Green 16™
Green 18™

Installation Manual

Model : PHT-65LHS
Version : 1.49

- English

Full Version

vatech

English

Notice

This manual covers the installation procedures for the **Green16/18** dental X-ray unit. The installation manual is shipped with a hardware unit and the user manual.

Brand name: Green16/18 (Model: PHT-65LHS)

Manufactured by: VATECH Co., Ltd.

In this manual, “equipment” refers to the **Green16/18**.

In abbreviated forms, CBCT, CEPH, and PANO denote Cone Beam Computed Tomography, Cephalo, and Panora, respectively. They are interchangeably used.

The “Optional” in this manual means that the function or features are left to the customer’s or user’s choice

A thorough review of this manual is recommended before installation to ensure the proper installation of this equipment. The **Green16/18** is in steady improvement. The information contained in this manual may be subject to change without notice, justification, or notification of the persons concerned.

This Equipment is covered by one or more of the US patents: US 8634515, US 8634621, US 9117301, US 2015/0117743, US 2015/0139524.

Windows 10, NVIDIA, etc., are 3rd parties’ prominent or registered trademarks protected by related laws, and these trademarks are used in this manual just only for explanation.

For further information not covered in this manual or the accompanying documentation, please contact us with any methods listed below:

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- **Manual Name: Green16/18 (Model: PHT-65LHS) Installation Manual**
- **Document Number: VHD-IM-068**
- **Version: 1.49**
- **Publication Date: 2022-02**

The QR code linked to video file about the installation is provided in the cover of this manual. The smart phone and pad which have the QR code reader application program can be used to watch video.

Important Notes

	Moisture could be built upon the equipment from a sudden temperature change inside and outside the installation room. Allow at least an hour before turning ON the equipment to avoid condensation.
CAUTION	▪ To avoid improperly balanced equipment, install the device on a flat surface to maintain stability. ▪ If the equipment is not stable, property damage and/or personal injury may occur. ▪ Do not push or pull the equipment. ▪ Equipment should only be installed by an authorized technician, complying with proper installation procedures
IMPORTANT	Failure to read and understand the information provided in the manual may result in injuries or damages to the equipment. Please read each CHAPTER in this manual and understand the information therein before starting any of the installation procedures.

English

Table of Contents

1. Introduction

1.1 Customer's Responsibility

Site planning and preparation are the responsibility of the customer. The following points should beconsidered fundamentally important to all customers of this product:

- Install all required materials before delivery of the system.
- Complete the floor, ceiling, and walls of the room before installing the equipment.
- Install proper sized junction boxes, with covers, at the necessary locations.
- Install a mains power with the proper voltage output and an adequate kVA rating.
- Install the circuit breaker specified by this manual.
- Provide the installer(s) with the current dimensions of the room, including the hallway and entry door sizes.
- The customer must have an electrician install more than two power outlets in the room.

1.2 Manufacturer's Liability

As the manufacturer, **VATECH** assumes liability for the safe and reliable installation and operation ofthis equipment only when:

- Equipment installation, including software installation, was carried out by an authorized agent following this installation manual.
- The electrical installation was carried out following the appropriate requirements specified in IEC-60363.
- Genuine original or approved replacement parts are used.
- Maintenance/repair service has been performed by a qualified technician(s) from one of our authorized agents.
- The equipment has been used under normal conditions following the user's manual.
- PC Software has been properly used following the manufacturer’s installation instructions and user manuals.

1.3 Conventions in this Manual

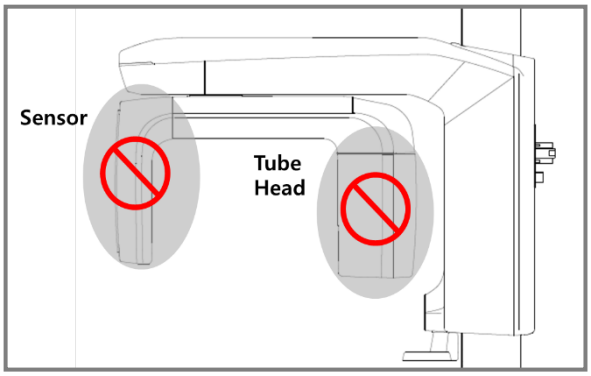
The following symbols are used throughout this manual to emphasize information or indicate a potential risk to the equipment or user. Make sure that you fully understand each symbol and follow the instructions accompanied.

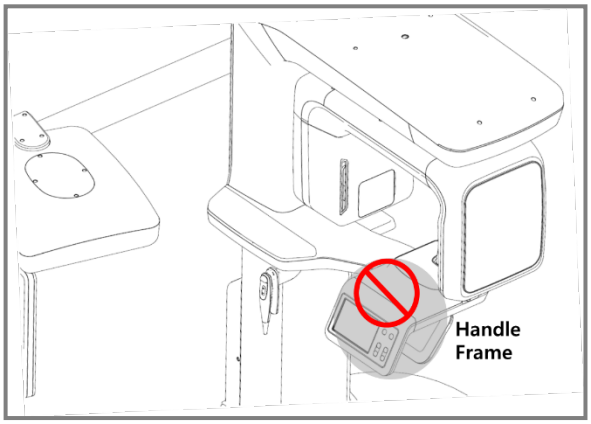
To prevent physical injury and/or damage to the equipment, please observe all warnings and safety information included in this document.

	**WARNING**	Indicates information that should be followed with the utmost care. Failure to comply with a warning may result in severe damage to the equipment or physical injury to the operator and/or patient.
	**CAUTION**	Indicates a situation that demands prompt and careful action, a specific remedy, or emergency attention.
	**IMPORTANT**	Indicates a situation or action that could potentially cause problems to the equipment and/or its operation.
	**NOTE**	Emphasizes valuable information or provides useful tips and hints.
	**RADIATION**	Indicates a danger from radiation exposure.
	**ESD susceptibility**	Indicates that an item is susceptible to damage from electrostatic discharges.

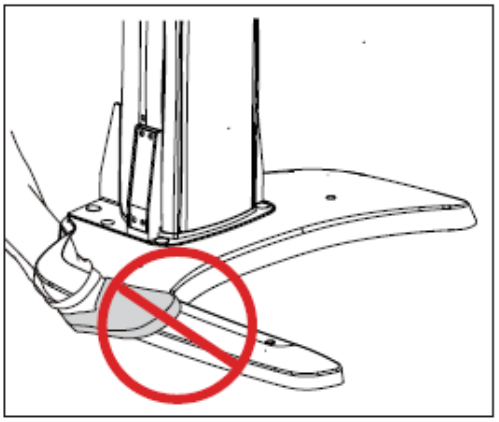
WARNING

DO NOT touch or hold the Sensor or Tube Head areas when moving, installing, or operating the equipment.





DO NOT step on the base unit when installing or operating the equipment.

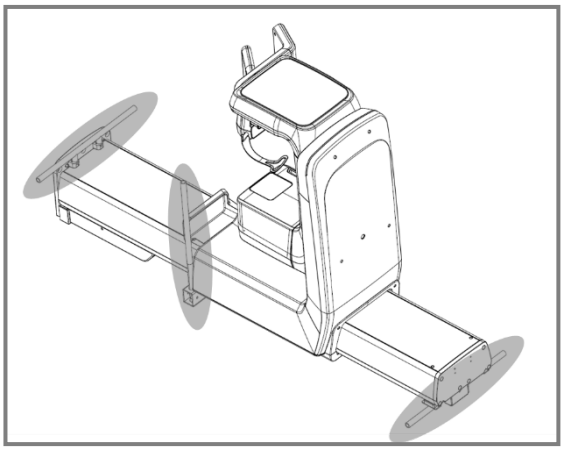


DO NOT use the electric drill to tighten bolts. This can damage the bolt. Use the tool for drilling the wall only.

IMPORTANT

You must hold the recommended holding area when moving the equipment.

<Recommended Holding Area>

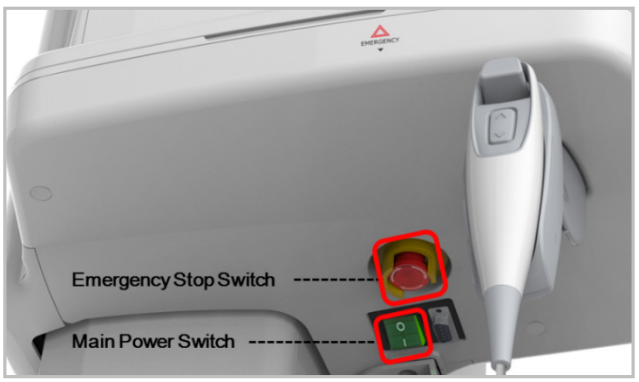


NOTICE

Four people are required for the safe installation.

NOTICE

Check the locations of the Emergency Stop Switch and the Main Power Switch.



CAUTION

Cautions for Installation

- You must read and understand all instructions in this manual before installing the equipment.
- You must confirm that the system is installed according to the instructions provided by this manual and perform the appropriate procedures therein.
- Before turning on the equipment, leave it a room temperature for more than an hour
- If the equipment has been stored at temperatures of below 10℃ (50˚F) for more than a couple of hours, allow the equipment to reach room temperature before applying mains voltage
- Installation and related work must be performed by people authorized by VATECH.
- DO NOT connect any items or equipment that is not part of this system: IEC60601-1-1 (3rd edition: 2005).
- Any equipment not approved by VATECH must comply with the applicable standards: IEC 60950-1 (2nd edition: 2005) for IT equipment (Ex: PC) and IEC 60601-1 (3rd edition: 2005) for medical electrical equipment.
- All operators of this equipment must ensure that all requirements outlined in IEC 60601-1-1 (3rd edition: 2005): Safety Requirements for Medical Electrical Equipment are fully met for the safety of patients, operators, and the environment.
- DO NOT touch-sensitive areas such as the sensor when installing the equipment. The touch-sensitive areas are mentioned in relevant sections.
- The use of wireless phones may interfere with the operation of this equipment.
- Use an ESD (electrostatic sensitive device) wrist band to connect it to a ground wire when installing the equipment.
- Touch a ground point to discharge static electricity before handling PCB boards.

IMPORTANT

Important Notes for Installation Site

- The PC monitor, emergency cut-off switch, and X-ray **Exposure Switch** must be located close to the operator

so that the person can reach out to them easily in an emergency.

- The X-ray room must be shielded accordingly to the radiation safety requirements to ensure the operator and patient's safety. You must verify that the room meets all applicable safety requirements.
- Other devices must not be installed near the X-ray equipment.
- DO NOT install this equipment in an area that is exposed to strong electromagnetic fields.
- DO NOT install this equipment near the explosive materials or in the explosion-prone area.
- The electrical installation of this equipment must follow all local code requirements for electro-medical systems: IEC 60364-7-710:2002.
- The UPS must be installed at the same time as the equipment.
- The equipment, PC, and all peripheral devices must be well-grounded.

X-ray Radiation Warnings

- Install this equipment in an approved location to ensure the patient's and operator's safety.
- Radiation Shielding (e.g., Stationary radiation shielding barriers) must be installed with the equipment to protect the operator from radiation exposure.
- Follow all federal and local The X-ray system may cause injury to the patient if improperly used. Obey all federal and municipal standards regarding radiation safety.
- When the patient is taking an X-ray image, the operator must stand behind a protective wall or take other protective actions.
- The operator must stay at least 2 m (6 feet) away from the X-ray source when pressing the **Exposure Switch** and observing the patient during the image acquisition.
- The operator must provide the patient with protective clothing before X-ray capturing.
- Pregnant women must consult with a doctor before being exposed to an X-ray.

IMPORTANT

This equipment complies with the following standards.

- **IEC60601-1-1:2005** Standard Safety Requirements for Medical Electrical Equipment
- **IEC 60601-1-2:2005** Electromagnetic Interference
- **IEC 60601-1-3:2005** Radiation Protection
- **IEC 60601-1:2005** Standards for Medical Electrical Equipment
- **IEC 60950-1: 2nd edition:2005** Standards for Information Technology Equipment
- **IEC60601-2-7 and IEC60601-2-28:** X-ray Tube Heads
- **IEC60364-7-710: 2002** Local Code Requirements for Electro-medical System Installation
- **IEC 60601-1-1:2005** regulation shall be met to their full extent for the safety of the patients, operators, and the environment—when any person assembles or modify a medical electrical system by combing it with other equipment.
- Any equipment not provided by VATECH can be connected when the following standards are complied with: IEC 60950-1 and IEC 60601-1
- The electrical installation shall comply with local code requirements for electro-medical systems: IEC 60364-7-710: 2002.

1.4 Marks and Symbols

Symbols	Description	Location
	Dangerous voltage	Power board / Inverter board / Monoblock
	Protective earth (Ground)	Column
	Off (power: disconnected to the **Main Power Switch**)	Main Power Switch
	On (power: connected to the **Main Power Switch**)	Main Power Switch
	Alternate current	Label
	Type B Applied Equipment (IEC 60601-1: Degree of protection against leakage current and electric shock: Class 1 equipment)	Label
	Radiation hazard	Label
	Indicates the authorized representative in the European Community.	Label
	The CE symbol indicates that this product complies with the European Directive for Medical Devices 93/42/EEC as amended by 2007/47/EC as a class IIb device.	Label
	UL mark No. E476672	Label
	Caution: Federal law restricts this device to sale by or on the order of a licensed healthcare practitioner.	Label
	Addresses where the equipment was manufactured.	Label

Symbols	Description	Location
	Indicates that electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately.	Label
	Warns ESD hazard.	MCU board / Board package
	This indicates that this equipment is classified as a CLASS 1 LASER PRODUCT by IEC 60825-1 ED.3 regulations.	Label
	This indicates that the user needs to refer to the **Instruction Manual.**	Label
	Indicates the date of manufacture.	Label

1.5 Standards and Regulations

Standards

Green16/18 (PHT-65LHS) is designed and developed to comply with the following international standards and regulations:

- MEDICAL - APPLIED ELECTROMAGNETIC RADIATION EQUIPMENT AS TO ELECTRICAL SHOCK, FIRE, AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH ANSI/AAMI ES60601-1 (2005) + AMD 1 (2012),
- CAN/CSA-C22.2 No. 60601-1 (2014)
- 21 CFR 1020.30, 31, 33
- NEMA Standard publication PS 3.1-3.18, 2008

CE 2460	This is Class IIb equipment and obtained CE marking in April 2007 for regulations compliance following the revised European Union's MDD (Medical Devices Directive) 93/42 EEC.
CLASSIFIED c UL us E476672	MEDICAL - APPLIED ELECTROMAGNETIC RADIATION EQUIPMENT AS TO ELECTRICAL SHOCK, FIRE, AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH ANSI/AAMI ES60601-1 (2005) + AMD 1 (2012), CAN/CSA-C22.2 No. 60601-1 (2014)

Classifications (IEC 60601-1 6.1)

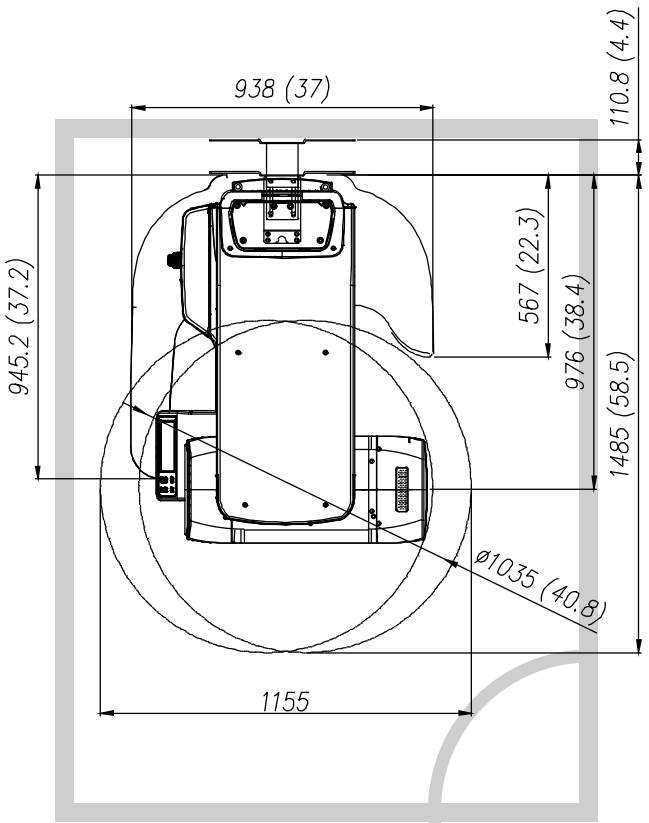
- The degree of protection against water ingress: Ordinary Equipment: IPX0
- The degree of protection against electric shock: Class 1 equipment, Type B Applied Parts (Temple Supports, Chinrests and cover, Nasal Positional and cover, Ear Rod and cap, Carpus Plate)

2. Choosing an Installation Site

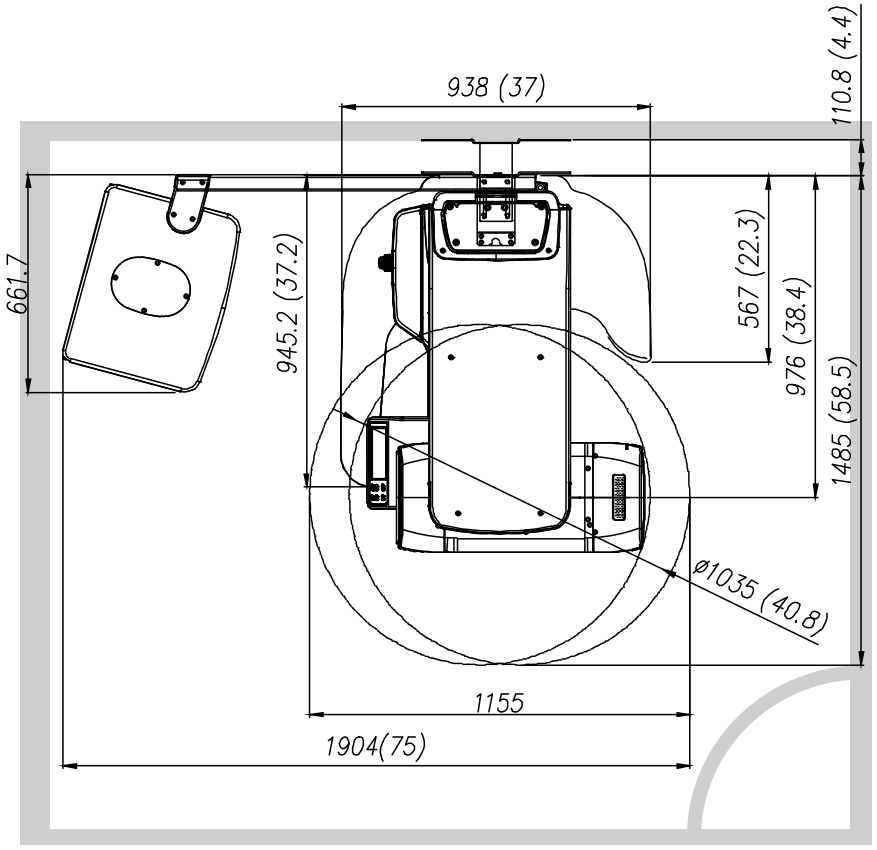
2.1 Room Requirements

IMPORTANT

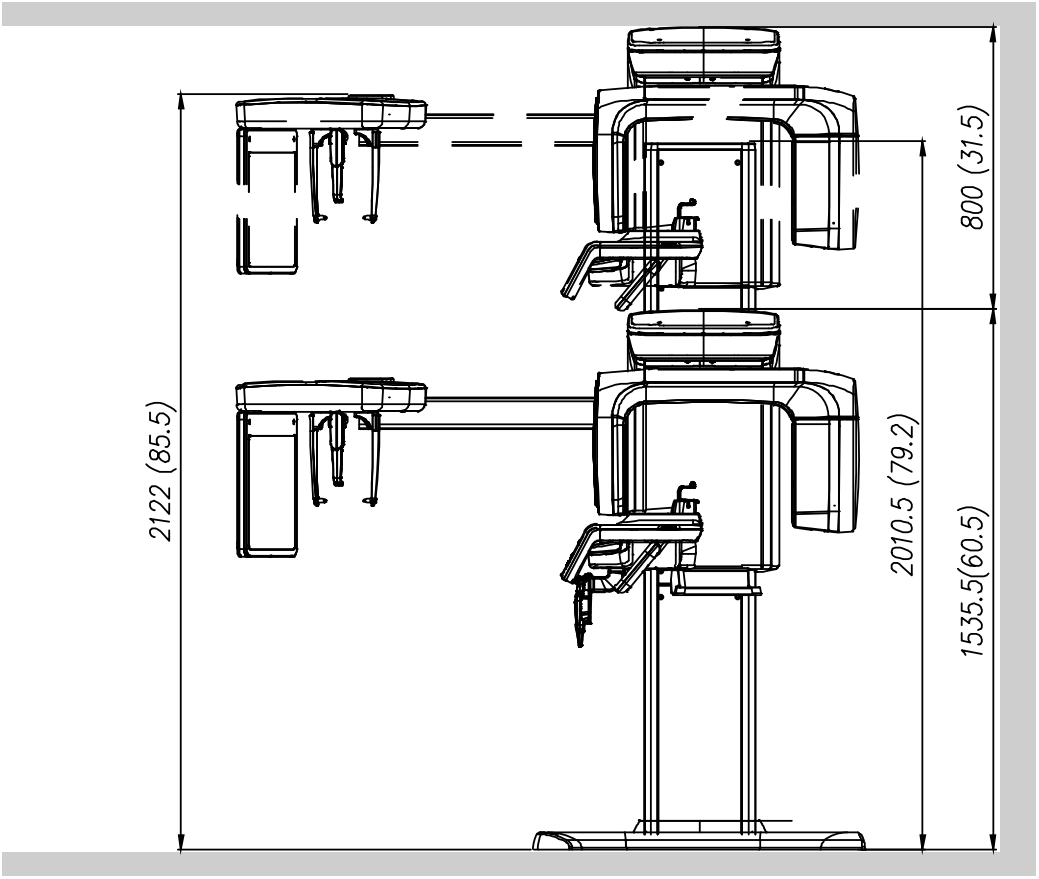
- The location of this equipment should allow for high visibility of the patient by the operator, and the operator should be as about the patient as possible.
- This equipment should not be installed on thick carpets for stability reasons.
- Anti-static floor materials should be used around the equipment.
- The PC monitor, emergency cut-off switch, and X-ray **Exposure Switch** should be installed in the vicinity of the operator so that he or she can manage them simultaneously in case of emergency.



<Without CEPH Unit (optional): 2,055 mm (L) x 2,495.8 mm (W) or wider >



<With CEPH Unit (optional): 2,804 (L) x 2,495.8 mm (W) or wider >



<Ceiling Height: 2,435.5 mm (H) or higher >

Minimum Space Required

Without CEPH unit	2,055 mm (L) x 2,495.8 mm (W) x 2,435 mm (H)
With CEPH unit	2,804 mm (L) x 2,495.8 mm (W) x 2,435 mm (H)

IMPORTANT	If the ceiling height is less than 2403.5 mm (without Base) / 2435.0 mm (with Base) (= max. height of the column + 100 mm), refer to **Appendix C. Limiting the Column Height** to lower the max. Height of the column.

Lead Thickness

≥ 1 mm

Width of the Entrance

The door of the X-**r**ay room should have a clearance of more than 800 mm (31.5”) wide.

Floor Area

The floor of the X-**r**ay room must be stable and level for system balance.

The floor must be able to support a minimum weight of 500 kg/m^2 (110 lbs. / $feet^2$)

Protection against Radiation

- To protect against radiation hazards, follow all federal and municipal requirements.
- During exposure, the operator should follow applicable radiation shielding requirements and remain at least 2m (7’) from the source of the radiation.
- Maintain visible contact with the patient and a clear view of indicators such as the warning lamp and imaging status on the PC.

2.2 Specifications for Electrical Installation

These specifications are based on the **MEIGaN** (Medical electrical installation guidance notes).

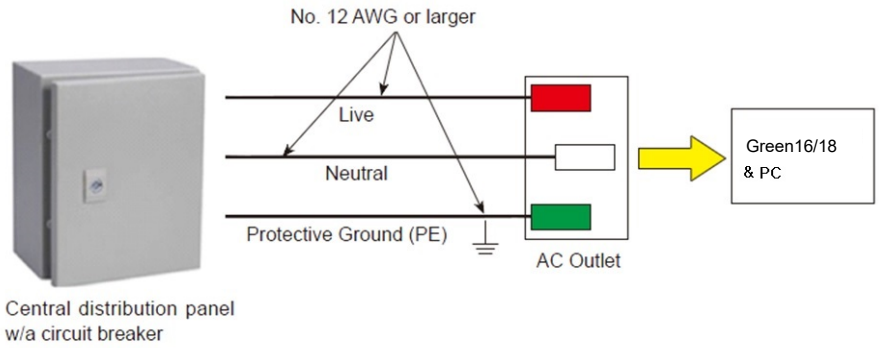
Consult the companion manual for further information: **Volume 3: Specification for Electrical Installation**.

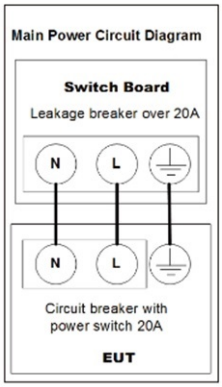
2.3 Electrical Requirement

WARNING	This equipment must be connected to a grounded outlet to fulfill the safety provisions specified in **IEC 60364: the 2nd edition (2006).**
WARNING	Both PC and equipment must use the same power line that is connected to an MPSO. Whenever possible, use different power outlets for each device. If a multiple portable socket outlet (MPSO) must be used, ensure that the PC and equipment are connected to the same MPSO.
WARNING	Use a dedicated power outlet for the power cord. Failure to do so may result in unstable system operations caused by power fluctuations.
NOTICE	It is strongly recommended that you install an AVR. An AVR (automatic voltage regulator) maintains a constant voltage and allows for continuous operation in the event of power fluctuation.

Item	Description
Power Supply Voltage	100 - 240 V ~
Frequency	50 / 60 Hz
Phase	Single
Power rating	2.0 kVA
Accuracy	Tube Voltage (kVp) ± 10 % Tube Current (mA) ± 20 % Exposure Time (s) ± (5 % + 50 ms)

- The input line voltage depends on the local electrical distribution system.
- Allowable input voltage fluctuation requirement: ±10 %.
- Mode of operation: Non-continuous operation (NFPA 70: long time operation) - needs waiting time (at least 60 times the exposure time) before the next
- Column operation time: Max. 2 min. On / 18 min. Off (Ratio 1:9)





NOTICE

- To assure line voltage quality, a separate 3-core grounded power cable connected directly to the central distribution panel with an over-current circuit breaker rated for 20A must be used.
- Maximally allowed deviation of the tube voltage/tube current/exposure time:
  Tube Voltage (kVp) ± 10 % / Tube Current (mA) ± 20 % / Exposure Time (s) ± (5 % + 50 ms) according to IEC 60601-2-63.
- The mains resistance should not exceed 0.045 ohms at 100 V and 0.19 ohm at 240 V.
- This equipment should be connected to the earthed outlet.

2.4 Environmental Specifications

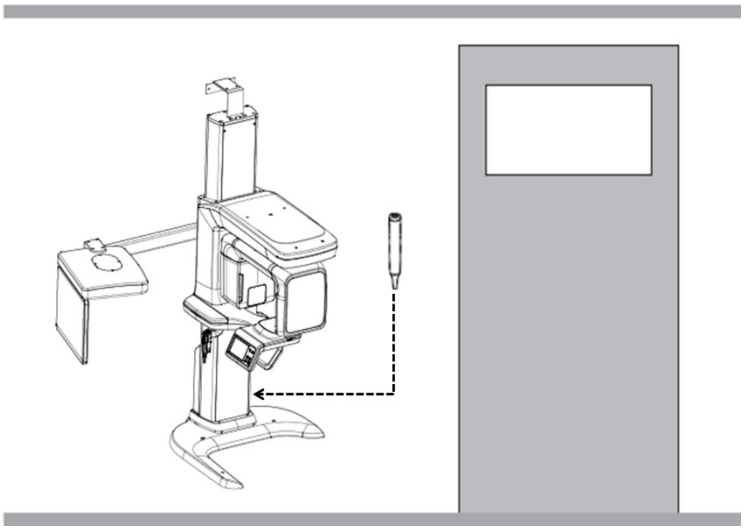
Item		Description
During Operation	Temperature	10 ~ 35 ℃
	Relative humidity	30 ~ 75 %
	Atmospheric pressure	860 ~ 1060 hPa
During Transport and Storage	Temperature	-10 ~ 60 ℃
	Relative humidity	10 ~ 75 % (non-condensing)
	Atmospheric pressure	860 ~ 1060 hPa

2.5 Exposure Switch Installation Options

When installing the exposure switch, you can choose one of three ways depending on your installation site and the user's request. However, the No.2 Option is most preferred to keep the patient and operator from unintended radiation exposure.

