







High Speed Rotation Starter
SA-60
OPERATION MANUAL

Read the instruction manual thoroughly before you use the product. Keep this instruction manual for future reference.



About the Symbols Appearing in this Operation Manual

Throughout the text in this manual, warnings and other information essential when using this unit, such as cautionary or prohibited items, appear classified as per the following:

Mark	Description
	Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.
	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or possibly death.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor to moderate injury or equipment damage.
	Emphasizes additional information that is provided to ensure the proper use of this product.
 Instructions	Indicates an action that must be performed.
 Prohibitions	Indicates an action that must not be performed.

Revision History

Revision	Date	Changes
B	May, 2012	Compliant with Standards.

Preface

Thank you for purchasing the SA-60 (hereafter referred to as "equipment").

This operation manual contains information for ensuring proper use of the equipment. Read this manual thoroughly before using the equipment and operate the equipment in accordance with the instructions in this manual. If the precautions in this manual are disregarded, there is risk of damage to equipment or injury to operators and patients. However, it is not possible to foresee all risks and provide precautions for each of them. Therefore, when using the equipment in ways not described in this manual or when any question arises in the manual description, please contact the place of purchase or a sales representative listed at the end of this manual.

This manual should be kept available for future reference. If the user or usage location changes, ensure that this operation manual is always kept together with the equipment. Periodically check to be sure that the operation manual and the warning labels are not missing or damaged. If they are, contact your Shimadzu service representative for replacement.

Original version is approved in English.

Notice

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- Other company names and product names mentioned in this manual are trademarks or registered trademarks of their respective companies.
- The TM and ® symbols are omitted in this manual.

Operating Precautions






"Operating Precautions for Safety in the Use of Electric Medical Equipment"



1. Only an experienced technician should operate the equipment.
2. When installing the equipment, pay attention to the following items:
 - (1) Do NOT install it near water faucet or similar equipment.
 - (2) Install it away from potential sources of problems such as abnormal pressure, temperature or humidity, drafts, direct sunlight, dust chlorine or sulfur gas.
 - (3) Avoid tilting, vibration and any impact during transportation and operation of the equipment.
 - (4) Keep the equipment away from the areas where chemicals or gases are stored.
 - (5) Use only the correct electrical power source with matching frequency, voltage and current (or wattage).
 - (6) Check the condition of the battery power source (power and polarity) before operating the equipment.
 - (7) Correctly ground the equipment.
3. Before operating the equipment, pay attention to the following items:
 - (1) Check the conditions of switch contacts, polarity, dial settings, and meters, and make sure the equipment performs correctly.
 - (2) Confirm that the ground is connected correctly.
 - (3) Check the whole wiring is connected correctly and completely.
 - (4) Pay attention when using more than one unit at a time, because it may lead to an incorrect diagnosis and cause danger.
 - (5) Check the condition of the external electric circuit, which will be directly connected to a patient.
 - (6) Check the condition of the battery power source.

4. While operating the equipment, pay attention to the following items:
 - (1) Do NOT over-exceed time or the amount of equipment use needed for diagnosis or therapy.
 - (2) Observe the equipment and patient continuously for early detection of problems.
 - (3) When a problem is detected with the equipment, take proper action to stop the equipment without harming the patient.
 - (4) Do NOT let the patient touch the equipment unless necessary.
5. After operating the equipment, pay attention to the following items:
 - (1) Return the operation buttons and the dial to their original states before use in the prescribed order. Then, turn off the main power.
 - (2) Do NOT pull the power cable forcibly from the outlet.
 - (3) When storing the equipment, pay attention to the following factors:
 - (i) Keep the equipment away from the water.
 - (ii) Store it away from the potential causes of problems such as abnormal pressure, temperature or humidity, draft, direct sunlight, dust chlorine or sulfur gas.
 - (iii) Avoid tilting, vibration and any impact when storing.
 - (iv) Store the equipment away from areas where chemicals and gases are stored.
 - (4) Clean all attachments, cables and contacts, and store them in one place.
 - (5) Keep the equipment clean to avoid problems during the next use.
6. If the equipment is found to be out of order, do not try to repair it. Immediately contact your Shimadzu service representative for repair.
7. Do NOT modify any part of the equipment.
8. Preventive maintenance
 - (1) The equipment and its parts should be periodically checked.
 - (2) If the equipment has not been in operation for an extended period of time, test it prior to actual operation to make sure it works correctly and safely.
9. Correctly operate the equipment according to the instruction manual.

Precautions in Usage







When using this equipment, please observe the following precautions for safety of the operator and patient:

 WARNING	
 Instructions	<p>The responsibility for management of use and maintenance of medical equipment lies with the user.</p> <p>This equipment is restricted to use by, or under supervision of, a diagnostic radiology technician or a person with a certificate indicating equal proficiency. Repair and inspection of the inside of the equipment is dangerous. Be sure to contact your Shimadzu service representative for repair and inspection.</p>
 Prohibitions	<p>Never modify the equipment.</p> <p>In general, modifications are strictly prohibited by the Regulatory requirements of the law of the country where the device is installed. Please contact your Shimadzu service representative if it is necessary to modify the equipment.</p>
 Instructions	<p>Perform periodic inspection.</p> <p>Preventive maintenance is required to maintain long-term safety and performance of the equipment.</p> <p>The "5 Maintenance" chapter in this manual gives detailed descriptions of daily and periodic maintenance and inspection that a user should perform.</p> <p>As for the maintenance and inspection that only specially trained experts can perform, utilize the maintenance agreement program offered by Shimadzu.</p>
 Instructions	<p>Repair and maintenance of the inside of the equipment can only be performed by engineers assigned by Shimadzu.</p> <p>Maintenance must be assigned to specially trained experts. Contact your Shimadzu service representative for repair and maintenance.</p>

 CAUTION	
 Instructions	<p>If the operator has no experience in operating the equipment, be sure that he or she receives instruction on how to operate it from Shimadzu service personnel or someone who has adequate experience in using the equipment.</p> <p>In order to operate the equipment safely, an explanation of the operation needs to be given. When installing the equipment, Shimadzu service personnel explain the operating procedure using this operation manual. Follow their directions and operate the equipment correctly.</p>

Be Sure to Read the Following to Prevent Explosion, Electric Shock, or Injury

 DANGER	
 Prohibitions	Do NOT use any potentially flammable or explosive gas, such as disinfectant sprays, near the equipment. Use of such gas may cause an explosion.

 WARNING	
 Instructions	Check the condition of the patient before conducting a study. If equipment usage is deemed to put the patient at risk due to the his or her condition, refrain from conducting the study or treatment.
 Prohibitions	Do NOT use the equipment at places where the liquid may enter. Do NOT spill liquids onto the surface or the inside of the equipment. Otherwise, electric shock may occur. In case of liquid spillage to the equipment, immediately turn off the power, and contact your Shimadzu service representative.
 Instructions	When there is any abnormality in operation, or unusual smell or smoke emission during operation, stop operation immediately and contact your Shimadzu service representative. Continued use may damage the equipment and cause injury.
 Prohibitions	Do NOT open the covers of the equipment. Otherwise, electric shock may result. When opening the covers for maintenance, contact your Shimadzu service representative.
 Instructions	Always be very careful when moving the equipment to avoid contact with the patient or operator and to ensure that the patient or operator does not become caught between the equipment and any neighboring devices. Otherwise, it may cause injury.

Cautions on Environmental Conditions



WARNING



Prohibitions

Do NOT use the equipment in an oxygen-rich environment.

The use in an oxygen-rich environment may cause fatal or serious injuries or damage to the equipment due to easy ignition.



