



PaX-i (PCH-2500)

Installation Manual | Version 2.6.0

HARDWARE and SOFTWARE

English

innovation **i**nside

"i" stands for 'innovation', one of the core values of VATECH, which aims to expand accessibility of medical solutions to more people.

Notice

This manual covers the installation procedures for the **PaX-i** dental X-Ray unit. An installation manual and user manual are shipped with each hardware unit.

Product name: PaX-i (Model: PCH-2500)

Manufactured by : VATECH Co., Ltd.

In this manual, Equipment refers to the **PaX-i**.

In abbreviated forms, **CEPH** and **PANO** denote **Cephalometric** and **Panoramic**, respectively.

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

Thorough review of this manual is recommended before installation to ensure proper installation of this equipment. The **PaX-i** is in steady improvement. The information contained in this manual may be subject to change without notice, justification or notification of the persons concerned.

All brand names and logos used in this manual are copyrighted.

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

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Important Information



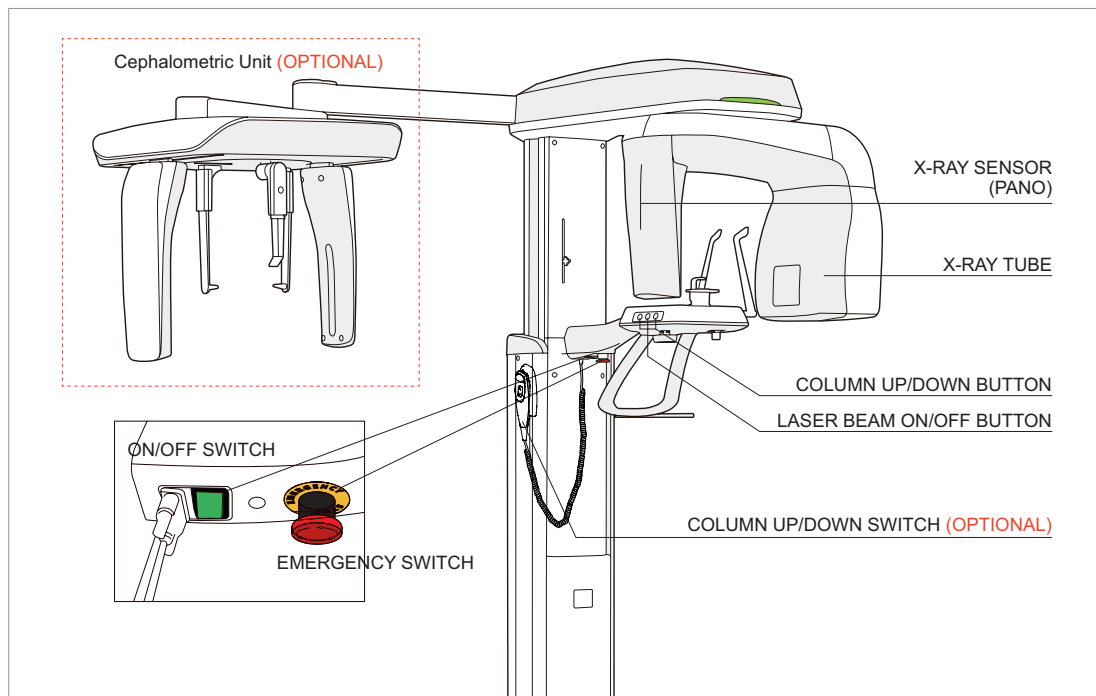
When installing the equipment under sudden temperature change inside and outside of the building, which could cause moisture condensation on it, allow at least an hour before turning ON the equipment



Failure to read and understand the information provided in this manual may result in physical injury, damage to the equipment or equipment failure. Please read each CHAPTER in its entirety and understand the information therein before attempting any of the installation procedures.







1. In order to avoid improperly balanced equipment, install the device on a flat surface to maintain stability.
2. If the equipment is not stable, property damage and/or personal injury may occur.
3. Do not push or pull the equipment.
4. Equipment should only be installed by an authorized technician, complying with proper installation procedures.

Location of the power and emergency stop switches

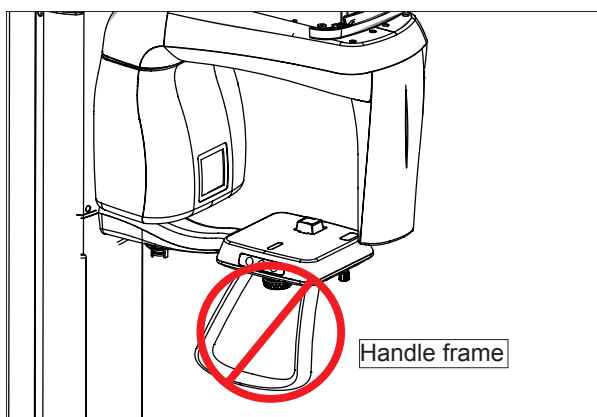
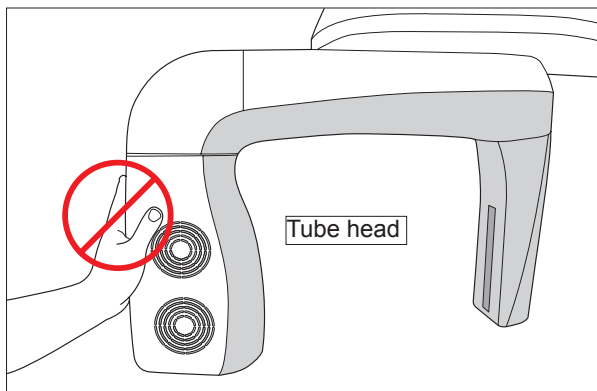
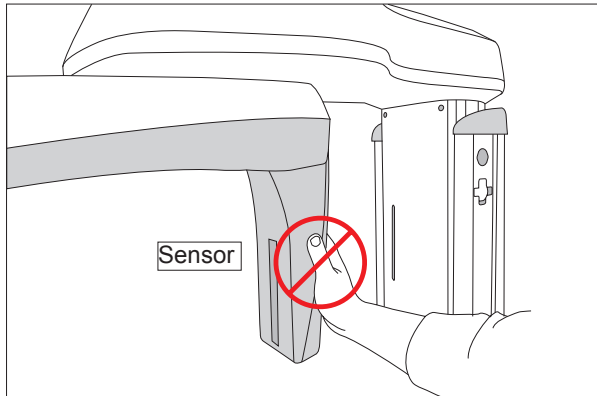


Conventions Used in this Guide

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 obey the instructions which appear to the right of the symbol.

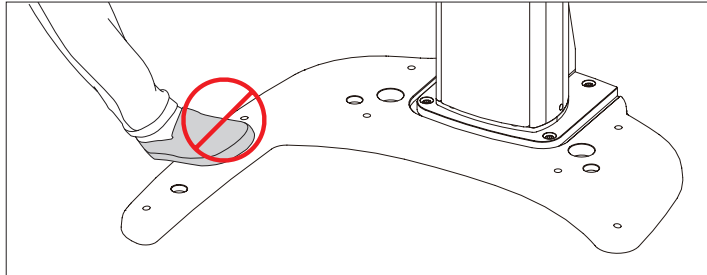
	<p>Notes help you optimize system performance. Carefully read each note to ensure that the equipment is used to its full potential.</p>
	<p>Cautions indicate a situation that demands prompt but careful action, remedy or emergency attention.</p>
	<p>Warnings indicate information that should be followed with the utmost precision. Failure to comply with warnings may result in severe damage to the equipment and/or physical injuries to the patient or operator.</p>
	<p>Radiation symbols indicate a possible danger from exposure to radiation.</p>
	<p>Important symbols indicate a compulsory action or instruction.</p>
	<p>ESD susceptibility symbols indicate that an item is susceptible to damage from electrostatic discharges.</p>

Never touch or hold the sensor or tube head areas while moving, installing or operating this equipment.





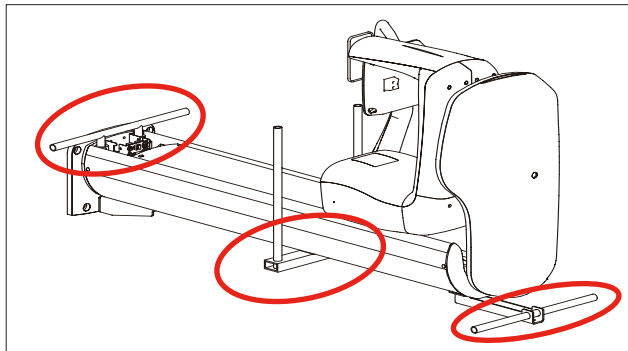
Do not step on the base of the unit while installing or operating the equipment.



Do not use the electrical power drill during installation unless it is allowed to do so.



Recommended holding area during transportation(OK)



3 installers are required to install the equipment safely.



Cautions

1. It is critical that installers read and understand the installation instructions fully before installation.
2. The installer must confirm that the system is installed according to the instructions provided by this manual and perform the appropriate procedures therein.
3. If the equipment has been stored at temperatures of below 10°C (50°F) for more than a couple of hours, allow the equipment to reach room temperature before applying mains voltage.
4. Installation and related work must only be performed by people authorized by VATECH.
5. Do not connect any items or equipment to this system which are not part of the system: **IEC60601-1-1**
6. Any equipment not approved by VATECH must comply with the applicable standards: **IEC 60950-1** for IT equipment (Ex: PC) and **IEC 60601-1** for medical electrical equipment.
7. All operators of this equipment are responsible for ensuring that the requirements outlined in **IEC 60601-1-1: Safety Requirements for Medical Electrical Equipment** are fully met to ensure the safety of patients, operators and the environment.
8. Never touch sensitive areas such as sensors during installation. These areas are indicated at the applicable stages during the installation procedures.
9. Use of wireless phones may interfere with the operation of this equipment.
10. Use an ESD (electrostatic sensitive device) wrist band during installation and connect it to a ground wire.
11. Touch a ground point to discharge static electricity before handling PCB boards.



Installation Site

1. 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 an emergency.
2. Proper shielding of the room is essential: Since these requirements vary depending on the country, it is the installer's responsibilities to verify that all applicable radiation safety requirements are met.
3. This equipment should not be installed in the immediate vicinity of other devices.
4. Do not install the equipment in an area that is exposed to strong electromagnetic fields.
5. Do not install this system in an area where there is the risk of an explosion.
6. The electrical installation of this system shall comply with all local code requirements for electro-medical systems: **IEC 60364-7-710**.
7. It is strongly recommended that a UPS be installed at the same time as the equipment.
8. The equipment, PC, and all peripheral devices must be well grounded



Warnings Regarding X-Ray Radiation

1. Failure to install this equipment in an approved location may be dangerous to the patient and operator.
2. Stationary radiation shielding must be installed to protect the operator from radiation.
3. The X-Ray system may cause injury to the patient if improperly used. Obey all federal and municipal standards regarding radiation safety.
4. When exposing the patient to the X-Ray, the operator must be behind a protective wall or take other protective actions. The operator should remain at least 2 m (7 feet) away from the X-Ray when pressing the exposure switch and observe the patient and capture-progression.
5. Operators must provide protective clothing to the patient before X-Ray capturing. Pregnant women must consult with a doctor prior to being exposed to an X-Ray.



This equipment complies with the following standards:

Installation and operation of this equipment complies with the following standards:

IEC 60601-1: General requirements for safety

IEC60601-1-1: General requirements for safety - Collateral standard: Safety requirements for medical electrical systems

IEC 60601-1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic

IEC 60601-1-3: General requirements for safety - Collateral standard: General requirements for radiation protection in diagnostic X-ray equipment

IEC60601-2-7 and IEC60601-2-28: Particular requirements for the safety of high-voltage generators of diagnostic X-ray generators / Particular requirements for the safety of X-ray source assemblies and X-ray tube assemblies for medical diagnosis

IEC 60601-2-32: Particular requirements for the safety of associated equipment of X-ray equipment

IEC 60950-1: 2nd edition: Standards for Information Technology Equipment

IEC60364-7-710: Local Code Requirements for Electro-medical System Installation

1. **IEC 60601-1:** regulations must be fully met in order to ensure the safety of patients, operators and the environment when any person assembles or modifies a medical electrical system or combines it with other equipment.
2. Any equipment not provided by VATECH must be connected in compliance with the following standards: **IEC 60950-1** and **IEC 60601-1**.
3. The electrical installation of this equipment must comply with local code requirements for electro-medical systems: **IEC 60364-7-710**.

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Introduction

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1.1 Manufacturer's Liability

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















- Equipment installation, including software installation, was carried out by an authorized agent in accordance with this installation manual.
- Electrical installation was carried out in accordance with 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 condition in accordance with the user's manual.
- PC Software has been properly used in accordance with the manufacturer's installation instructions and user manuals.

1.2 Customer's Responsibility

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

- Install all required materials prior to 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 hall way and entry door sizes.
- The customer must have an electrician install more than two power outlets in the room.

