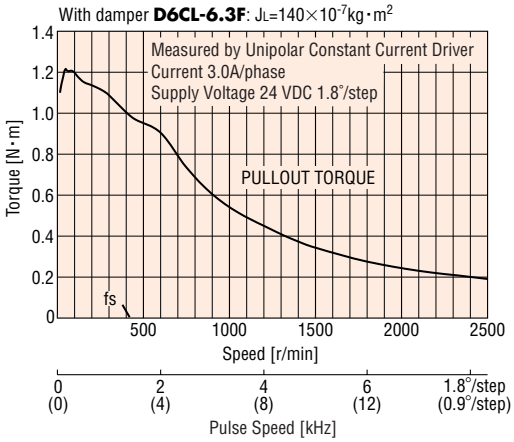
●PK268-02B Unipolar



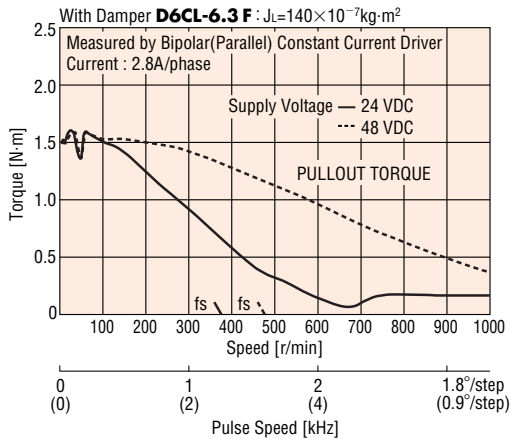
●PK268-03B Bipolar (Series)



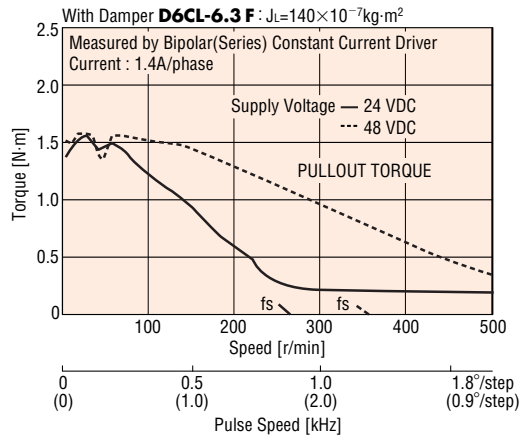
●PK268-03B Unipolar



●PK268-E2.0B Bipolar (Parallel)



●PK268-E2.0B Bipolar (Series)



M Type (High Resolution Type)

□56.4mm

Step Angle 0.9°

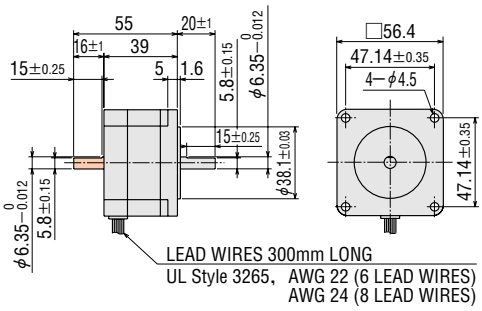
Specifications

Model Single Shaft Double Shaft	Connection Type	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK264M-01A	Bipolar (Series)	0.48	0.71	8.1	11.4	26	120×10^{-7}	6	3
PK264M-01B	Unipolar	0.39	1	5.7	5.7	6.5			2
PK264M-02A	Bipolar (Series)	0.48	1.4	3.9	2.8	6.8	120×10^{-7}	6	3
PK264M-02B	Unipolar	0.39	2	2.8	1.4	1.7			2
PK264M-03A	Bipolar (Series)	0.48	2.1	2.6	1.26	3	120×10^{-7}	6	3
PK264M-03B	Unipolar	0.39	3	1.9	0.63	0.75			2
PK264M-E2.0A	Bipolar (Parallel)	0.48	2.8	1.96	0.7	1.7	120×10^{-7}	8	6
PK264M-E2.0B	Bipolar (Series)	0.48	1.4	3.9	2.8	6.8			5
	Unipolar	0.39	2	2.8	1.4	1.7			4
PK266M-01A	Bipolar (Series)	1.17	0.71	11	14.8	50.8	300×10^{-7}	6	3
PK266M-01B	Unipolar	0.9	1	7.4	7.4	12.7			2
PK266M-02A	Bipolar (Series)	1.17	1.4	5	3.6	12.8	300×10^{-7}	6	3
PK266M-02B	Unipolar	0.9	2	3.6	1.8	3.2			2
PK266M-03A	Bipolar (Series)	1.17	2.1	3.2	1.5	5.8	300×10^{-7}	6	3
PK266M-03B	Unipolar	0.9	3	2.3	0.75	1.45			2
PK266M-E2.0A	Bipolar (Parallel)	1.17	2.8	2.52	0.9	3.2	300×10^{-7}	8	6
PK266M-E2.0B	Bipolar (Series)	1.17	1.4	5	3.6	12.8			5
	Unipolar	0.9	2	3.6	1.8	3.2			4
PK268M-01A	Bipolar (Series)	1.75	0.71	12	17.2	77.6	480×10^{-7}	6	3
PK268M-01B	Unipolar	1.35	1	8.6	8.6	19.4			2
PK268M-02A	Bipolar (Series)	1.75	1.4	6.3	4.5	19.2	480×10^{-7}	6	3
PK268M-02B	Unipolar	1.35	2	4.5	2.25	4.8			2
PK268M-03A	Bipolar (Series)	1.75	2.1	4.2	2	8.4	480×10^{-7}	6	3
PK268M-03B	Unipolar	1.35	3	3	1	2.1			2
PK268M-E2.0A	Bipolar (Parallel)	1.75	2.8	3.16	1.13	4.8	480×10^{-7}	8	6
PK268M-E2.0B	Bipolar (Series)	1.75	1.4	6.3	4.5	19.2			5
	Unipolar	1.35	2	4.5	2.25	4.8			4

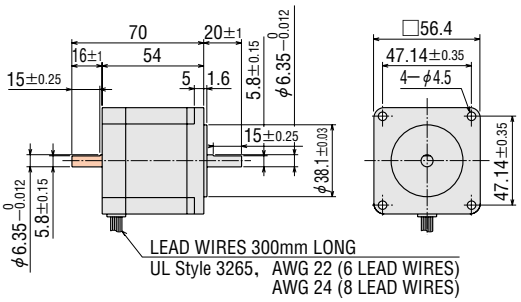
●Degree of Protection: IP30

Dimensions unit: mm

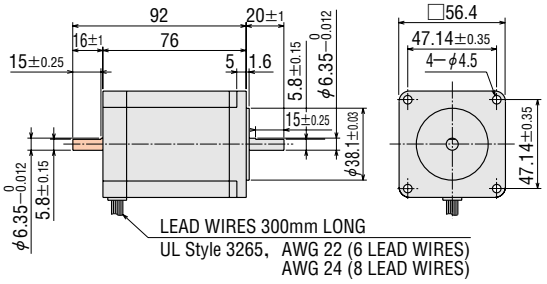
●**PK264M-0□A, PK264M-E2.0A** (Single Shaft) Mass 0.45 kg
●**PK264M-0□B, PK264M-E2.0B** (Double Shaft) Mass 0.45 kg



●**PK266M-0□A, PK266M-E2.0A** (Single Shaft) Mass 0.7 kg
●**PK266M-0□B, PK266M-E2.0B** (Double Shaft) Mass 0.7 kg



●**PK268M-0□A, PK268M-E2.0A** (Single Shaft) Mass 1 kg
●**PK268M-0□B, PK268M-E2.0B** (Double Shaft) Mass 1 kg

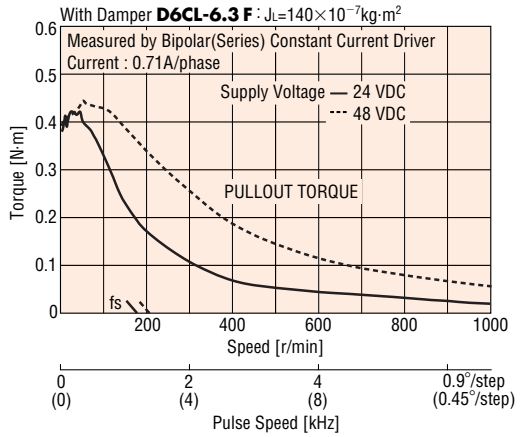


●These dimensions are for double shaft models. For single shaft, ignore the colored areas.