CAUTION



Instructions



Be sure to use the equipment under the following environmental conditions:







The installation of a dedicated air-conditioner in the examination room is recommended if the building air-conditioner cannot meet the necessary environmental conditions.

- Atmosphere: No explosive or corrosive gases
- Ambient temperature: 10 °C to 40 °C
- Relative humidity: 30 % to 80 % (no condensation)
- Atmospheric pressure: 800 hPa to 1060 hPa (800 mbar to 1060 mbar)
- Environment luminosity: 150 lx to 500 lx
- Ambient noise level: Under 70 dB



Note also that there must be no sudden change in temperature or humidity. This causes condensation, which can lead to equipment failure.

Cautions on Cleaning and Disinfection








 WARNING	
	<p>Be sure to turn the equipment power OFF before cleaning and disinfecting the equipment.</p> <p>Otherwise, a malfunction may occur in the equipment, or the equipment may operate in an unintended way.</p> <p>Also, thoroughly ventilate the room before turning ON the power after disinfection work is complete.</p>

 CAUTION	
	<p>Be sure to clean and disinfect the equipment.</p> <p>Cleaning and disinfection is very important to ensure that the equipment can be used hygienically and safely. Strictly follow the methods prescribed.</p>
	<p>Do NOT directly apply rubbing alcohol or water, or spray it onto the equipment.</p> <p>Wipe the surface of the equipment with a cloth soaked with rubbing alcohol. If rubbing alcohol gets inside the equipment, it can cause failure or accidents.</p>
	<p>Do NOT use an organic solvent.</p> <p>Organic solvents may change the surface color. If an organic solvent adheres to the surface, wipe it out immediately.</p>
	<p>Do NOT use the following disinfectants:</p> <p>If any of the following disinfectants are applied, the equipment performance and safety cannot be guaranteed.</p> <ul style="list-style-type: none"> • Chlorine-based disinfectants • Disinfectants that corrode metals, plastics, rubber, or paint • Disinfectants unsuitable for metals, plastics, rubber, or paint • Spray-gas type disinfectants • Volatile disinfectants • Disinfectants that may enter the equipment
	<p>Use disinfectants at a minimum.</p> <p>Repeated disinfection over a long time may lead to discoloring and cracking on the equipment surface, and deterioration of rubber and plastic. If any abnormality is found on the equipment after disinfection, stop using the equipment immediately. Contact your Shimadzu service representative for repair.</p>

Cautions Relating to Cellular Telephones

 WARNING	
 Prohibitions	<p>Do NOT bring any cellular telephones or related devices into the examination room with their power ON.</p> <p>Such devices can exceed the EMC standard limitations, and under some conditions this can impair the proper functioning of the equipment. In the worst case, this can cause serious injuries or clinical errors.</p>

Cautions on Electromagnetic Compatibility (EMC)

 WARNING	
 Instructions	<p>This equipment needs special precautions regarding EMC.</p> <p>Install and use the equipment according to the EMC information provided in this operation manual.</p> <p> Reference "6.1 Environmental Conditions of EMC (Electromagnetic Compatibility)" P.6-2</p>
 Instructions	<p>Make sure that electromagnetic compatibility is obtained.</p> <p>All peripheral devices must satisfy EMC standards regarding emission of electromagnetic energy and susceptibility to electromagnetic environment. Devices that do not satisfy these standards may disturb the correct functioning of the equipment. In the worst case, this can cause serious injuries or clinical errors.</p> <p> Reference "6.1 Environmental Conditions of EMC (Electromagnetic Compatibility)" P.6-2</p>
 Prohibitions	<p>Do NOT use this equipment adjacent to, or stacked with, other equipment.</p> <p>If adjacent or stacked use is necessary, check to be sure that this equipment works properly in the environment.</p> <p> Reference "6.1 Environmental Conditions of EMC (Electromagnetic Compatibility)" P.6-2</p>

Cautions When Irradiating Consecutive Pulse-shaped X-ray Fluxes



WARNING



Instructions

Observe the following precautions when irradiating consecutive pulse X-rays:

- Conducting studies involving irradiating consecutive pulse X-rays onto the region where an implantable pacemaker or defibrillator is implanted may cause these devices to malfunction.
- Refer to the "Important General Cautions," "Interactions," or other relevant sections in the accompanying documentation of the implantable pacemaker or defibrillator and take the prescribed measures before irradiating the implanted region of these devices with consecutive pulse X-rays.

Fluoroscopy or radiography performed by irradiating consecutive pulse X-rays (such as serial radiography with a few second intervals, pulsed fluoroscopy, digital angiography, DSA, or cineradiography) can adversely affect the CMOS circuit in implantable pacemakers and defibrillators. Such affects may cause oversensing in these devices that can temporarily inhibit pacing pulse output and result in an inappropriate heart rate.

Warranty

The system is warranted to be free from defects in material and workmanship for one year from the date of delivery. If found to be defective, the system must be offered to Shimadzu for inspection and examination. Upon examination, Shimadzu, at its sole option, will repair or replace at no charge, the system or any part found to be defective. Components which wear are not warranted.

This warranty extends to original purchaser or the lessee of the new system only.

If the system is to be resold or delivered to a third party, such third party must be provided with a copy of this manual, the installation manual and the technical manual supplied with the system.

This warranty does not apply to the following:

1. Failure or damage due to any installation, relocation, or service not provided by your Shimadzu service representative or a SHIMADZU designated contractor.
2. Failure or damage caused by the product of other companies (except those purchased from SHIMADZU).
3. Failure or damage due to repairs using non-SHIMADZU certified service parts.
4. Failure or damage due to non-compliance with the notices and procedures set forth in this manual.
5. Failure or damage due to any operating environment deviating from the requirements set forth in this manual.
6. Failure or damage due to natural disasters such as power surge, rain, fire, earthquake, flood, and thunder.

Service after the expiration of the warranty is available at a reasonable cost and should be performed by your Shimadzu service representative.

IN NO EVENT SHALL SHIMADZU AND ITS AFFILIATED ENTITIES BE LIABLE TO ANY PERSON OR ENTITY FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, ANY DAMAGES RESULTING FROM LOSS OF USE, BUSINESS INTERRUPTION, LOSS OF PROFITS, LOSS OF SAVINGS, THE COST OF PROCUREMENT OF SUBSTITUTED GOODS, SERVICES OR TECHNOLOGIES OR FOR ANY MATTER ARISING OUT OF OR IN CONNECTION WITH THE USE OR INABILITY TO USE THE SYSTEM. In some jurisdictions, some of the foregoing warranty disclaimers or damage limitations may not apply.

Shimadzu will be indemnified for any claim, liability, or damage arising out of the misuse or non-compliance with this manual by the purchaser or lessee of the system.

Software Version



This manual is compatible with the software version 1.**.

* : Even if the last digit of the software version is different from that above, the descriptions in the manual are valid.

Service Life

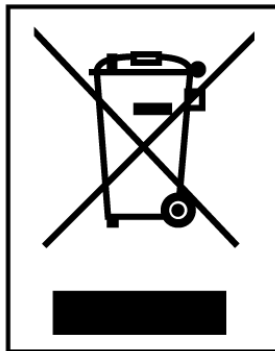
The equipment lifetime is 10 years (based on Shimadzu's criteria) assuming the specified maintenance checks are performed.

Disposal Precaution

	CAUTION
	When disposing of the equipment, contact your Shimadzu service representative.
Instructions	An improper disposal of this equipment may pollute the environment by substances contained in parts.

Action for Environment (WEEE) To all users of Shimadzu equipment in the European Union:

Equipment marked with this symbol indicates that it was sold on or after 13th August 2005, which means it should not be disposed of with general household waste. Note that our equipment is for industrial/professional use only.



