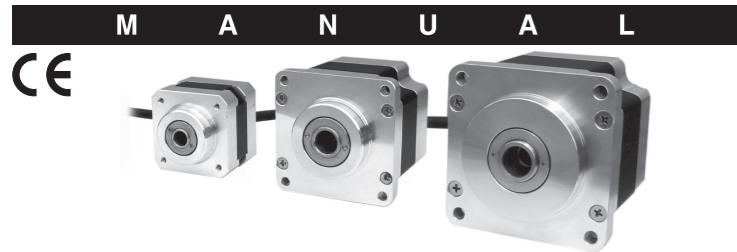


# Autonics

## 5 PHASE HOLLOW SHAFT TYPE STEPPING MOTOR



Thank you very much for selecting Autonics products.  
For your safety, please read the following before using.

### Caution for your safety

- Please keep these instructions and review them before using this unit.
- Please observe the cautions that follow:
  - Warning** Serious injury may result if instructions are not followed.
  - Caution** Product may be damaged, or injury may result if instructions are not followed.
- The following is an explanation of the symbols used in the operation manual.
  - Injury or danger may occur under special conditions.

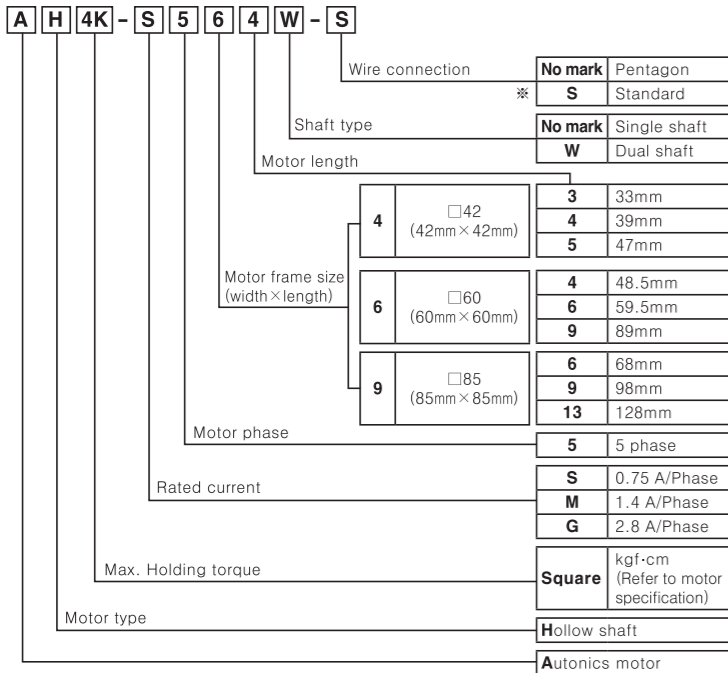
### Warning

1. In case of using this unit with machinery (medical equipment, vehicle, train, airplane, combustion apparatus, entertainment processing equipment, conveyor, elevator or safety device, etc.), it is required to install fail-safe device, or contact us for information required.  
It may cause serious a fire, human injury or property loss.

### Caution

- Do not put flammable objects around this unit.  
It may cause a fire or burn.
- Do not obstacle object for well ventilation around this unit.  
It may cause a damage to this product or malfunction of peripheral equipment by motor heating.
- The surface temperature of the motor is possible to be over 70°C in normal operating state. Please put a caution mark on outstanding place when somebody may approach to the operating motor.  
It may cause a burn.
- Do not carry the cable or rotating part of this unit.  
It may cause human injury.
- Do not inordinate impact or continuous vibration to this unit.  
It may cause malfunction of this product.
- Please put a cover on the rotating part of this unit.  
It may cause human injury.
- Do not disassemble or modify this unit.  
It may cause damage to this product or quality down.
- Please separate as industrial scrapped material when disuse this unit.

### Ordering information



\* Standard wiring is optional.  
\* The above specifications are subject to change and some models may be discontinued without notice.

