

Floor Mounted Type System

# SST-4100S

## Operation Manual

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

Thank you for purchasing SHIMADZU medical equipment.  
Please read this manual thoroughly before using this equipment.

## About the Symbols 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.

Symbol	Explanation
 <b>DANGER</b>	Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.
 <b>WARNING</b>	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or possibly death.
 <b>CAUTION</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor to moderate injury or equipment damage.
 <b>NOTE</b>	Emphasizes additional information that is provided to ensure the proper use of this product.
	Indicates information for better performance of the product.

# Preface

Thank you for purchasing the FTMS System SST-4100S (hereinafter 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.

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## Notice

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## Operating Precautions

### Operating Precautions (for Both the Safety and the Prevention of Danger) for Safety in the Use of Electric Medical Equipment

1. Nobody without the following experience and knowledge should use the equipment.
  - (1) Medical (radiographic) training (if particular qualifications are required in the country concerned, those qualifications must be held).
  - (2) The capacity to read and understand the operation manual.
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 sulphur gas.
  - (3) During transportation and operation of the equipment, avoid tilting, vibration, and sharp impact against it.
  - (4) Keep the equipment away from 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 conditions of the battery power source (power and polarity) before operating the equipment.
  - (7) Properly 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 properly.
  - (3) Check all wiring for proper and correct connections.
  - (4) Check the condition of the external electric circuit, which will be directly connected to a patient.
  - (5) Check the condition of the battery power source.

4. While operating the equipment, pay attention to the following items:
  - (1) Do NOT 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 equipment touch the patient unless necessary.
5. After operating the equipment, pay attention to the following items:
  - (1) Turn off the switches and return the dial to their original before use in the prescribed order. Then, turn off the main power switch.
  - (2) Do NOT pull the power cable forcibly from the outlet.
  - (3) When storing the equipment, pay attention to the following items:
    - (i) Keep it 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) During transportation and storage of the equipment, avoid tilting, vibration, and sharp impact against it.
    - (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. When the equipment is found to be out of order, do not try to repair it. Display an appropriate sign to indicate that the equipment is out of order, and 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. Concerning other items, operate properly according to the operation manual.

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## Precautions in Usage

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



**The responsibility for management of use and maintenance of medical equipment lies with the user.**

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.



**Never modify the equipment.**

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.



**Do NOT try to defeat or bypass built-in safety features.**



**Do NOT try to move equipment or disconnect any communication or power cables.**

Please contact your Shimadzu service representative if it is necessary to modify the equipment.



**Perform periodical maintenance.**

Preventive maintenance is required to maintain long-term safety and performance of the equipment.

The “Chapter 6 Specifications” in this manual gives detailed descriptions of daily and periodic maintenance and inspection that a user should perform. As for the maintenance and inspection that only specially trained experts can perform, utilize the maintenance agreement program offered by your Shimadzu service representative.



**Repair and maintenance of the inside of the equipment can only be performed by your Shimadzu service representative.**

Maintenance must be assigned to specially trained experts. Contact your Shimadzu Service Representative for repair and maintenance.



**In order to ensure safety when using the system, read the operation manual provided with each system component for details on usage and relevant precautions.**



**Connect this equipment only to Shimadzu certificated devices or devices that are proven to be safe and show no performance degradation in any combination including connecting system.**



**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 representative or someone who has adequate experience in using the equipment.**

In order to operate the equipment safely, an explanation of the operation needs to be given. When installing the equipment, your Shimadzu service representative explains the operating procedure using this operation manual. Follow their directions and operate the equipment correctly.

 1.5 Operator Profile



**Secure the means for the operator and the patient to communicate with each other.**

If equipment usage is deemed to put the patient at risk due to his or her condition, refrain from conducting the study or treatment.



**Federal law restricts this equipment to sale by or on the order of physician. (This caution is the prescription language required by Federal Regulations in U.S.A.)**

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

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**Do NOT use the equipment in places where liquid may enter.**

The equipment is not designed to be waterproof. Invasion of any liquid should cause electric shock, system failure or malfunction.



**Do NOT spill any liquid, such as contrast medium, saline, or disinfectant, onto the equipment.**

Should such liquid drip on equipment surfaces, wipe it off immediately. Any such liquid entering into system electronics may cause failure or malfunction. Should liquid drip on the equipment or enter the covers, immediately turn off the power and contact your Shimadzu service representative.



**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.



**Do NOT open the covers of the equipment unless instructed by this manual.**

Otherwise, electric shock may result. When opening the covers for maintenance, contact your Shimadzu service representative.



**Always be very careful when moving the X-ray radiography stand and X-ray radiography table to ensure that the patient does not become caught between these devices and this equipment.**

Otherwise, it may cause injury.



**Do NOT use in a location where metal fragments may enter the equipment.**

This can result in electric shocks.



**Do NOT perform any maintenance work of the equipment during study.**

The patient may be injured.



- Accuracy of displayed values is not guaranteed.
- Displayed values measured by the measurement functions of this equipment are not absolute values but relative values based on the capability of the equipment used.
-  7.4.3 International Standards

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## Cautions on Environmental Conditions

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**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.



**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.**



1.3 Environmental Conditions

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

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## Cautions on Radiography

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**Restrict all persons other than the patient from accessing the equipment in accordance with local regulations.**

To avoid unnecessary exposure, acceptable distances (maximum access values) to the equipment by any person other than the patient are defined for each region.



**The equipment can be operated only by qualified personnel, such as radiology technicians or those with equivalent qualifications.**



**No person but the patient is allowed to stay in the examination room during X-ray irradiation.**

If the equipment is not used correctly, the operator, the patient, and other persons may receive a greater dose of radiation than necessary.

\* During radiography, the radiography indicator illuminates and the buzzer sounds an audible warning.



**Perform X-ray irradiation carefully and according to the doctor's directions when using the equipment with expectant mothers, women who suspect they are pregnant, lactating women, or children.**

Particular ways of using the equipment may increase the scatter dose absorbed into the patient, which may cause a radiation hazard.



**Always check the X-ray exposure region using the collimator lamp.**

Irradiating a patient with X-rays outside the required region risks exposure of the patient to unnecessary radiation.



**During X-ray irradiation, ensure that the X-rays irradiate the necessary region only.**

To avoid unnecessary exposure, narrow down the collimator and take protection measures, such as wearing a protective apron.



**Do NOT place any unnecessary object in the location within the X-ray exposure region.**

Doing so may result in unnecessary radiation exposure to the patient.



**Be sure to carry out a warm-up (running-in operation of the X-ray tube unit) before taking an X-ray radiograph.**

Follow the warm-up procedure described in the X-ray high voltage generator operation manual.



**Perform the warm-up if an arc occurs.**

Suddenly using the X-ray tube unit near the nominal X-ray tube voltage (above 100 kV) after using the unit at a relatively low tube voltage (80 kV max.) for a prolonged period may result in arc. This arc occurs due to loss of the warm-up effect at high tube voltage after the X-ray tube unit is used at a relatively low tube voltage for a prolonged period.

In this case, warm-up the X-ray tube unit by referring to the procedure described in the X-ray high voltage generator operation manual.



**Do NOT perform unnecessary standby operations.**

If standby status continues after the radiography preparation button is pressed, wire disconnection or withstand voltage failure may result owing to the evaporation of the X-ray tube filament.

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**In order to minimize the radiation dose on the patient, make the distance between the focus and the patient's body surface as long as possible (Minimum 45 cm).**

The shorter the distance becomes, the greater the amount of scatter dose absorbed into the patient, which may cause a radiation hazard.

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**Pay extra attention when irradiating X-rays for a long time or repeatedly.**

It may cause a radiation hazard.

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## Cautions on Cleaning and Disinfection

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

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.



**Be sure to clean and disinfect the equipment periodically.**

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



**Be sure to clean the equipment frequently and after each patient use.**

While doing so, do NOT directly apply or spray any disinfectant, cleaner, or water onto the equipment. Wipe down all contact surfaces using a cloth moistened with 70% isopropyl alcohol. Make sure the cloth is NOT too wet. If it is, liquid may enter into system electronics, causing failure or malfunction.



**Do NOT immerse the equipment in liquid. Do NOT autoclave equipment.**



**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.



**Do NOT use an organic solvent.**

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

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**When disinfecting resin parts such as reticule of the collimator, do NOT use rubbing alcohol.**

Rubbing alcohol may lead to deformation or crack of resin parts such as reticule of the collimator. Wipe it off immediately if it adheres to the reticule of the collimator.

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**When cleaning resin parts such as reticule of the collimator, use cloth lightly moistened, not soaked, with cold or warm water mixed with neutral detergent that does not include organic solvent.**

Rubbing alcohol, organic solvents or non-neutral detergents may lead to deformation or crack of resin parts such as reticule of the collimator. Wipe them off immediately if they adhere to the reticule of the collimator.

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On completing the work, check the following points before switching the power ON again.

- There must be no water or disinfectant adhering to the equipment.
- The tools used in cleaning and disinfecting work must be tidied away.



**When turning the power ON after cleaning, make sure the examination room is properly ventilated.**

Turning the power ON while any flammable gas remains in the examination room could lead to fire, smoke, explosion, or electrocution.

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## Cautions Relating to Cellular Telephones

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**Do NOT bring any cellular telephones or related devices into the examination room with their power ON.**

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.

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## Cautions on Electromagnetic Compatibility (EMC)

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**This equipment needs special precautions regarding EMC.**

Install and use the equipment according to the EMC information provided in this operation manual.

 6.1 Environmental Conditions of EMC (Electromagnetic Compatibility)



**Make sure that electromagnetic compatibility is obtained.**

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.

 6.1 Environmental Conditions of EMC (Electromagnetic Compatibility)



**Do NOT use this equipment adjacent to, or stacked with, other equipment.**

If adjacent or stacked use is necessary, check to be sure that this equipment works properly in the environment.

 6.1 Environmental Conditions of EMC (Electromagnetic Compatibility)



**Do not use accessories, transducers and cables other than those specified or provided by Shimadzu.**

The use of accessories, transducers and cables other than those specified or provided by Shimadzu could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.



**Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the SST-4100S, including cables specified by the manufacturer.**

Otherwise, degradation of the performance of this equipment could result.



**Portable RF communications equipment (including peripherals such as antenna cables and external antennas) using TETRA (TERrestrial TRunked RADio) should be used no closer than 50 cm to any part of the SST-4100S, including cables specified by the manufacturer.**

Otherwise, degradation of the performance of this equipment could result.



**Portable RF communications equipment (including peripherals such as antenna cables and external antennas) using Bluetooth, Wireless LAN (2.4 GHz), RFID, LTE (Band7) should be used no closer than 45 cm to any part of the SST-4100S, including cables specified by the manufacturer.**

Otherwise, degradation of the performance of this equipment could result.



**Portable RF communications equipment (including peripherals such as antenna cables and external antennas) using GSM 180, CDMA 1900, GSM 1900, DECT, LTE Band 1,3,4,25, UMTS should be used no closer than 45 cm to any part of the SST-4100S, including cables specified by the manufacturer.**

Otherwise, degradation of the performance of this equipment could result.

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## Cautions When Irradiating Consecutive Pulse X-rays

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**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 effects 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 your Shimadzu service representative for inspection and examination. Upon examination, your Shimadzu service representative, 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 the installation, relocation, or service not offered by the SHIMADZU Service Representative or a SHIMADZU designated contractor.
2. Failure or damage attributing to 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 not observing the notices and procedures described in this manual.
5. Failure or damage due to the operating environment deviating from the requirements stipulated in this manual.
6. Failure or damage due to natural disasters such as fire, earthquake, flood, and thunder.
7. Failure or damage due to installation on non-SHIMADZU approved vehicle, ship, aircraft, or others.
8. Failure or damage due to use in non-SHIMADZU certified countries.
9. Failure or damage in case of purchase from entity other than SHIMADZU or Shimadzu service representative.
10. Failure or damage due to impact, drop, or shock.

Service after the expiration of the warranty is available at a reasonable cost and should be performed by the 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

The information in this Operation Manual is based on the following software.

- Version: V2.0.\*.\*

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

## Service Life

The equipment lifetime is 7 years (based on Shimadzu's criteria) assuming the specified maintenance checks are performed.

## Disposal Precautions

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**When disposing of the equipment, contact your Shimadzu service representative.**

An improper disposal of this equipment may pollute the environment by substances contained in parts.

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## 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.

**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.

## For California, USA Only

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**This product contains a battery that contains perchlorate material.**

**Perchlorate Material - special handling may apply.**

**See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)**

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## The Equipment to be Combined with



The "collimator" in this operation manual denotes the following model:  
• R-20J

## 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.



**Follow all safety labels placed on the equipment.**



## Related Documents

This manual describes the basic operating procedures for the equipment. For more detailed information, refer to the operation manuals of the respective components.

Component	Document Name	Document No.
X-ray High Voltage Generator	X-ray High Voltage Generator D150BC-40/LC-40/VC-40, D150BC-41/LC-41/VC-41, GSC-TAB GSC-MONO Operation Manual	M501-E119
Collimator	Collimator Type R-20J Operation Manual	M526-E016
System	Digital Radiography System RADspeed Pro Operation Manual	M517-V074

## Abbreviations

Abbreviations	Abbreviations Descriptions
deg	Degree (Unit of angle)
SID	Source Image Distance (Radiography distance between X-ray tube focus and X-ray detector)
FPD	Flat Panel Detector

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## Revision History

<b>Rev.</b>	<b>Date</b>	<b>Descriptions</b>
Original	2026-02-07	First edition.

# Chapter 1

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## Outline

This chapter contains information about the applications, features and usage environment of SST-4100S.

## 1.1 Applications

### Intended Use

SST-4100S is a high-frequency diagnostic X-ray system used in hospitals for patients requiring diagnostic X-ray imaging. It is designed to produce X-ray images of the skull, spine, chest, abdomen, limbs, and other body parts, excluding pediatric patients.

The system is versatile, allowing for use while the patient is sitting, standing, prone, or lying in the supine position, and is suitable for all routine X-ray examinations.

Please note, this device is not intended for mammography or dental applications.

### Indication for Use

SST-4100S is used for radiographic examinations of the whole body except mammography or dental applications when combined with an X-ray high voltage generator, an X-ray tube unit, and an X-ray collimator.



- **Do NOT use the system for any other purpose than indicated above.**
  - **Do NOT connect the system to any other equipment, either by electrical or mechanical means, or modify the system.**
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## 1.2 Principle

SST-4100S consists of Tube Stand, Patient Table, and Bucky Stand.

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### 1.2.1 Tube Stand

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By releasing the locks on all system motions and manually operating the X-ray tube in longitudinal motion, transverse motion, vertical motion, horizontal rotation and vertical rotation, you can set the radiography position.

Note also that position information such as the exposure distance and angle of rotation are displayed using a position detection mechanism.

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### 1.2.2 Patient Table

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Lay the patient on the floating tabletop and move the tabletop to adjust the radiography position. FPD is held inside the Bucky device.

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### 1.2.3 Bucky Stand

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By releasing the lock at the switch panel and operating the Bucky device manually in the vertical direction, you can set the X-ray radiography position. FPD is held inside the Bucky device.

## 1.3 Environmental Conditions

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

### 1.3.1 Operating 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.



**Operate under the condition limits described below.**

Failed to do so may lead to malfunction or damage the equipment.



**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.



**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 Optimal condition: 17 °C to 27 °C
Relative Humidity	30% to 75% (non-condensing) Optimal condition: 40% to 60%
Atmospheric Pressure	860 hPa to 1100 hPa
Environment Luminosity	150 lx to 500 lx
Ambient Noise Level	Under 70 dB

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### 1.3.2 Transport and Storage Environmental Condition

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Item	Specifications
Ambient Temperature	-25 to 70 °C
Relative Humidity	5 % to 95% (non-condensing)
Atmospheric Pressure	860 hPa to 1100 hPa

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### 1.3.3 Power Supply

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Single-phase, 120V, 500VA, 50/60Hz  
Single-phase, 220 - 240V, 500VA, 50/60Hz

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### 1.3.4 Grounding

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Grounding resistance: less than 100Ω



**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.

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### 1.3.5 Installation Requirements

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#### **Anchors and Concrete Strength**

This equipment is designed to be secured using wedge anchors, M12 x 100 mm. Please comply with the following when installing anchors:

- Concrete compressive strength:  
F  $\geq$  20 MPa (approximately 3,000 psi) or higher (Recommended: 25–30 MPa).
- For cracked concrete, use anchors certified for cracked conditions.
- Follow the anchor manufacturer's datasheet regarding embedment depth, edge distance, recommended torque, etc.
- Before installation, check the condition of the concrete (lightweight/normal/cracked) and the available embedment depth. If necessary, consult the structural/design engineer.

## 1.4 Classification of Equipment

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

### Protection Method Against Electric Shock

Class I equipment

### Classification of Applied Parts

Equipment Including Type B Applied Parts  
(Bucky enclosure on Bucky Stand, Tabletop on Patient Table)

### Operation Mode

Continuous operation

### Degree of Protection Against Liquid Ingress

- Ordinary equipment (IPX0)
  - IPX1\* (Drip proof) for foot switch only

\* : The IPX Waterproof Specification, specified by the International Electrotechnical Commission, indicates waterproof/drip-proof performance on instruments and equipment.

### For Use in an Oxygen-rich Environment



**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.

### For Use in Flammable Atmosphere



**Do NOT use the equipment or system in the presence of flammable anesthetics gas**

It may cause an explosion.

### Classification of Installation Type

- Permanently installed equipment.

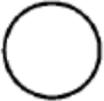
## 1.5 Operator Profile

Item	Details
Age	The age at which the medical education required to operate the X-ray diagnostic equipment is completed, and if applicable, the age at which the qualification required to operate the X-ray diagnostic equipment in the country is obtained
Sex	No limitation
Nationality	No limitation
Education	Medical education required to operate the X-ray diagnostic equipment is completed, and if applicable, the qualification required to operate the X-ray diagnostic equipment in the country.
Knowledge	Medical education required to operate the X-ray diagnostic equipment is completed, and if applicable, the qualification required to operate the X-ray diagnostic equipment in the country.
Language	English
Experience	All operators should be informed about operation before using the device.
Permissible impairments	Corrected visual acuity is over 20/28 (6/9). Impaired hearing or color blindness is permitted to operate the equipment.

## 1.6 Symbols and Labels

### 1.6.1 Symbols

Symbols used on this system are shown and described as follows.

Symbol	Location	Meaning
	Main switch	Power ON
	Main switch	Power OFF
	In name plate on covers	Alternating current
	In name plate on covers	Direct current
	Where protective earth conductor is connected	Protection earth grounding
	Stop Switch	Identify the emergency stop control device
<b>N</b>		Connection point for the neutral conductor on PERMANENTLY INSTALLED equipment (IEC60445)
		General mandatory action sign
		Refer to instruction manual/booklet.
		General prohibition sign
	On warning/caution labels	To signify a general warning. Refer to cautions and attached documents

Symbol	Location	Meaning
	On warning/caution labels	To warn of electricity. Refer to cautions and attached documents
	On warning/caution labels	A risk of a hand getting pinched or pushed.
	Near bucky enclosure on Bucky Stand & tabletop on Patient Table	Type B protective equipment
IPX1	Foot switch	Protection against vertically falling water droplets. In other words, the equipment can function without issues for 10 minutes when exposed to vertically falling water droplets, similar to light rain.
	In name plate on covers	Serial number
	In name plate on covers	Manufactured date
	In name plate on covers	Manufacturer
		Medical Device
		Declaration of Conformity CE certificate logo
Indicator Lights and Controls		<u>RED</u> : Warning – immediate response by the OPERATOR is required. <u>Yellow</u> : Caution – prompt response by the OPERATOR is required. <u>Green</u> : Ready for use. <u>Any other color</u> : Meaning other than that of red, yellow, or green.

<b>Symbol</b>	<b>Location</b>	<b>Meaning</b>
Specified colors in ISO 3864-1 used for safety signs		1, 2: Warning: Yellow 4: Prohibition: Red 8: Mandatory Action: Blue

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# Chapter 2

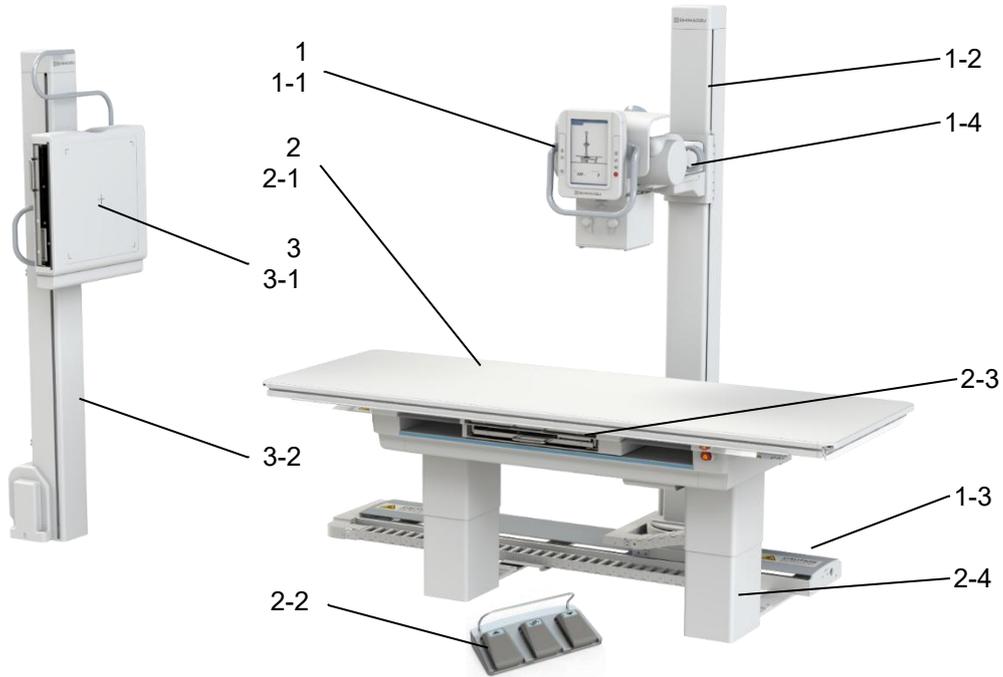
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## Controls and Indicators

This chapter describes the configuration and operating panel of SST-4100S.

