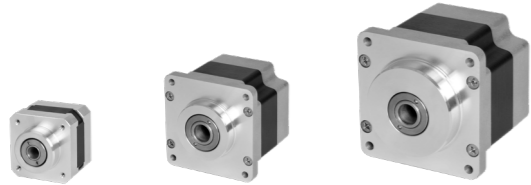


Autonics 5 PHASE HOLLOW SHAFT TYPE STEPPER MOTOR

INSTRUCTION MANUAL



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

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.

※⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow these instructions may result in serious injury or death.

⚠ Caution Failure to follow these instructions may result in personal injury or product damage.

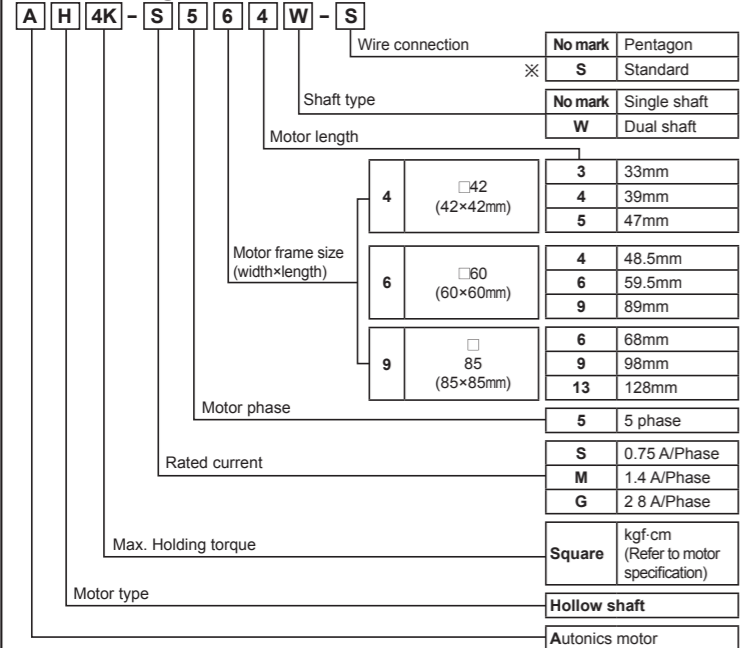
⚠ Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.) Failure to follow this instruction may result in fire, personal injury, or economic loss.
- Fix the unit on the metal plate.** Failure to follow this instruction may result in personal injury, or product and ambient equipment damage.
- Do not connect, repair, or inspect the unit while connected to a power source.** Failure to follow this instruction may result in fire.
- Install the unit after considering counter plan against power failure.** Failure to follow this instruction may result in personal injury, or economic loss.
- Check 'Connections' before wiring.** Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.** Failure to follow this instruction may result in electric shock or fire.
- Install the motor in the housing or ground it.** Failure to follow this instruction may result in electronic shock, fire, or personal injury.
- Make sure to install covers on motor rotating components.** Failure to follow this instruction may result in personal injury.
- Do not touch the unit during or after operation for a while.** Failure to follow this instruction may result in burn due to high temperature of the surface.
- Turn OFF the power directly when error occurs.** Failure to follow this instruction may result in electric shock, fire, or personal injury.

⚠ Caution

- Use the unit within the rated specifications.** Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.** Failure to follow this instruction may result in fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.** Failure to follow this instruction may result in fire or explosion.
- The motor may overheat depending on the environment.** Install the unit at the well-ventilated environment and forced cooling with a cooling fan. Failure to follow this instruction may result in product damage and degradation.

