Product Specification

STEPPING MOTOR

Model number: 103H5205-0476

Contractor Henan Dingzet Electrical Equipment Co., Ltd

Customer Shinetek Instruments(Beijing)Co.Ltd.

Your	Signature
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Kindly check the document and if there is no problem, please sign and return by January 31, 2023 If you need correction, write them in red pen and return.

WARRANTY CONDITIONS

The warranty period of SANYO DENKI's product shall be within one (1) year after delivery to a location specified by you.

We shall have responsibility or liability, in case where we received written notice specifying defect or malfunctions attributable to our products within one (1) year from the date of shipment.

Attached document

No.	Item	Number of Document	Rev.	Description
1	STEPPINGMOTOR INSTRUCTIONS	M0011348	D	
2	STEPPING MOTOR	103H5205-0476	А	Outline drawing
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Approved by	M.Yamaguchi	January 11, 2023	
Reviewed by M.Kaneko January 11, 2023			
Prepared by	January 11, 2023		
SANYO DENKI CO., LTD.			
Servo Systems Division, Design Department 1			

STEPPING MOTOR INSTRUCTIONS SANMOTION F Series

Safety Precautions

The stepping motors are the products designed to be used for the general industrial devices.

When using those, pay enough attention to the following points.

- · Read this instructions thoroughly prior to placement, assembly and/or operation in order to use the product properly.
- Refrain from modifying or processing the product in any way.
- · Contact us or your point of sale for placement or maintenance services of the product.
- Regarding the following uses of the product, contact us or your point of sale for the special care required for operation, maintenance and management such as multiplexing the system, installing an emergency electric generator set, and so forth.
- Use in medical equipment that may have an effect on human life or the human body
- 2 Use in transportation systems or transport-related equipment such as trains or elevators, that may have an effect on human life or the human body
- 8 Use in computer systems that may have an impact on society or on the public

Use in other devices that have a major impact on human safety or on maintaining public operations

In addition to the above, contact us or your point of sale for use in an environment where vibrations occur, such as in automobiles or transport.

For use in space, aviation, or nuclear power-related applications, contact us or your point of sale.

Make yourself knowledgeable and familiarize with the devices, safety issues and cautions before handling the product.

The products are subject to Japanese Export Control Law. Diversion contrary to the law of exporting country is prohibited.

Safety ranks of the cautions





<General matters>

- 1. Do not use the product in an explosive, flammable or corrosive atmosphere, watery place or near a combustible material. Doing so may cause injury or fire.
- 2. Have a person with expert knowledge on hand for performing the transportation, placement, wiring, operation, maintenance or inspection of the product. Without such knowledge, it may cause an electric shock, injury or fire.
- 3. Do not work on wiring, maintenance servicing or inspection with the electric power on. Perform either of those five minutes after turning the power off. Failure to do so may cause an electric shock.
- 4. When the protective functions of the product is activated, turn the power off immediately and eliminate the cause. If continuing the operation without eliminating the cause, the product may operate improperly and cause injury or a breakdown of the system devices.
- 5. Stepping motor may run out of order when operating and stopping depending on the magnitude of the load. Put the product into use after confirming with the adequate trial test operation in the maximum load conditions that the product operates reliably. Doing otherwise may cause a breakdown of the system. (Should the product run out of order in the use to drive upward/downward, it may cause a fall of the load.)

<Wiring>

- 6. Do not connect the stepping motor directly to a commercial power outlet. Doing so may cause an electric shock, injury or fire. Power should be supplied to the stepping motor through the driving circuit.
- 7. Use an electric power source within the rated input voltage. Using otherwise may cause fire or an electric shock.
- Connect the stepping motor to the ground. Using without grounding may cause an electric shock.
- 9. Do not harm, forcibly put a stress, or load a heavy article on the cable or get it caught between the articles. Doing so may cause an electric shock.
- Perform wiring with the power cable as instructed by the wiring diagram or the Operation Manual. Doing otherwise may cause an electric shock or fire.
- 11. Do not move the stepping motor cable, as it is not a movable cable. Doing so may result in electric shock, injury, or fire.

<Operation>

- 12. Be sure not to touch the rotating part of the stepping motor during its operation. Touching it may cause injury.
- 13. Do not reach or touch the electric terminals while electric power is on. Doing so may cause an electric shock.
- 14. Never disconnect any of the connectors while electric power is on. Doing so may cause an electric shock and corruption.
- 15. Do not operate this product with live parts exposed. Doing so may result in electric shock.
- 16. If smoke, fire, unusual smells, or unusual sounds are produced from the driver or stepping motor, turn off the power and stop using this product immediately. Not doing so may result in electric shock, injury, or fire.