## 2.1 Configuration

SST-4100S consists of the following parts. Refer to the following sections for details.

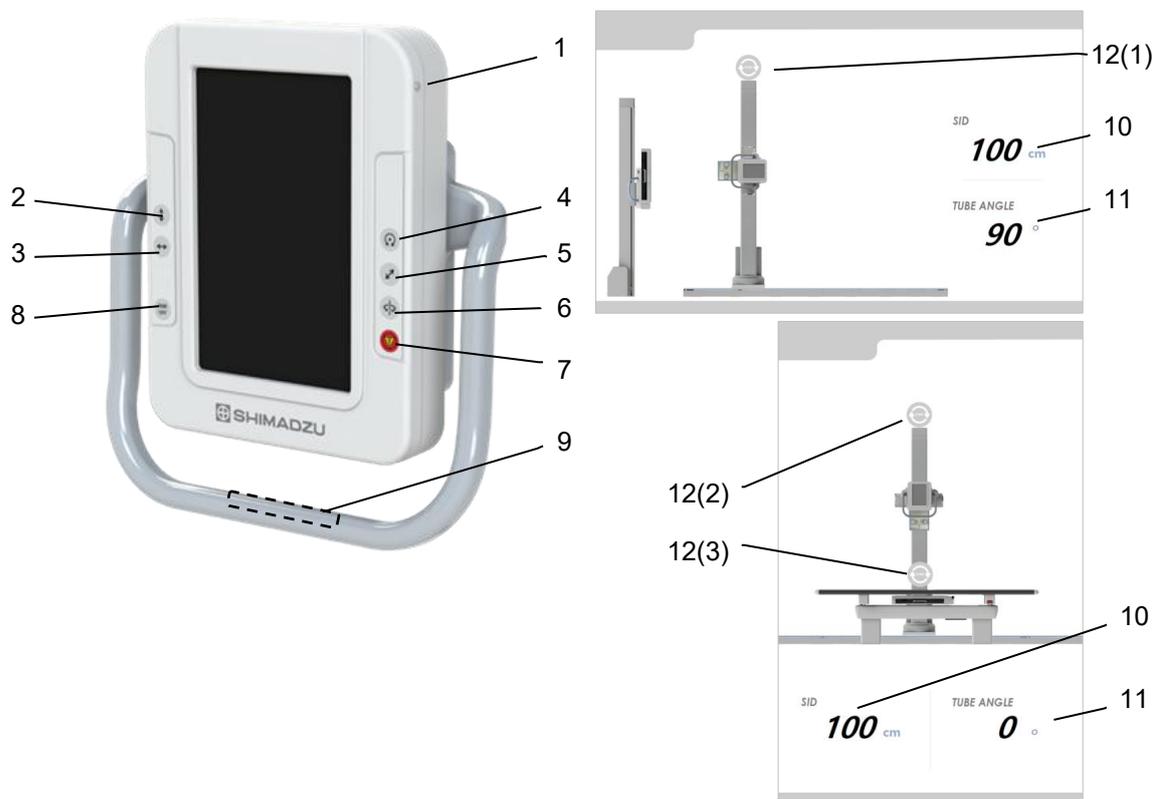


No.	Name
1	Tube Stand
1-1	Operation Panel
1-2	Column
1-3	Floor Rail
1-4	Tube Arm
2	Patient Table
2-1	Tabletop <sup>*1</sup>
2-2	Foot Switch
2-3	Bucky
2-4	Table Legs
3	Bucky Stand
3-1	Bucky <sup>*1</sup>
3-2	Column

\*1: An applied part that contacts the patient's body.

## 2.2 Operation Panel

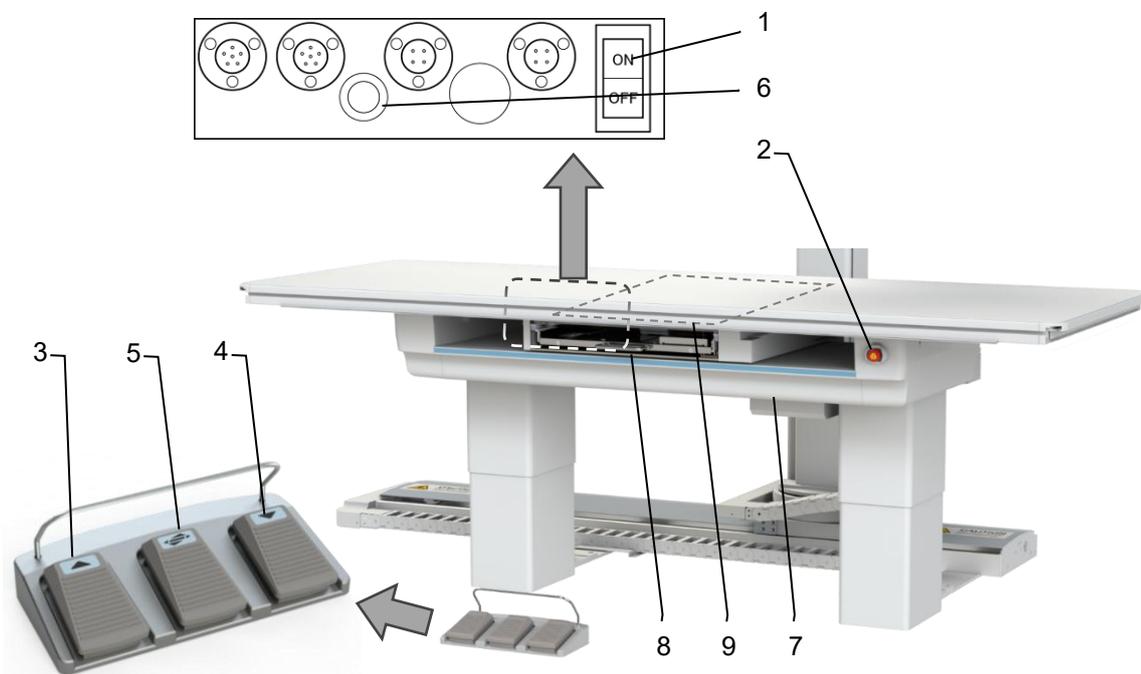
### 2.2.1 Operation Panel for Tube Stand



No.	Name	Function
1	Display ON/OFF button	This button turns ON/OFF the display.
2	Vertical release button	This button releases the lock when moving the Tube Stand vertically.
3	Longitudinal release button	This button releases the lock when moving the Tube Stand longitudinally.
4	H-axis rotation release button	This button releases the lock when rotating the Tube Stand around the horizontal axis.
5	Transverse release button	This button releases the lock when moving the Tube Stand transversely.
6	Column rotation release button	This button releases the lock when rotating the Tube Stand column.
7	Emergency button	This button is used for emergency stop.
8	Emergency release button	This button releases the emergency stop.
9	All-free button	This button placed at the rear side of the handle is to release the button longitudinal and vertical direction.
10	SID indicator	This shows the Source Image Distance (SID) between X-ray tube focus and X-ray detector.
11	Rotation angle indicator	This shows the angle at which the Tube Stand is rotated around the horizontal axis.

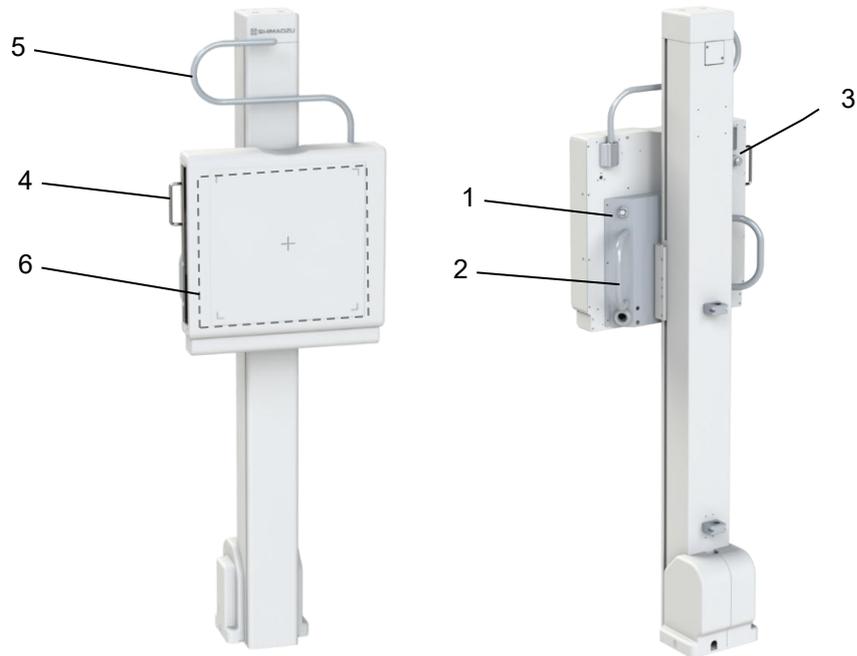
No.	Name	Function
12	Sync button	(1) This button activates/deactivates the following 3 auto-tracking functions. (2) Tube Stand tracks vertically to the Bucky Stand. (3) Patient Table tracks to the X-ray axis of the tube. (4) Tube Stand tracks vertically to the table top to keep distance.

### 2.2.2 Patient Table



No.	Name	Function
1	Main Power Switch	This button turns ON/OFF the main power for SST-4100S.
2	Emergency Switch	This switch is used for emergency stop.
3	Up Switch	This switch elevates the tabletop.
4	Down Switch	This switch lowers the tabletop.
5	All Free Switch	This switch releases the lock to move the tabletop in the horizontal direction.
6	Table legs initialization button	This button starts the initialization mode for the table legs.
7	Anti-Collision Sensor	This sensor senses object under the table when the table is lowered to prevent collision.
8	Tray Handle	This handle is used when pulling out the tray or moving the bucky.
9	Grid	The grid removes scattered X-rays.

### 2.2.3 Bucky Stand



No.	Name	Function
1	Vertical Release Button	This button releases the lock when moving the bucky vertically.
2	Bucky Handle	This handle is used when moving the bucky vertically. It is also used to support the patient at frontal position.
3	Tray Lock Release Knob	Pulling this knob releases the lock when inserting the tray.
4	Tray Handle	This handle is used when pulling out the tray.
5	Handle Grip	This handle supports the patient at lateral position.
6	Grid	The grid removes scattered X-rays. It can be detached from the bucky.

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# Chapter 3

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## Operation

This chapter describes how to move or rotate SST-4100S and its optional equipment.

## 3.1 Power ON/OFF

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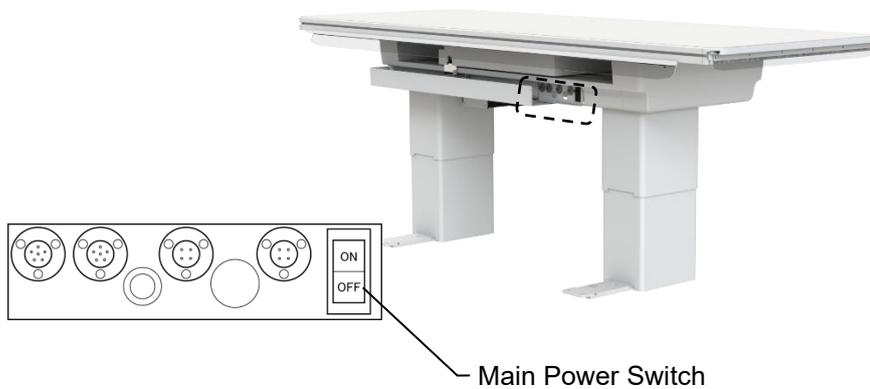
### 3.1.1 Turning ON/OFF the Main Power

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To turn the main power ON, press the Main Power Switch located at the rear side of the Patient Table to ON. Power will be supplied to the device.  
Proceed to the next section to turn OFF the display.

To turn the main power OFF, press the same Main Power Switch to OFF. Power will be cut off from the device.  
Proceed to the next section to turn OFF the display.

### 3.1.2 Turning ON/OFF the Display



**Before powering on the system, check that there is nothing on the Tube Stand rail cover.**

---



Be sure to turn OFF the display when the main power is OFF.  
The display is battery powered; therefore this will discharge if kept ON for a long time, requiring time to charge the next time the main power is turned ON.

### 3.1.2 Turning ON/OFF the Display

The display alone could be turned OFF in cases such as the following.

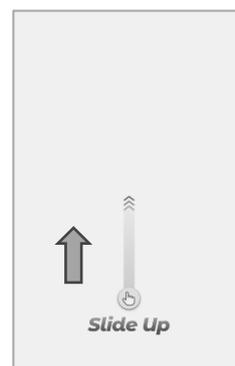
- After daily use
- During the day when the device is not used for long time

1. Press the Display ON/OFF button located at the side of the display for more than 3 seconds.
2. When turning ON the display, follow the instructions on the display to swipe up.



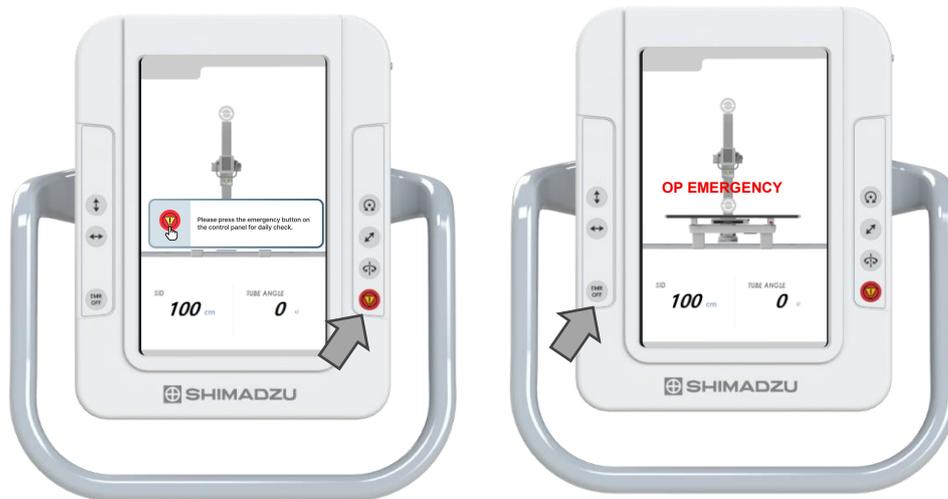
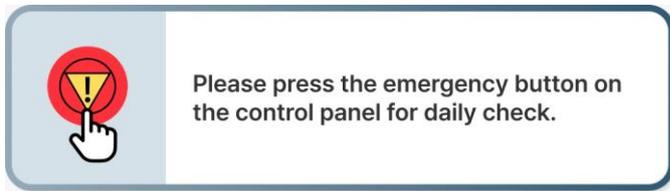
**Be sure to store the Foot Switch and the Grip Switch after use so that it will not unintentionally be pressed and move the device.**

When the display is turned OFF, the device can still be moved in case the button, or the switch is pushed. Unintentional movement of the table could cause injury.



Turn ON: Swipe up

3. When turning ON the display, following popup shows. Press the Emergency Button on the right side of the Operation Panel.
4. "OP EMERGENCY" will show and the daily check is complete. Press the EMR OFF button on the left side of the Operation Panel.



**In case the "OP EMERGENCY" does not appear during the check mode, the Emergency Button is not working properly. Stop using the equipment immediately. Contact your Shimadzu service representative for repair.**

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### 3.1.3 Sleep Mode

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In case where the equipment is not used for some time, the control panel will go to "Sleep Mode" and the display will turn black. In this case, press the Display ON/OFF button once to wake up the display. Swipe up to unlock. The display can also be turned OFF when the Display ON/OFF button is pressed once.

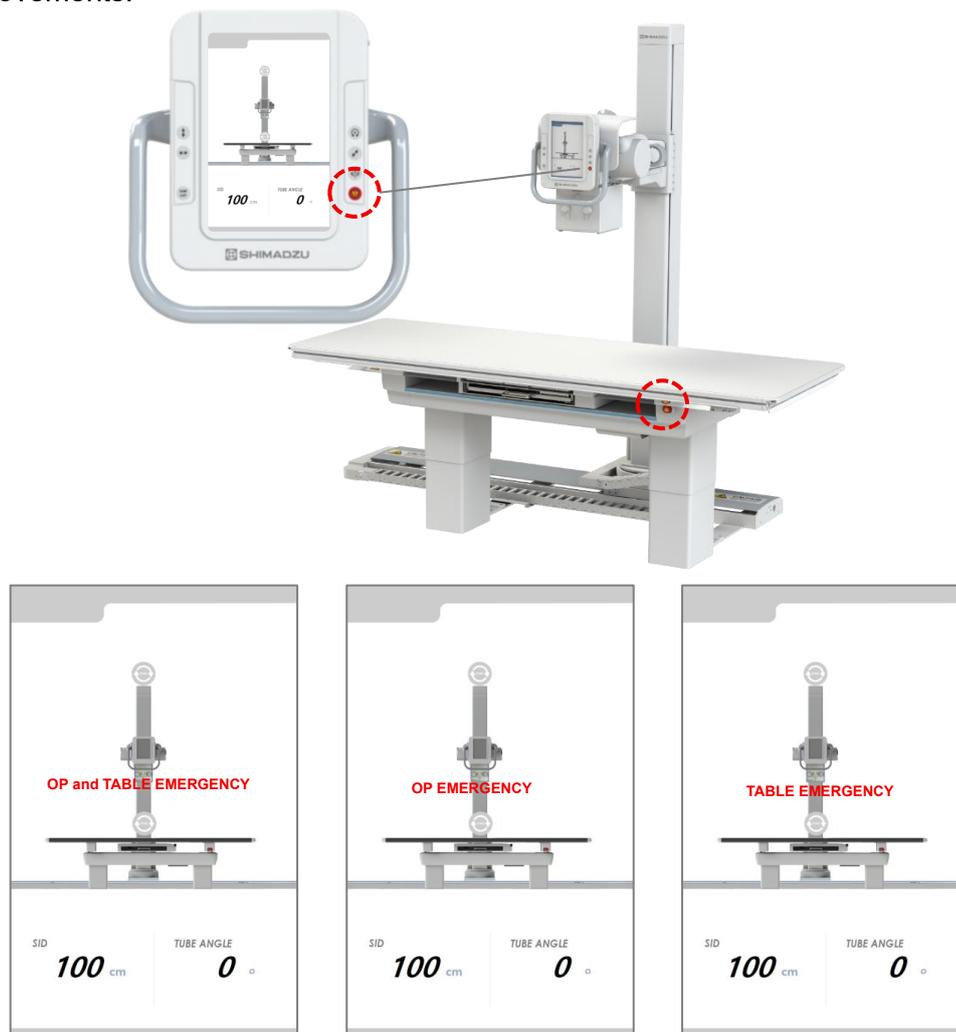
## 3.2 Actions in case of Emergency

### 3.2.1 Emergency Stop

In an event of emergency in which SST-4100S continues to move, press the emergency switch  provided in the following.

- Lower right of the tabletop of the Patient Table
- Lower left side of the Operation Panel of the Tube Stand

When pressed, error will be displayed and stops and deactivates all the motorized movements.



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### 3.2.2 Recovery from Emergency Stop

---

To recover the SST-4100S from the emergency stop status, perform either step described below.

- Pull or turn clockwise the emergency switch of the Patient Table.
- Press “EMR Reset” button on the Operation Panel of the Tube Stand

The equipment will be recovered to the normal status after a few seconds, and the error will disappear from the display.



**When recovering the equipment from the emergency stop status, pay rigid attention to make sure that the equipment is not moving abnormally. If the unit moves abnormally again, stop the unit immediately using the emergency stop procedure.**

---

### 3.2.3 Action when the Power is Interrupted

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While the power is interrupted, SST-4100S tabletop cannot be elevated or lowered. However, the tabletop can be moved to the horizontal direction against the brake if over 15 kgf is applied.

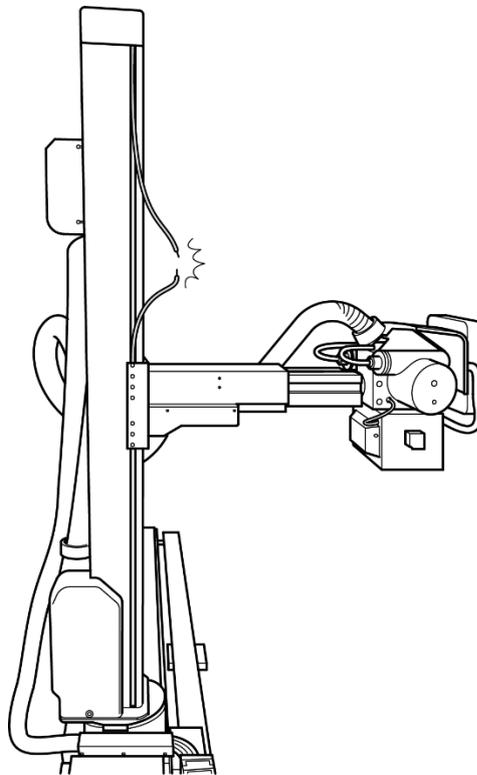
## 3.3 Operating the Tube Stand

### 3.3.1 Moving the Tube Stand



**In any case where there is a wire rope hanging from the base of the Tube Arm, stop using the equipment and contact your Shimadzu service representative.**

This situation indicates that 1 of the 2 wire ropes supporting the Tube Arm is broken. Although 1 wire rope is sufficient to hold the weight of the Tube Arm, continuing to use the device may damage the existing wire rope and cause the Tube Arm to fall.