■ Ordering Information



※Standard wiring is optional.
※The above specifications are subject to change and some models may be discontinued without notice.
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

■ Specifications

□42			
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 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	0.75 A/Phase		
Basic step angle	0.72 / 0.36 (Full/Half)		
Unit weight	Approx. 0.25kg	Approx. 0.3kg	Approx. 0.4kg

□60						
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 ² (175×10 ⁻⁷ kg·m ²)	175 g·cm ² (175×10 ⁻⁷ kg·m ²)	280 g·cm ² (280×10 ⁻⁷ kg·m ²)	280 g·cm ² (280×10 ⁻⁷ kg·m ²)	560 g·cm ² (560×10 ⁻⁷ kg·m ²)	560 g·cm ² (560×10 ⁻⁷ kg·m ²)
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	

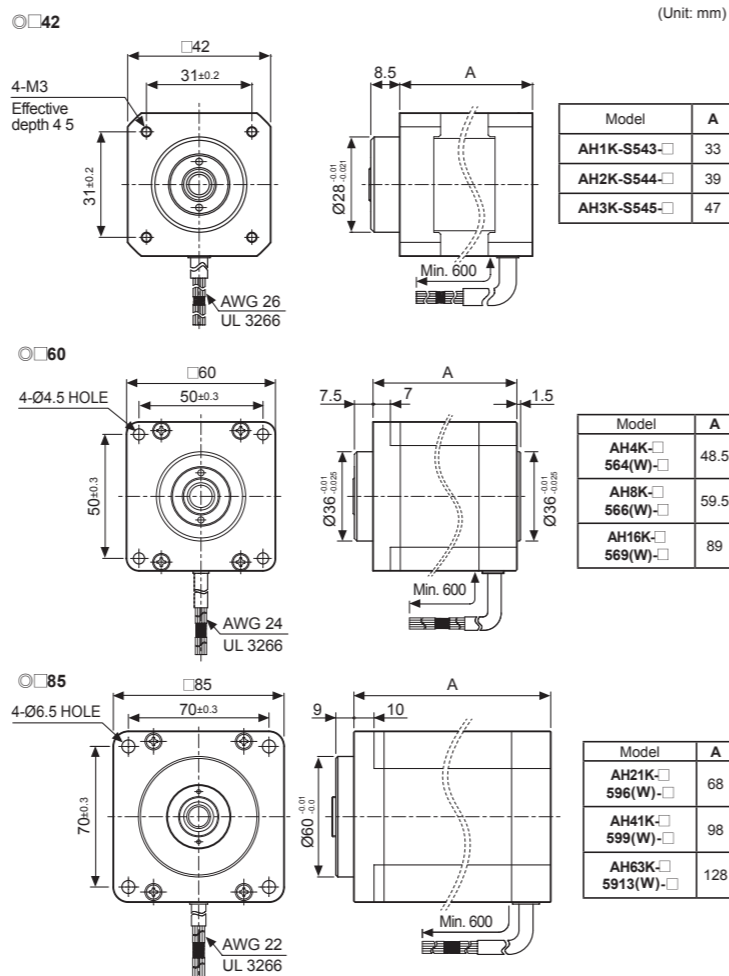
□85						
Model	AH21K-M596(W)-□	AH21K-G596(W)-□	AH41K-M599(W)-□	AH41K-G599(W)-□	AH63K-M599(W)-□	AH63K-G599(W)-□
Max. holding torque (※1)	21 kgf·cm (2.1 N·m)	21 kgf·cm (2.1 N·m)	41 kgf·cm (4.1 N·m)	41 kgf·cm (4.1 N·m)	63 kgf·cm (6.3 N·m)	63 kgf·cm (6.3 N·m)
Moment of rotor inertia	1,400 g·cm ² (1,400×10 ⁻⁷ kg·m ²)	1,400 g·cm ² (1,400×10 ⁻⁷ kg·m ²)	2,700 g·cm ² (2,700×10 ⁻⁷ kg·m ²)	2,700 g·cm ² (2,700×10 ⁻⁷ kg·m ²)	4,000 g·cm ² (4,000×10 ⁻⁷ kg·m ²)	4,000 g·cm ² (4,000×10 ⁻⁷ kg·m ²)
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 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 (EC34-5 standards)