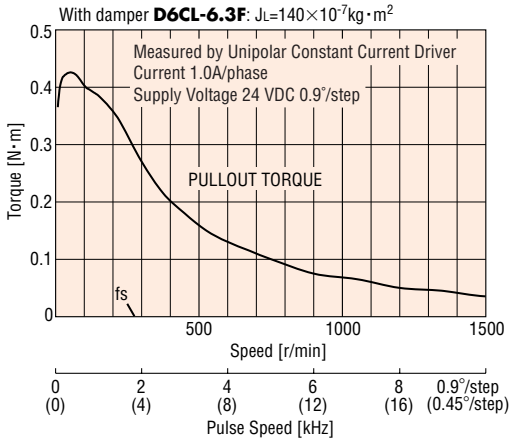
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

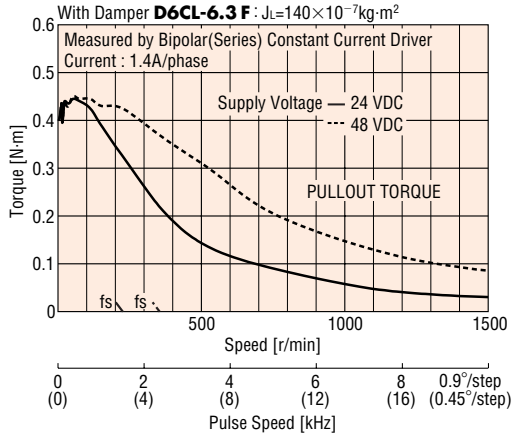
●PK264M-01B Bipolar (Series)



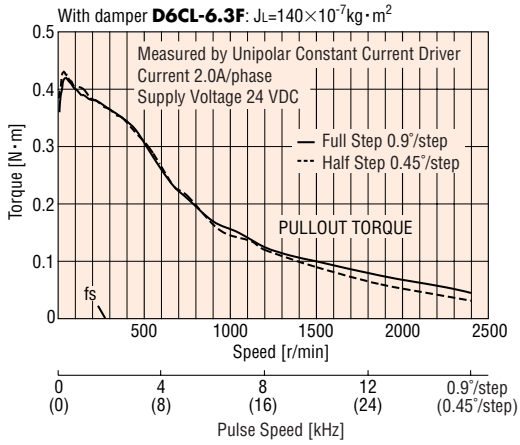
●PK264M-01B Unipolar



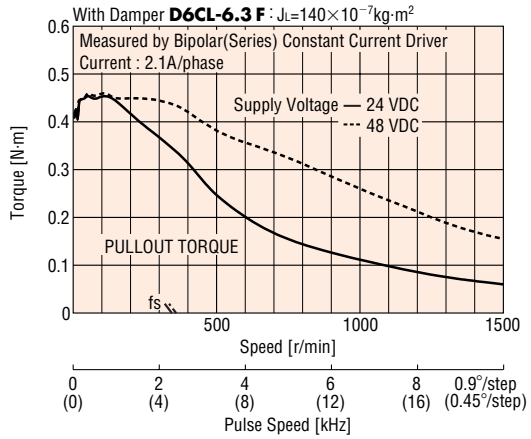
●PK264M-02B Bipolar (Series)



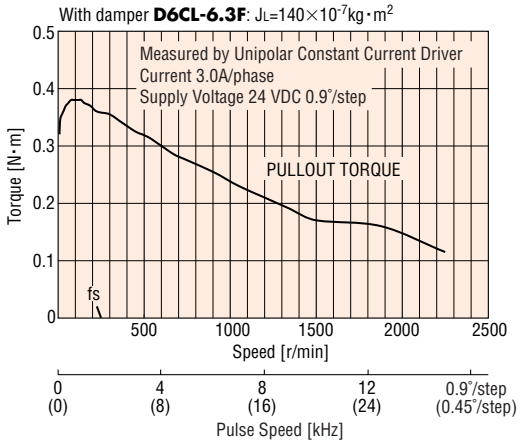
●PK264M-02B Unipolar



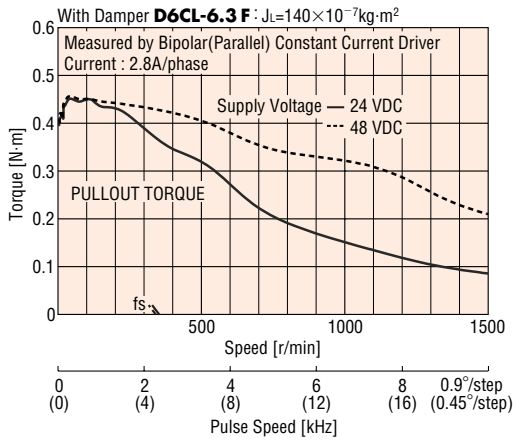
●PK264M-03B Bipolar (Series)



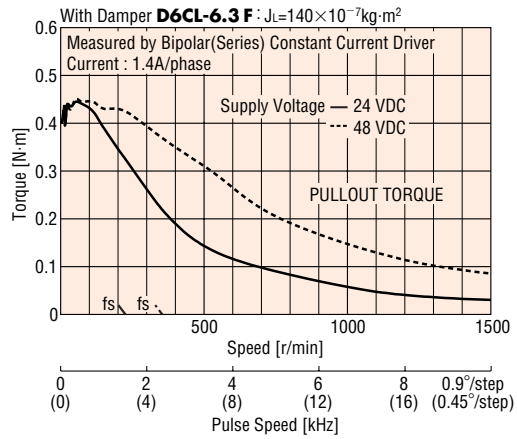
●PK264M-03B Unipolar



●PK264M-E2.0B Bipolar (Parallel)



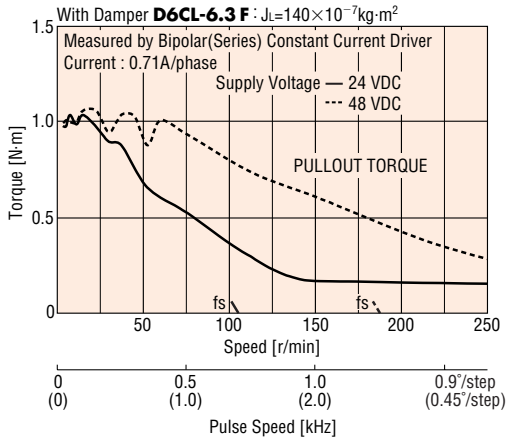
●PK264M-E2.0B Bipolar (Series)



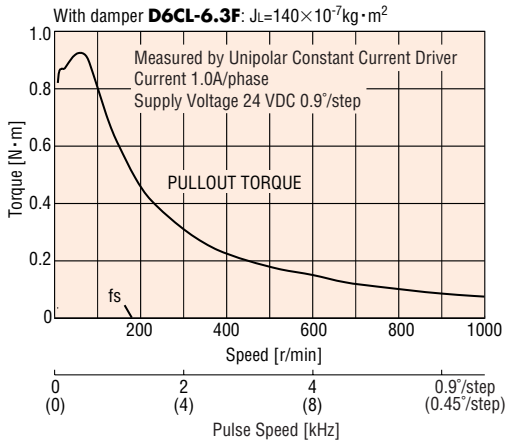
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

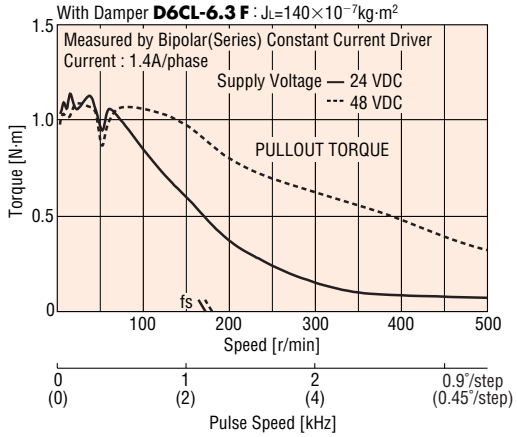
●PK266M-01B Bipolar (Series)