WEEE Mark

Contact your Shimadzu service representative when the equipment has reached the end of its life. They will advise you regarding the equipment take-back.

With your co-operation we are aiming to reduce contamination from waste electronic and electrical equipment and preserve natural resource through re-use and recycling. Do not hesitate to ask your Shimadzu service representative, if you require further information.

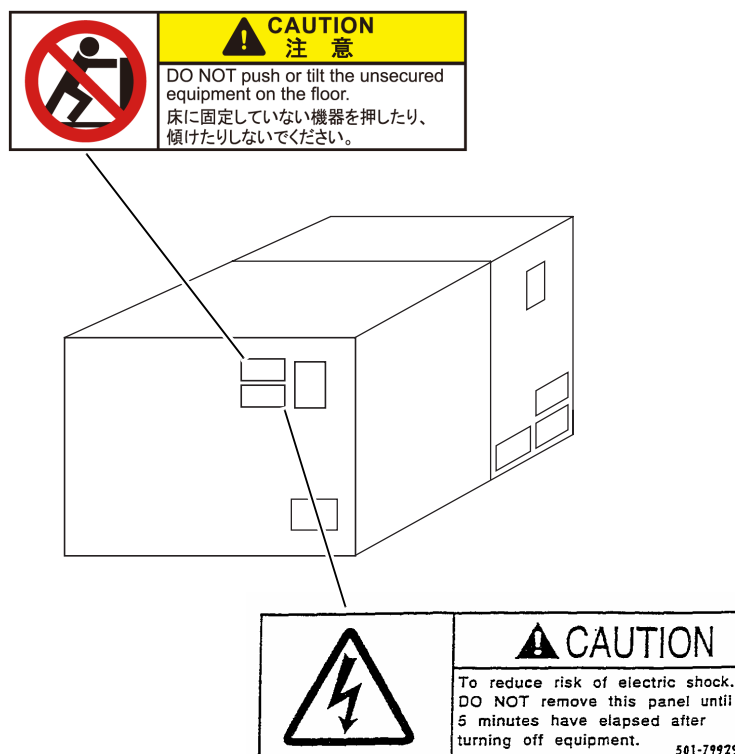
Warning and Caution Labels

The following safety labels, which describe handling precautions, are attached to the equipment. With adequate understanding of the contents on these labels and the warning/caution items in this manual, operate the equipment safely.

Inspect the safety labels periodically (once a year).

If any label is peeled or unreadable by stain or scratch, replace it with a new one.

For new labels, contact your Shimadzu service representative.



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Outline

This chapter describes the applications and features of the SA-60.

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1.1 Application

Shimadzu High Speed Rotation Starter SA-60 is a power supply unit to rotate the anode of rotating anode X-ray tubes of 1.5 MHU, 1.0 MHU, 750 kHU, 600kHU, and 400 kHU, etc. made by Shimadzu (Circlex) and other manufacturers.

This unit is of compact design and mountable in a 19-inch rack.

1.2 Features

This unit has following features it is:

- Designed for rotating anode X-ray tubes made by Shimadzu (Circlex series) and other manufacturers as well
- Compatible with Q (QUICK) stator that can start up the anode in much shorter time in addition to the conventional R (REGULAR) stator
- Selectable between AC braking and DC braking (in installation)
- Possible to hold high speed and low speed anode rotation with spot fluoroscopy technique
- Mountable in a floor case (option)

1.3 Principle

This equipment is combined with the X-ray high voltage generator, and supplies power for rotating the anode of the X-ray tube unit.

1.4 Environmental Conditions

To obtain proper performance, be sure to use the equipment under the specified environmental conditions.

1

1.4.1 Operation Environment

Use the equipment under the environmental conditions listed below:

The installation of a dedicated air-conditioner in the examination room is recommended if the building air-conditioning cannot meet the necessary environmental conditions.

WARNING

Prohibitions

Do NOT use the equipment in an oxygen-rich environment.

The use of the equipment in an oxygen-rich environment may cause fatal or serious injuries or damage to the equipment due to easy ignition.

CAUTION

Instructions

Even under the prescribed conditions, avoid rapid changes of temperature or humidity.

Condensation may occur and cause failure. Also, rust or corrosion may occur inside the equipment.

Item	Specifications
Atmosphere	No explosive or corrosive gases
Ambient temperature	10 °C to 40 °C
Relative humidity	30 % to 85 % (no condensation)
Atmospheric pressure	800 hPa to 1060 hPa
Environment luminosity	150 lx to 500 lx
Ambient noise level	Under 70 dB

1.4.2 Transportation and Storage Environment

Item	Specifications
Temperature	-10 °C to 60 °C
Humidity	10 % to 95 %
Atmospheric pressure	700 hPa to 1060 hPa

1.4.3 Power Supply

Item	Specifications
Phase	Single phase AC
Frequency	50/60 Hz
Standard voltages	AC200 V, AC208 V, AC220 V, AC230 V, AC240 V (for power and control circuits)
Permitted voltage range	±10 % of standard voltage
Supply capacity	5 kVA
Power Consumption	<ul style="list-style-type: none"> When the anode of the X-ray tube unit starts rotation: 7.5 kV Rotation stand-by: 100 VA

DANGER

Prohibitions

Be sure to use the power supply specified in the operation manual.

Using a power supply other than the one specified may cause equipment malfunction or serious accidents such as fire, smoke emission, or explosions.

1.4.4 Grounding

Class D grounding

WARNING

Instructions

Be sure to connect the equipment only to a (commercial) power outlet with a ground terminal.

If the outlet does not have a ground terminal, electric shock may occur.

1.5 Classification of Equipment

This equipment is classified as follows, based on safety standards for electrical medical equipment.

1

■ Protection Method Against Electric Shock

Class I equipment

■ Classification of Applied Parts

No Applied Parts



■ Operation Mode

Continuous operation with intermittent loading



■ Degree of Protection Against Liquid Ingress

Ordinary equipment

■ For Use in an Oxygen-rich Environment

 WARNING	
 Prohibitions	<p>Do NOT use the equipment in an oxygen-rich environment.</p> <p>The use in an oxygen-rich environment may cause fatal or serious injuries or damage to the equipment due to easy ignition.</p>

■ For Use in Flammable Atmosphere

 DANGER	
 Prohibitions	<p>Do NOT use the equipment or system in the presence of flammable anesthetics gas.</p> <p>It may cause an explosion.</p>

■ Classification of Installation Type






Stationary equipment

1.6 Operator Profile

Item	Details
Age	Age that which a person can obtain the license of Radiological Technologist or a license equal to it.
Sex	No limitation
Nationality	No limitation
Education	Radiological Technologist or person who has a license equal to it. The capacity to read and understand the operation manual.
Knowledge	Radiological Technologist or person who has a license equal to it.
Language	Can read and understand English.
Experience	Necessary. Every operator needs to take training for operating the equipment before using the equipment.
Permissible impairments	Corrected visibility is over 0.7 in the decimal number. Impaired by 40 % resulting in 60 % of normal hearing at 500 Hz to 2 kHz.

1.7 Symbols

The symbols used on the equipment are shown below:

Symbol	Location	Meaning
	On name plate	Alternating current
	Inside the equipment, where protective earth conductor in power cord is connected	Protective earth ground
	On warning and caution labels	Refer to the operation manual
	Breaker switch	Power ON
	Breaker switch	Power OFF

1

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2

Configuration

This chapter describes the configuration of the equipment.