### Specifications

Model	AH1K-S543-□	AH2K-S544-□	AH3K-S545-□
Max. holding torque(※1)	1.3 kgf·cm (0.13 N·m)	1.8 kgf·cm (0.18 N·m)	2.4 kgf·cm (0.24 N·m)
Moment of rotor inertia	35 g·cm <sup>2</sup> (35x10 <sup>-7</sup> kg·m <sup>2</sup> )	54 g·cm <sup>2</sup> (54x10 <sup>-7</sup> kg·m <sup>2</sup> )	68 g·cm <sup>2</sup> (68x10 <sup>-7</sup> kg·m <sup>2</sup> )
Rated current	0.75 A/Phase		
Basic step angle	0.72° / 0.36° (Full/Half)		
Unit weight	Approx. 0.25kg	Approx. 0.3kg	Approx. 0.4kg

Model	AH4K-S564(W)-□	AH4K-M564(W)-□	AH8K-S566(W)-□	AH8K-M566(W)-□	AH16K-M569(W)-□	AH16K-G569(W)-□
Max. holding torque(※1)	4.2 kgf·cm (0.42 N·m)	4.2 kgf·cm (0.42 N·m)	8.3 kgf·cm (0.83 N·m)	8.3 kgf·cm (0.83 N·m)	16.6 kgf·cm (1.66 N·m)	16.6 kgf·cm (1.66 N·m)
Moment of rotor inertia	175 g·cm <sup>2</sup> (175x10 <sup>-7</sup> kg·m <sup>2</sup> )	175 g·cm <sup>2</sup> (175x10 <sup>-7</sup> kg·m <sup>2</sup> )	280 g·cm <sup>2</sup> (280x10 <sup>-7</sup> kg·m <sup>2</sup> )	280 g·cm <sup>2</sup> (280x10 <sup>-7</sup> kg·m <sup>2</sup> )	560 g·cm <sup>2</sup> (560x10 <sup>-7</sup> kg·m <sup>2</sup> )	560 g·cm <sup>2</sup> (560x10 <sup>-7</sup> kg·m <sup>2</sup> )
Rated current	0.75 A/Phase	1.4 A/Phase	0.75 A/Phase	1.4 A/Phase	1.4 A/Phase	2.8 A/Phase
Basic step angle	0.72° / 0.36° (Full/Half)					
Unit weight	Approx. 0.6kg		Approx. 0.8kg		Approx. 1.3kg	