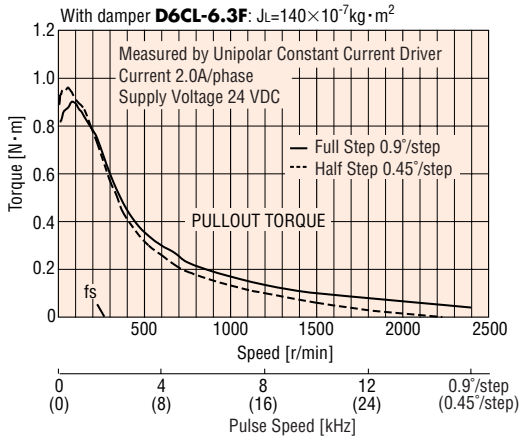
●PK266M-01B Unipolar



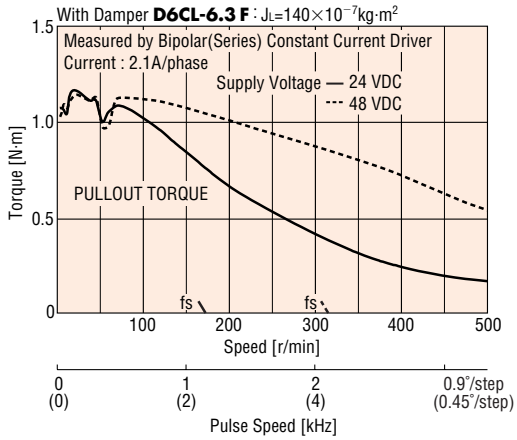
●PK266M-02B Bipolar (Series)



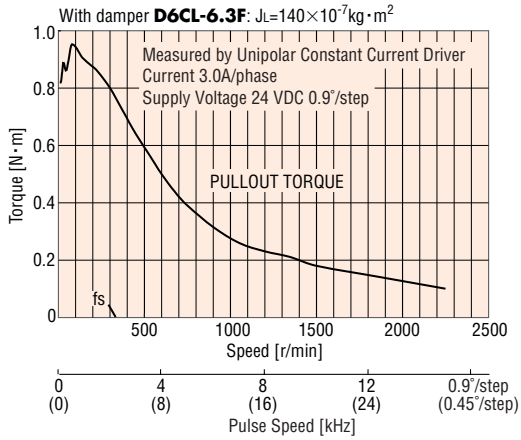
●PK266M-02B Unipolar



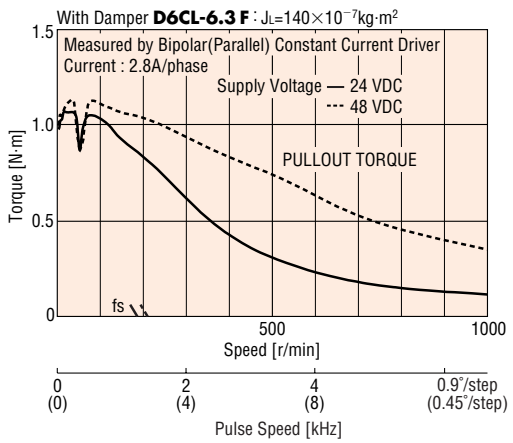
●PK266M-03B Bipolar (Series)



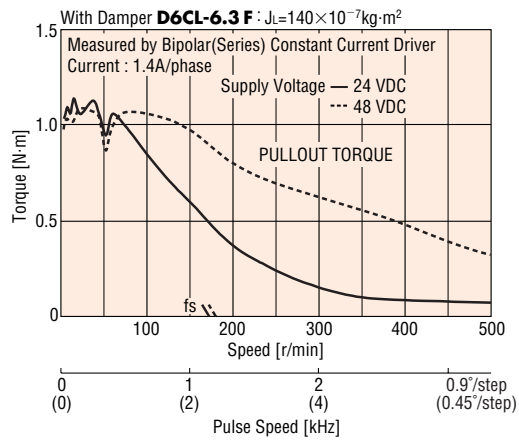
●PK266M-03B Unipolar



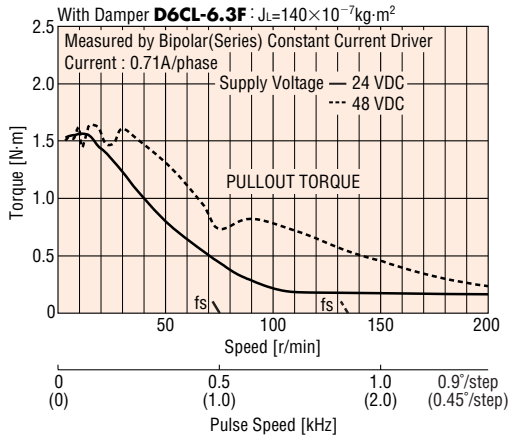
●PK266M-E2.0B Bipolar (Parallel)



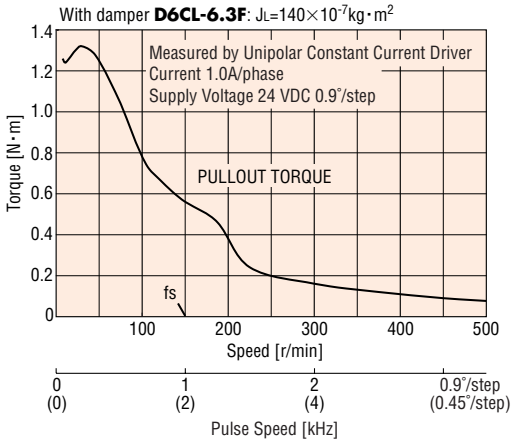
●PK266M-E2.0B Bipolar (Series)



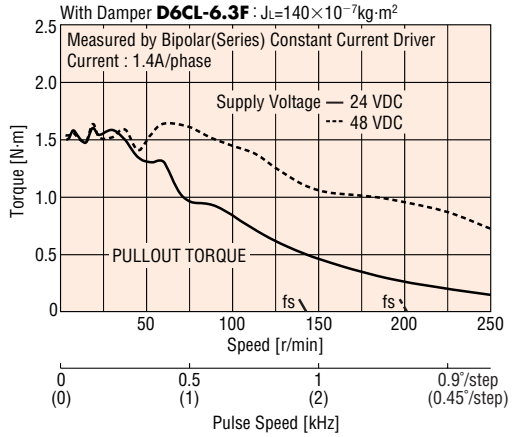
●PK268M-01B Bipolar (Series)



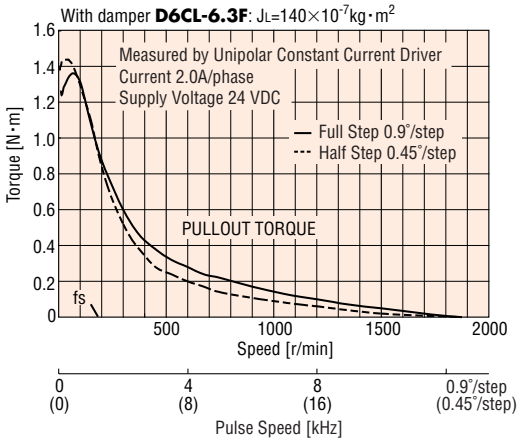
●PK268M-01B Unipolar



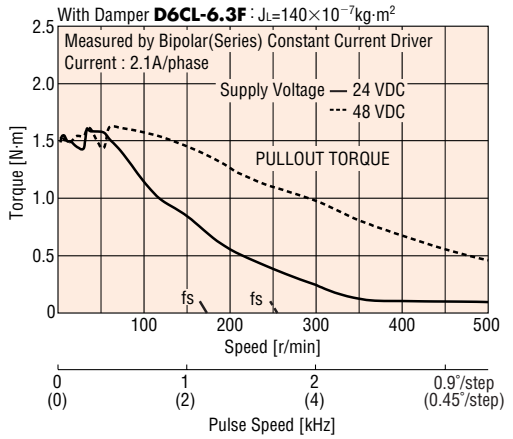
●PK268M-02B Bipolar (Series)



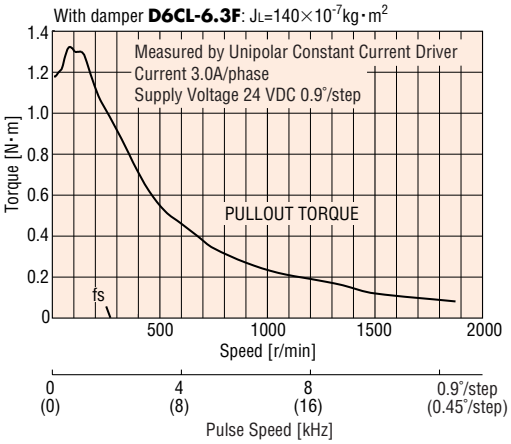
●PK268M-02B Unipolar



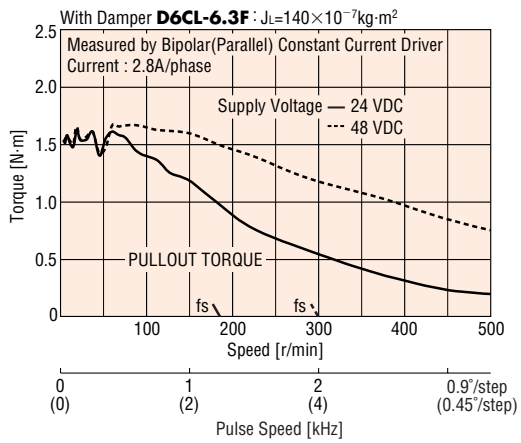
●PK268M-03B Bipolar (Series)