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2.1 Configuration

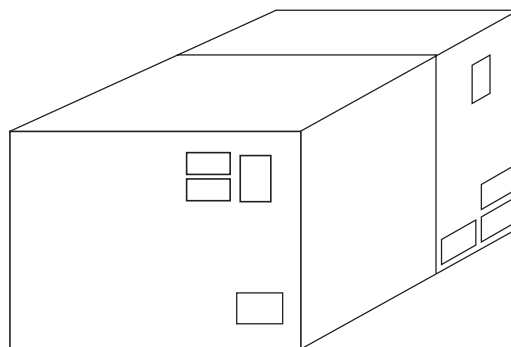


Fig. 2.1

The High Speed Rotation Starter SA-60 consists of the following components.

Name		Detail
SA-60 main unit		1 set
Accessories	Power cable SA-60	3 cores, 18 m, 1 piece
	DC signal cable <JS1>	30 cores, 5 m, 1 piece
	AC signal cable	16 cores, 5 m, 1 piece
Floor case (option)		1 set

3

Operation

This chapter describes how to operate the equipment and optional components.

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3.1 Power ON/OFF

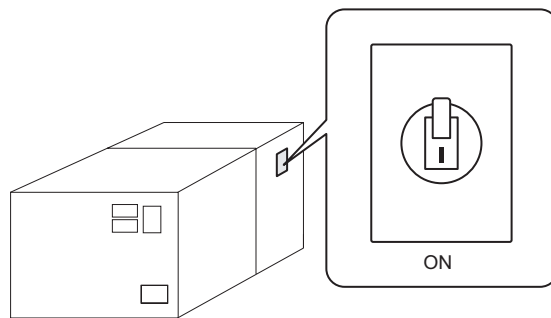
Before applying the power, make sure that the power switch of the SA-60 power control box is turned ON.



When turning the power supply ON, follow the instructions in the separate operation manual of the X-ray high voltage generator.

3.1.1 Power ON

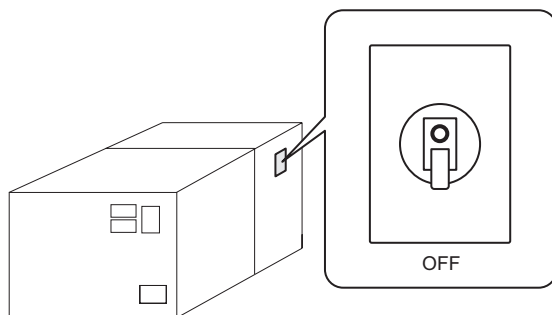
- 1 Turn ON the knife switch or the molded case circuit breaker connected to the power supply cables of the Starter SA-60 and the X-ray high voltage generator.
- 2 When the molded case circuit breaker of the Starter SA-60 is OFF, turn it ON.



- 3 Power the X-ray high voltage generator on.
The indicator lamps of X-ray generator come on.
The starter SA-60 is automatically powered on when the X-ray high voltage generator is turned on.

3.1.2 Power OFF

- 1 Power the X-ray high voltage generator off.
The starter SA-60 is automatically powered off, after the tube stator drive is over.
- 2 Turn the knife switch or molded case circuit breaker OFF to which the power supply cables of the starter SA-60 and the X-ray high voltage generator are connected.

**3**

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4

Troubleshooting

This chapter explains the emergency stop operation and error messages.

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4.1 Error Messages

If any abnormality occurred in starter, the below error message is displayed on the control console of X-ray high voltage generator.

Failure	Possible Cause	Action
Starter ERR	Output current is too much or no current flow.	Depress the ON side of the power supply switch located on control console of high voltage generator. If this message appears repeatedly, contact your local distributor.

5

Maintenance



This chapter explains the daily and periodic inspection items and describes the consumables.

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5.1 Daily Inspections

Inspect the following items before operating the equipment, and if any abnormality is observed, contact your Shimadzu service representative or qualified personnel.

 CAUTION	
 Instructions	If any abnormality is found during the maintenance check, stop using the equipment and contact your Shimadzu service representative.
	When a user performs the maintenance check for himself or herself, please keep in mind his or her own safety.
	Shimadzu shall not be liable for any damage resulting from the checks other than those by Shimadzu or Shimadzu representative.

5.1.1 Inspection before Operating the Unit

Check the following items before operating the unit in order to use it correctly and safely:

- 1 Visual checking.
 - Any bloodstains or water drops are adhered to the equipment?
 - Are there any defects of cables such as bites, twists, or thread bareness?
- 2 Checking after tuning on power.
 - Any abnormal sound or foul smell occurs?

5.1.2 Inspection after Operating the Unit


Check the following items after operating the unit in order to prepare for the next use.

- 1 Visual checking.
 - Are there any defects of cables such as bites, twists, or thread bareness?


5.1.3 Inspection for Warning and Caution Labels


Periodically (once a year) inspect the labels attached on the equipment.

If any label is peeled or unreadable by stain or scratch, contact your Shimadzu service representative for replacement of a new one.

 **Reference** ["Warning and Caution Labels" P.xiii](#)

5.1.4 Cleaning and Disinfection


 **WARNING**




Be sure to turn the equipment power OFF before cleaning and disinfecting the equipment.

Instructions Otherwise, a malfunction may occur in the equipment, or the equipment may operate in an unintended way.


Also, thoroughly ventilate the room before turning on the power after disinfection work is complete.

 **CAUTION**




Be sure to clean and disinfect the equipment.

Instructions Cleaning and disinfection are very important to ensure that the equipment can be used hygienically and safely. Strictly follow the methods prescribed.




Do NOT directly apply rubbing alcohol or water, or spray it onto the equipment.

Prohibitions Wipe the surface of the equipment with a cloth soaked with rubbing alcohol. If rubbing alcohol gets inside the equipment, it can cause failure or accidents.



Do NOT use an organic solvent.

Prohibitions Organic solvents may change the surface color. If an organic solvent adheres to the surface, wipe it out immediately.



Do NOT use the following disinfectants:

Prohibitions If any of the following disinfectants are applied, the equipment performance and safety cannot be guaranteed.


- Chlorine-based disinfectants
- Disinfectants that corrode metals, plastics, rubber, or paint
- Disinfectants unsuitable for metals, plastics, rubber, or paint
- Spray-gas type disinfectants
- Volatile disinfectants
- Disinfectants that may enter the equipment

**CAUTION**

Instructions

Use disinfectants at a minimum.

Repeated disinfection over a long time may lead to discoloring and cracking on the equipment surface, and deterioration of rubber and plastic. If any abnormality is found on the equipment after disinfection, stop using the equipment immediately. Contact your Shimadzu service representative for repair.

- 1 Ensure that the equipment power is turned OFF.
 **Reference** ["3.1 Power ON/OFF" P.3-2](#)
- 2 Carry out the cleaning and disinfection.
 Clean the equipment with a cloth soaked with rubbing alcohol.
- 3 When the cleaning and disinfection work is complete, check the following points before turning the power back ON:
 - No water or disinfectant remains on the surface
 - All tools used for cleaning and disinfection have been cleared away

5.1.5 Check Sheet for Daily Inspection

Date of inspection:

Inspected by:

- 1 Check the following points visually and perform the appropriate procedure in case of any problems.

Check points	Procedure
<input type="checkbox"/> Are all unnecessary objects removed from the vicinity of the equipment?	Remove
<input type="checkbox"/> Any breakage (dents, fractures, etc.) on the cover?	Contact your Shimadzu service representative

- 2 Turn ON the power supply and check the following points. Perform the appropriate procedure in case of any problems.



Check points	Procedure
<input type="checkbox"/> Are there any defects of cables such as bites, twists, or thread bareness?	Contact your Shimadzu service representative

5.2 Periodic Inspection

Even without any problem in daily inspection, the following items should be inspected periodically.

The maintenance work involves dangerous tasks. Be sure to request your Shimadzu service representative to perform the periodic inspection.

