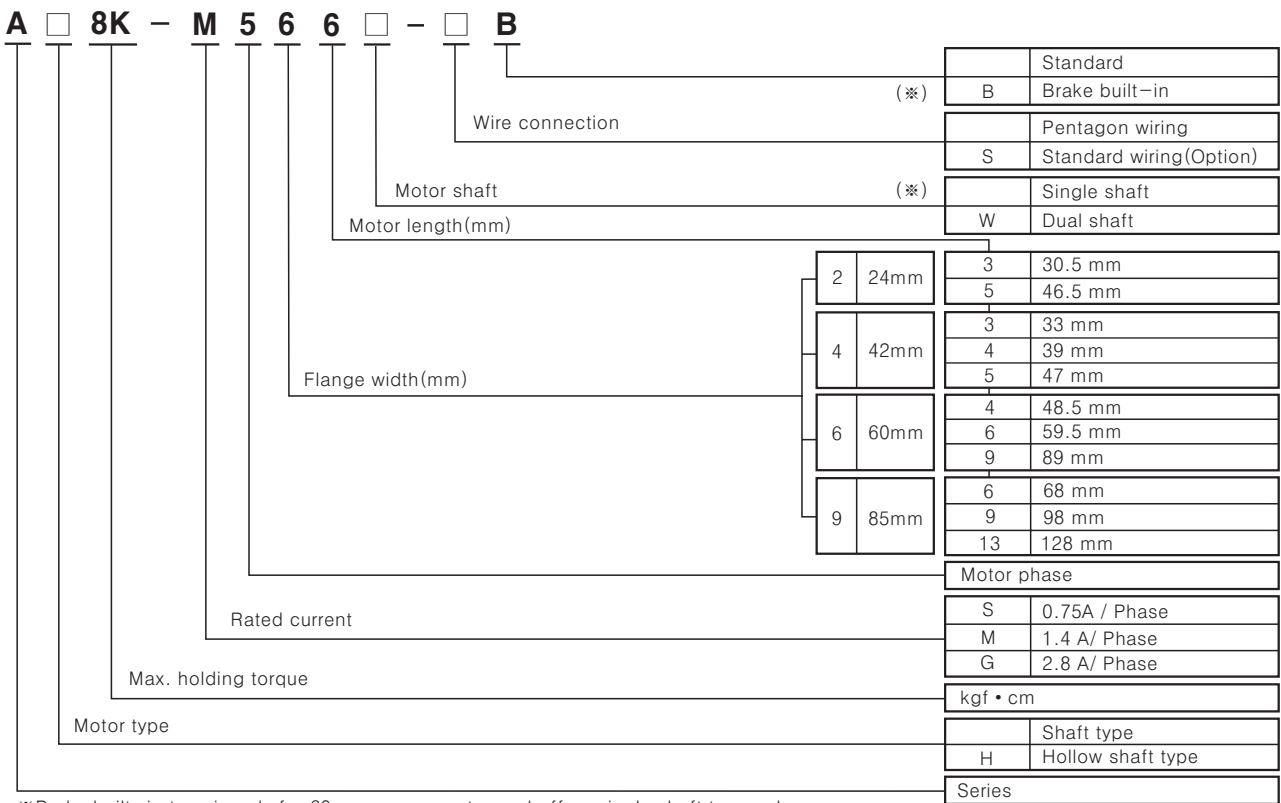


5-Phase stepping motor

Ordering information



Specifications

Type	Model	Max. holding torque (kgf • cm)	Rated current (A/phase)	Winding resistance (Ω)	Rotor inertia (g • cm ²)	Motor length (mm)	Weight (kg)			
24mm Square	Shaft type	02K-S523(W)	0.18	0.75	1.1	4.2	0.07			
		04K-S525(W)	0.28	0.75	1.7	8.2	0.12			
42mm Square	Shaft type	A1K-S543(W) - □	1.3	0.75	1.7	35	0.25			
		A2K-S544(W) - □	1.8	0.75	2.2	54	0.3			
		A3K-S545(W) - □	2.4	0.75	2.2	68	0.4			
	Hollow shaft type	AH1K-S543	1.3	0.75	1.7	35	0.25			
		AH2K-S544	1.8	0.75	2.2	54	0.3			
		AH3K-S545	2.4	0.75	2.2	68	0.4			
60mm Square	Shaft type/ Shaft+Brake built-in type	A4K-S564(W) - □ B	4.2	0.75	2.6	175	48.5	0.6		
		A4K-M564(W) - □ B	4.2	1.4	0.8	175	48.5	0.6		
		A8K-S566(W) - □ B	8.3	0.75	4.0	280	59.5	0.8		
		A8K-M566(W) - □ B	8.3	1.4	1.1	280	59.5	0.8		
		A16K-M569(W) - □ B	16.6	1.4	1.8	560	89	1.3		
		A16K-G569(W) - □ B	16.6	2.8	0.56	560	89	1.3		
	Hollow shaft type	AH4K-S564(W)	4.2	0.75	2.6	175	48.5	0.6		
		AH4K-M564(W)	4.2	1.4	0.8	175	48.5	0.6		
		AH8K-S566(W)	8.3	0.75	4.0	280	59.5	0.8		
		AH8K-M566(W)	8.3	1.4	1.1	280	59.5	0.8		
		AH16K-M569(W)	16.6	1.4	1.8	560	89	1.3		
		AH16K-G569(W)	16.6	2.8	0.56	560	89	1.3		
		85mm Square	Shaft type / Shaft+Brake built-in type	A21K-M596(W) - □ B	21	1.4	1.76	1400	68	1.7
				A21K-G596(W) - □ B	21	2.8	0.4	1400	68	1.7
A41K-M599(W) - □ B	41			1.4	2.60	2700	98	2.8		
A41K-G599(W) - □ B	41			2.8	0.58	2700	98	2.8		
A63K-M5913(W) - □ B	63			1.4	3.92	4000	128	3.8		
Hollow shaft type	A63K-G5913(W) - □ B		63	2.8	0.86	4000	128	3.8		
	AH21K-M596(W)		21	1.4	1.76	1400	68	1.7		
	AH21K-G596(W)		21	2.8	0.4	1400	68	1.7		
	AH41K-M599(W)		41	1.4	2.60	2700	98	2.8		
	AH41K-G599(W)		41	2.8	0.58	2700	98	2.8		
	AH63K-M5913(W)	63	1.4	3.92	4000	128	3.8			
	AH63K-G5913(W)	63	2.8	0.86	4000	128	3.8			

* Motor length is without shaft.

* () indicates dual shaft of motor. (Brake built-in type except.)

* S type for hollow shaft type is optional. (Except for 24mm)

5-Phase stepping motor

■ Specifications

●24 square /42 square

Model	02K-S523□	04K-S525□	A1K-S543□-□ AH1K-S543	A2K-S544□-□ AH2K-S544	A3K-S545□-□ AH3K-S545
Max. holding torque	0.18 kgf · cm (0.018N · m)	0.28f kg · cm (0.028 N · m)	1.3 kgf · cm (0.13 N · m)	1.8 kgf · cm (0.18 N · m)	2.4 kgf · cm (0.24 N · m)
Rotor moment of inertia	4.2 g · cm ² (4.2 × 10 ⁻⁷ kg · m ²)	8.2 g · cm ² (8.2 × 10 ⁻⁷ kgf · m ²)	35 g · cm ² (35 × 10 ⁻⁷ kg · m ²)	54 g · cm ² (54 × 10 ⁻⁷ kg · m ²)	68 g · cm ² (68 × 10 ⁻⁷ kg · m ²)
Rated current	0.75A/Phase				
Basic step angle	0.72° / 0.36° (Full/Half)				
Insulation class	CLASS B type (130°C)				
Insulation resistance	Max. 100MΩ (Standard 500VDC mega) between Motor coil-case				
Dielectric strength	1Min. at 1kVAC 50/60Hz between Motor coil-case				
Ambient temperature	-10°C ~ +50°C, Storage condition : -25°C ~ +85°C				
Ambient humidity	35 ~ 85%RH				
Protection	IP30(IEC34-5)				
Weight	0.07kg	0.12kg	0.25kg	0.3kg	0.4kg