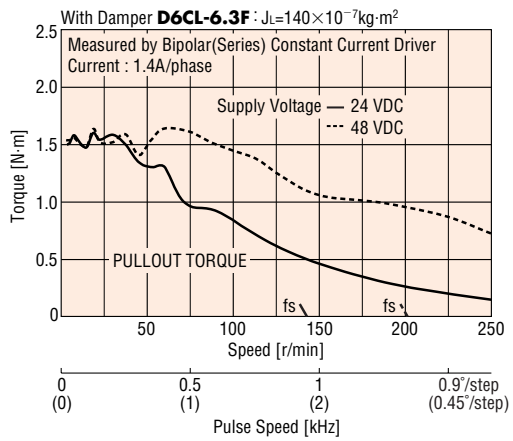
●PK268M-03B Unipolar



●PK268M-E2.0B Bipolar (Parallel)



●PK268M-E2.0B Bipolar (Series)



SH Geared Type

□60mm

Specifications

●Motor Specifications

Model Single Shaft Double Shaft	Connection Type	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK264AE-SG□ **PK264BE-SG□**	Bipolar (Parallel)	2.8	1.96	0.7	1.4	120×10^{-7}	8	6
	Bipolar (Series)	1.4	3.9	2.8	5.6			5
	Unipolar	2	2.8	1.4	1.4			4

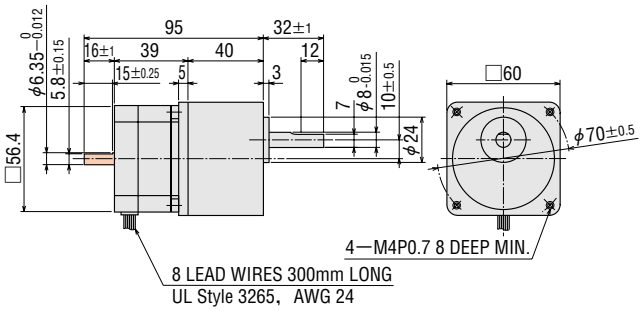
∗Enter the gear ratio in the box (□) within the model name.
●Degree of Protection: IP30

●Gearmotor Specifications

Model Single Shaft Double Shaft	Gear Ratio	Holding Torque N·m	Step Angle	Permissible Speed r/min	Permissible Thrust Load N	Permissible Overhung Load (at 10mm from shaft end) N
PK264AE-SG3.6 **PK264BE-SG3.6**	1:3.6	1	0.5°	500	30	50
PK264AE-SG7.2 **PK264BE-SG7.2**	1:7.2	2	0.25°	250	30	50
PK264AE-SG9 **PK264BE-SG9**	1:9	2.5	0.2°	200	30	50
PK264AE-SG10 **PK264BE-SG10**	1:10	2.7	0.18°	180	30	50
PK264AE-SG18 **PK264BE-SG18**	1:18	3	0.1°	100	30	120
PK264AE-SG36 **PK264BE-SG36**	1:36	4	0.05°	50	30	120

Dimensions unit: mm

●**PK264AE-SG□** (Single Shaft) Mass 0.75 kg
●**PK264BE-SG□** (Double Shaft) Mass 0.75 kg



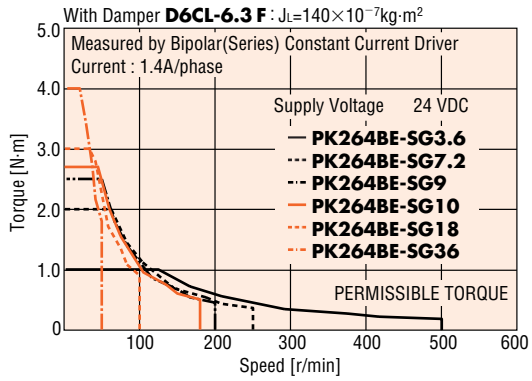
Mounting Screws (included)
M4 P0.7 15mm long: 4 pieces

●This dimension is for double shaft models. For single shaft, ignore the colored area.

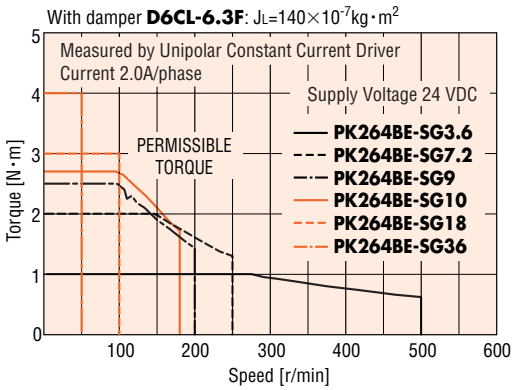
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

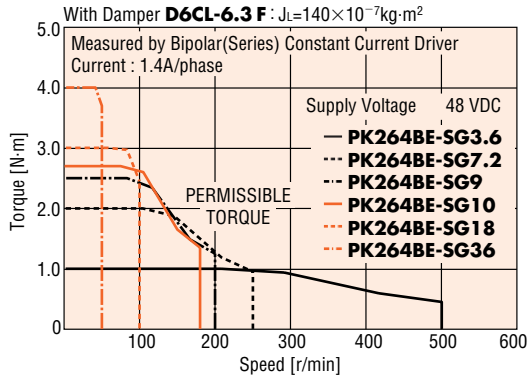
●PK264BE-SG Bipolar (Series) 24 VDC



●PK264BE-SG Unipolar



●PK264BE-SG Bipolar (Series) 48 VDC



J Type (High Inertia Capability)

□60mm

Step Angle 1.8°

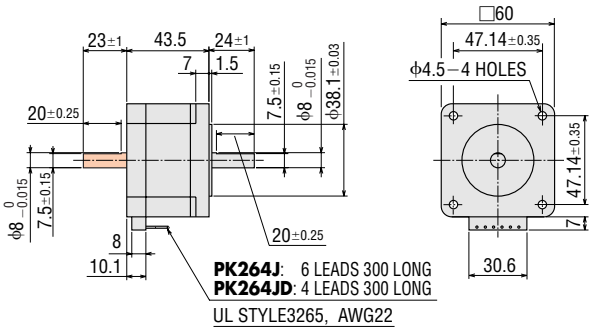
Specifications

Model Single Shaft Double Shaft	Connection Type	Holding Torque N·m	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK264JDA **PK264JDB**	Bipolar	1.06	2.8	2.1	0.73	1.8	280×10^{-7}	4	1
PK264JA	Bipolar (Series)	1.06	1.4	4.1	2.92	7.2	280×10^{-7}	6	3
PK264JB	Unipolar	0.75	2	2.9	1.46	1.8			2
PK266JDA **PK266JDB**	Bipolar	1.75	2.8	2.8	1	3.05	450×10^{-7}	4	1
PK266JA	Bipolar (Series)	1.75	1.4	5.6	4	12.2	450×10^{-7}	6	3
PK266JB	Unipolar	1.35	2	4	2	3.05			2
PK267JDA **PK267JDB**	Bipolar	2.2	2.8	3.4	1.2	3.54	570×10^{-7}	4	1
PK267JA	Bipolar (Series)	2.2	1.4	6.7	4.8	14.2	570×10^{-7}	6	3
PK267JB	Unipolar	1.7	2	4.8	2.4	3.54			2
PK269JDA **PK269JDB**	Bipolar	3.1	2.8	4.2	1.49	5.7	900×10^{-7}	4	1
PK269JA	Bipolar (Series)	3.1	1.4	8.3	5.96	22.8	900×10^{-7}	6	3
PK269JB	Unipolar	2.2	2	6	2.98	5.7			2