1.3 Marks & Symbols

Symbols	Description	Location
	Alternate current	
	Attention: consult accompanying documents	Label
	Dangerous voltage	Power board
	Protective earth (Ground)	Power board
	Off (power: disconnect from the main switch)	Main switch
	On (power: connect to the main switch)	Main switch
	TYPE B Equipment	Label
	Radiation hazard	Label
	EC representative	Manual
	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
	This equipment is UL-marked according to UL60601-1 and CAN/CSA C22.2 No. 601.1	Label
	Address where the equipment was manufactured	Label
	This symbol indicates that electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately.	Label
	This symbol warns the user to take precautions when dealing with electronic components which are sensitive to static charges	MCU board packaging
	This symbol indicates that this equipment is classified as a CLASS 1 LASER PRODUCT in accordance with IEC 60825-1 ED.1 regulations.	Label

1.4 Standards and Regulations

A. Standards

This X-Ray equipment complies with the following standards:

IEC/EN/UL 60601-1, IEC/EN 60601-1-1, IEC/EN 60601-1-2, IEC/EN 60601-1-3, IEC/EN 60601-2-7, IEC/EN 60601-2-28, IEC/EN 60601-2-32, ISO 9001, ISO 13485



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.

B. Classification: (IEC60601-1 6.1)

Protection against the ingress of water: IEC60529 edition 2.1

Ordinary Equipment: IPX0

Protection against electric shock:

Class I equipment, Type B Applied Parts



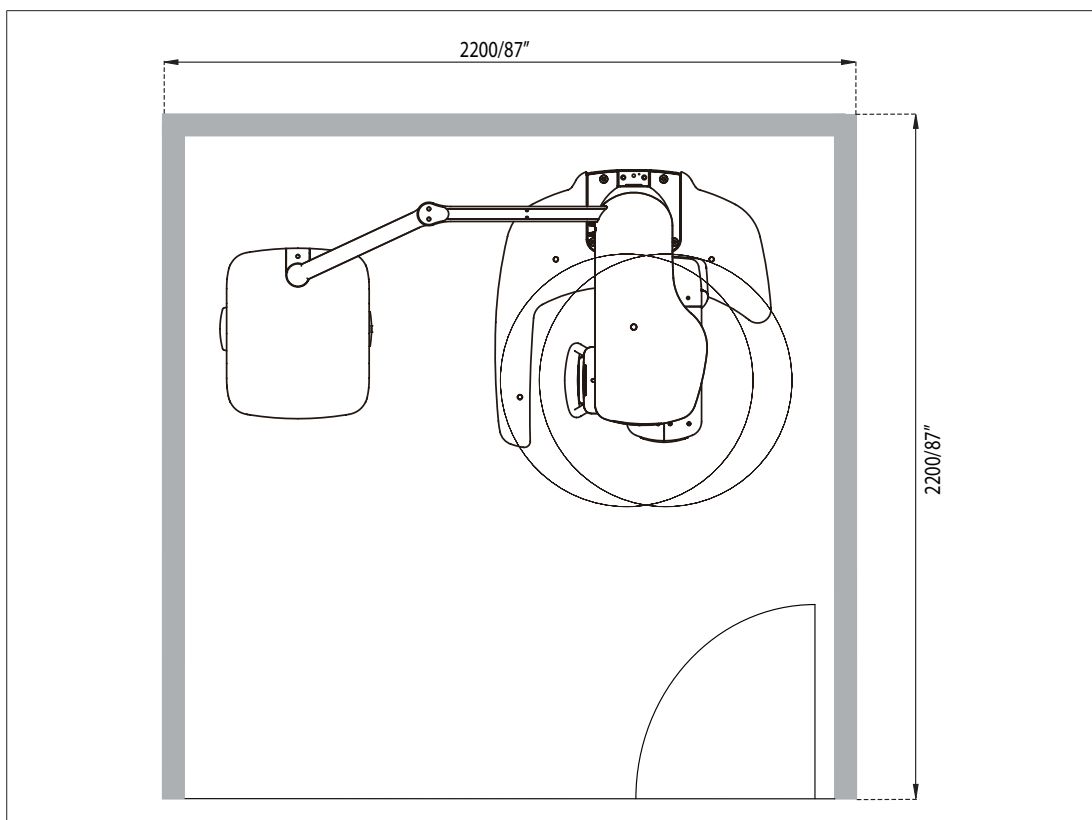
Choosing an Installation Site

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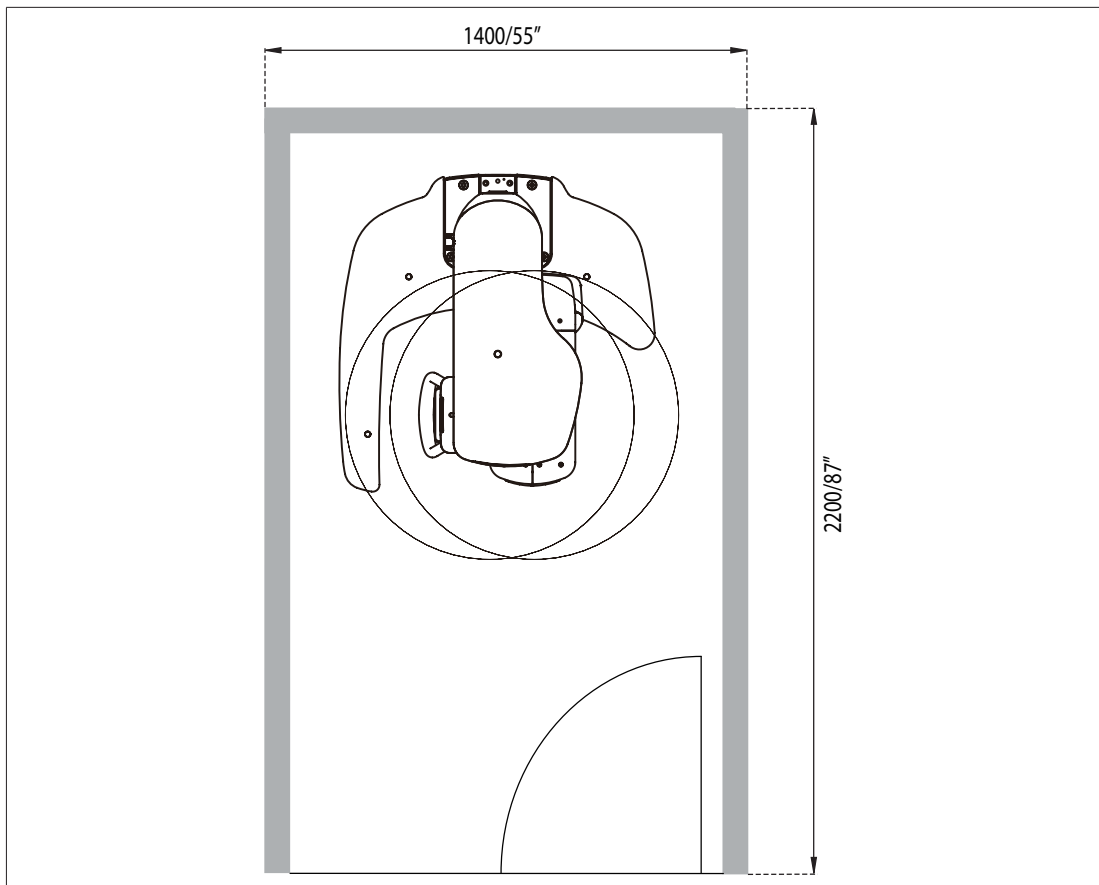
2.1 Room Requirements



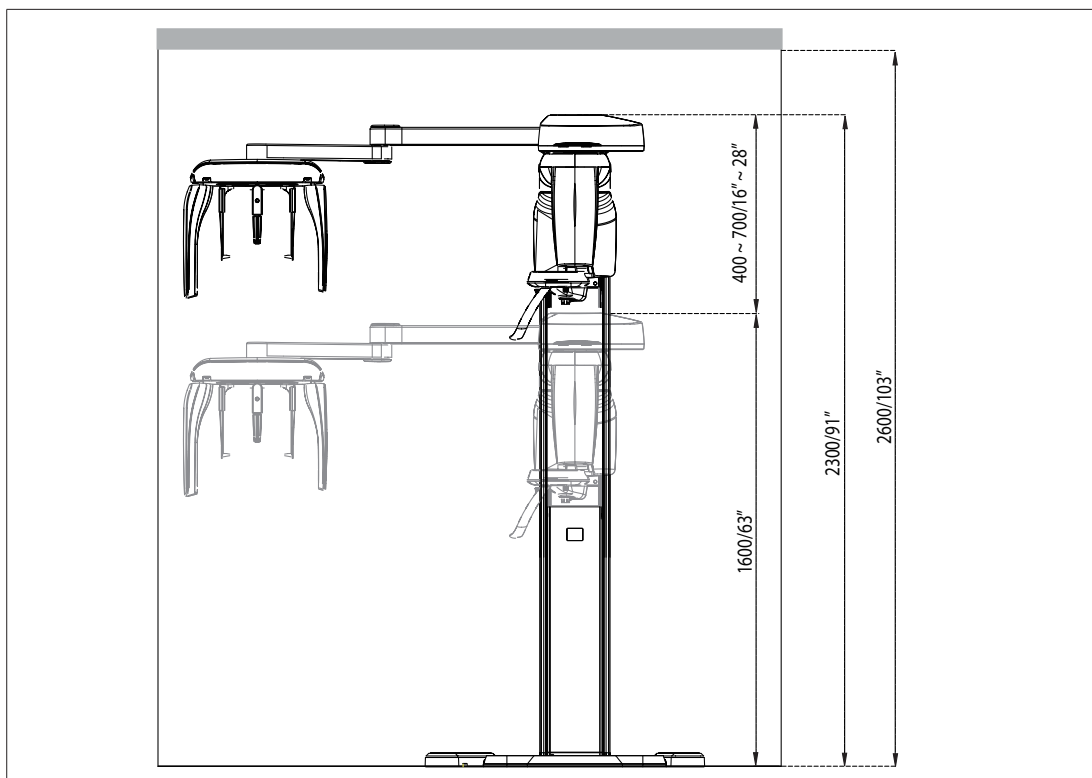
1. The location of this equipment should allow for high visibility of the patient by the operator and the operator should be as near to the patient as possible.
2. This equipment should not be installed on thick carpets for stability reasons.
3. Anti-static floor materials should be used around the equipment.
4. 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.



With Cephalometric unit (optional): 2,200 mm x 2,200 mm/87" x 87" or wider



Without Cephalometric unit: 2,200 mm x 1,400 mm/87" x 55" or wider



Minimum space required:

- **With Cephalometric unit:** 2,200 mm(L) x 2,200 mm(W) x 2,600 mm(H) / 87\"(L) x 87\"(W) x 103\"(H)
- **Without Cephalometric unit:** 2,200 mm(L) x 1,400 mm(W) x 2,600 mm(H) / 87\"(L) x 55\"(W) x 103\"(H)

The system is normally installed beside a wall, and the operator uses the system on the left.

Lead thickness: ≥ 1 mm

Width of the entrance:

The door of the X-Ray room should have a clearance of more than 800 mm (31.5\") wide.

Floor area:

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

The floor must be able to support a minimum weight of 500 kg/m² (110 lbs/feet²).

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 Requirements



It is mandatory that both PC and equipment use the same power line if 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.

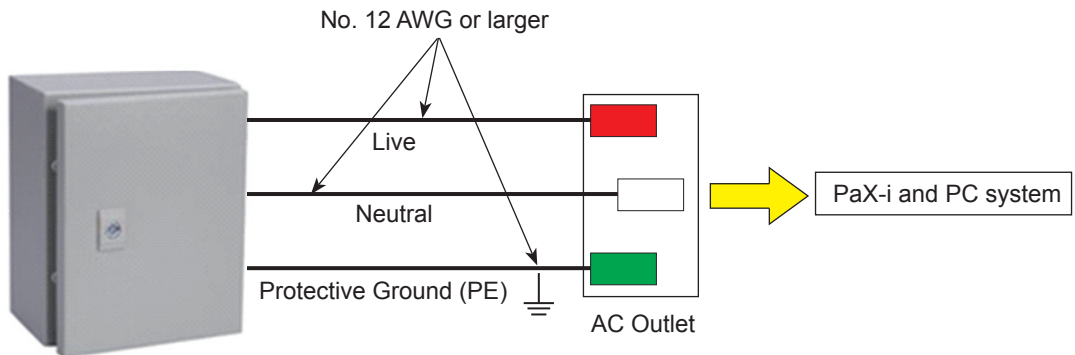
This equipment must be connected to a grounded outlet to fulfill the safety provisions specified in IEC 60364: the 2nd edition (2006).

Use a dedicated power outlet for the power cord. Failure to do so may result in unstable system operation caused by power fluctuations.

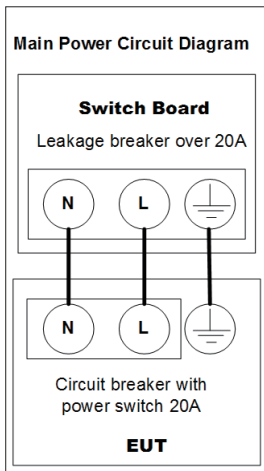


It is strongly recommended that you install an AVR. An AVR (automatic voltage regulator) maintains a constant voltage and allows for continuous operation in the event of a power fluctuation.