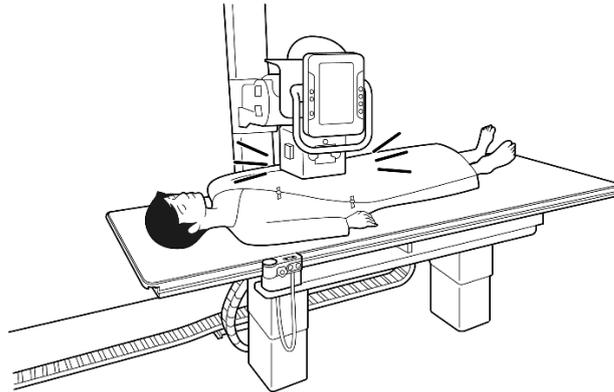


**When moving the X-ray tube support, take ample precautions to prevent the equipment from contacting other devices in the surrounding area.**

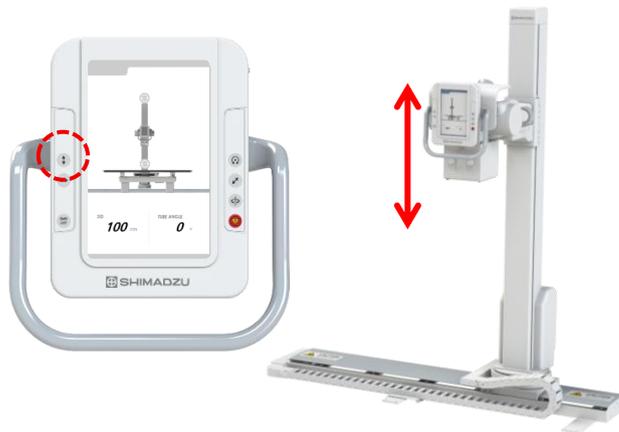
## Vertical Movement



**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.**



1. While pressing the  button on the operation panel, hold the grip and move the Tube Stand vertically.
2. When reaching the intended vertical position, release the  button. This will lock the Tube Stand.



### Longitudinal Movement

1. While pressing the  button on the operation panel, hold the grip and move the Tube Stand longitudinally.
2. When reaching the intended longitudinal position, release the  button. This will lock the Tube Stand.



### Transversal Movement

1. While pressing the  button on the operation panel, hold the grip and move the Tube Stand transversally. There is a detent at the middle of the stroke which indicates that the tube is positioned to the bucky of the Patient Table and the Bucky Stand.
2. When reaching the intended transversal position, release the  button. This will lock the Tube Stand.



#### NOTE

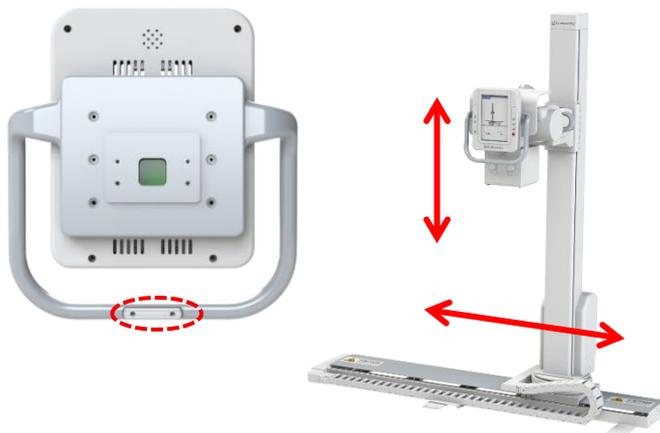
There is a detent at the center of the stroke. This position also places the tube to the center of the bucky.



### 2-Directional Movement

This function simultaneously enables the vertical and the longitudinal movement of the Tube Stand. The button for this feature is placed at the back of the handle.

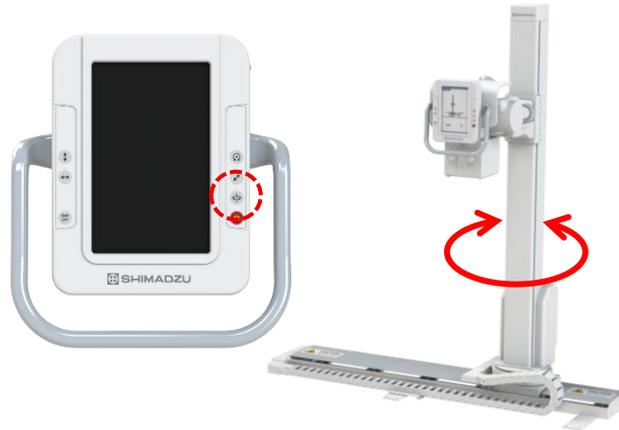
1. While pressing this button on the operation panel, hold the grip and move the Tube Stand both vertically and longitudinally.
2. When reaching the intended longitudinal position, release this button. This will lock the Tube Stand.



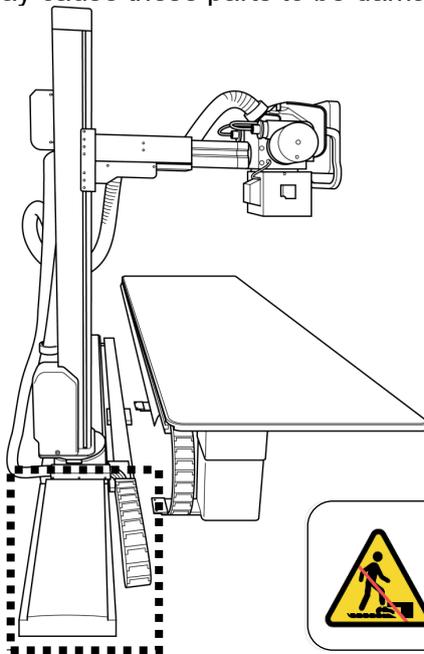
### 3.3.2 Rotating the Tube Stand

#### Rotation Around the Column

1. While pressing the  button on the operation panel, hold the grip and rotate the column.
2. When reaching the intended position, release the  button. This will lock the Tube Stand.



**Be careful not to step on the cable chain or the rail cover when rotating the column.**  
Doing so may cause these parts to be damaged.



### Rotation Around the Horizontal Axis

1. While pressing the  button on the operation panel, hold the grip and rotate the column.
2. When reaching the intended position, release the  button. This will lock the Tube Stand.



**Do NOT rotate the tube more than 180 deg (tube facing upward).**  
Doing so may cause the cables to be pulled and damaged.

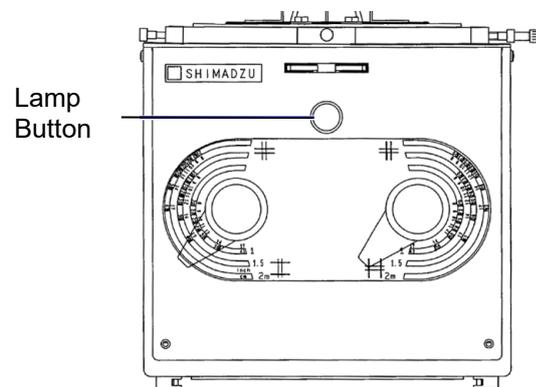
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### 3.3.3 Lighting the Collimator Lamp



For details on operating the collimator, refer to the operation manual for R-20J.

1. Press the collimator lamp button at the front of the collimator.  
This will light up the collimator lamp for approx. 30 seconds.
2. Press the collimator lamp button again to turn the light off.

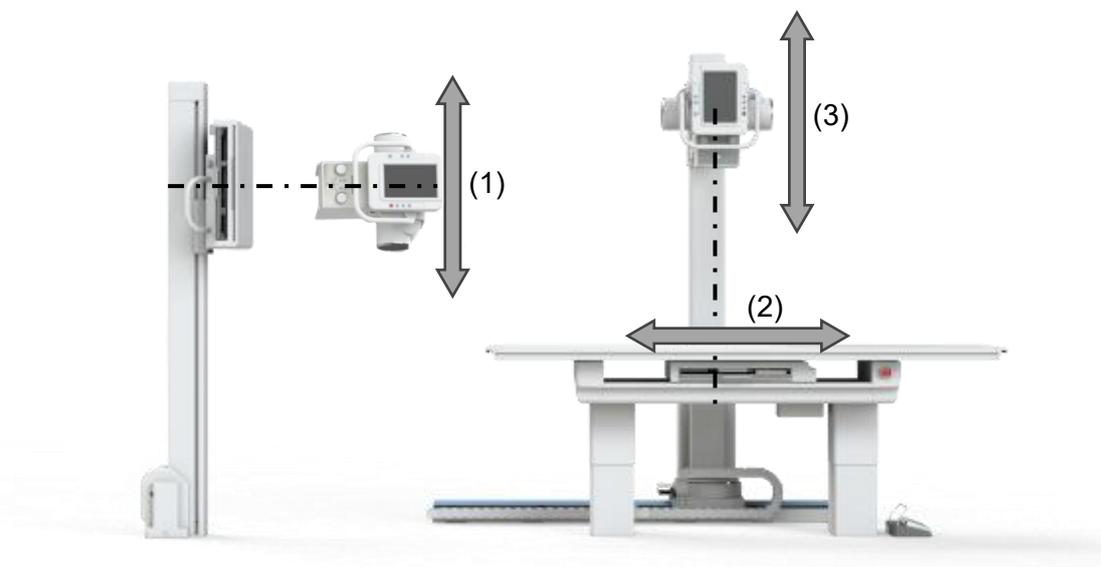


### 3.3.4 Auto-Tracking

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There are 3 types of auto-tracking function.

- Auto-tracking (1): Tube Stand Vertical Tracking to the Bucky Stand
- Auto-tracking (2): Bucky for the Patient Table tracking to the X-ray Tube
- Auto-tracking (3): Tube Stand Vertical Tracking to the Patient Table



**When an emergency has occurred due to failure in switches, etc., perform an emergency stop.**

### Auto-tracking (1)

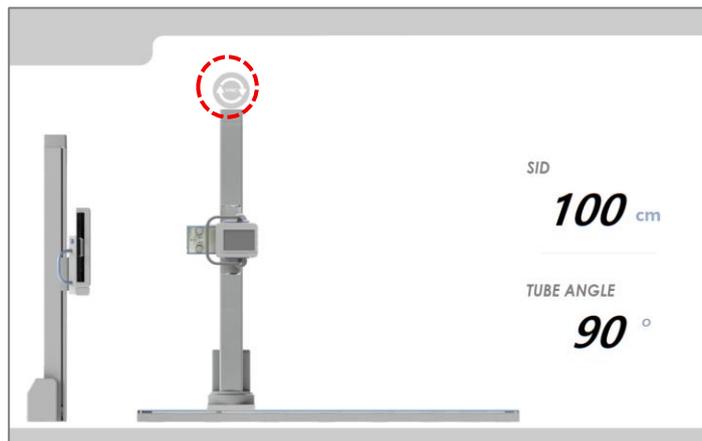
This function is used for radiography using the Bucky Stand.  
The Tube Stand moves vertically to track the height position of the Bucky Stand.

1. Slide the tabletop of the Patient Table away from the Bucky Stand.



**Make sure the tabletop is not in the path of the Tube Stand's vertical movement.**  
Failing to do so may cause the Tube Stand and the Tabletop to collide and damage the device.

2. Rotate the Tube Stand so it is facing the Bucky Stand.  
The Bucky Stand will be shown on the display.



**Verify that the X-ray tube is facing toward the Bucky Stand.**  
Auto-tracking (1) can still be activated in case where the column of the Tube Stand is rotated and not facing the stand.

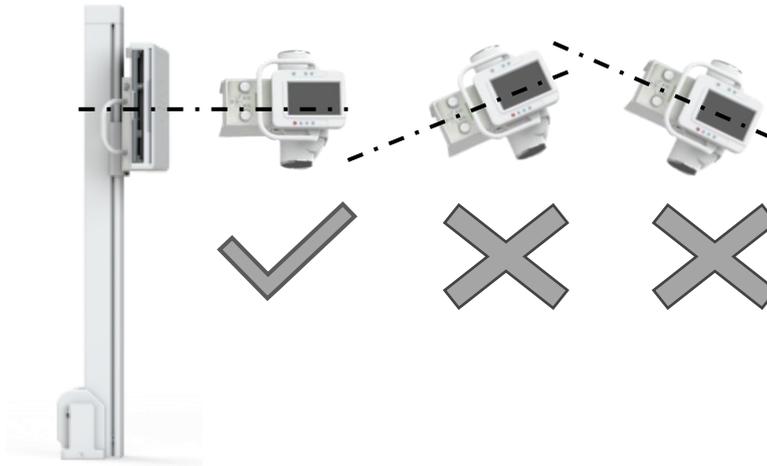


**Be sure to press the  button to release the brake when rotating the tube.**  
Auto-tracking may not work properly if rotated without pressing the button. It could also damage the device.

 NOTE

The Auto-tracking (1) feature only supports the following condition.

- The Tube Stand is horizontally facing the Bucky Stand.



3. Move the Tube Stand longitudinally so it is set at an intended SID.

 NOTE

When the Tube Stand is positioned over SID 100cm, Auto-tracking (1) will stop just over the tabletop and will not track to the Bucky Stand. The color of  button will turn red.

To lower it further, there are 2 ways.

- (1) Manually lower the Tube Stand
- (2) Move the Tube Stand to SID 100cm.

“SID 100cm” is the default setting and can be changed by service personnel.

4. Move the Bucky Stand to the intended position.
5. Press the  button to activate the auto-tracking mode.

The color of  button will turn from gray to yellow, and the Tube Stand will move vertically.

 WARNING

**Ensure that there is no patient at the position where the X-ray tube support is to be lowered before starting tracking operations.**

Contact with the X-ray tube support could result in injuries.

**WARNING**

**To prevent damage to other equipment, confirm that nothing is blocking the X-ray tube support when moving it.**

6. After the tube is aligned with the bucky, the Tube Stand will stop. The color of  will turn green. A beep will sound.
7. Adjust the position of the Bucky Stand, and the Tube Stand will move vertically again to align with the bucky.

**WARNING**

**Always check the X-ray exposure region using the collimator lamp.**  
Irradiating a patient with X-rays outside the required region risks exposure of the patient to unnecessary radiation.

8. Press the  to exit the auto-tracking mode.  
The color of  button will turn gray, and the movement of the Tube Stand will stop.

**NOTE**

You can also exit the auto-tracking mode with the following.

- Press any button on the operation panel.
- Press  button for the other auto-tracking modes.

### Auto-tracking (2)

This function is used for radiography using the Patient Table.

The bucky of the Patient Table moves horizontally to track the center of the X-ray field calculated from the Tube Stand's position.

1. Rotate the Tube Stand toward the table.  
The Patient Table will be shown on the LCD display.



**Be sure to press the  button to release the brake when rotating the tube.**

Auto-tracking may not work properly if rotated without pressing the button. It could also damage the device.

2. Make sure the FPD is installed in the tray, and the tray is inserted to the bucky.



Check that the tray is inserted to the bucky. Auto-tracking (2) will not start if the tray is not inserted.

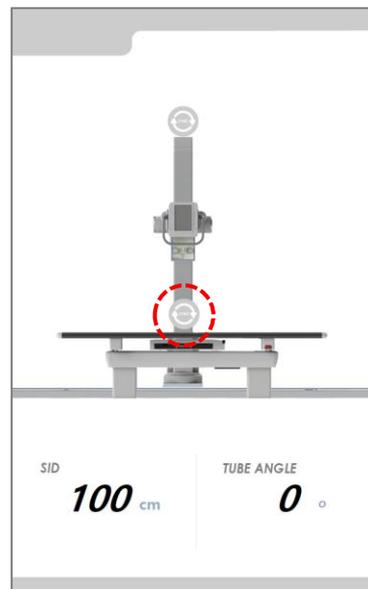
3. Move the Tube Stand in transversal direction to the center position. There is a detent at the center.



**Make sure that the X-ray tube is positioned at the center position of the transversal direction.**

Failure to do so may cause the X-ray field to exceed the area of the FPD image receptor. This will result in inadequate image and unnecessary exposure.

4. Move the Tube Stand vertically and longitudinally to the intended position.
5. Press the  button to activate the auto-tracking mode.  
The color of  button will turn from gray to yellow, and the bucky will move horizontally. If the Tube Stand is positioned outside of the bucky stroke, the color of  will turn to red.



**Do NOT touch the bucky and the tray handle when it is moving.**  
Contact with the moving bucky could result in injuries.

1. After the bucky is aligned with the X-ray tube, the bucky will stop. The color of  will turn green. A beep will sound.
2. Adjust the position of the X-ray tube, and the bucky will move horizontally again to align with the X-ray tube.



**Always check the X-ray exposure region using the collimator lamp.**  
Irradiating a patient with X-rays outside the required region risks exposure of the patient to unnecessary radiation.

3. Press the  to exit the auto-tracking mode.  
The color of  button will turn gray, and the movement of the Tube Stand will stop.



You can also exit the auto-tracking mode with the following.

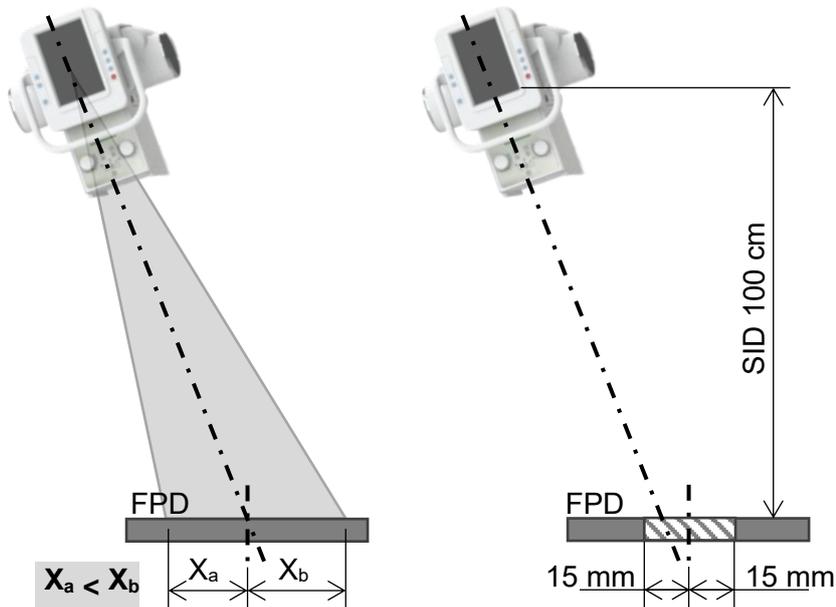
- Press any button on the operation panel.
- Press  button for the other auto-tracking modes.

 NOTE

In Auto-tracking (2) mode, the bucky will track so that center of the FPD is aligned to the X-ray tube. Due to this, when oblique radiography is performed, the irradiation field will not be symmetrical.

Additionally, the error limit of tracking is within  $\pm 15$  mm at SID 100cm. If the SID is greater than 100 cm, the limit will be over  $\pm 15$  mm.

Therefore, for oblique radiography, it is recommended to check the actual irradiation field by pulling out the tray and the tube arm, so that the irradiation field does not exceed the imaging area for the FPD.



### Auto-tracking (3)

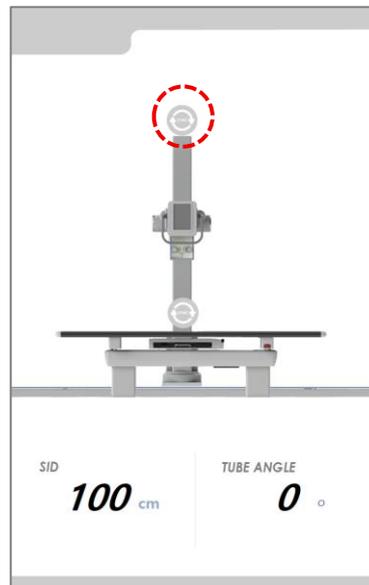
This function is used for radiography using the Patient Table. The Tube Stand moves vertically to maintain constant distance between the X-ray tube and the tabletop of the Patient Table.

1. Rotate the Tube Stand toward the table.  
The Patient Table will be shown on the LCD display.



**Be sure to press the  button to release the brake when rotating the tube.** Auto-tracking may not work properly if rotated without pressing the button. It could also damage the device.

2. Adjust the tabletop to the intended height.
3. Press the  button to activate the auto-tracking mode.  
The color of  button will turn from gray to yellow, and the Tube Stand will move vertically.



**Make sure that the patient is lying still on the tabletop while the Tube Stand or the Patient Table is moving.**  
Contact with the X-ray tube support could result in injuries.

4. After the tube is moved to the set SID, the Tube Stand will stop. The color of  will turn green. A beep will sound.
5. Adjust the height of the tabletop, and the Tube Stand will move vertically again to maintain constant distance with the tube.



**Always check the X-ray exposure region using the collimator lamp.**  
Irradiating a patient with X-rays outside the required region risks exposure of the patient to unnecessary radiation.

6. Press the  to exit the auto-tracking mode.

The color of  button will turn gray, and the movement of the Tube Stand will stop.



You can also exit the auto-tracking mode with the following.

- Press any button on the operation panel
- Press  button for the other auto-tracking modes.

## 3.4 Operating the Patient Table



**Take care to avoid direct contact with the device for patients with skin injuries such as lesions, scars or a rash.**

Such contact may cause harm to the patient.

