Autonics

GEARED TYPE 5 PHASE STEPPING MOTOR

U

☐ 60 Geared type

☐42 Geared type





■85 Geared type

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.

▲ 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.

⚠ Caution: Injury or danger may occur under special conditions.

∆Warning

- 1. In case of using this unit with machinery(nuclear power control, medical equipment, vehicle, train, airplane, combution apparatus, entertainment or safty device, etc.), it is requiied to install fail-safe device, or contact us for information on type required. nay cause a fire, human injury or property loss.
- 2. Do not use this unit where flammable or explosive gas, corrosion and water exist.
- It may cause a fire or burn.

 3. Installation, connection, operation, control, maintenan.
- It may cause a fire or human injury, give electronic shock **4. Please install it in power off.**
- 5. Please earth or install it with housing so that protecting a touch of human body. nav give electronic shock or human ir
- Do not disassemble or modify this unit.

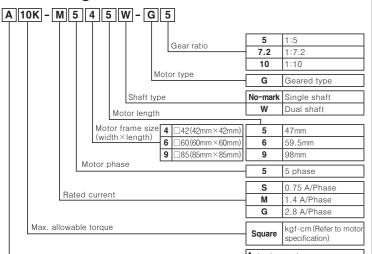
 It may cause damage to this product or quality down

∆Caution

- 1. Please keep the specification of this unit.
- 2. Do not put obstacle object for well ventilation around this unit.
- It may cause a damage to this product or malfunction of peripheral equipment by motor heating 3. Please fix this unit on a metal plate tightly.
- It may cause human injury or damage of this product and peripheral device.

 4. Please stop this unit when mechanical trouble occurred.
- 5. Do not inordinate impact or continuous vibration to this unit.
- 6. 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
- 7. Do not use the brake for safety.
- 8. Do not carry the cable or rotating part of this unit.
- 9. Please put a cover on the rotating part of this unit.
- 10. Please separate as industrial scrapped material when disuse this unit.

Ordering information



★The above specifications are subject to change without notice

Specifications

□85

Model	A10K-S545(W)-G5	A15K-S545(W)-G7.2	A15K-S545(W)-G10		
Max. allowable torque(%1)	10 kgf·cm (1.0 N·m)	1.5 kgf·cm (1.5 N·m)	15 kgf·cm (1.5 N·m)		
Moment of rotor inertia(* 2)	68 g⋅cm² (68x10 ⁻⁷ kg⋅m²)				
Rated current	0.75 A/Phase				
Basic step angle	tep angle 0.144 ° /0.072 ° (Full/Half) 0.1 ° /0.05 ° (I		0.072 ° /0.036 ° (Full/Half)		
Permissible speed range	0 to 360 rpm	0 to 250 rpm	0 to 180 rpm		
Backlash	±35(0.58 °)				
Protection	IP30(IEC34-5 standards)				
Unit weight	Approx. 0.58kg				

□ 60					
Model	A35K-M566(W)-G5 A40K-M566(W)-G7.2 A50K-S566(W)-G				
Max. allowable torque(%1)	35 kgf·cm 40 kgf·cm 50 kgf·cm (3.5 N·m) (4.0 N·m) (5.0 N·m)				
Moment of rotor inertia(* 2)	280 g⋅cm² (280x10 ⁻⁷ kg⋅m²)				
Rated current	1.4 A/Phase				
Basic step angle	0.144 ° /0.072 ° (Full/Half)	0.1 ° /0.05 ° (Full/Half)	0.072 ° /0.036 ° (Full/Half)		
Permissible speed range	le speed 0 to 360 rpm 0 to 250 rpm 0 to 180 rpm		0 to 180 rpm		
Backlash	±20'(0.33°)				
Unit weight	Approx. 1.3kg				