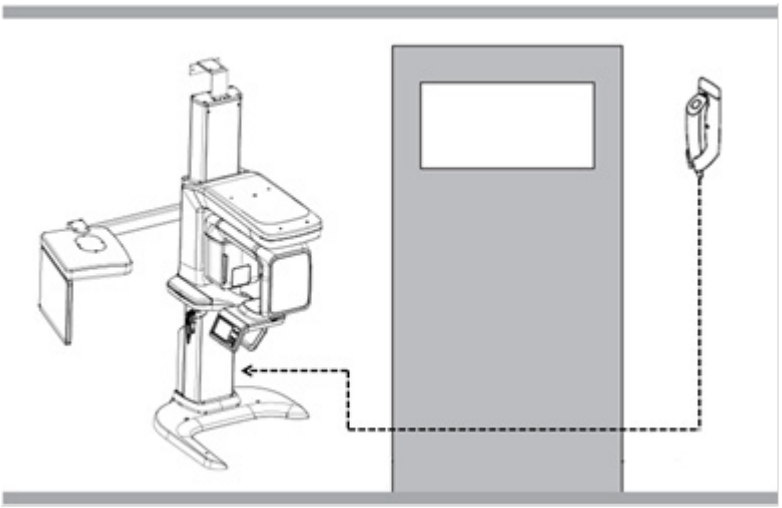
Option No. 1:

The user operates the **Exposure Switch** from inside the X-**r**ay room.



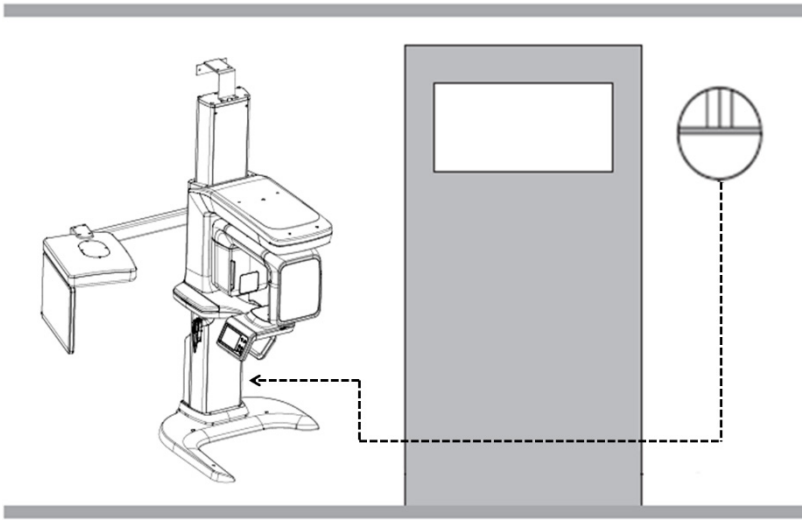
Option No. 2:

The user operates the **Exposure Switch** from outside the X-**r**ay room. The **Exposure Switch** holder is mounted on the wall.



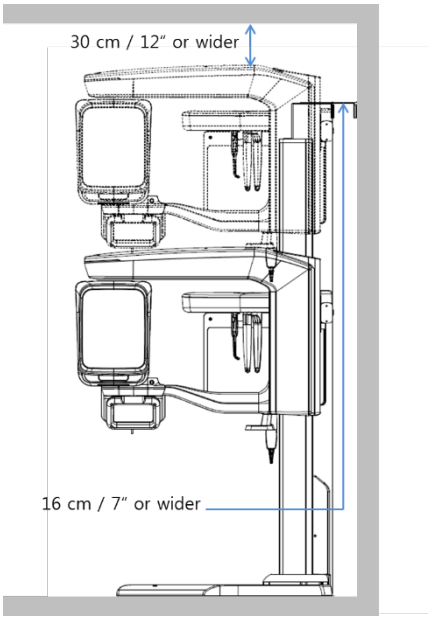
Option No. 3:

The 3rd party **Exposure Switch** (not VATECH's) is used on the demand of the customers. For this scenario, see Appendix D, "Connecting the 3rd party The **Exposure Switch,**" for details.

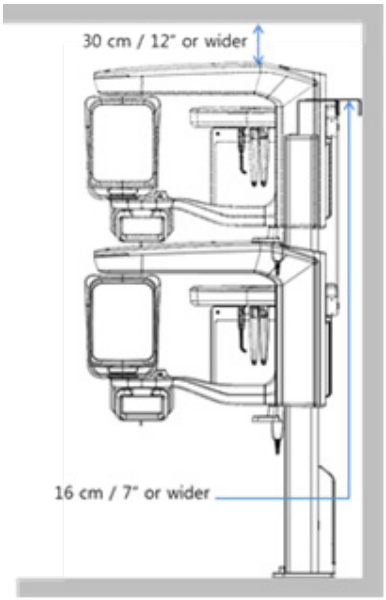


2.6 Installation Versions

Base-stand Type



Wall-mount Type



2.7 Installing the Warning Lamp and Door Interlock Switch

Refer to **Appendix A** for a complete installation guide.

- This system can be equipped with a warning lamp and the Door Interlock Switch, which are activated when the X-ray is energized.
- The warning lamp and Door Interlock Switch are not included with the equipment.
- The warning lamp and the Door Interlock Switch must be installed by a qualified technician.

2.8 Installing the Emergency Stop Switch

Refer to **Appendix B** for a complete installation guide.

- Install the Emergency Stop Switch along the main power cable in the central distribution panel
- Install this switch so that it is within easy reach of the operator but cannot be accidentally pressed.
- The switch must be a fool-proof l.

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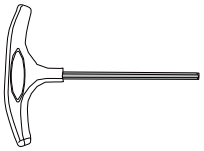
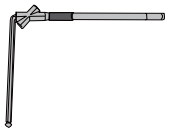
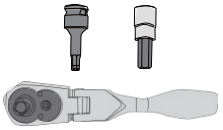
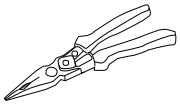
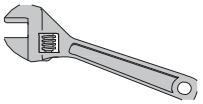
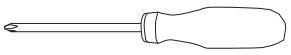
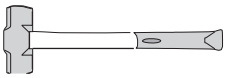
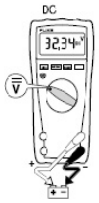
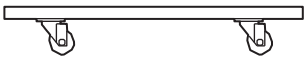
3. Before Installing the System

IMPORTANT	Please read **checklist No.3 through No.6** in **Appendix F** before or during the system installation.

3.1 Required Tools

The following tools are necessary to install the **Green16/18**.

Item	Figure	Size
Wrench Set		1.5 mm -10 mm (0.06” - 0.4”)
T-shaped Hex Wrench		6 mm - 10 mm (0.24” - 0.4”)
Hex Wrench w/ Handle		6 mm - 10 mm (0.24” - 0.4”)
Ratchet Wrench		Tips: 3 mm - 8 mm (0.12” - 0.3”)
Needle-nose Pliers		Regular
Monkey Wrench		n/a
Cross Head Screw Driver w/ Magnetic Tip		L = 200 mm (7.9”)
Spirit Level		n/a

Item	Figure	Size
Anti-Static Glove		n/a
Knife		n/a
Tape Ruler	 : for Wall Mount type	5 m
Marker Pen (thick tip)	 : for Wall Mount type	n/a
Hammer	 for Wall Mount type	n/a
Multimeter		n/a
Hammer Drill	 for Wall Mount type	L = 200 mm (7.9”)
Transport Dolly		n/a

3.2 Checking the ShockWatch and TiltWatch Indicators

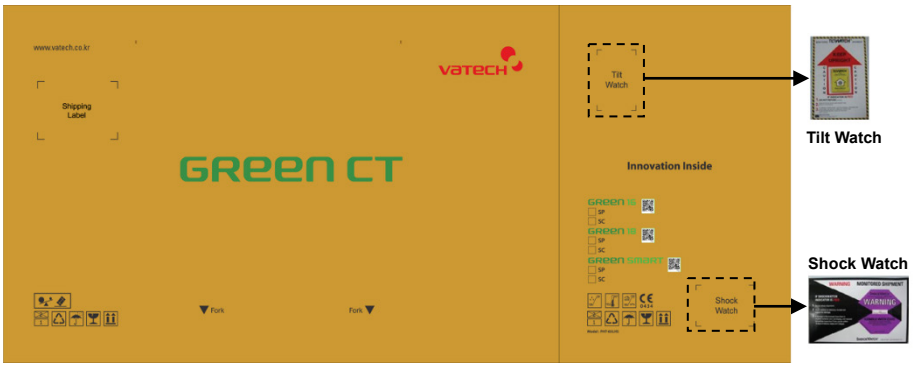
This equipment is carefully inspected and packed before shipment. Nevertheless, the recipient of this equipment should carry out a visual inspection of all packages before opening them to ensure that the equipment was not damaged during shipping.

IMPORTANT	You must check the status indicators on each package before opening the package.
NOTICE	▪ The ShockWatch and TiltWatch indicators become red if the package has suffered any physical impacts during transportation. However, a red indicator does not necessarily mean that the unit has been damaged. ▪ These indicators are affixed only on the main box, which contains the equipment overly sensitive to external impacts.

Check the following before opening each package:

1. These indicators are affixed only on the main box, which contains the equipment overly sensitive to external impacts.
2. Check the packaging for signs of damage visually.
3. Locate the ShockWatch and TiltWatch indicators and check if they have been activated.

If either the packaging is damaged or the ShockWatch or TiltWatch indicators have been activated, please do not open the package and immediately contact the shipping company, agent, or **VATECH**.



Green16/18 (Model: PHT-65LHS) is an advanced 4 in 1 digital X-ray imaging system that incorporates PANO, CEPH (Optional), CBCT, 3D MODEL Scan imaging capabilities into a single system.

Green16/18 (Model: PHT-65LHS), a digital radiographic imaging system, acquires and processes multi FOV diagnostic images for dentists. Specifically designed for dental radiography, **Green16/18** is a complete digital X-ray system equipped with imaging viewers, an X-ray generator, and a dedicated SSXI detector.

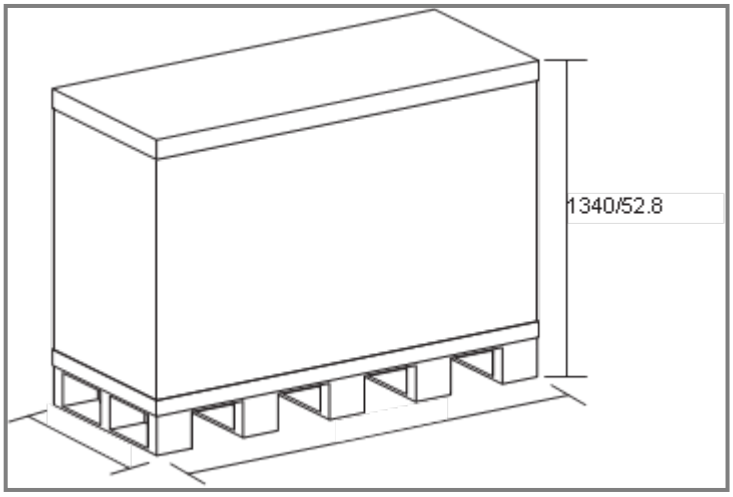
The digital CBCT system is based on a CMOS digital X-ray detector. The CMOS CT detector is used to capture 3D radiographic images of the head, neck, oral surgery, implant, and orthodontic treatment. **Green16/18** can also acquire 2D diagnostic image data in panoramic and cephalometric mode.

3.3 Unpacking Boxes

IMPORTANT	▪ All packaging and Styrofoam used to ship this equipment are recyclable. ▪ Return the packaging to **VATECH** representatives or dispose of it in compliance with the legal regulations of your country.

3.3.1 Box No. 1 - Main Box

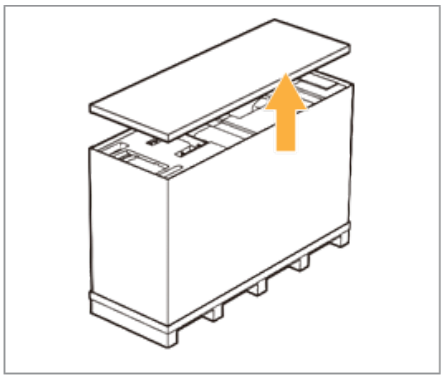
Component	Size (mm / inch)	Weight (kg / lbs.)
▪ Column and Rotating Unit Assembly ▪ Accessories and Parts ▪ PC System (Optional) ▪ Monitor (Optional)	2100 (L) x 750 (W) x 1340 (H) / 82.7" (L) x 29.5" (W) x 52.8" (H)	274 / 604



<Main Box>

Removing the Cover

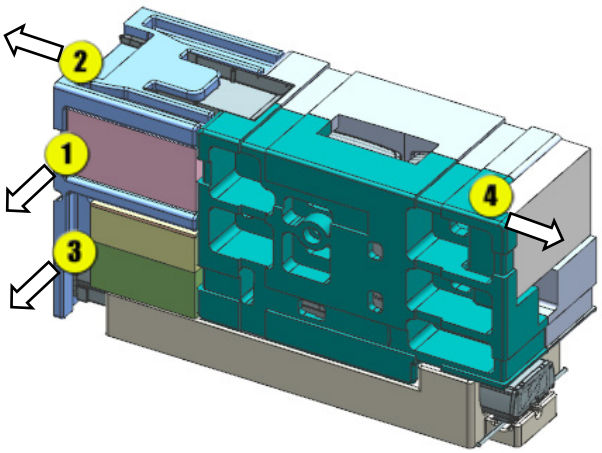
1. Move the main box to a convenient place as close as possible to the installation location.
2. Separate the top cover after removing the strapping bands.



3. Lift a small distance remove the side covers.
4. Remove the plastic wrap covering the box by using a cutter.

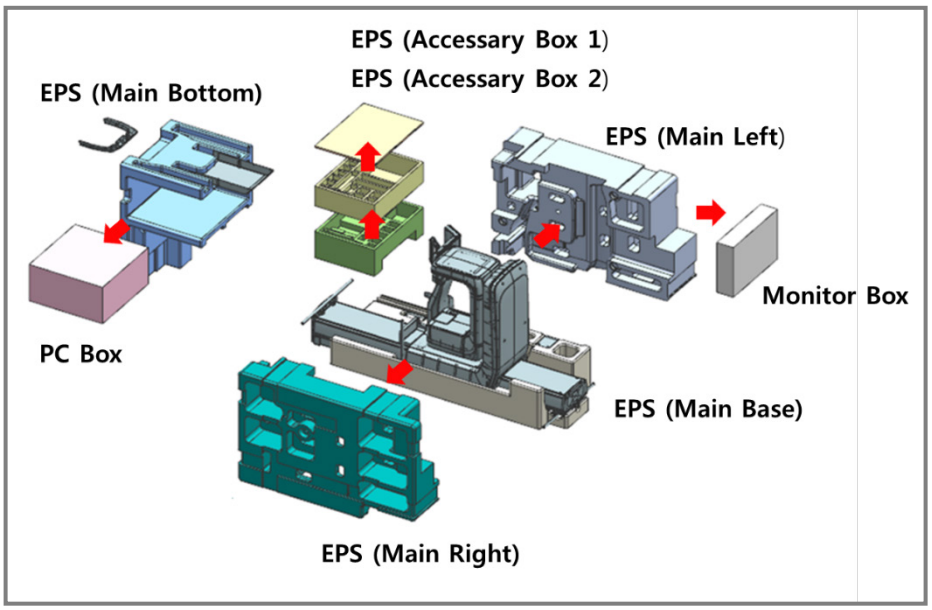
⚠ CAUTION	When you are removing the side cover, another person must hold the box to prevent the parts from falling.

5. Remove the component boxes and packingmaterials in the sequence, as shown in the figure.

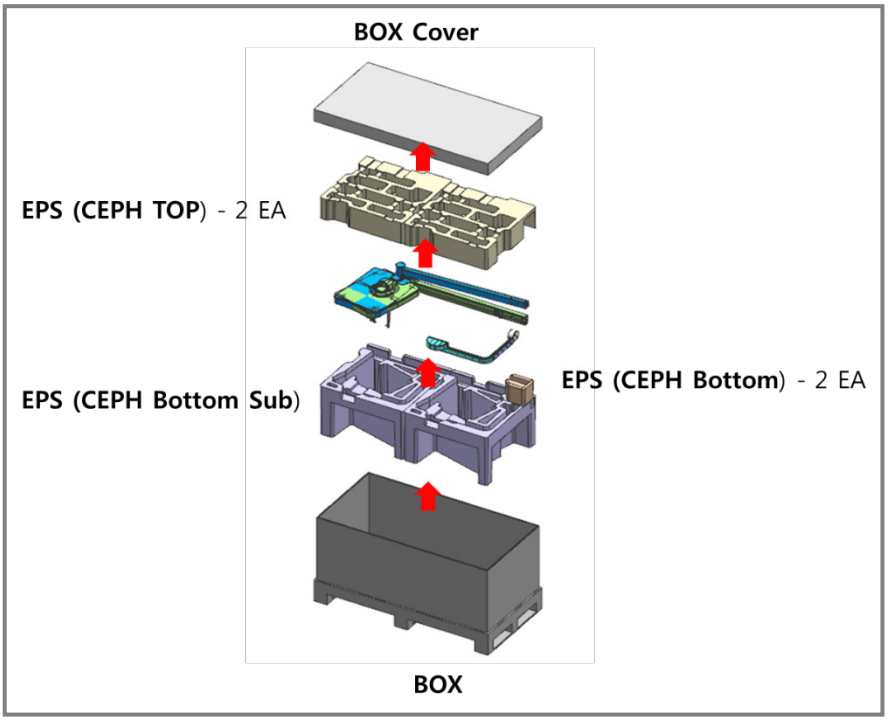


① PC Box
② Main Bottom EPS
③ Accessory Box #1, #2
④ Monitor Box

- **PANO Box Configuration**

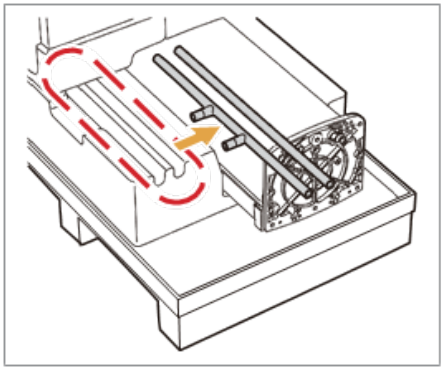


- **CEPH Box Configuration**



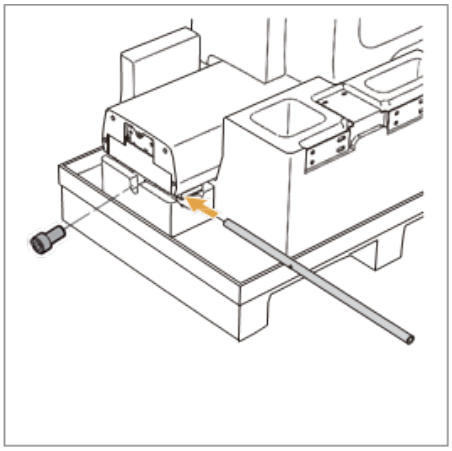
Transportation

1. Pull out the upper and lower carrying handles from **EPS (Main Base)**.



2. Assemble the upper carrying handle by using one wrench bolt.

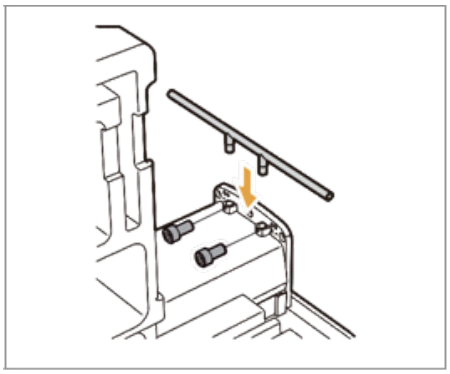
Wrench Bolt	M8 x 25 (2 Items) - 1 pc	
Allen Wrench	6 mm / 0.24”	



NOTICE	The Wrench Bolt is attached to the upper carrying handle. Remove the bolt from the handle first.

3. Assemble the lower carrying handle by using two Wrench Bolts.

Wrench Bolt	M8 x 30 - 2 pcs	
Allen Wrench	6 mm / 0.24”	

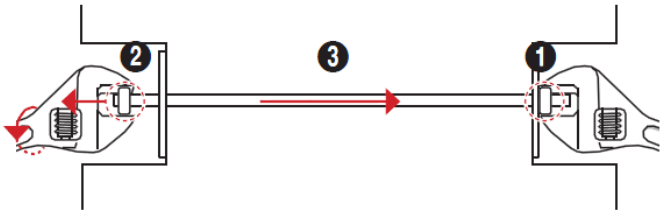


NOTICE	The Wrench Bolt is attached to the Column unit. Remove the bolts from the column first.

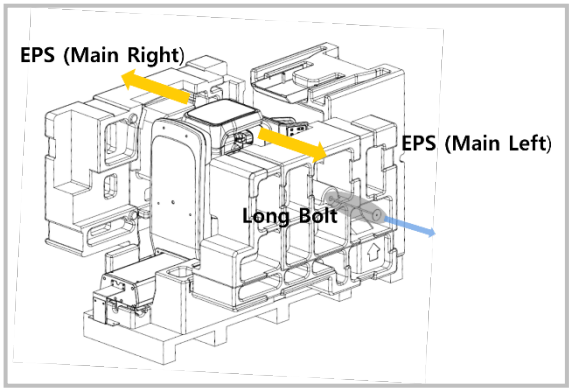
4. Remove the **EPS (Main Right)** and **EPS (Main Left)** as follows:

① Remove the fixing tapes on the EPS by using a cutter.

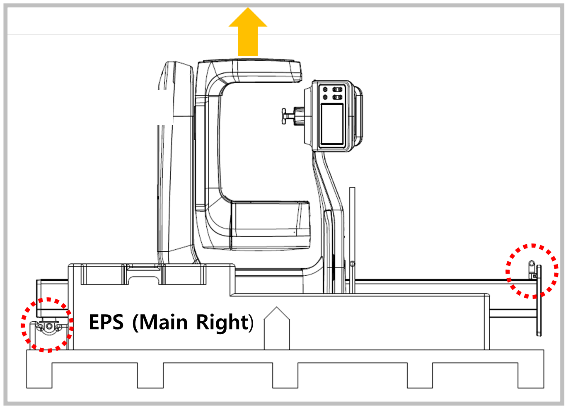
② Remove the **Long Bolt** and nuts by using two monkey wrenches.



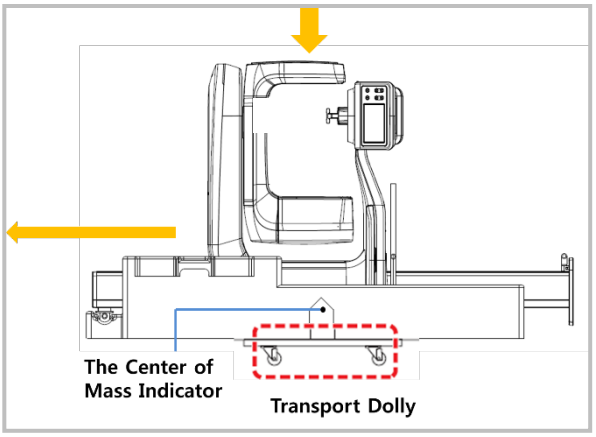
③ Remove the **EPS (Main Right)** and **EPS (Main Left)**.



5. Pull out the **Main Unit** with the **EPS (Main Base)**.from the pallet.

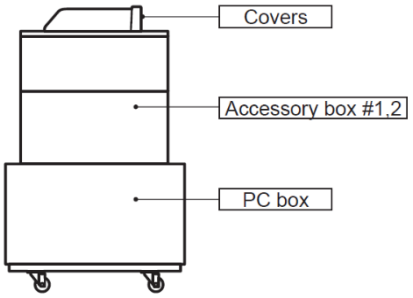


6. Put the **Main Unit** with the **EPS (Main Base)** on a Transport Dolly and move it to the installation site.



IMPORTANT

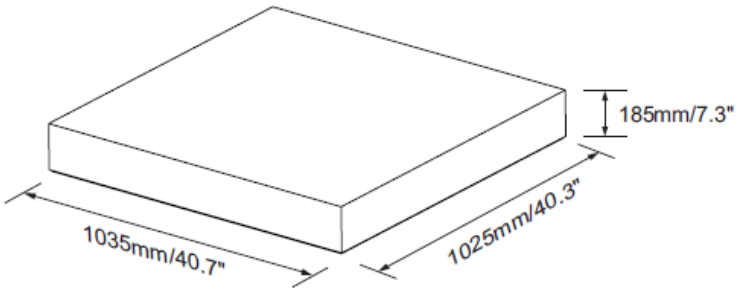
- When putting the Main Unit on the dolly, make sure that the center of the mass indicator is aligned with the center of the dolly.
- If you move the unit manually, make sure that the persons holding the upper handle take the lead.



<Transportation Example>

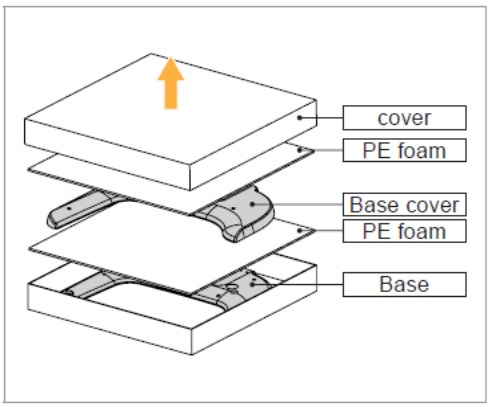
3.3.2 Box No. 2 - Base Unit

Component	Size (mm / inch)	Weight (kg / lbs.)
Base	1035(L) x 1025(W) x 185(H) / 40.7"(L) x 40.3"(W) x 7.3"(H)	65 / 143



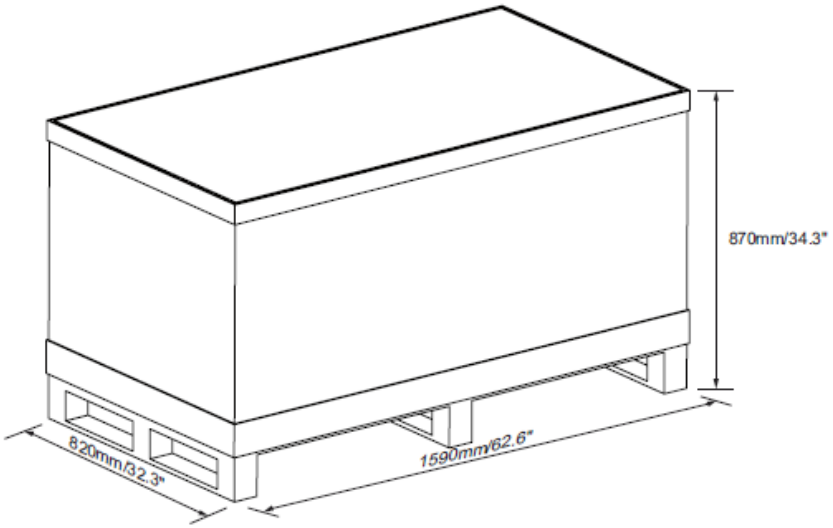
Removing the cover

Open the box cover and remove the packing material, as shown in the figure.