For more detail, refer to the operation manual of the X-ray high voltage generator combined with the starter.

 WARNING	
	Be sure to perform periodic inspection (every 6 months).
Instructions	Failure to do this may cause serious accidents or significantly shorten the lifetime of the equipment.

Periodic inspections mainly check the equipment performance and the internal mechanisms. The inspections require good knowledge of the internal mechanisms and can also be dangerous. Contact your Shimadzu service representative to request a periodic inspection. It is recommended to conduct periodic inspections every 6 months. A fee is charged for periodic inspections after expiry of the warranty periods.

5.3 Consumable Parts List

When replacing consumable parts, use the genuine parts with the following part number:

	Name	Part No.	Required Qty	Replacement cycle	Implemented by
fuse	FLQ20	072-01659-36	1	2 years	your Shimadzu service representative
	313.500	072-01664-15	2	2 years	
	600FH-50	072-06033-05	1	2 years	
battery	CR2450	074-73307-02	1	2 years	

6

Specifications

This chapter describes the specification of the equipment.



■ Chapter Contents

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6.1 Environmental Conditions of EMC (Electromagnetic Compatibility)

The equipment satisfies the EMC (Electromagnetic Compatibility) standard below:

IEC 60601-1-2:2007



 CAUTION	
	<p>Pay attention to the electromagnetic circumstances at the installation site.</p>
<p>Instructions</p>	<p>The equipment may be affected by the electromagnetic environment at the installation site.</p> <p>Also, the installation of the equipment may affect other existing equipment.</p>

■ Classification of EMI in Accordance with EN/IEC 60601-1-2:2007

Group 1, Class A

The system uses radio-frequency energy only for its internal function and is not intended to deliver energy to the patient. But little leakage radio-frequency energy does harm to highsensitive equipment.

The system main power line in the clinical site should be connected to the domestic power sources which are separated from the public main network.

 CAUTION	
	<p>For replacement parts of internal components, make sure to apply the cables supplied by Shimadzu.</p>
<p>Instructions</p>	<p>The use of non-cable devices, accessories, or cables other than those sold by Shimadzu as replacement parts for the internal components may result in increased emissions or decreased immunity of the equipment.</p>

■ Performance to be EMC Immunity Tested (Essential performance)

Essential performances of the equipment are as follows:

Anode rotation control of rotating anode X-ray tube

List of Cables

Cable Name	Cable Length	Shield	Remarks (Manufacturer/Part No.)
Power Cable SA-60	18 m	N	Shimadzu/502-21311
Signal Cable, for Generator	5 m	Y	Shimadzu/502-20091
Cable, JS1	5 m	Y	Shimadzu/502-79774
Low-Voltage Cable, #21	22 m	Y	Shimadzu/532-24776



NOTE

The cables listed above are the parts specified to be compliant with the standards. These parts are not provided attached to the equipment.


■ Guidance and Manufacturer's Declaration - Electromagnetic Emissions

Guidance and manufacturer's declaration - electromagnetic emissions		
High Speed Rotation Starter SA-60 is intended for use in the electromagnetic environment specified below. The customer or the user of High Speed Rotation Starter SA-60 should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions EN 55011/ CISPR11	Group 1	High Speed Rotation Starter SA-60 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions EN 55011/ CISPR11	Class A	High Speed Rotation Starter SA-60 is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions EN 61000-3-2/IEC 61000-3-2	Not applicable (Combined total system's RATED input current exceeds 16 A per phase)	
Voltage fluctuations/ flicker emissions EN 61000-3-3/IEC 61000-3-3	Not applicable (Combined total system's RATED input current exceeds 16 A per phase)	

Guidance and Manufacturer's Declaration - Electromagnetic Immunity

Guidance and manufacturer's declaration - electromagnetic immunity			
High Speed Rotation Starter SA-60 is intended for use in the electromagnetic environment specified below. The customer or the user of High Speed Rotation Starter SA-60 should assure that it is used in such an environment.			
Immunity test	EN/IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) EN 61000-4-2/IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If the floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient / burst EN 61000-4-4/IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge EN 61000-4-5/IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV line(s) to line(s) ±2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines EN 61000-4-11/IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	Not applicable <5 % U_T (>95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of High Speed Rotation Starter SA-60 requires continued operation during power mains interruptions, it is recommended that High Speed Rotation Starter SA-60 be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field EN 61000-4-8/IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE • U_T is the AC mains voltage prior to application of the test level.			

Guidance and Manufacturer's Declaration - Electromagnetic Immunity

Guidance and manufacturer's declaration - electromagnetic immunity			
High Speed Rotation Starter SA-60 is intended for use in the electromagnetic environment specified below. The customer or the user of High Speed Rotation Starter SA-60 should assure that it is used in such an environment.			
Immunity test	EN/IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
<p>Conducted RF EN 61000-4-6/ IEC 61000-4-6</p> <p>Radiated RF EN 61000-4-3/ IEC 61000-4-3</p>	<p>3 Vrms 150 kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2.5 GHz</p>	<p>3 Vrms 150 kHz to 230 MHz</p> <p>3 V/m 351.2 MHz 800 MHz 1980 MHz 2412 MHz</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of High Speed Rotation Starter SA-60, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance</p> $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = 2.3\sqrt{P} \quad 800 \text{ MHz to } 2.5 \text{ GHz}$ <p>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey^{*1}, should be less than the compliance level in each frequency range^{*2}.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> <div style="text-align: center;">  </div>
<p>NOTE</p> <ul style="list-style-type: none"> At 80 MHz and 800 MHz, the higher frequency range applies. These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. 			
<p>*1: Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which High Speed Rotation Starter SA-60 is used exceeds the applicable RF compliance level above, High Speed Rotation Starter SA-60 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating High Speed Rotation Starter SA-60.</p> <p>*2: Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

List of the transmitters or equipment used as RF test sources and the frequency and modulation characteristics of each source

kind of equipment	type	manufacturer	Spot check frequencies	Modulation
Digital Transceiver	IC-DPR5	ICOM	351.2 MHz	FSK (frequency shift keying)
Cellular Telephone	P251S/ F212i	Panasonic/ Fujitsu	800 MHz	PM (Phase modulation)
Cellular Telephone	812SH	Sharp	1980 MHz	PM (Phase modulation)
Wireless LAN Station	WHR-HP-G	BUFFALO	2412 MHz	OFDM (Orthogonal Frequency- Division Multiplexing)

WARNING

Instructions

When using the devices at frequencies other than the tested frequencies, be sure to check the electromagnetic influence.

The equipment is tested for radiated RF immunity only at particular frequencies. Note that the test is not necessarily performed over the entire frequency range from 80 MHz to 2.5 GHz.

■ Recommended Separation Distances between Portable and Mobile RF Communications Equipment and the EQUIPMENT or SYSTEM

Recommended separation distances between portable and mobile RF communications equipment and High Speed Rotation Starter SA-60			
<p>High Speed Rotation Starter SA-60 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled.</p> <p>The customer or the user of High Speed Rotation Starter SA-60 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and High Speed Rotation Starter SA-60 as recommended below, according to the maximum output power of the communications equipment.</p>			
Rated maximum output power of transmitter (W)	Separation distance according to frequency of transmitter (m)		
	150 kHz to 80 MHz $d = 1.2 \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
<p>NOTE</p> <p>For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.</p> <ul style="list-style-type: none"> At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. 			