Power supply voltage	AC100-120 V / 200-240 V
<ul style="list-style-type: none"> The input line voltage depends on the local electrical distribution system. Allowable input voltage fluctuation requirement: $\pm 10\%$. 	
Frequency	50/60 Hz
Phase	single
Power rating (maximum power consumption)	Max.2.0 kVA (during exposure)



Central distribution panel w/a circuit breaker



1. To assure line voltage quality, a separate 3-core grounded power cable connected directly to central distribution panel with over-current circuit breaker rated for 20/15A must be used.
2. The mains resistance should not exceed 0.5 Ω .
3. This equipment should be connected to the earthed outlet.



2.4 Temperature and Humidity

During operation:

Ambient temperature	10 ~ 35 °C (50 ~ 95 °F)
Relative humidity	30 ~ 75 %
Atmospheric pressure	860 ~ 1060 hPa

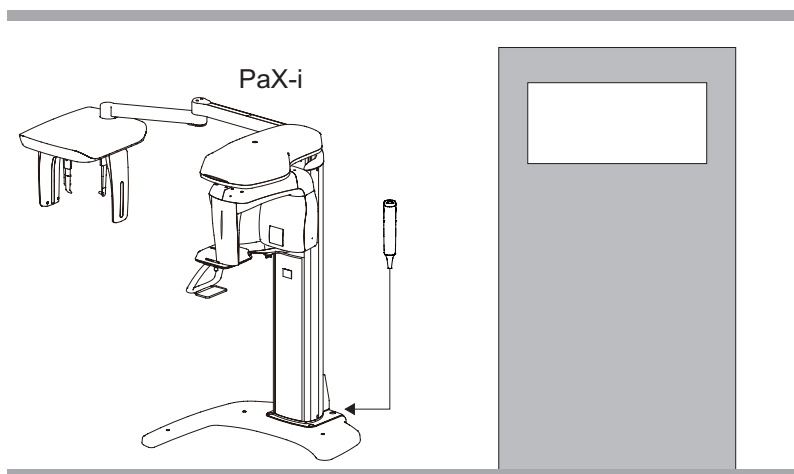
During transportation and storage:

Temperature	-10 ~ 60 °C (14 ~ 140 °F)
Relative humidity	10 ~ 75 % non-condensing
Atmospheric pressure	860 ~ 1060 hPa

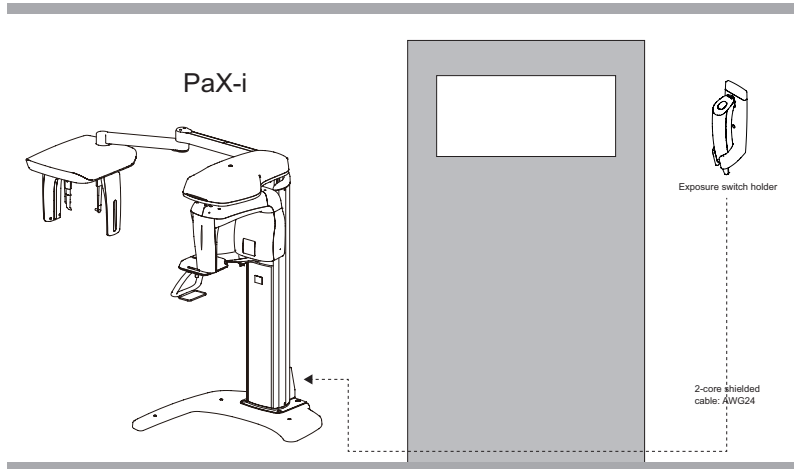
2.5 Exposure Switch Installation Options

There are three options for installation, depending on the configuration of the site. Nevertheless, the 2nd option is preferred.

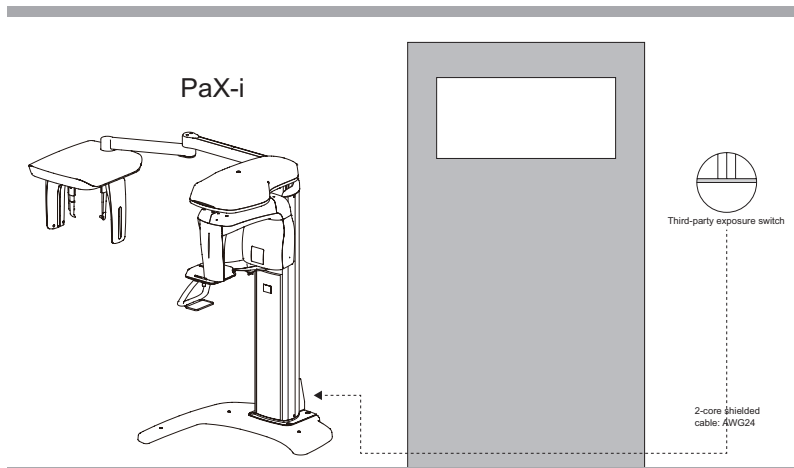
Option No. 1: The user operates the exposure switch from inside the X-Ray room.



Option No. 2: The user operates the exposure switch from outside the X-Ray room.
The exposure switch holder is mounted on the wall.

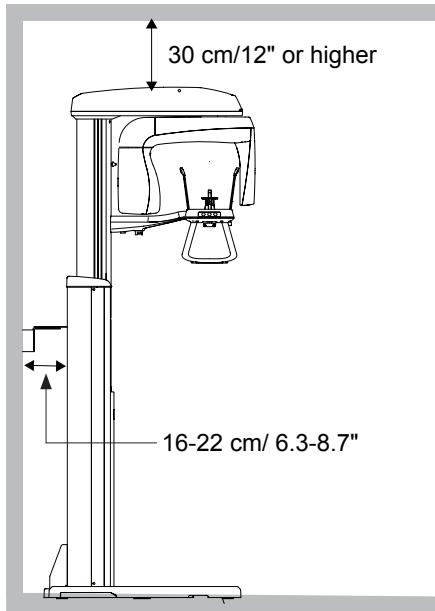


Option No. 3: The 3rd party exposure switch (not VATECH's) is used on demand of the customers.
For this scenario, see the Appendix D “**Connecting the 3rd party exposure switch**” for details.

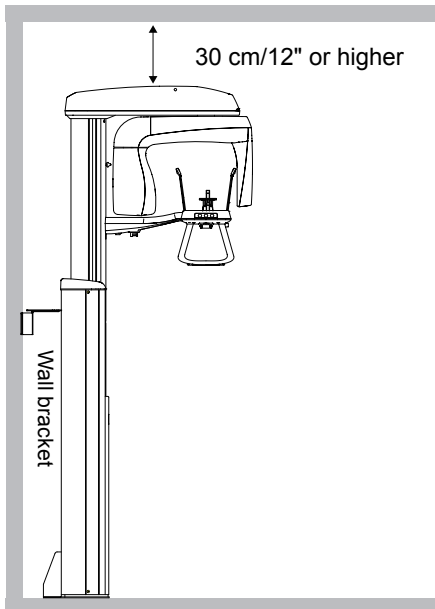


2.6 Installation Versions

Base unit and wall mount bracket 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 the 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.


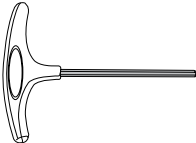
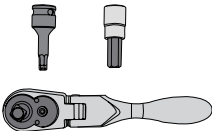
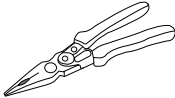
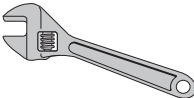
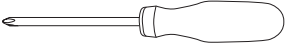

- Install the emergency stop switch along the main power cable in the central distribution panel.
- Install this switch so that it is within easy reach of the operator but cannot be accidentally pressed.
- The switch must be a fool-proof model..





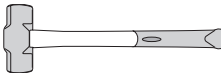
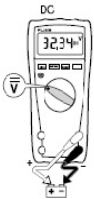

Before Installing the System

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3.1 Required Tools

The following tools are necessary to install the **PaX-i**.

Item	Figure	Size
Wrench set	 <p>Allen wrench set 1.5 mm - 10 mm (0.05"-0.4")</p>	1.5 mm-10 mm/0.05"-0.4"
T-shaped hex wrench		6 mm-10 mm/0.23"-0.4"
Ratchet wrench		Tips: 3 mm-8 mm/0.12"-0.3"
Needle-nose pliers		regular
Monkey wrench		
Cross head screw driver w/ magnetic tip		L=200 mm(7.9")
Spirit level		

Item	Figure	Size
Anti-static glove		
Knife		
Tape ruler (Optional)		5 m: for wall mounted type
Marker pen(thick tip)		For wall mounted type
Hammer (Optional)		For wall mounted type
Multi-meter		
Hammer drill(Optional)		For wall mounted type

3.2 Checking the ShockWatch and TiltWatch Indicators

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



The installers and/or supervisor should check the status indicators on each package before opening the package.



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 very sensitive to external impacts

Check the followings before opening each package:

1. These indicators are affixed only on the main box, which contains the equipment very 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**.



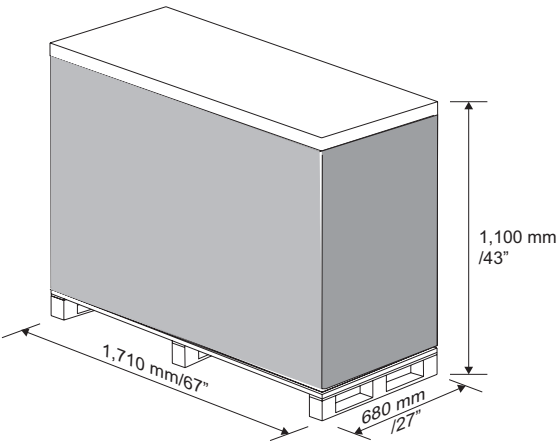
3.3 Unpacking the Boxes



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

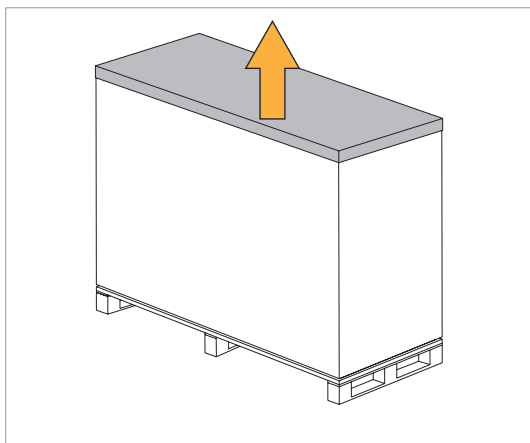
Box No.1: Main box

Components	<ul style="list-style-type: none">• Column and Rotating unit assembly• Accessories and parts• PC system(optional)
Size(mm/inch)	1,710 (L) x 680 (W) x 1,100 (H)/67" (L) x 27" (W) x 43" (H)
Weight(kg/lbs)	145/320

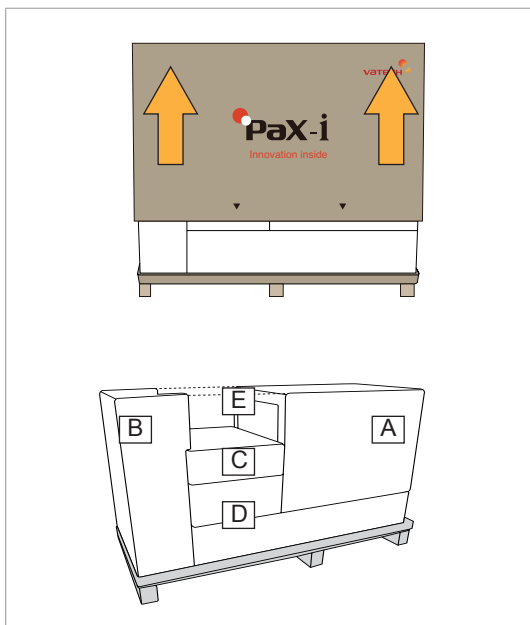


Main box

1. Move the main box to the installation location as close as possible.



2. Remove the top cover.



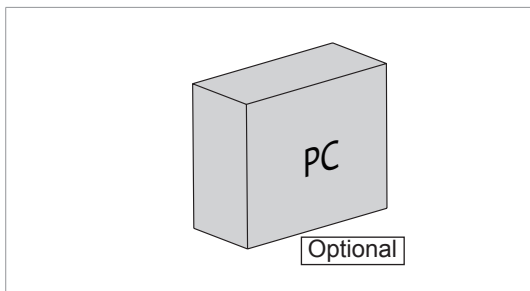
3. Remove a single side cover.



NOTE

In case of unable to lift the side cover up fully, due to ceiling height, cut the box in half using the utility knife instead.