Model	A140K- M599(W)-G5	A140K- G599(W)-G5	A200K- M599(W)-G7.2	A200K- G599(W)-G7.2	A200K- M599(W)-G10	A200K- G599(W)-G10
Max. allowable torque(%1)	140 kgf·cm (14 N·m)		200 kgf·cm (20 N·m)		200 kgf·cm (20 N·m)	
Moment of rotor inertia(※ 2)	2,700 g·cm² (2,700x10 ⁻⁷ kg·m²)					
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	0.144 ° / 0.072 ° (Full/Half)		0.1 ° / 0.05 ° (Full/Half)		0.072 ° / 0.036 ° (Full/Half)	
Permissible speed range	0 to 360 rpm		0 to 250 rpm		0 to 180 rpm	
Backlash			±15'(0.25 °)		
Unit weight			Appro	x. 4.4kg		

¾ 1: Max. allowable torque is a holding torque when stop the motor supplying the rated current * 2: Moment of rotor inertia indicates a part, except Gear Head part

Con	Common specification					
Operation type		Planetary Geared type				
Insul	ation class	CLASS B(130℃)				
Insul	ation resistance	Min. 100№ (at 500VDC megger) between Motor coil-case				
Diele	ectric strength	1 kVAC(at 0.75 A/Phase is 0.5 kVAC) 50/60Hz for 1 min. between Motor coil-case				
Tem	perature rise	5-Phase excitation for rated current, below 80℃ at stop status (resistance method)				
Environment	Ambient temperature	-10 to 50℃, Storage: -25 to 85℃				
Enviro	Ambient Humidity	35 to 85%RH, Storage: 35 to 85%RH				
Posit	tional accuracy(%1)	±3'(±0.05 °)				
Shaft vibration(※4)		0.05 T.I.R.[mm]				
Radial Movement(*2)		0.025[mm] Max.(Load 5N)				
Axial	Movement(※3)	0.075[mm] Max.(Load 10N)				
Concentricity for shaft of setup in low		0.075 T.I.R.[mm]				
Perpendicularity of seating plane shaft		0.075 T.I.R.[mm]				
Protection		IP30(IEC34-5 standards)				

- * 1: This vaule is when full-step and no-load(It varies as
- load size.)

 ** 2: It is shaft displacement quantity of radial direction when load 5N is added to edge part of the motor
- shaft to vertical way. * 3: It is shaft displacement quantity of axis direction when load 10N is added to the motor shaft to axis
- way.

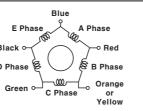
 4: T.I.R.(Total Indicator Reading): In case of making
 1 rotation with the standard point as the center, it
 indicates the whole quantity of dial gauge.
- * Rotation direction of the Motor and the Gear Head output axis is same

Connection diagram

Our 5 phase stepping motor is internally wired in a pentagon connection.

Therefore, it is a proper product for the driver working as a bipolar pentagon driving method of 5 phase stepping motor drivers

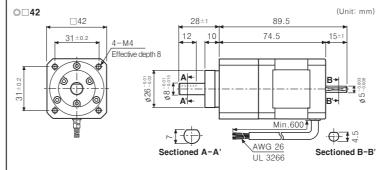
The figure shows the relationship of inside each phase and wire color of stepping motor.

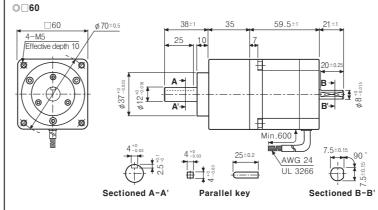


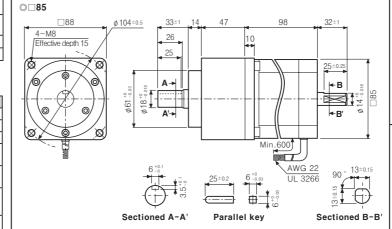
Α

◎ Ø 0.075 A

Dimensions







★There dimensions are for dual shaft type.

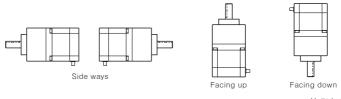
For single shaft model, there is no sectioned B-B' shaft.

Installation

1. Mounting direction

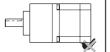
Motors can be mounted in any directions - facing up, facing down and side ways. No matter which direction motors to be mounted, be sure not to apply overhung or thrust load

Refer to the table below for allowable shaft overhung load/ thrust load.