●60 square

Model	A4K-S564□-□ A4K-S564-□B AH4K-S564	A4K-M564□-□ A4K-M564-□B AH4K-M564	A8K-S566□-□ A8K-S566-□B AH8K-S566	A8K-M566□-□ A8K-M566-□B AH8K-M566	A16K-M569□-□ A16K-M569-□B AH16K-M569	A16K-G569□-□ A16K-G569-□B AH16K-G569
Max. holding torque	4.2 kgf · cm (0.42 N · m)		8.3 kgf · cm (0.83 N · m)		16.6 kgf · cm (1.66 N · m)	
Rotor moment of inertia	175 g · cm ² (175 × 10 ⁻⁷ kg · m ²)		280 g · cm ² (280 × 10 ⁻⁷ kg · m ²)		560 g · cm ² (560 × 10 ⁻⁷ kg · m ²)	
Rated current	0.75A/Phase	1.4A/Phase	0.75A/Phase	1.4A/Phase	1.4A/Phase	2.8A/Phase
Basic step angle	0.72° / 0.36° (Full/Half)					
Electro magnetic brake	●Rated excitation voltage:24VDC ●Rated excitation current:0.33A ●Rotation inertia:2.5 × 10 ⁻⁶ [kg · m ²] ●Rated stop:4 [kgf · cm] ●Brake force operation time:Min. 22ms, Brake force termination time:Min. 37ms					
Insulation class	CLASS B type (130°C)					
Insulation resistance	Max. 100MΩ (Standard 500VDC mega) between Motor coil-case					
Dielectric strength	1Min. at 1kVAC 50/60Hz between Motor coil-case					
Ambient temperature	-10°C ~ +50°C, Storage condition : -25°C ~ +85°C					
Ambient humidity	35 ~ 85%RH					
Protection	IP30(IEC34-5)					
Weight	Standard type : 0.6kg, Brake built-in type : 0.9kg		Standard type : 0.8kg, Brake built-in type : 1.1kg		Standard type : 1.3kg, Brake built-in type : 1.6kg	

●85 square

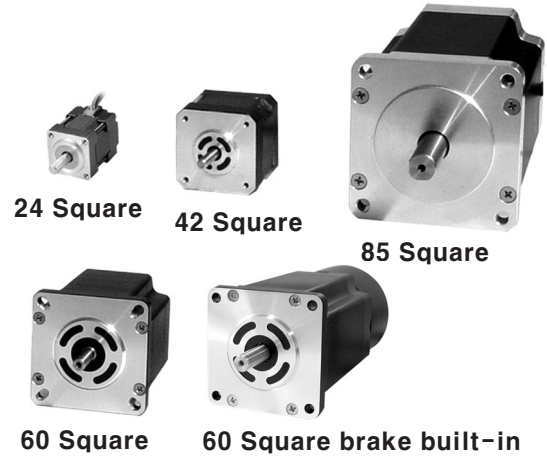
Model	A21K-M596□-□ A21K-M596-□B AH21K-M596	A21K-G596□-□ A21K-G596-□B AH21K-G596	A41K-M599□-□ A41K-M599-□B AH41K-M599	A41K-G599□-□ A41K-G599-□B AH41K-G599	A63K-M5913□-□ A63K-M5913-□B AH63K-M5913	A63K-G5913□-□ A63K-G5913-□B AH63K-G5913
Max. holding torque	21 kgf · cm (2.1 N · m)		41 kgf · cm (4.1 N · m)		63 kgf · cm (6.3 N · m)	
Rotor moment of inertia	1400 g · cm ² (1400 × 10 ⁻⁷ kg · m ²)		2700 g · cm ² (2700 × 10 ⁻⁷ kg · m ²)		4000 g · cm ² (4000 × 10 ⁻⁷ kg · m ²)	
Rated current	1.4A/Phase	2.8A/Phase	1.4A/Phase	2.8A/Phase	1.4A/Phase	2.8A/Phase
Basic step angle	0.72° / 0.36° (Full/Half)					
Electro magnetic brake	●Rated excitation voltage:24VDC ●Rated excitation current:0.62A ●Rotation inertia:42.5 × 10 ⁻⁶ [kg · m ²] ●Rated stop:40 [kgf · cm] ●Brake force operation time:Min. 80ms, Brake force termination time:Min. 70ms					
Insulation class	CLASS B type (130°C)					
Insulation resistance	Max. 100MΩ (Standard 500VDC mega) between Motor coil-case					
Dielectric strength	1Min. at 1kVAC 50/60Hz between Motor coil-case					
Ambient temperature	-10°C ~ +50°C, Storage condition : -25°C ~ +85°C					
Ambient humidity	35 ~ 85%RH					
Protection	IP30(IEC34-5)					
Weight	Standard type : 1.7kg, Brake built-in type : 2.9kg		Standard type : 2.8kg, Brake built-in type : 4.0kg		Standard type : 3.8kg, Brake built-in type : 5.0kg	

5-Phase stepping motor

- 24mm/□42mm/□60mm/□85mm Shaft type 5-phase stepping motor
- 60mm/□85mm Shaft+Brake built-in type 5-phase stepping motor

■ Features

- Most compact and light (24 square type)
- Compact design and light weight with high accuracy, speed and torque.
- Best suited for small-sized equipment applications.
- Brake built-in on □60mm shaft type Compact equipment (AK-B series)
- Brake lock when applying power on brake wire (AK-B series) (24VDC non-polar type)
- Cost effective



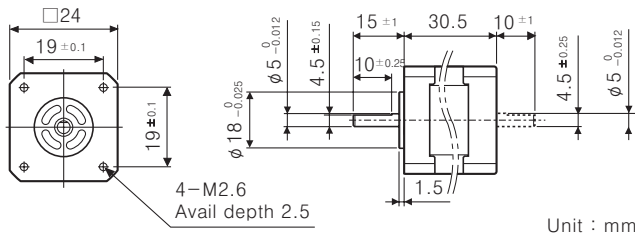
⚠ Please read "Caution for your safety" in operation manual before using.



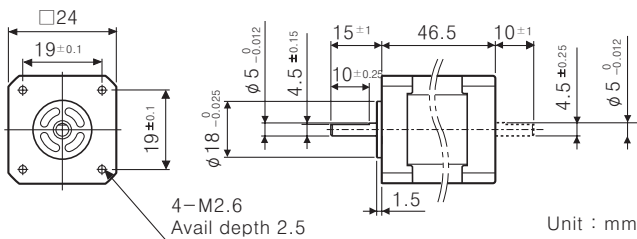
(Except for 85 square)

■ Dimensions

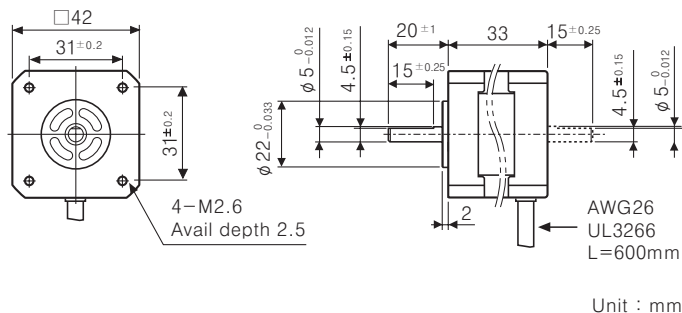
●02K-S523(W)



●04K-S525(W)



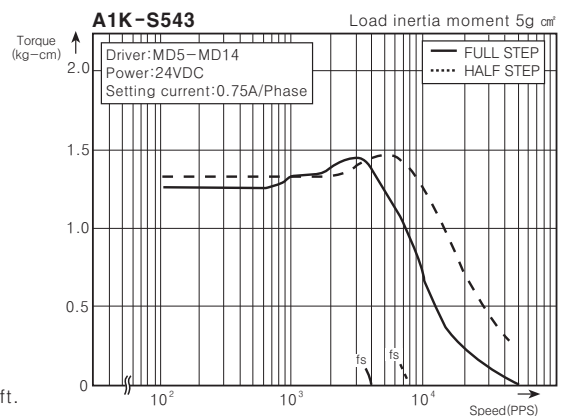
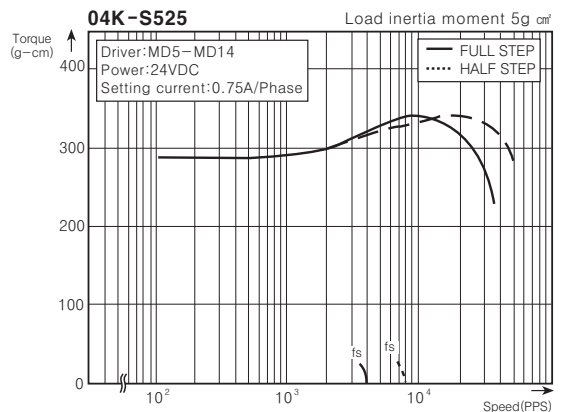
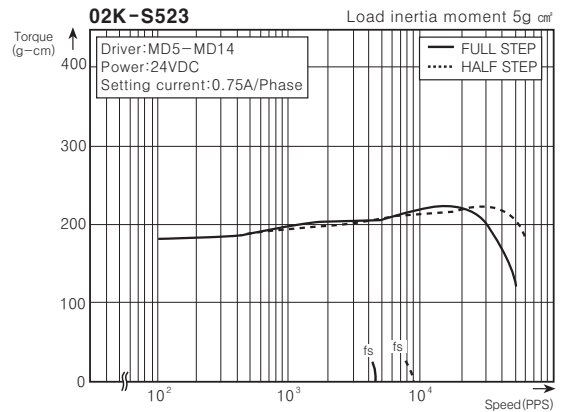
●A1K-S543(W) - □



※ This is dual shaft dimension. In case of single shaft there is no (.....) shaft.