- A: EPS
- B: EPS
- C: Accessory and part box 1
- D: Accessory and part box 2
- E: PC system (Optional)



4. Put the PC system (Optional) down on the floor.

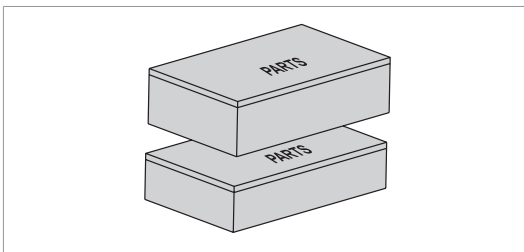


5. Separate two side EPS (A, B). The resulting view is as follows.

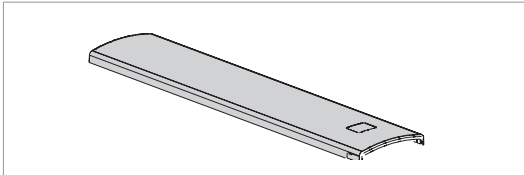


IMPORTANT

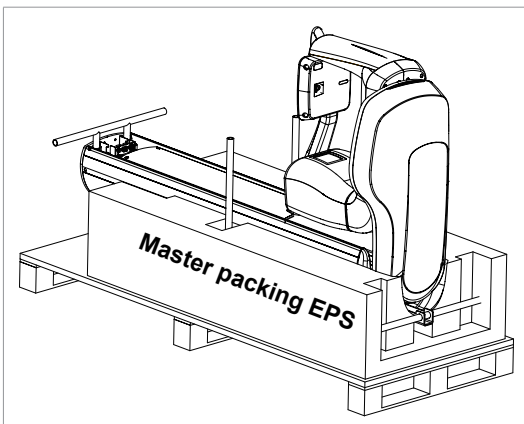
Do not discard these EPS(A, B), so that they are reused later when the CEPH unit is installed.



6. Remove 2 parts boxes (C, D).



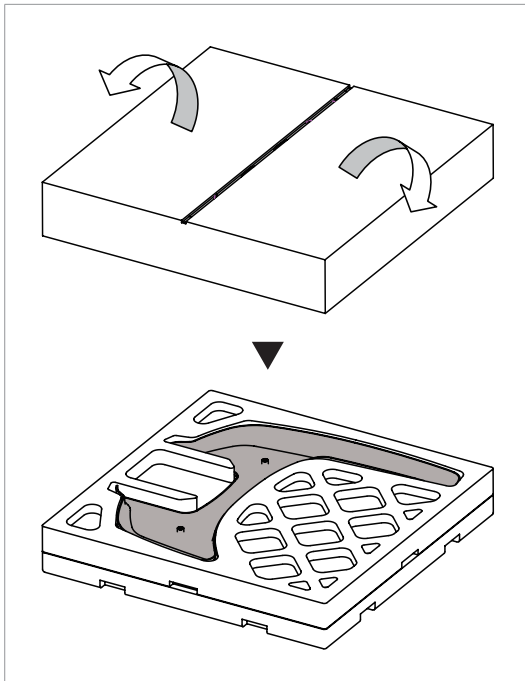
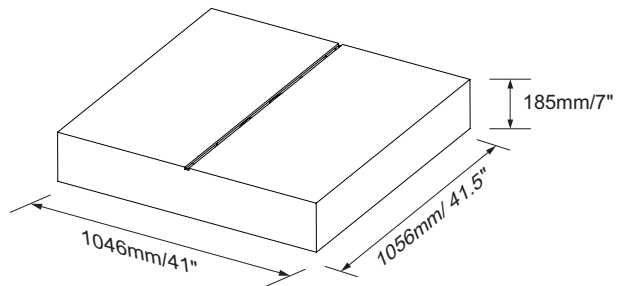
7. Remove the case column front cover.



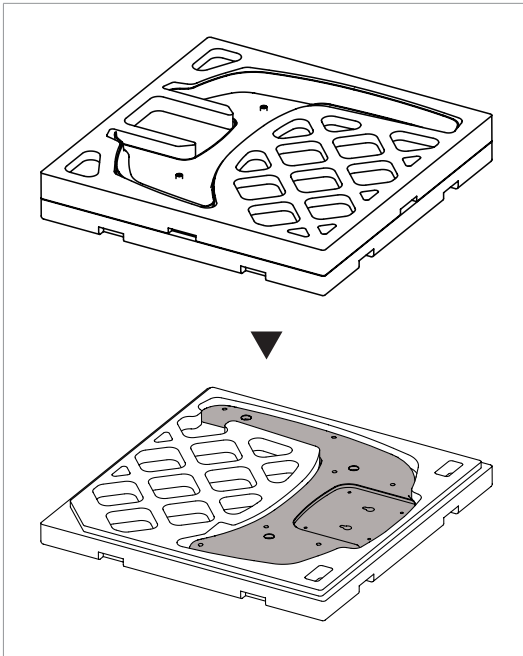
The view after removal of the EPS.

Box No. 2: Base unit

Component	Size(mm/inch)	Weight(kg/lbs)
Base	1046(l) x 1056(w) x 185(h) / 41"(l) x 41.5"(w) x 7"(h)	47/103



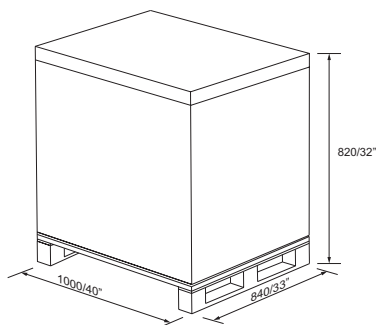
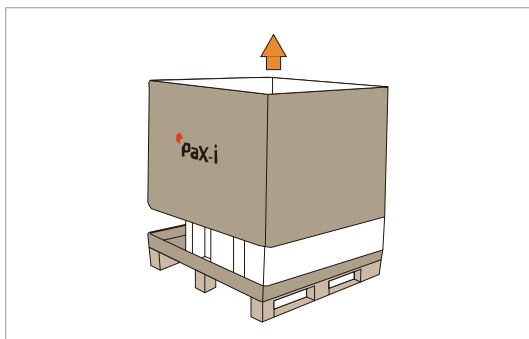
1. Open the box cover, the Base Cover is appeared.



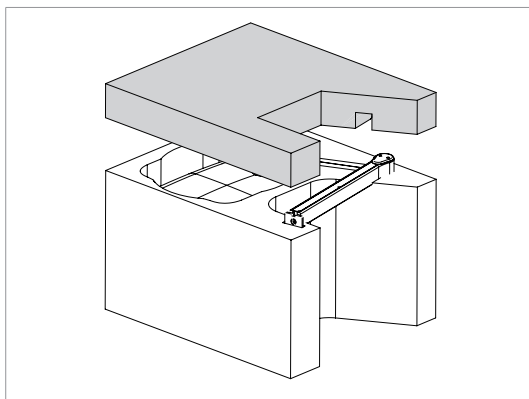
2. Remove the upper box, the Base Unit is appeared.

Box No. 3: Cephalometric unit (Optional)

Component	Size(mm/inch)	Weight(kg/lbs)
Cephalometric unit	1000 x 840 x 820 / 40" x 33" x 32"	45/100

**Removing the cover**

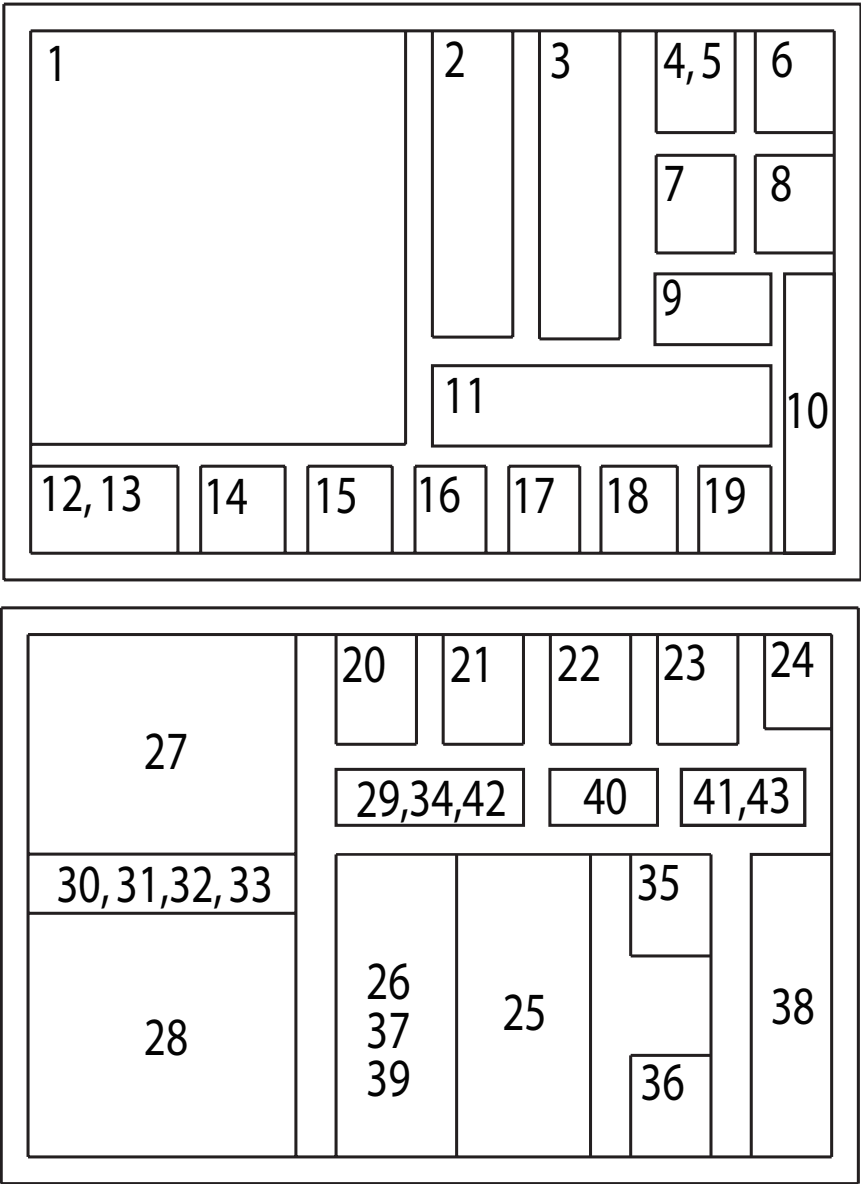
1. Open the box cover, starting with the top cover.



2. Remove the top EPS cover

3.4 Checking the Parts


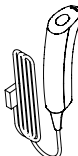

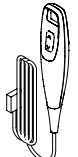

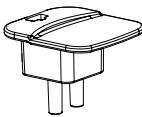
Location layout of the parts and accessories




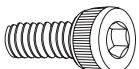
Parts list: In the accessorybox








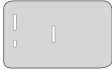
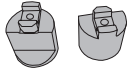





The images may be different from actual products.

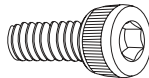
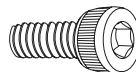
Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
1	MANUALS	User		1		Yes <input type="checkbox"/> No <input type="checkbox"/>
		Installation		1		Yes <input type="checkbox"/> No <input type="checkbox"/>
		EasyDent		1		Yes <input type="checkbox"/> No <input type="checkbox"/>
	INSTALLATION CD			1		Yes <input type="checkbox"/> No <input type="checkbox"/>
2	EXPOSURE SWITCH			1 set		Yes <input type="checkbox"/> No <input type="checkbox"/>
	SWITCH HOLDER	Exposure S/W		1	w/sticker and 3 screws	Yes <input type="checkbox"/> No <input type="checkbox"/>
3	UP/DOWN SWITCH			1 set	Optional	Yes <input type="checkbox"/> No <input type="checkbox"/>
	SWITCH HOLDER (Optional)	Up/Down S/W		1	w/sticker	Yes <input type="checkbox"/> No <input type="checkbox"/>
4	CHIN SUPPORT	NORMAL		1		Yes <input type="checkbox"/> No <input type="checkbox"/>

Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
5	BITE BLOCK			1		Yes <input type="checkbox"/> No <input type="checkbox"/>
6	CHIN SUPPORT	TMJ		1		Yes <input type="checkbox"/> No <input type="checkbox"/>
7	CHIN SUPPORT	For the edentulous		1		Yes <input type="checkbox"/> No <input type="checkbox"/>
8	CHIN SUPPORT	SINUS		1		Yes <input type="checkbox"/> No <input type="checkbox"/>
9	PANO COVER			1		Yes <input type="checkbox"/> No <input type="checkbox"/>
10	CABLE TIE			10		Yes <input type="checkbox"/> No <input type="checkbox"/>
11	TEMPLE SUPPORT	Right and Left		1 set		Yes <input type="checkbox"/> No <input type="checkbox"/>
12			Blank			
13			Blank			
14	EAR ROD CAPS A			4	For CEPH	Yes <input type="checkbox"/> No <input type="checkbox"/>
15	EAR ROD CAPS B			1 set		Yes <input type="checkbox"/> No <input type="checkbox"/>

Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
16	SILICON CAPS	White		11	Some extra	Yes <input type="checkbox"/> No <input type="checkbox"/>
17	SILICON CAPS	Gray		10	Some extra	Yes <input type="checkbox"/> No <input type="checkbox"/>
18	Blank					
19	BASE CAP 2			4	Base	Yes <input type="checkbox"/> No <input type="checkbox"/>
	BASE CAP 1			3	Base	Yes <input type="checkbox"/> No <input type="checkbox"/>
20	WRENCH BOLTS	M10 x 20 w/spring washer		4		Yes <input type="checkbox"/> No <input type="checkbox"/>
21		M10 x 30		2	Guiding base	Yes <input type="checkbox"/> No <input type="checkbox"/>
22		M8 x 20		4		Yes <input type="checkbox"/> No <input type="checkbox"/>
		M6 x 15 w/ spring washer		2		
23	TRUSS BOLTS	M5 x 8		3		Yes <input type="checkbox"/> No <input type="checkbox"/>
24		M4 x 8		11		Yes <input type="checkbox"/> No <input type="checkbox"/>

Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
25	RS-232 CABLE	10 m/32.8'		1	For LVDS Type Only	Yes <input type="checkbox"/> No <input type="checkbox"/>
	CAT6 CROSS ETHERNET CABLE	10m/32.8'		1	For Crong Board Type Only	Yes <input type="checkbox"/> No <input type="checkbox"/>
26	LAN CABLE	10 m/32.8'		1	If one shot CEPH installed	Yes <input type="checkbox"/> No <input type="checkbox"/>
27	FRAME GRABBER BOARD	AnyGrabber board		1	For LVDS Type Only	Yes <input type="checkbox"/> No <input type="checkbox"/>
	GIGABIT ETHERNET BOARD			1	For Crong Board Type Only	Yes <input type="checkbox"/> No <input type="checkbox"/>
28	WARNING SYSTEM			1set	Optional	Yes <input type="checkbox"/> No <input type="checkbox"/>
29	CEPH ARM COVER			1	CEPH	Yes <input type="checkbox"/> No <input type="checkbox"/>
30	PLATE HAND REST CEPH			1	CEPH	Yes <input type="checkbox"/> No <input type="checkbox"/>
	BLOCK ACRYL FIX BOLT			2	CEPH	Yes <input type="checkbox"/> No <input type="checkbox"/>
	KNOBS			2	CEPH	Yes <input type="checkbox"/> No <input type="checkbox"/>
	HANDREST STICKER			1	CEPH	Yes <input type="checkbox"/> No <input type="checkbox"/>
31			Blank			
32			Blank			
33			Blank			
34	SUPPORT ARM SHAFT PIN			1	CEPH	Yes <input type="checkbox"/> No <input type="checkbox"/>

Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)
35	ANCHOR BOLTS	M8 w/ flat and spring washer		8	Wall mount	Yes <input type="checkbox"/> No <input type="checkbox"/>
	NUTS	M8		4		Yes <input type="checkbox"/> No <input type="checkbox"/>
	FLAT WASHER	M8		4		Yes <input type="checkbox"/> No <input type="checkbox"/>
	FLAT WASHER	M10		2		Yes <input type="checkbox"/> No <input type="checkbox"/>
	WOOD SCREWS	8 X 60 w/flat and spring washer		4	Wall mount(wood)	Yes <input type="checkbox"/> No <input type="checkbox"/>
36	BOLTS	M8 x 20 w/ flat and spring washer		6		Yes <input type="checkbox"/> No <input type="checkbox"/>
	NUTS	M8 size		2		
	WOOD SCREWS	12 X 70		2	For the Japanese market only	Yes <input type="checkbox"/> No <input type="checkbox"/>
37	COLUMN BRACKET			1		Yes <input type="checkbox"/> No <input type="checkbox"/>
38	WALL BRACKET			1		Yes <input type="checkbox"/> No <input type="checkbox"/>
39	ALIGNMENT PLATE	Template		1	Wall mount	Yes <input type="checkbox"/> No <input type="checkbox"/>

Part No.	Items	Specification	Figure	QTY	Comments	Confirmed (OK?)	
40	Blank						
41		M8 x 45		2	Wall mount For leveling equipment	Yes <input type="checkbox"/>	No <input type="checkbox"/>
		M12 x 15		1			
42		M6 x 15		4	Fixing CEPH arm	Yes <input type="checkbox"/>	No <input type="checkbox"/>
43	Blank						

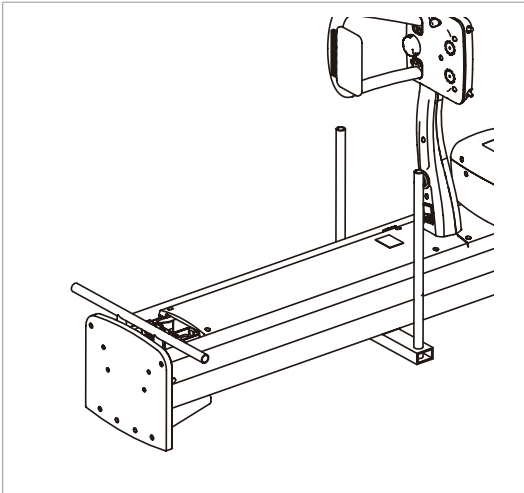
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Installing the Equipment: Floor Standing (Optional)

4.1	Assembling the Base and Main Units.....	48
4.2	Removing the Transportation Handles	53
4.3	Removing the Transportation Safety Bolts	54
4.4	Installing the Cephalometric Unit (Optional).....	55
4.5	Leveling the Equipment.....	70

4.1 Assembling the Base and Main Units

Unloading the main unit



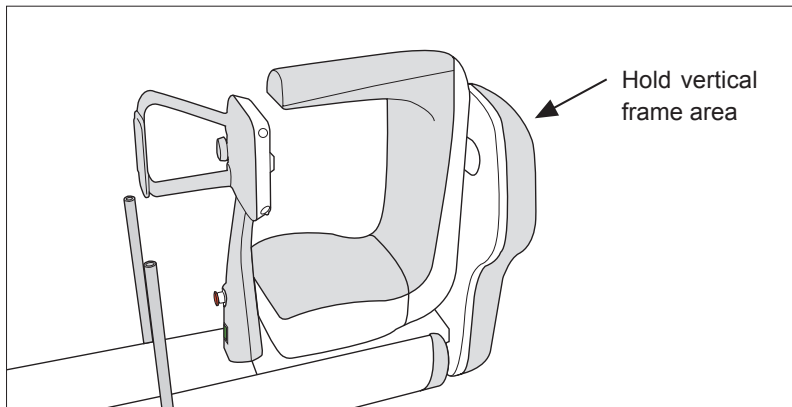
1. First unload the main unit on the floor.

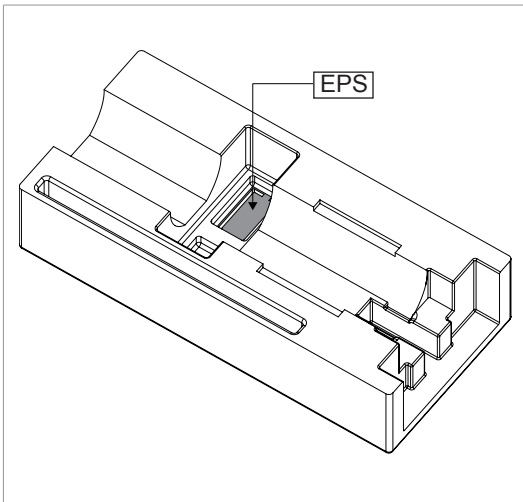
Place some protective stuff on the floor to avoid the scratches on the surface

One installer should keep on holding the vertical frame area to keep the equipment stable, after it is unloaded.

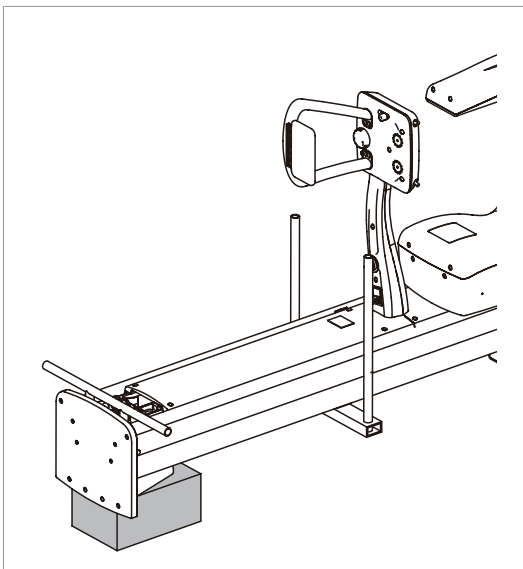


IMPORTANT

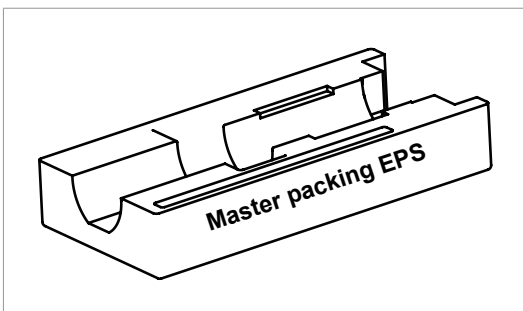




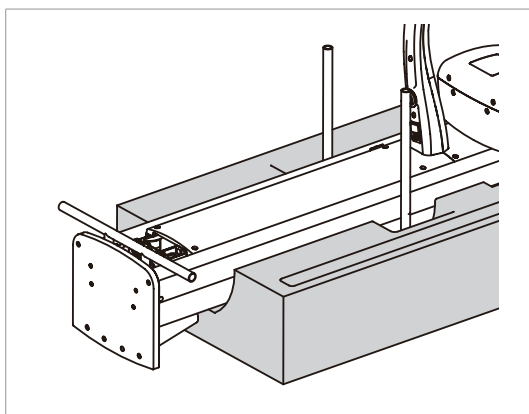
2. Take the EPS piece out from styrofoam cover and put it down on the floor.



3. Slide the EPS piece under the bottom of the column unit.



4. Place the master packing EPS on the floor.

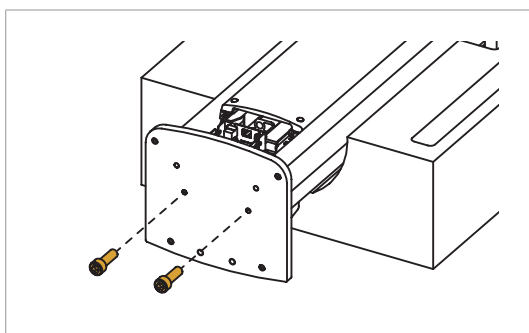


5. Put the main unit back on the master packing EPS and remove the protective plastic cover with knife. Then put the cables down on the floor carefully.



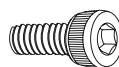
CAUTION

Be careful not to damage the cables and have the column surface scratched.

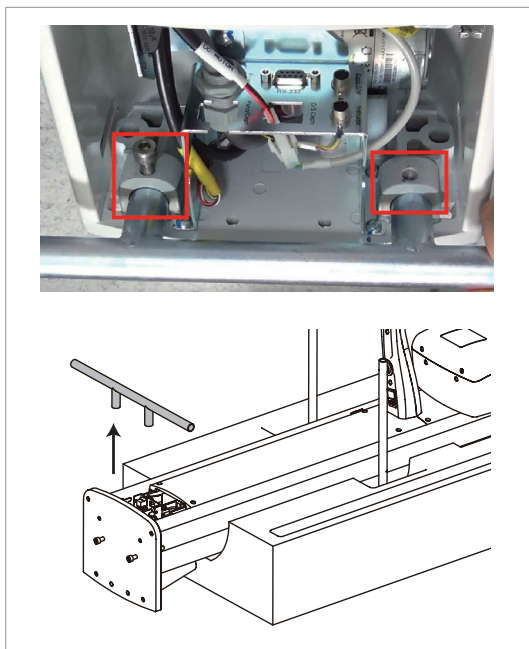


6. Assemble two wrench bolts as shown in the illustration.

Wrench
Bolts



M10 x 30
Part No. : 21
Qty : 2



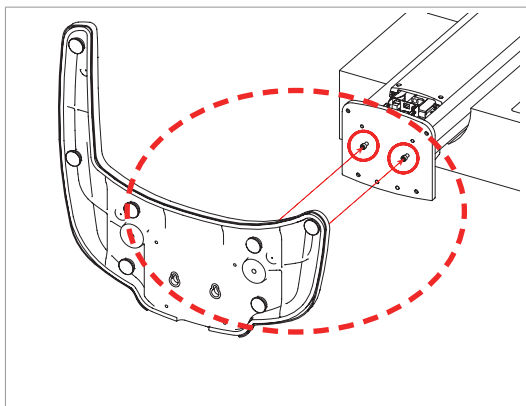
7. Remove the carrying handle at the bottom of the column unit.