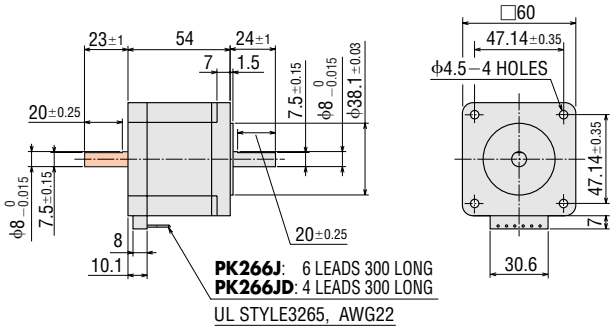
●Degree of Protection: IP30

Dimensions unit: mm

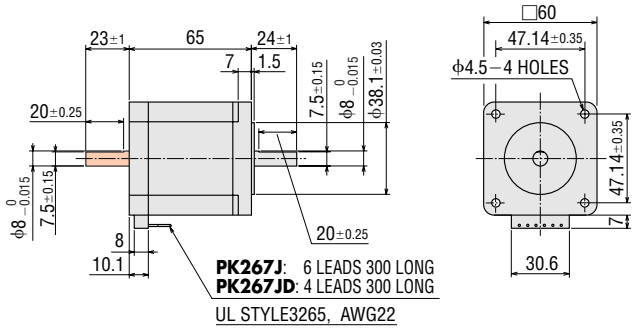
●**PK264JDA, PK264JA** (Single Shaft) Mass 0.6 kg
●**PK264JDB, PK264JB** (Double Shaft) Mass 0.6 kg



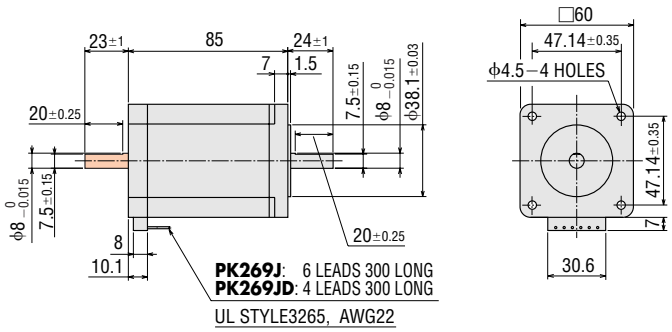
●**PK266JDA, PK266JA** (Single Shaft) Mass 0.83 kg
●**PK266JDB, PK266JB** (Double Shaft) Mass 0.83 kg



●**PK267JDA, PK267JA** (Single Shaft) Mass 1.02 kg
●**PK267JDB, PK267JB** (Double Shaft) Mass 1.02 kg



●**PK269JDA, PK269JA** (Single Shaft) Mass 1.43 kg
●**PK269JDB, PK269JB** (Double Shaft) Mass 1.43 kg

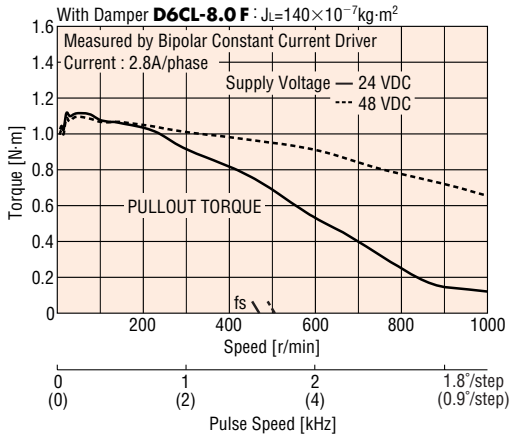


●These dimensions are for double shaft models. For single shaft, ignore the colored areas.

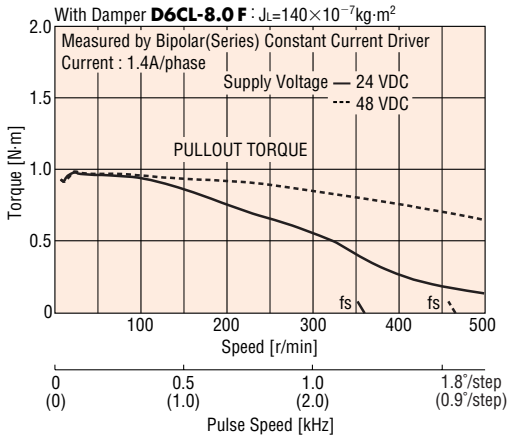
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

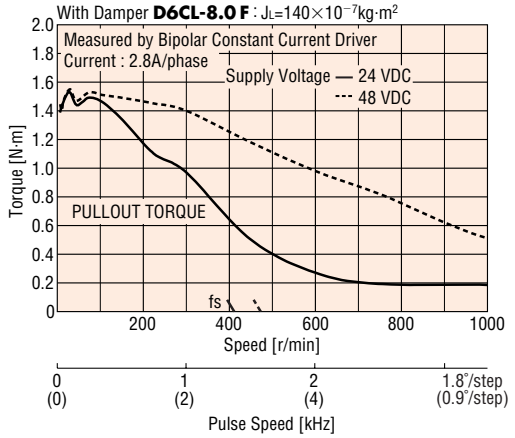
●PK264JDB Bipolar



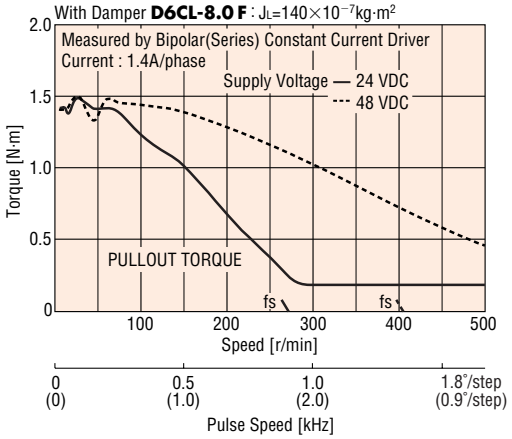
●PK264JB Bipolar (Series)



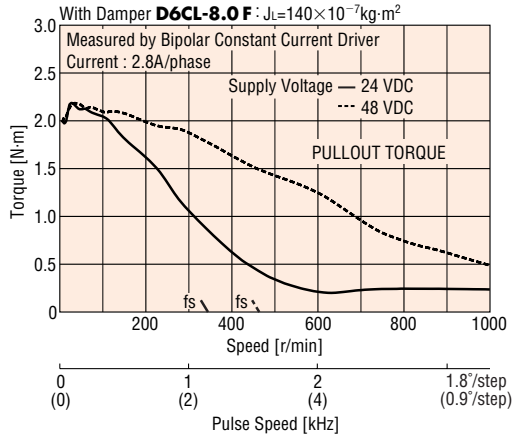
●PK266JDB Bipolar



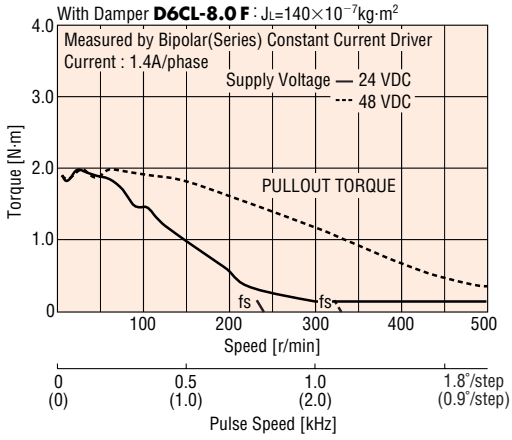
●PK266JB Bipolar (Series)



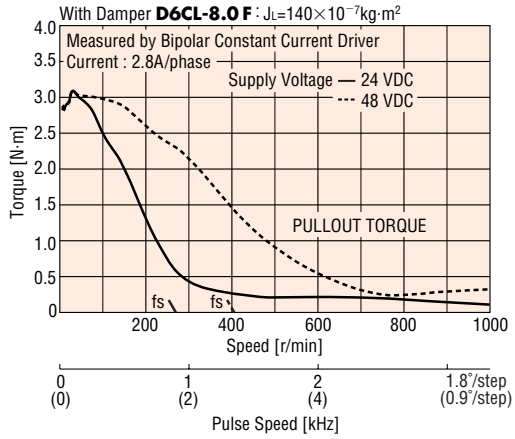
●PK267JDB Bipolar



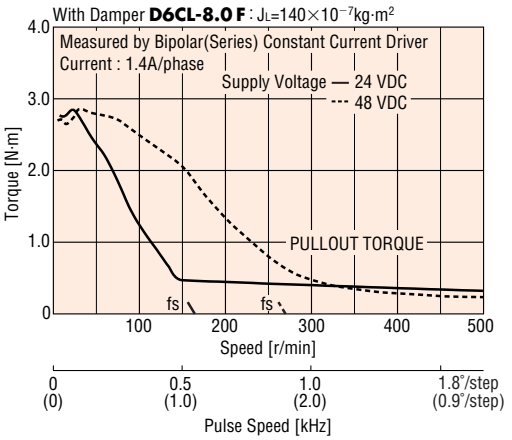
●PK267JB Bipolar (Series)