■ Characteristic

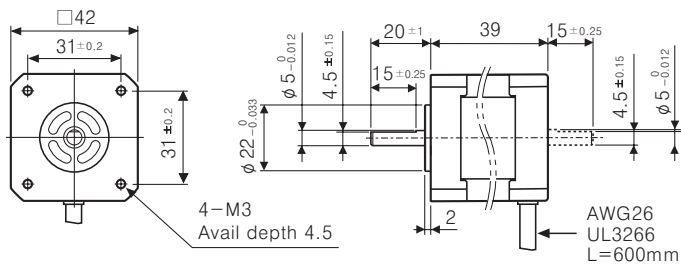
※ fs: Max. self synchronization



5-Phase stepping motor

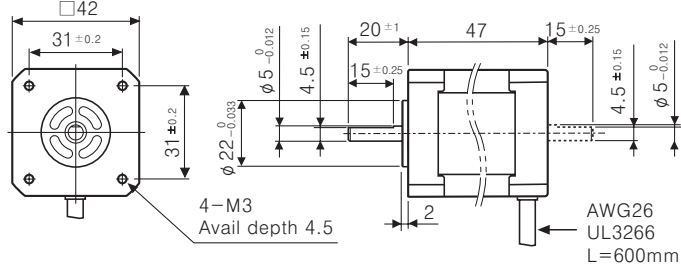
■ Dimensions

● A2K-S544(W)-□



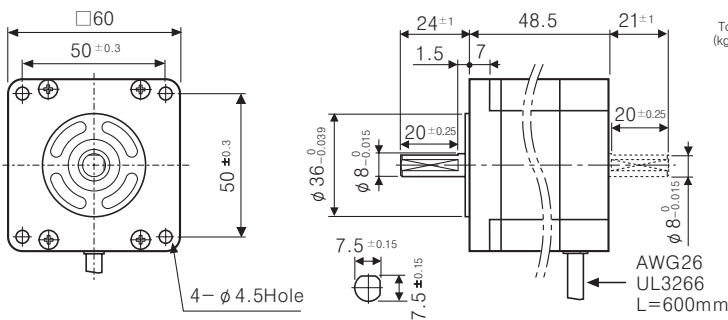
Unit : mm

● A3K-S545(W)-□



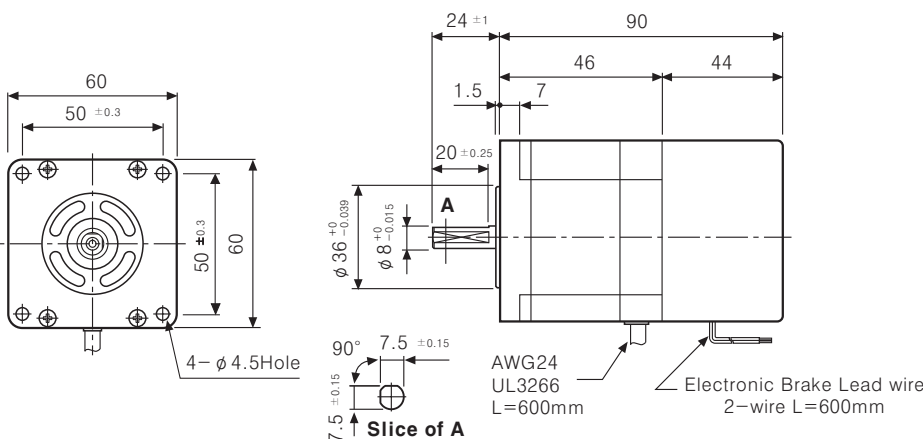
Unit : mm

● A4K-S564(W)-□/ A4K-M564(W)-□

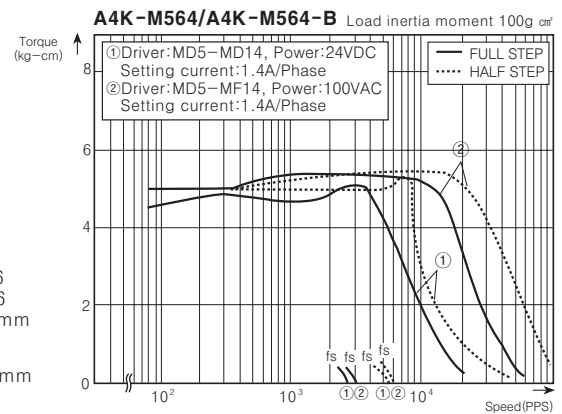
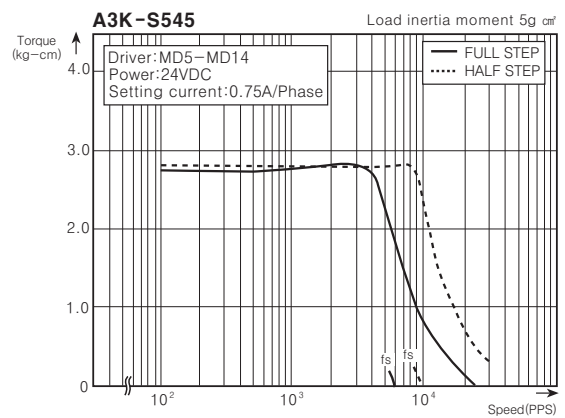
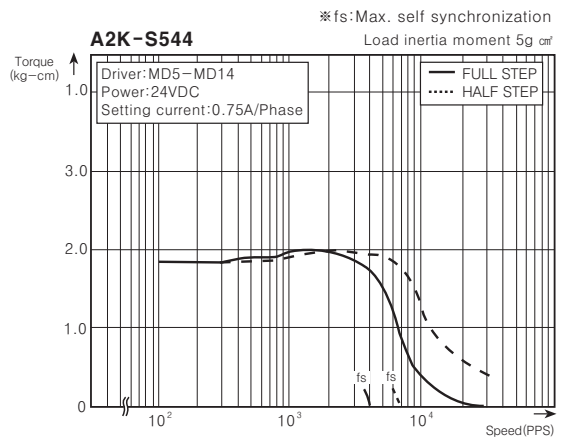


Unit : mm

● A4K-S564-□B/A4K-M564-□B

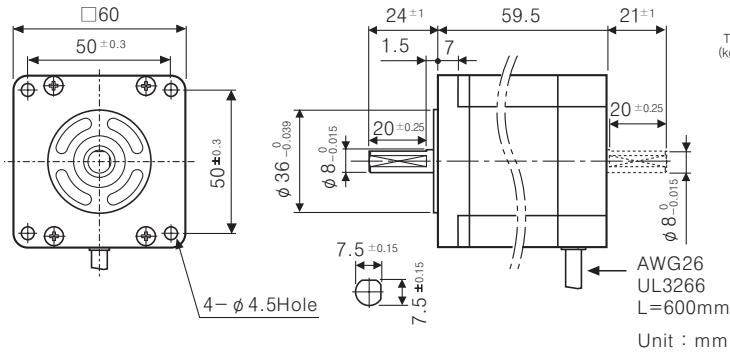


■ Characteristic



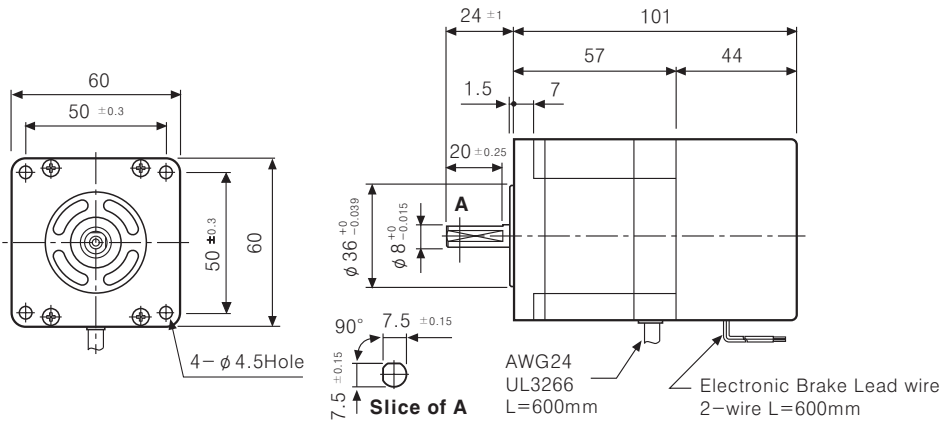
5-Phase stepping motor

●A8K-S566(W)-□/ A8K-M566(W)-□

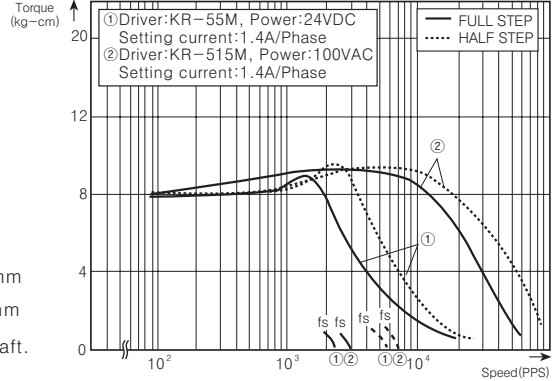


※This is dual shaft dimension. In case of single shaft there is no (.....) shaft.