6.2 Statement of Compliance [For Europe]

6.2.1 Regulatory Information

For Europe:

The product complies with the requirement of the Medical Device Directive 93/42/EEC

Product Name: High Speed Rotation Starter

Model Name: High Speed Rotation Starter SA-60

Parts Number: 516-E009

Manufacturer: SHIMADZU CORPORATION
Medical Systems Division

Address: 1, NISHINOKYO-KUWABARACHO,
NAKAGYO-KU, KYOTO, 604-8511, JAPAN

Authorized SHIMADZU EUROPA GmbH
Representative in EU:

Address: Albert-Hahn-Strasse 6-10, 47269 Duisburg, F.R. Germany

6.2.2 Company's Quality System

The company's Quality System is satisfied with Annex II, Article 3 for 93/42/EEC as amended by 2007/47/EC, which is certified by TUV Rheinland LGA Products GmbH; Tillystrasse 2, D-90431 Nurnberg, Germany (Notified under No. 0197) as Registration No.: HD 60029841 0001

6

6.2.3 International Standards

This equipment conforms the following international standards.

- IEC 60601-1:2005 / EN 60601-1:2006

6.3 Manufacturer Information

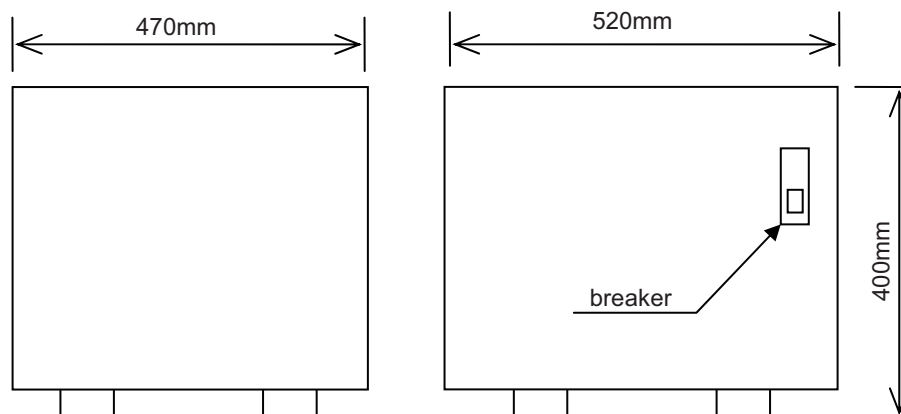
Manufacturer: SHIMADZU CORPORATION
Medical Systems Division

Address: 1, NISHINOKYO-KUWABARACHO,
NAKAGYO-KU, KYOTO, 604-8511, JAPAN

6.4 Specification

6.4.1 Outside Dimensions and Mass

■ Floor Supported Case (Option)



Mass: Approx. 50 kg

6.4.2 Input Ratings

Item	Specifications
Phase	Single phase AC
Frequency	50/60 Hz
Standard voltages	AC200 V, AC208 V, AC220 V, AC230 V, AC240 V (for power and control circuits)
Permitted voltage range	±10 % of standard voltage
Supply capacity	5 kVA

6.4.3 Output Ratings

Item	Item	Specifications
Voltage	High speed rotation	150 V, 220 V, 275 V, 340 V, 425 V, 500 V, 550 V, 600 V (rectangular wave output) Frequency 150/180 Hz Phase Shift Capacitor 21 μ F (Q-stator), 5 μ F (R-stator)
	Low speed rotation	AC 150 V, AC 220 V, AC275 V (sinusoidal wave output) Frequency 50/60 Hz Phase shift capacitor 66 μ F (Q-stator), 30 μ F (R-stator)
Intermittent drive		Power is supplied intermittently with the same specifications as above.
Braking	AC braking	150 V, AC 220 V, AC 275 V (rectangular wave output) 50 Hz Phase shift capacitor 66 μ F (Q-stator), 30 μ F (R-stator)
	DC braking	DC 140 V, DC 210 V, DC 260 V



The voltages in (a) to (d) vary within 10 % of the above values with the variation of supply voltage.

The unit can drive up to two kinds and three X-ray tubes.

6.4.4 Power Consumption

Item	Specifications
Power Consumption	<ul style="list-style-type: none"> Rotation start-up for anode of X-ray tube unit: 7.5 kV Rotation stand-by: 100 VA

6.4.5 Heat Generation

Heat generated from the equipment is as follows;

Item	Specifications
SA-60 Heat generation	1400 W (1200 kcal/h)



1 kW = 860 kcal/h

Heat calculated drive sequence:

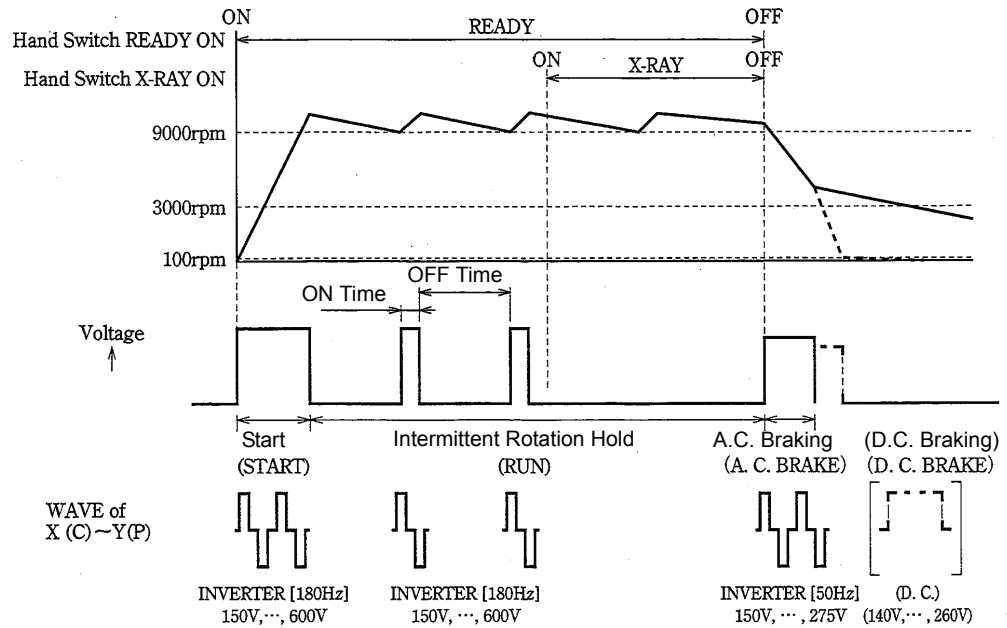
Repeating acceleration and braking of Varian-made 1.5 MHU x-ray tube anode every 3 minutes.

Note that heat generation value alters according to the drive sequence.