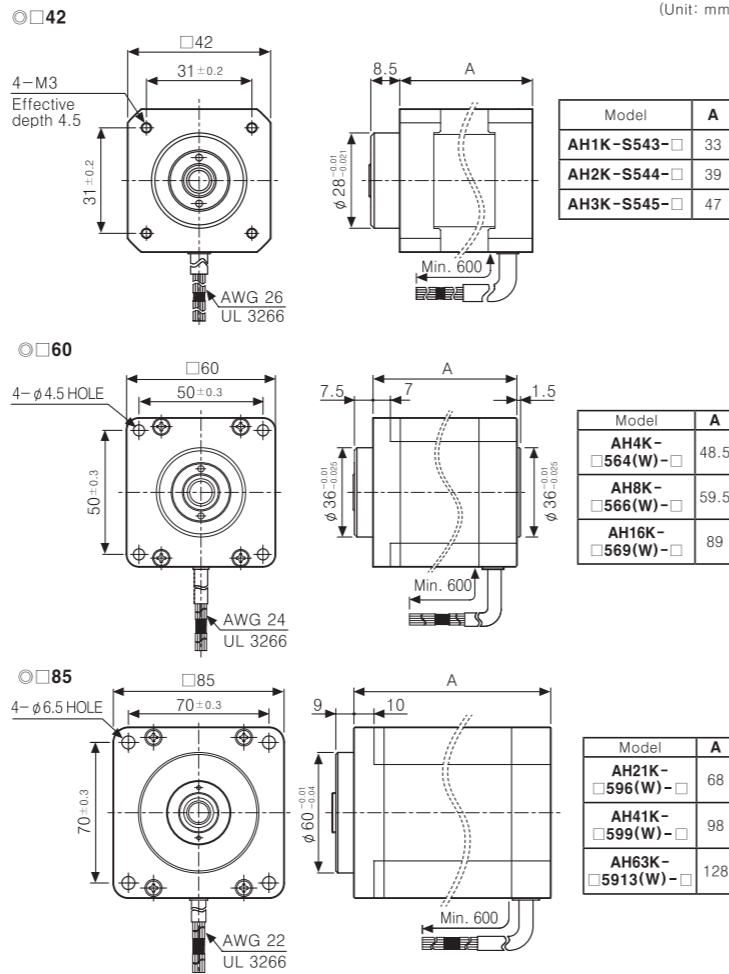
Model	AH21K-M596(W)-□	AH21K-G596(W)-□	AH41K-M599(W)-□	AH41K-G599(W)-□	AH63K-M5913(W)-□	AH63K-G5913(W)-□
Max. holding torque(※1)	21 kgf·cm (2.1 N·m)	21 kgf·cm (2.1 N·m)	41 kgf·cm (4.1 N·m)	41 kgf·cm (4.1 N·m)	63 kgf·cm (6.3 N·m)	63 kgf·cm (6.3 N·m)
Moment of rotor inertia	1,400 g·cm <sup>2</sup> (1,400x10 <sup>-7</sup> kg·m <sup>2</sup> )	1,400 g·cm <sup>2</sup> (1,400x10 <sup>-7</sup> kg·m <sup>2</sup> )	2,700 g·cm <sup>2</sup> (2,700x10 <sup>-7</sup> kg·m <sup>2</sup> )	2,700 g·cm <sup>2</sup> (2,700x10 <sup>-7</sup> kg·m <sup>2</sup> )	4,000 g·cm <sup>2</sup> (4,000x10 <sup>-7</sup> kg·m <sup>2</sup> )	4,000 g·cm <sup>2</sup> (4,000x10 <sup>-7</sup> kg·m <sup>2</sup> )
Rated current	1.4 A/Phase	2.8 A/Phase	1.4 A/Phase	2.8 A/Phase	1.4 A/Phase	2.8 A/Phase
Basic step angle	0.72° / 0.36° (Full/Half)					
Unit weight	Approx. 1.7kg		Approx. 2.8kg		Approx. 3.8kg	

※ 1: Max. Holding torque is a retaining torque when 5 phase excitation stopped after at the rated current is flowed in motor.

Common specification	
Insulation resistance	Min. 100MΩ (at 500VDC megger) between Motor coil-case
Dielectric strength	1 kVAC(at 0.75 A/Phase is 0.5 kVAC) 50/60Hz for 1 minute between Motor coil-case
Temperature rise	5-Phase excitation for rated current, below 80°C at stop status (resistance method)
Environment	Ambient temperature
	Ambient humidity
Protection	IP30(IEC34-5 standards)