### 3.4.1 Moving Up/Down the Tabletop



**If the tabletop continues to move up or down without being stopped, press the Emergency switch (⏏) provided in the right portion of the front face of the unit. Then, vertical movement of the tabletop will be forcibly stopped.**



**While moving up/down the tabletop, pay rigid attention so that a patient and the tabletop do not come into contact with the adjacent equipment.**



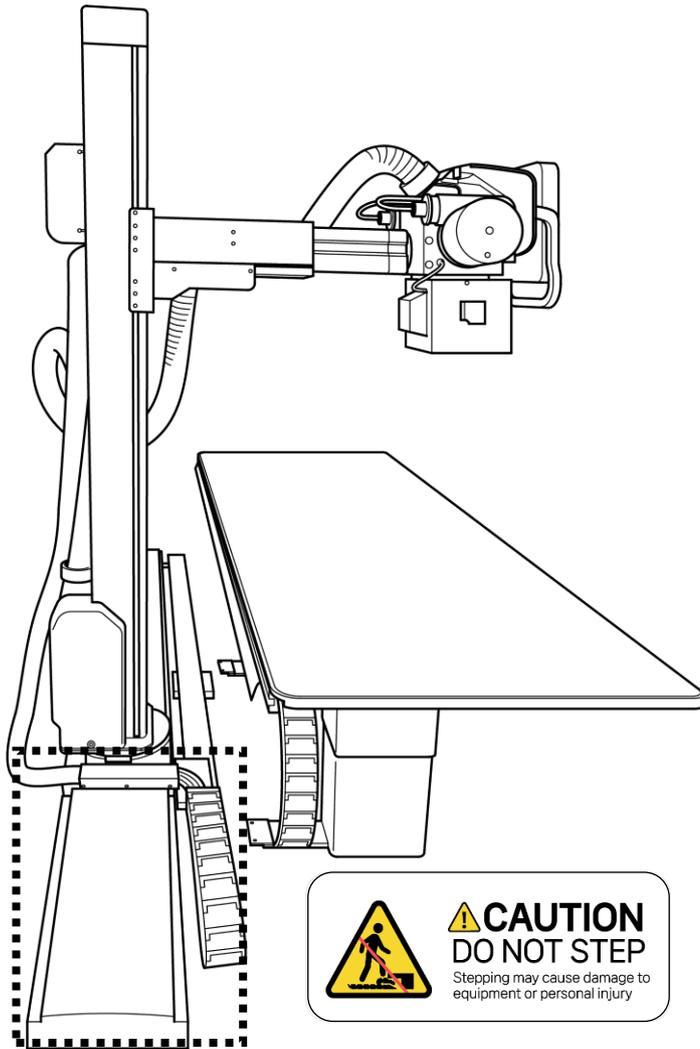
**Do NOT use wireless connection if there is another SST-4100S nearby. In this case, use wired connection ONLY.**

The foot switches for the SST-4100S use the same signal; therefore it will cause unintentional movement of the table resulting in injury.



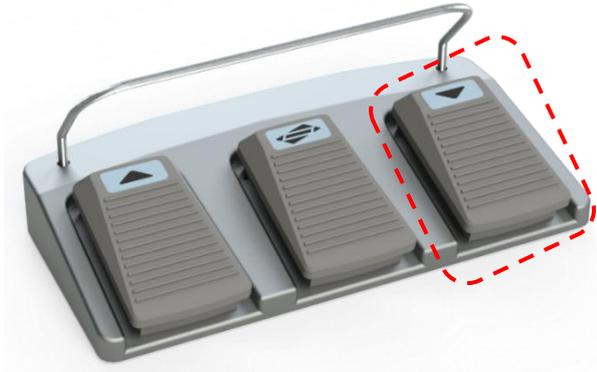
**Be careful not to step on the cable chain or the rail cover when operating at the rear side of the table (ex. assisting patient getting on the Patient Table).**

Tripping on these parts may cause injury. Stepping on these parts may cause damage.



### Moving down operation

1. Press the foot switch to move the tabletop down.  
Release the foot switch to stop the tabletop.



- When the patient is placed on the table, lower the table to the lowest position.
- When the patient is placed on the table, keep the tabletop in the correct position.
- Be careful not to lose balance on the edge of the tabletop.
- Do not allow the patient get on the table by themselves.



**Do NOT place the foot switch under the tabletop during operation.**

The operator's foot may be pinched and injured when the tabletop descends.



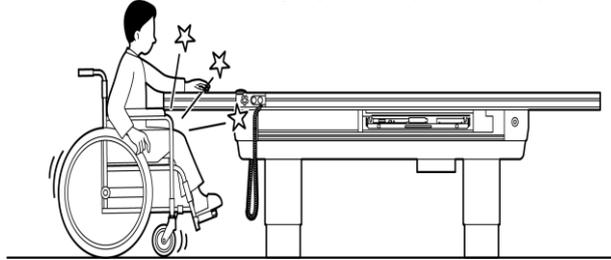
**Do NOT move the tabletop down when the patient's body is underneath it, for example when taking X-rays of a person sitting in a wheelchair or on a chair.**

The patient may be pinched by the equipment and get injured.



**When taking X-rays of a patient sitting in a wheelchair or on a chair, make sure the patient does not touch the foot switch.**

The tabletop may move down and cause injury if the patient is pinched by the equipment.



**Do NOT put any object such as a chair or drip stand under the equipment for any purpose other than examination.**

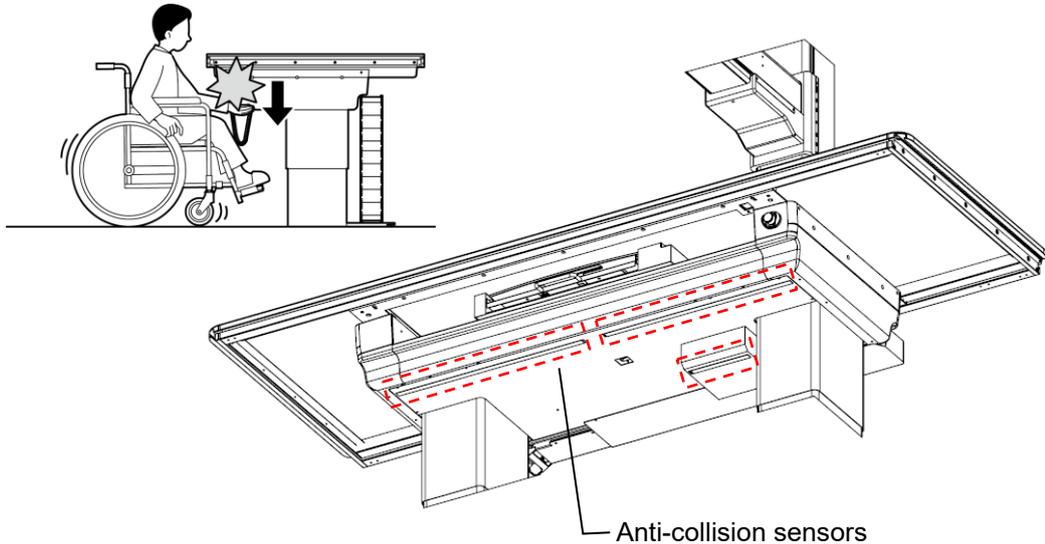
Doing so may cause damage to the equipment and object or cause the object to fall if the object is pinched by the equipment.

### Anti-collision sensor

There is an anti-collision sensor feature implemented under the Patient Table to prevent collisions with the patient underneath the table.

When this sensor detects an object, the tabletop will stop and elevate slightly to avoid collision.

After the object is removed, slightly elevate the table before moving down.



**While moving down the tabletop, pay rigid attention so that a patient does not come into contact with the Patient Table.**

Anti-collision sensor is only detectable under limited conditions.

■ **Moving up operation**

1. Press the foot switch to move the tabletop up.  
Release the foot switch to stop the tabletop.



**While moving up the tabletop, always make sure of safety of a patient.  
Unless sufficient attention is paid, the patient may be caught in the clearance  
between the tabletop and the Tube Stand.**

### 3.4.2 Moving the Floating Tabletop

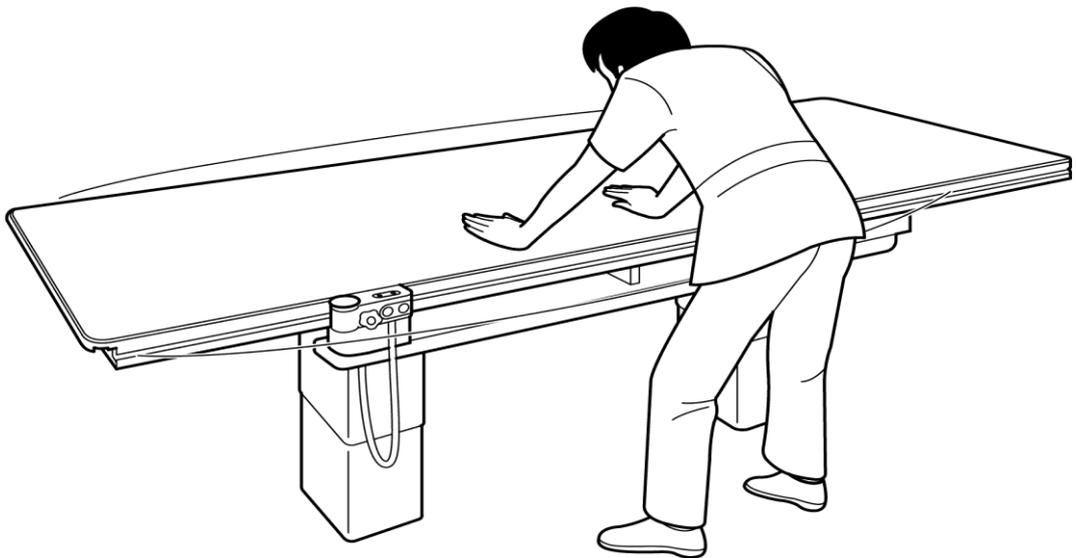


**Do NOT use wireless connection if there is another SST-4100S nearby. In this case, use wired connection ONLY.**

The foot switches for the SST-4100S use the same signal; therefore, it will cause unintentional movement of the table resulting in injury.

#### Tabletop Movement

1. Keep pressing the foot switch and put your hand on the top surface of the tabletop to move it.  
While the foot switch is pressed and held, the lock is released, and the tabletop can be moved by hand.



2. Release the foot switch when the tabletop comes to the desired position.



**Do NOT place any object on or in front of the foot switch. Be careful not to press the switch unintentionally.**

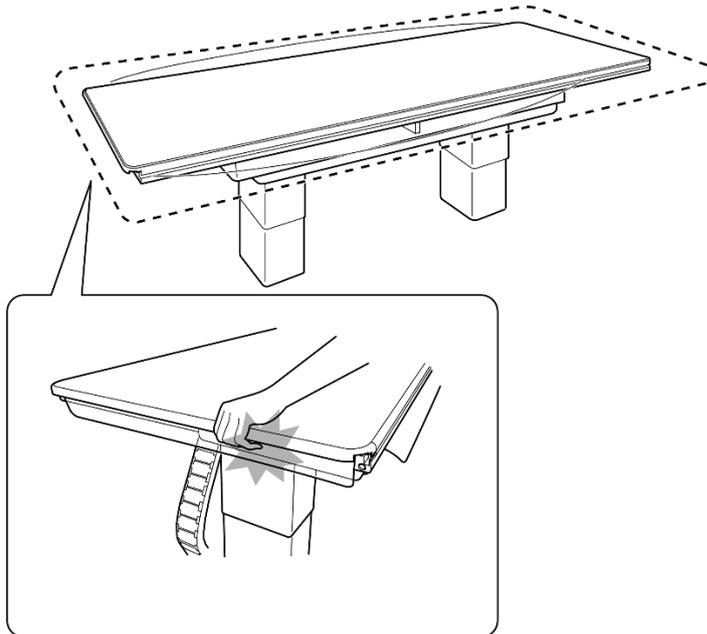
If the foot switch is pressed by mistake, the tabletop may suddenly be moved up/down or moved horizontally.

---



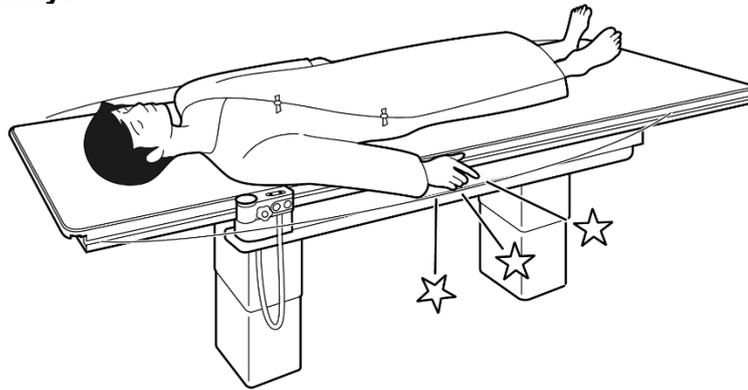
**Do NOT hold any edge face of the tabletop with your hand during the tabletop working.**

Otherwise, you may catch your hand or finger in the tabletop causing an injury.



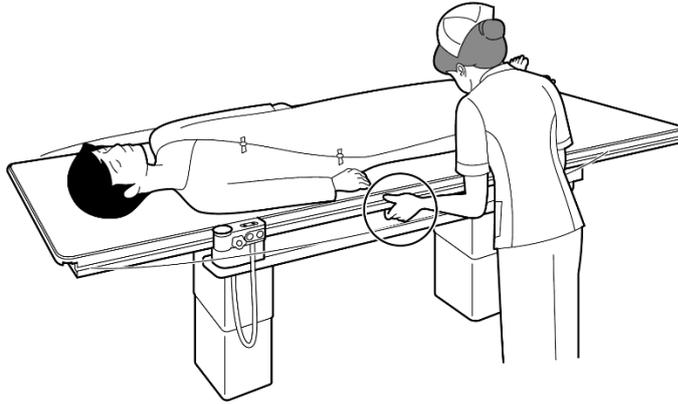


**Make sure the patient does not put their hand or fingers into the clearance between tabletop and Bucky.**





**While operating the tabletop, pay rigid attention so that your fingers/hands are not caught by clearance between the tabletop and the Bucky.**



**Be careful not to apply excessive force (over 15 kgf) to the tabletop.**  
The tabletop may move even when it is locked.  
e.g. When moving the patient from a stretcher to the tabletop.



**When operating the tabletop, do NOT pull the tabletop side guard (transparent sheet).**



When operating the tabletop, Do NOT pull the tabletop side guard (transparent sheet).

---

### 3.4.3 Positioning the Bucky for the table

---

**WARNING**

**Always check the X-ray exposure region using the collimator lamp.**

Irradiating a patient with X-rays outside the required region risks exposure of the patient to unnecessary radiation.

#### Manual Positioning

1. Hold the tray handle and move it sideways.



#### Automatic Positioning using Auto-tracking function

The bucky can automatically be aligned to the X-ray tube. Refer to clause “3.3.4 Auto-Tracking” for details.

---

### 3.4.4 Operation of the FPD Tray for Patient Table

---

Set the FPD to the Bucky to perform cassette radiography.  
Cassette type FPD (14x17 or 17x17) can be installed to the FPD Tray.



**Do NOT place your hand inside the tray or near the slot of the bucky when inserting the FPD Tray into its slot.**

This may result in injury from getting your hand caught.

---



**When removing or setting the FPD, draw out the FPD Tray completely.**

Otherwise, the FPD may hit the main unit and scratch it.

---

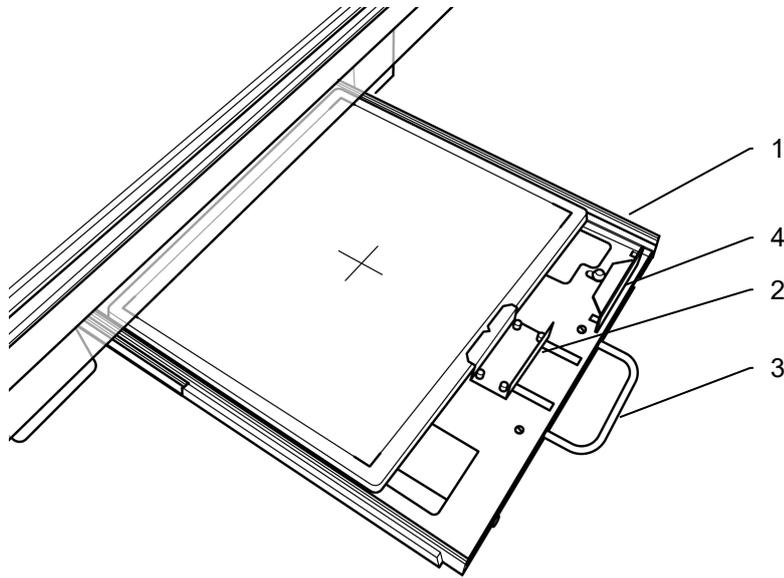


**When removing or setting the FPD, support the FPD with your hand to prevent it from falling.**

Otherwise, the FPD may fall and cause injuries or damage to the FPD itself.

---

### Names and Functions of the FPD Tray



No.	Name	Function
1	FPD Tray	Stores the FPD in the equipment.
2	Clamp Handle	Fixes the FPD to the FPD Tray.
3	Tray Handle	Used to draw or insert the FPD Tray.
4	Bracket	Not used for Patient Table. Used in Bucky Stand to support the FPD.

## ■ Installing the FPD

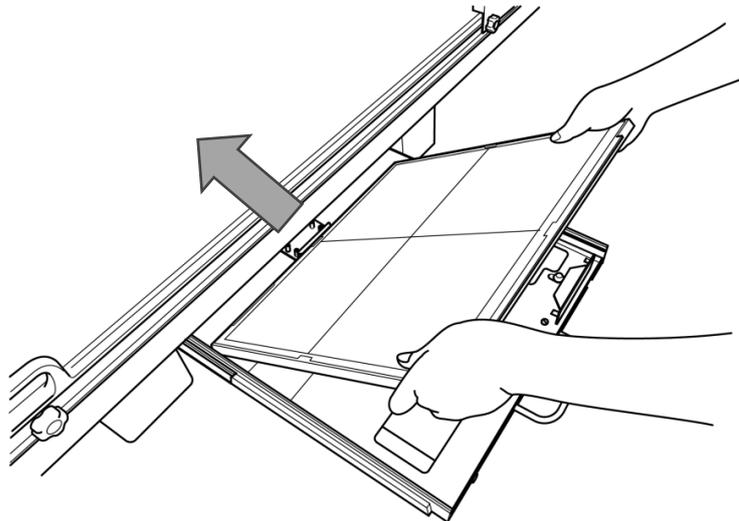
1. Draw out the FPD Tray.



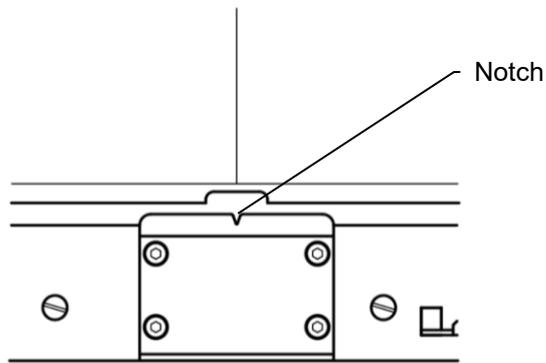
**Do not lean on the FPD Tray or apply an excessive force on the tray when it is drawn out.**

Doing so may cause damage to the tray and result in injuries.

2. Lay the FPD against the clamp of the FPD Tray.
3. Push the FPD to slide the clamp further. Hold the Tray Handle with the other hand while pushing.



4. Position the FPD's center mark to the notch on the clamp handle.



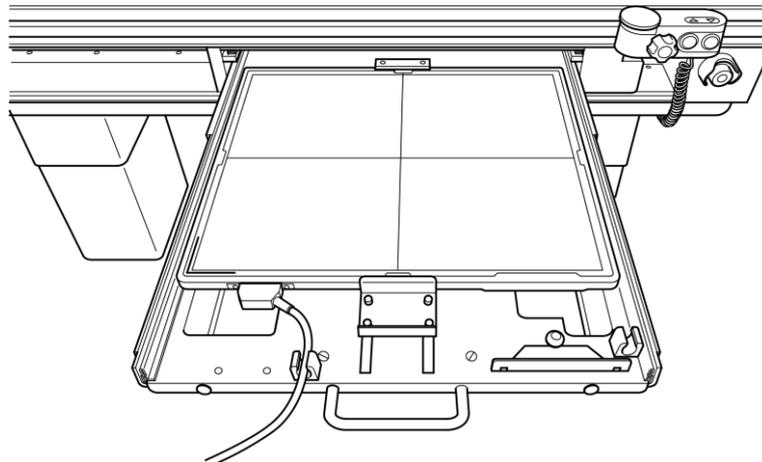


**Avoid excessive shock to FPD when setting the FPD into the tray.**  
The FPD may be damaged.



**Take care not to pinch finger or hand between FPD and the tray when setting the FPD into the tray.**  
Doing so may result in injury.

5. Release the FPD to fix it to the clamp handle.
6. If a cable is connected to the FPD, set the cable in the cable clip.
  -  M517-V077 RADspeed Pro Reference Guide  
Chapter 3 "Combinations of Trays and FPDs"



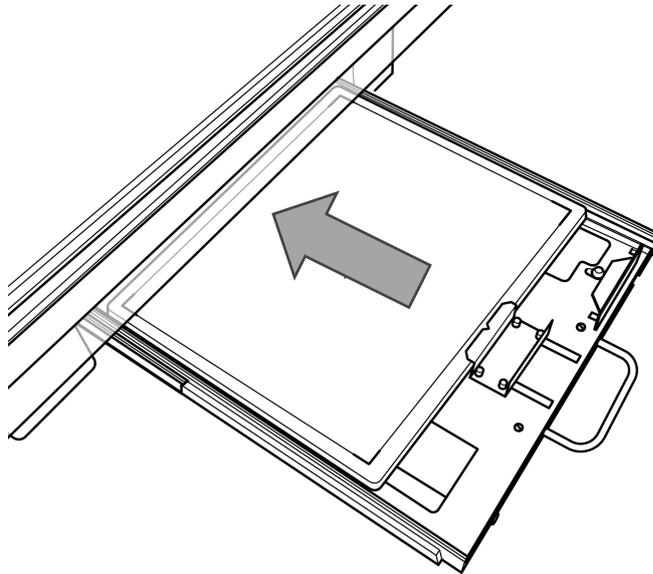
7. Insert the tray into the Bucky.



**Avoid sudden movements with the tray after setting the FPD into the tray.**  
Such action may cause misalignment of the FPD or even damage the FPD.  
Please insert the tray gently.