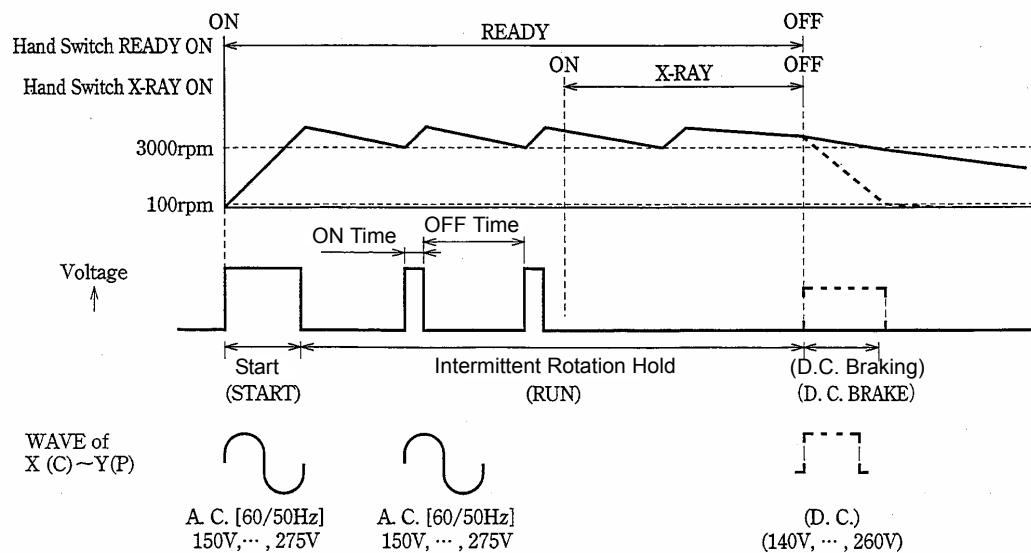
6.5 Operating Mode

6.5.1 Outputs and Anode Rotation Velocity in Each Mode

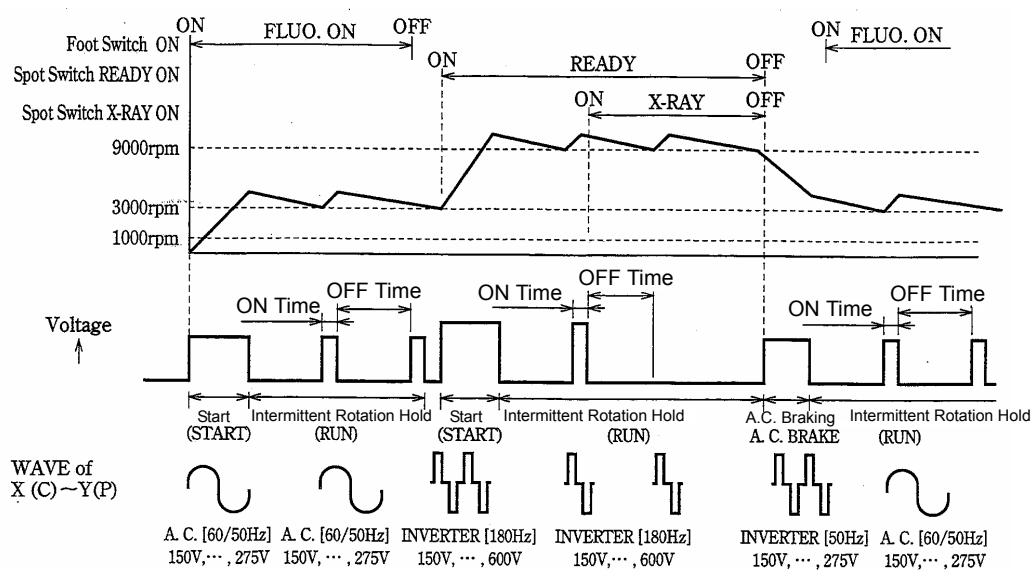
General Technique High Speed Rotation Mode



General Technique Low Speed Rotation Mode



Fluoroscopy Spot Mode



6.5.2 Specifications of X-ray Tube in Each Mode

General Technique High Speed Rotation Mode

X-ray tube type	Acceleration			Intermittent drive		Phase shift capacitor
	Time	Frequency	Voltage	ON time	OFF time	
Varian-made 1.5MHU X-ray tube	3.5 s	180 Hz	INV. 550 V	1.0 sec	25 sec	5 μ F
Varian-made 1.0MHU X-ray tube	2.3 s	180 Hz	INV. 550 V	1.0 sec	25 sec	5 μ F
Varian-made 600KHU X-ray tube	1.7 s	180 Hz	INV. 500 V	1.0 sec	25 sec	5 μ F
Shimadzu-made 1.5MHU (J-type)	3.5 s	180 Hz	INV. 500 V	1.0 sec	25 sec	5 μ F
Shimadzu-made 750KHU (J-type)	3.5 s	180 Hz	INV. 500 V	1.0 sec	25 sec	5 μ F
Shimadzu-made R stator 400KHU (P3-type)	1.6 s	180 Hz	INV. 425 V	1.0 sec	25 sec	5 μ F
Shimadzu-made Q stator 400KHU (P3-type)	1.0 s	180 Hz	INV. 340 V	0.28 sec	25 sec	21 μ F

* INV. means rectangular output from inverter.

X-ray tube type	Braking			Phase shift capacitor	
	Time	Frequency	Voltage		
Varian-made 1.5MHU X-ray tube	4.0 s	50 Hz	INV. 275 V	30 μ F	
	7.0 s	50 Hz + DC	INV. 260 V	-	Normally unused
Varian-made 1.0MHU X-ray tube	3.0 s	50 Hz	INV. 220 V	30 μ F	
	5.5 s	50 Hz + DC	INV. 210 V	-	Normally unused
Varian-made 600KHU X-ray tube	2.5 s	50 Hz	INV. 150 V	30 μ F	
	4.5 s	50 Hz + DC	INV. 140 V	-	Normally unused
Shimadzu-made 1.5MHU (J-type)	5.0 s	50 Hz	INV. 220 V	30 μ F	
	7.5 s	50 Hz + DC	INV. 210 V	-	Normally unused
Shimadzu-made 750KHU (J-type)	5.0 s	50 Hz	INV. 150 V	30 μ F	
	7.5 s	50 Hz + DC	INV. 140 V	-	Normally unused
Shimadzu-made R stator 400KHU (P3-type)	1.6 s	50 Hz	INV. 150 V	30 μ F	
	2.6 s	50 Hz + DC	INV. 140 V	-	Normally unused
Shimadzu-made Q stator 400KHU (P3-type)	0.8 s	50 Hz	INV. 220 V	66 μ F	
	1.8 s	50 Hz + DC	INV. 210 V	-	Normally unused

General Technique Low Speed Rotation Mode

6

X-ray tube type	Acceleration			Intermittent drive		Phase shift capacitor
	Time	Frequency	Voltage	ON time	OFF time	
Varian-made 1.5MHU X-ray tube	4.0 s	50/60 Hz	275 V	1.0 sec	15 sec	30 μ F
Varian-made 1.0MHU X-ray tube	2.5 s	50/60 Hz	220 V	1.0 sec	15 sec	30 μ F
Varian-made 600KHU X-ray tube	2.8 s	50/60 Hz	150 V	1.0 sec	15 sec	30 μ F
Shimadzu-made 1.5MHU (J-type)	4.0 s	50/60 Hz	220 V	1.0 sec	15 sec	30 μ F
Shimadzu-made 750KHU (J-type)	4.0 s	50/60 Hz	150 V	1.0 sec	15 sec	30 μ F
Shimadzu-made R stator 400KHU (P3-type)	1.6 s	50/60 Hz	150 V	0.28 sec	10 sec	30 μ F
Shimadzu-made R stator 400KHU (P1-type)	1.6 s	50/60 Hz	150 V	0.28 sec	10 sec	30 μ F
Shimadzu-made Q stator 400KHU (P3-type)	1.0 s	50/60 Hz	220 V	0.28 sec	10 sec	66 μ F

6 Specifications

X-ray tube type	Braking			Phase shift capacitor	
	Time	Frequency	Voltage		
Varian-made 1.5MHU X-ray tube	3.0 s	DC	260 V	-	Normally unused Normally no braking
Varian-made 1.0MHU X-ray tube	2.5 s	DC	210 V	-	Normally unused Normally no braking
Varian-made 600KHU X-ray tube	2.0 s	DC	140 V	-	Normally unused Normally no braking
Shimadzu-made 1.5MHU (J-type)	2.5 s	DC	210 V	-	Normally unused Normally no braking
Shimadzu-made 750KHU (J-type)	2.5 s	DC	140 V	-	Normally unused Normally no braking
Shimadzu-made R stator 400KHU (P3-type)	1.0 s	DC	140 V	-	Normally unused Normally no braking
Shimadzu-made R stator 400KHU (P1-type)	1.0 s	DC	140 V	-	Normally unused Normally no braking
Shimadzu-made Q stator 400KHU (P3-type)	1.0 s	DC	210 V	-	Normally unused Normally no braking