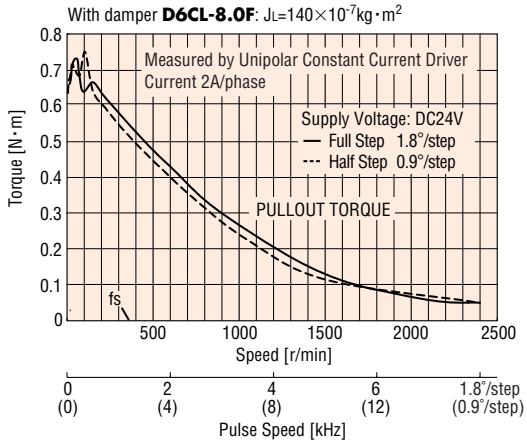
●PK269JDB Bipolar



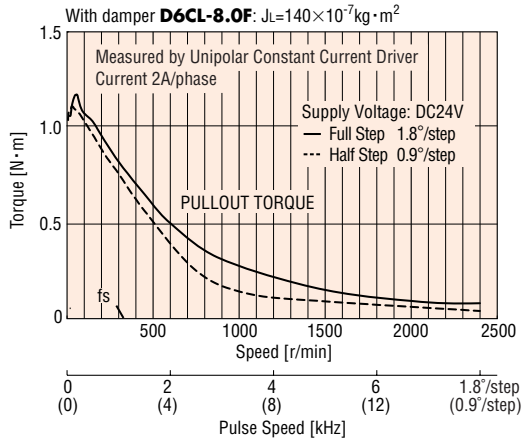
●PK269JB Bipolar (Series)



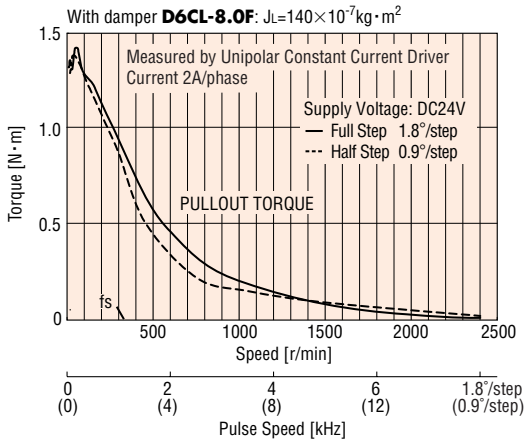
●PK264JB Unipolar



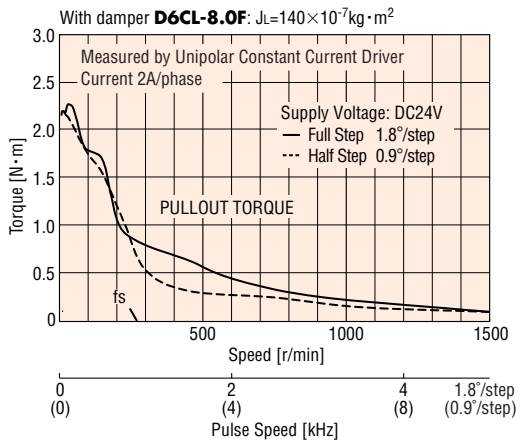
●PK266JB Unipolar



●PK267JB Unipolar



●PK269JB Unipolar



Product Number Code

PK 2 9 6 E A T
① ② ③ ④ ⑤ ⑥ ⑦

①	**PK** Series
②	2-Phase
③	Motor Frame Size **6**: 56.4 mm **9**: 85 mm
④	Motor Case Length
⑤	**D**: 4 terminals (Bipolar) **E** : 8 terminals
⑥	Motor Shaft Type **A**: Single Shaft
⑦	IP65 Rated Motor

Specifications

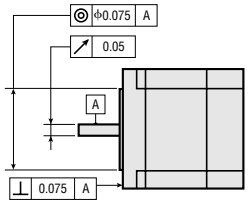
Model	Connection Type	Holding Torque N·m	Current per Phase A/phase	Voltage VDC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Basic Step Angle	Number of Terminals	Mass kg
PK264DAT	Bipolar	0.48	2.8	1.96	0.7	1.4	120×10^{-7}	1.8°	4	0.6
PK266DAT	Bipolar	1.17	2.8	2.52	0.9	2.5	300×10^{-7}		4	0.9
PK268DAT	Bipolar	1.75	2.8	3.16	1.13	3.6	480×10^{-7}		4	1.2
PK296EAT	Bipolar (Parallel)	3.1	6.3	1.4	0.24	1.5	1400×10^{-7}		8	2.1
	Bipolar (Series)	3.1	3.18	2.8	0.96	6.0				
	Unipolar	2.2	4.5	2	0.48	1.5				
PK299EAT	Bipolar (Parallel)	6.2	6.3	1.9	0.33	2.5	2700×10^{-7}		8	3.2
	Bipolar (Series)	6.2	3.18	3.9	1.32	10.0				
	Unipolar	4.4	4.5	2.8	0.66	2.5				
PK2913EAT	Bipolar (Parallel)	9.3	5.6	2.6	0.49	4.2	1400×10^{-7}		8	4.3
	Bipolar (Series)	9.3	2.8	5.3	1.94	16.8				
	Unipolar	6.6	4	3.8	0.97	4.2				

General Specifications

Specifications		Motor
Degree of Protection		IP65 (except for mounting surface)
Insulation Class		Class B (130°C) [Recognized as class A (105°C) by UL/CSA standards]
Insulation Resistance		100 MΩ minimum under normal temperature and humidity, when measured by a 500 VDC megger between the windings and motor casing.
Dielectric Strength		Sufficient to withstand 1.5 kV, 50 Hz or 60 Hz applied between the windings and casing for one minute, under normal temperature and humidity.
Operating Environment (In Operation)	Ambient Temperature	−10°C～+50°C (nonfreezing)
	Ambient Humidity	85% or less (noncondensing)
	Atmosphere	No corrosive gases
Temperature Rise		Temperature rise of the coil measured by the change resistance method is 80°C or less. (at rated current, at standstill, two phases energized)
Static Angle Error*1		±3 arc minutes (±0.05°)
Shaft Runout		0.05 T.I.R. (mm)*4
Radial Play*2		0.025 mm Max. of 5 N
Axial Play*3		0.075 mm Max. of 10 N
Concentricity		0.075 T.I.R. (mm)*4
Perpendicularity		0.075 T.I.R. (mm)*4

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

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



Permissible Overhung Load and Permissible Thrust Load

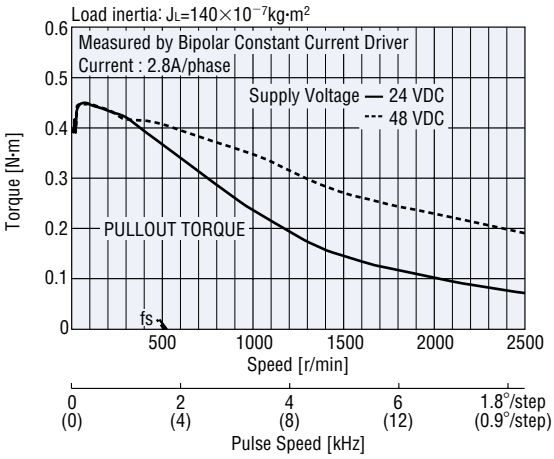
Unit=N

Model	Overhung Load Distance from Shaft End (mm)					Thrust Load
	0	5	10	15	20	
PK264DAT **PK266DAT** **PK268DAT**	54	67	89	130	–	The permissible thrust load shall be no greater than the motor mass.
PK296EAT **PK299EAT** **PK2913EAT**	260	290	340	390	480	