**Removing the FPD**

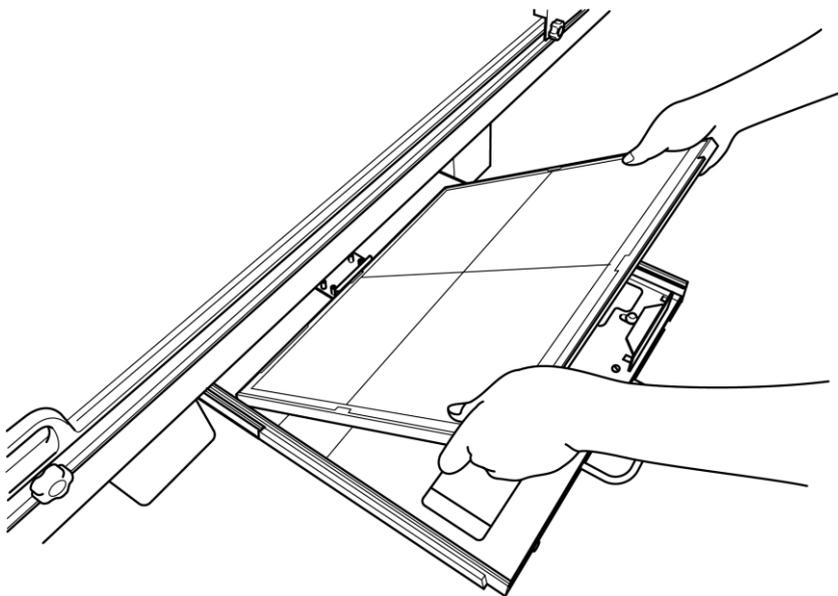
1. Draw out the FPD tray.
2. If a cable is connected to the FPD, disconnect the cable.
3. Push the FPD further to release the clamp.



**Be careful not to push the FPD against the FPD tray with excessive force.**  
The FPD tray will be inserted unintentionally and may damage the FPD.

---

4. Hold the FPD with both hands and remove it from the FPD tray.



5. Insert the tray into the Bucky.

### 3.4.5 Operation of the Grid

The grid can be removed when it is necessary to reduce exposure dose, such as in case for infant radiography.



**Confirm the grid insert status or grid type before performing radiography.**

Appropriate radiography images cannot be obtained if the grid is not properly inserted, or if the grid type does not match the specified radiography conditions.

If the grid is not inserted properly, it may contact with the patient or the neighboring devices and cause injury to the patient or damage to the devices.



**Do NOT insert your hand into the grid slot.**

Doing so may cause injury.



**Handle the grid with care.**

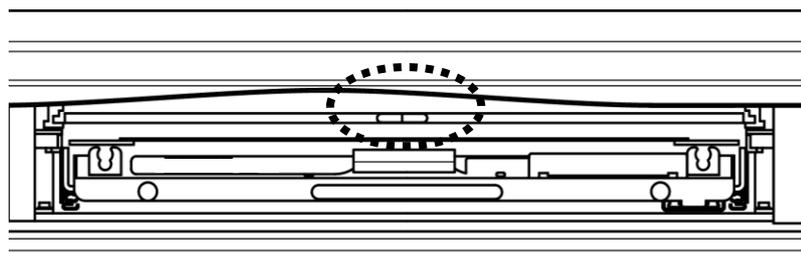
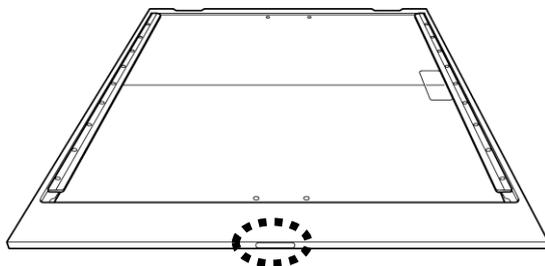
It may be deformed or damaged if dropped or given an impact.

If the grid is deformed or damaged, stop usage.

When removing the grid from the device, store it separately in a special storage case or shelf, or a case surrounded by soft materials such as cushions. Do NOT stack things on top of it or lean it against the wall. Such action may damage the FPD.

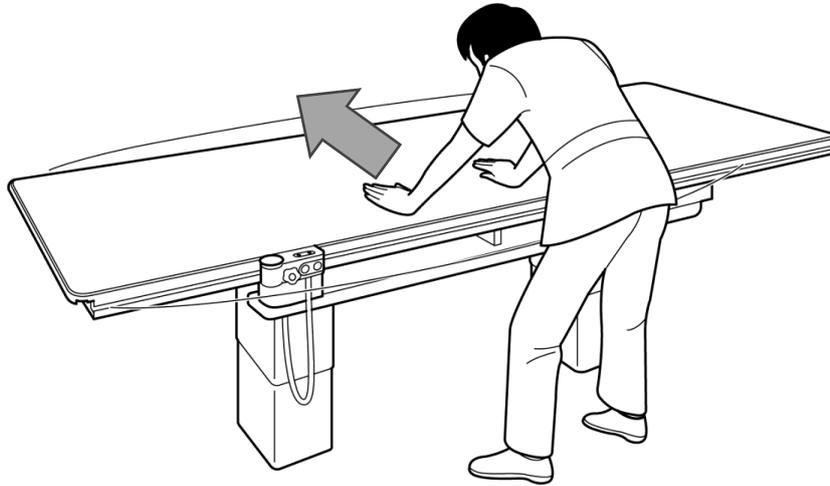
#### Identifying the Grid

The side of the grid shows its intended SID and the identification number. This can be seen when the grid is placed inside the bucky.

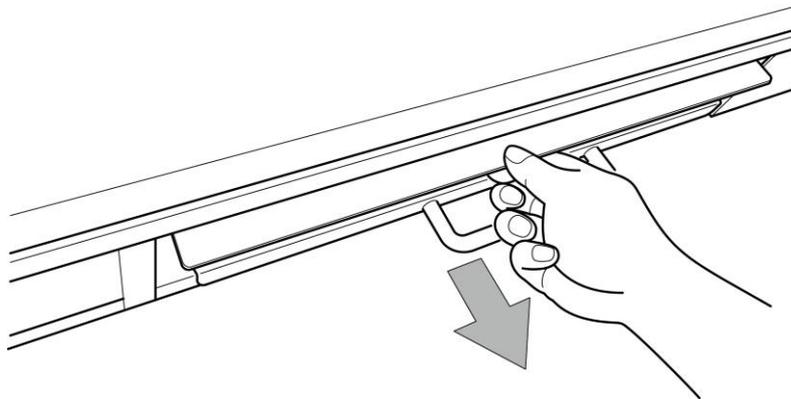


■ **Removing the Grid**

1. Move the tabletop to the far side.



2. Hold the grid handle and pull towards you.



**Be careful when removing the grid to avoid contact with the patient or the neighboring devices.**

Failure to do so may cause injury to the patient or damage to the devices.

---

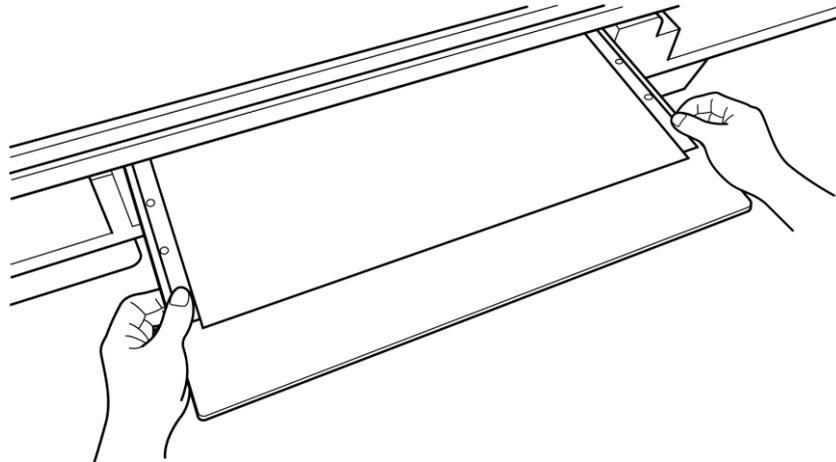


**Make sure the FPD tray is inserted when removing or installing the grid.**

Failure to do so may cause the hand to be pinched or damage to the FPD Tray or the Grid.

---

3. Hold the grid with both hands and pull it out from the grid slot.



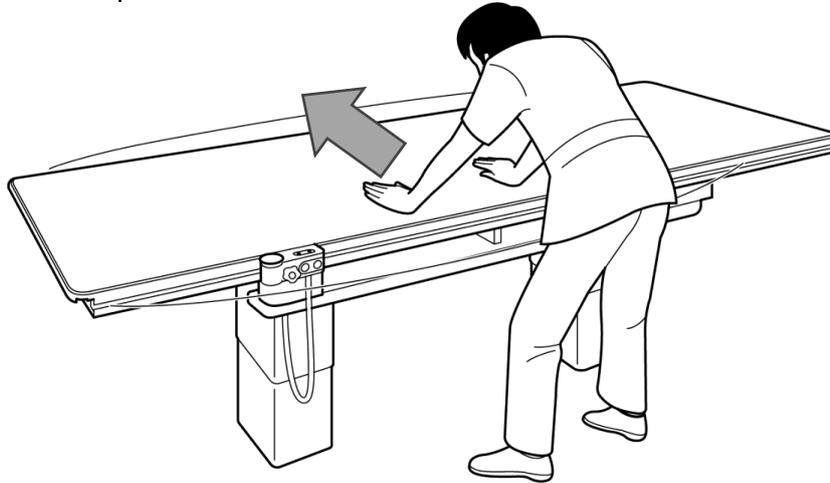
**The grid is heavy. Do NOT hold the grid with one hand.**  
Dropping the grid may cause personal injury or damage the grid.



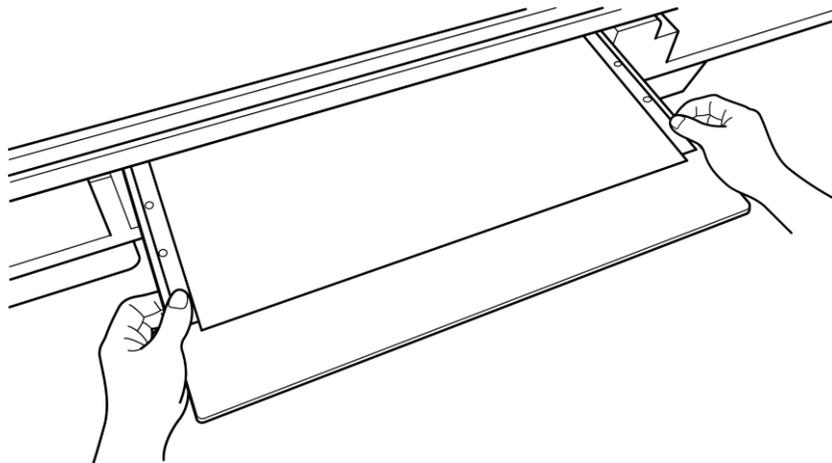
**Pull out the grid slowly and straight out from the slot.**  
Failing to do so may damage the grid or equipment.

## ■ Installing the Grid

1. Move the tabletop to the far side.



2. Hold the grid with both hands and insert it into the grid slot.



**The grid is heavy. Do NOT hold the grid with one hand.**  
Dropping the grid may cause personal injury or damage the grid.

---



**Insert the grid slowly and straight into the slot.**  
Failing to do so may damage the grid or equipment.  
Handle the grid especially with care when placing it on the rail of the grid slot.

---



**Make sure the FPD tray is inserted when removing or installing the grid.**

Failure to do so may cause the hand to be pinched or damage to the FPD Tray or the Grid.

---

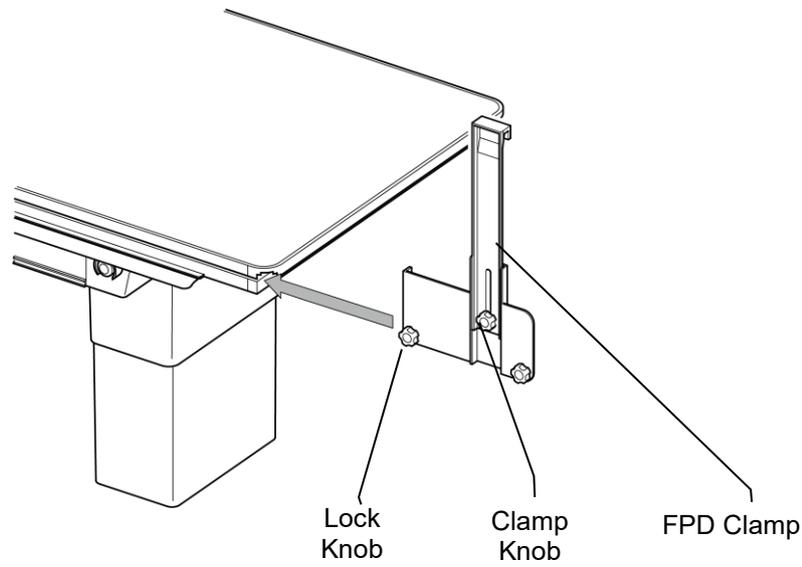
3. Insert the grid to the Bucky all the way in.

### 3.4.6 Operation of the Lateral Detector Holder (Option)

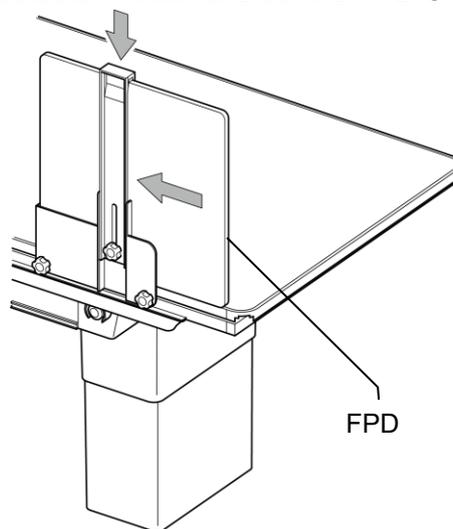
---

This option is mounted to the tabletop to hold FPD during lateral radiography.

1. Insert the detector holder into the table groove, move it to the required position.
2. Turn the Lock Knob to secure the detector holder to the tabletop.



3. Insert the FPD to the detector holder and set the FPD Clamp.



4. Turn the Clamp Knob to secure the FPD.



**Make sure the FPD is fixed.**

Otherwise, the FPD may fall and cause injuries or damage to the FPD.

---

### 3.4.7 Operating the Grip Switch (Option)

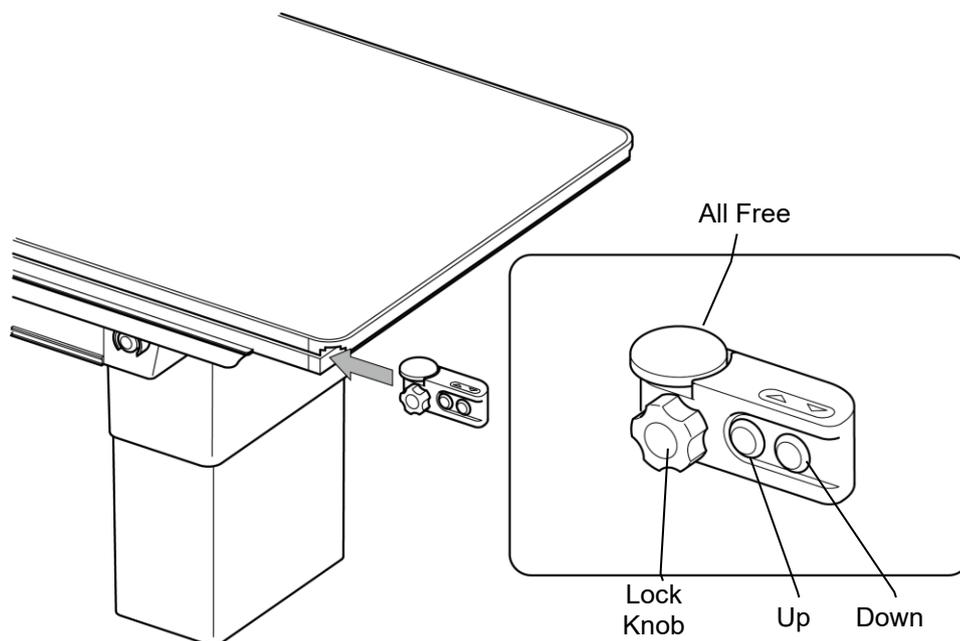
This option is mounted to the tabletop to operate the Patient Table.



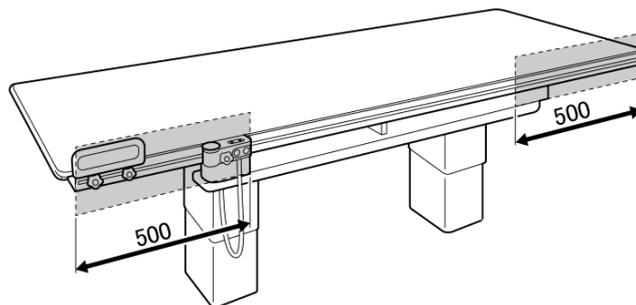
When using the Grip Switch, the Foot Switch cannot be used with wired connection.

#### Preparing the Grip Switch

1. Insert the Grip Switch into the table groove, move to the desired position.
2. Turn the locking lever to secure the Grip Switch to the tabletop.

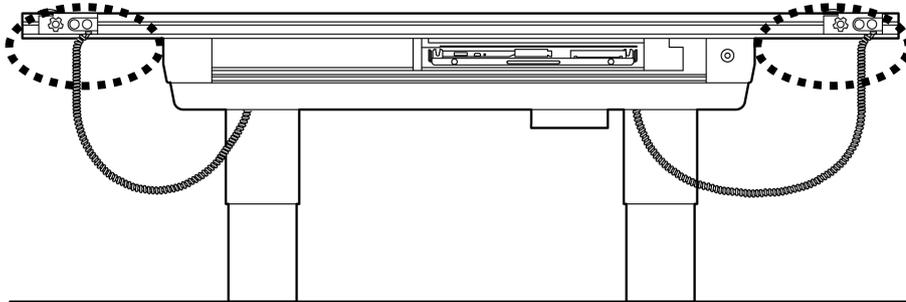


**Lock the Grip Switch at the end of the tabletop. (Within 500 mm is recommended.)** Further inside may interfere with the patient when getting on and off the tabletop. Make sure the Grip Switch does not come in contact with the patient.



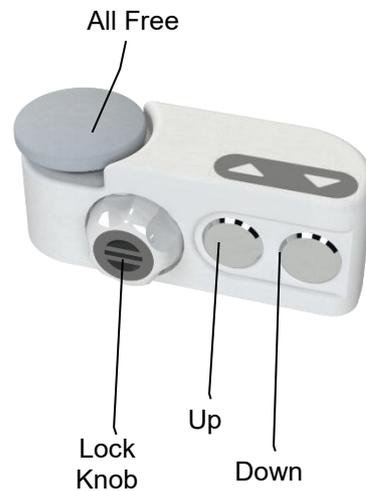
 NOTE

Grip Switch can be positioned to either the left or the right side of the tabletop. The specific side depends on the cable route, and this is determined during installation.



### Operating the Grip Switch

1. Keep pushing the All-Free knob to move the tabletop.
2. Press UP/DOWN switch to move the tabletop up and down.



**Make sure the patient does not touch the Grip Switch.**

Unintended movement of the table may cause the patient or the operator to be injured.

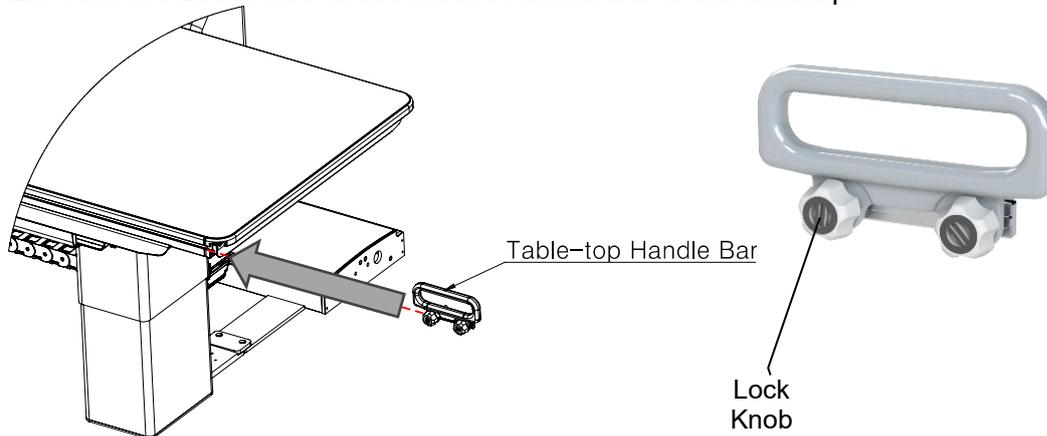
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### 3.4.8 Operating the Tabletop Handle Bar (Option)

---

This option is mounted to the tabletop to operate the floating tabletop.

1. Insert the Handle Bar into the table groove, move into the required position.
2. Turn the Lock Knob to secure the Handle Bar to the tabletop.



3. Press the All-Free button on the foot switch, and hold the Handle Bar to move the tabletop.
4. If you need to move the Handle Bar, turn the Lock Knob to unlock.



**Make sure the Handle Bar is placed so it does not come in contact with the patient.**  
Interfering the patient's movement to get on/off the table may cause patient to fall.



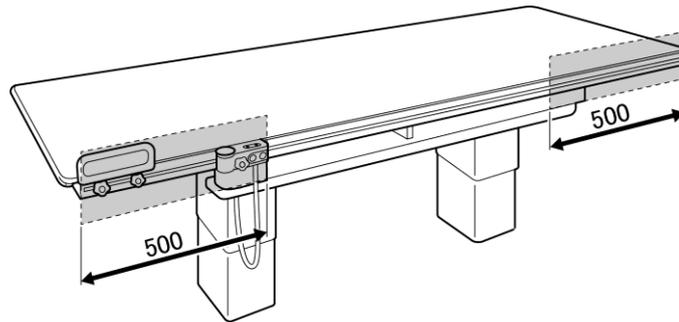
**Make sure the patient does not grab the Handle Bar when getting on/off the table.**  
This handle is not intended for patient use. Wrong use may break the Handle Bar and cause the patient injury.