CAUTION

<General matters>

- Prior to mounting, operation, maintenance servicing or inspection, be sure to read the Operation Manual and follow the instructions to perform. Failure to follow the instructions may cause an electric shock, injury or fire.
- 2. Do not use the stepping motor in conditions that exceed the specification values. Doing so may cause an electric shock, injury or fire.
- 3. Do not insert a finger or an object into the opening of the product. Doing so may cause an electric shock, injury or fire.
- 4. Do not use a damaged stepping motor. Doing so may cause injury, fire or the like.
- 5. Use the driver and stepping motor in the designated combination. Using otherwise may cause fire or a trouble.
- 6. Be careful when the temperature rises in the operating driver, stepping motor or peripheral devices. Failure to be careful may cause a burn.
- Never disassemble, repair, modify, or remanufacture this product. Doing so may result in electric shock, injury, or fire.
 Do not remove the rating plate. To do so may lead to fire by misapplication
- Do not remove the rating plate. To do so may lead to fire by misapplication of product.
 Be careful that this product does not fall or tip over when handling, as this
- Be careful that this product does not fall or tip over when handling, as this can be dangerous.

 Unpacking>
- 10. Confirm that the bottom and top of the box are facing correctly while unpacking. Failure to do so may cause injury.
- 11. Confirm that the product is the one that you have ordered. Installing an incorrect product may cause a breakdown.

<Wiring>

- 12. Do not measure the insulation resistance or dielectric voltage of the product. Doing so may cause a breakdown. Contact us or your point of sale instead, if such a measurement is required.
- Perform wiring conforming to the technical standards of electric facility or the internal rule. Doing otherwise may cause burning or fire.
 Ensure that wiring has been correctly done. Incorrect wiring may cause
- the stepping motor to run out of control, resulting in injury.

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<Mounting>

- 15. Do not step on or put a heavy article on the product. Doing so may cause injury.
- 16. Make sure that the intake and exhaust ports are not blocked or stuffed by foreign Particles. Doing so may cause fire.
- 17. Mount the product with great care to prevent from danger such as a tumble or a turnover.
- 18. Mount the product on an incombustible material such as metal. Failure to do so may cause fire, injury, or device breakdown.
- 19. Do not place combustible material around this product. Failure to do so may result in fire or burns.
- 20. Be sure to provide an adequate ventilation path when installing this product, and do not block the intake and exhaust ports. Failure to do so may result in electric shock, fire, or device breakdown.
- 21. Confirm the rotating direction before connecting with the mechanical device. Failure to do so may cause injury or a breakdown.
- 22. Do not touch the motor output shaft (including the key slot and gears) with your bare hand. Doing so may cause injury.
- 23. Do not add load more than the permission load to the motor output shaft.
- 24. When you attach a pulley, coupling, etc. to the output shaft of the stepping motor, pay attention to the amount of unbalance. A large unbalance amount will increase vibration, which may result in a deterioration of product lifetime and earlier damage of the motor.
- 25. For belt drive, make sure that the shaft conversion value of the belt tension does not exceed the allowable load. Allowable load is the load that thrust load and radial load are applied to the output shaft independently in one direction.
- 26. Perform centering between the output shaft of the stepping motor and the mating device properly. Insufficient centering may result in increased vibration, which may lead to deterioration of product lifetime and earlier damage of the motor.
- 27. To prevent fretting, etc., decrease the fit clearance when fixing the output shaft of a stepping motor to the mating device.

<Operation>

- 28. The stepping motor is not equipped with any protective device. Take protective measures using an over-current protective relay, a ground fault interrupter, a protective device from excess temperature, and an emergency stopping device. Failure to do so may cause injury or fire.
- 29. Do not touch the product for a period after the power is on or has been turned off, since the driver and stepping motor remain at a high temperature. Doing so may cause burns. In particular, the temperature rises considerably of the stepping motor depending on the operating conditions.
 - Do not allow the motor surface to exceed the following temperatures:
 - •Thermal class F (+155°C) stepping motors: 125°C
 - •Thermal class B (+130°C) stepping motors: 100°C
 - Regardless of thermal class, encoder equipped stepping motors: 85°C, stepping motors with built in drivers: 70°C, stepping motors for vacuum
 - environments: 150°C
- 30. Stop operations immediately when an emergency occurs. Failure to do so may cause an electric shock, injury or fire.
- 31. Do not change adjustment to an extreme, for such a change results in unstable operation. Doing so may cause injury.
- 32. During trial operations, firmly stabilize the stepping motor, and confirm operations by disconnecting from the mechanical system before connecting with it. Failure to do so may cause injury.
- 33. During operation of the stepping motor, provide a cover or other safety measures to prevent touching the rotating parts. Failure to do so may result in injury.
- 34. When the alarm has been activated, eliminate the cause and ensure safety before resuming operations. Failure to do so may cause injury.
- 35. When the electric power recovers after a momentary interruption, do not approach the devices because the system may restart operation by itself. (Set the system so as to secure the safety even when it restarts on such occasions.) Failure to do so may cause injury.
- 36. Confirm that the electric power supply proper conforms to the product specifications. Failure to do so may cause a breakdown.
- 37. The brake mechanism of the motor with the electro-magnetic brake is used to hold the movable section and the motor position. Do not use it as a safety measure. Doing so may cause the breakdown of the system.
- 38. Firmly stabilize the key when operating the motor with the key individually. Failure to do so may cause injury.
- 39. If the shaft is to be subjected to variable loads (precessional motion, etc.), please contact us in advance. If a variable load is applied to the shaft, it may cause a failure.

