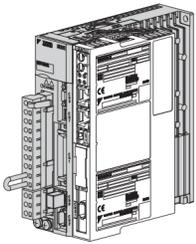


AC SERVOPACK
Σ-V Series/
Σ-V Series for Large-Capacity Models/
Σ-7 Series/Σ-X Series

SAFETY PRECAUTIONS
Option Module

Option Module Model: SGDV-00AD00A

To properly use the product, read this manual thoroughly and retain for easy reference, inspection, and maintenance. Ensure the end user receives this manual.



MANUAL NO. T0BP C720829 00L

为了您能够安全使用本产品，请您务必阅读《安全注意事项》，即可通过下列方法获得《安全注意事项》。

请访问以下网址或扫描右边的二维码下载电子版。
https://www.yaskawa.com.cn/instructions/



客户服务中心
电话: 400-821-3680
邮箱: customer@yaskawa.com.cn
周一至周五(法定节假日除外)9:00-11:30, 12:30-16:30

General Precautions

- The drawings presented in this manual are sometimes shown without covers or protective guards. Always replace the cover or protective guard as specified first, and then operate the products in accordance with the manual.
- The drawings presented in this manual are typical examples and may not match the product you received.
- This manual is subject to change due to product improvement, specification modification, and manual improvement. When this manual is revised, the manual code is updated and the new manual is published as a next edition. The edition number appears on the front and back covers.
- Yaskawa will not take responsibility for the results of unauthorized modifications of this product. Yaskawa shall not be liable for any damages or troubles resulting from unauthorized modification.

Safety Information

The following conventions are used to indicate precautions in this manual. Failure to heed precautions provided in this manual can result in serious or possibly even fatal injury or damage to the products or to related equipment and systems.

- WARNING** Indicates precautions that, if not heeded, could possibly result in loss of life or serious injury.
- CAUTION** Indicates precautions that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation. In some situations, the precautions indicated could have serious consequences if not heeded.
- PROHIBITED** Indicates prohibited actions that must not be performed. For example, this symbol would be used to indicate that fire is prohibited as follows:
- MANDATORY** Indicates compulsory actions that must be performed. For example, this symbol would be used as follows to indicate that grounding is compulsory:

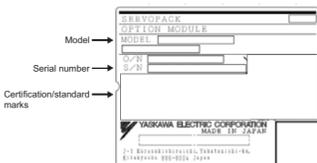
1 Checking Products on Delivery

Check the following items when the option module is delivered.

Items	Check Method
Is the delivered option module the one that was ordered?	Check the model numbers marked on the nameplates of the option module included in the package. Check the accessories as well.
Is there any damage?	Check the appearance, and check for damage or scratches that may have occurred during shipping.
Are there any loose screws?	Check screws for looseness using a screwdriver.

If any of the above items are faulty or incorrect, contact your Yaskawa sales representative or the dealer from whom you purchased the products.

1.1 Nameplate



Option module nameplate

2 Installation

Observe the instructions in the manuals below when mounting the SERVO-PACK with the option module already installed.

- Σ-V SERVOPACKs: Σ-V Series User's Manual Setup Rotational Motor/Linear Motor (Manual No.: SIEP S800000 43/44)
- Large-Capacity Σ-V SERVOPACKs: Σ-V Series User's Manual For Use with Large-Capacity Models Setup (Manual No.: SIEP S800000 89)
- Σ-7 SERVOPACKs: Product Manuals for Σ-7 Series Σ-7S SERVOPACKs
- Σ-X SERVOPACKs: Product Manuals for Σ-X Series Σ-XS SERVOPACKs
- User's Manual for the relevant optional module

For installation sites, use proper care with the following notes.

Situation	Notes on Installation
When installed in a control panel	<ul style="list-style-type: none"> Design the control panel size, unit layout, and cooling method so that the surrounding air temperature of the SERVO-PACK does not exceed 55°C. When installing multiple SERVO-PACKs side by side in a control panel, install cooling fans.
When installed near a heating unit	Suppress radiation heat from the heating unit and a temperature rise caused by convection so that the surrounding air temperature of the SERVO-PACK does not exceed 55°C.
When installed near a source of vibration	Install a vibration isolator underneath the SERVO-PACK to prevent it from receiving vibration.
When installed in a place receiving corrosive gases	<ul style="list-style-type: none"> Corrosive gases do not immediately affect the SERVO-PACK but will eventually cause SERVO-PACK or connector-related devices to malfunction. Take appropriate action to protect against corrosive gases. Avoid installation in a hot and humid place or where excessive dust or iron powder is present in the air. Be sure there is no condensation or freezing. Keep the surrounding air temperature 45 °C or less to ensure long-term reliability.
Others	

3 Wiring

Observe the instructions in the manuals below when mounting the SERVO-PACK with the option module already installed.