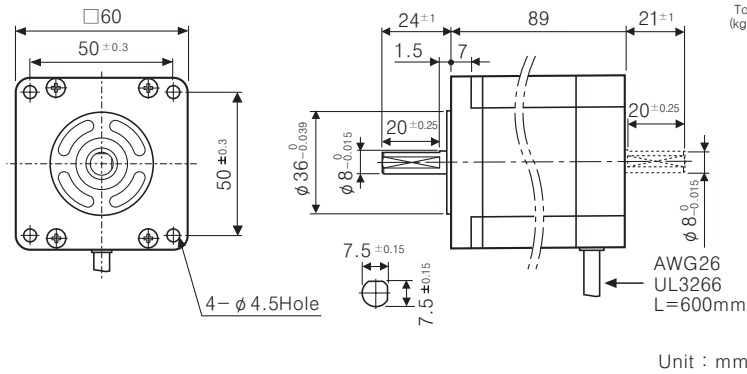
●A8K-S566(W)-□B/ A8K-M566-□B



A8K-M566/A8K-M566-B Load inertia moment 100g ω

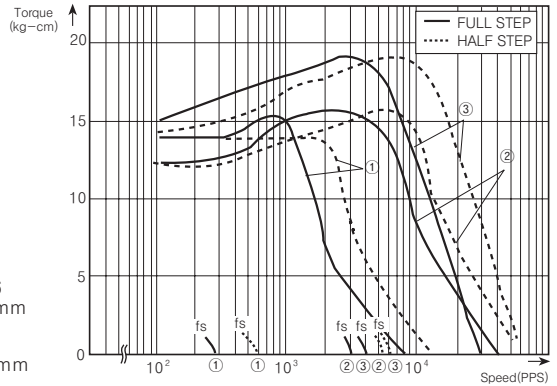


●A16K-M569(W)-□/ A16K-G569(W)-□

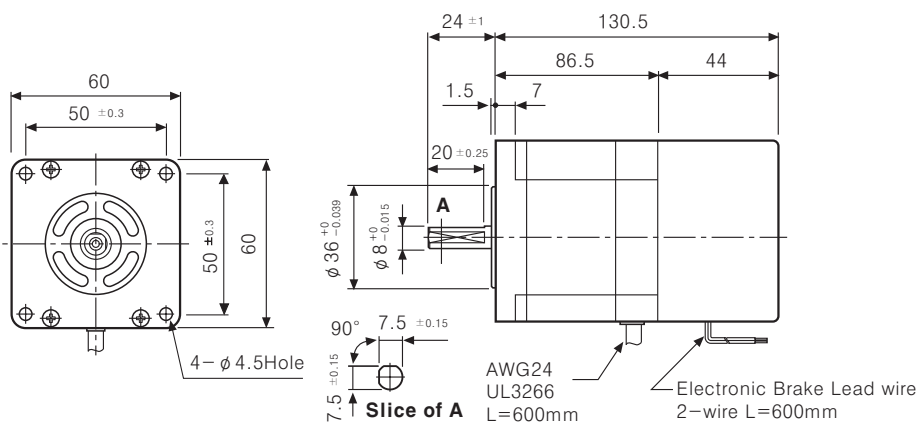


A16K-M(G)569/ A16K-M(G)569-B

※fs: Max. self synchronization
Load inertia moment 100g ω



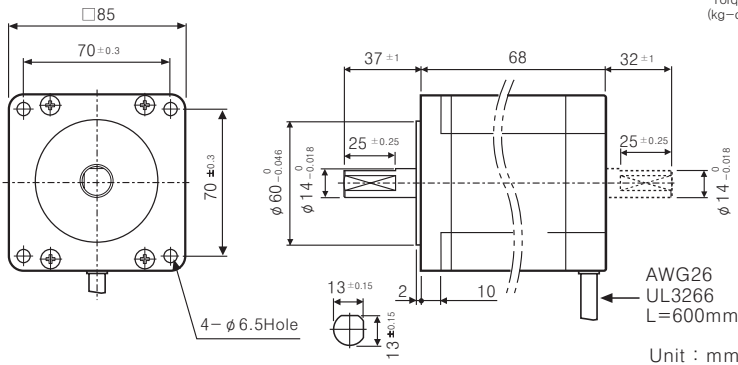
●A16K-M569-□B/ A16K-G569-□B



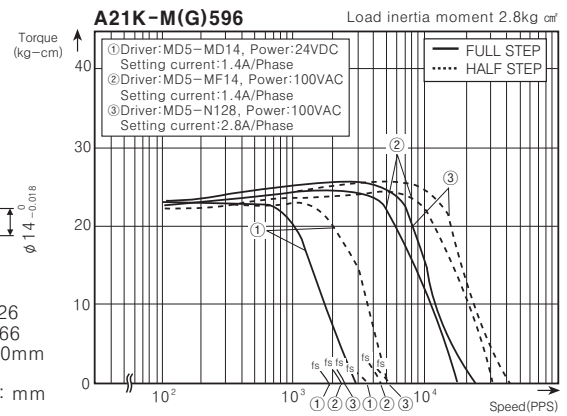
5-Phase stepping motor

■ Dimensions

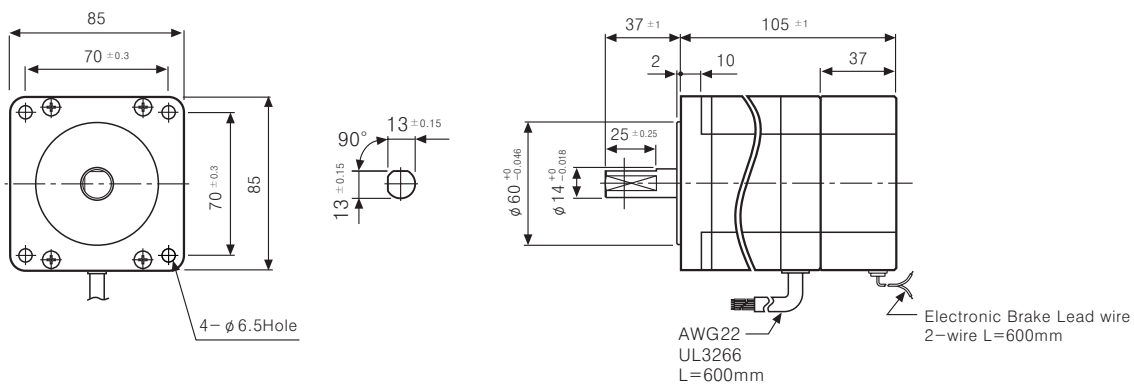
● A21K-M596(W)-□/ A21K-G596(W)-□



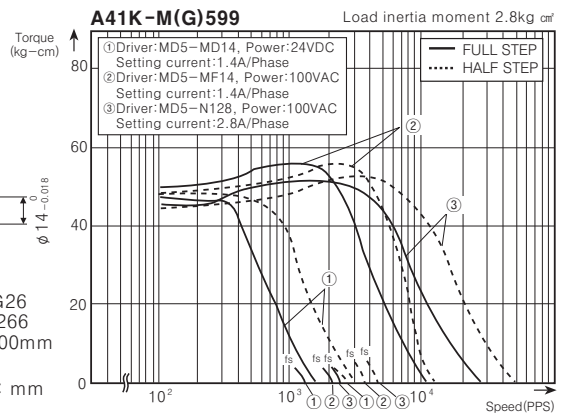
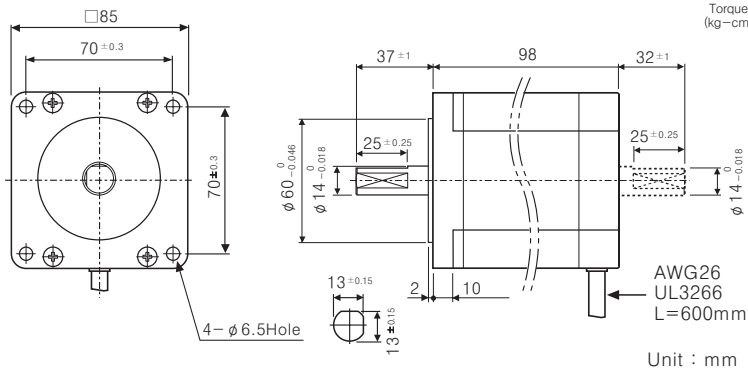
■ Characteristic