<Maintenance>

- 40. Be careful when performing maintenance services or inspection regarding the temperature which rises highly in the stepping motor frame. Failure to do so may cause burns.
- Contact us or your point of sale for repair. If the product is disassembled by the user, it may become inoperable.
- 42. Oil seals, electromagnetic brakes, bearings, and other parts used in stepping motors have a limited lifespan. Please use motors after determining the replacement timing through performance evaluation tests on your actual devices.

<Transportation>

- 43. Handle the product with care during transportation so as to prevent from dangers such as tumbling or overturning.
- 44. Do not hold with the cable or the motor shafts. Doing so may cause trouble or injury. <Disposal>
- 45. When scrapping the driver or stepping motor, dispose it as industrial waste.

SANYODENKI Servo Systems Division



- Storage>

 Avoid storing this product in places exposed to rain or water drops, or in an environment with hazardous gas or liquid. Failure to do so may cause trouble.
 - <Maintenance services>
- $2. \ \mbox{Do not disassemble or repair the product. Doing so may cause fire or an electric shock.}$
- General matters >
 3. Do not remove the rating plate. Using this product with the incorrect rating may result in fire.



Storage>

 Store the product in a location that is not exposed to sunlight, at a temperature and humidity within the product specifications.

< Operation >

- 2. Install an external emergency stop circuit to turn the power off in the event
- that operation must be instantly halted.3. Operate this product within the specified ambient temperature and humidity.

<Transportation>

4. Excess loading of the product on the carrier may cause the load to fall in pieces. Follow the instructions given outside the package

Safety standards

	Direc	Standard	
CE marking in Europe	No	None	
UKCA marking in Great Britain	No	None	
	Classification	Standard	File No.
UL	UL	None	None
	cUL	None	None

Hazardous substances

RoHS Directive (2011/65/EU)

Harmonized standard: EN IEC 63000:2018

Specification

ITEM		SPEC		Remarks	
Insulati	on resistance	DC500V, 100MQ Min. (Between the motor coil and frame)		*	
Dielectric strength		50/60Hz, AC500V, 1 minute (Between the motor coil and frame)		-	
Ambient temperature	When operated	Standard model Low-backlash geared model Electromagnetic brake model Harmonic geared model	-10° C~+50°C 0°C~+40°C	Coil temperature should be less than 120 ℃	
		Encoder model	$-10^{\circ}C \sim +40^{\circ}C$		
	When stored	-20° C \sim $+65^{\circ}$ C		—	
Ambient	When operated	20%~90%RH		No condensation	
humidity	When stored	5% ~ 95%RH			
Operation altitude		1000 m max. above sea level		-	
Direction of motor mounting		Can be freely mounted vertically or horizontally		-	

*Encoder insulation resistance

DC 250 V, 50 MΩ Min.

Between the encoder lead wire and frame. (Excluding the shielded wire)

Rating plate

- Contents
 - Model number
 - Rated
 - Lot number
 - Country of Origin



Service part

None

Main parts which influences lifetime

Part name	Expected lifetime	Conditions
Bearing	20,000 hours (Equal to 10 years)	 Allowable radial load should be less than the value of an outline drawing. Bearing temperature should be less than 100°C.

*The expected lifetime is designed in 20,000 hours or more (Normal use in marketplace), but it may change according to environment and/or operation conditions

Treatment of the defective products

In the case whereby a defective product is (one which is defective due to the fault of production by supplier) discovered within one year of delivery, the supplier will be held responsible for it.

In all other cases, the item in question will be checked by both parties, and responsibility will be determined through discussion between the two parties. The reason for the problem will also be determined and the procedures will be agreed upon.

Specification change

When either party deems a change in specifications necessary, the persons in charge will discuss the nature of the change, the reason and its result from both.

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		RATED VOLTAGE2.88定格電流	V[DC]	
_		RATED CURRENT 1.2	A/PHASE	-
		WINDING RESISTANCE 2.4	$\Omega \pm 10\%$	at 25 ℃
Н		巻線インタクタンス <u>WINDING INDUCTANCE</u> 2.3	mH±20%	6 at 1 kHz 1 V[rms]
		ホールディングトルク HOLDING TORQUE 0.2	N•m MI	2相励磁 N. at I=1.2 A∕PHASE 2 PHASE
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_	NOTE1	MAXIMUM STARTING PULSE RATE 1600 最大連結応答用波数	pulse/s	MIN. at NO LOAD 毎食荷時
	NOTE1	MAXIMUM SLEWING PULSE RATE 3400	pulse/s	MIN. at NO LOAD
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