- Σ-V SERVOPACKs: Σ-V Series User's Manual Setup Rotational Motor/Linear Motor (Manual No.: SIEP S800000 43/44)
- Large-Capacity Σ-V SERVOPACKs: Σ-V Series User's Manual For Use with Large-Capacity Models Setup (Manual No.: SIEP S800000 89)
- Σ-7 SERVOPACKs: Product Manuals for Σ-7 Series Σ-7S SERVOPACKs
- Σ-X SERVOPACKs: Product Manuals for Σ-X Series Σ-XS SERVOPACKs
- User's Manual for the relevant optional module

4 Inspection

4.1 Option Module Inspection

For inspections and maintenance of the option module, follow the inspection procedures in the table below at least once every year.

Item	Frequency	Procedure	Remedy
Exterior	At least once a year	Check for dust, dirt, and oil on surfaces.	Clean with compressed air or cloth.
Loose screws		Check for loose terminal block and connector screws.	Tighten any loose screws.

4.2 Option Module's Replacement Schedule

Refer to the instructions in the User's Manual for the relevant optional module.

Notes for Safe Operation

WARNING

- Never touch any rotating motor parts while the motor is running. Failure to observe this warning may result in injury.
- Before starting operation with a machine connected, make sure that an emergency stop can be applied at any time. Failure to observe this warning may result in injury or damage to the product.
- Never touch the inside of the SERVO-PACKs. Failure to observe this warning may result in electric shock.
- Do not remove the cover of power supply terminal while the power is ON. Failure to observe this warning may result in electric shock.
- Σ-V SERVO-PACKs, Σ-7 SERVO-PACKs, or Σ-X SERVO-PACKs: Do not touch the power supply terminals while the CHARGE lamp is ON because high voltage may still remain in the SERVO-PACK after turning power OFF. Make sure the charge indicator is OFF first before starting to do wiring or inspections. Residual voltage may cause electric shock.
- Large-Capacity Σ-V SERVO-PACKs: Do not touch the power terminals while discharging the main circuit's capacitor, because high voltage may still remain in the SERVO-PACK and the converter after turning power OFF. For details on the charging time of the main circuit's capacitor, refer to 3.2 Discharging Time of the Main Circuit's Capacitor in Large-Capacity Σ-V Series User's Manual Setup. Before starting to do wiring or inspections, confirm that the charge indicator is OFF and that the power has been completely discharged by using a tester to measure the voltage between the P and N terminals for DC power. Residual voltage may cause electric shock.
- Follow the procedures and instructions for the trial operation as noted in the applicable manual for that product. Malfunctions that occur after the servomotor is connected to the equipment not only damage the equipment, but may also cause an accident resulting in death or injury.
- The output range of multi-turn data for Σ-V, large-capacity Σ-V, Σ-7, or Σ-X series absolute detection system differs from that for conventional systems (15-bit encoder and 12-bit encoder). Especially when "Infinite length positioning system" of Σ series is to be configured with Σ-V, large-capacity Σ-V, Σ-7, or Σ-X series, be sure to make the system modification.
- The multi-turn limit value must be changed only for special applications. Changing it inappropriately or unintentionally can be dangerous.
- If the Multi-Turn Limit Disagreement alarm occurs, check the setting of parameter Pn205 in the SERVO-PACK to be sure that it is correct. If Fn013 is executed when an incorrect value is set in Pn205, an incorrect value will be set in the encoder. The alarm will disappear even if an incorrect value is set, but incorrect positions will be detected, resulting in a dangerous situation where the machine will move to unexpected positions.
- Do not remove the front cover, cables, connectors, or optional items on the fuseside while the power is ON. Failure to observe this warning may result in electric shock.
- Do not damage, press, exert excessive force or place heavy objects on the cables. Failure to observe this warning may result in electric shock, stopping operation of the product, or fire.
- Do not modify the product. Failure to observe this warning may result in injury, damage to the product, or fire.
- Provide an appropriate stopping device on the machine side to ensure safety. A holding brake for a servomotor with brake is not a stopping device for ensuring safety. Failure to observe this warning may result in injury.
- Do not come close to the machine immediately after resetting momentary power loss to avoid an unexpected restart. Take appropriate measures to ensure safety against an unexpected restart. Failure to observe this warning may result in injury.
- Connect the ground terminal to electrical codes (ground resistance: 100 Ω or less for a SERVO-PACK with a 200 V/100 V power supply, 10 Ω or less for a SERVO-PACK with a 400 V power supply). Improper grounding may result in electric shock or fire.
- Installation, disassembly, or repair must be performed only by authorized personnel. Failure to observe this warning may result in electric shock or injury.
- The person who designs a system using the safety function (Hard Wire Base-block function) must have full knowledge of the related safety standards and full understanding of the instructions in the applicable manual for that product. Failure to observe this warning may result in injury or damage to the product.