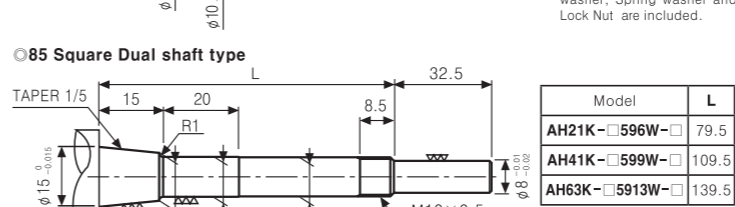
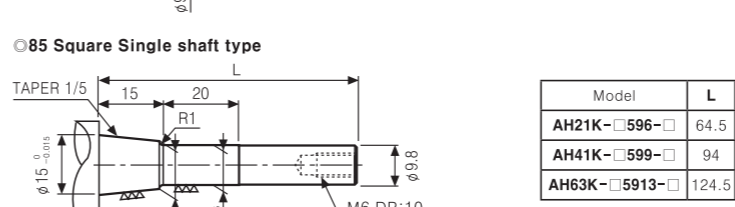
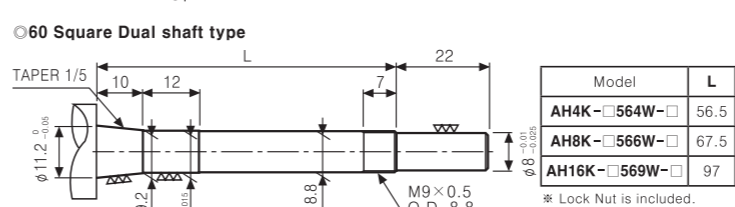
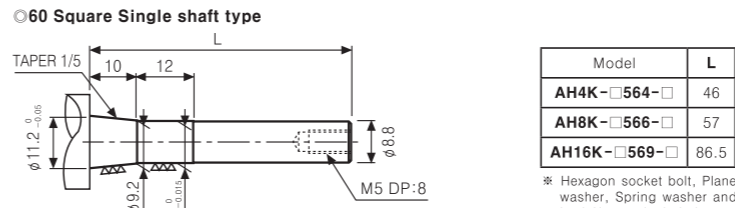
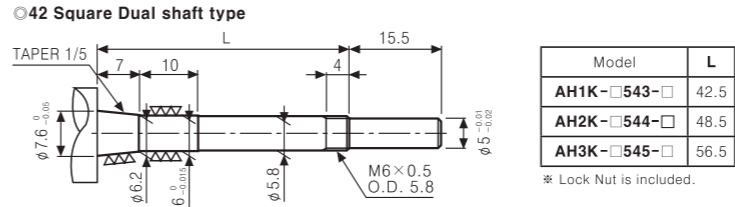
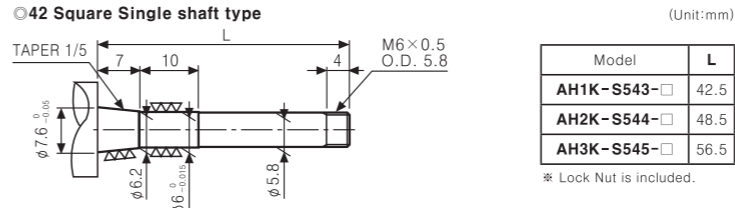
\* Environment resistance is rated at no freezing or condensation.

### Dimensions



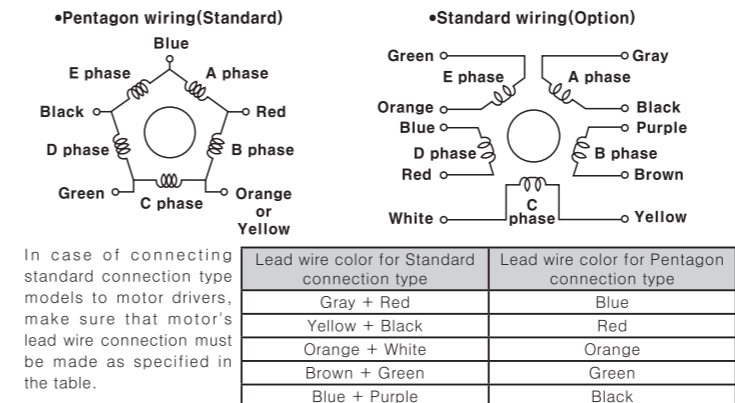
### Processing Example for Shaft Assembly

In order to assemble external shafts into Autonics motors, the shafts must be processed as shown in the figures below.  
This motor is developed for direct connection to the axis of Ball-screw or TM-screw, etc. without a coupling.



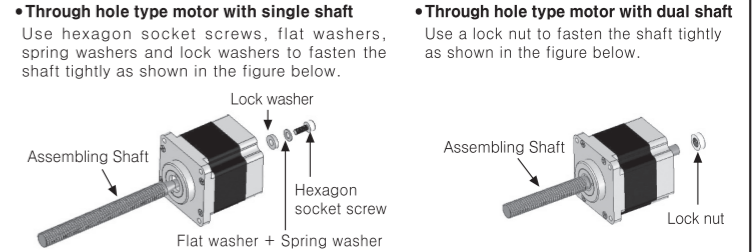
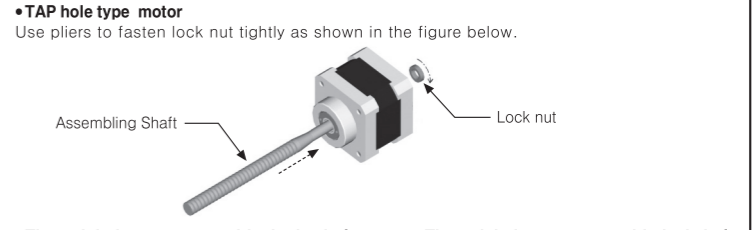
### Connection diagram

Refer to the below for correlations of motor's each phase(coil) and the color of lead wire. Note that Pentagon connection type is a standard model.(Standard connection type is an option model.)