---



**Lock the Handle Bar at the end of the tabletop. (Within 500 mm is recommended.)**

Further inside may interfere with the patient when getting on and off the tabletop. Make sure the Handle Bar does not come in contact with the patient.



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### 3.4.9 Using the Foot Switch with Wired or Wireless Connection

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The foot switch is available to use it wired or wireless.



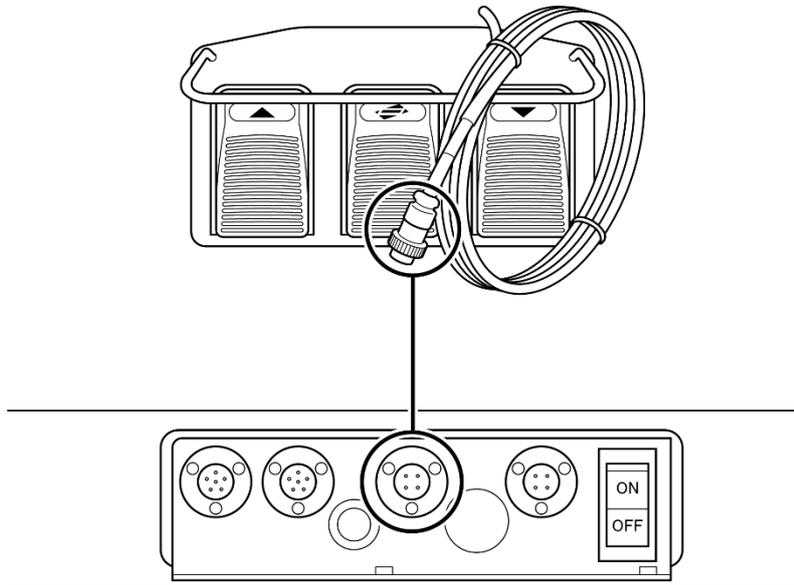
**Do NOT use wireless connection if there is another SST-4100S nearby. In this case, use wired connection ONLY.**

The foot switches for the SST-4100S use the same signal; therefore, it will cause unintentional movement of the table resulting in injury.

---

#### Wired Connection

The cable of the footswitch is connected to the connector at the rear side of the Patient Table.



## Wireless Connection

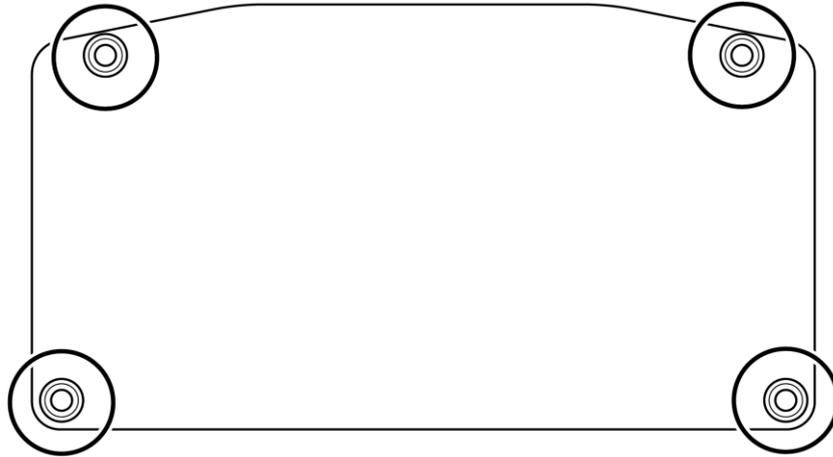
The wireless connection does not require any physical connection, but it requires the batteries to be replaced occasionally.

 NOTE

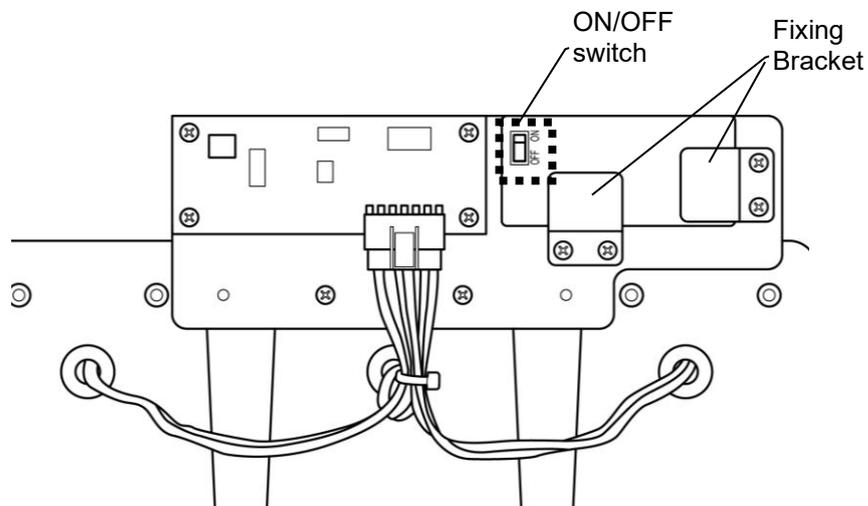
This following procedure requires items prepared by the user.

- AA battery 2 pieces
- Phillips head screwdriver

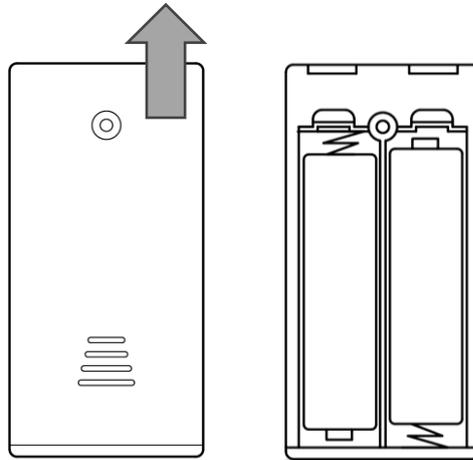
1. Turn OFF the Main Power for SST-4100S.  
 3.1 Power ON/OFF
2. Remove the four screws using a screwdriver to open the bottom cover.



3. Turn OFF the switch of the battery box.
4. Remove the 4 screws fixing the battery box.



5. Push and slide the cover for the battery box.
6. Replace the 2 AA batteries with new ones.



7. Cover the battery box and fix it to the foot switch. Refer to steps 6, 5 and 4.
8. Turn ON the battery box switch. Refer to step 3.
9. Reattach the bottom cover. Refer to step 2.
10. Turn On the Main Power and the Display for SST-4100S and check that the following functions are working correctly.

- ✎ 3.1.1 Turning ON/OFF the Main Power
- 3.1.2 Turning ON/OFF the Display
- 3.4 Operating the Patient Table

- Tabletop up movement
- Tabletop down movement
- Tabletop floating movement

## 3.5 Operating the Bucky Stand

**CAUTION**

**Take care to avoid direct contact with the device for patients with skin injuries such as lesions, scars or a rash.**

Such contact may cause harm to the patient.

### 3.5.1 Vertical Movement for the Bucky

**WARNING**

When moving the Bucky up and down, always confirm the safety of the patient.

**WARNING**

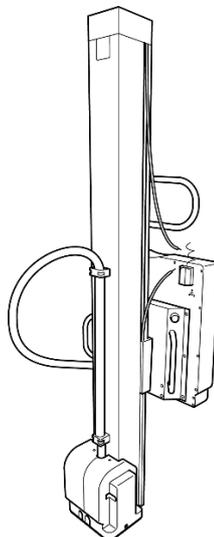
**Always check the X-ray exposure region using the collimator lamp.**

Irradiating a patient with X-rays outside the required region risks exposure of the patient to unnecessary radiation.

**WARNING**

**In any case where there is a wire rope is hanging from the bucky, stop using the equipment and contact your Shimadzu service representative.**

This situation indicates that 1 of the 2 wire ropes supporting the bucky is broken. Although 1 wire rope is sufficient to hold the weight of the bucky, continuing to use the device may damage the existing wire rope and cause the bucky to fall.





**When moving the Bucky up and down, pay attention so that the Bucky does not come into contact with adjacent equipment.**



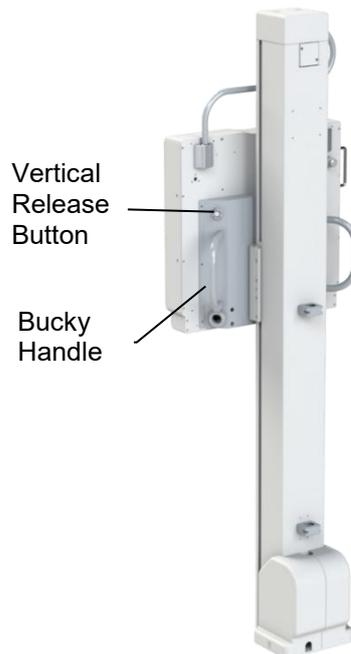
**Do NOT hang on to the Bucky applying weight of more than 15 kgf.**  
The Bucky may slide down suddenly, and patient's position may become unstable.



The vertical movement of bucky may be unbalanced when certain parts are detached from the bucky. In this case, the bucky movement is light upward, and heavy downward.

- FPD
- Grid
- Handle Grip

1. Hold the Bucky Handle and press the Vertical Release Button on the rear side of Bucky.  
The brake is released while the button is pressed. The handle and the button are placed on both sides of the bucky.



### 3.5.2 Operation of the FPD Tray for the Bucky Stand

Set the FPD to the Bucky to perform cassette radiography.  
Cassette type FPD (1417 panel or 1717 panel) can be installed to the tray.



**Do NOT place your hand inside the tray or near the slot of the bucky when inserting the tray into its slot.**

This may result in injury from getting your hand caught.



**When removing or setting the FPD, draw out the FPD Tray completely.**

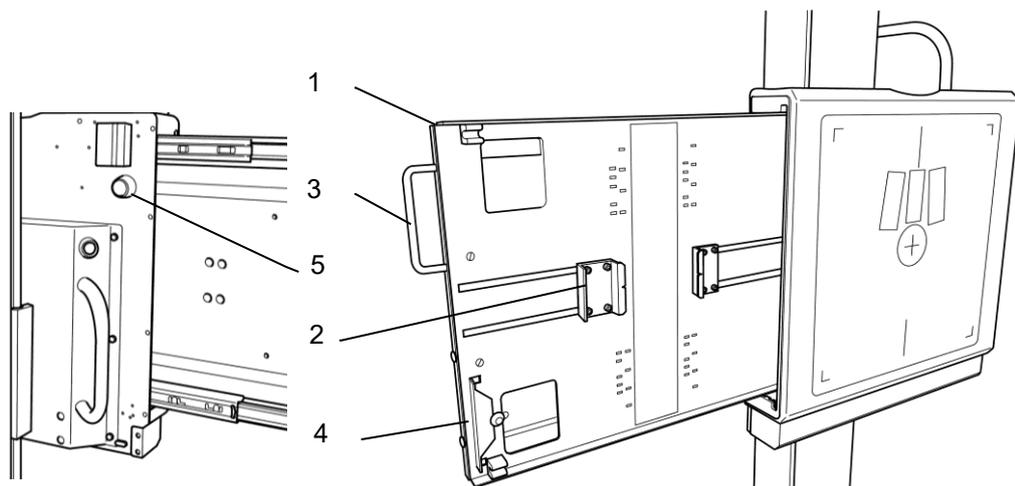
Otherwise, the FPD may hit the main unit and scratch it.



**When removing or setting the FPD, support the FPD with both hands to prevent it from falling.**

Otherwise, the FPD may fall and cause injuries or damage to the FPD itself.

#### Names and Functions of the Tray



No.	Name	Function
1	FPD Tray	Stores a FPD in the equipment.
2	Clamp Handle	Fixes the FPD to the tray.
3	Tray Handle	Used to draw or insert the tray.
4	Bracket	Support the FPD.
5	Tray Lock Release Knob	Knob to release the tray lock.

## Installing the FPD

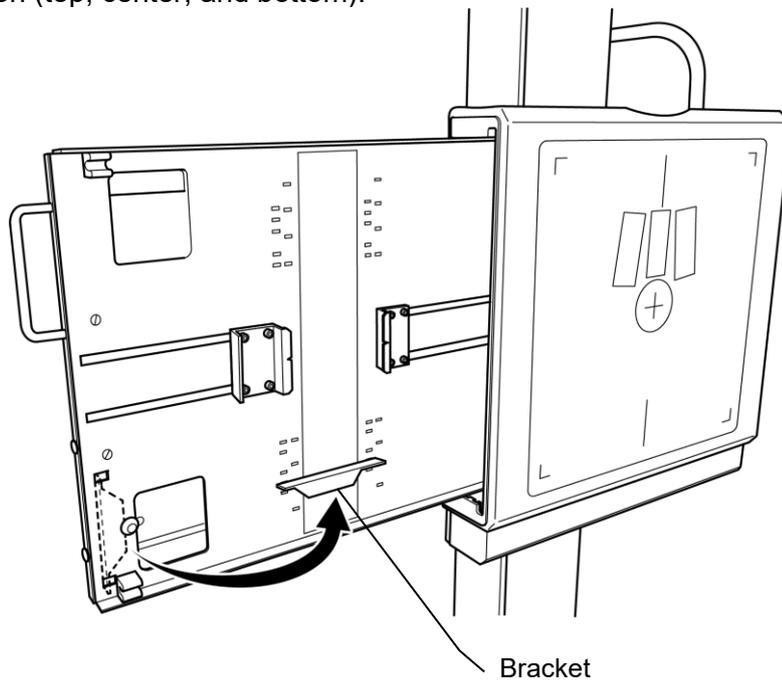
1. Draw out the FPD Tray.



**Do not lean on the tray or apply an excessive force on the tray when it is pulled out.** Doing so may cause damage to the tray and result in injuries.

---

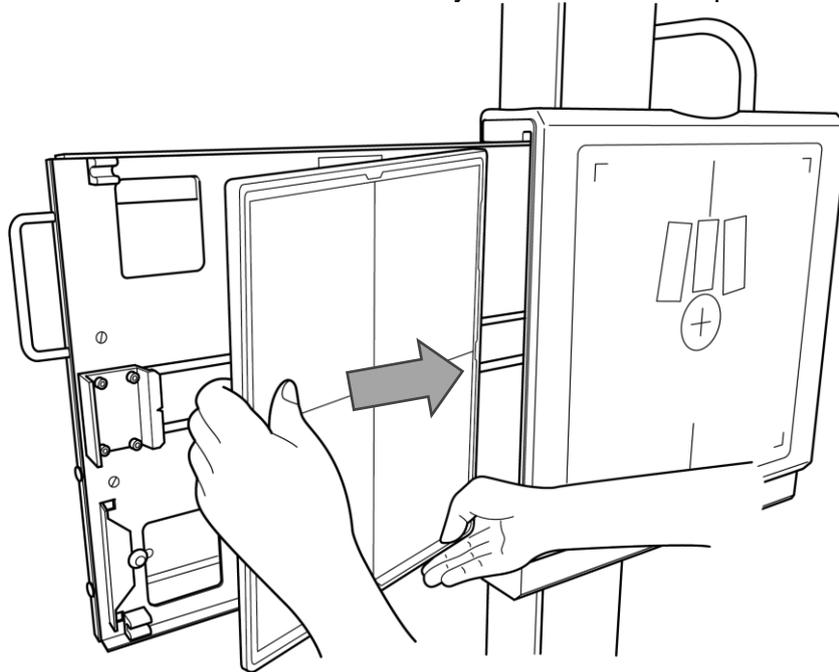
2. For 1417 size FPD, fix the Bracket in accordance with the radiography reference position (top, center, and bottom).



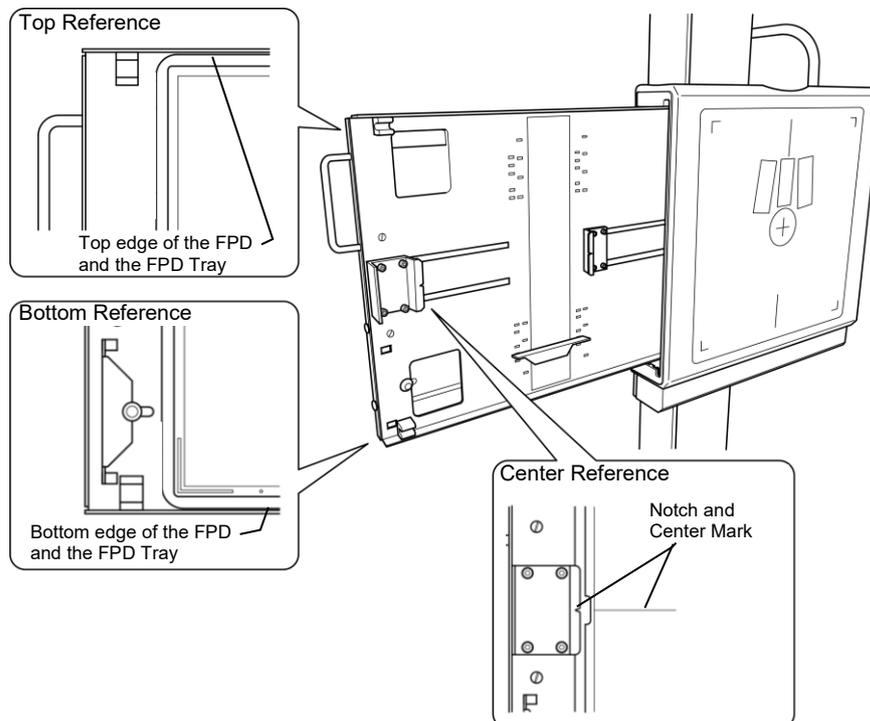
**Fix the bracket at the correct position so that it is horizontal.** Otherwise, the FPD may fall and cause injuries or damage to the FPD itself.

---

3. Place one side of the FPD on the tray and slide the clamp further.



- Center reference: Align the center mark with the center notch.
- Top reference: Align the top edge of the FPD with the top edge of the tray.
- Bottom reference: Align the bottom edge of the FPD with the bottom edge of the tray.





**Avoid excessive shock to FPD when setting the FPD into the tray.**

The FPD may be damaged.

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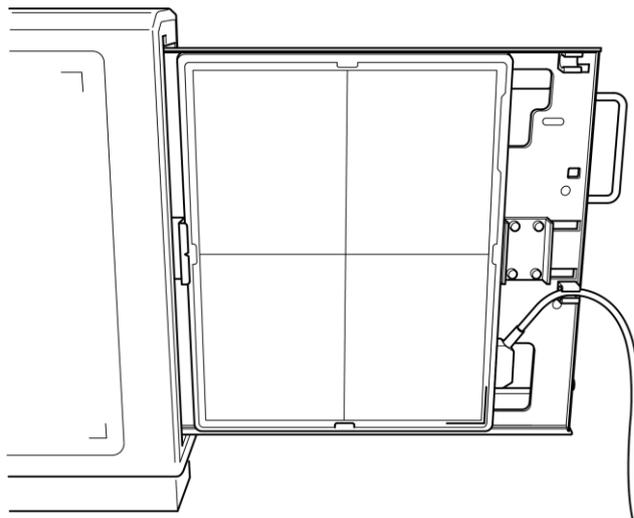


**Take care not to pinch finger or hand between FPD and the tray when setting the FPD into the tray.**

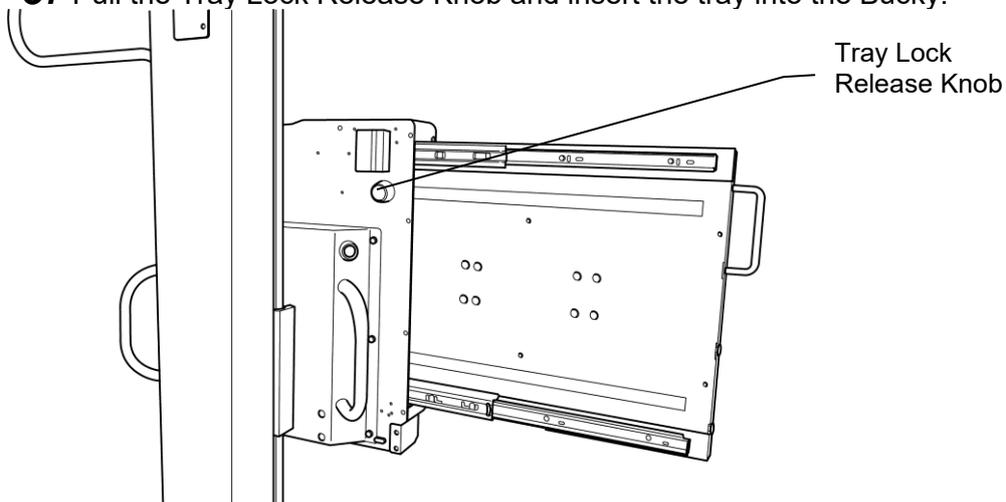
Doing so may result in injury.

---

4. Release the FPD to fix it to the clamp handle.
5. If a cable is connected to the FPD, set the cable in the cable clip.  
 M517-V077 RADspeed Pro Reference Guide  
Chapter 3 "Combinations of Trays and FPDs"



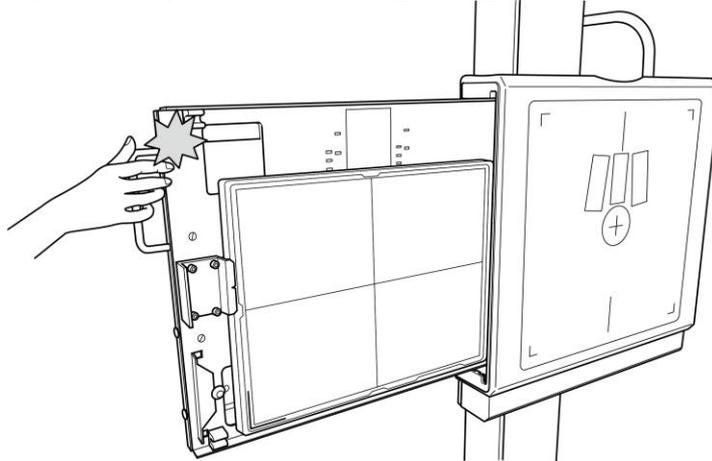
6. Pull the Tray Lock Release Knob and insert the tray into the Bucky.