Storage and Transportation

CAUTION

- Do not store or install the product in the following places.
 - Locations subject to direct sunlight.
 - Locations subject to temperatures outside the range specified in the storage/installation temperature conditions.
 - Locations subject to humidity outside the range specified in the storage/installation humidity conditions.
 - Locations subject to condensation as the result of extreme changes in temperature.
 - Locations subject to corrosive or flammable gases.
 - Locations subject to dust, salts, or iron dust.
 - Locations subject to exposure to water, oil, or chemicals.
 - Locations subject to shock or vibration.
- Failure to observe this caution may result in fire, electric shock, or damage to the product.
- Do not hold the product by the cables, motor shaft, or detector while transporting it. Failure to observe this caution may result in injury or malfunction.

CAUTION

- Do not place any load exceeding the limit specified on the packing box. Failure to observe this caution may result in injury or malfunction.
- If disinfectants or insecticides must be used to treat packing materials such as wooden frames, pallets, or plywood, the packing materials must be treated before the product is packaged, and methods other than fumigation must be used. Example: Heat treatment, where materials are kiln-dried to a core temperature of 56°C for 30 minutes or more.
- If the electronic products, which include stand-alone products and products installed in machines, are packed with fumigated wooden materials, the electrical components may be greatly damaged by the gases or fumes resulting from the fumigation process. In particular, disinfectants containing halogens, which includes chlorine, fluorine, bromine, or iodine can contribute to the erosion of the capacitors.

Installation

CAUTION

- Never use the products in an environment subject to water, corrosive gases, inflammable gases, or combustibles. Failure to observe this caution may result in electric shock or fire.
- Do not step on or place a heavy object on the product. Failure to observe this caution may result in injury or malfunction.
- Do not cover the inlet or outlet ports and prevent any foreign objects from entering the product. Failure to observe this caution may cause internal elements to deteriorate resulting in malfunction or fire.
- Be sure to install the product in the correct direction. Failure to observe this caution may result in malfunction.
- Provide the specified clearances between the SERVO-PACK and the control panel or other devices. Failure to observe this caution may result in fire or malfunction.
- Do not apply any strong impact. Failure to observe this caution may result in malfunction.
- Observe the instructions in the instruction manual included in the package when installing the option module to the SERVO-PACK. Failure to observe this caution may result in the malfunction.

Wiring

CAUTION

- Be sure to wire correctly and securely. Failure to observe this caution may result in motor overrun, injury, or malfunction.
- Do not connect commercial power supply to the U, V, or W servomotor connection terminals. Failure to observe this caution may result in injury or fire.
- Securely connect the power supply terminal screws and servomotor connection terminal screws. Failure to observe this caution may result in fire.
- Do not bundle or run the main circuit cables and input/output signal lines, the encoder cables or communication cable together in the same duct. Keep power and signal lines separated by at least 30 cm.
- Use twisted-pair shielded wires or multi-core twisted pair shielded wires for input/output signal lines and the encoder cables. The maximum length is 3 m for input/output signal lines and 20 m for encoder cables.
- Observe the following precautions when wiring main circuit terminal blocks.
 - If the main circuit terminal is the connector, remove the connector from the SERVO-PACK prior to wiring.
 - Insert only one wire per insertion slot on the terminal block and the connector.
 - Make sure that the core wire is not electrically shorted to adjacent core wires.
- Install the battery at either the host controller and the battery unit of the encoder. It is dangerous to install batteries at both simultaneously, because that sets up a loop circuit between the batteries.
- Always use the specified power supply voltage. An incorrect voltage may result in fire.
- Take appropriate measures to ensure that the input power supply is supplied within the specified voltage fluctuation range. Be particularly careful in places where the power supply is unstable. An incorrect power supply may result in damage to the product.
- Install external breakers or other safety devices against short-circuiting in external wiring. Failure to observe this caution may result in fire.
- Take appropriate and sufficient countermeasures for each when installing systems in the following locations.
 - Locations subject to static electricity or other forms of noise.
 - Locations subject to strong electromagnetic fields and magnetic fields.
 - Locations subject to possible exposure to radioactivity.
 - Locations close to power supplies.
- Failure to observe this caution may result in damage to the product.
- Do not reverse the polarity of the battery when connecting it. Failure to observe this caution may damage the battery, SERVO-PACK, and servomotor or cause it to explode.
- Wiring or inspection must be performed by a technical expert.