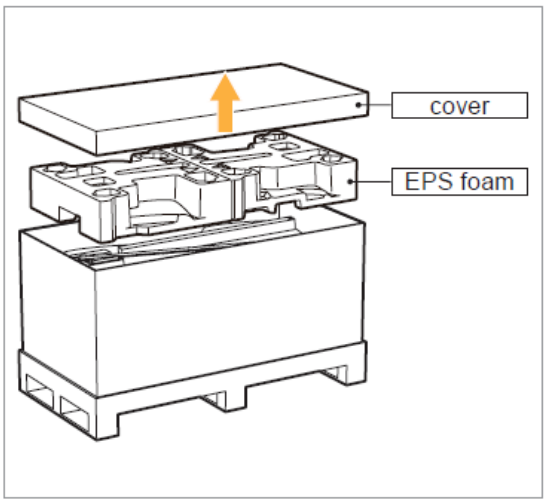
3.3.3 Box No. 3 – CEPH Unit (Optional)

Component	Size (mm / inch)	Weight (kg / lbs.)
CEPH unit	1590(L) x 820(W) x 870(H) / 62.6"(L) x 32.3"(W) x 34.3"(H)	50 / 110



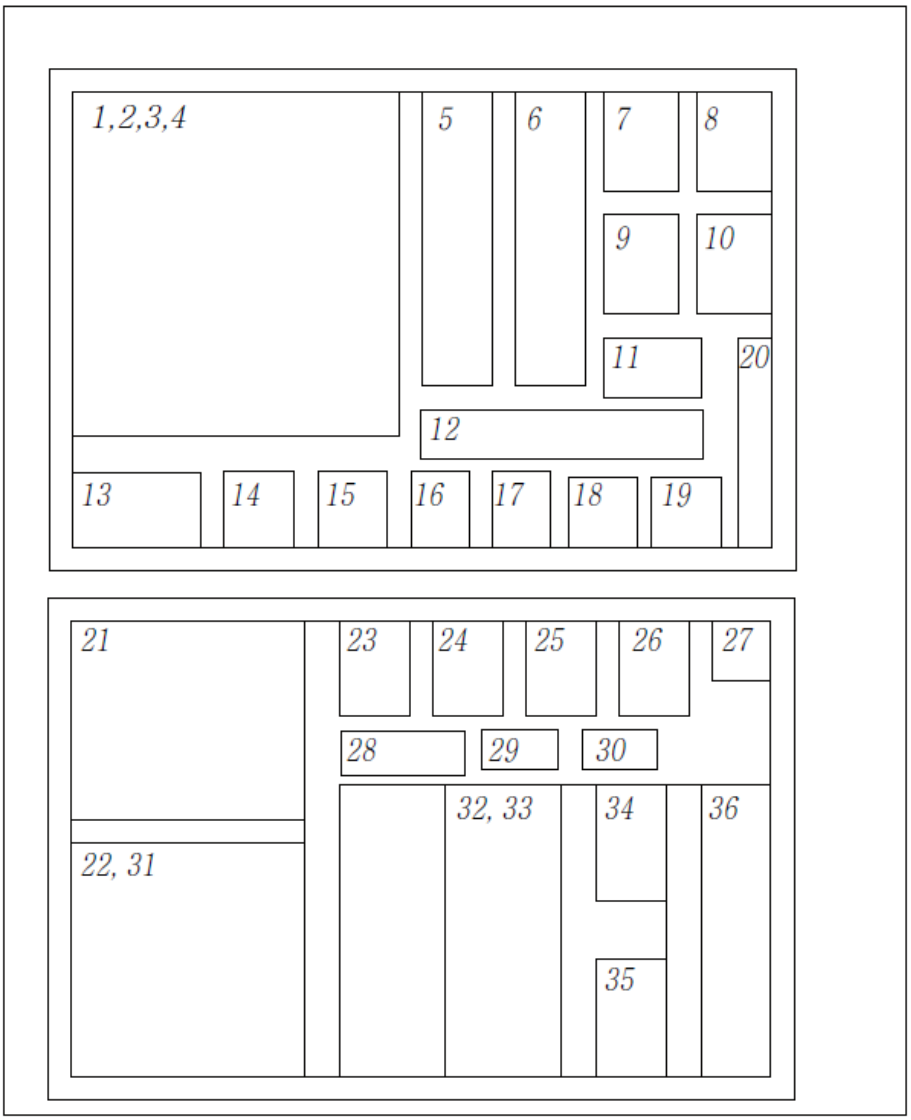
Removing the cover

1. Open the box cover and remove the packing material, as shown in the figure.



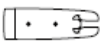
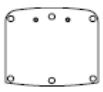
3.4 Checking the Parts

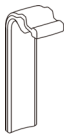
3.4.1 Location Layout of the Parts and Accessories



3.4.2 Parts List

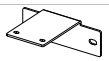
In the Accessory Box 1 & 2

Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
1	Manuals	User Manual		1		Yes □ No □
		Installation Manual		1		Yes □ No □
		2D Viewer Manual (For EzDent)		1		Yes □ No □
		3D Viewer Manual (For Ez3D-i		1		Yes □ No □
	Installation USB			1		Yes □ No □
	3D Viewer License Key	For Ez3D-i		1		Yes □ No □
2	Exposure Switch			1		Yes □ No □
	Exposure Switch Holder			1		Yes □ No □
	Double-Sided Sticker			1		Yes □ No □
	Screws	M3 x 16		2		Yes □ No □
3	Carpus Plate			1	CEPH Option	Yes □ No □
	Handrest Sticker			1		Yes □ No □
4	Alignment Plate			1	Floor Mount Option	Yes □ No □
5	Temple Supports	Right & Left		1 set		Yes □ No □

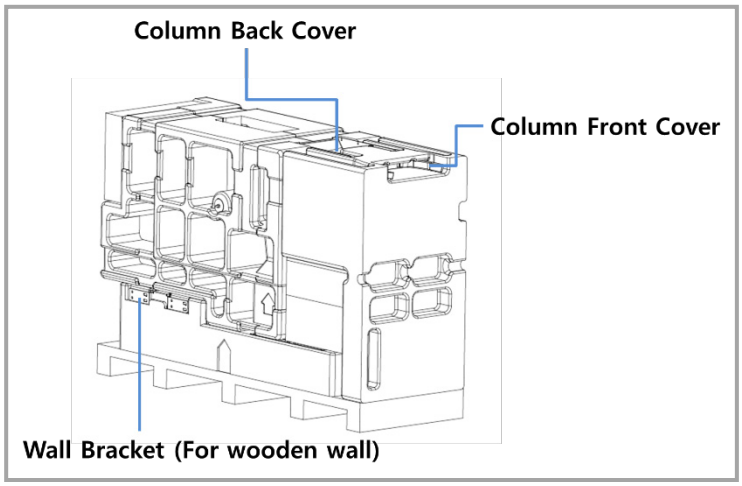
Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
6	Anti-Static Gloves			1 pair		Yes □ No □
7	Chinrest	Special		1		Yes □ No □
8	Bite / Block	Normal		1		Yes □ No □
		Deep*		1	*. Deep Bite Block is only available in some Asian countries.	Yes □ No □
		Special A		1		Yes □ No □
		Special B		1		Yes □ No □
9	Chinrest	Normal		1		Yes □ No □
10	Left Blank Intentionally					
11	Sanitary Vinyl Cover	For Normal Bite		1		Yes □ No □
12	Left Blank Intentionally					
13	Left Blank Intentionally					
14	Cap	For Ear Rods		2	CEPH Option (2: on the equipment)	Yes □ No □
	Silicon Cover	For Nasal Positioner		1	CEPH Option: extra	Yes □ No □
15	Left Blank Intentionally					
16	Silicon Cap	White		8		Yes □ No □
17	Base Cap	Small		3	Base Option	Yes □ No □

Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
18	Left Blank Intentionally					
19	Left Blank Intentionally					
20	Cable Tie			10		Yes □ No □
21	Frame Grabber System	Optic Cable		1	One additional fiber optic cable is required when SC type is installed	Yes □ No □
		LAN Cable		1		Yes □ No □
		IFC Card (or) FTG Card (or) VTG Card		1		Yes □ No □
	MODEL Scan Jig			1	For the 3D MODEL Scan model	Yes □ No □
22	Column Bracket			1		Yes □ No □
23	Wrench Bolt	M10 x 25 w/ Spring and Flat Washers		6	Base Option	Yes □ No □
24	Wrench Bolt	M8 x 45		2	Base Option	Yes □ No □
25	Wrench Bolt	M8 x 20		4		Yes □ No □
	Spring Washer			4		Yes □ No □
	C_E_Washer			4		Yes □ No □

Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
26	Truss Bolt	M5 x 8		3	Base Option	Yes □ No □
27	Truss Bolt	M4 x 8		10		Yes □ No □
28	Flat Head Screw	M3 x 6		2	CEPH Option	Yes □ No □
	CEPH Arm Cover 4			1		Yes □ No □
29	Flat Head Screw	M5 x 12		4		Yes □ No □
30	Set Screw	M10 x 20		4		Yes □ No □
31	Protractor			1		Yes □ No □
	Wall Plate			1		Yes □ No □
	Terminal Block 3 Pole			1		Yes □ No □
32	Middle Bracket			1	Optional	Yes □ No □
	Wrench Bolt	M8 x 25 w/ Spring and Flat Washers		2		Yes □ No □
	Nut	M8		2		Yes □ No □
33	UP / DOWN Switch			1	Optional	Yes □ No □
	UP / DOWN Switch Holder			1		Yes □ No □
	Double-Sided Sticker			1		Yes □ No □
	Truss Bolt	M4 x 10		2		Yes □ No □
34	Wood Screw	M8 x 60		8	For Wood	Yes □ No □
	Spring Washer			4		

Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
	Flat Washer			4		
	Wood Screw	M12 x 70		2	For Wood	Yes □ No □
	Anchor Bolt	5/16 x 60 w/ Spring and Flat Washers		10	For Concrete	Yes □ No □
35	Wrench Bolt	M8 x 25 w/ Spring and Flat Washers		2		Yes □ No □
	Nut	M8		2		Yes □ No □
36	Wall Bracket Rear			1		Yes □ No □

Another location



Items	Specification	Figure	QTY	Comments	Location	Confirmed (OK?)
Base Front Cover	n/a		1	n/a	On the upper side of the EPS (Main Bottom)	Yes □ No □
Column Back Cover	n/a		1	n/a	On the upper side of the EPS (Main Bottom)	Yes □ No □
Wall Bracket (For Wood Wall)	16 inch		1	For the USA only	Under the bottom side of the EPS (Main Left)	Yes □ No □

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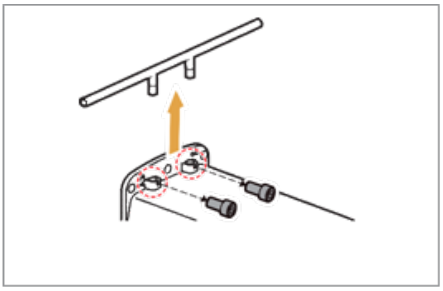
4. Installing the Equipment: Base Stand (Optional)

4.1 Assembling the Base and Main Units

NOTICE	If the installation site is a concrete floor, go to section **4.4 Fixing the base (Optional)** and do number **1** first; after that, turn back **4.1 Assembling the Base and Main Units**.

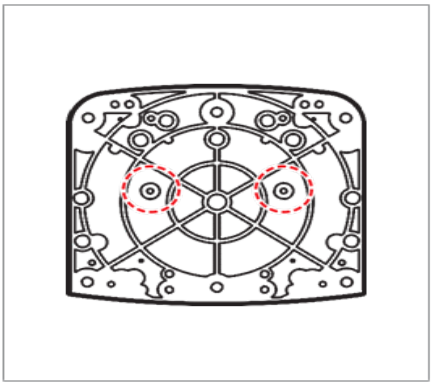
1. Remove the lower carrying handle.

Allen Wrench	6 mm / 0.24”	



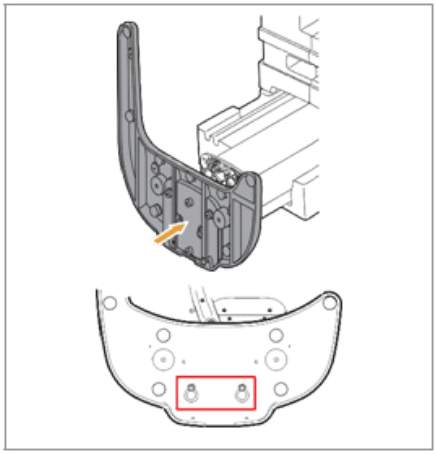
2. Put two wrench bolts into the holes on the bottom of the column unit.

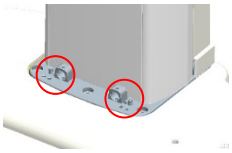
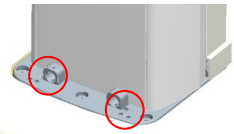
Allen Wrench	6 mm / 0.24”	
Wrench Bolt	M8 x 45 - 2 pcs (Part No. 24)	



IMPORTANT	Put the bolts into the holes until about 30 mm are left outside. 

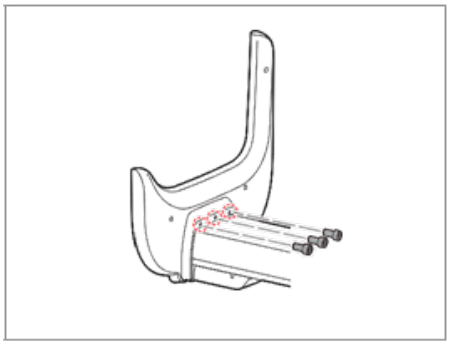
3. Put the base unit to the column unit by engaging the base holes in the bolts, as shown in the figure.



CAUTION	Hold the base unit to keep it from falling.
NOTICE	If you do not use the base during the assembly, remove 2 pcs of Truss bolts while installing the front cover as below.  

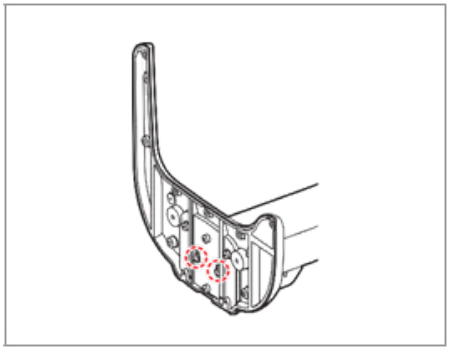
4. Put the base unit to the column unit by engaging the base holes in the bolts, as shown in the figure.

Allen Wrench	8 mm / 0.31”	
Wrench Bolt	M10 x 25 - 3 pcs (Part No. 23)	

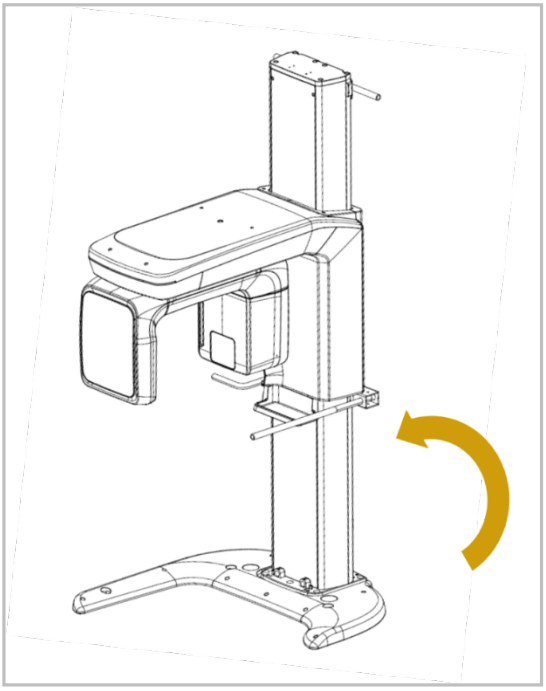


5. Tighten the two wrench bolts.

Allen Wrench	6 mm / 0.24”	



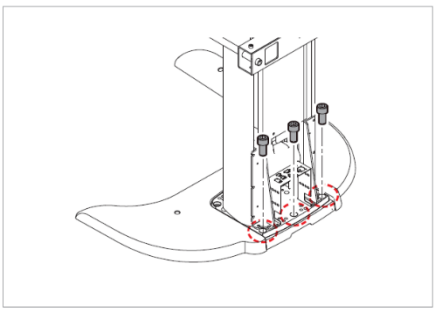
6. Put the equipment in a vertical position slowly while holding the upper handle.



CAUTION	Be sure not to damage the cables. Before erecting the equipment, keep them clear of the equipment.

7. Tighten the three wrench bolts to attach the base unit.

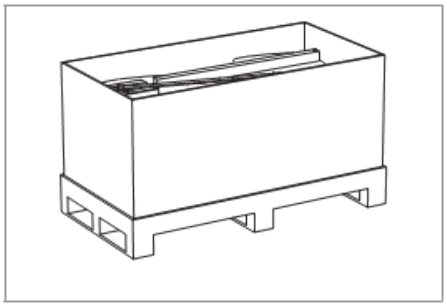
Allen Wrench	8 mm / 0.31”	
Wrench Bolt	M10 x 25 - 3 pcs (Part No. 23)	



4.2 Installing the CEPH Unit (Optional)

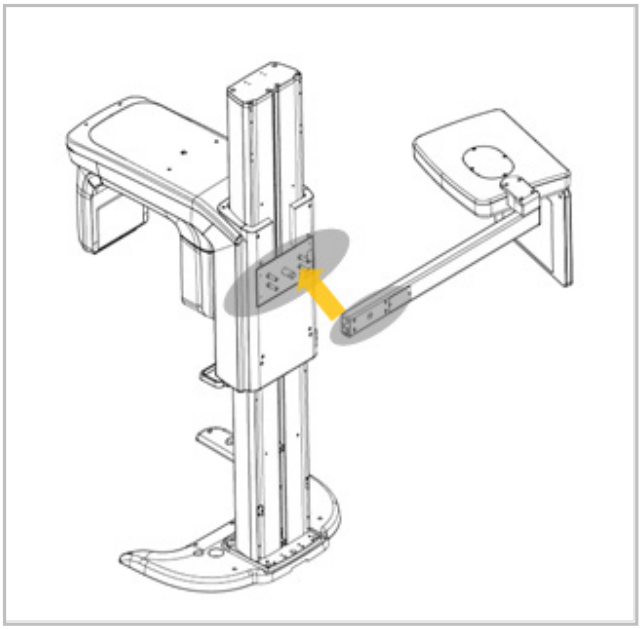
⚠WARNING	Never hold the areas of the collimator, sensor, and tube head.

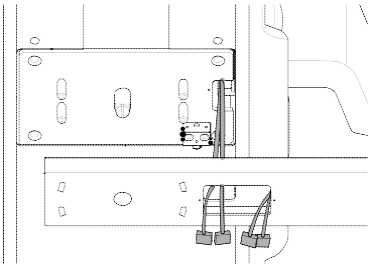
1. Now it is assumed that the CEPH box has already been opened.



2. Remove the plastic wrap covering the column unit and the tape for fixing the CEPH cables by using a cutter.

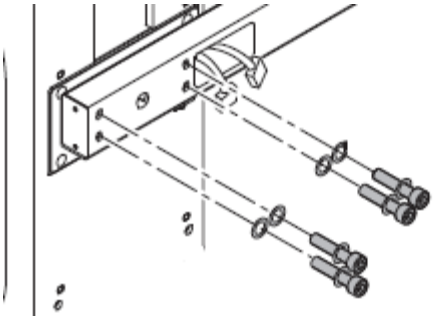
3. Move and mount the CEPH unit on the Main Unit carefully while observing the insertion state of 4 studs.



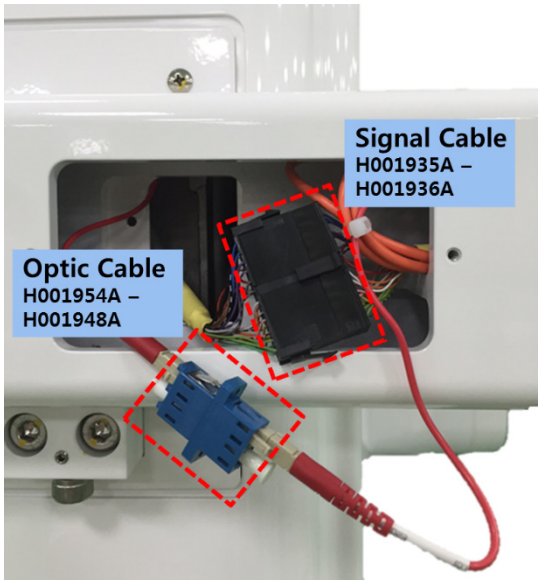
IMPORTANT	Make sure the CEPH cables from the equipment go through the CEPH armhole. 

4. Tighten the three wrench bolts to attach the base unit.

Allen Wrench	6 mm / 0.24”	
Wrench Bolt	M8 x 20 - 3 pcs (Part No. 25)	
Flat Washer	(Part No. 34)	

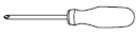
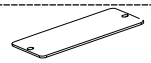


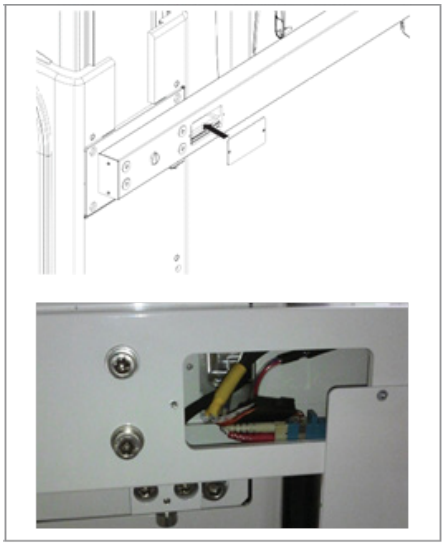
5. Connect the cables as shown in the figure.



⚠ CAUTION	When handling fiber optic cable, - Do not bend, pull, and/or crush it. - Ensure that the caps of the fiber optic cable be removed - Do not touch the tip of the fiber optic cable to prevent it from being dirty. - Insert the fiber optic cable fully until the click sound is heard.

6. Put the cables inside the CEPH Arm and assemble the CEPH arm cover by using two flat head screws.

Cross Head Screwdriver w/ Magnetic Tip	6 mm / 0.24”	
Flat Head Screw	M3 x 6 - 2 pcs (Part No. 28)	
CEPH Arm Cover 4	(Part No. 28)	



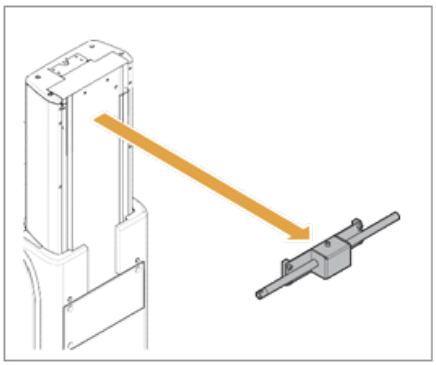
4.3 Installing the Wall and Column Brackets

4.3.1 Assembling the Column Bracket

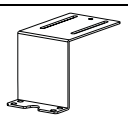
1. Move the equipment to the installation site near the wall.
2. Remove the lower carrying handle.

Allen Wrench	6 mm / 0.24”	

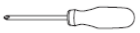
CAUTION	When you are removing the bolts on the lower carrying handle, another person must be holding the handle to prevent it from falling. The fall of the handle can cause injury or property damage.

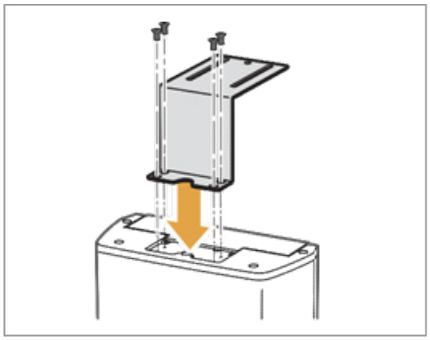


3. Remove the plastic wrap covering the column unit by using a cutter.
4. Prepare the column bracket.

Column Bracket	(Part. No. 22)	

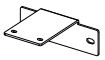
5. Assemble the column bracket to the top of the column with four flat head screws.

Cross Head Screwdriver w/ Magnetic Tip	6 mm / 0.24”	
Flat Head Screw	M5 x 12 - 4 pcs (Part No. 29)	

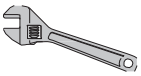


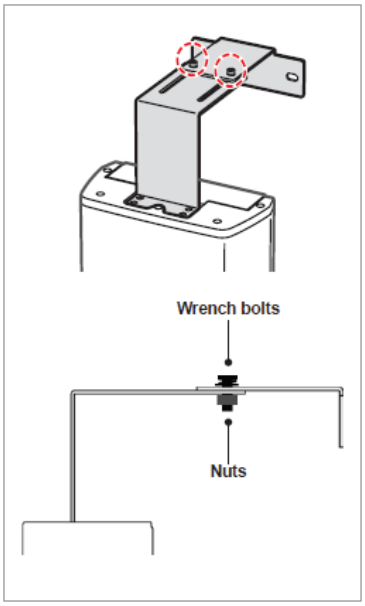
4.3.2 Combining Column and Wall Brackets

1. Prepare the wall bracket.

Wall Bracket	(Part No. 36)	
Wall Bracket (for Wood Wall)	Optional (Part No. 37)	

2. Combine the column and wall brackets in the following manner with the 2 wrench bolts.

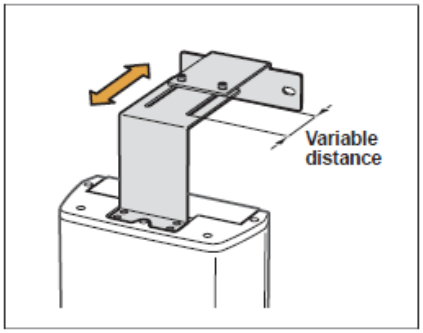
Allen Wrench	6 mm / 0.24”	
Wrench Bolt	M8 x 25 w/ Spring and Flat Washers (Part No. 35)	
Monkey Wrench	n/a	
Nut	M8 - 2 pcs (Part. No. 35)	



⚠ CAUTION	Do not tighten the bolts fully yet.

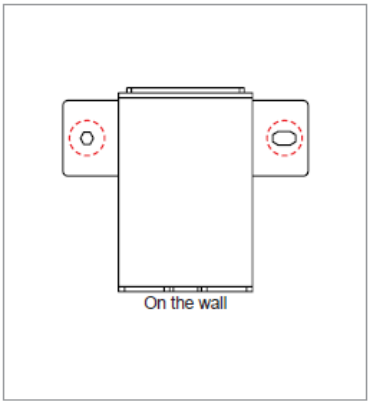
4.3.3 Marking Points on the Wall

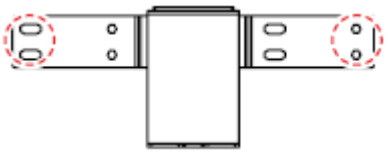
1. Move the equipment to the installation site as close as possible.
2. Adjust the distance between the wall and equipment by moving it slightly, so that the wall bracket touches the wall.



3. Mark the anchor bolt locations on the wall.

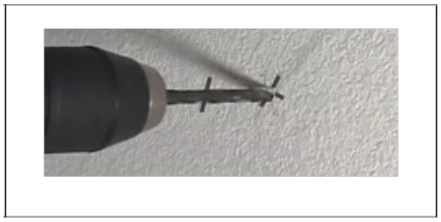
Marker	n/a	



NOTICE	For the wood wall with 16-inch studs, mark the wood screw locations as shown in the figure. 

4.3.4 Drilling holes on the Wall

1. Drill the wall holes of size 10.5 mm x 30 mm (depth) using the concrete hammer drill.



2. Remove the debris and clean the holes using the dust pump.
3. Using the hammer, insert a Ficher strong anchor into the hole.

Ficher strong anchor	M8 x 30	
Hammer	N/A	

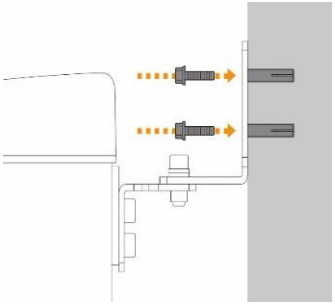
4. Using the hammer, insert an EHS tool into the inner bolt.

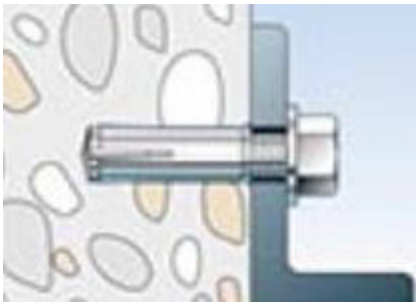
EHS tool	EAW H 8 x 30	
Hammer	N/A	

4.3.5 Combining the Equipment with the Anchor Bolts

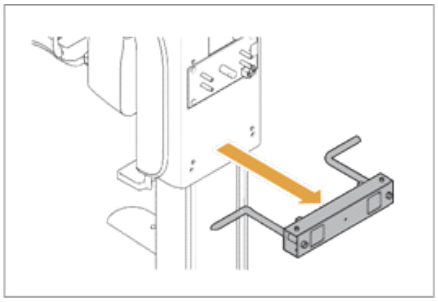
1. Place the equipment on the alignment plate while observing 4 Hex bolts are being inserted properly through each hole.

Hex Bolt	M8 x 15	
Spring washer	M8	
Flat washer	M8	
Torque wrench	Spanner type	



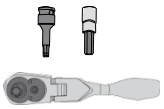


2. Remove the middle carrying handle.

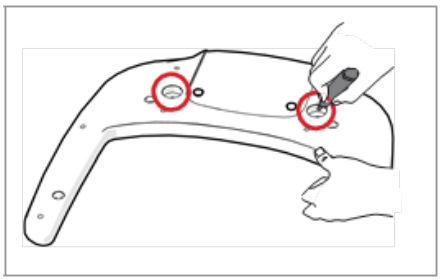


4.4 Fixing the Base (Optional)

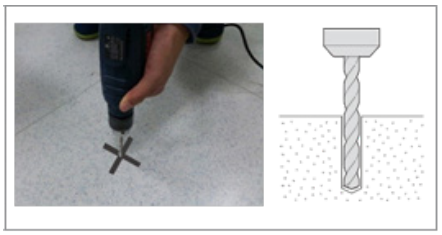
4.4.1 On the Concrete Floor

Anchor Bolt	5/16 x 60 w/ Spring and Flat Washers 2 pcs (Part No. 34)	
Hammer Drill	L = 200 mm (7.9”)	
Hammer	n/a	
Ratchet Wrench	Tips: 3 mm – 8 mm (0.12” – 0.3”)	

1. Before installing the equipment, but the base unit on the installation site and mark 2 locations on the floor

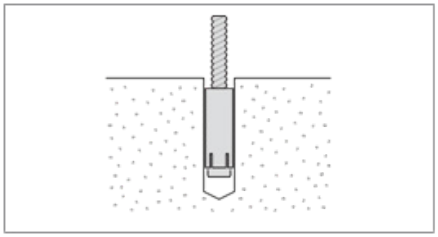


2. Drill the floor holes of size 12 mm x 30 mm (depth) using the concrete hammer drill.

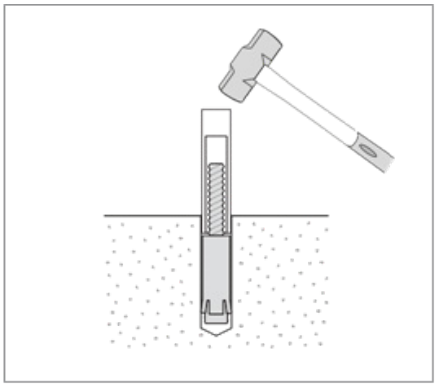


3. Remove the debris and clean the holes using the dust pump.

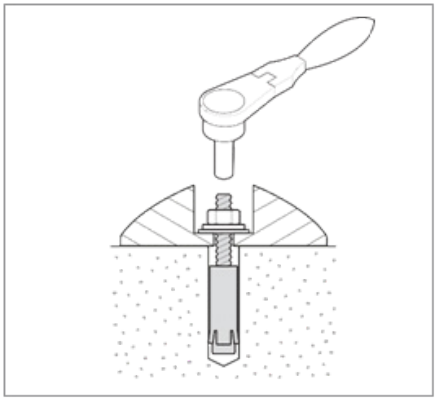
4. Remove nuts and washers put the anchor bolts into the holes.