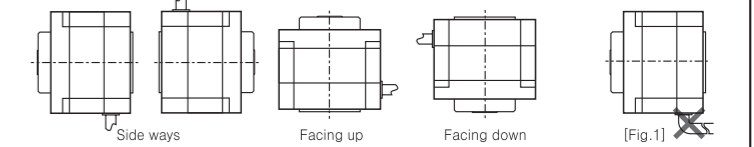
### Shaft assembly for hollow shaft with Motor

Make sure that external shaft assembly into motors must be made as sturdy as possible. If not, motor's torque might not be thoroughly transmitted to the shaft. In case no additional shaft assembly changes would be made, it is recommended to apply adhesives on screw fixing part.

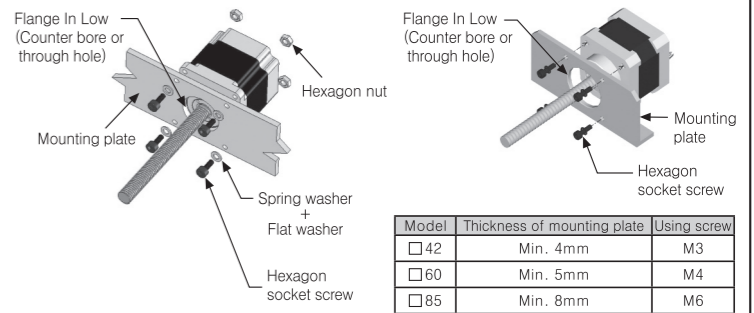


### Motor mounting

• Motors can be mounted in any directions - facing up, facing down and side ways. No matter which direction motors to be mounted, be sure not to apply overhung or thrust load on the shaft. Do not apply excessive force on motor cable when mounting motors like [Fig.1]. It may cause disconnection of motor cable.



• With considering heat radiation and vibration isolation, mount the motor as tight as possible against a metal panel having high thermal conductivity such as iron or aluminum.  
• When mounting motors, use hexagon socket screw, hexagon nuts, spring washers, flat washers. Refer to the table below for allowable thickness of mounting plate and using screw.



### Caution for using

- It may cause the efficiency of motor down if disassembling the motor.
- Do not disassemble motor. Be sure of an impact like motor drop.
- Do not pull the connecting cable of motor.
- Please avoid below place to use this product.
  - The place where can cause vibration or an impact to motor
  - The place where has a lot of pollutant like dust, etc.
  - The place where can cause water or oil, etc. to go into motor
  - The place where flammable or corrosive gas is.
  - The place where ambient temperature is beyond of -10°C to 50°C
- Temperature rise  
The surface temperature of motor shall be under 100°C and it can be significantly increased in case of running motor by constant current drive. In this case, use the fan to lower the temperature forcibly.
- Using at low temperature  
Using motors at low temperature may cause reducing maximum starting/driving characteristics of the motor as ball bearing's grease consistency decreases due to low temperature. (Note that the lower the bearing's grease consistency, the higher the bearing's friction torques.) Start the motor in a steady manner since motor's torque is not to be influenced.

\* It may cause malfunction if above instructions are not followed.

### Major products

- Photoelectric sensors
- Fiber optic sensors
- Door sensors
- Door side sensors
- Area sensors
- Proximity sensors
- Pressure sensors
- Rotary encoders
- Connectors/Sockets
- Switching mode power supplies
- Control switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper motors/drivers/motion controllers
- Graphic/Logic panels
- Field network devices
- Laser marking system(Fiber, CO<sub>2</sub>, Nd:YAG)
- Laser welding/soldering system
- Temperature controllers
- Temperature/Humidity transducers
- Tachometer/Pulse(Rate)meters
- SSR/Power controllers
- Sensor controllers
- Display units
- Panel meters
- Counters
- Timers

**Autonics Corporation**  
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