Operation

CAUTION

- Conduct trial operation on the servomotor alone with the motor shaft disconnected from machine to avoid any unexpected accidents. Failure to observe this caution may result in injury.
- Before starting operation with a machine connected, change the settings to match the parameters of the machine. Starting operation without matching the proper settings may cause the machine to run out of control or malfunction.
- Avoid frequently turning power ON and OFF. Since the SERVO-PACK has a capacitor in the power supply, a high charging current flows when power is turned ON. Frequently turning power ON and OFF causes main power devices like capacitors and fuses to deteriorate, resulting in unexpected problems.
- Forced stop function with forward/reverse overtravel is not effective during JOG mode operation using utility function Fn002 and zero point search using Fn003.
- When using the servomotor for a vertical axis, install the safety devices to prevent workpieces to fall off due to occurrence of alarm or overtravel. Set the servomotor so that it will stop in the zero clamp state at occurrence of overtravel. Failure to observe this caution may cause workpieces to fall off due to overtravel.
- When not using the tuning-less function, set to the correct moment of inertia ratio Pn103. Setting to an incorrect moment of inertia ratio may cause vibration.
- Do not touch the SERVO-PACK heatsinks, regenerative resistor, or servomotor while power is ON or soon after the power is turned OFF. Failure to observe this caution may result in burns due to high temperatures.
- Do not make any extreme adjustments or setting changes of parameters. Failure to observe this caution may result in injury or damage to the product due to unstable operation.
- When an alarm occurs, remove the cause, reset the alarm after confirming safety, and then resume operation. Failure to observe this caution may result in damage to the product, fire, or injury.
- Do not use the holding brake of the servomotor for braking. Failure to observe this caution may result in malfunction.
- Always use the servomotor and SERVO-PACK in one of the specified combinations. Failure to observe this caution so may result in fire or malfunction.
- The servomotor stopping method of turning the main-circuit or control-circuit power OFF without turning the servo OFF during operation can not be set in Parameter Pn001.
 - When turning the main-circuit power OFF without turning the servo OFF: The servomotor will be stopped by dynamic braking (DB).
 - When turning the control-circuit power OFF without turning the servo OFF: The stopping method will vary depending on the SERVO-PACK model. For details, refer to the applicable manual for that product.

Maintenance and Inspection

CAUTION

- Do not disassemble the SERVO-PACK/option module. Failure to observe this caution may result in electric shock or injury.
- Do not attempt to change wiring while the power is ON. Failure to observe this caution may result in electric shock or injury.
- When replacing the SERVO-PACK, resume operation only after transferring the previous SERVO-PACK parameters to the new SERVO-PACK. Failure to observe this caution may result in damage to the product.
- Always leave the option module attached to the SERVO-PACK when sending the option module to YASKAWA for service.

Disposal

CAUTION

- Correctly discard the product as stipulated by regional, local, and municipal laws and regulations. Be sure to include these contents in all labelling and warning notifications on the final product as necessary.

Warranty Information

Free Warranty Period

This product is warranted for twelve months after being delivered to Yaskawa's customer or if applicable eighteen months from the date of shipment from Yaskawa's factory whichever comes first.

Scope of Warranty

- Attach the nameplate included in the package to the designated location on the module cover. This product is under warranty only when the nameplate is attached.

If a Yaskawa product is found to be defective due to Yaskawa workmanship or materials and the defect occurs during the warranty period, Yaskawa will provide a replacement, repair the defective product, and provide shipping to and from the site free of charge.

However, if the Yaskawa Authorized Service Center determines that the problem with a Yaskawa product is not due to defects in Yaskawa's workmanship or materials, then the customer will be responsible for the cost of any necessary repairs.

○:表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

×:表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572 规定的限量要求。

○: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below or equal to the limit requirement of GB/T 26572.

×: Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

注: 本产品符合欧盟的 RoHS 指令。

本表中的 "×" 表示含有欧盟 RoHS 指令豁免的有害物质。

Note: This product complies with EU RoHS directives.

In the table, "x" indicates that hazardous substances that are exempt from EU RoHS directives are contained.

产品中有害物质的名称及含量
Contents of hazardous substances in products

部件名称 Parts Name	有害物质 Hazardous substances									
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 Hexavalent chromium (Cr(VI))	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)	邻苯二甲酸二丁酯 (DBP)	邻苯二甲酸二乙酯 (DEHP)	邻苯二甲酸二正辛酯 (DINP)	邻苯二甲酸二正壬酯 (DIBP)
变频器 Converter	×	○	○	○	○	○	○	○	○	○
电子元件 Electronic parts	×	○	○	○	○	○	○	○	○	○
散热器 Heat sink	×	○	○	○	○	○	○	○	○	○
机械零件 Mechanical parts	×	○	○	○	○	○	○	○	○	○

10 Precautions for Korean Radio Waves Act

한국 전파법에 관한 주의사항

韩国電波法に關連する注意事項

Precautions for Korean Radio Waves Act

针对韩国电波法的注意事项

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다. (주) 사용자 안내문은 "업무용 방송통신기자재"에만 적용함.	사용자 안내문

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