5. Secure the anchor bolts with the hammer.



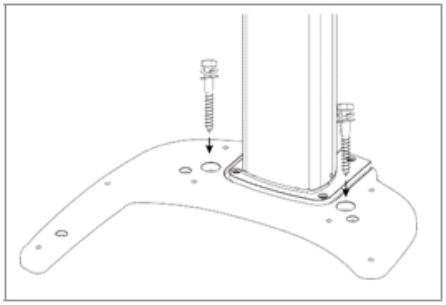
6. Place the base unit combined equipment in the proper position lock the nuts and washers using a ratchet wrench.



4.4.2 On the Wooden Floor

Wood Screws	M12 x 70 – 2 pcs (Part No. 34)	
Hammer Drill	L = 200 mm (7.9”)	

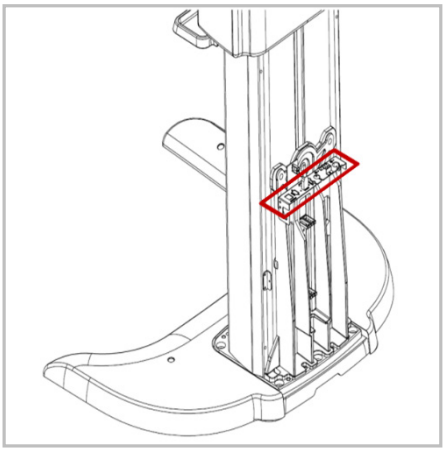
1. Prepare two wood screws and insert them into each hole on the base.
2. Use a hammer drill to tighten the screws to secure the base.

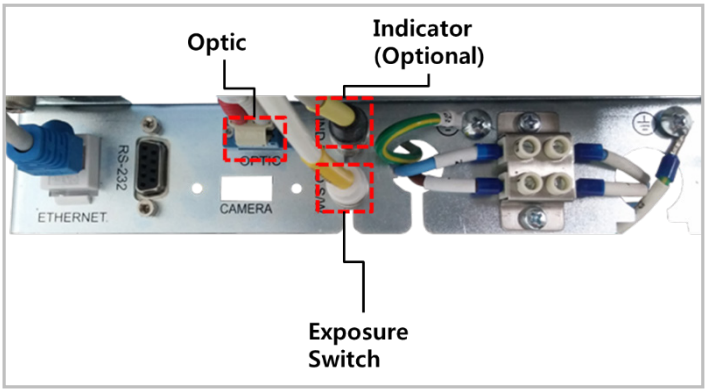


4.5 Connecting the Cables to the Equipment.

1. Connect the cables in the back of the column as shown in the figure.

Optic Cable	Cable No. H000014A (Part No. 21)	
Cable Tie	(Part No. 20)	
Exposure Switch	(Part No. 2)	

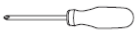


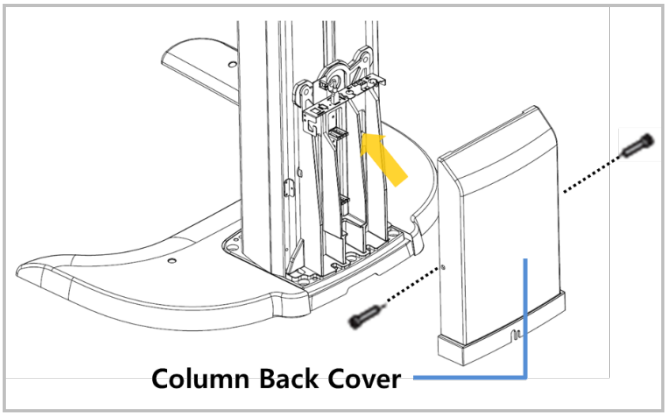


NOTICE

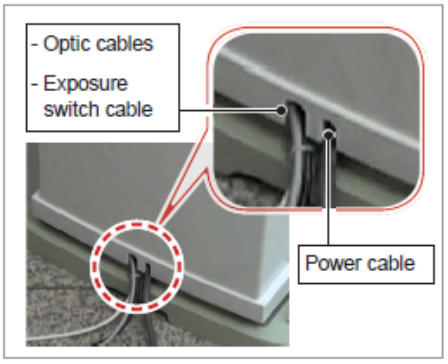
Use the Cable Tie (Part No. 20) to fix the cables, as shown below, after the connection is completed.

2. Assemble the Column Back Cover with four truss bolts.

Truss Bolt	M4 x 8 – 2 pcs (Part No. 27)	
Cross Head Screwdriver w/ Magnetic Tip	6 mm / 0.24”	



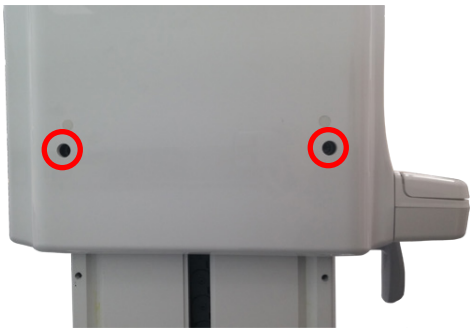
3. Ensure the cables go through the Column Back Cover holes as shown in the figure.



4.6 Removing the Transportation Safety Bolts

1. Remove the two-column fixing bolts, including the tags.

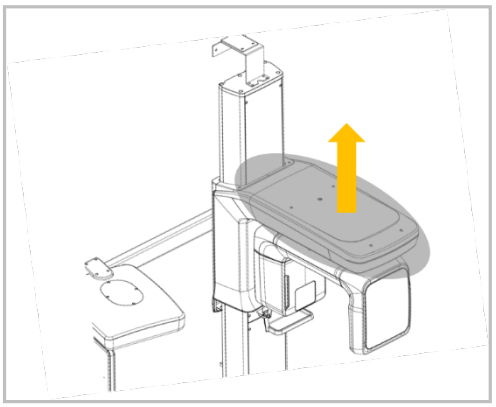
Allen Wrench	6 mm / 0.24”	



2. Remove the semi-clear tape on both sides.

CAUTION	Be careful not to scratch the cover.

3. Remove the Vertical Frame Cover.



4. Remove four Safety Bolts and one Safety Bracket, including the tags.

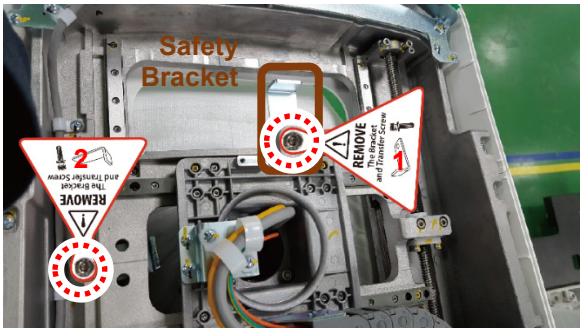
Allen Wrench	6 mm / 0.24”	

CAUTION

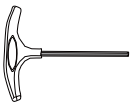
Be sure not to damage the cables when removing the bolts.

IMPORTANT

The Safety Bracket is removable only after the Safety Bolt upon it is removed.



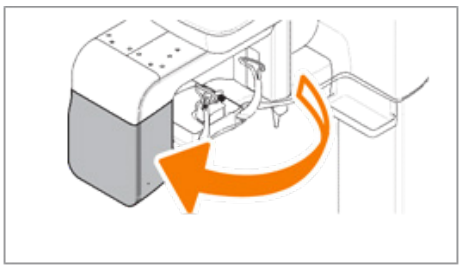
4.7 Leveling the Equipment

T-shaped Hex Wench	8 mm / 0.3”	
Sprit Level	n/a	

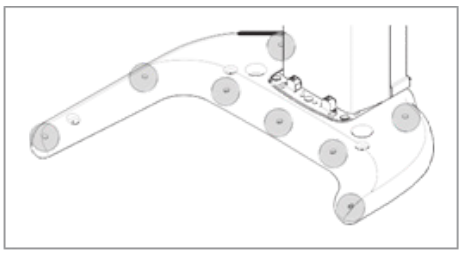
4.7.1 Getting Started

To prepare the equipment for the leveling procedure, follow the steps below:

1. Prepare the Spirit Level.
2. Turn the Rotating Unit clockwise so that the X-ray tube head faces the front, as shown in the figure.



3. Turn all eight screws on the base plate unit clockwise until they touch the ground.

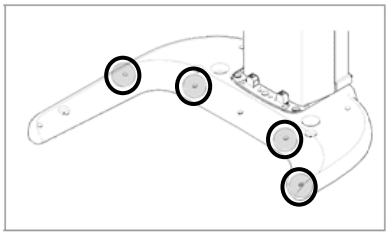


4.7.2 Leveling Right and Left

IMPORTANT	Place the spirit level as indicated in the images below to obtain an accurate center of the equipment.

1. Place the Spirit Level, as shown in the image below.

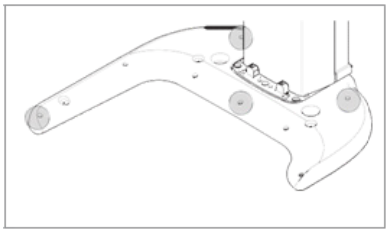
2. Turns each of the four screws on the base left and right until the bubble in the spirit level comes to the middle. The location of each screw is circled in the image below.



4.7.3 Leveling the Front and Back

1. Place the Spirit Level on the Vertical Frame, as shown in the following figure.

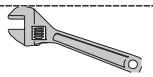
2. Adjust the screws until the bubble of Spirit Level centers (level) by turning the front and/or back screws clockwise or vice versa.

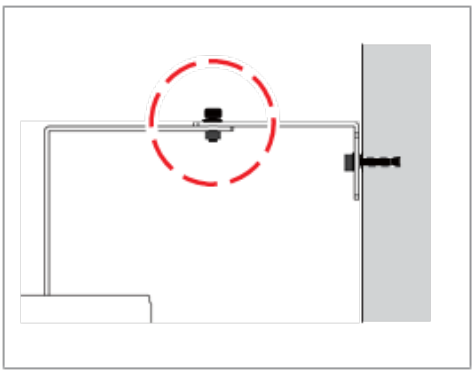


3. When the leveling is completed, make sure that all eight set screws touch the floor by turning them clockwise if necessary.

4.8 Tightening the Bolts

When leveling the equipment is completed, use a monkey wrench and Allen wrench to tighten the bolt on the joint bracket.

Allen Wrench	6 mm / 0.24”	
Monkey Wrench	n/a	

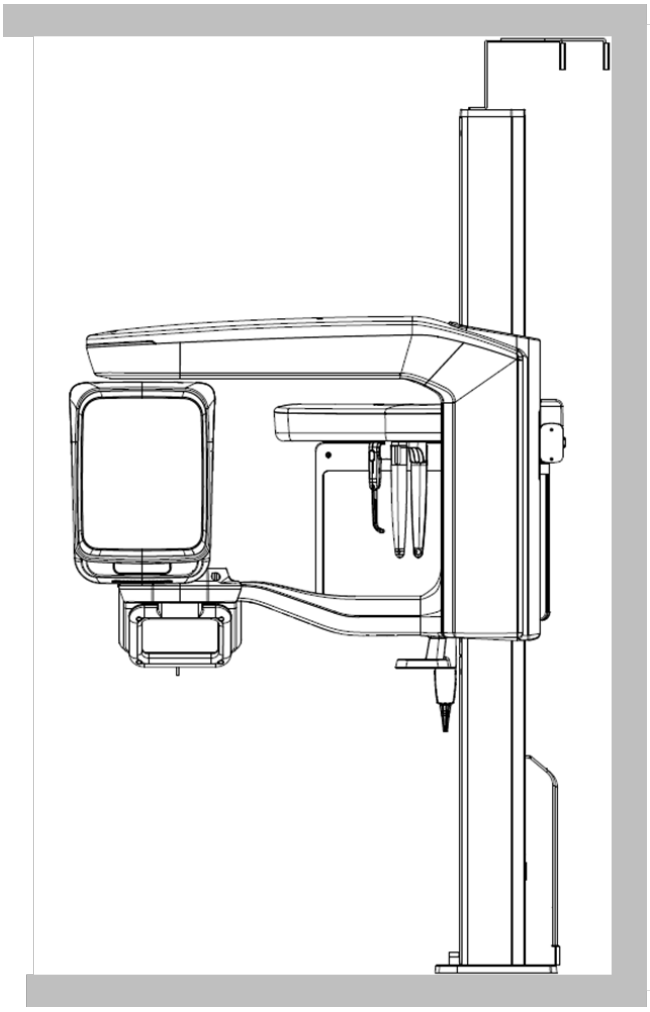


5. Installing the Equipment: Wall Mount

5.1 Installing the Equipment

You are advised to plan and study the installation environment carefully in advance before proceeding since the installation involves drilling the wall and floor. Pre-installation planning is crucial to a successful installation.

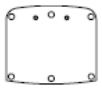
Accurate marking is of critical importance for a successful installation.

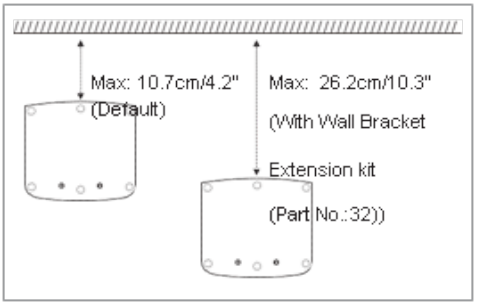


Installation Overview

5.1.1 Marking Points on the Floor

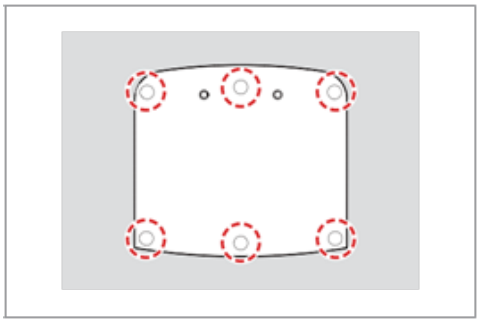
1. Put the aligning plate on the floor near the wall where the equipment should be installed, as shown in the figure.

Alignment Plate	(Part No. 4)	



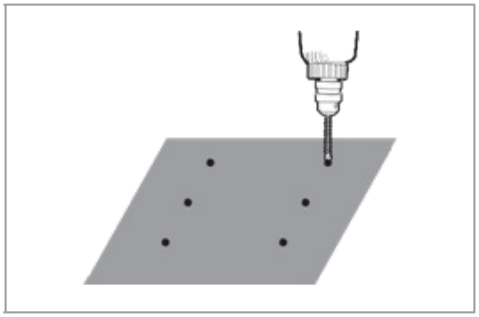
2. Mark 6 anchor bolts holes on the floor.

Marker	n/a	



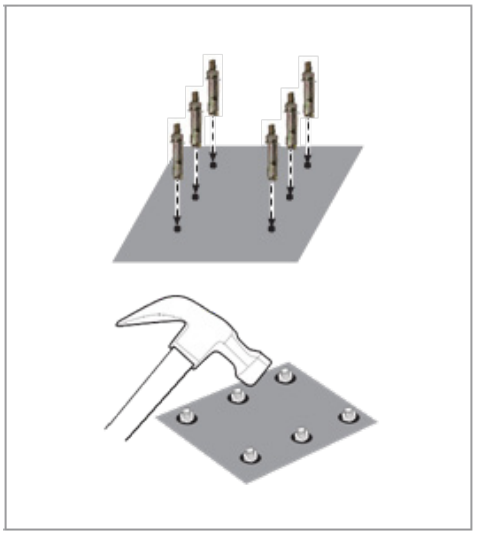
5.1.2 Drilling the Floor

1. Remove the aligning plate.
2. Drill the floor holes (size: 10.5 x 30 mm) by using the concrete hammer drill.



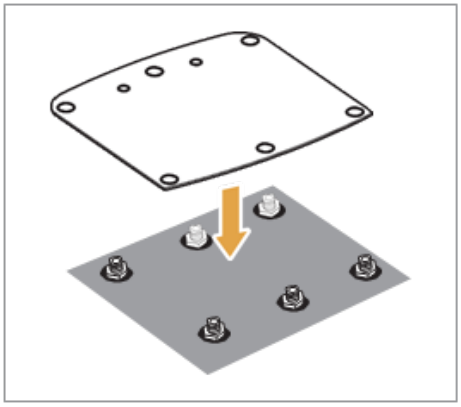
3. Remove the debris and clean the holes withthe dust pump.
4. Put the anchor bolts into the holes and attach them with the hammer. Verify that the anchors are secured.

Anchor Bolt	5/16 x 60 w/ Spring and Flat Washers 2 pcs (Part No. 34)	
Hammer Drill	L = 200 mm (7.9”)	

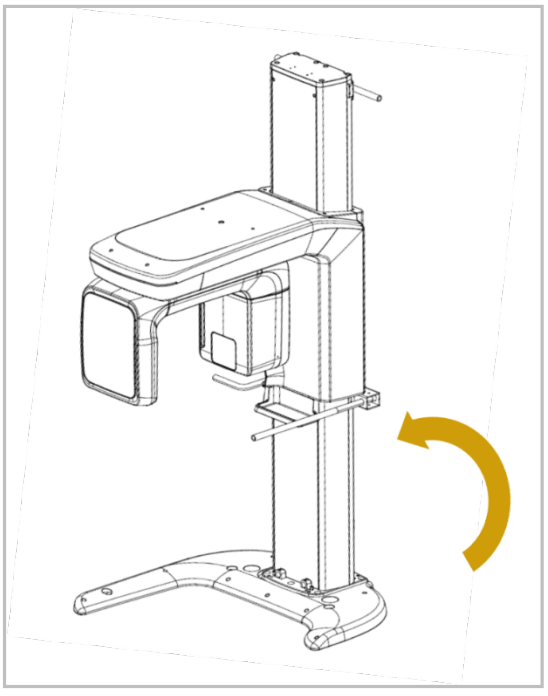


5.1.3 Combining the Equipment with the Anchor Bolts

1. Put the aligning plate on the floor while making sure that the aligned plate's holes engage in the anchored bolts.

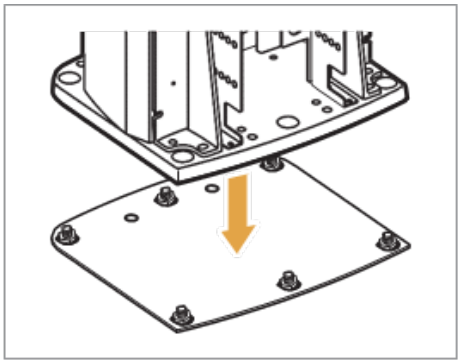


2. Put the equipment in a vertical position slowly while holding the upper handle, as shown in the figure.

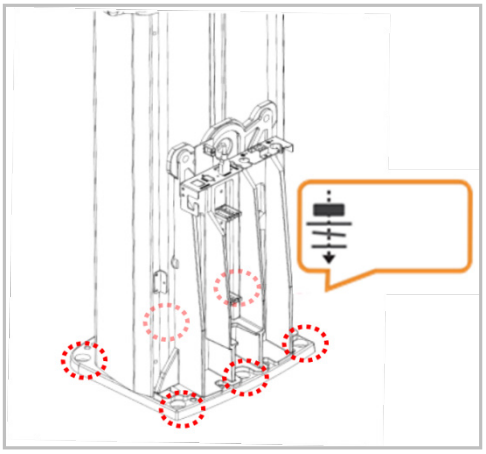


⚠ CAUTION	Be careful not to damage the cables before erecting the equipment. Keep them clear of the equipment.

3. Put the Equipment on the aligning plate while making sure that the column bottom holes engage in the anchored bolts.



4. Put the washers and nuts into the six anchored bolts on the floor and tighten the nuts loosely. Make sure that you put the fasteners in the sequence, as shown in the figure.



IMPORTANT	▪ Do not tighten the nuts until the leveling is completed. ▪ When you are tightening the nuts, another person must hold the middle handle to prevent the equipment from falling.

5.2 Installing the CEPH Unit (Optional)

Please refer to section **4.2 Installing the CEPH Unit (Optional)**.

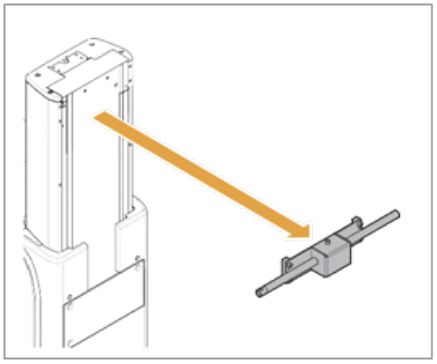
5.3 Installing the Wall and Column Brackets

5.3.1 Assembling the Column Bracket

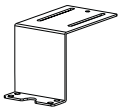
1. Move the equipment to the installation site near the wall.
2. Remove the lower carrying handle.

Allen Wrench	6 mm / 0.24”	

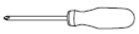
⚠ CAUTION	When you are removing the bolts on the lower carrying handle, another person must be holding the handle to prevent it from falling. The fall of the handle can cause injury or property damage.

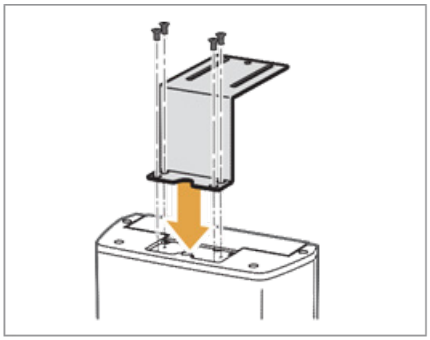


3. Remove the plastic wrap covering the column unit by using a cutter.
4. Prepare the column bracket.

Column Bracket	(Part. No. 22)	

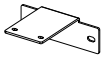
5. Assemble the column bracket to the top of the column with four flat head screws.

Cross Head Screwdriver w/ Magnetic Tip	6 mm / 0.24”	
Flat Head Screw	M5 x 12 - 4 pcs (Part No. 29)	

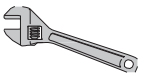


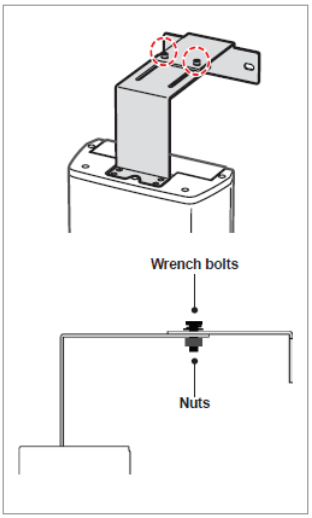
5.3.2 Combining Column and Wall Brackets

1. Prepare the wall bracket.

Wall Bracket	(Part No. 36)	
Wall Bracket (for Wood Wall)	Optional (Part No. 37)	

2. Combine the column and wall brackets in the following manner with the 2 wrench bolts.

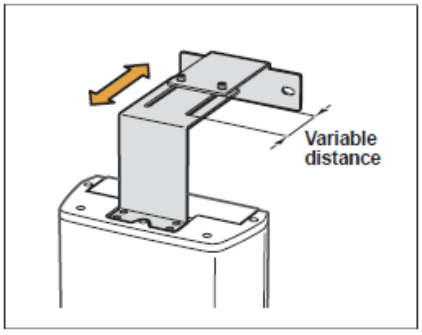
Allen Wrench	6 mm / 0.24”	
Wrench Bolt	M8 x 25 w/ Spring and Flat Washers (Part No. 35)	
Monkey Wrench	n/a	
Nut	M8 - 2 pcs (Part. No. 35)	



CAUTION	Do not tighten the bolts fully yet.

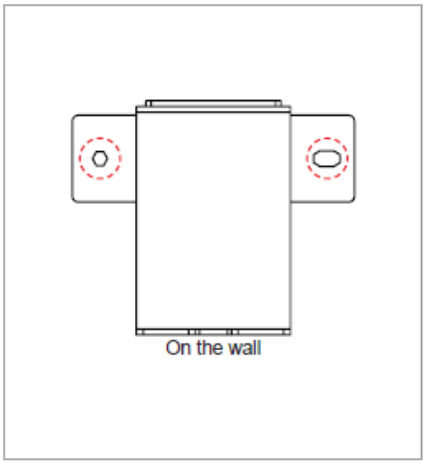
5.3.3 Marking Points on the Wall

1. Move the equipment to the installation site as close as possible.
2. Adjust the distance between the wall and equipment by moving it slightly, so that the wall bracket touches the wall.



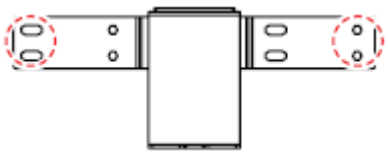
3. Mark the anchor bolt locations on the wall.

Marker	n/a	



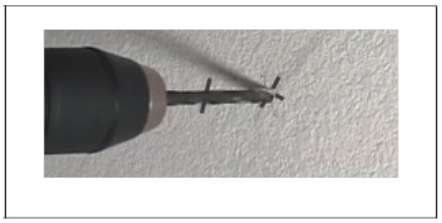
NOTICE

For the wood wall with 16-inch studs, mark the wood screw locations as shown in the figure.



5.3.4 Drilling Holes on the Wall

1. Drill the wall holes of size 10.5 mm x 30 mm (depth) using the concrete hammer drill.



2. Remove the debris and clean the holes using the dust pump.
3. Using the hammer, insert a Ficher strong anchor into the hole.

Ficher strong anchor	M8 x 30	
Hammer	N/A	

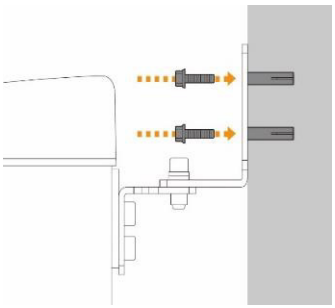
4. Using the hammer, insert an EHS tool into the inner bolt.

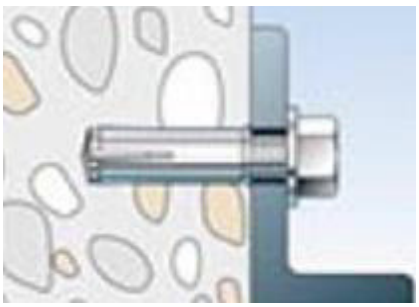
EHS tool	EAW H 8 x 30	
Hammer	N/A	

5.3.5 Combining the Equipment with the Anchor Bolts

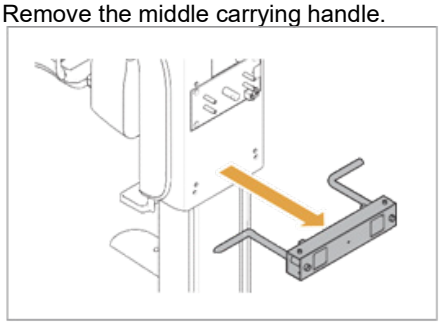
1. Place the equipment on the alignment plate while observing 4 Hex bolts are being inserted properly through each hole.

Hex Bolt	M8 x 15	
Spring washer	M8	
Flat washer	M8	
Torque wrench	Spanner type	





2. Remove the middle carrying handle.



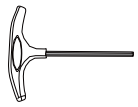
5.4 Connecting the Cables to the Equipment

Please refer to section **4.5 Connecting the Cables to the Equipment**.

5.5 Removing the Transportation Safety Bolts

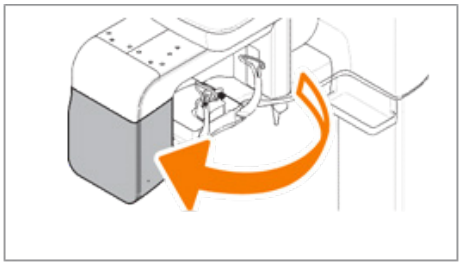
Please refer to section **4.6 Removing the Transportation Safety Bolts**.

5.6 Leveling the Equipment

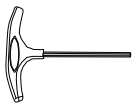
T-shaped Hex Wench	8 mm / 0.3”	
Sprit Level	n/a	

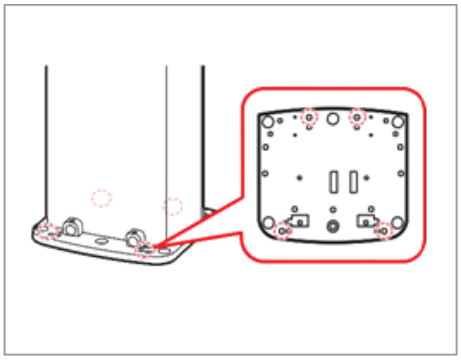
IMPORTANT	Ensure that the Spirit Level should rest only on the locations indicated in the following figures to obtain the accurate center.

1. Prepare the Spirit Level.
2. Turn the Rotating Unit clockwise so that the X-ray tube head faces the front, as shown in the figure.



3. Put the set screws into the four holes and turn them clockwise with the hex wrench until they touch the aligning plate.

