



# AC Servomotor Instructions

MODEL USA \_\_\_\_\_ - \_\_\_\_\_  
SGM \_\_\_\_\_ - \_\_\_\_\_  
SGM H- \_\_\_\_\_

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Upon receipt of the product and prior to installing the product, read these instructions thoroughly, and retain for future reference.

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For long life of the AC SERVOMOTOR, read these instructions carefully and follow the procedures for use. Detailed documents such as bulletins or user's manuals are prepared for every AC servo drive. Contact your Yaskawa representative.

### General Precautions

- This manual may be modified when necessary because of product improvements, modification or changes in specifications. Such modifications are denoted by a revised manual number.
- To order a copy of this manual if your copy has been damaged or lost, contact your Yaskawa representative.
- Yaskawa is not responsible for any modification of the product made by the user because that will void our guarantee.

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## NOTES FOR SAFE OPERATION

Read these instructions thoroughly before using the AC SERVOMOTOR. In these instructions, NOTES FOR SAFE OPERATION are classified as “WARNING” and “CAUTION.”



: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.



: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to personnel and damage to equipment. It may also be used to alert against unsafe practices.

Even items described in  may result in a vital accident in some situations. In either case, follow these important notes.

- The following shows the symbols of prohibition and mandatory action.



: Specifies prohibited handling.



: Specifies actions that must be taken.

After reading these instructions, keep this manual readily available for those using the equipment.

## 1. NOTES ON USE

### **WARNING**

- Observe the following items to avoid electric shock or injury.  
Ground the ground terminals of the servo amplifier and the motor (or ground the metallic part such as frame in case of no ground terminal) according to local and/or national electrical codes.  
Failure to observe this warning can result in electric shock.
  - Use grounding wires of a size complying with relevant international or local standards.
  - Make wiring length as short as possible. Separate power cables from signal lines. Noise on signal lines may cause vibration or malfunctions.
- Disconnect all power and wait 5 minutes before wiring or inspection.  
Failure to observe this warning may result in electric shock.
- Do not damage the cables or apply excess stress; do not place heavy objects on the cables or clamp the cables.  
Failure to observe this warning can result in electric shock.
- Never touch the motor rotary parts during operation.  
Failure to observe this warning may result in personal injury.

 **CAUTION**

- Use only the specified combination of servo amplifier and motor.  
Failure to observe this caution may result in fire or malfunctions.
  - Never connect commercial power supply directly to the motor.
- Never use at locations exposed to water splashes, corrosive and inflammable gases, or near combustible substances.  
Failure to observe this caution may result in fire or malfunctions.
  - Use under the following environmental conditions:
    1. Indoors where no corrosive or explosive gas exists
    2. Well-ventilated without dust or metallic particles
    3. Ambient temperature from 0°C to 40°C and free from freezing
    4. Humidity from 20% to 80%RH (non-condensing)
    5. Easy to check, clean and maintainFor use at locations where excessive water or oil splashes exist, use a cover or other protection. Except for S series, motor shields are used to protect against some splashes. It is recommended to place the connectors facing down.
- Do not touch the radiator or regenerative resistor of the servo amplifier, motor or peripheral units while the power is ON or immediately after turning the power OFF.  
Failure to observe this caution may cause harmful burns.

## 2. STORAGE



- Do not store the equipment in locations where water splashes are present or where there are corrosive gases or liquids.



- Store the equipment protected from direct sunlight in the specified range of temperature and humidity (-20°C to +60°C, 20% to 80% RH).
- After long time storage, contact your Yaskawa representative.

## 3. TRANSPORTATION



- Do not lift the cables or the motor shaft when carrying the equipment. Failure to observe this caution may result in product malfunctions or personal injury.
- Do not load the products excessively. Failure to observe this caution may result in collapse of cargo and personal injury.



- Use the motor eyebolts exclusively for lifting and transportation of the motor. Do not attempt to move when other equipment is attached to the motor.