Allen
wrench



6 mm/0.23"

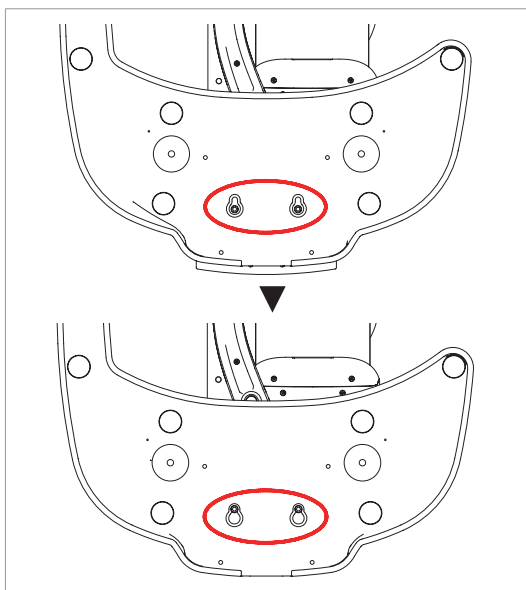
Assembling the base with column units



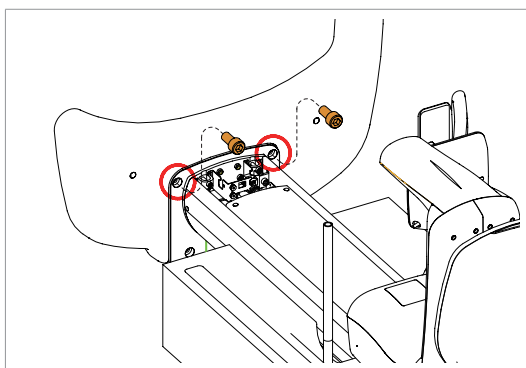
1. Hang the base unit onto 2 bolts temporarily as shown as shown in the illustration.

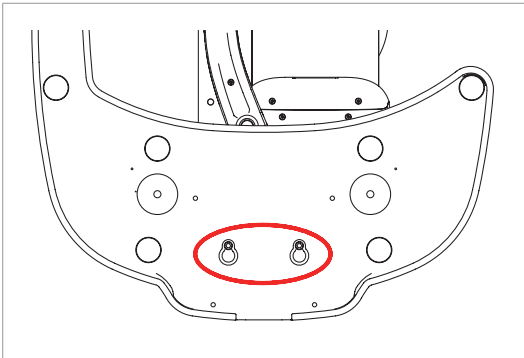


An installer should hold the base unit to keep it from falling down.

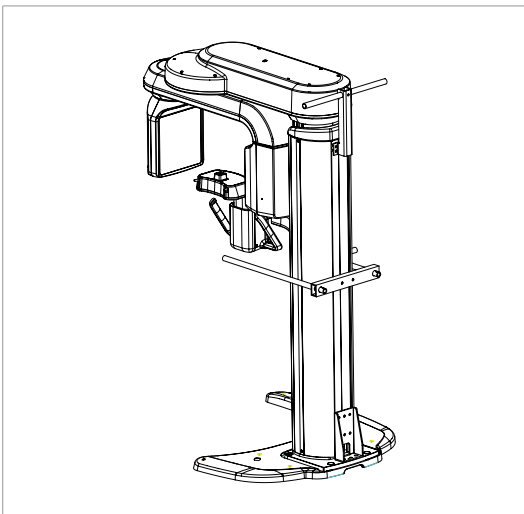


2. Fasten the base unit with two wrench bolts (Part No. : 20, M10 x 20).





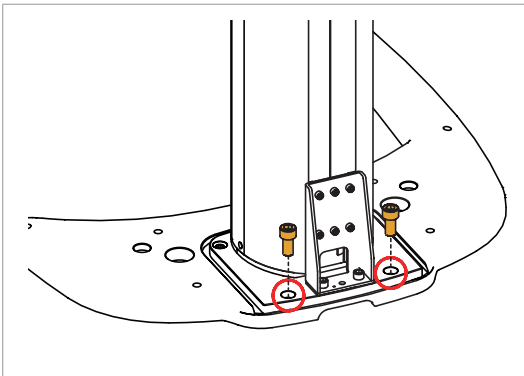
3. Tighten two wrench bolts firmly as shown in the illustration.



4. Erect the equipment in an upright position.



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

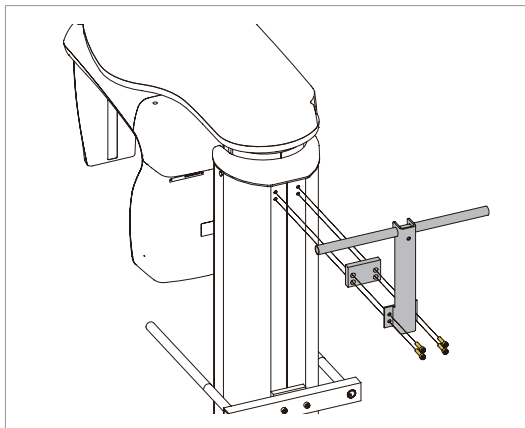
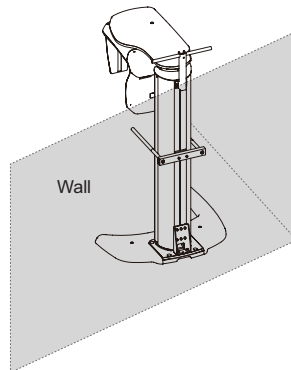


5. Fasten the base unit with two wrench bolts (Part No. : 20, M10 x 20).

4.2 Removing the Transportation Handles



Before removing the handles, move the equipment to installation location in the following manner.



1. Remove the upper carrying handles.

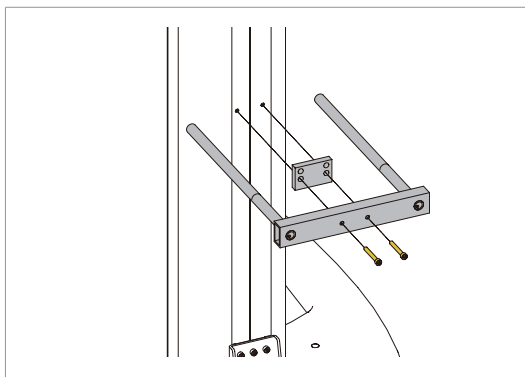
Allen wrench

6 mm/0.23"



CAUTION

One installer should hold the handle, while the other is removing the bolts



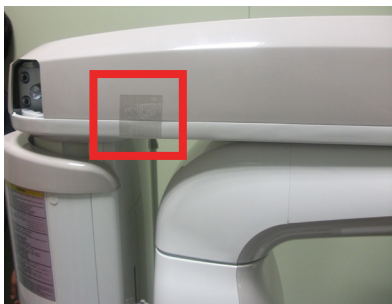
2. Remove the handle in the middle.



If the CEPH unit is to be installed, this is used as the carrying handle.

Do not detach it until indicated later after the equipment is moved to the installation site.

4.3 Removing the Transportation Safety Bolts



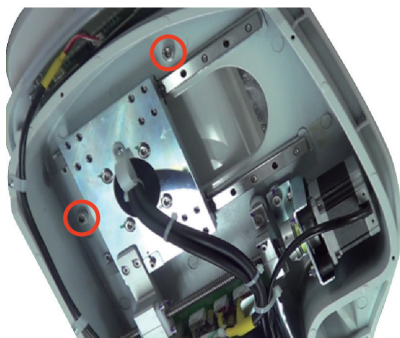
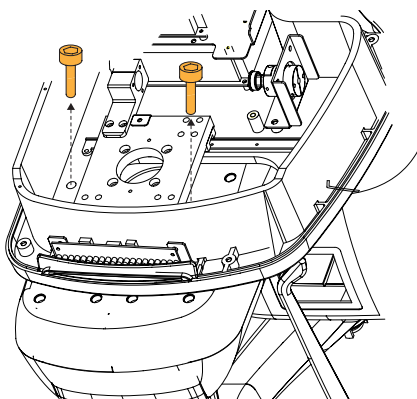
1. Remove the semi-clear tape on the both sides and open the top cover.



NOTE

Be careful not to scratch the cover.

2. Remove the safety bolt.



Allen
wrench

6 mm/0.23"

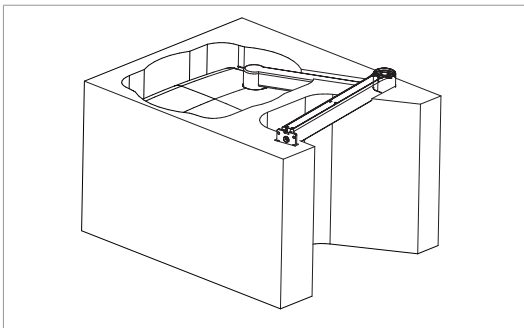


4.4 Installing the Cephalometric Unit (Optional)

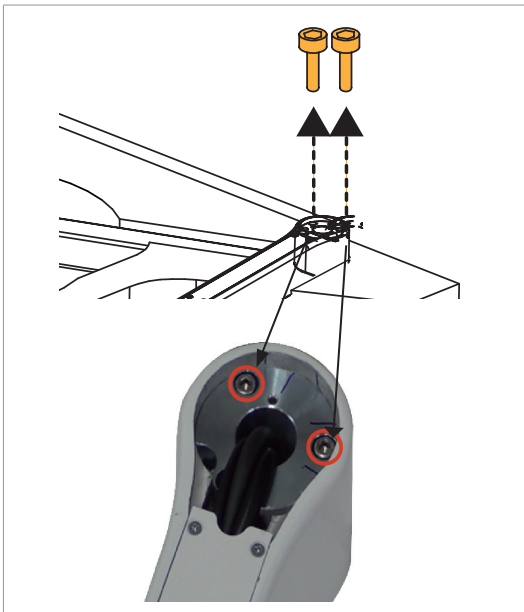


Never hold the areas of the collimator, sensor and tube head.

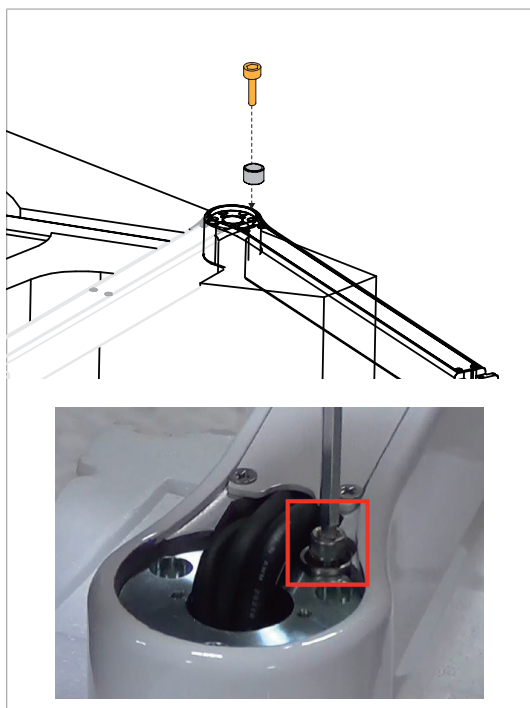
Preparing the Cephalometric unit



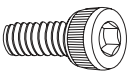


1. Now it is assumed that the 2nd box has already been opened

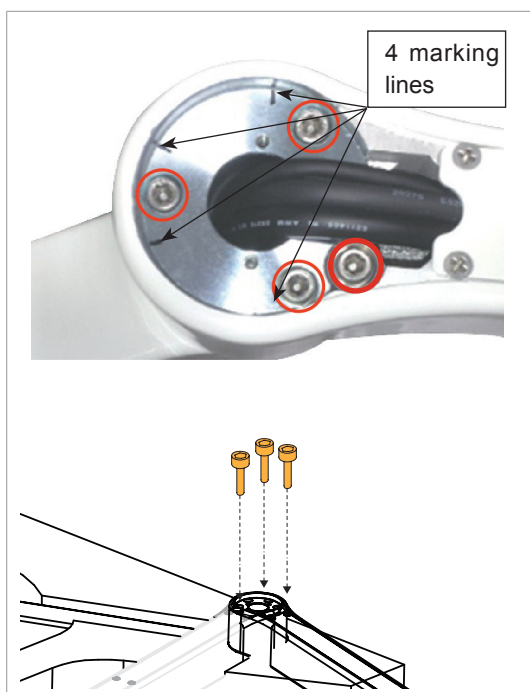


2. Remove 2 bolts from the Cephalometric arm's joint

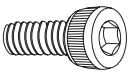



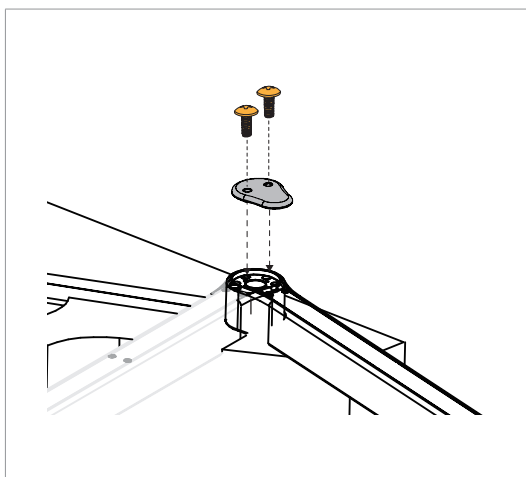
3. Stretch the arm and insert the support pin (part No.: 34). Then secure them loosely with the wrench bolt(M6 x 15, Part No.: 42).