T-shaped Hex Wench	8 mm / 0.3”	
Set Screw	M10 x 20 – 4 pcs (Part No. 30)	

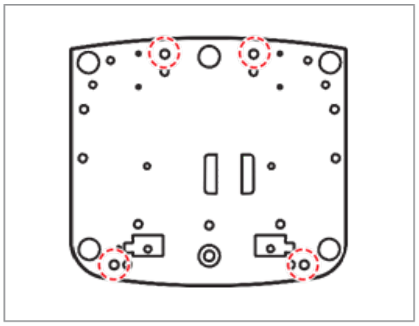


4. Put the Spirit Level on the location as shown in the figure.

▲ For leveling right and left

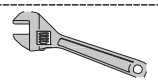
▲ For leveling front and rear

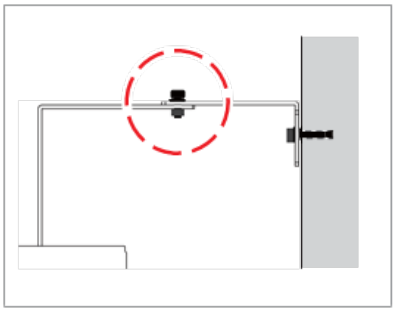
5. Turn each set screw clockwise or counterclockwise to make the equipment level while another person monitors the level indicator.



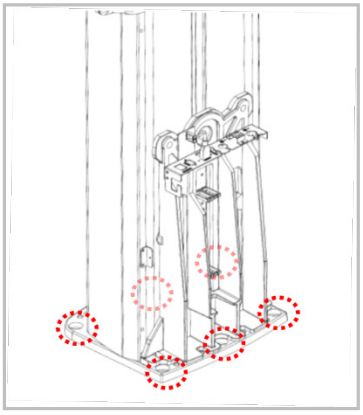
5.7 Tightening the Bolts

1. Tighten the joint bracket bolts.

Allen Wrench	6 mm / 0.24”	
Monkey Wrench	n/a	



2. Tighten the nuts in the anchored bolts on the floor.



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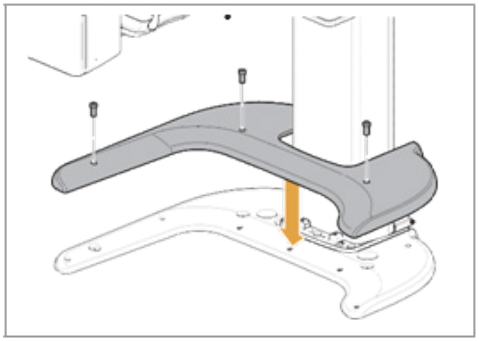
6. Completing Miscellaneous Works

6.1 Assembling Various Covers

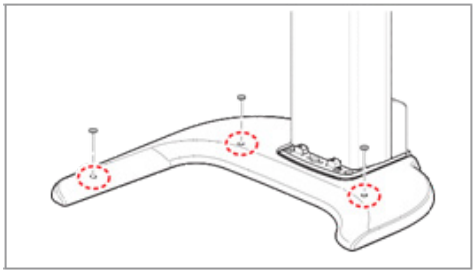
6.1.1 Base Cover (Optional)

Truss Bolt	M5 x 8 – 3 pcs (Part No. 26)	
Base Cap	3 pcs (Part No. 17)	

1. Assemble the base cover and fix it with three Truss Bolts.



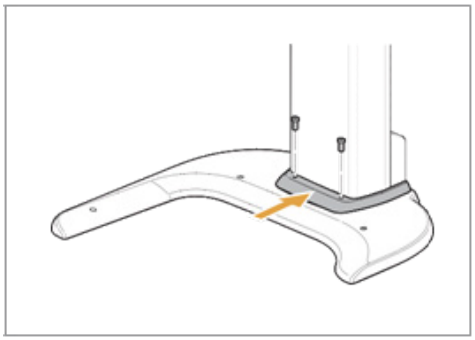
2. Cover 3 holes on the base with three Base Caps.



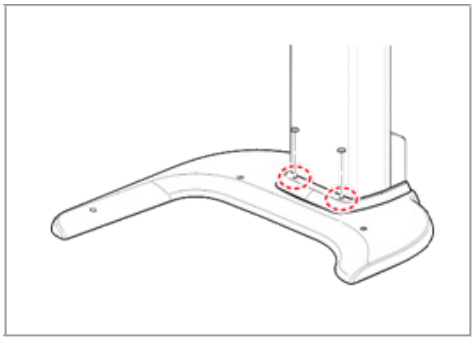
6.1.2 Base Front Cover

Truss Bolt	M4 x 8 – 2 pcs (Part No. 27)	
Silicon Cap	2 pcs (Part No. 16)	

1. Assemble the base cover and fix it with two Truss Bolts.

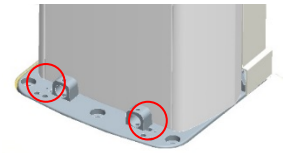


2. Cover 3 holes on the base with two white Silicon Caps.



NOTICE

If you do not use the base during the assembly, remove 2 pcs of Truss bolts while installing the front cover as below.

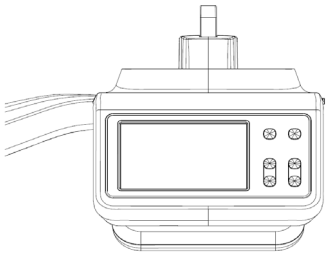


6.2 Assembling the Temple Supports and the Chinrest

IMPORTANT	Assembling the Temple Supports and the Bite Block should be done after **Chapter 10 Acquiring a test image** is completed

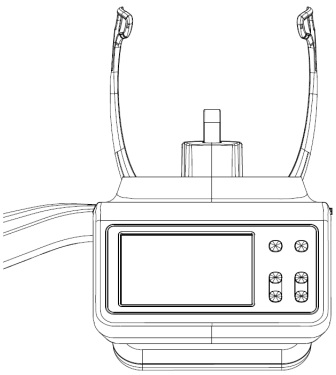
1. Insert the normal Chinrest and the normal Bite Block into the unit.

Chinrest (Normal)	1 pc (Part No. 9)	
Bite (Normal)	1 pc (Part No. 8)	

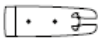


2. Insert the Temple Supports.

Temple Supports	1 set (Part No. 5)	

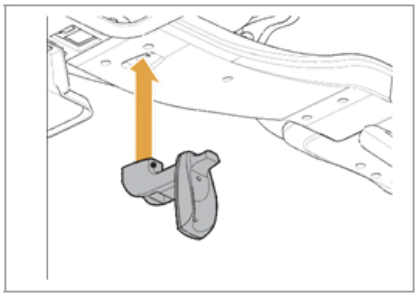


6.3 Installing the Switch Holders

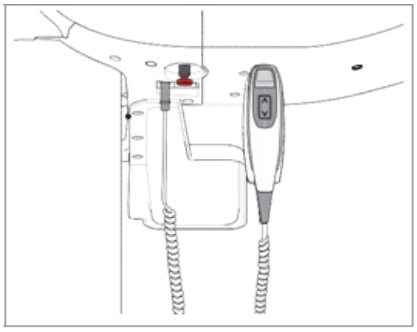
UP / DOWN Switch Holder	1 pc (Part No. 2)	
UP / DOWN Switch	Optional - 1 pc (Part No. 33)	
Exposure Switch Holder	1 pc (Part No. 33)	
Truss Bolt	M4 x 10 – 2 pcs (Part No. 33)	

6.3.1 UP / DOWN Front Cover

1. Assemble the UP/DOWN Switch Holder on the bottom of the Vertical Frame with two Truss Bolts (M4 x 10).



2. Connect the UP/DOWN switch to the unit and hang it on the UP / DOWN Switch Holder

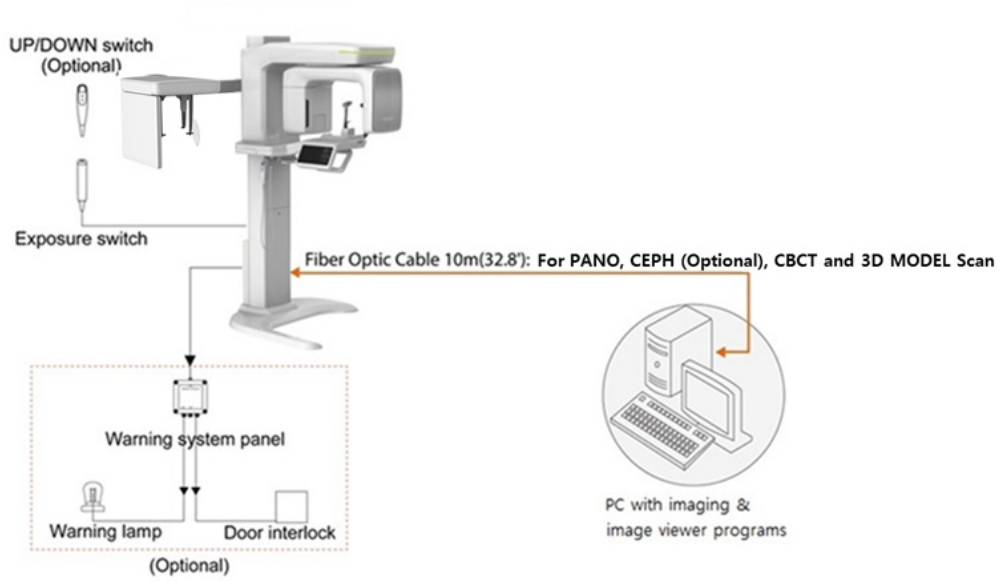


6.3.2 Exposure Switch Holder

1. Locate the Exposure Switch Holder with a sticker and two screws.
2. Install the Exposure Switch Holder on the wall at the appropriate height using two screws.

7. Setting Up PC

7.1 Direct Connection Diagram



Fiber Optic Cable - Used to transfer image data to the PC.

Warning System Panel - Used to provide a visible indicator: Light on when the equipment is irradiating X-ray.

7.2 The Recommended PC Requirements

IMPORTANT

- Ensure that your PC meets the recommended PC specifications to run the image viewer software.
- Since image quality may deteriorate from lack of resources, observe the requirement guideline specified in the following tables.
- The PC components shall be approved by UL/CSA.
- The PC shall be grounded well protectively.
- The multiple portable socket-outlets must not be placed on the floor.
- In case the equipment is to be installed in an area with an unstable electric power supply, it is strongly recommended to use the AVR (automatic voltage regulator) to keep the line voltage stable.
- The PC system provided with the **Green16/18** undergoes a rigorous test for software compatibility before shipping. Therefore, any later changes to the hardware and/or software may cause malfunction.

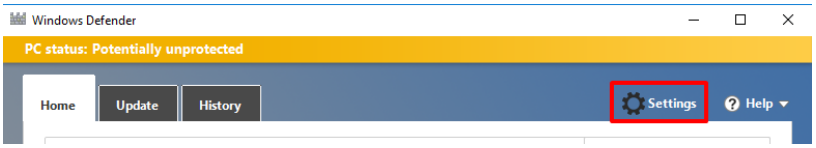
Item	Specification (HP)
CPU	Intel Xeon W-2223 3.6 GHz 4 Core Processor
RAM	16GB DDR4-2133 Registered RAM
HDD	1TB SATA 1st HDD
Graphics board	NVIDIA GeForce GTX970 D5 4GB or greater (Green16) NVIDIA GeForce GTX1060 D5 6GB or greater (Green18)
Ethernet Interface	Integrated Intel I218LM PCIeGbE
Serial Port (RS232)	HP Serial Port Adapter Kit
Power Supply	≥ 700 Watts (90% Efficiency)
Slots	2 PCI Express Gen3 x 16 slot 1 PCI Express Gen3 x 8 Slot 1 PCI Express Gen2 x 4 Slot 1 PCI Express Gen2 x 1 Slot
	1 PCI Slot
CD/DVD Drive	DVD-ROM, DVD+/-RW, Blu-Ray
Monitor Resolution	1280 x 1024 screen resolution
Operating System	Windows 10 Professional 64-Bit OS
Recommended system	HP Z4

IMPORTANT

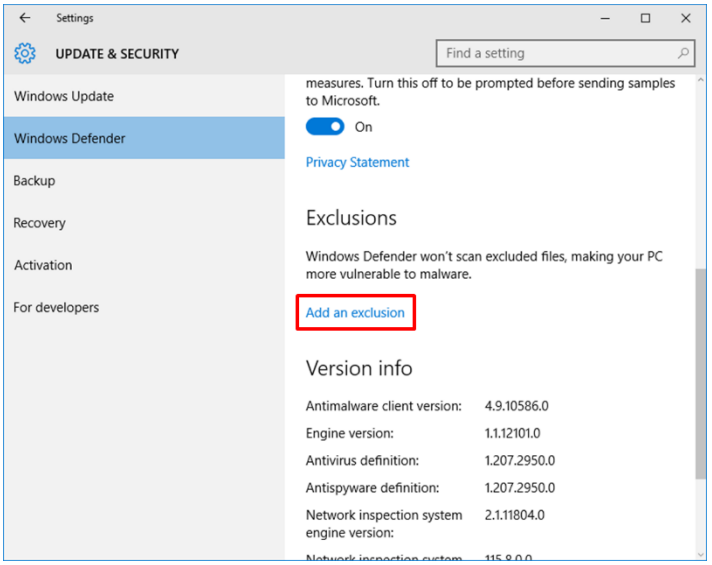
In Windows 10, disable Windows Defender ⚠ When Windows Defender is not enabled, Windows 10 is not protected from malware and virus.

7.3 Disabling Windows Defender

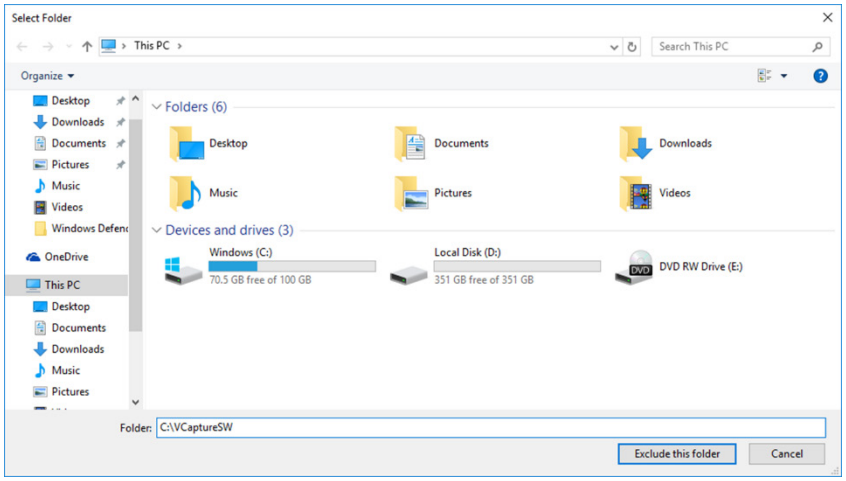
1. Open the Start screen type **Windows Defender** in the search box.
2. Click the **Windows Defender** icon to start Windows Defender on the search result.
3. Click **the Settings** icon.



4. On the Settings window, click **Add an exclusion** in the **Exclusions** section.



5. On **Select Folder** window, type **C:\VcaptureSW** in the folder field and **click** Exclude this folder.



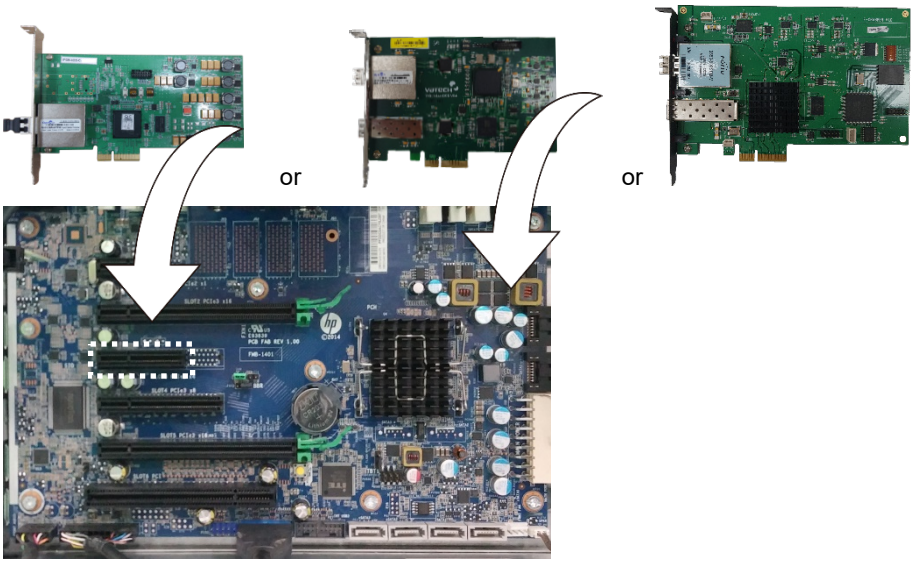
7.4 Installing the Internal Peripherals

CAUTION	Allow enough time to dissipate remnant energy after unplugging the power cord from the main outlet or PC.
IMPORTANT	▪ Disregard this section in case the PC system is supplied with the equipment. (The peripherals have already been installed inside the PC.) ▪ Whenever handling the fiber optic frame grabber board:  **1.** Wear the anti-static glove.  Do not wear the likes of a thick jacket.
NOTICE	The following figures and descriptions are based on the PC model Z4 from HP.

7.4.1 Installing the Fiber Optic Frame Grabber Board

1. Unplug the power cable from the back of the PC and wait for a while.
2. Open the PC cover.
3. Insert the grabber board (Part No. 21) carefully into that PCIe2 x 4 slot and lock it.

   The frame grabber can be one of the following: IFG, or FTG or VTG



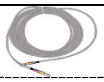
CAUTION	Double-check the locking status between the board and its holder after installing the board. A bad insertion of the board into the PC slot could cause dark calibration data acquisition or noisy image acquisition.

4. Put the slot holder back to its initial position.

7.5 Connecting the Cables to PC

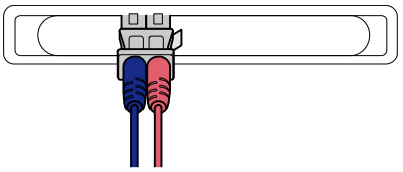
NOTICE

- Always check the cable condition visually. Surprisingly, unexpected image acquisition errors arise from the bad cable or its bad contact condition.
- Connect the regular cables for PC: keyboard, mouse, and video in advance.
- The following figures and descriptions are based on the PC model Z4 from HP.

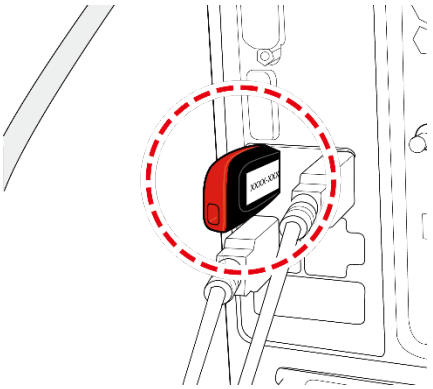
Fiber Optic Cable	1 pc (Part No. 21)	
3D Viewer License Key	1 pc (Part No. 1)	

1. Remove the caps of the fiber optic cable.

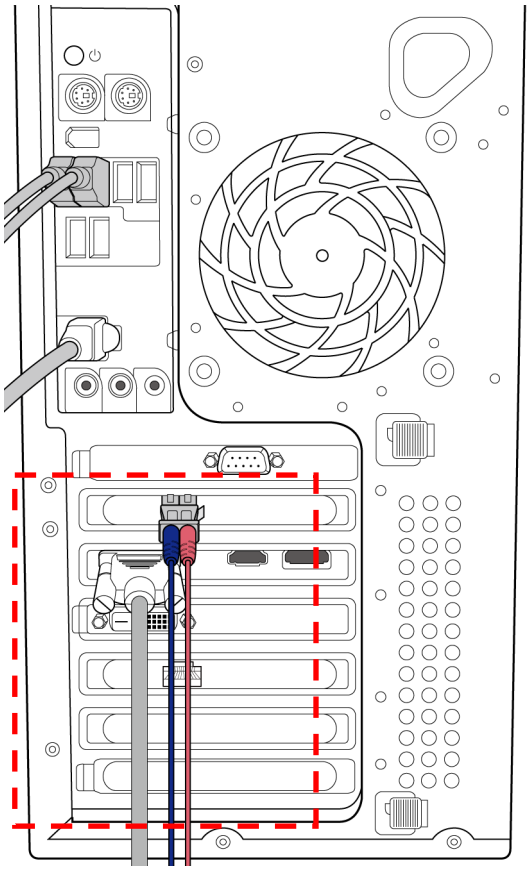
2. Connect the Fiber Optic Cable.



3. Insert the 3D viewer License Key into a USB port.



4. Confirm the result after connections are as same as below.



NOTICE

The illustrations may differ from the actual product.

8. Setting Up PC Environment Variables

NOTICE	Disregard this section in case the PC system is supplied with the equipment. (The environment variables of the PC have already been set on the PC.)

8.1 Before Beginning

Before setting PC environment variables, ensure that your PC and system are ready for the procedure.

IMPORTANT	▪ Ensure that the Emergency Stop Switch is off before installing the InstallShield installation. ▪ Do not install the programs irrelevant to image acquisition and view on the same PC. There may be subtle conflicts between them, leading to the malfunction. ▪ The PC system supplied with the equipment is intended to be used as an image acquisition only. The PC server for image management is strongly recommended to use a different PC. ▪ The programs related to the acquisition, viewing, and manipulation of images should be installed on the formatted PC, where no other program(s) except the operating system (OS) is present. ▪ Before InstallShield installation, ensure that the video card driver installed on the PC is the most up-to-date version. To check this, go to the website of the graphic card manufacturer.

Checking PC BIOS Settings

Check the BIOS settings of your PC before starting the next step. The BIOS settings must meet specifications in **Appendix E: Checking PC BIOS Settings**. If the BIOS hasn't been set up in your PC or the settings are different from Appendix E, take the steps below to configure the BIOS in your PC.

1. Reboot the PC and enter the BIOS setup untitly.
2. Go to Appendix E and set the variables as specified on the page.

IMPORTANT	The "EnhancedHalt State (C1E)" option will be displayed when you update the BIOS settings.

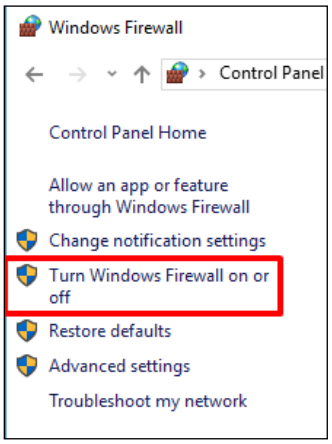
8.2 Turning off the Firewall

The LAN port and/or local IP can be blocked by the Windows. This can cause interruptions in imaging acquisitions and data transmissions. For this reason, follow the steps below to disable the Windows Firewall:

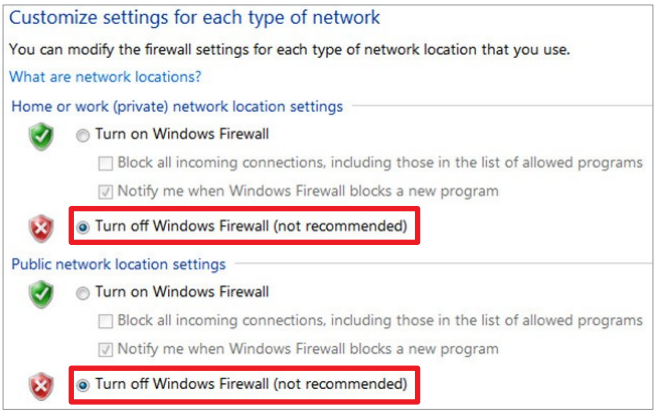
1. Open the Start screen and type **Windows Firewall** in the search box.

2. Click the **Windows Firewall** icon to start the Windows Firewall on the search result.

3. On the Windows Firewall screen, click the **Turn Windows Firewall on or off**.



4. Select the Turn off Windows Firewall for both Home or work (private) and Public network location settings.



5. Click **OK** to apply the settings.

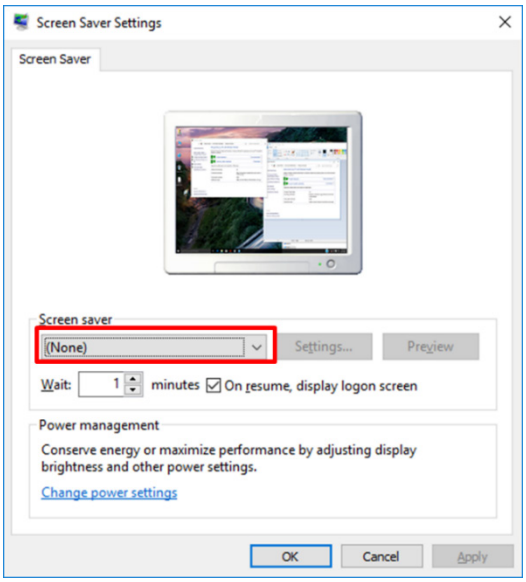
8.3 Setting up the Power Management Options

Disable the screen saver to avoid system failure during the image acquisition.

8.3.1 Disable the Screen Saver

Follow the steps below to disable the screen saver on your PC

1. Open the Start screen and type **Screen Saver** in the search box.
2. On the Settings window, select **(None)** from a drop-down menu.

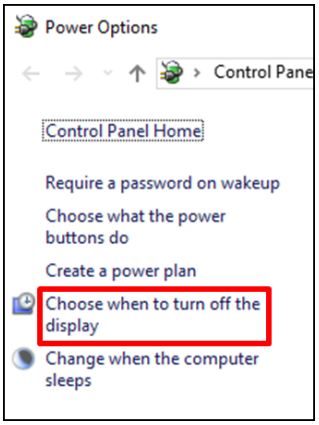


3. Click **OK** to apply the settings.

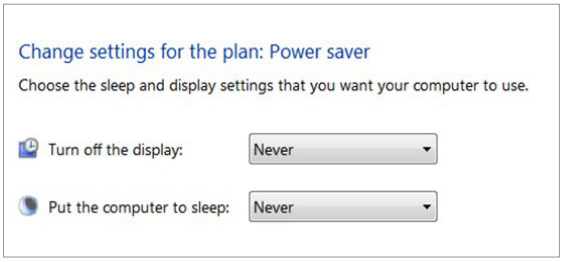
8.3.2 Selecting the Power Options: Monitor and System

Follow the steps below to set up the power options for the monitor and system

1. Type **Power Options** in the search box and open the menu.
2. Click **Choose when to turn off the display**.



3. Select **Never** for both **Turn off the display and Put the computer to sleep** fields.



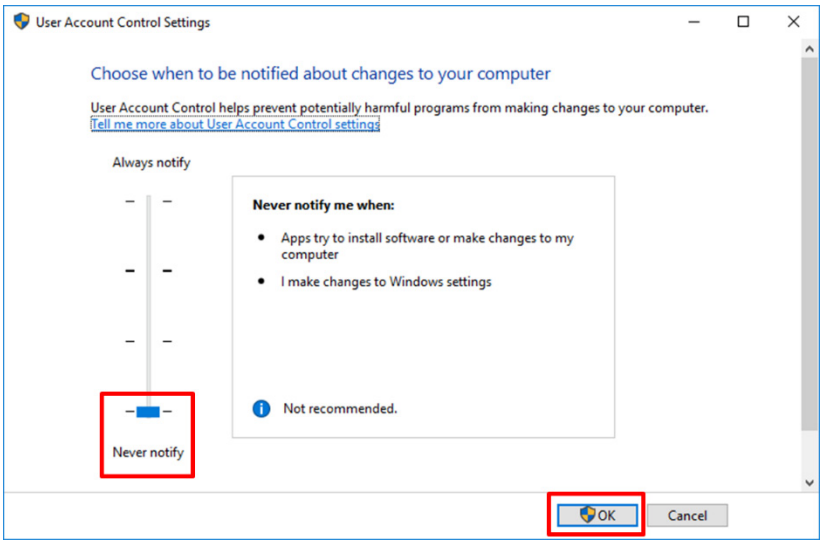
4. Click **Save changes to apply the settings.**

8.4 Turning off the User Account Control

Follow the steps below to turn off the user account control on your PC

1. Open the Start screen and type **User Account Control** in the search box.

2. Disable the UAC by moving the slider bar down to the bottom, **Never notify**. Then, click **OK** to apply change settings.



8.5 Setting Folder Exclusions with Anti-virus Software

IMPORTANT

- Set the virus scan exception for the files and folders related to this equipment.
- Do not run the memory-resident background programs unrelated to the equipment.
- It is recommended to run the virus scan only when the equipment is idle.
- Turn the firewall off.
- Always use the blank USB drive whenever possible.

Some files used by the **Green16/18** are incorrectly recognized as viruses/trojans by anti-virus software. If you are using anti-virus software on your PC, you must exclude those files from all scans performed by the anti-virus software.

For the **Green16/18**, the following folders and files for relevant software should be excluded from the virus scan.

Path	Software
C:\Program Files\Vatech	**EzDent-i**
C:\VCaptureSW	Console Software

NOTICE

- Suppose the anti-virus program from McAfee is running in the background.
- The procedure to set folder exclusions is similar for most anti-virus programs.

1. Open the McAfee anti-virus program and select the **VirusScan**.
2. Right-click the **On-Access Scan** menu option and left-click the **Properties** tab.
3. Select the **All Processes** → **Detection** → **Exclusions** menu option and choose the **Add** menu button.
4. Navigate to the folders or the files you want to designate an exclusion path for, and select the checkbox to **Also Exclude Subfolders**.
5. Click **OK** when completed and exit McAfee for the path exclusion to be completed.