**CAUTION**

**Grip only the Tray Handle when inserting it into the system.**

Gripping the tray itself may result in pinching of fingers.

**CAUTION**

**Avoid sudden movements with the tray after setting the FPD into the tray.**

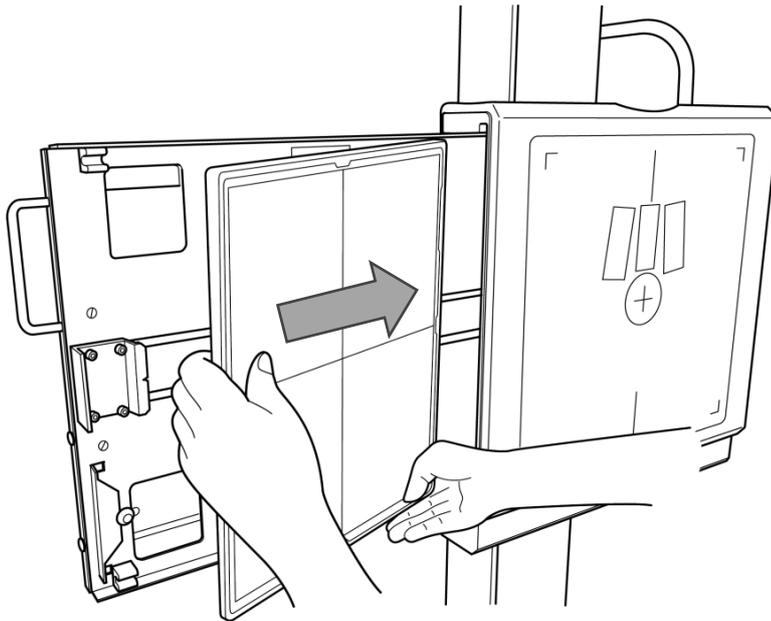
Such action may cause misalignment of the FPD or even damage the FPD.

Please insert the tray gently.

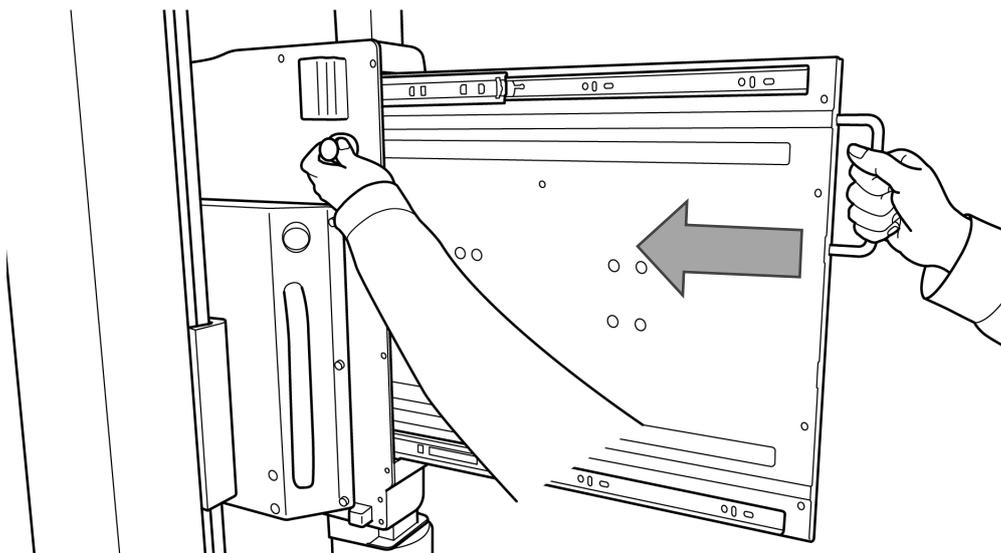
---

■ **Removing the FPD**

1. Draw out the cassette tray all the way.
2. If a cable is connected to the FPD, disconnect the cable.
3. Push the FPD further to release the clamp.
4. Hold the FPD with both hands and remove it from the FPD tray.



5. Pull the Tray Lock Release Lever and insert the tray into the Bucky.





**Be careful when raising or lowering the Bucky of the X-ray radiography stand when the FPD is not mounted.**

The Bucky of the Bucky Stand is balanced when the FPD is mounted. Removing the FPD makes the Bucky lighter, which can cause the device to move upward when the brake is released. Make sure it does not hit any person or object.

### 3.5.3 Operation of the Grid

---

The grid can be removed when it is necessary to reduce exposure dose, such as during infant radiography.

Note that this section will describe the procedure with grid slot at the right side of Bucky, and the procedure with grid slot at the left side is the same.



**Confirm the grid insert status or grid type before performing radiography.**

Appropriate radiography images cannot be obtained if the grid is not properly inserted, or if the grid type does not match the specified radiography conditions.

If the grid is not inserted properly, it may contact with the patient or the neighboring devices and cause injury to the patient or damage to the devices.

---



**Do NOT insert your hand into the grid slot.**

Doing so may cause injury.

---



**Handle the grid with care.**

It may be deformed or damaged if dropped or given an impact.

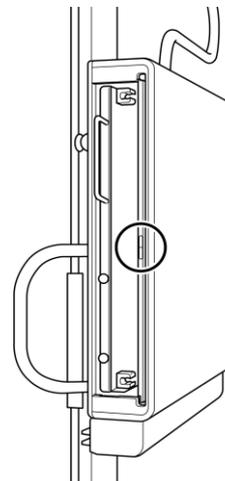
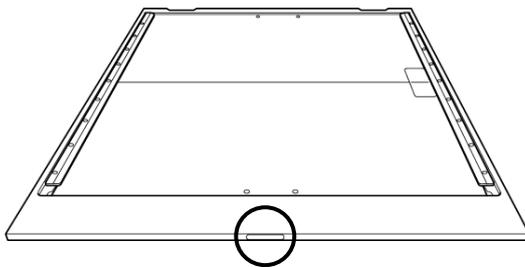
If the grid is deformed or damaged, stop usage.

When removing the grid from the device, store it separately in a special storage case or shelf, or a case surrounded by soft materials such as cushions. Do NOT stack things on top of it or lean it against the wall. Such action may damage the FPD.

---

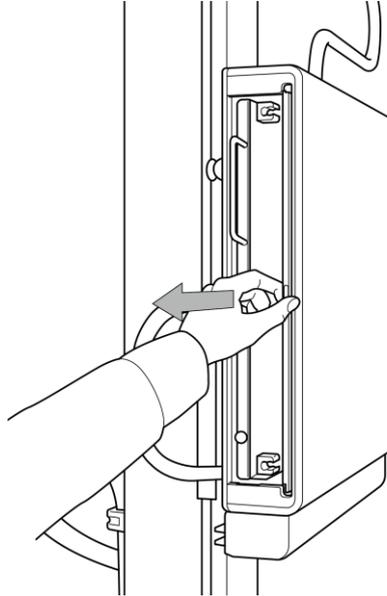
#### Identifying the Grid

The side of the grid shows its intended SID and the identification number. This can be seen when the grid is placed inside the bucky.



## Removing the Grid

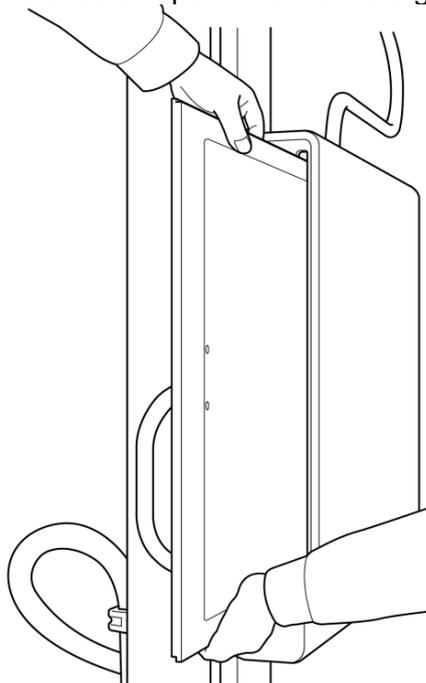
1. Hold the grid handle and pull towards you.



**Be careful when removing the grid to avoid contact with the patient or the neighboring devices.**

Failure to do so may cause injury to the patient or damage to the devices.

2. Hold the grid with both hands and pull it out from the grid slot.





**The grid is heavy. Do NOT hold the grid with one hand.**  
Dropping the grid may cause personal injury or damage the grid.

---



**Pull out the grid slowly and straight out from the slot.**  
Failing to do so may damage the grid or equipment.

---



**Be careful when raising or lowering the Bucky of the X-ray radiography stand when the Grid is not mounted.**  
The Bucky of the Bucky Stand is balanced when the Grid is mounted. Removing the Grid makes the Bucky lighter, which can cause the device to move upward when the brake is released. Make sure it does not hit any person or object.

---

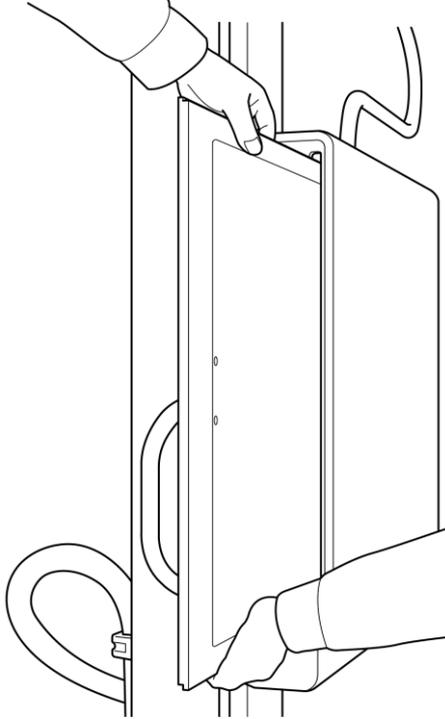


**Make sure the FPD tray is inserted when removing or installing the grid.**  
Failure to do so may cause the hand to be pinched or damage to the FPD Tray or the Grid.

---

## Installing the Grid

1. Hold the grid with both hands and insert it into the grid slot.



**The grid is heavy. Do NOT hold the grid with one hand.**  
Dropping the grid may cause personal injury or damage the grid.

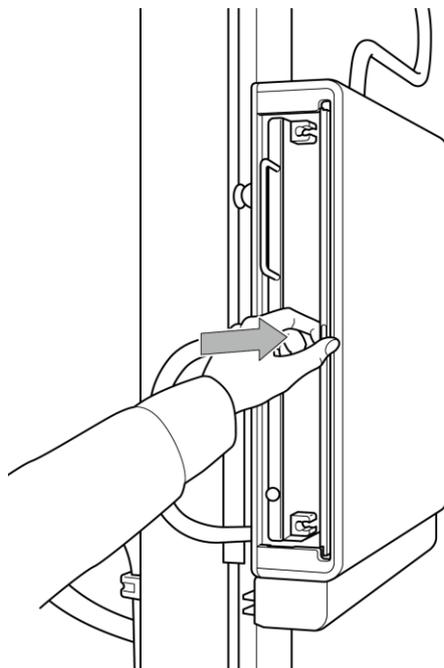


**Insert the grid slowly and straight into the slot.**  
Failing to do so may damage the grid or equipment.  
Handle the grid especially with care when placing it on the rail of the grid slot.



**Make sure the FPD tray is inserted when removing or installing the grid.**  
Failure to do so may cause the hand to be pinched or damage to the FPD Tray or the Grid.

2. Insert the grid to the Bucky all the way in.

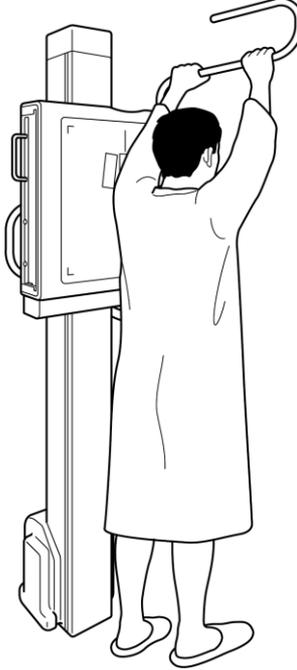


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### 3.5.4 Handle Grip

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The Handle Grip is used to keep the patient still for lateral positions.



**The handle grip is used to hold patient position.  
Do NOT hang nor lean on the handle grip applying a weight of more than 10 kgf.**  
Otherwise, the patient may collapse and cause injury.  
This also may damage the equipment.

---



**Be careful of patient's head etc. not to collide with handle grip.**  
Otherwise, it may cause injury.

---



**When using the handle grip, make sure it does not hit the equipment, such as the stand, Bucky, any system component including Tube Stands, the ceiling, and peripherals.**  
Otherwise, the equipment may be damaged.

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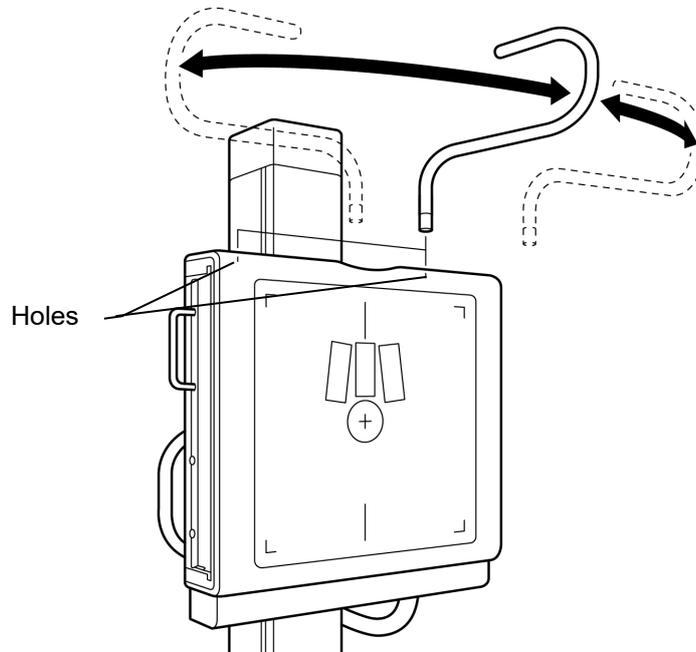
**Be careful when raising or lowering the Bucky of the X-ray radiography stand when the Handle Grip is not mounted.**

The Bucky of the Bucky Stand is balanced when the Handle Grip is mounted. Removing the Handle Grip makes the Bucky lighter, which can cause the device to move upward when the brake is released. Make sure it does not hit any person or object.

---

## Positioning the Handle Grip

1. Insert the handle grip into the holes at the upper side of the bucky. The angle of the handle grip can be positioned at 3 places.



**Check that the handle grip is inserted all the way into the hole.**

If not inserted correctly, the handle grip may fall causing injury to the patient or damage to the equipment.



**Be careful not to pinch your finger when inserting the handle grip.**

**Take care not to pinch finger or hand between the handle grip and the Bucky when inserting the handle grip.**

Doing so may result in injury.



**Handle grip is heavy. Do NOT hold it with one hand when pulled out from the bucky.**

Dropping the handle grip may cause personal injury or damage itself.

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# Chapter 4

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## Troubleshooting

This chapter describes operation when a trouble occurs.

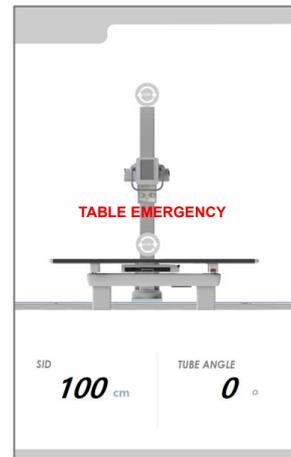
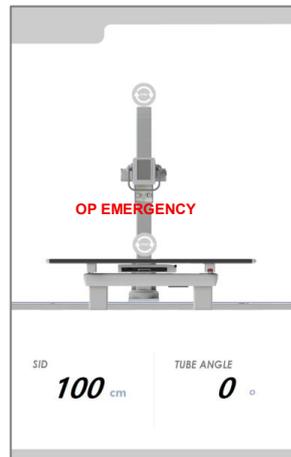
## 4.1 Error Message

### 4.1.1 Emergency Error Message

In an event of emergency in which SST-4100S continues to move, press the emergency switch (⚠) provided in the following.

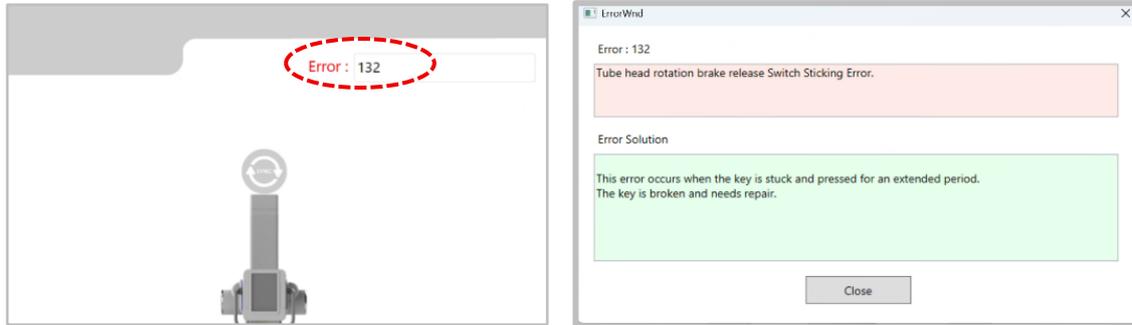
- Lower right of the tabletop of the Patient Table
- Lower left side of the Operation Panel of the Tube Stand

When pressed, error will be displayed and stops and deactivates all the motorized movements.



### 4.1.2 Other Error Code and Messages

If a problem occurs during operation for SST-4100S, an error code will appear to the upper right side of the display. Tap the error code for detail message.



Code		Error Name	Error Cause	Troubleshooting
101	201	Brake Release Switch Power ON Error	The button was pressed when the main power was turned ON. The message shows which button is pressed.	Make sure no keys are pressed, then turn the power off and on again. If the error shows again, contact your service personnel.
111	211			
121	221			
131	231			
141	241			
151	251			
161	271			
171				
102	202	Brake Release Switch Sticking Error	This error occurs when the key is stuck and pressed for an extended period. The message shows which button is pressed.	Make sure no keys are pressed, then turn the power off and on again. If the error shows again, Contact your service personnel.
112	212			
122	222			
132	232			
142	242			
152	252			
162	272			
172				

## 4.2 Initialization of the Patient Table Up/Down Movement

Perform the following procedure for cases described below.

- Table Legs get jammed.
- Table legs get uneven due to malfunction of one of the table legs.



**Do NOT perform this procedure with the patient on the table, or patient close to the table.**

If trouble occurs when patient is on the table, remove the patient from the table first.

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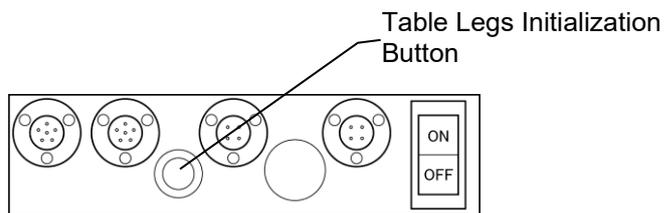


**Do NOT perform this procedure move the tabletop down when the operator's body is underneath the table.**

The Patient Table will start downward movement in this procedure.

---

1. Move the Tube Stand to the longitudinal end of the rail to access the rear side of the Patient Table.
2. Press the Table Legs Initialization Button located at the rear side of the Patient Table.  
The table legs will immediately move down to the lowest point and initialize the table legs.
3. Release the button after the Patient Table stops moving.



### 4.3 Operation during a power outage

During a power outage, pressing the lock release button will not disengage the lock. For the safety of the patient as well as other individuals, apply a 15 to 20 kg force on the device vertically to move the X-ray tube assembly. This enables X-ray tube assembly to move vertically contrary to the lock.



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# Chapter 5

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## Maintenance

This chapter provides points for daily and periodic inspections as well as consumable parts.

## 5.1 Maintenance Check

- SST-4100S is a precision medical device and requires periodical maintenance checks as well as daily checks before and after the use of the device in order to keep its life as long as possible.
- Daily and periodical checks would prevent the device from various possible troubles, including freeze of the application, and support the proper and safe operation of the device.
- Daily and periodical checks including wire ropes check are necessary to maintain safety and high-performance of the device. If no check is performed, the equipment life may decrease, or the equipment may be severely damaged or pose a serious health risk to human body.
- The maintenance check not only includes daily and periodical checks, but also covers replacement of consumable parts and periodic replacement of parts.
- A part of the periodical checks and the replacement of parts require knowledge and skills sufficient to use special tools or deal with dangerous situations in the process.
- For more information on periodical checks and periodic replacement of parts, contact your Shimadzu service representative.



**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.

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## 5.2 Daily Inspection (Inspected by User)

Inspect the following items before operating the device, and if any abnormal points are observed, please contact your Shimadzu service representative:

### 5.2.1 Check Sheet for Daily Inspection

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

Verification points	Procedure
<input type="checkbox"/> Are all unnecessary objects removed from the vicinity of the device?	Remove
<input type="checkbox"/> Are the cables free of pinches, twists and scrapes?	Fix the cables
<input type="checkbox"/> Any breakage (dents, fractures, etc.) on the cover?	Contact your Shimadzu service representative.