Wrench bolts	M6 x 15: Qty: 1 Part No.: 42	
Support Arm pin	Part No.: 34	
Tool	5 mm/0.23"	



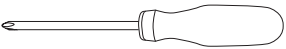


4. After inserting the other 3 bolts(M6 x 15,Part No.: 42) into the holes, align 4 marking lines and tighten 4 bolts firmly(red circle)

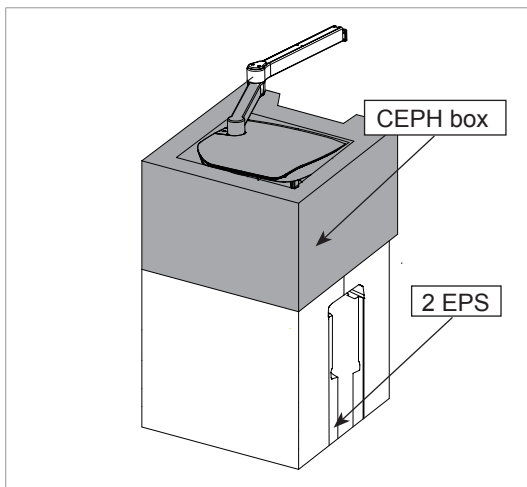
Wrench bolts	M6 x 15: Part No.: 42 Qty: 3	
Tool	5 mm/0.23"	



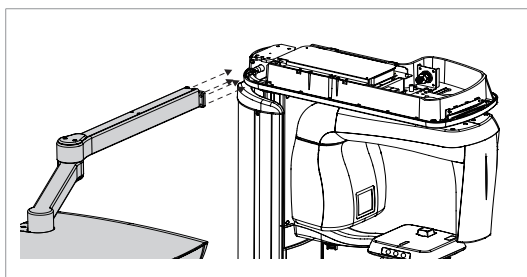
5. Fix the CEPH arm cover (**Part No.: 29**) using 2 truss bolts(**Part No.: 24**).

Truss bolts	M4 x 8 Part No.: 24 Qty: 2	
CEPH arm cover	Part No.: 29	
Cross head screw driver w/ magnetic tip		

Mounting the Cephalometric unit



1. Stack the CEPH unit on the 2 EPS, as shown in the left figure. Note that these EPS are from the step 5 in the section 3.3



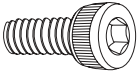

2. Mount the CEPH unit on the main unit carefully.

If the height between the column unit and the CEPH arm is different, adjust the difference by move the column unit up or down using the UP/DOWN button.





3. Secure them loosely using 4 wrench bolts (Part No.: 22). Do not tighten them fully yet.

Wrench bolts	M8 x 20	
	Part No.: 22	
	Qty: 4	
Allen wrench	6 mm/0.24"	



Be careful not to scratch the surface while tightening the bolts.

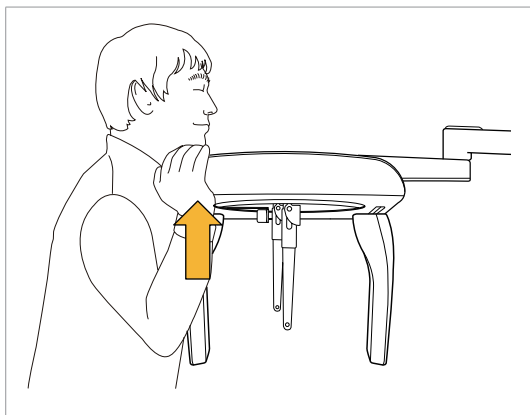
If necessary, one installer should try to level the CEPH unit with the column unit to facilitate screwing them.

4. Remove the EPS, starting with the lower one.

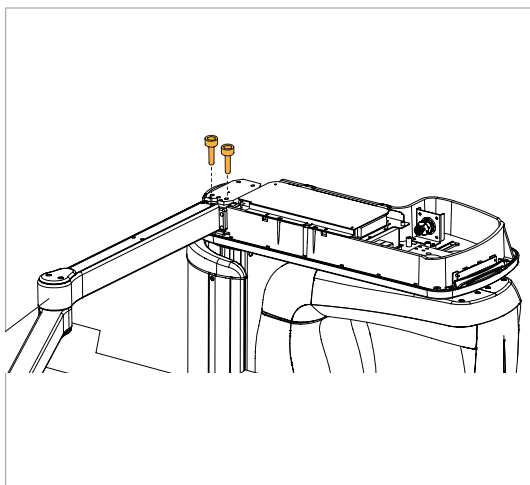


Raise the column up a little bit with the UP/DOWN switch to make it easy to remove EPS

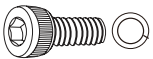

5. If the equipment turned ON, now turn it OFF.



6. Tighten 4 bolts firmly, while the other installer is pushing the CEPH unit up as hard as possible.



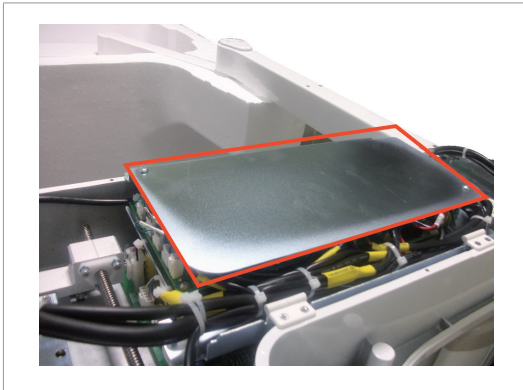
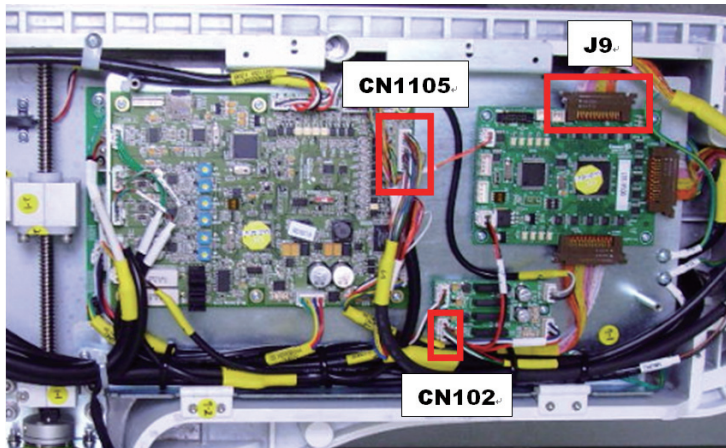
7. Tighten 2 wrench bolts (Part No.: 22) firmly at the following location. One installer should keep on lifting the CEPH unit up slightly.

Wrench bolts	M6 x 15 w/ spring washer Part No.: 22 Qty: 2	
Allen wrench	5mm	

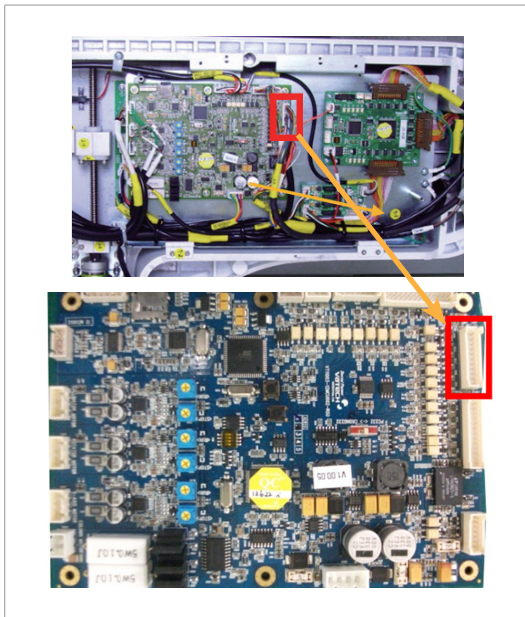
Cabling between the Cephalometric and main units

A. LVDS cable in use

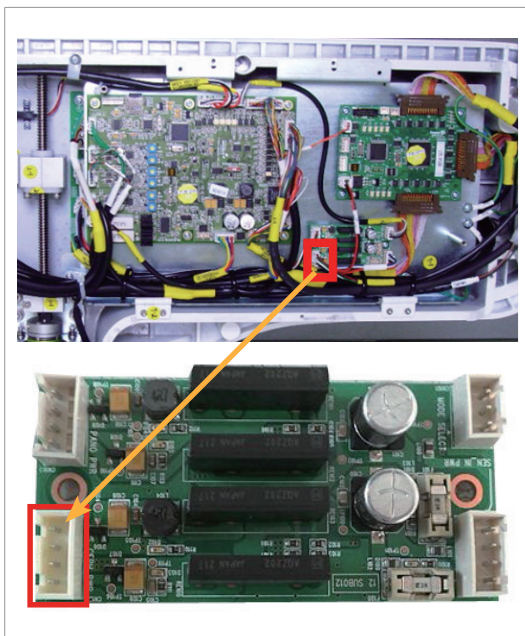
Scan type:



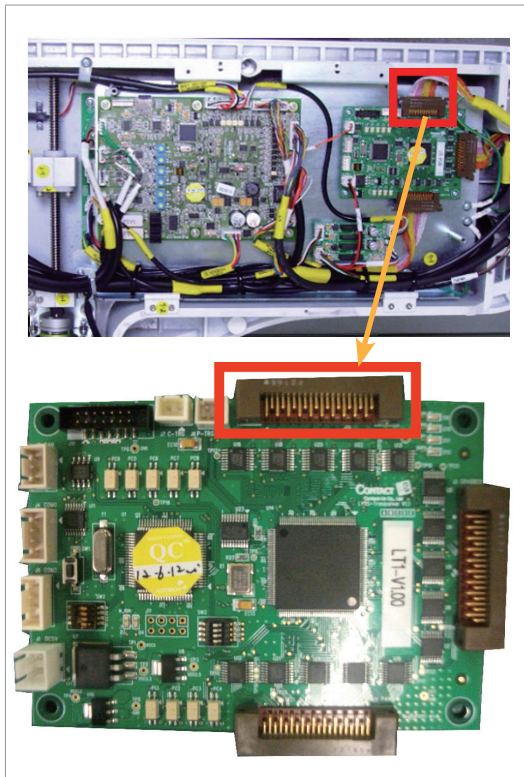
1. Remove the 4 screws to separate the top cover.



2. Connect the cable **H000921A(CN1105)** from the Cephalometric unit with the connector **CN1105** on the main CPU board



3. Connect the cable **H000924A** from the CEPH unit with the Connector **CN102** on the relay board.

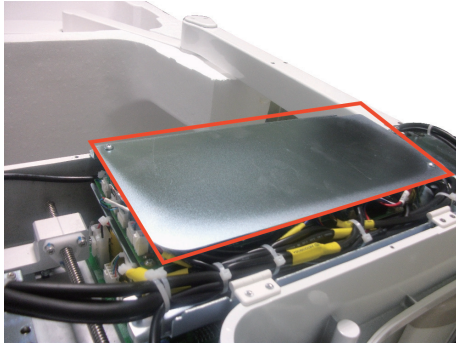


4. Connect the cable **H000047A** from the CEPH unit with the connector **J9** on the LTI board

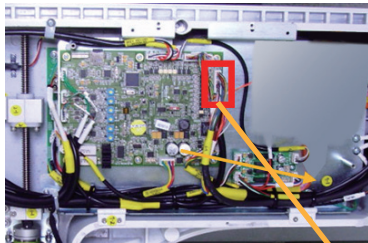


5. Connect the ground cable (FG) to the frame.
6. Arrange the cables and tie them with the cable tie(Part No.: 10)
7. Put the top cover back.

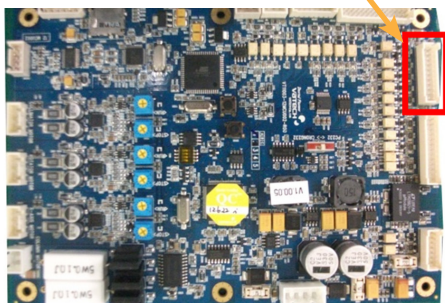
OS(one shot) type:Optional



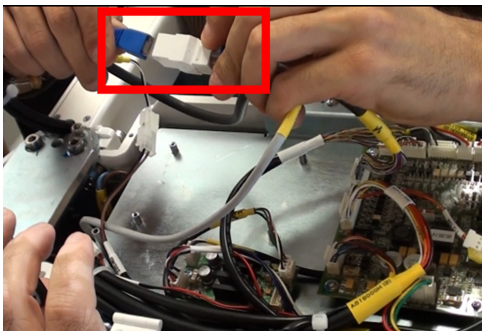
1. Remove the 4 screws to separate the top cover.