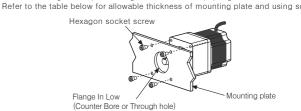
						OTILL Kgr(IV)
Motor size	Allowable overhung load per certain distance(mm) from the end of shaft					Allowable
WOLOI SIZE	0	5	10	15	20	thrust load
□42	7.3(73)	8.4(84)	10(100)	12.3(123)	-	5(50)
□60	25(250)	27(270)	30(300)	34(340)	39(390)	10(100)
□85	48(480)	54(540)	60 (600)	68 (680)	79(790)	30(300)

Do not apply excessive force on motor cable when mounting motors. Do not forcibly pull or insert the cable. It may cause poor connection or disconnection of the cable. In case of frequent cable movement required application, proper safety countermeasures must be ensured.



2. Motor mounting

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 wrench screws, spring washers and flat washers.



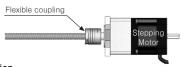
counter Bore or Through hole)				
Notor size	The thickness of mounting plate	Using screw		
□42	Min. 5mm	M4		
□60	Min. 8mm	M5		
□85	Min. 12mm	M8		

3. Connection with load

In case of using motors with connecting a load - Ball screw or TM screw - to motor's shaft, make sure to use flexible couplings as shown in the figure below

If the center of the load is not matched to that of shaft, it may cause severe vibration, shaft damage or shortened life cycle of bearings.

Do not disassemble or modify motor shaft in order to connect a load. Contact us if it is required. In case of making connection with a pulley or a belt, be sure to observe allowable Thrust load and Radial load. Make sure no severe vibration applied on shaft.



4. Installation condition

Install the motor in a place that meets certain conditions specified below. It may cause product damage if instructions are not following.

1 It shall be used indoors. (This product is designed / manufactured to be installed on machinery as a part.)

- ② Within -10°C to 50°C (at non-freezing status) of ambient temperature
- ③ Within 85%RH (at non-dew status) of ambient humidity
- 4 The place without explosive, flammable and corrosive gas (5) The place without direct ray of light
- 6 The place without dust, dregs, etc.
- The place without water, oil, etc.
- (8) The place where easy heat dissipation could be made 9 The place where no continuous vibration or severe shock
- 10 The place with less salt content
- (f) The place with less electronic noise occurred by welding machine, motor, etc.
- The place where no radioactive substances and magnetic fields exist. It shall be no vacuum

Caution for using

1. Do not disassemble or modify the product.

It may cause a malfunction due to small dregs. Once disassembling the motor, its performance would significantly decline.

Do not impact the motor.

The air-gap, the distance between rotator and stator is processed as 0.05mm, but if it is impacted, the balance of air-gap can be broken and it may cause a malfunction. 3. Use the motor within the allowable torque range.

The allowable torque range indicates the maximum value of mechanical strength of gear part and the total of ac/deceleration torque of start/stop and friction torque shall not be exceed the allowable torque range, or it may cause the breakdown of gear.

I. Use the motor within the allowable speed range.

The allowable speed range includes the revolution number of gear and pulse speed of motor. Use the motor within the allowable speed range, or it may shorten the life cycle of gear part. (Backlash is increased.)

Be careful of backlash when positioning the motors in both CW/CCW directions. Backlash refers to the displacement occurred on motor's output shaft while gear's input axis is fixed. Geared type stepping motors are to realize high accuracy and low backlash. When positioning the motors in both CW/CCW directions, however, backlash may possibly occur,

geared type motors. 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 forcedly.

Therefore, make sure that motor positioning will be made in one single direction in case of

. 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.

Timers

Panel meters

Major products

■ Proximity sensors Area sensors ■ Photoelectric sensors ■ Display units ■ Fiber optic sensors

■ Door/Door side sensors ■ Pressure sensors Rotary encoders

Power controllers ■ Graphic/Logic panels
■ Sensor controll Temperature controllers

■ Tachometer/Pulse(Rate) meters ■ Temperature/Humidity transducers

Switching power supplies Stepping motors/drivers/motion controllers

■ Field network devices
■ Laser marking system(CO₂, Nd:YAG) ■ Laser welding/soldering system

Autonics Corporation

Satisfiable Partner For Factory Automation

■HEAD QUARTERS :

Norea

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