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9. Installing Software

NOTICE

Skip this section if your PC comes with the equipment. The PC system provided by VATECH has all software installed and is ready to use.

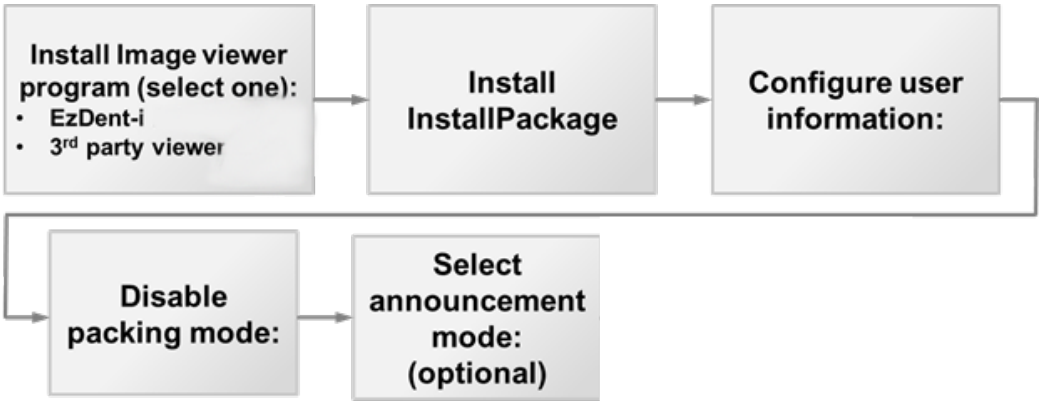
9.1 Before Beginning

Before you start the software installation for Green 16/18 on your PC, follow the steps below:

- Turn off the Emergency Stop Switch
- Remove the programs from your PC other than the imaging software.
- Scan your PC with an antivirus software
- Ensure to check that the video card driver for your PC is the up-to-date version. To check, go to the website: www.nividia.com
- Install an image viewer program before installing the console software.

9.2 Software Installation Flow

The software installation workflow for Green 16/18 is illustrated in the flow chart below. Check the chart to complete the installation in the right sequence:



9.3 Installing the Image Viewer Program

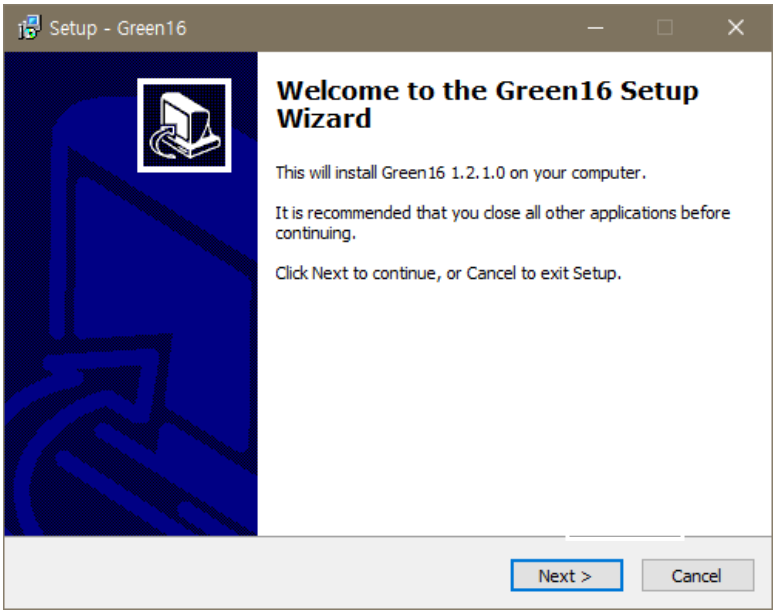
Install the image viewer before installing console software (EzDent-i or 3rd party). Follow the instructions in the image viewer's manual, separately provided from this installation manual. If you have a question about the EzDent-i, please contact your VATECH representative.

9.4 Installing the Install-Package

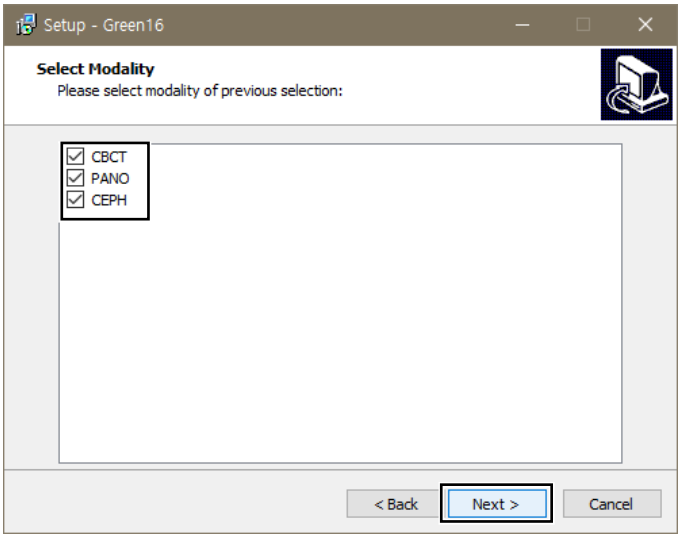
The InstallShield is provided in a USB flash drive. Before installing the console software, check the model's name and serial number on your InstallShield.

NOTICE	The examples used in this section are from Green 16 InstallShield.
IMPORTANT	Before downloading the InstallShield, perform a virus scan for your PC.

1. Insert the USB flash drive into a USB port on your PC.
2. Go to the InstallShield folder and run **Setup.exe**.
3. Click **Next** on the Setup dialog box.

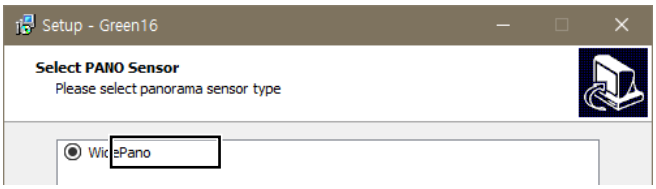


4. Check if all modalities are selected (CBCT, PANO, and CEPH). If your equipment does have the CEPH option, uncheck CEPH and click **Next**.

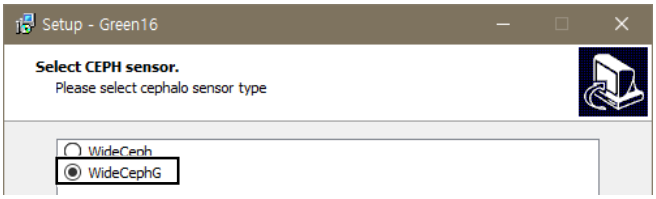


5. Check **WidePano** for CT sensor.

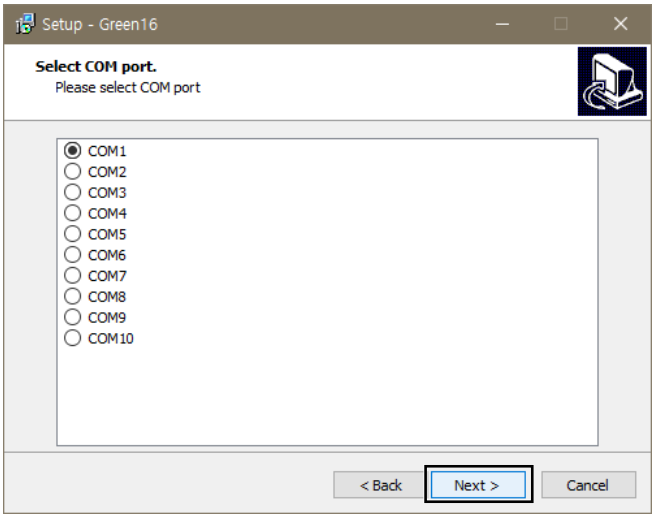
6. Check **WidePano** for the PANO sensor.



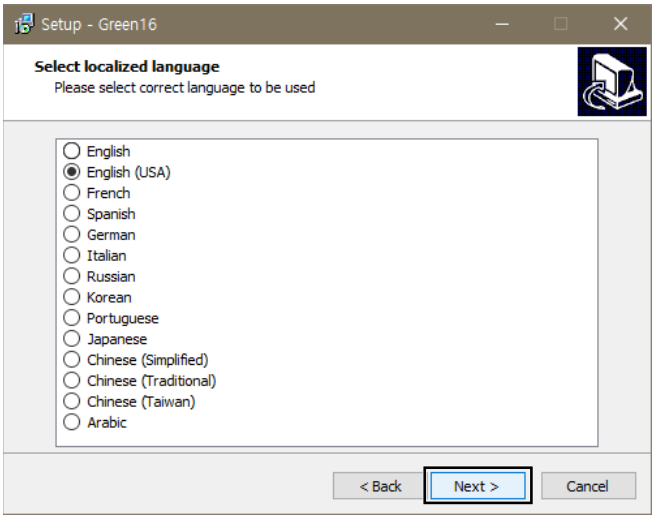
7. Check **WideCephG** or **WideCeph** for the CEPH sensor.



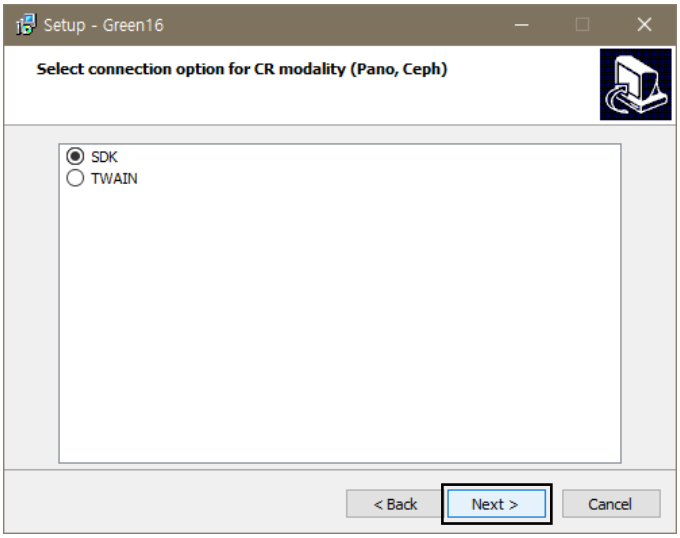
8. Check **COM1** for the default port number and click **Next**.



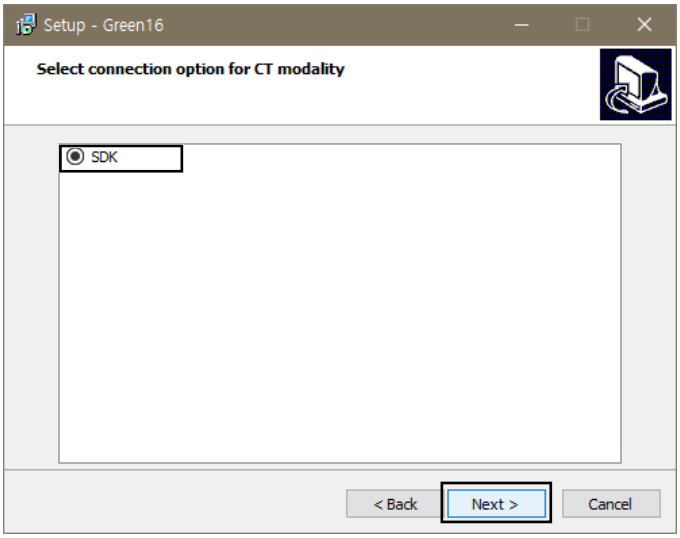
9. Select a language for your equipment and click **Next**.



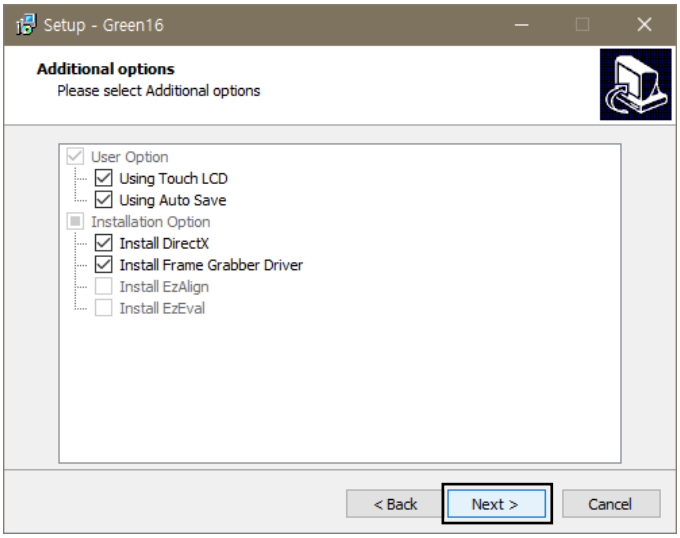
10. Check SDK or TWAIN for CR modality (PANO, CEPH), and click **Next**.



11. Check SDK for CT modality, and click **Next**.

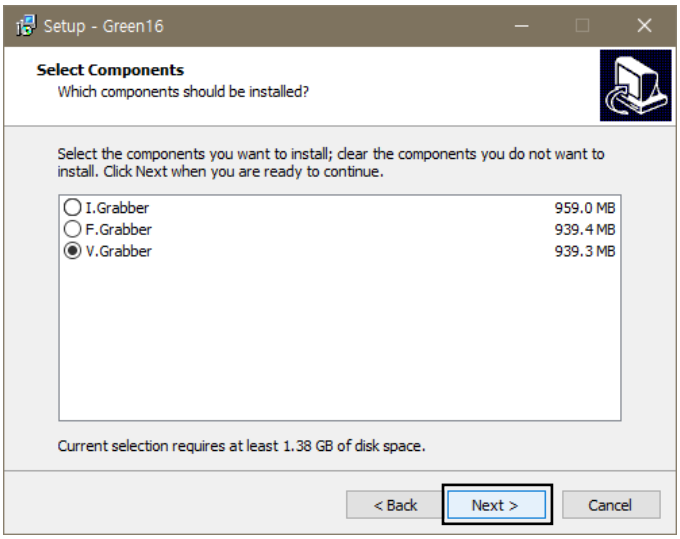


12. You can set user-specific options for your equipment and software in additional options. Check options on this page according to your preference and PC environment.

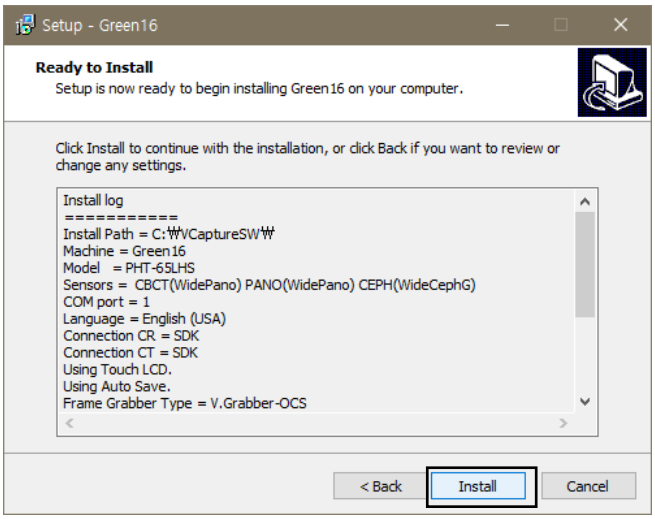


IMPORTANT	The system proceeds to install the options you chose from the 'Installation Option' menu. If you don't select any option, the system will finalize the console software installation.

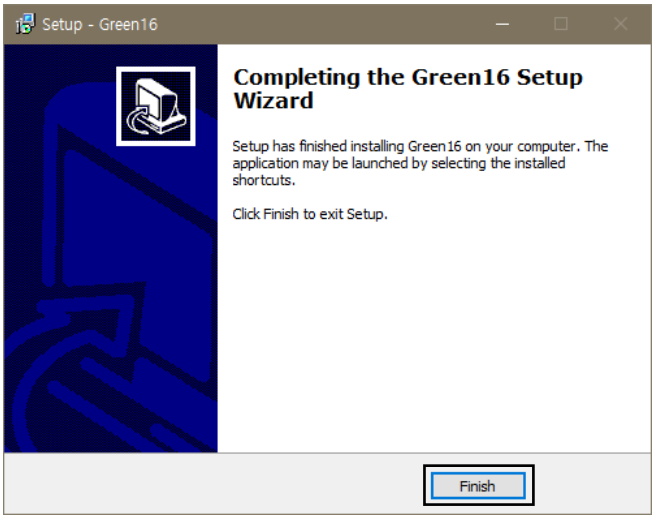
13. Select a grabber you want to install for your PC, then click **Next**.



14. After you click Next, the **Ready to Install** dialog box will appear below. Click **Install** to start the installation.



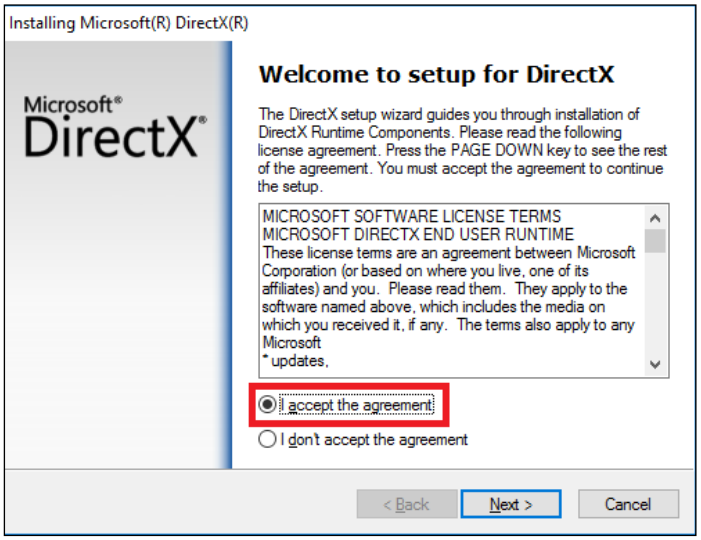
15. Click Finish to complete the installation and exit the dialog box.



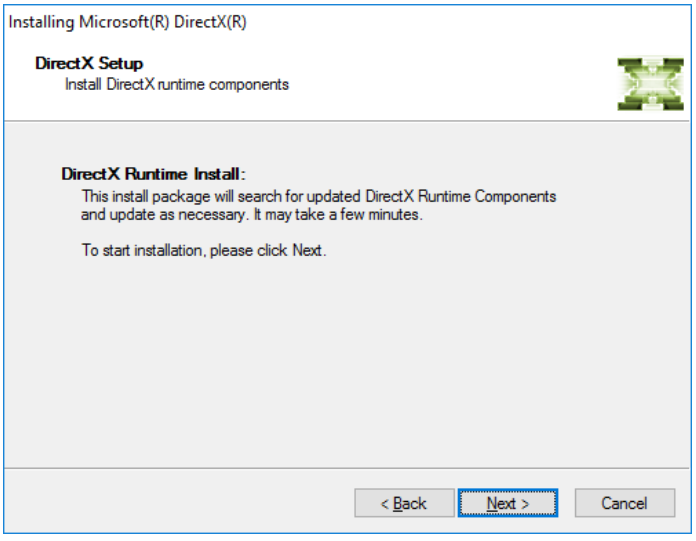
9.4.1 Installing the DirectX®

If you checked DirectX® for an additional option during the console software installation, Follow the steps below to install DirectX® on your computer.

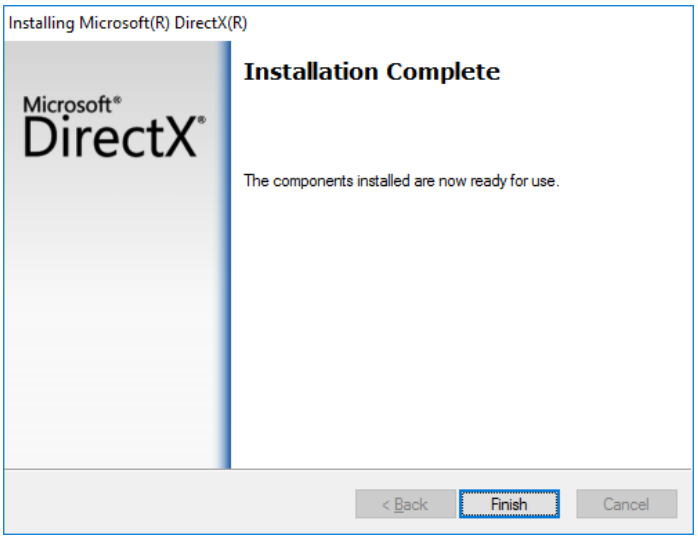
1. Check "**I accept the agreement**" in the dialog box



2. Click **Next**.



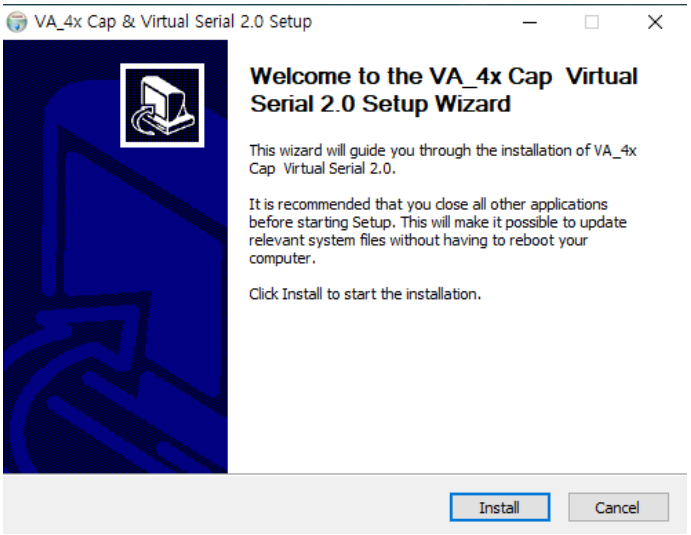
3. When “the installation complete” window appears, click Finish to exit The dialog box. And move to install the frame grabber (see 9.4.2)



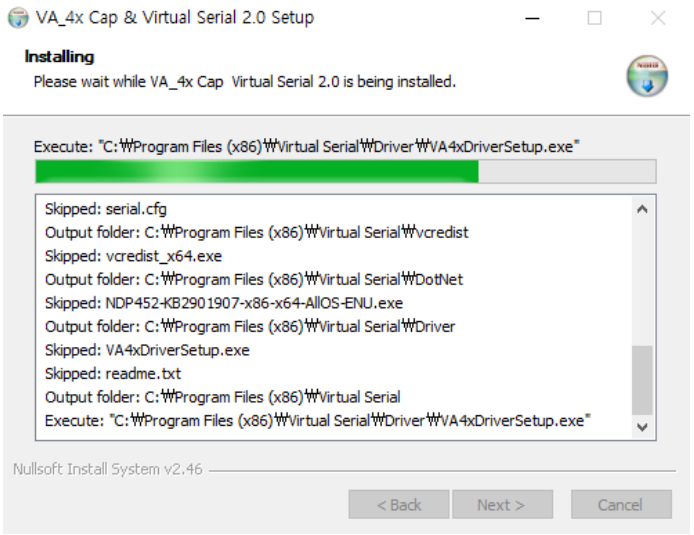
9.4.2 Installing the Frame Grabber

9.4.2.1 I.Grabber-C

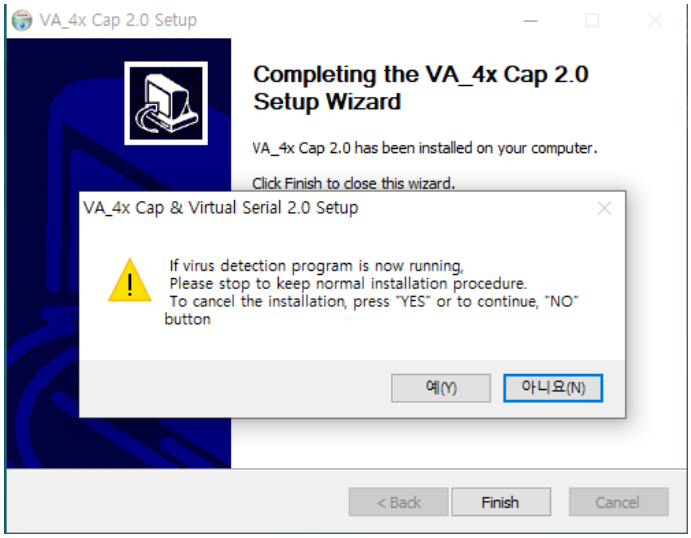
1. After completing the Direct X® installation, Virtual Serial 2.0 installation will be started. Click **Install** in the Welcome window.



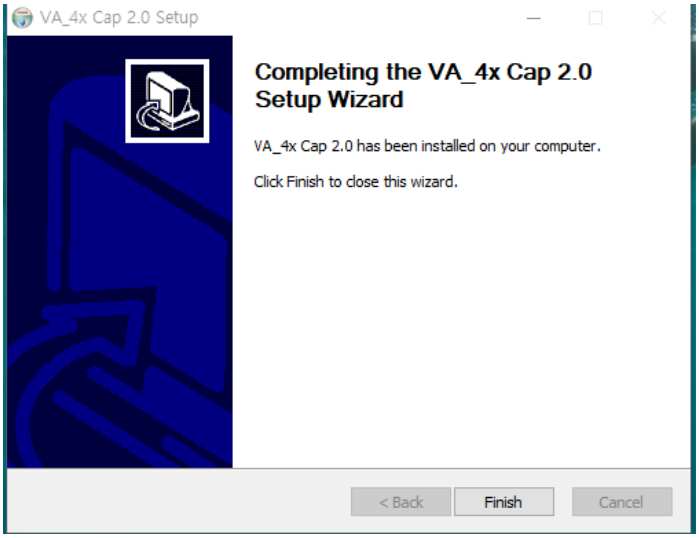
2. Click **Install** to start the installation.



3. If the Windows Security pop-up window appears, click **Install**.



4. Click **Finish** to exit the wizard.

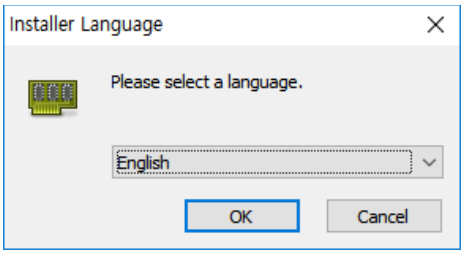


5. (Optional) When **Microsoft Visual C++ 2010 x64 Redistributable** installation window appears, click **Install** to continue the process and click **Finish** when completed.

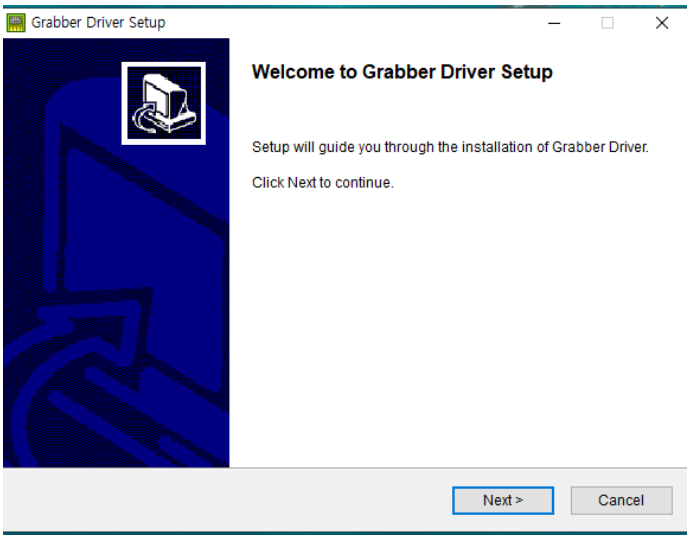
6. (Optional) When **Microsoft .NET Framework 4. x.x** installation window appears, click **Install** to continue the process and click **Finish** when completed.

9.4.2.2 F.Grabber-C1

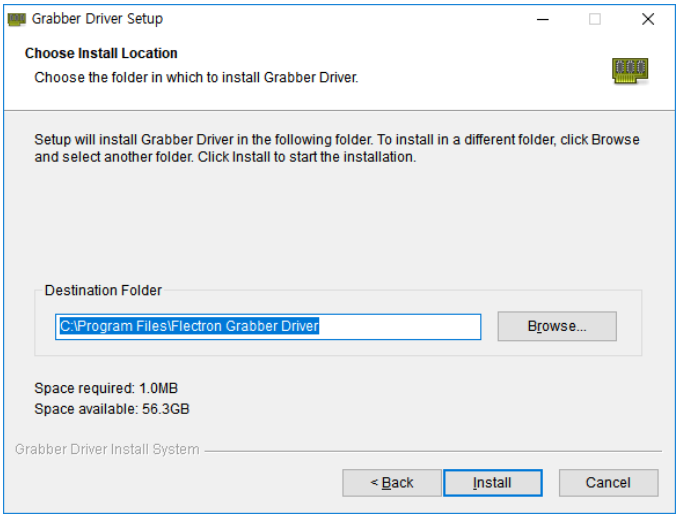
1. After completing the Direct X® installation, Grabber Driver Setup will be started. Select the language in the installer language window and press the **OK** button.