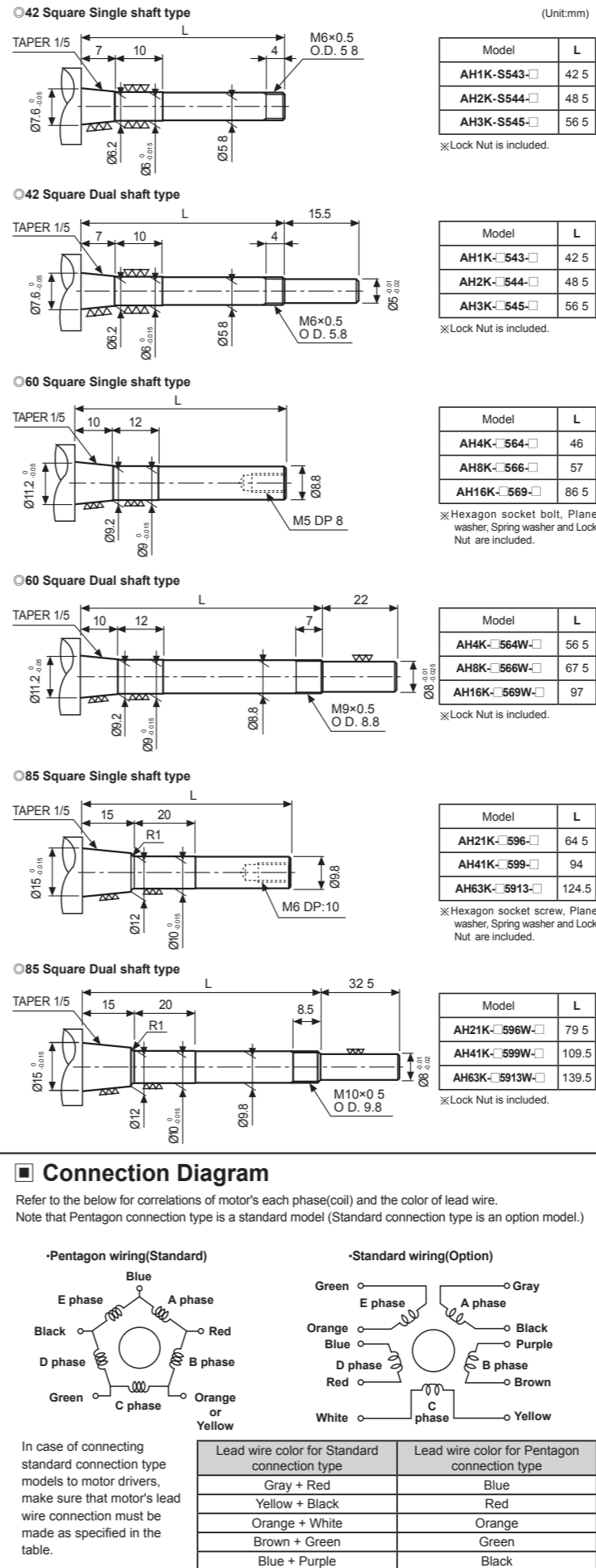
※Environment resistance is rated at no freezing or condensation.

■ Dimensions



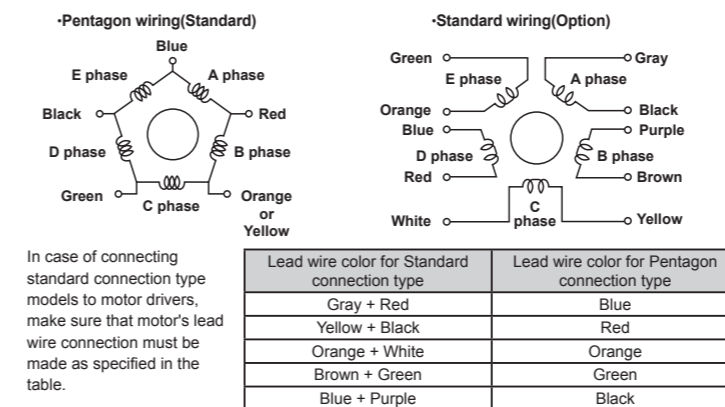
■ Processing Example for Shaft Assembly

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.