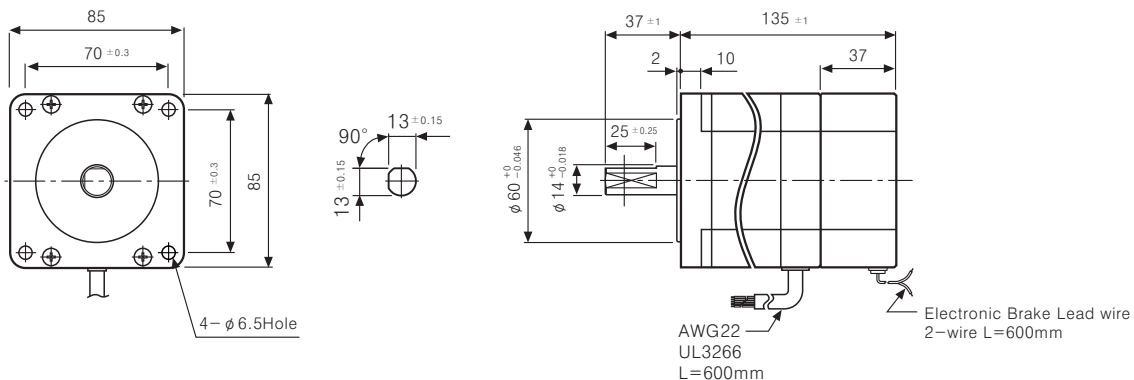
● A21K-M596-□B/ A21K-G596-□B



● A41K-M599(W)-□/ A41K-G599(W)-□

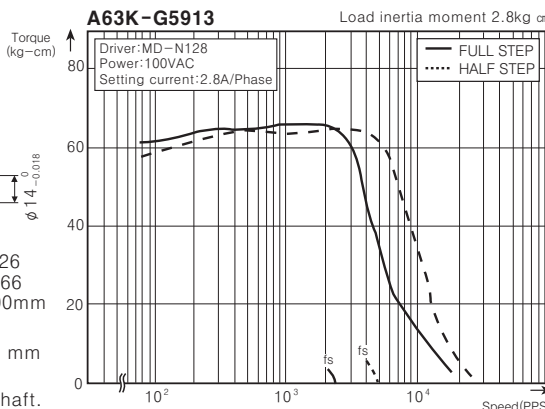
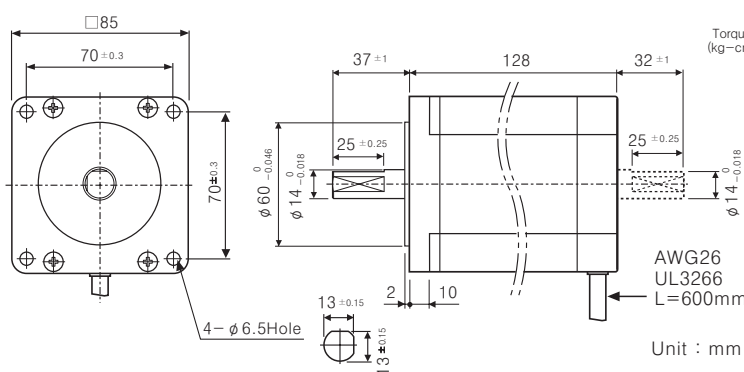


● A41K-M599-□B/ A41K-G599-□B



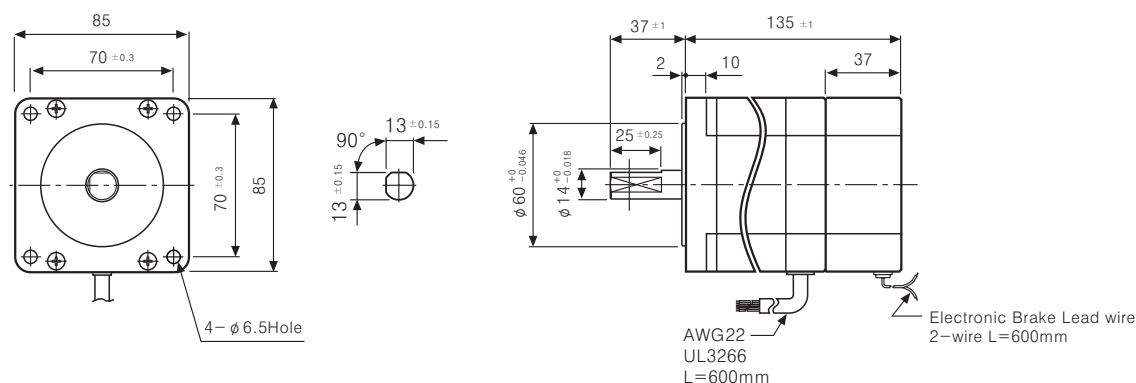
5-Phase stepping motor

●A63K-M5913(W)-□/ A63K-G5913(W)-□



※This is dual shaft dimension. In case of single shaft there is no(.....) shaft.

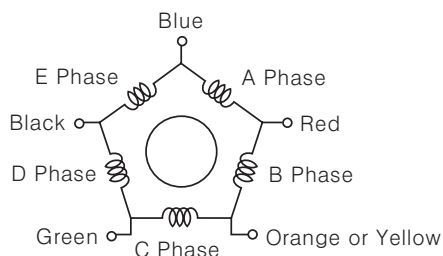
●A63K-M5913-□B/A63K-G5913-□B



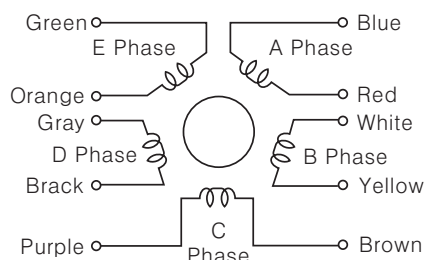
■ Connection diagram

Each phase(Coil) of stepping motor and color of lead wire is shown as following. Our product has Pentagon and Standard connections by inner connection of motor.

●Pentagon connection(Standard)



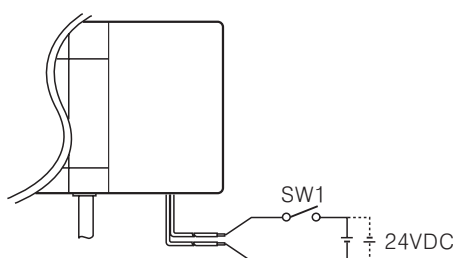
●Standard connection(Optional)



Please connect standard wiring motor to 5-phase stepping drive after connect wiring of motor as the below chart.

Standard connected product lead-wire color	Pentagon connected product lead-wire color
Gray + Red	Blue
Yellow + Black	Red
Orange + White	Orange
Brown + Green	Green
Blue + Purple	Black

■ Electronic brake connection



※SW1 ON → Brake OFF

SW1 OFF → Brake ON

※Brake power is non-polar type, and do not exceed the rated excitation voltage.

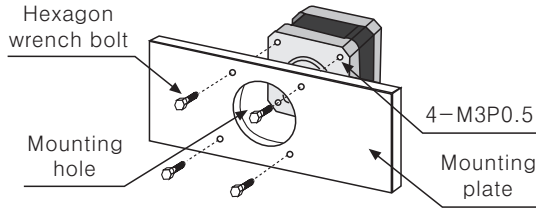
5-Phase stepping motor

■ Shaft type motor mounting

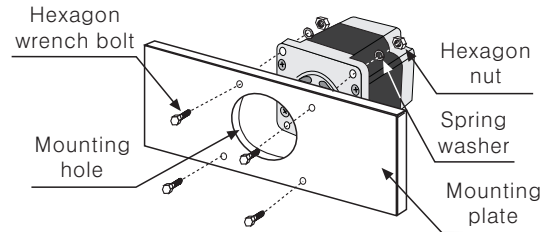
1. Set mounting

- ① Please mount closely on the surface of a panel which has high-thermal conductivity such as iron, aluminum etc. for protection against heat and vibration.
- ② Please assemble motor tightly using hexagon wrench bolt, nut.
- ③ Please see below chart for the thickness of mounting plate and bolt.

●24 Square / 42 Square



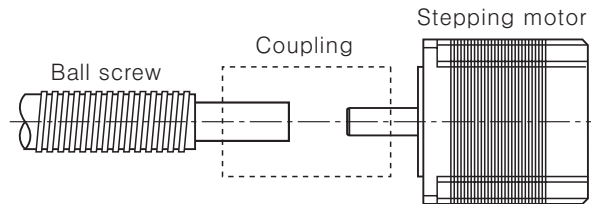
●60 Square / 85 Square



Model	The thickness of mounting plate	Using bolt
A□K-□52□	Min. 3mm	M2.6
A□K-□54□		M3
A□K-□56□	Min. 4mm	M4
A□K-□59□	Min. 5mm	M6

2. Connection with load

- ① Please use flexible coupling when assembling a load (Ball-Screw etc.) at the shaft of motor.
If the center is not matched, it may cause the life cycle of the bearing to be reduced or an incident such as a break of the motor shaft may occurred.
- ② When processing shaft or assembling pulley etc., please don't affect an impact or the weight of thrust to the shaft.



■ Caution for using

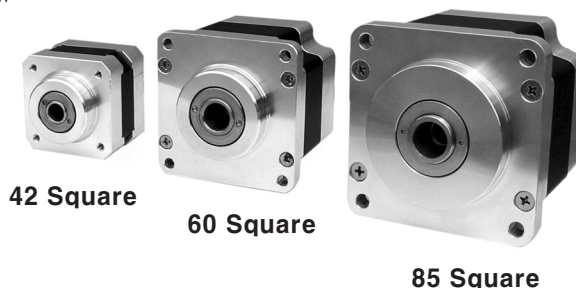
1. Do not disassemble motor.
2. Do not drop motor.
3. Do not pull the connecting cable of motor.
4. Please avoid the following
 - ① A place which can cause vibration or an impact to motor.
 - ② A place which has a lot of pollutant like dust etc.
 - ③ A place which can cause water or oil etc. to go into motor.
 - ④ A place where flammable or corrosive gas exists.
 - ⑤ A place where the ambient temperature is beyond -10°C to $+50^{\circ}\text{C}$.
5. Temperature rise
Please use it on a surface temperature under 100°C .
The surface temperature of motor can be significantly increased in case of driving the motor by constant current. In this case please consider using forced cooling methods like a fan etc.
6. Usage in low temperature
The features of max. operation and max. start-stop frequency may go down as the ambient temperature of ball bearing for the axis of motor falls down.
But, use it operating motor slowly as the torque of motor is not damaged.
7. The noise of electromagnetic brake
The short-noise when power applies is occurred by brake operation.