2. Check the following points by hand and perform the appropriate procedure in case of any problems.

	Verification points	Procedure
Tube Stand	<input type="checkbox"/> Is the collimator fixed?	Affix
	<input type="checkbox"/> Does the handle wobble or shake?	
Patient Table and Bucky Stand	<input type="checkbox"/> Any large shaking at overall structure?	Contact your Shimadzu service representative.
	<input type="checkbox"/> Tray is put in/out smoothly?	
	<input type="checkbox"/> FPD is fixed to the tray?	
	<input type="checkbox"/> Any jerk or creak while rotating of handle grip?	
	<input type="checkbox"/> Grid is put in/out smoothly?	
	<input type="checkbox"/> Grid is fixed?	

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

	Verification points	Procedure
Tube Stand, Patient Table, and Bucky Stand	<input type="checkbox"/> Does the equipment make any noise when moving, rotating and stopping?	Contact your Shimadzu service representative.
	<input type="checkbox"/> Check for any abnormal odors.	
	<input type="checkbox"/> Is the lock released for moving or rotating the device?	
	<input type="checkbox"/> Is the lock engaged for moving or rotating the device?	
	<input type="checkbox"/> The lock position is suitable for moving/rotating the equipment	
	<input type="checkbox"/> Does the equipment move smoothly?	
	<input type="checkbox"/> Are the buttons on the operation panel in good working order?	
	<input type="checkbox"/> Is the vertical motion of the equipment in balance?	
Patient Table	<input type="checkbox"/> Does the table move both upward and downward?	

---

### 5.2.2 Inspection for Warning and Caution Labels

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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.

---

### 5.2.3 Cleaning and Disinfection

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

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.



**Be sure to clean and disinfect the equipment periodically.**

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



**Be sure to clean the equipment frequently and after each patient use.**

While doing so, do NOT directly apply or spray any disinfectant, cleaner, or water onto the equipment. Wipe down all contact surfaces using a cloth moistened with 70% isopropyl alcohol. Make sure the cloth is NOT too wet. If it is, liquid may enter into system electronics, causing failure or malfunction.



**Do NOT immerse the equipment in liquid. Do NOT autoclave equipment.**



**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.

---

**Do NOT use an organic solvent.**

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

**When disinfecting resin parts such as reticule of the collimator, do NOT use rubbing alcohol.**

Rubbing alcohol may lead to deformation or crack of resin parts such as reticule of the collimator. Wipe it off immediately if it adheres to the reticule of the collimator.

**When cleaning resin parts such as reticule of the collimator, use cloth lightly moistened, not soaked, with cold or warm water mixed with neutral detergent that does not include organic solvent.**

Rubbing alcohol, organic solvents or non-neutral detergents may lead to deformation or crack of resin parts such as reticule of the collimator. Wipe them off immediately if they adhere to the reticule of the collimator.

On completing the work, check the following points before switching the power ON again.

- There must be no water or disinfectant adhering to the equipment.
- The tools used in cleaning and disinfecting work must be tidied away.

**When turning the power ON after cleaning, make sure the examination room is properly ventilated.**

Turning the power ON while any flammable gas remains in the examination room could lead to fire, smoke, explosion, or electrocution.

## 5.3 Periodic Inspection

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



**Be sure to perform periodic inspection (every 1 year).**

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.

		Verification points	Procedure
Loosening of bolts		Are there any loosening in bolts fixing the structure and rollers?	Contact your Shimadzu service representative.
Remove the cover and check	Wire rope	Is the wire rope severed? <ul style="list-style-type: none"> <li>• Is the wire rope scratched or snagged?</li> <li>• Is the wire pulley scratched?</li> <li>• Are there any scratches or obstructions around the rail in the wheels?</li> </ul>	
	Power supply	Is input/Output voltage appropriate?	
	Pulley, shaft, pins, screws, etc.	Wear, deformation, breakage, looseness, dropping	
	Bearing	Wear, rust oil shortage	
	Magnet	Are there any damage or dirt on the magnet surface?	

## 5.4 Maintenance Parts List

To maintain the performance of the system, the following parts need replacing at regular intervals. When replacing them, use the genuine parts and contact your Shimadzu service representative.

- Maintenance Parts List

Item	Name	Required Quantity	Replacement Cycle	Implemented by
Parts for Periodical Inspection	Wire Rope for Tube Stand* <sup>1</sup>	2	7 years	Shimadzu service representative
	Wire Rope for Bucky Stand* <sup>1</sup>	2	7 years	
Maintenance Parts	Spring Balance Drum ASSY for Tube Stand	1	7 years	
	Spring Balance Drum ASSY for Bucky Stand	1	7 years	

\*1: The replacement period of the main wire rope differs depending on the frequency of use. Replacement may be required at shorter intervals depending on the operating environment and conditions.

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# Chapter 6

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## Specifications

This chapter describes specifications.

## 6.1 Environmental Conditions of EMC (Electromagnetic Compatibility)

This Product is a part of “RADspeed Pro” system.  
For details on description for “RADspeed Pro” system, refer to the operation manual for RADspeed Pro.



**The equipment is suitable for installing at a professional healthcare facility environment except below:**

- Medical treatment areas with high-powered medical electrical equipment (High frequency surgical equipment, short-wave therapy equipment)
  - Inside the radio frequency shielded room of an MRI.
-

## 6.2 Specification



- Contents of this specifications are subjected to change for further improvement without notice.
- The specifications indicate standard values, which may differ from actual values.

### 6.2.1 Tube Stand

Item		Specifications	
Maximum suspended mass		Approx. 30 kg	
Balancing Method		Spring Balance	
Movement of X-ray Tube Unit	Vertical Travel	Travel Range	Approx. 400 – 1,890 mm: continuously
		Operation	Manual, electromagnetic brake
			Auto-tracking (1): Tube Stand Vertical Tracking to the Bucky Stand
	Longitudinal Travel	Travel Range	For 1.9m rail type: 1,600 mm ± 10 mm For 3.0m rail type: 2,650 mm ± 10 mm Continuous
		Operation	Manual, electromagnetic brake
	Transversal Travel	Travel Range	250 mm ± 10 mm
		Operation	Manual, electromagnetic brake Click stop at the center
	Rotation around horizontal axis	Travel Range	± 180 deg: Continuous
		Operation	Manual, electromagnetic brake Click stop at 4 points: ±90 deg, 0 deg, and 180 deg.
	Rotation around vertical axis	Travel Range	Column Rotation ±90 deg
		Operation	Manual Click stop at 3 points, ± 90 deg and 0 deg

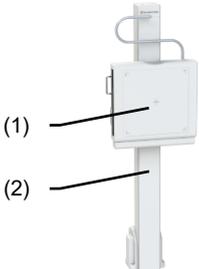
Item		Specifications	
Control Panel	Buttons on the control panel 	<ul style="list-style-type: none"> <li>• Lock release button for each direction</li> <li>• All-free button</li> <li>• Emergency stop button</li> <li>• Emergency release button</li> </ul>	
	Indication on the display	SID	3 digits, digital display, Unit: cm (1cm increment) or Inch (0.1 increment)
		X-ray tube angle	3 digits, digital display, Unit: deg
		Sync button	Start the tracking movement selected from 3 modes. Auto-tracking (1): Tube Stand Vertical Tracking to the Bucky Stand Auto-tracking (2): Bucky for the Patient Table tracking to the X-ray Tube Auto-tracking (3): Tube Stand Vertical Tracking to the Patient Table
Touch Panel Size		10.1"	

6.2.2 Patient Table

Item		Specifications	
Construction (1) Main Frame (2) Floating Tabletop Assembly (3) Bucky			
Main Body	Size of Tabletop	805 mm x 2,200 mm Flat Tabletop	
	Material of Tabletop	Melamine	
	Attenuation equivalent for table	1.3 mmAl or less	
	Longitudinal movement	Operation	Manual
		Travel Range	± 360 mm (± 10 mm)
	Lateral movement	Operation	Manual Click stop at center
		Travel Range	± 100 mm (± 10 mm)
	Lock of the tabletop	Method	By permanent electromagnetic lock (Released when activated).
		Operation	By infrared controlled foot switch (Wired control available)
	Vertical moving range	Travel Range	300 mm
Operation		Electric (Deadman's control by infrared/wired footswitch)	
Distance between tabletop and floor	524 – 824 mm		
Distance between tabletop and detector plane	112 mm		
Maximum allowable load	350 kg (uniform load on tabletop)		
Bucky	Applicable FPD size	• FPD Tray 14 x 17 in / 35 x 43 cm sized FPD 17 x 17 in / 43 x 43 cm sized FPD	
	Radiography reference position	Center position	
	Bucky moving distance	±250 mm ± 5 mm	
	Mounting/removing grid	Possible	
	X-ray grid	Size	438 mm x 479 mm
		Intermediate material	AL
Grid density Grid ratio		40 lines/cm, 8:1 40 lines/cm, 10:1 40 lines/cm, 12:1	

Item		Specifications
Other Standard Features	Auto-tracking	(2) Bucky for the Patient Table tracking to the X-ray Tube
		(3) Tube Stand Vertical Tracking to the Patient Table
Option Features	Lateral Detector Holder	Mounted to the side of the tabletop to hold FPD during lateral radiography. Can hold both 17 x 17 and 14 x 17 in. FPD.
	Grip Switch	Mounted to the side of the tabletop to operate the floating tabletop and the vertical movement without using the foot switch.
	Table-top Handlebar	Mounted to the side of the tabletop for the operator to move the floating table. Requires foot switch operation.

## 6.2.3 Bucky Stand

Item		Specifications	
Construction (1) Bucky (2) Column		 <p>(1) — Bucky (2) — Column</p>	
Bucky	Distance between FPD center and floor surface	400-1,890 mm	
	Applicable FPD size	<ul style="list-style-type: none"> <li>FPD Tray</li> <li>14 x 17 in / 35 x 43 cm sized FPD</li> <li>17 x 17 in / 43 x 43 cm sized FPD</li> </ul>	
	Radiography reference position	Center Position / Upper Position	
	Mounting/removing grid	Possible	
	Distance between bucky front face and FPD tray	67 mm	
	X-ray grid	Size	438 mm x 479 mm
		Intermediate material	AL
		Grid density Grid ratio	40 lines/cm, 8:1 40 lines/cm, 10:1 40 lines/cm, 12:1
Attenuation equivalent for front panel		1.0 mmAl or less	
Other Standard Features	Handle Grip	This handle supports the attitude of the patient at lateral position.	
	Front Radiography Handle (Bucky Handle)	This handle supports the attitude of the patient at frontal position.	
	Auto-tracking (1)	Tube Stand Vertical Tracking to the Bucky Stand. Center Position only.	
	Both side operation	Vertical movement of the bucky can be controlled from both right and left sides of the bucky.	
	Wall Mounting	This fixes the upper part of the column to the wall. Use this when it is difficult to secure the equipment only by fixing it to the floor.	

6.2.4 SST-4100S Overall Specification

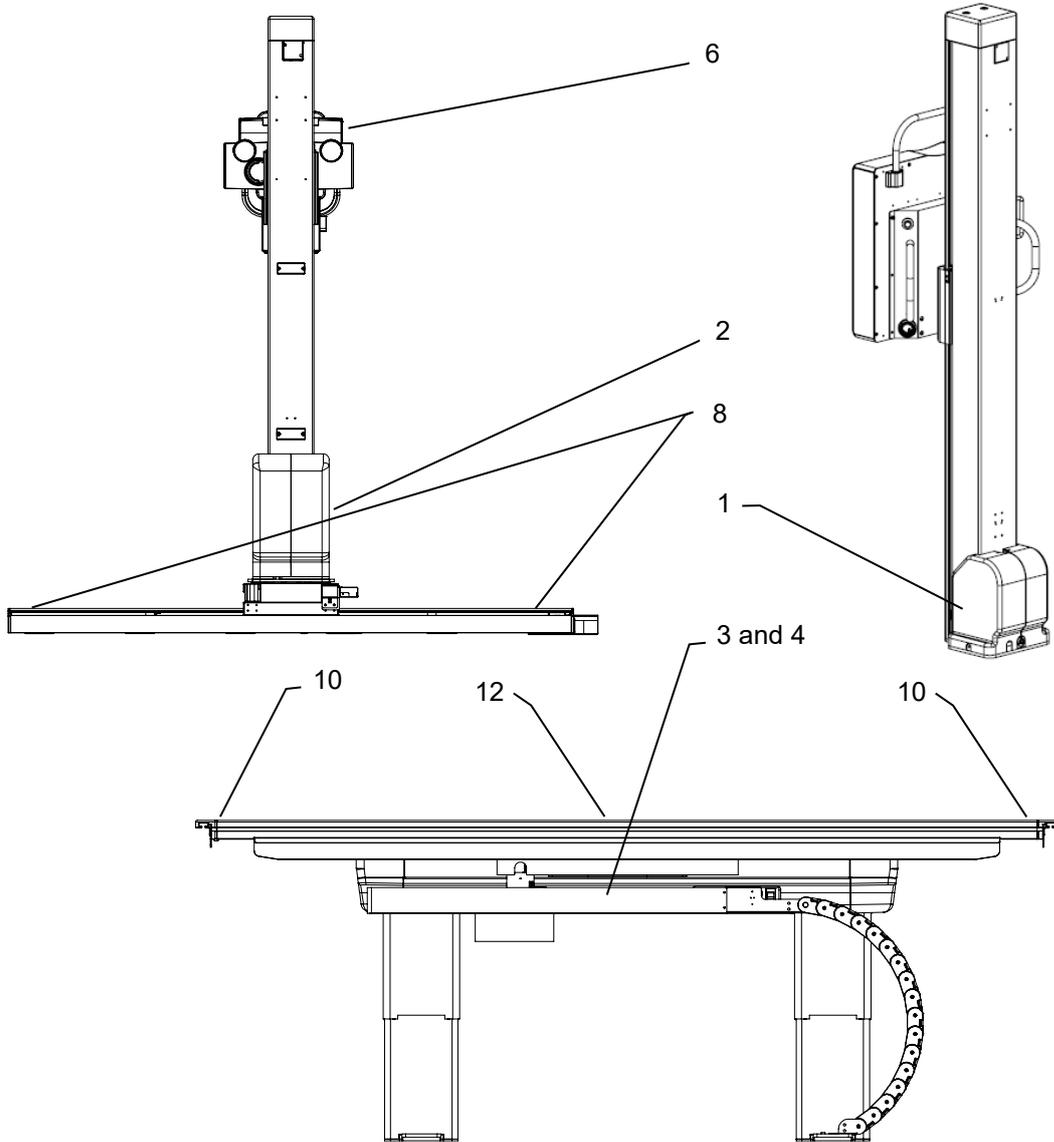
Item		Specifications		
Installation Conditions	Outer Dimension		See Layout Diagram	
	Required Space	1.9m rail type	4,200 x 2,600 mm	
		3.0m rail type	5,000 x 2,600 mm	
	Required Ceiling Height		2,600 mm or more	
	Mass	Tube Stand	1.9m rail type	172 kg
			3.0m rail type	200 kg
		Patient Stand		250 kg
		Bucky Stand		71 kg
	Power Supply		Single phase, 120 V or 220-240V, 50/60 Hz, 500VA  Impedance 2.8 Ω or less (120 V) 9.5 Ω or less (220-240 V)	

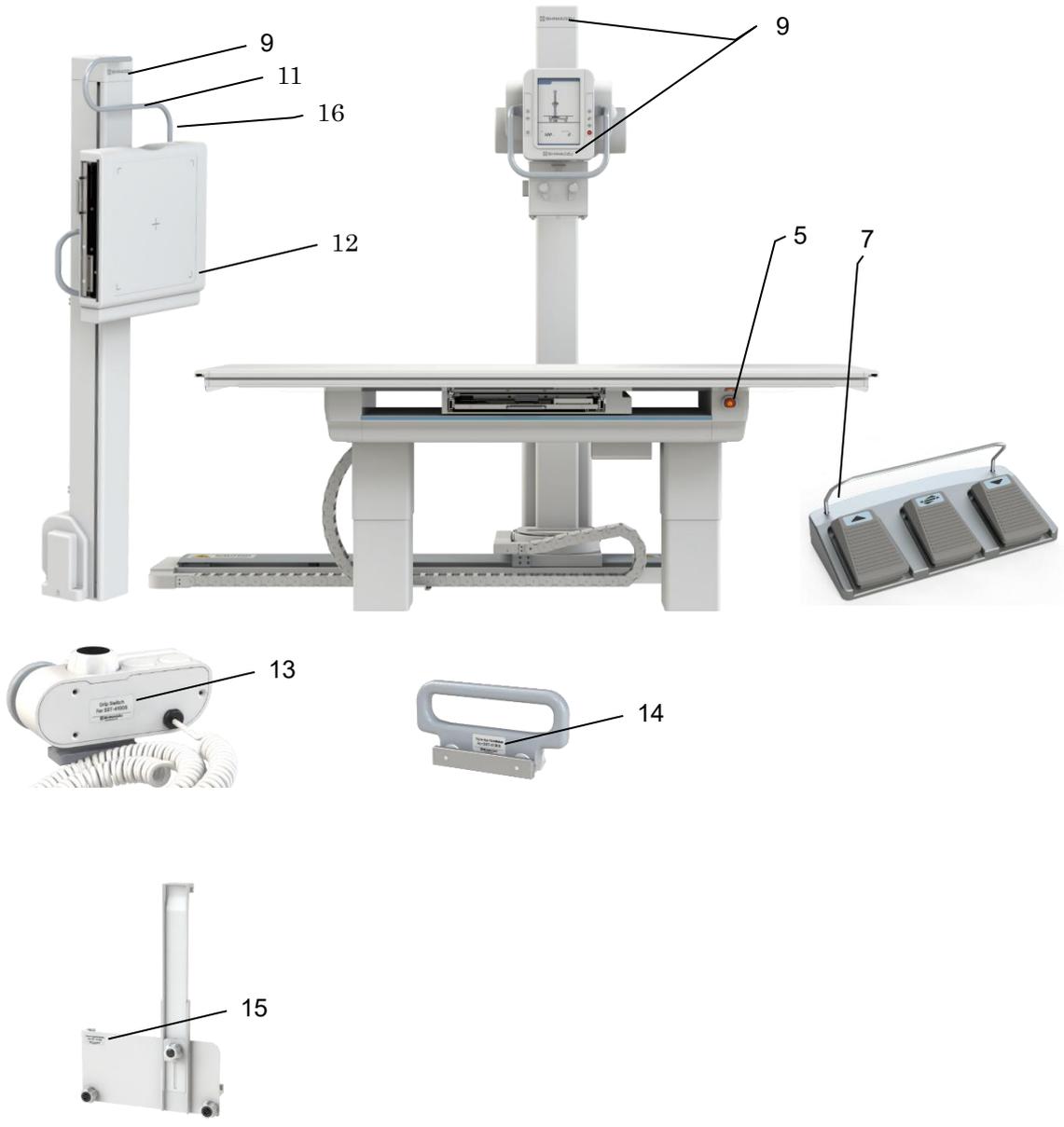
### 6.3 Labels and Symbols

No	Label Location	Label Designs
1	Rear cover for the Bucky Stand	
2	Rear cover for the Tube Stand	
3	Rear cover for the Patient Table Input: 120V	
4	Rear cover for the Patient Table Input: 220-240V	
5	Emergency Switch for Tube Stand	

6	Inside of tube mount for Tube Stand	
7	Side of the foot switch for Patient Table	
8	Both end of the rail for Tube Stand	
9	Tube Stand and Bucky Stand	
10	Tabletop for Patient Table	
11	Handle Grip for Bucky Stand	
12	Tabletop for Patient Table	
13	Grip Switch for Patient Table	
14	Table-top Handlebar for Patient Table	
15	Lateral Detector Holder for Patient Table	

16	Handle Grip for Bucky Stand	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Handle Grip For SST-4100S</p>  <p>www.shimadzu.com</p> </div>
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## 6.4 Statement of Compliance [For Europe]

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### 6.4.1 Regulatory Information

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For Europe:

This product complies with the requirement of the REGULATION (EU) 2017/745 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL and RoHS Directive 2011/65/EU.

Product Name: SST-4100S

Manufacturer: Shinyoung For M Co.,Ltd.  
423-1, jingeononam-ro, Jingeon-eup,  
Namyangju-si, Gyeonggi-do, 12129,  
Korea, Republic of

Authorized Representative: Obelis s.a.  
Bd. General Wahis 53  
1030 Brussels, Belgium

Importer: Shimadzu Europa GmbH  
Albert-Hahn-Strasse 6-10,  
47269 Duisburg, Germany

This Product is a part of "RADspeed Pro" system.  
For details on description for "RADspeed Pro" system, refer to the operation manual for RADspeed Pro.

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### 6.4.2 Company's Quality System

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This Product is a part of "RADspeed Pro" system.

For details on description for "RADspeed Pro" system, refer to the operation manual for RADspeed Pro.

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### 6.4.3 International Standards

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This Product is a part of "RADspeed Pro" system.

For details on description for "RADspeed Pro" system, refer to the operation manual for RADspeed Pro.

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### 6.4.4 Protection Against Radiation

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Refer to the standard for the acceptance and performance testing.  
(ex: DIN 6868-150:2013-06)

## **6.5 Statement of Compliance with Standards**

This Product is a part of “RADspeed Pro” system.

For details on description for “RADspeed Pro” system, refer to the operation manual for RADspeed Pro.

## 6.6 Manufacturer Information

Manufacturer: SHINYOUNG FOR M Co., Ltd.

Address: 423-1, jingeononam-ro, Jingeon-eup, Namyangju-si,  
Gyeonggi-do, 12129, Korea, Republic of

## 6.7 Product Safety



**Do NOT operate this unit if there is any uncertainty as to the proper functioning of the system. Refer all servicing to qualified service personnel.**



**This equipment must be ground. To minimize the shock hazard, make sure of performing the ground work according to Installation Manual**



**The operator must set the focal spot to skin distance as large as possible in order to keep the absorbed dose to the patient as low as reasonably achievable.**

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## **6.8 List of Associated Equipment [For Europe]**

This Product is a part of “RADspeed Pro” system.

For details on description for “RADspeed Pro” system, refer to the operation manual for RADspeed Pro.

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# 文書承認履歴

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