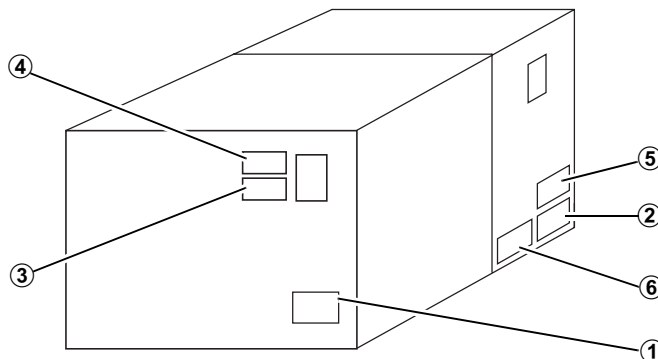
■ Fluoroscopy Spot Mode

X-ray tube type	F/Spot acceleration			Intermittent drive		Phase shift capacitor
	Time	Frequency	Voltage	ON time	OFF time	
Varian-made 1.5MHU X-ray tube	3.0 s	180 Hz	INV. 550 V	1.0 sec	25 sec	5 μ F
Varian-made 1.0MHU X-ray tube	1.8 s	180 Hz	INV. 550 V	1.0 sec	25 sec	5 μ F
Varian-made 600KHU X-ray tube	1.2 s	180 Hz	INV. 500 V	1.0 sec	25 sec	5 μ F
Shimadzu-made 1.5MHU (J-type)	3.2 s	180 Hz	INV. 500 V	1.0 sec	25 sec	5 μ F
Shimadzu-made 750KHU (J-type)	2.5 s	180 Hz	INV. 500 V	1.0 sec	25 sec	5 μ F
Shimadzu-made R stator 400KHU (P3-type)	0.8 s	180 Hz	INV. 425 V	1.0 sec	25 sec	5 μ F
Shimadzu-made R stator 400KHU (P1-type)	1.2 s	50/60 Hz	150 V	0.28 sec	10 sec	30 μ F
Shimadzu-made Q stator 400KHU (P3-type)	0.7 s	180 Hz	INV. 340 V	0.28 sec	25 sec	21 μ F

X-ray tube type	Braking			Phase shift capacitor	
	Time	Frequency	Voltage		
Varian-made 1.5MHU X-ray tube	4.0 s	50 Hz	275 V	30 μ F	
Varian-made 1.0MHU X-ray tube	3.0 s	50 Hz	220 V	30 μ F	
Varian-made 600KHU X-ray tube	2.5 s	50 Hz	150 V	30 μ F	
Shimadzu-made 1.5MHU (J-type)	5.0 s	50 Hz	220 V	30 μ F	
Shimadzu-made 750KHU (J-type)	5.0 s	50 Hz	150 V	30 μ F	
Shimadzu-made R stator 400KHU (P3-type)	1.6 s	50 Hz	150 V	30 μ F	
Shimadzu-made Q stator 400KHU (P3-type)	0.8 s	50 Hz	220 V	66 μ F	


6.6 Labels

Locations where labels are attached are shown as follows.




■ Name Plate

① Name Plate of Type A (SA-60)

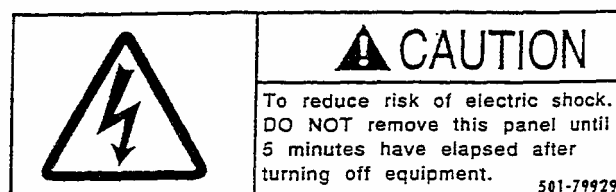
MODEL	SA-60	
NO.		
SUPPLY MAINS V	~200/208/220/230/240	50/60Hz
INPUT POWER VA	7.5k	
INPUT CURRENT		
MOMENTARY	A	35
CONTINUOUS	A	2
WIRING	503-03929	
502-21172		
 株式会社島津製作所 604 京都市中京区西ノ京染原町1 SHIMADZU CORPORATION 1. Nishinokyo-Kuwabaracho, Nakagyo-ku, Kyoto 604, Japan		

② Name Plate of Type B (SA-60)

MODEL	SA-60	
NO.		
SUPPLY MAINS V	~200/208/220/230/240	50/60Hz
INPUT POWER VA	7.5k	
INPUT CURRENT		
MOMENTARY	A	35
CONTINUOUS	A	2
WIRING	503-03929	
502-21172		
 株式会社島津製作所 604 京都市中京区西ノ京染原町1 SHIMADZU CORPORATION 1. Nishinokyo-Kuwabaracho, Nakagyo-ku, Kyoto 604, Japan		

Other Label

③ Caution Label



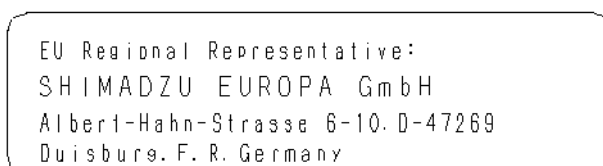
④ Caution Label



⑤ CE Label

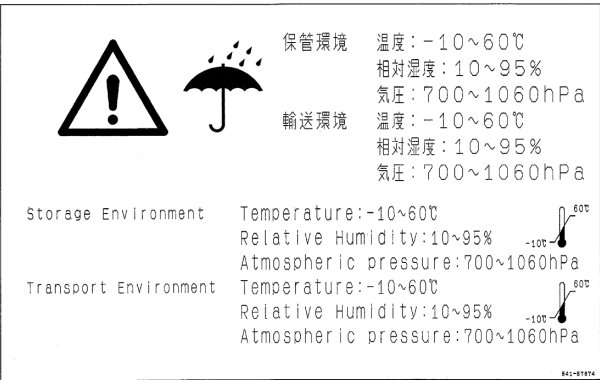



⑥ Label of SHIMADZU EUROPA GmbH



■ Package for Transportation

The following shows the label on the package for transportation, describing about storage environment and transport environment.



Symbol	Location	Meaning
	Package	Keep away from rain in during transport.

Appendix

■ Check List for Troubleshooting

Fill following blanks and contact your Shimadzu service representative.

Hospital:

Phone:

FAX:

Serial Number:

Date of Installation:

Item	Check
<input type="checkbox"/> Someone injured	
<input type="checkbox"/> When is the trouble occurred?	
<input type="checkbox"/> Is there a sign of the trouble?	
<input type="checkbox"/> Is there a power failure or thunderbolt when the trouble is occurred?	
<input type="checkbox"/> the equipment has been watered?	
<input type="checkbox"/> the equipment has been given an impact upon?	
<input type="checkbox"/> The number of patients a day with the equipment?	
<input type="checkbox"/> When is the last periodic inspection?	

Safety Instruction Registry

Hospital	<input type="checkbox"/> Name	
	<input type="checkbox"/> Phone	
	<input type="checkbox"/> Extension number	
	<input type="checkbox"/> FAX	
	<input type="checkbox"/> Address	
	<input type="checkbox"/> Room number	
Device	<input type="checkbox"/> Name	
	<input type="checkbox"/> Serial number	
	<input type="checkbox"/> Date of installation	
Instructor	<input type="checkbox"/> Affiliation	
	<input type="checkbox"/> Phone	
	<input type="checkbox"/> FAX	

Date	Description	This device's maintenance and operation staff	Instructor
		Signature	Signature

- At the time of installation or when changing the designated operator, your Shimadzu service representative will explain this manual's safety description of this device's maintenance to operation staff and record the new information.
- This manual is important. We request all maintenance personnel to keep it in a safe place close to the equipment.

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