5-Phase stepping motor

□42mm/□60mm/□85mm Hollow shaft type 5-phase stepping motor

■ Features

- It adopts the method connected Ball-screw or TM-screw directly and removed the coupling.
- Exclude the vibration, noise with removing coupling.
- Economical price.
- Best suited for applications with small sized equipment.
- Compact design and light weight with high accuracy, speed and torque.

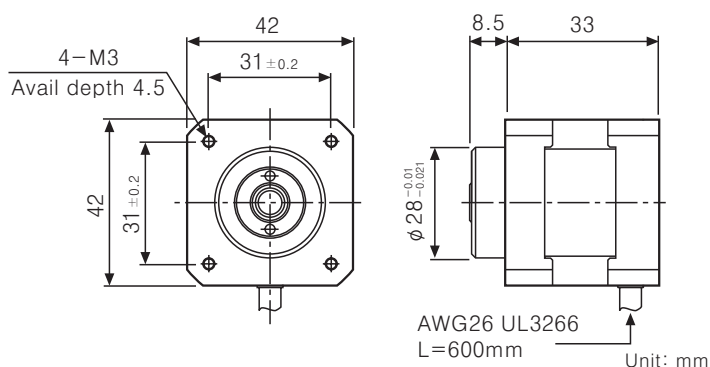


⚠ Please read "Caution for your safety" in operation manual before using.

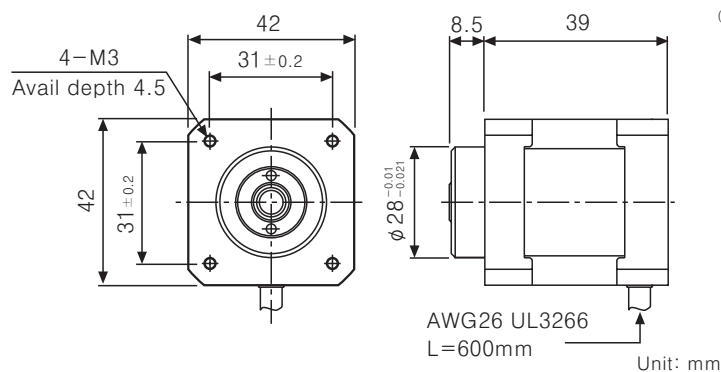


■ Dimensions

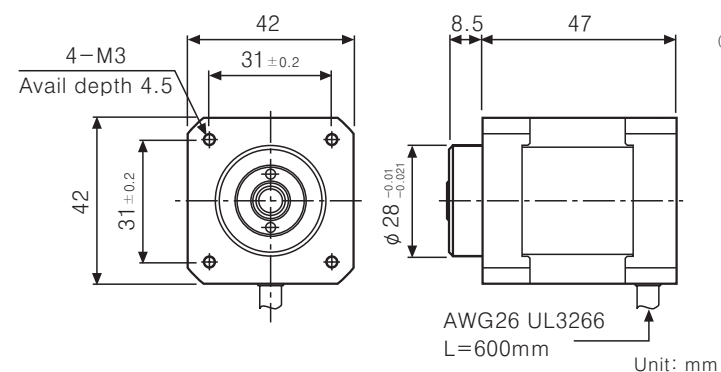
● AH1K-S543



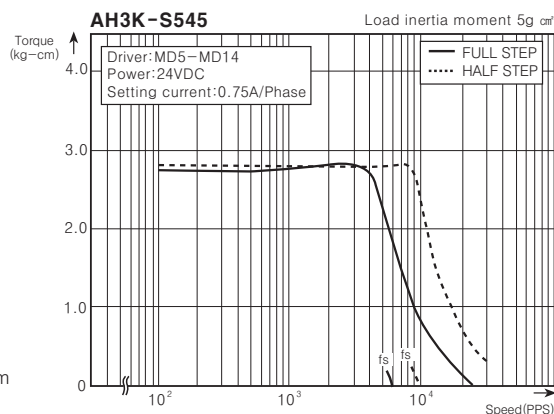
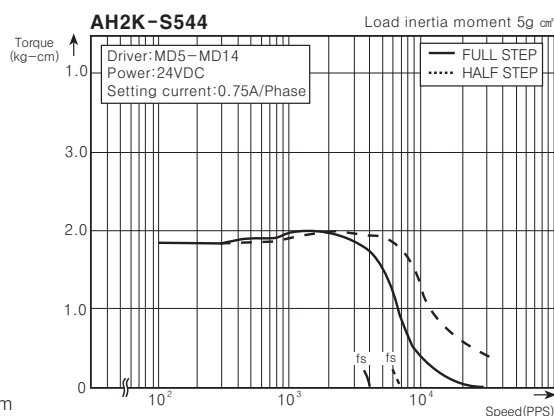
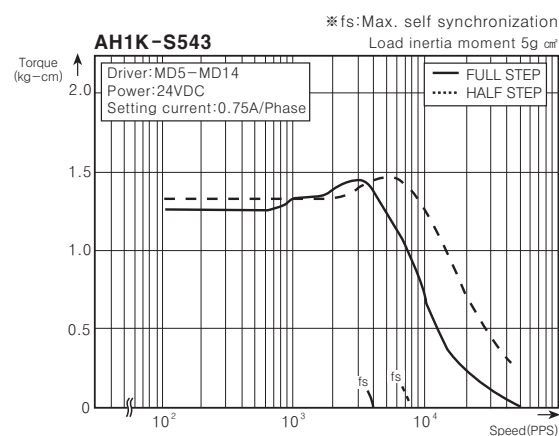
● AH2K-S544



● AH3K-S545



■ Characteristic

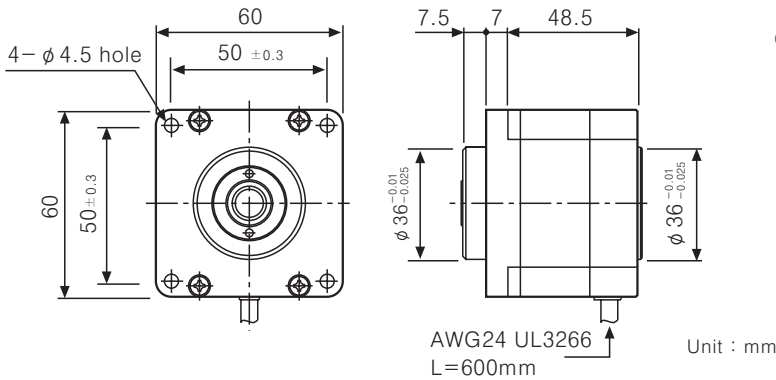


※ According to processing, the 42mm square can be used both single and double shaft.

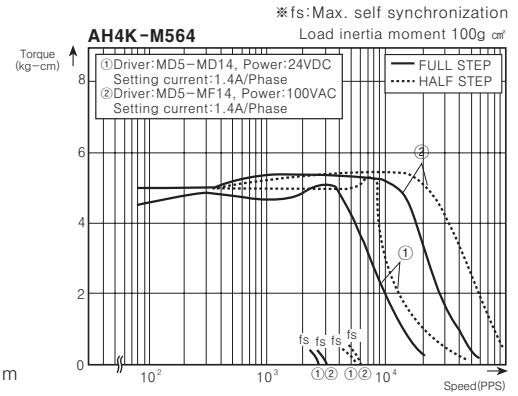
5-Phase stepping motor

■ Dimensions

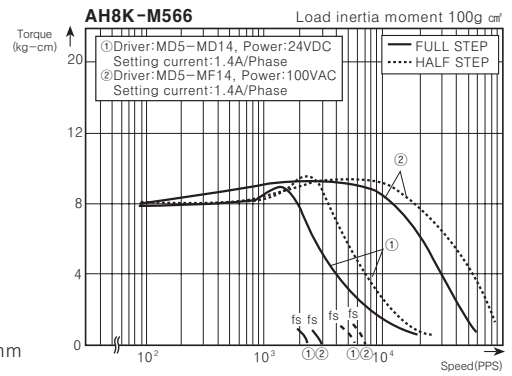
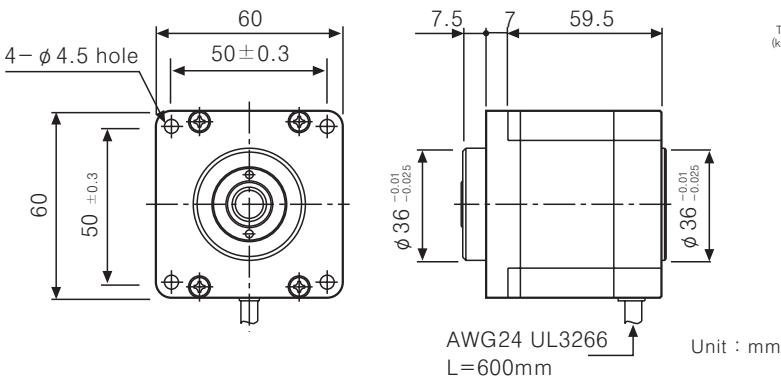
●AH4K-□564(W)