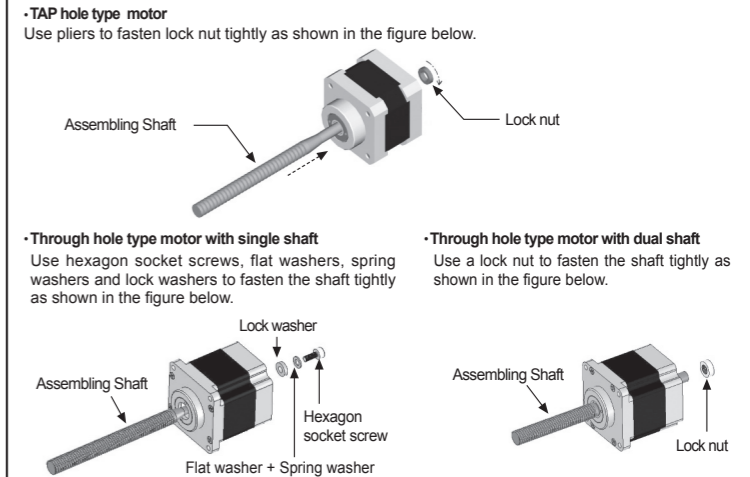
■ Connection Diagram

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).



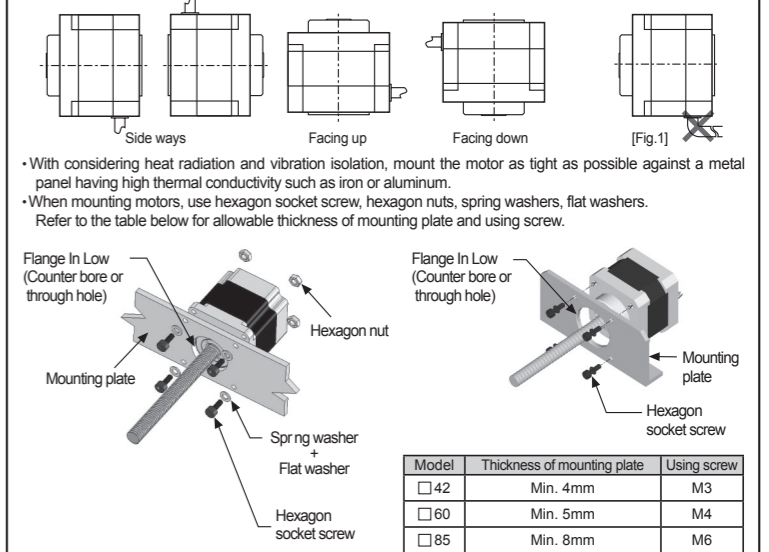
■ Shaft Assembly for Hollow Shaft with Motor

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.



■ Caution during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Using motors at low temperature may cause reducing ball bearing's grease consistency and friction torque is increased. Start the motor in a steady manner since motor's torque is not to be influenced.
- For using motor, it is recommended to maintenance and inspection regularly.
 - ①Unwinding bolts and connection parts for the unit installation and load connection
 - ②Strange sound from ball bearing of the unit
 - ③Damage and stress of lead cable of the unit
 - ④Connection error with driver
 - ⑤Inconsistency between the axis of motor output and the center, concentric (eccentric, declination) of the load, etc.
- This unit may be used in the following environments.
 - ①Indoors (in the environment condition rated in 'Specifications')
 - ②Altitude max. 2,000m
 - ③Pollution degree 2
 - ④Installation category II

■ 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, CO₂, Nd: YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometer/Pulse (Rate) Meters
- Display Units
- Sensor Controllers