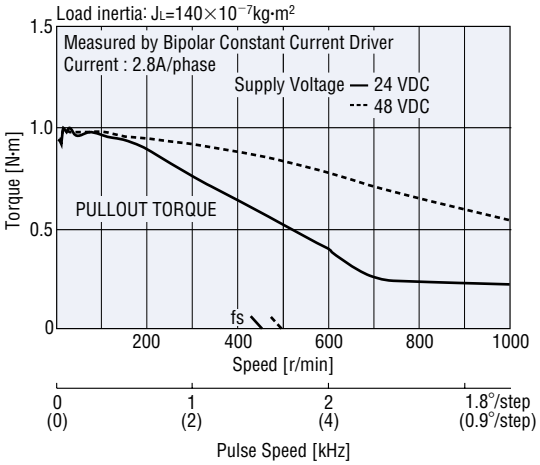
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

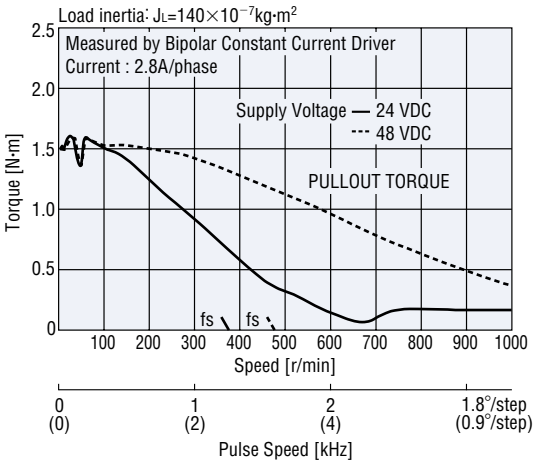
●PK264DAT Bipolar



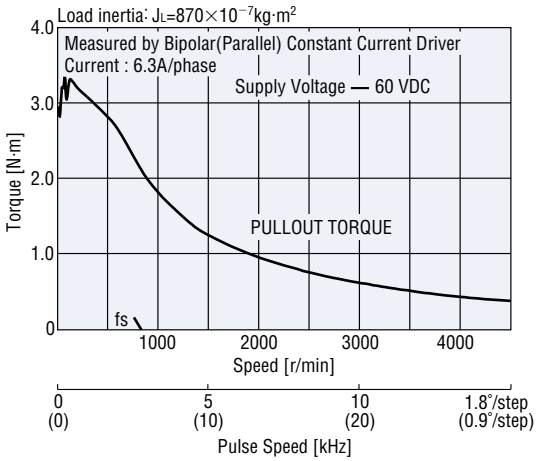
●PK266DAT Bipolar



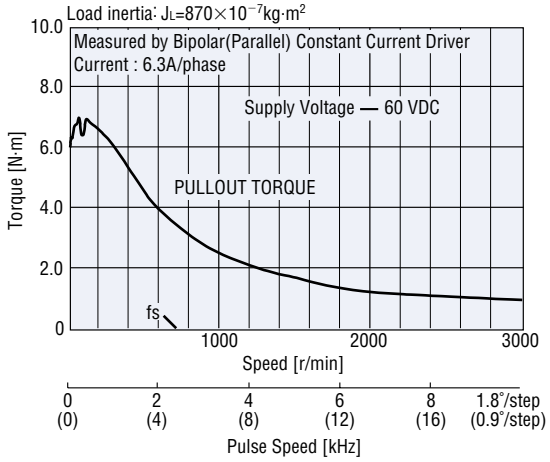
●PK268DAT Bipolar



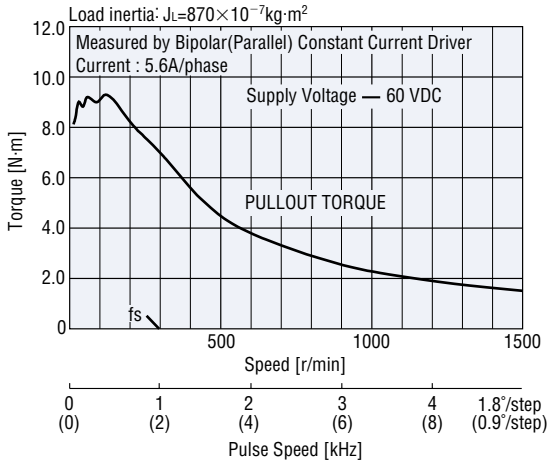
●PK296EAT Bipolar (Parallel)



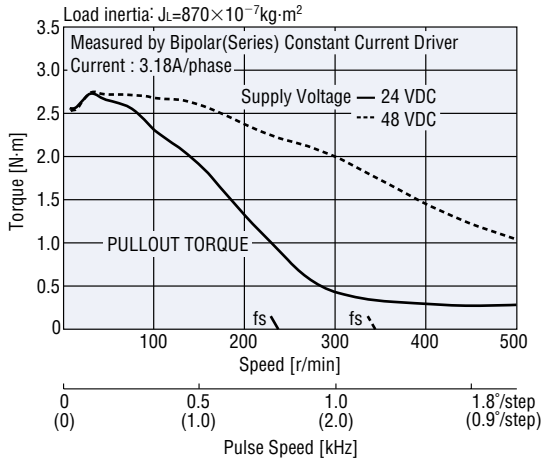
●PK299EAT Bipolar (Parallel)



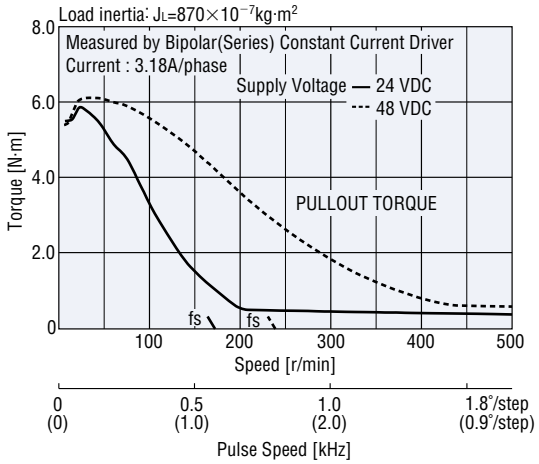
●PK2913EAT Bipolar (Parallel)



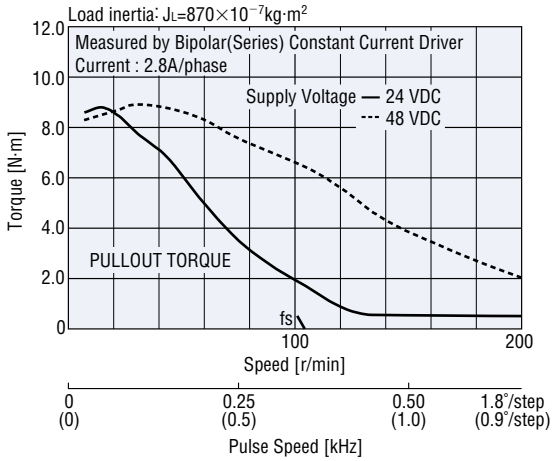
●**PK296EAT** Bipolar (Series)



●**PK299EAT** Bipolar (Series)



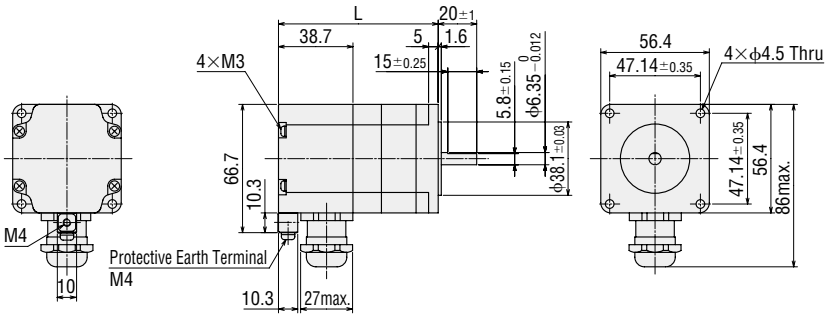
●**PK2913EAT** Bipolar (Series)



Dimensions (Unit=mm)