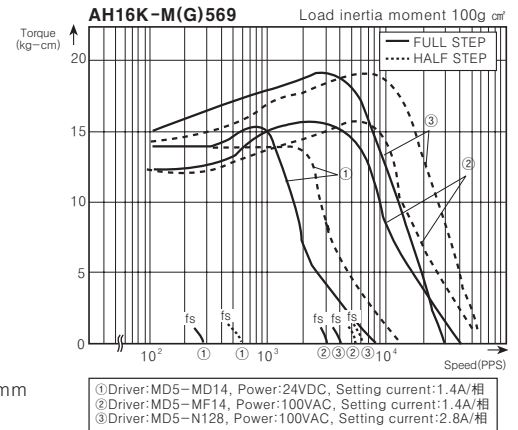
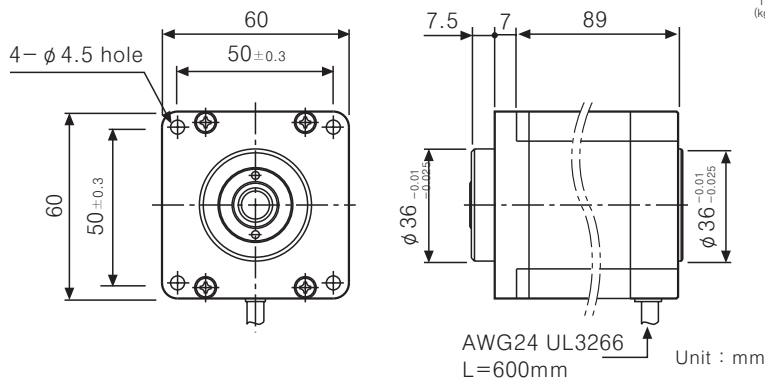
■ Characteristic



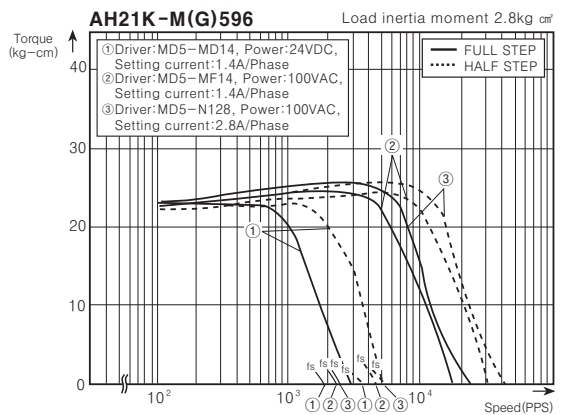
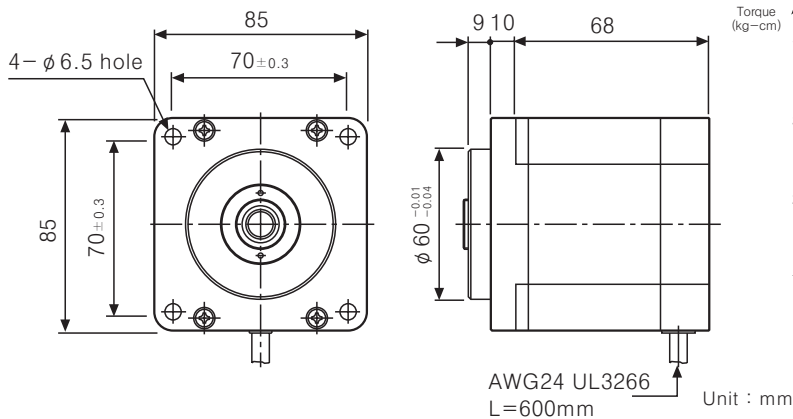
●AH8K-□566(W)



●AH16K-□569(W)



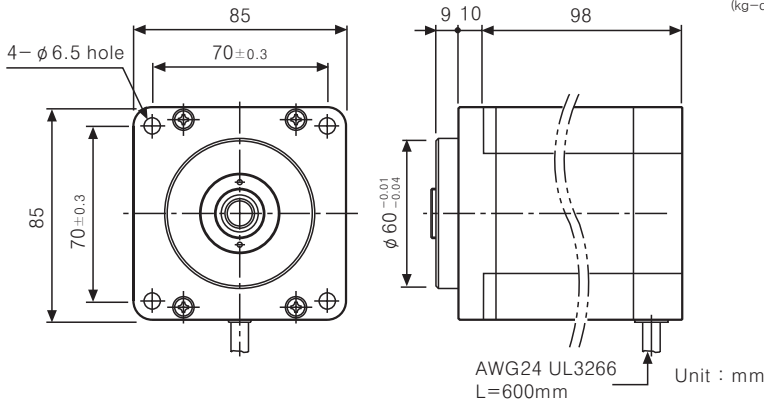
●AH21K-□596(W)



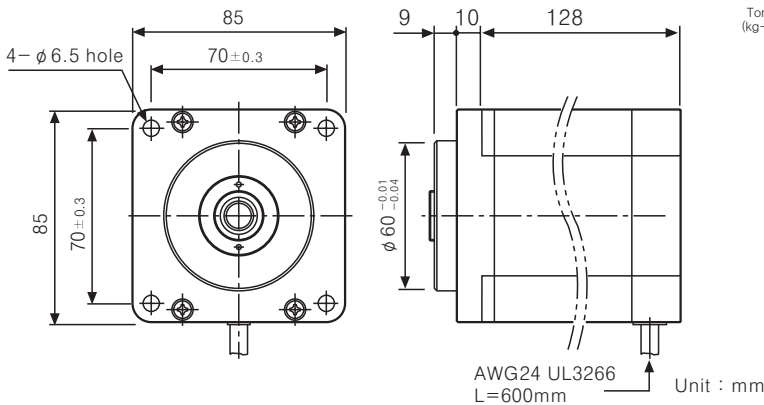
5-Phase stepping motor

■ Dimensions

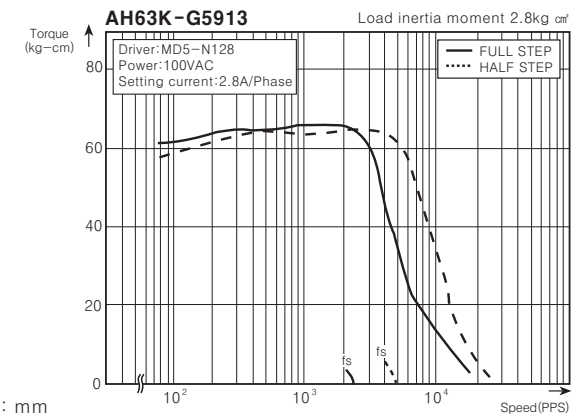
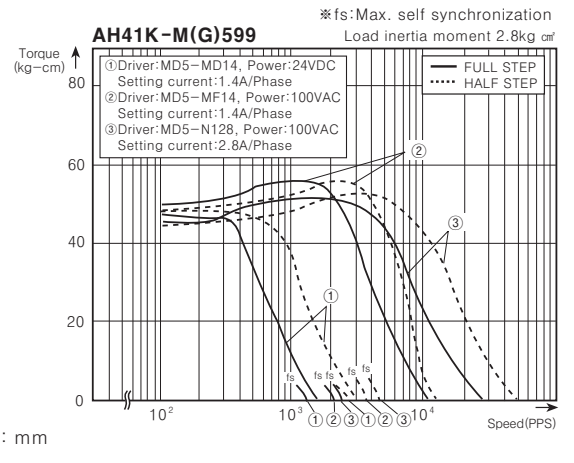
● AH41K - □ 599(W)



● AH63K - □ 5913(W)



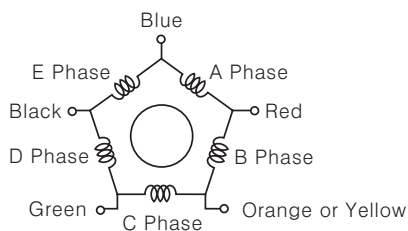
■ Characteristic



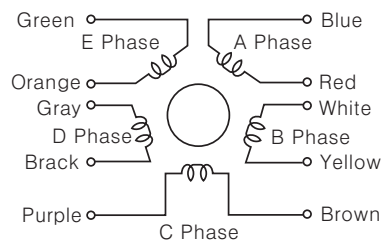
■ Connection diagram

Each phase (Coil) of stepping motor and color of lead wire is shown as following.
Our product has Pentagon and Standard connections by inner connection of motor.