## 4. INSTALLATION

### CAUTION

- Do not climb on the motor or place heavy objects on it.  
Failure to observe this caution may result in personal injury.
- Do not block the air inlet and outlet, and do not allow foreign materials to enter.  
Failure to observe this caution may result in fire.
- Do not apply heavy shock.  
Failure to observe this caution may result in a malfunction.
  - The motor shaft extension is coated with anticorrosive paint. Before installation, wipe off the paint with a cloth soaked in liquid detergent.
  - Use a flexible coupling for coupling with the load machine.
  - The motor system is precision equipment. Do not apply shock to the motor or the motor output shaft. Design machines so that the thrust load and radial load applied to the motor shaft extension during operation should be within the allowable range described in the manual of each model.
  - Never make any additional machining to the motor.
  - When using oil as a lubricant for models with motor capacity of 1.2kW and above, and reduction gear frame numbers 4130 and higher, always lubricate before operation.
  - The motor can be installed in either horizontal or vertical direction. However, models with oil seal cannot be installed with output shaft up. Mounting direction is limited for some motors with reduction gears. For details, refer to the manual for each model.



## 5. WIRING

### CAUTION

- Perform wiring securely according to the connection diagrams. Failure to observe this caution may cause motor runaway and personal injury.
  - Perform proper grounding and noise control.
  - Make wiring length as short as possible. Separate the power cables from the signal lines. Do not run power cables and signal lines in the same duct or bundle. Noise on signal lines may cause vibration or malfunctions.
  - Use Yaskawa-specified cables. To use other cables, check the rated current of your equipment, and consider operating environment to select correct cables. If cables not specified by Yaskawa are to be used for the encoder, select twisted-pair shielded wires.
  - The terminal block, connectors or connector pin layout differ according to the model. Refer to the manuals for the relevant model before wiring.

## 6. OPERATION

### CAUTION

- Perform a test run as follows. Secure the motor and disconnect from load machine system, check operations, then connect the motor to the load machine. Failure to observe this caution may result in personal injury.
- The holding brake is not a stopping device to secure the safety of the load machine. Therefore, apply a stopping device on the load machine side. Failure to observe this caution may result in personal injury.
- If an alarm is issued, correct the cause, verify safety, then reset the alarm and resume operation. Failure to observe this caution may result in personal injury.
- If momentary power loss occurs, turn the power supply OFF. The machine may resume operation suddenly and may result in personal injury.

### PROHIBITION

- The brake incorporated in the motor is a holding brake. Do not use it for normal braking.

### MANDATORY ACTION

- Build an external emergency stop circuit that immediately stops operation and shuts down power in an emergency.

## 7. MAINTENANCE AND INSPECTION



### PROHIBITION

- Only authorized personnel should be permitted to disassemble or repair the equipment.
  - If it becomes necessary to disassemble the motor, contact your Yaskawa representative.
  - Perform daily inspection and maintenance of the motor according to the table below.  
The AC SERVOMOTOR requires only simple daily inspections. The inspection periods in the table are only a guide. Adjust the periods according to operating conditions and environment.

Inspection Item	Frequency	Operation	Remarks
Vibration and noise	Daily	Touch and hearing	Vibration and noise must not be greater than normal levels.
Exterior	As required	Clean with dry cloth or compressed air.	—
Insulation resistance	Annually	Disconnect the motor from the servo amplifier and ensure that the resistance is more than 10M $\Omega$ by measuring with a 500V megger. (Refer to the note below.)	If the resistance is less than 10M $\Omega$ , contact your Yaskawa representative.  Do not measure insulation resistance or perform withstand voltage tests of the encoder.
Oil seal	Every 5,000 hours	Disconnect the motor from the load machines and replace the seal.	Only for motors with oil seal.
Overall	Every 20,000 hours or 5 years, whichever is sooner	Contact your Yaskawa representative.	Do not perform disassembly or cleaning by yourself.

Note: Measure the insulation resistance between any of the phase U, V or W of the motor power cables and the frame ground (FG).



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