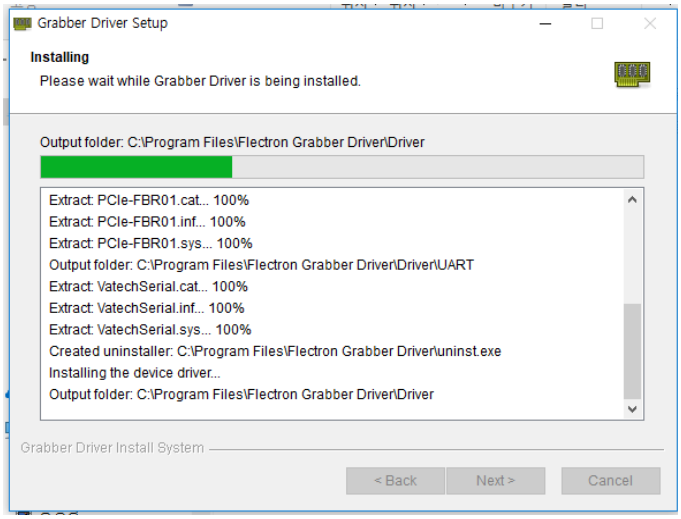
2. When the Grabber Driver Setup window appears, click the **Next** button.

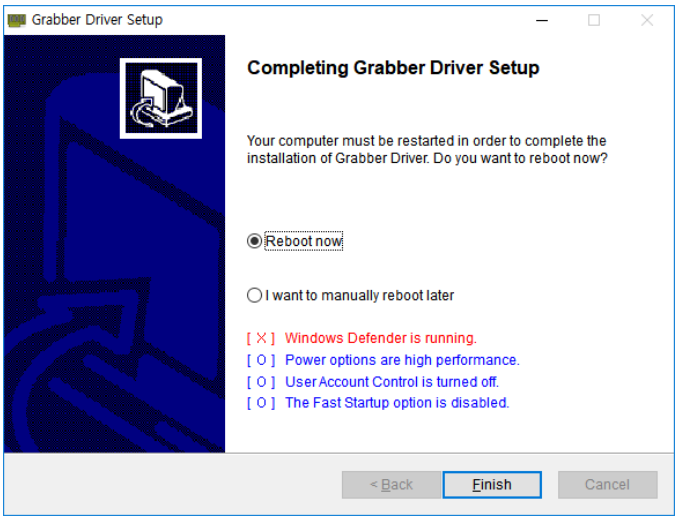


3. Enter the installation location and click the **Install** button.



4. The "Installing" window will appear and disappear, and the Completing Grabber Driver Setup window will appear. Choose the **Reboot now,** or **I want to reboot later and click the button manually.**





NOTICE

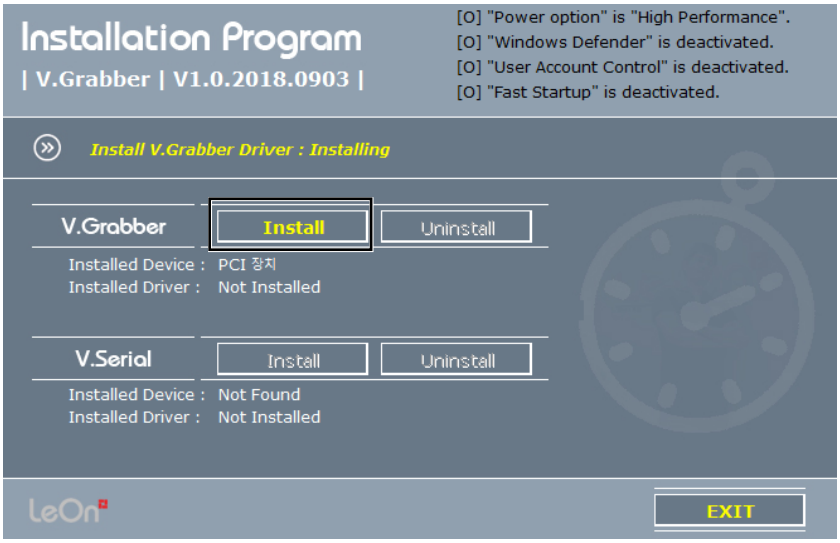
If an error occurs during installation, it will be displayed in red font color below. If no abnormality is found, it is displayed in blue font color.

[X] Windows Defender is running.
[O] Power options are high performance.
[O] User Account Control is turned off.
[O] The Fast Startup option is disabled.

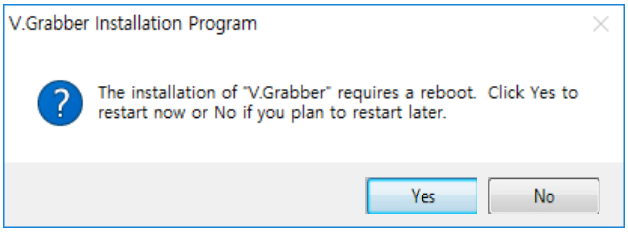
9.4.2.3 V.Grabber-OCS

1. After completing the Direct X® installation, the installation program will be started. Select the installer language, select the window, and press the **OK** button.

2. Press the V.Grabber's **Install** button.

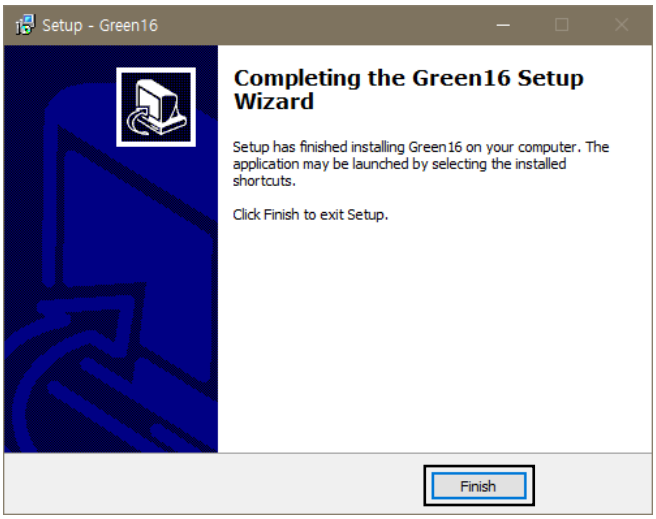


3. The installation is completed, and the V.Grabber Installation Program window appears. Click the **Yes** button to immediately reboot or the **NO** button to reboot later.



9.4.3 Finalizing Installation

The dialog box (see below) will pop up when all installation procedures are completed. Click **Finish** and restart your PC.



If you want to verify that all components are properly installed, follow the steps below:

1. Locate the file: **GreenCT_Install_Log.txt** on the desktop.
2. Check the file that You can find out that all components are installed.
3. Go to the **9.5 Configuring User Information**.

9.4.4 Uninstalling Software

If you want to uninstall the software, follow the steps below:

1. Open the Start screen; type **Uninstall a Program** in the search box.
2. Find the programs you want to uninstall and double-click the program to uninstall.
3. When asked if you want to continue, click **Yes** or **OK** and follow the prompts to finish the uninstallation.

9.5 Configuring User Information

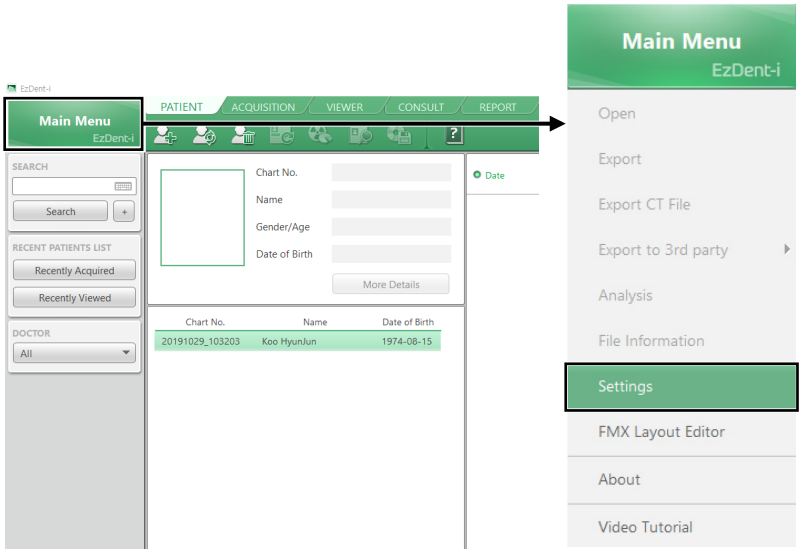
NOTICE	Go to the corresponding section for set-up instructions based on the viewer program. If EzDent-I is installed on your PC, go to **9.5.1 Setting EzDent-i**.
NOTICE	When using the Console program with automatic interworking function and EzDent-i program, the automatic interworking function is activated. If it cannot use the automatic interworking function, or if it needs to set it manually after the automatic interworking, follow the procedure below.

9.5.1 Setting EzDent-i

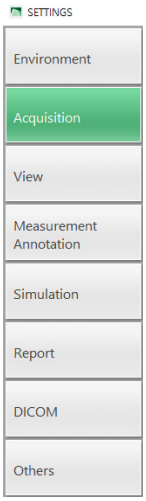
Set the EzDent-i's imaging acquisition options:

1. Start EzDent-i on your PC. When you start the program, the

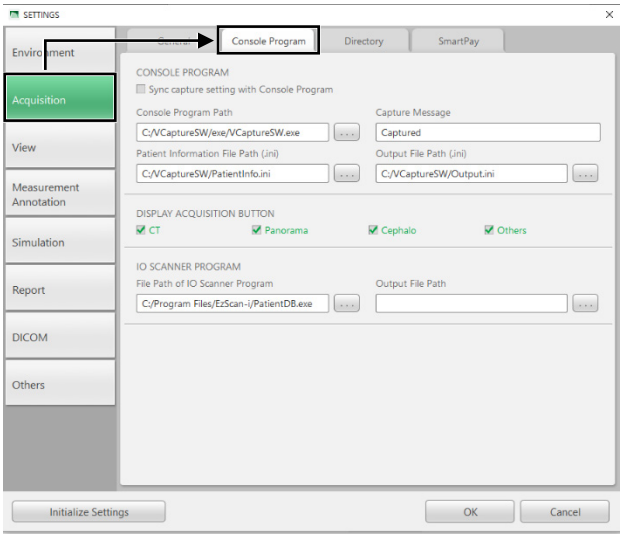
2. Click **Main Menu**, then select **Settings**.



3. In setting widow, click **Acquisition**.



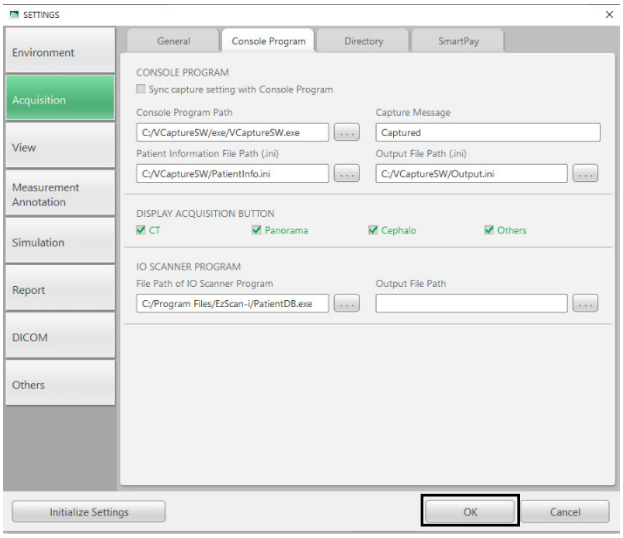
4. In the Acquisition tab, click **Console Program**.



In the **Console Program** tab, check:

- whether “Sync capture setting with console program is selected
- Console software path
- Patient information fire path
- Display acquisition button.

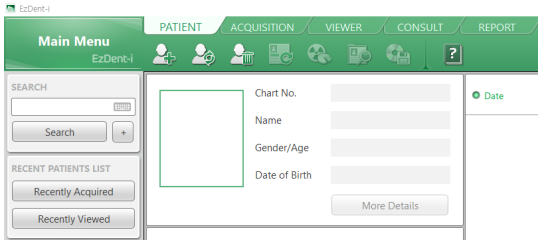
5. Click **OK** and restart the computer to apply the new setting.



Creating a New Patient Information

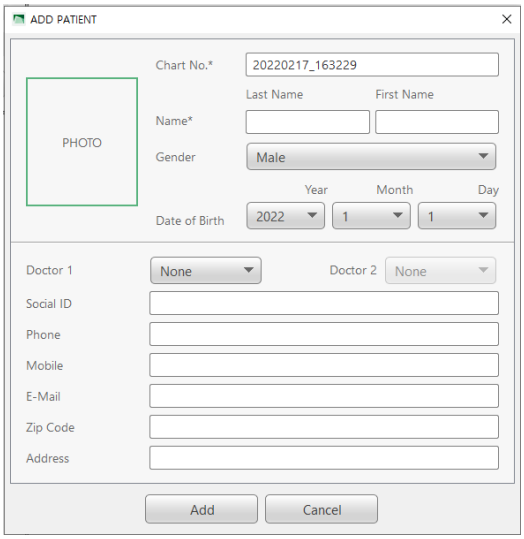
NOTICE	For further details on this subject, refer to the accompanying **EzDent-i** Manual.

1. Click the **Add Patient** from the **PATIENT** tab.



2. Enter the required fields (*) in the patient information:
   - Chart number
   - First name
   - Last name

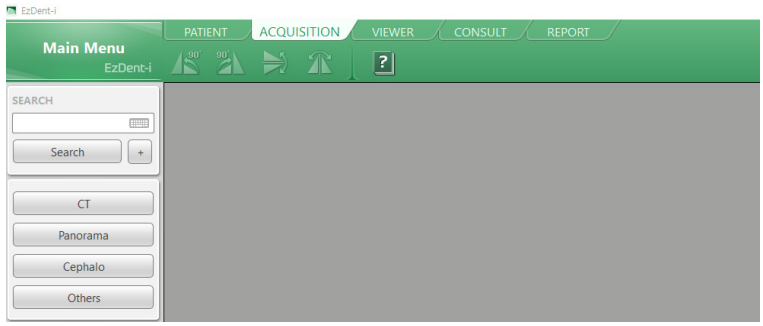
   the rest of the fields are optional, but it is recommended that you fill them in



3. Click **Add** to save the patient record.

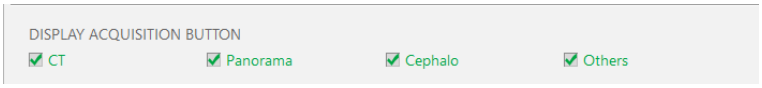
Initiating the Imaging Program

1. Click the **ACQUISITION** tab. The imaging mode selection menu will appear in the left pane (see below).

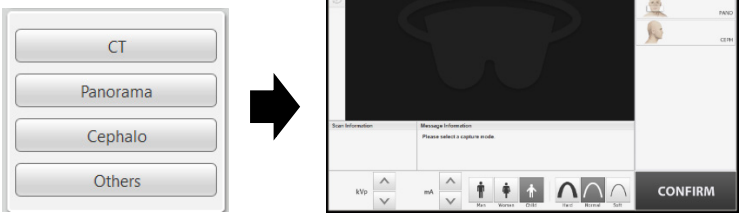


NOTICE

The imaging mode selection menu may differ due to your equipment's option (CEPH or non-CEPH) or the Display option you selected in the **Settings** (see below).



2. When you click an imaging mode, the main GUI for the selected mode appears



NOTICE

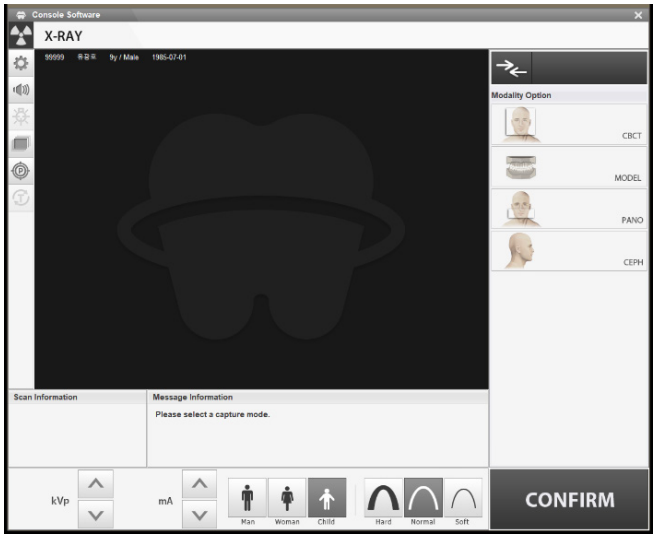
If the equipment is still in packing mode, the error code E033 appears. Go to **9.6 Disabling the Packing Mode** to disable packing mode

3. Go to **9.5.2 Configuring the parameters** to set imaging variables for the selected mode.

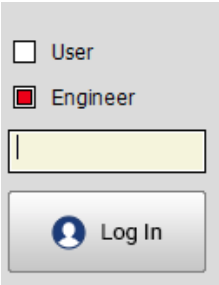
9.5.2 Configuring the Parameters

Before starting the equipment, ensure to configure the console software and the equipment. Follow the steps below to set up your console software environment:

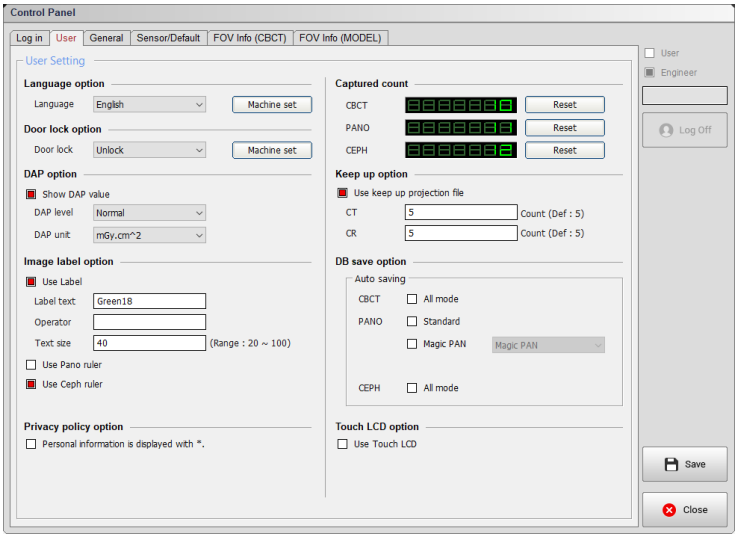
1. Click the Setting icon ( )from the main GUI window



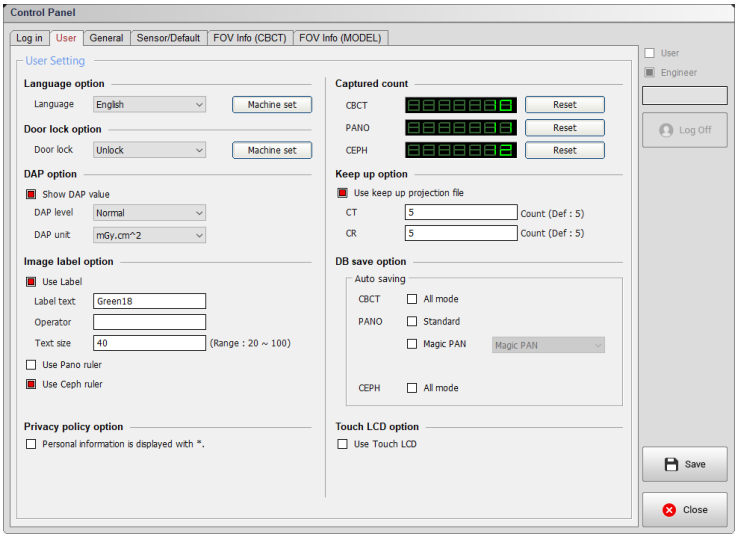
2. Check **Engineer** and type the password (“vatech”).



3. Click the **User** tab and go to the "**Image label option**" to change the text size for Control panel. Enter the number between 20 and 100 according to the user's pref erence.

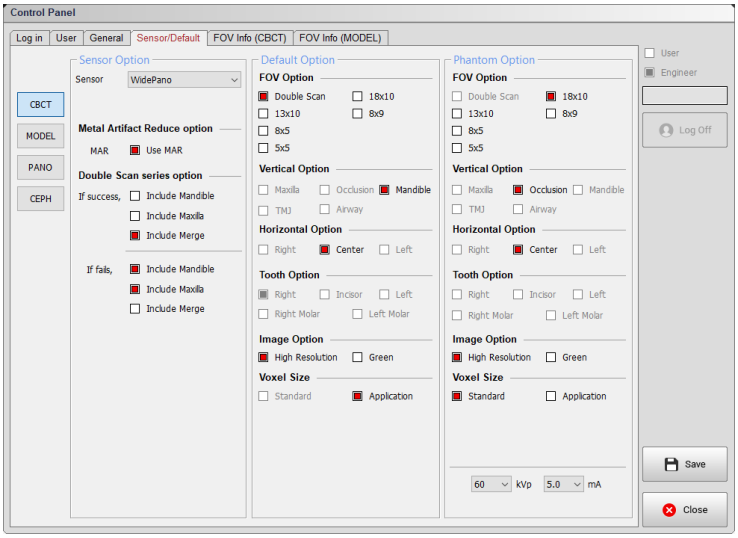


4. Set the DAP (Dose Area Product) level and unit.



5. Select the language and click **Machine se**t to save your choice.

6. Click the Sensor and Default tab. On this tap, you can set variables for each imag ing mode.



7. When selecting options on each menu, click **Save** to confirm your choice.

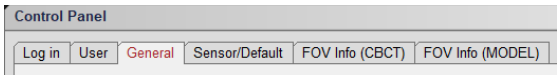
8. Click Close to exit the control panel and restart the computer to apply the new set tings.

9.6 Disabling the Packing Mode

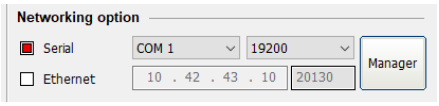
When it is shipped for the first time, your equipment might be in packing mode. Disable the packing mode before starting the operation. If the packing mode is still active, the equipment will not work, even when turning on the power.

Follow the steps below to disable the packing mode:

1. Click the **General tab** on the **Setting** window.



2. Go to the Networking option and check if the serial port and baud rate are set as the image below. Click **Manager** to confirm the settings.

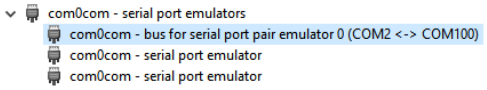


NOTICE

When an error occurs during the connection, check if the COM port setting is correct as of the followings:

A. Start **Device Manage**r.

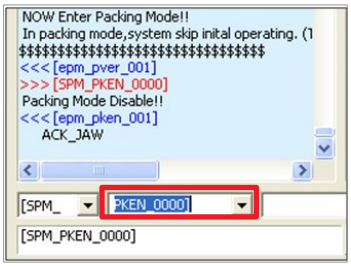
B. Check if the COM port is assigned to a virtual serial port under **com0com – serial port emulators**:



C. If necessary, change the COM port In the Networking option and click **Save**.

3. Enter **PVER**] to verify current mode. Note that the equipment is in packing mode.

4. **Enter PKEN_0000]** to end the packing mode. Upon entering the command, packing mode will be disabled.



5. Click **Exit** and close the control panel window.

6. Restart the equipment so that the change can take effect.

NOTICE	If you want to return to the packing mode, enter **PKEN_0001]** on the command window.

9.7 Selecting an Announcement Mode (Optional)

When selecting an announcement between music and beep arises, take the following procedures.

Commands specifications:

Command format: [SPM_MPOP_XXXX]			
XXXX	**Imaging Modes**	**Announcement Mode**	**Division**
0000	CT/PANO	Music	Different for each mode
0001	CT/PANO	Music	The same for each mode
0002 (Default)	CT/PANO	Beep	The same for each mode

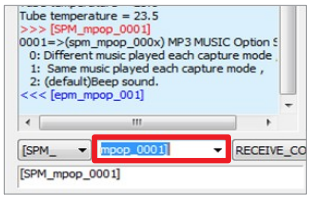
1. Send the command following the command specification, as in the table above.

   Here are some examples.

   Default mode: 0002(beep) for each imaging mode.

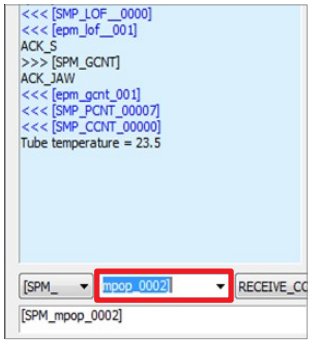
   < When the same Music Announcement is desired for CT and PANO imaging modality >

   : Enter the command **[SPM_MPOP_0001]** in the command field, followed by **Send**.



   < When the same Beep Announcement is desired for CT and PANO imaging modality >

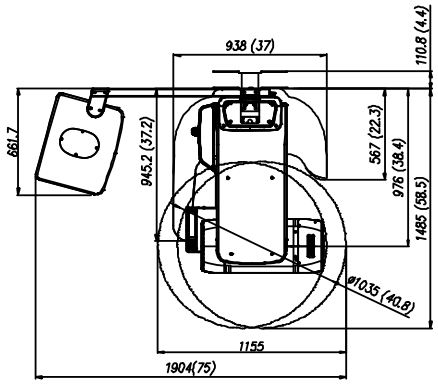
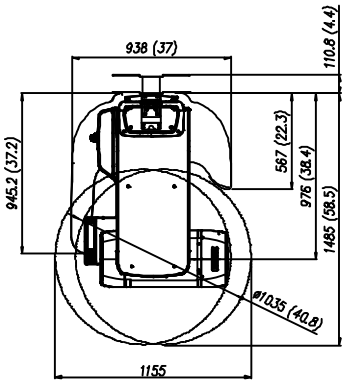
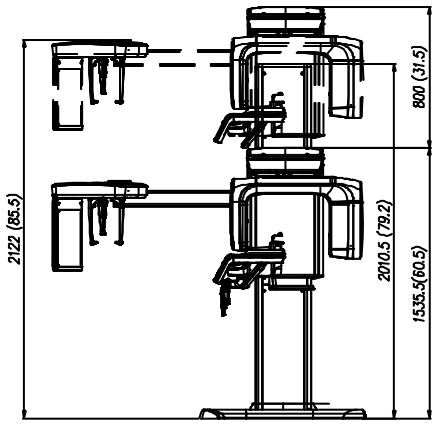
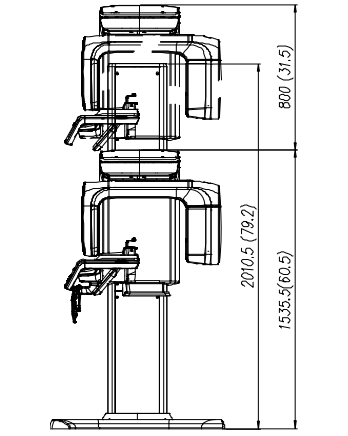
   : Enter the command **[SPM_MPOP_0002]** in the command field, followed by **Send**.

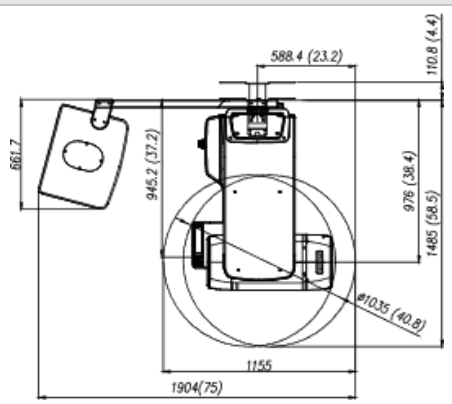
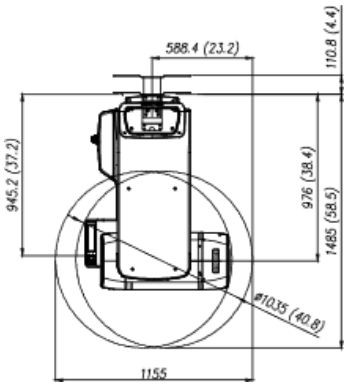
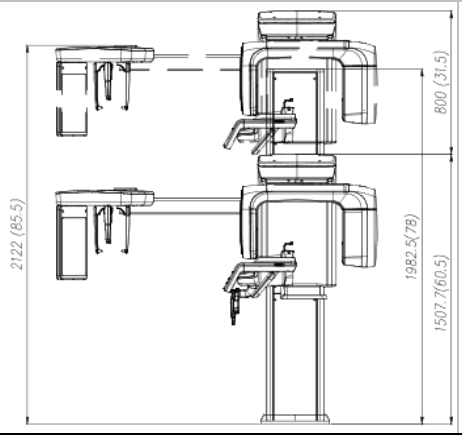
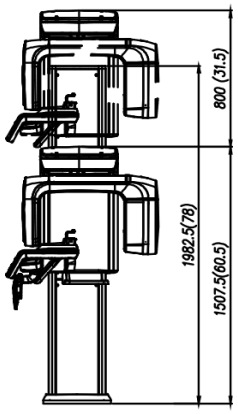


10. Technical Specifications

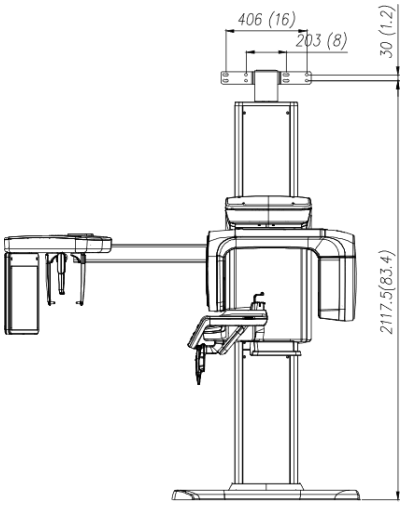
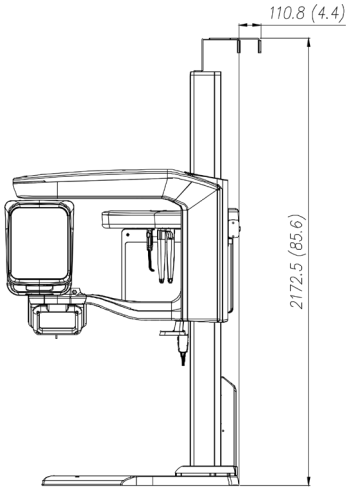
10.1 Mechanical Specifications.