● Pentagon connection (Standard)

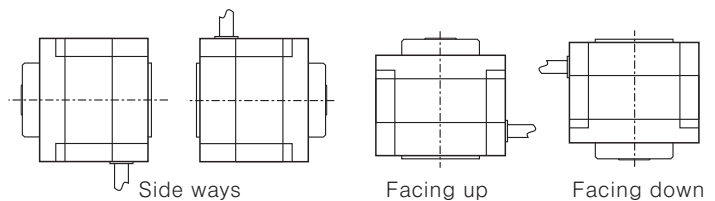


● Standard connection (Option)

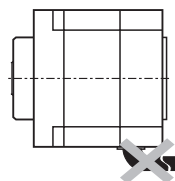


■ Motor mounting

It is allowable to mount the motor in any direction of horizon, up or down.
But, please be careful of overhang and thrust load placed on the shaft.



And, be sure of overload on Motor's cable.
It may cause the cable of Motor to break.

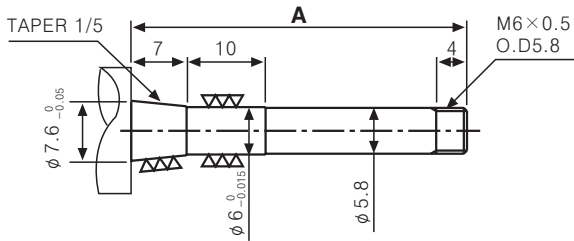


5-Phase stepping motor

Process for shaft assembly

In order to connect external shaft to our motor it should be processed as below drawings and be assembled.

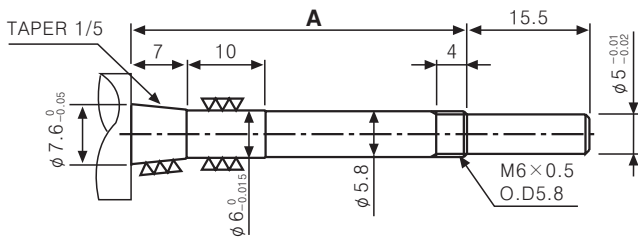
●42 Square(AH□K-□54□ Series) single shaft



(Unit:mm)

MODEL	A
AH1K-□543	42.5
AH2K-□544	48.5
AH3K-□545	56.5

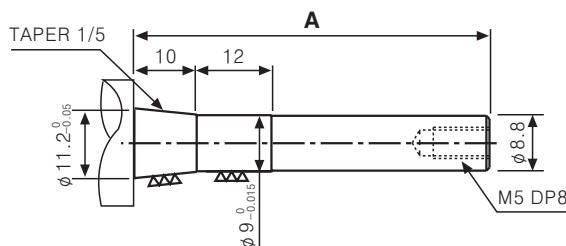
●42 Square(AH□K-□54□ Series) dual shaft



(Unit:mm)

MODEL	A
AH1K-□543	42.5
AH2K-□544	48.5
AH3K-□545	56.5

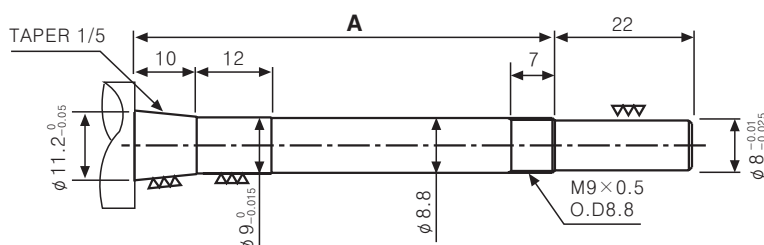
●60 Square(AH□K-□56□ Series) single shaft



(Unit:mm)

MODEL	A
AH4K-□564	46
AH8K-□566	57
AH16K-□569	86.5

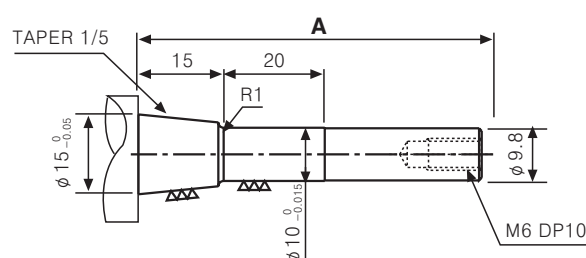
●60 Square(AH□K-□56□W Series) dual shaft



(Unit:mm)

MODEL	A
AH4K-□564W	56.5
AH8K-□566W	67.5
AH16K-□569W	97

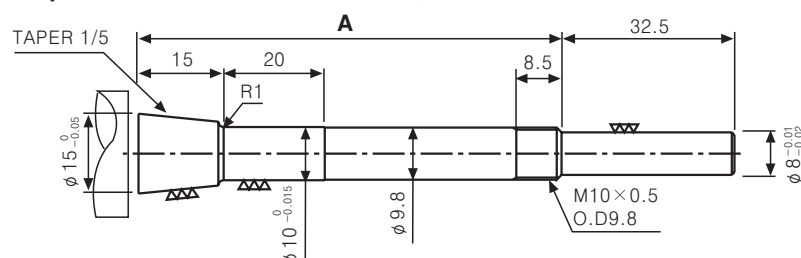
●85 Square(AH□K-□59□ Series) single shaft



(Unit:mm)

MODEL	A
AH21K-□596	64.5
AH41K-□599	94
AH63K-□5913	124.5

●85 Square(AH□K-□59□W Series) dual shaft



(Unit:mm)

MODEL	A
AH21K-□596W	79.5
AH41K-□599W	109.5
AH63K-□5913W	139.5

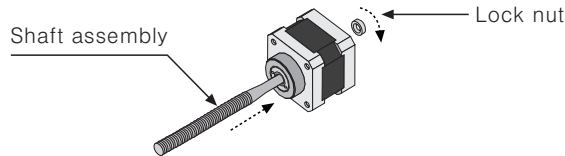
5-Phase stepping motor

■ Shaft for assembly with hollow shaft motor

Please assemble the shaft with motor tightly as in the following picture. It may be not transferred the torque of motor to the shaft when it is not assembled tightly.

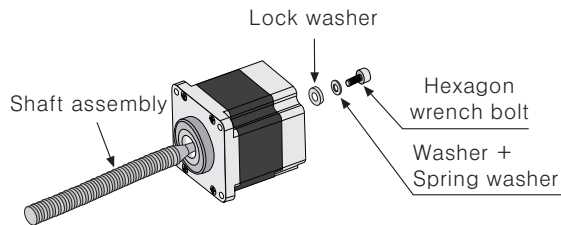
● TAP HOLE type motor

Please use it by fixing lock nut tightly on motor.



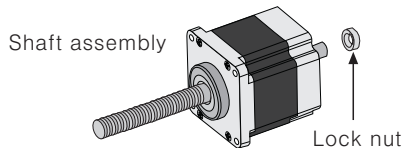
● Through HOLE type motor for single shift

Please use it by fixing hexagon wrench bolt, flat washer, spring washer, lock washer on motor tightly as following drawing.



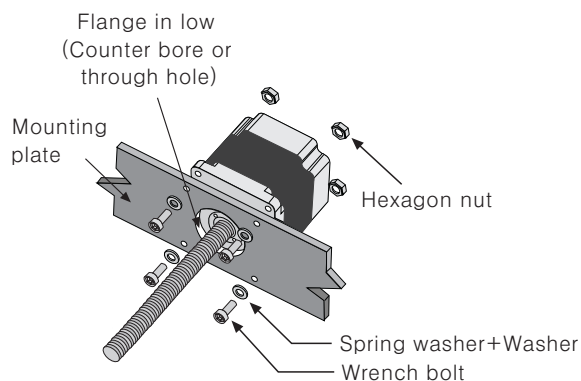
● Through HOLE type motor for dual shift

Please use it by fixing lock nut tightly on motor as in following drawing.

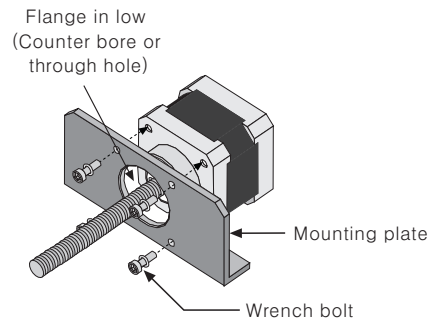


● Please use it by fixing hexagon wrench bolt, nut, spring washer, flat washer on motor tightly when installing motor and refer to the following table for thickness of mounting plate and the bolts.

< Through HOLE type >



< TAP HOLE type >



Model	The thickness of mounting plate	Using bolt
AH□K-□54□ Series	Min. 3[mm]	M3
AH□K-□56□ Series	Min. 4[mm]	M4
AH□K-□59□ Series	Min. 5[mm]	M6

■ Caution for using

1. Do not disassemble motor.
2. Do not pull the connecting cable of motor.
3. Please avoid the following
 - ① A place which can cause vibration or an impact to motor.
 - ② A place which has a lot of pollutant like dust etc.
 - ③ A place where water or oil can permeate into the motor easily.
 - ④ A place where flammable or corrosive gas exists.
 - ⑤ A place where the ambient temperature is beyond of $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$.
5. Temperature rise

Please use it on a surface temperature under 100°C . The surface temperature of motor can be significantly increased in case of driving the motor by constant current. In this case please consider using forced cooling methods like a fan etc.
6. Usage in low temperature

The features of Max. self-starting frequency and Max. operation may go down as the ambient temperature of ball bearing for the axis of motor falls down. But, use it operating motor slowly as the torque of motor is not damaged.