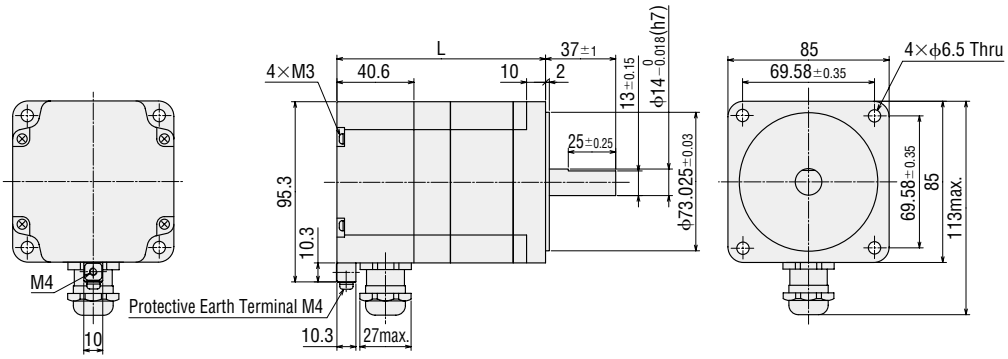
□ 56.4 mm

Model	L	Mass (kg)
PK264DAT	83	0.6
PK266DAT	98	0.9
PK268DAT	120	1.2



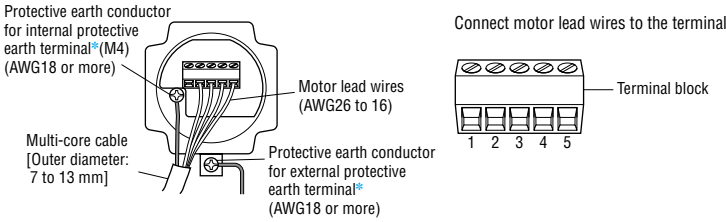
□ 85 mm

Model	L	Mass (kg)
PK296EAT	110	2.1
PK299EAT	140	3.2
PK2913EAT	170	4.3



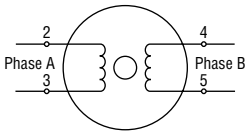
■ Connection Diagrams

●□ 56.4 mm

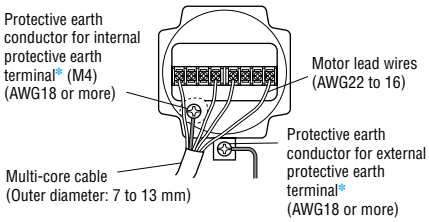


*Connect either the internal protective earth terminal or external protective earth terminal to the ground.

◇ PK26□DAT (Bipolar Connection)



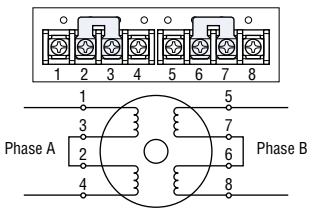
●□ 85 mm



*Connect either the internal protective earth terminal or external protective earth terminal to the ground.

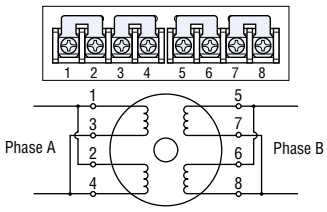
◇ Series Bipolar Connection

Connect the supplied shorting bars (two pieces) as shown in the figure below.



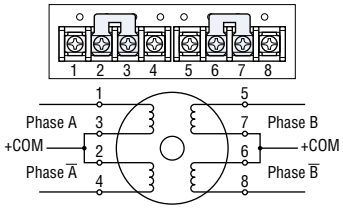
◇ Parallel Bipolar Connection

Connect the supplied shorting bars (four pieces) as shown in the figure below.



◇ Unipolar Connection

Connect the supplied shorting bars (two pieces) as shown in the figure below.



SH Geared Type

□90mm

Specifications

●Motor Specifications

Model Single Shaft Double Shaft	Connection Type	Current per Phase A/phase	Voltage V DC	Resistance per Phase Ω/phase	Inductance mH/phase	Rotor Inertia J kg·m²	Lead Wires (Pin)	Connection Diagram (see page B-197)
PK296AE-SG□ **PK296BE-SG□**	Bipolar (Parallel)	4.2	1	0.24	1.5	1400×10^{-7}	8	6
	Bipolar (Series)	2.1	2	0.96	6.0			5
	Unipolar	3	1.4	0.48	1.5			4

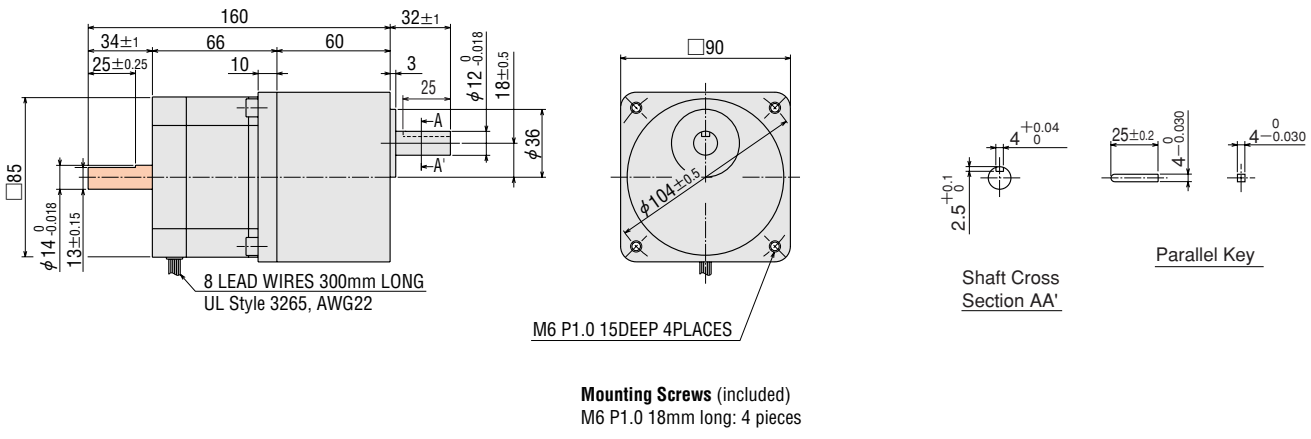
∗Enter the gear ratio in the box (□) within the model name.
●Degree of Protection: IP30

●Gearmotor Specifications

Model Single Shaft Double Shaft	Gear Ratio	Holding Torque N·m	Step Angle	Permissible Speed r/min	Permissible Thrust Load N	Permissible Overhung Load (at 10mm from shaft end) N
PK296AE-SG3.6 **PK296BE-SG3.6**	1:3.6	2.5	0.5°	500	100	300
PK296AE-SG7.2 **PK296BE-SG7.2**	1:7.2	5	0.25°	250	100	300
PK296AE-SG9 **PK296BE-SG9**	1:9	6.3	0.2°	200	100	300
PK296AE-SG10 **PK296BE-SG10**	1:10	7	0.18°	180	100	300
PK296AE-SG18 **PK296BE-SG18**	1:18	9	0.1°	100	100	300
PK296AE-SG36 **PK296BE-SG36**	1:36	12	0.05°	50	100	300

Dimensions unit: mm

●**PK296AE-SG□** (Single Shaft) Mass 2.8 kg
●**PK296BE-SG□** (Double Shaft) Mass 2.8 kg



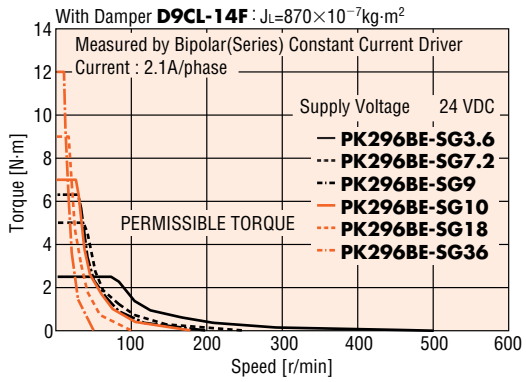
Mounting Screws (included)
M6 P1.0 18mm long: 4 pieces

●This dimension is for double shaft models. For single shaft, ignore the colored area.

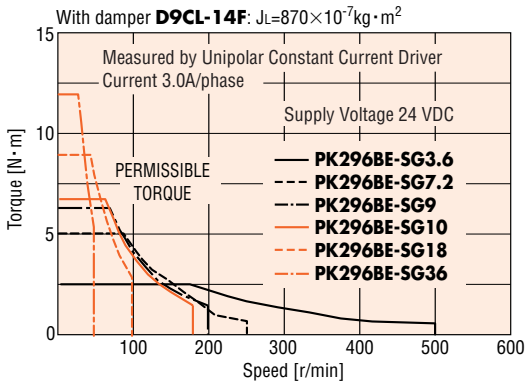
Speed-Torque Characteristics

fs: Maximum Starting Pulse Rate

●PK296BE-SG□ Bipolar (Series) 24 VDC



●PK296BE-SG□ Unipolar



●PK296BE-SG□ Bipolar (Series) 48 VDC