Dimensions (unit = mm)

	With CEPH unit	Without CEPH unit
Top view (with Base)		
Front view (with Base)		

	With CEPH unit	Without CEPH unit
Top view (without Base)		
Front view (without Base)		

(Wall bracket dimensions)

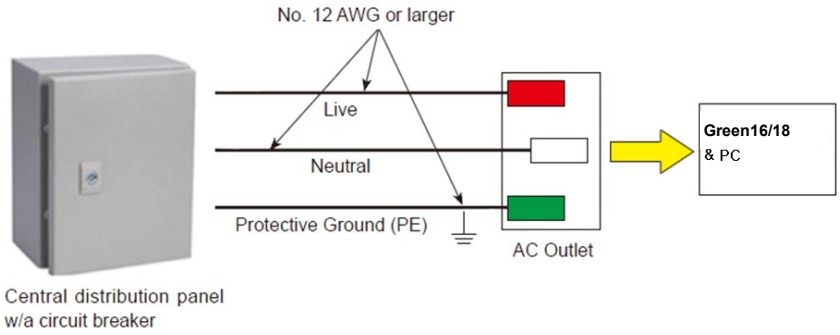
Front view	Side view
	

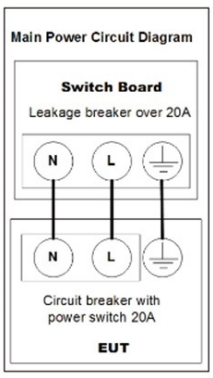
Item		Description
Weight	Without CEPH unit	137 kg (302.0 lbs. – without Base)
		190 kg (418.9 lbs. – with Base)
	With CEPH unit	162 kg (357.1 lbs. – without Base)
		215 kg (474.0 lbs. – with Base)
Total Height	Without Base	Max. 2307.5 mm (90.9”)
	With Base	Max. 2335.5 mm (92.0”)
Dimensions during operation (Length x Width x Height)	Without CEPH unit	1155 (L) x 1595.8 (W) x 2307.5 (H) (mm, without Base) 45.5 (L) x 62.9 (W) x 90.9 (H) (inch, without Base)
		1155 (L) x 1595.8 (W) x 2335.5 (H) (mm, with Base) 45.5 (L) x 62.9 (W) x 92.0 (H) (inch, without Base)
	With CEPH unit	1904.0 (L) x 1595.8 (W) x 2307.5 mm (H) (mm, without Base) 75.0 (L) x 62.9 (W) x 90.9 (H) (inch, without Base)
		1904.0 (L) x 1595.8 (W) x 2335.5 (H) (mm, with Base) 75.0 (L) x 62.9 (W) x 92.0 (H) (inch, with Base)
Rotating Unit Vertical Movement		Max. 800.0 mm (31.5”)
Installation Type		Base Stand/Wall Mount (Default: Wall Mount type)
Packing Box Organization		Main Box, CEPH Box (Optional), Base Box (Optional)

10.2 Electrical Specifications

Item	Description
Power supply voltage	100 - 240 V ~
Frequency	50 / 60 Hz
Power rating	2.0 kVA
Accuracy	Tube Voltage (kVp) ± 10 %, Tube Current (mA) ± 20 %, Exposure Time (s) ± (5 % + 50 ms)

- The input line voltage depends on the local electrical distribution system.
- Allowable input voltage fluctuation requirement: ±10 %.
- Mode of operation: non-continuous operation (NFPA 70: long time operation) - needs waiting time (at least 60 times the exposure time) before the next exposure begins.
- Column operation time: Max. 2 min. On / 18 min. Off (Ratio 1:9)





10.3 Environmental Specifications

Item		Description
During Operating	Temperature	10 ~ 35 ℃
	Relative humidity	30 ~ 75 %
	Atmospheric pressure	860 ~ 1060 hPa
During Transport and Storage	Temperature	-10 ~ 60 ℃
	Relative humidity	10 ~ 75 %
	Atmospheric pressure	860 ~ 1060 hPa

Appendix

A. Installing the Warning Lamp and Door Interlock Switch

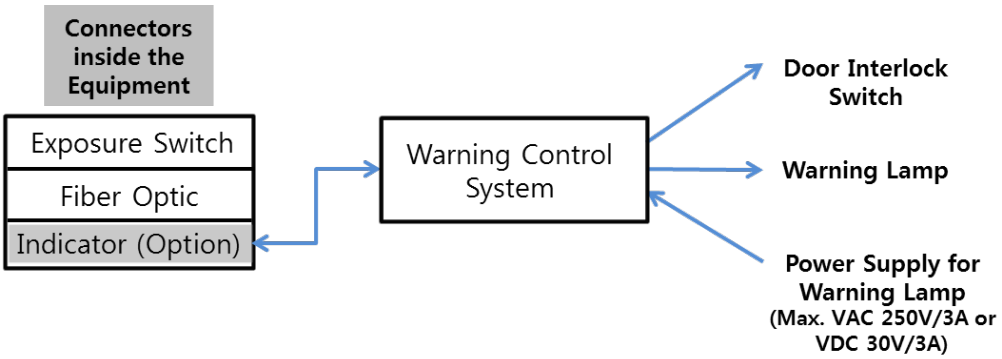
Requirement

1. The warning control system shall be connected to the ERB (earth reference bar) of the room associated with it.
2. The switching arrangements, location, height, and several illuminated warning signs shall be agreed upon with the local radiation protection advisor (RPA). (customer)
3. A fluorescent lamp shall not be used in the 'X-rays on' sign.
4. The customer shall be responsible for the proper installations for the warning control system, including the lamp and door interlock switch, based on the MEIGaN guideline.

MEIGaN: Medical Electrical Installation Guidance Notes

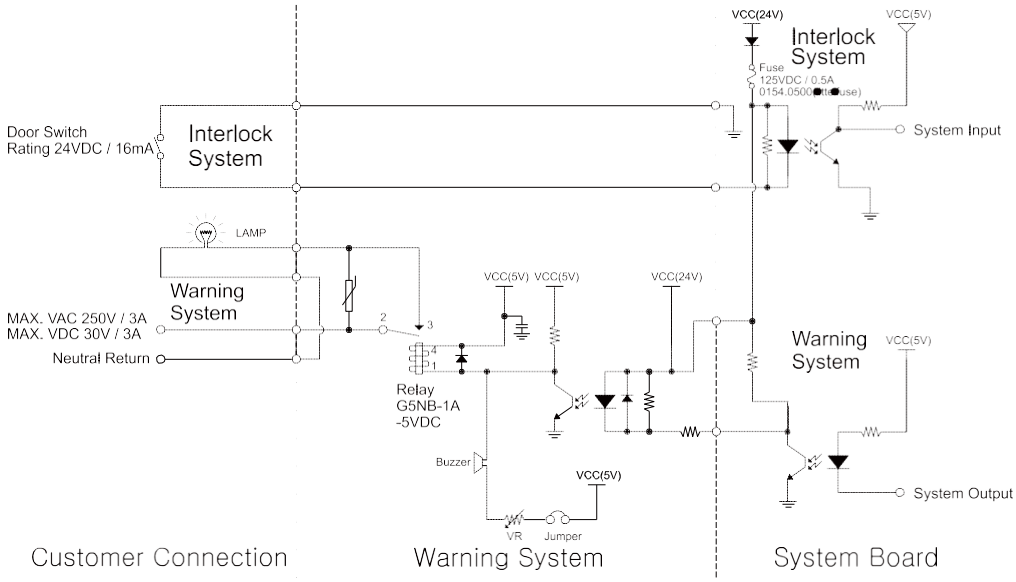
5. Pre-installation planning is crucial to a successful installation for these devices.
6. For further details, refer to the accompanying volume: Specification for Electrical Installation

Block Diagram

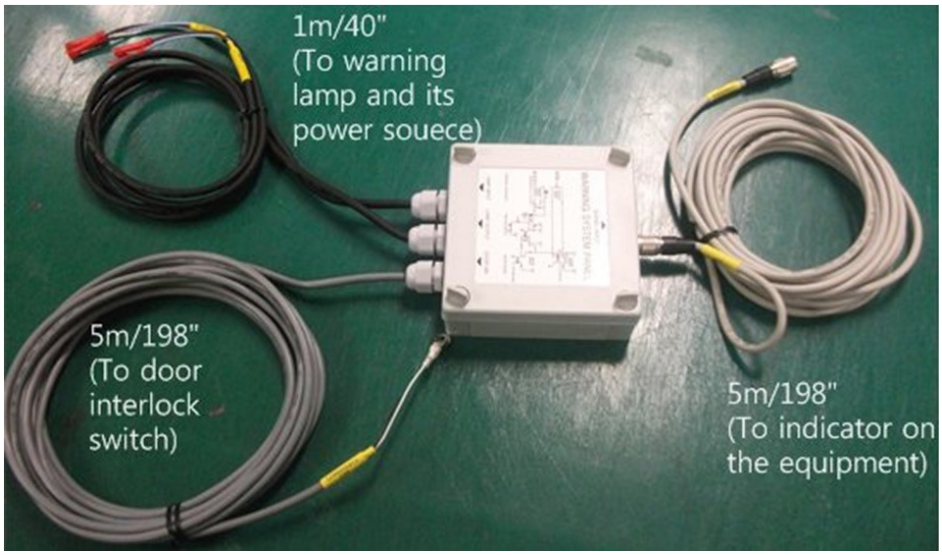


English

Schematic Diagram



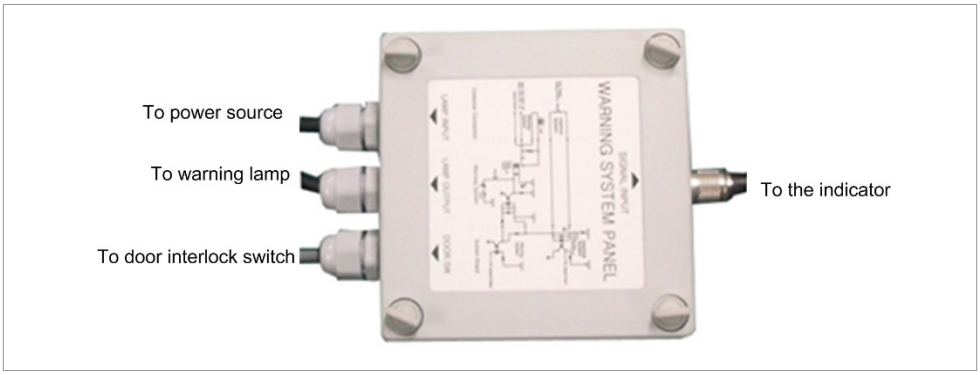
Components Supplied



Procedures

<The individual cable length:>

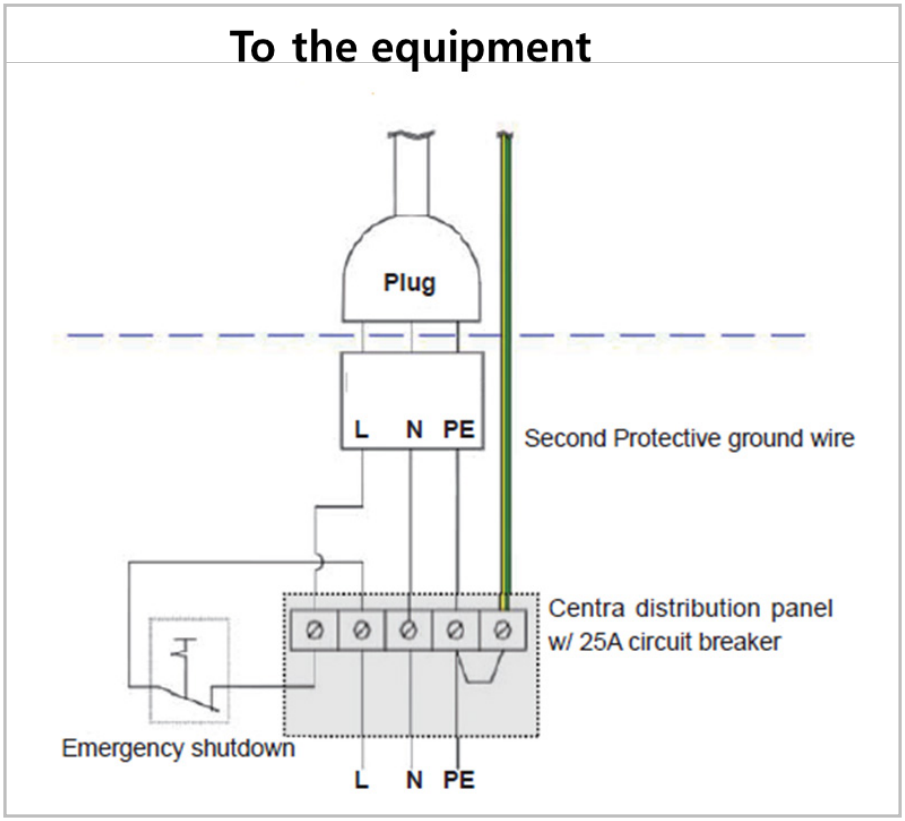
- Signal Cable: 5m/198”
- Door interlock cable: 5m/198”
- Warning lamp: 1m/40”
- Power source cable: 1m/40”



1. Prepare the Warning System Panel (Part No. 28)
2. Install the Warning System Panel at the proper height after taking each cable length into account.
3. Connect the warning lamp (not provided).
4. Connect the door interlock switch (not provided).
5. Connect the power source for the warning lamp.

B. Installing the Emergency Stop Switch

- Install the **Emergency Stop Switch** in the power cable line.
- Install this switch, so it is easy to reach in the emergency case but can't be pushed bymistake.
- The switch shall be a type of mistake-proof.
- The switch is not supplied.]
- The switch shall be installed at the height of 1.2 to 1.5 meters (47 to 60").



1. The cable sizes: N, L, and PE≥ 12 AWG (3 x 4 mm^2).
2. The cable to **Emergency Stop Switch** shall be the same size as the power cable itself.
3. Install the socket connector terminal for the 2nd protective ground wire.

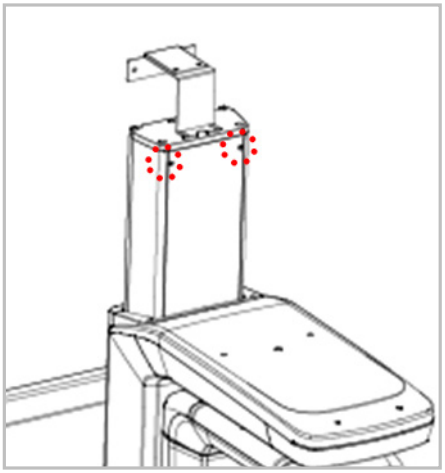
C. Limiting the Column Height

This section explains how to limit the column height within the permissible range.

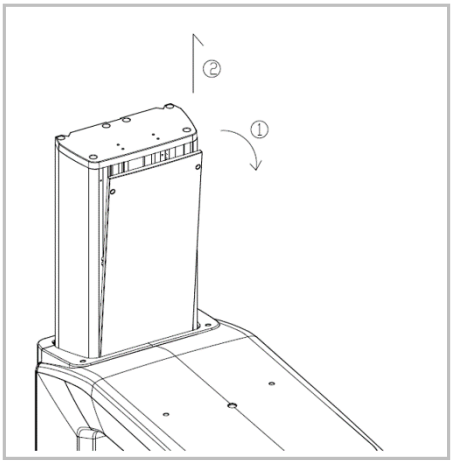
1. Measure the ceiling height in the X-ray shield room: $H_{ceiling}$

< Removing the column covers >

2. Remove two Fixing Bolts as shown in the figure.



3. Remove the Column Rear-Top Cover as shown in the figure.



Determining the Height

1. Determine the screw height using the following formula.

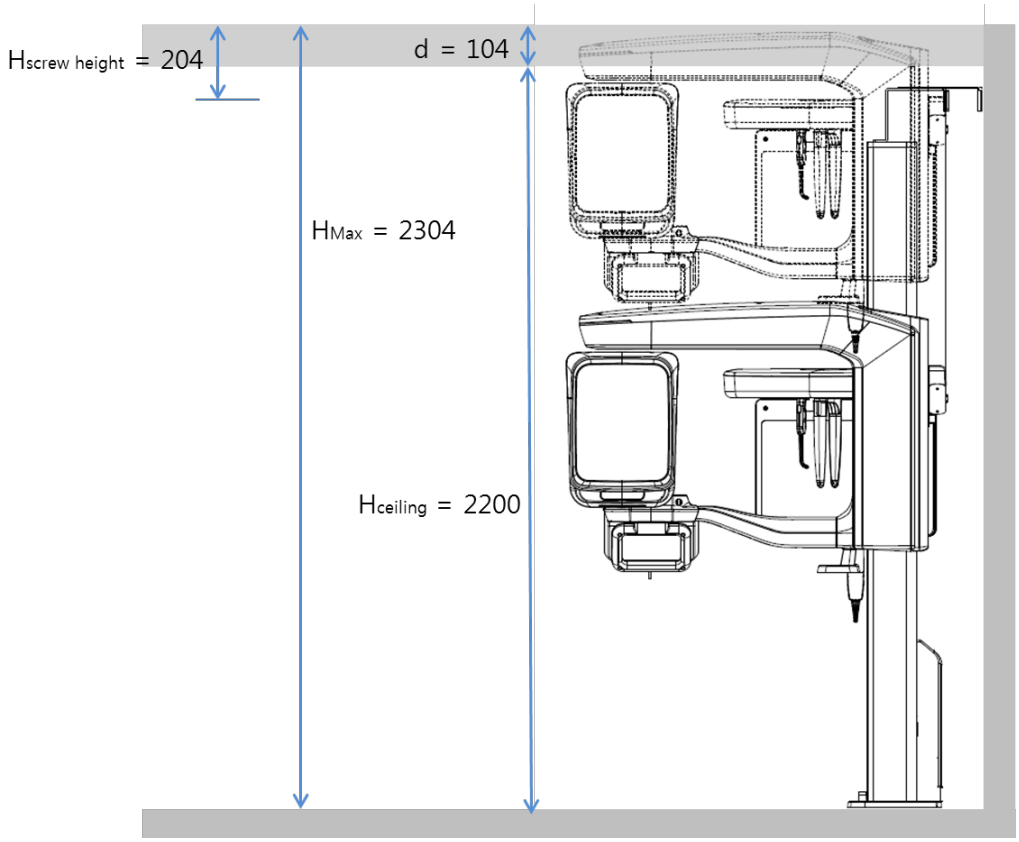
   $H_{screw\ height} = 100\ mm - d$

   - 100 mm: the minimum desired distance between the ceiling and the top of the equipment when the column is fully extended.
   - $d = H_{ceiling} - H_{Max} = H_{ceiling} - 2304$ mm (Example hight: The height of the equipment without Base)

     Ex) If $H_{ceiling}$ is 2200 mm, $H_{screw\ height}$ value is calculated as follows:

   - $d = H_{ceiling} - H_{Max} = 2200\ mm - 2304\ mm = -104\ mm$
   - $H_{screw\ height} = 100\ mm - d = 100\ mm + 104\ mm = 204\ mm$

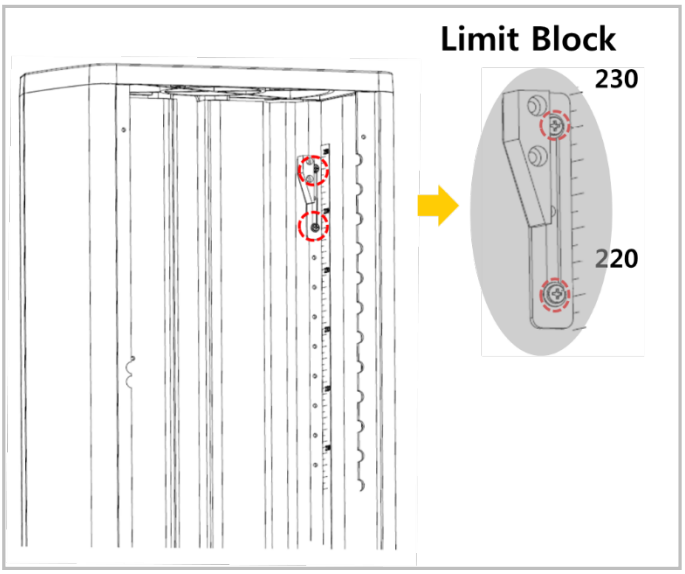
     (If d is more than 100 mm, the column height limit is not necessary.)



Adjusting the Screw Height

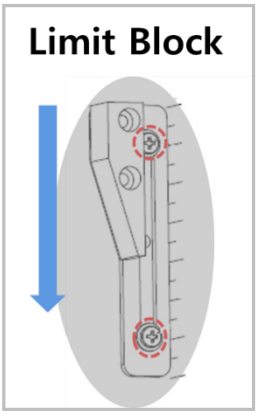
We know the $H_{screw\ height}$ is 204 mm from the previous example. So we will move the screw from the default (current) position to a new one.

1. Loosen two bolts halfway **(important!)**.



IMPORTANT	Do not unscrew the bolt completely. If not, it could drop into the column and cause big trouble retrieving it.

2. Looking up the scale, slide the Limit Block down to a new location ($H_{screw\ height}$ = 236 mm) and fix it back.



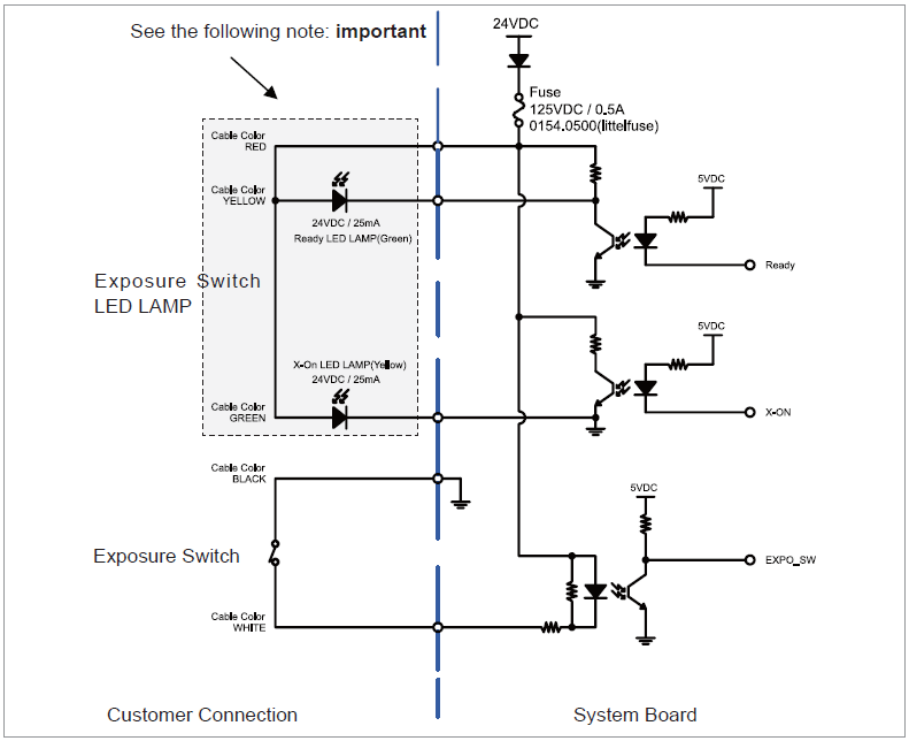
3. Put the covers back in reverse order and fix them with the bolts.

D. Connecting the 3rd party Exposure Switch (Optional)

This section explains how to connect the third-party **Exposure Switch** with the equipment from **VATECH**.

< How to >

1. Cut the **Exposure Switch** cable provided with the equipment.
2. According to the following schematic diagram, rewire the cables.
3. Double-check the wiring before use.



NOTICE	Tape the end of each unused wire to prevent the wires from causing an inadvertent short circuit

E. Checking PC BIOS Settings

< HP PC BIOS Setup >

PC Model: HP Z440

PC BIOS default			
Main Menu	**Sub1 Menu**	**Sub2 Menu**	**Setup Value**
Advanced	Power Options	Runtime Power Management	[Disable]
Advanced	Power Options	Idle Power Savings	[Normal]
Advanced	Power Options	Enhanced Halt State (C1E)	[Disable]

F. Installation Checklist

1. General Information:

Customer

Information about the Equipment Purchaser	
Name of Clinic or Hospital	
Address	
Phone	
E-Mail	
Web site	

Dealer

Information about the Equipment Seller	
Name of Dealer	
Address	
Phone	
E-Mail	
Web site	

2. Installation Information:

Address of Installation Site	
Names of Installers	
Scheduled Date of Installation	
Date of installation	
Model	
Serial No.	

3. System Delivery to Site:

	Yes	No
Did you review and identify the delivery route and method for equipment in advance?	☐	☐
Is the freight elevator available?	☐	☐
Is the security guard, if any, notified of the installation in advance?	☐	☐
Are two installers, including the helpers, available to move and unload the equipment?	☐	☐

4. Before Installation:

Site Check List

	Yes	No
Is the room large enough? At minimum, with CEPH unit : 2,804 mm (L) x 2,495.8 mm (W) x 2,435 mm (H) / 111” x 99” x 96” Without CEPH unit : 2,055 mm (L) x 2,495.8 mm (W) x 2,435 mm (H) / 81” x 99” x 96”	☐	☐
Is the door entrance wider than 800mm (32”)?	☐	☐
Is a radiation protection plan in place?	☐	☐
Do equipment and PC use the same dedicated circuit?	☐	☐
Does the electrical input condition to the installation site meet the MEIGaN requirements?	☐	☐
Is the local Network IP address of clinic 192.168.33.xx?	☐	☐
Is a compressor or air conditioner suction located right next to X-ray Room?	☐	☐
Is the floor flat and level?	☐	☐
Is the carpet on the floor? If so, remove it.	☐	☐

Before Opening Boxes

	Yes	No
Did the delivery company carry and handle with caution?	☐	☐
Did the installers take pictures of boxes before opening them?	☐	☐
Did the installer make sure there were no suspicious holes or scratches on the box?	☐	☐
Is the ShockWatch indicator red?	☐	☐
Is the TiltWatch indicator red?	☐	☐

After Opening Boxes

	Yes	No
Did the installers make sure there were no scratches or broken surfaces on the equipment?	☐	☐
Are all accessories and cases included in the box?	☐	☐
Have you read the installation manual out in its entirety before starting the installation?	☐	☐
Did the installer take pictures after opening the boxes?	☐	☐
Did the installer make sure there were no suspicious holes or scratches on the box after opening?	☐	☐

5. While Installing Equipment

	Yes	No
Are installers careful with any sensitive parts while carrying equipment?	☐	☐
Did the installers ensure that various cables, especially optic cables, are not coiled too much?	☐	☐
Did the installers perform installations, according to the manual?	☐	☐
Did the installers not touch or place pressure on sensors while installing?	☐	☐
Did the installer ensure the harness and equipment are well connected and not damaged?	☐	☐
Did the installers check if the emergency button (switch) is working properly?	☐	☐
Did the equipment be well balanced?	☐	☐

6. After Installation

	Yes	No
Does the chin rest successfully initialize after turning on the system?	☐	☐
Are the cables organized well?	☐	☐
Is it OK after visually checking the equipment?	☐	☐
Is the normal voice message audible during system initialization after turning on the system?	☐	☐
Does the LED on the front of the equipment turn green?	☐	☐
Do the equipment's Up/Down switch works properly?	☐	☐

7. Software Compatibility

	Yes	No
Anti-virus software installed?	☐	☐
Installed a firewall? If yes, indicate software or hardware.	☐	☐
	Type:	
Is the 3rd party software installed? If yes, indicate the name(s) and versions.	☐	☐
Are they compatible with software from **Vatech®**? If No, indicate the name(s) and versions.	Version:	

8. Electrical Requirements:

	Yes	No
Is the circuit breaker installed and tested in the distribution panel for over-current protection w/ 20A?	☐	☐
Is internal line impedance checked? ($Z_{input} \leq 0.5\Omega$)	☐	☐
Do equipment and PC use the same dedicated circuit?	☐	☐

9. Network Configuration:

	Yes	No
Is a network configured with 1 Gbit/s of CAT5?	☐	☐
Is the equipment connected to the network?	☐	☐
Is the network installation company identified?	☐	☐
What is the TCP/IP address assigned?	Address:	
What is the subnet masking address?	Address:	
Is there a DHCP server?	☐	☐

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CE 2460

The CE symbol grants this product compliance to the European Directive for Medical Devices 93/42/EEC as amended by 2007/47/EC as a class IIb device.

Green 16™
Green 18™

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