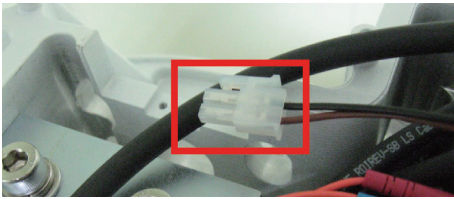


2. Connect the cable **H000921A(CN1105)** from the Cephalometric unit with the connector **CN1105** on the main CPU board



3. Connect the LAN cables.

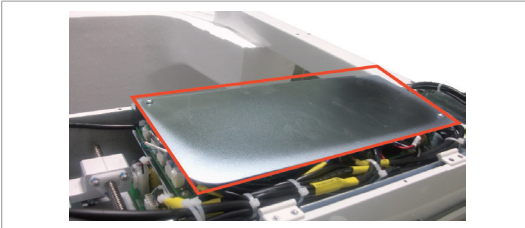




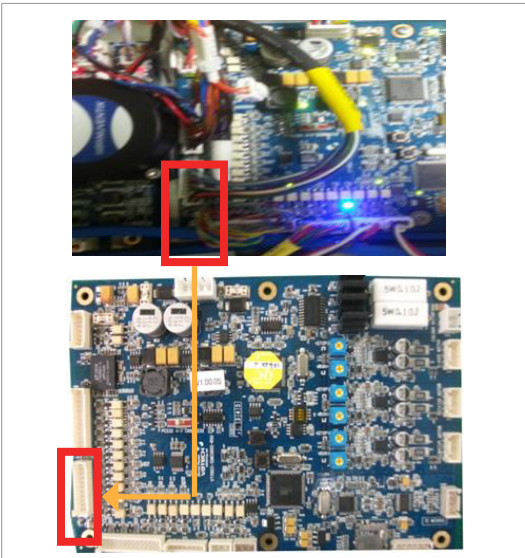
4. Connect the OS power cable H000927A with the cable from the connector CN3 on the power board.
5. Arrange the cables and tie them with the cable tie(Part No.: 10)
6. Put the top cover back.

B. The LAN cable in use: Crong board

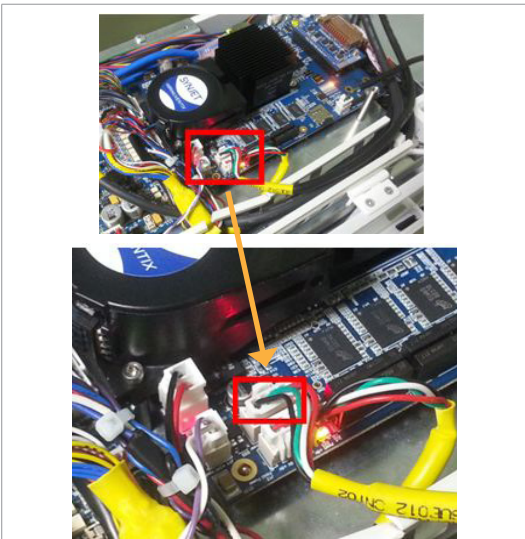
Scan type



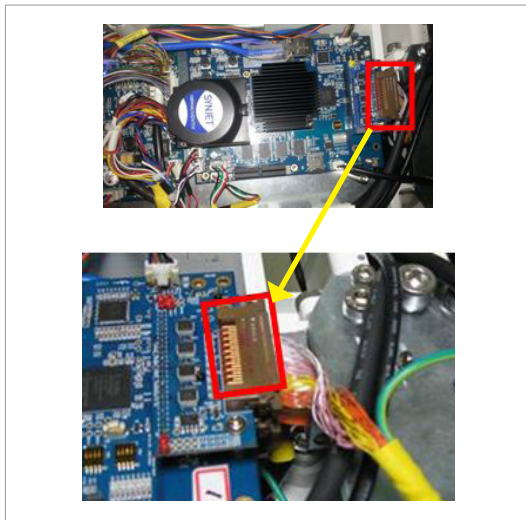
1. Remove the 4 screws to separate the top cover.



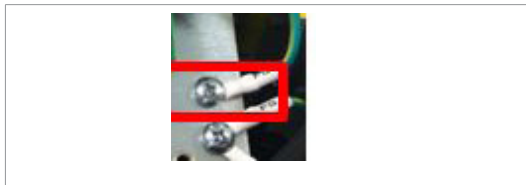
2. Connect the cable **H000921A(CN1105)** from the Cephalometric unit with the connector **CN1105** on the main CPU board.



3. Connect the cable **H000924A** from the CEPH unit with the Connector **CN102** on the crong board.

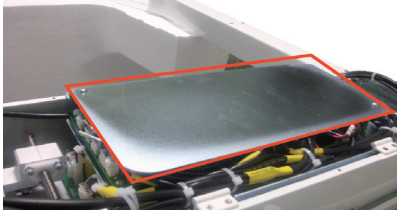


4. Connect the cable **H000047A** from the CEPH unit with the connector **J9** on the PANO/ CEPH board.

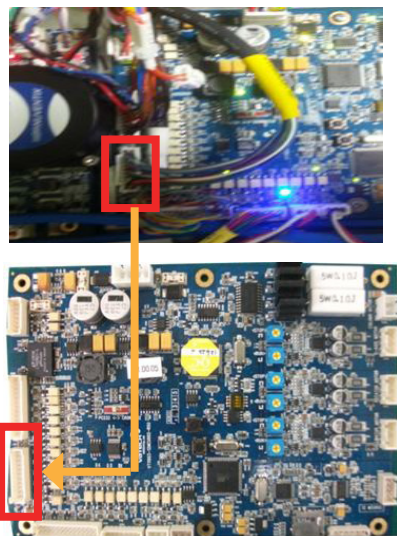


5. Connect the ground cable (FG) to the frame.
6. Arrange the cables and tie them with the cable tie(Part No.: 10)
7. Put the top cover back.

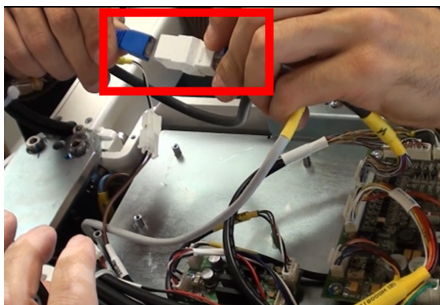
OS(one shot) type:Optional



1. Remove 4 screws and separate the top cover.



2. Connect the cable **H000921A(CN1105)** from the Cephalometric unit with the connector **CN1105** on the main CPU board.



3. Connect the LAN cables.



4. Connect the OS power cable **H000927A** with the cable from the connector **CN3** on the power board.
5. Arrange the cables and tie them with the cable tie(Part No.: 10)
6. Put the top cover back.

4.5 Leveling the Equipment



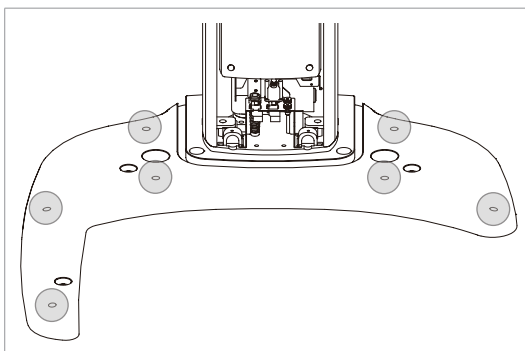
Ensure that the spirit level should rest only on the locations indicated in the following figures to obtain the accurate center.



1. Prepare the spirit level.



2. Position the rotating unit so that the X-Ray tube head faces the front.



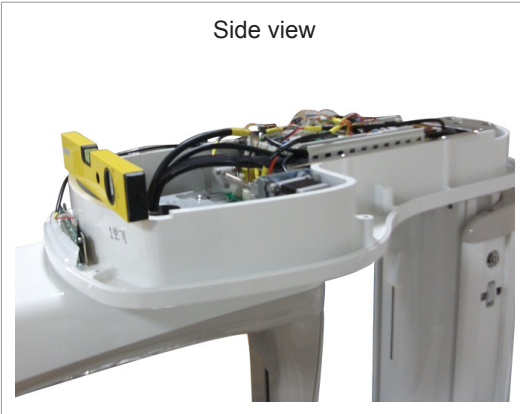
3. Turn the Level Foot on the Base Unit clockwise with the wrench until the equipment touches the ground as shown in the illustration.

Allen
wrench



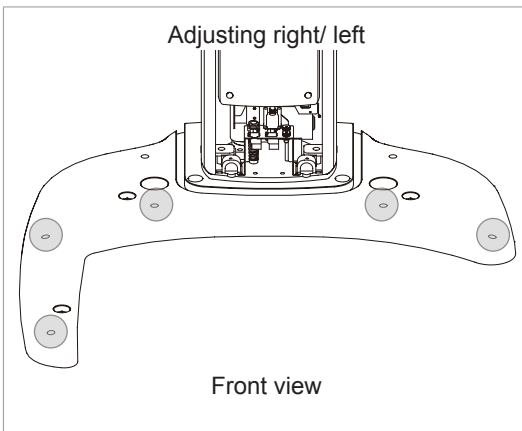
Leveling right and left of the equipment

Side view



4. Place the spirit level on the front of the Vertical Frame as shown in the illustration.

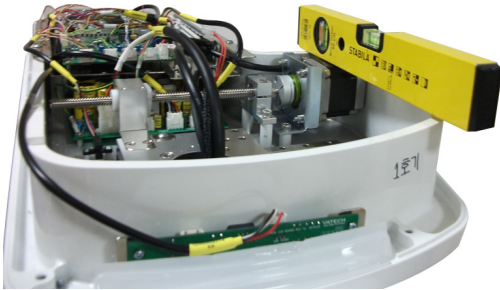
Adjusting right/ left



5. While checking the bubble on the spirit level, align the right/left level by adjusting the Level Foot as shown in the illustration.

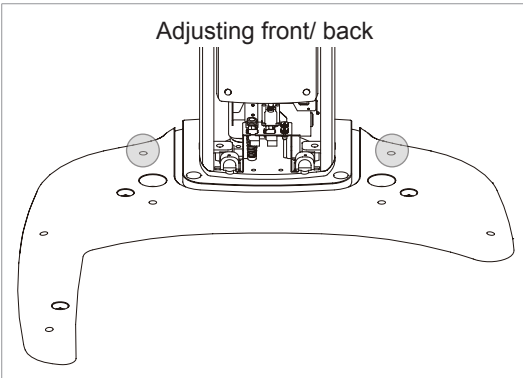
Leveling the front and back of the equipment

Front view



6. Place the spirit level on the side of the Vertical Frame as shown in the illustration.

Adjusting front/ back



7. While checking the bubble on the spirit level, align the front/back level by adjusting the Level Foot as shown in the illustration.

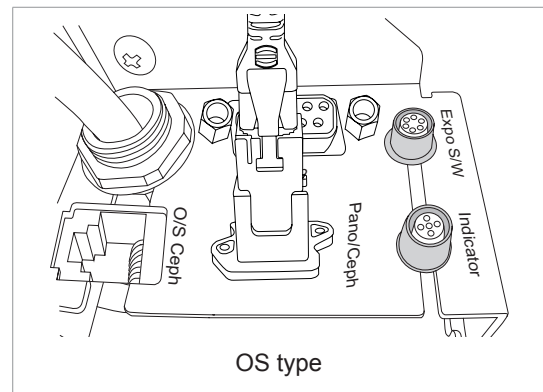
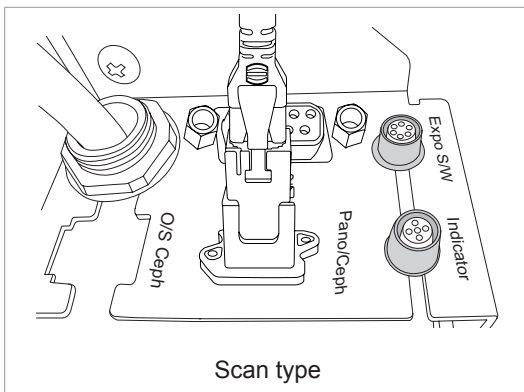
Completing Miscellaneous Works

5.1	Connecting the Cables to the Equipment.....	74
5.2	Assembling the Front Column Cover	78
5.3	Assembling Temple and Chin Supports	78
5.4	Assembling the Base Cover	79
5.5	Covering the Holes	80
5.6	Installing the Switch Holders	81
5.7	The Leftover Components.....	82

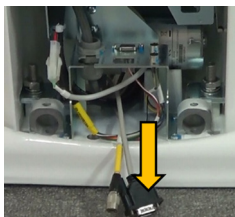
5.1 Connecting the Cables to the Equipment

A. The LVDS cable in use

Connector layout

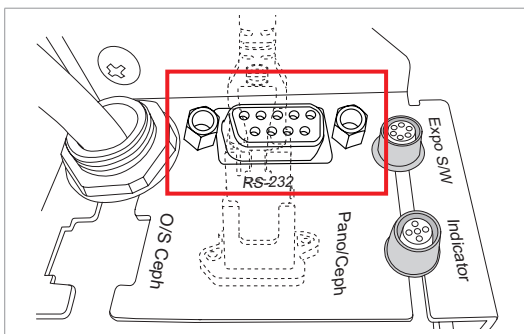


Rear

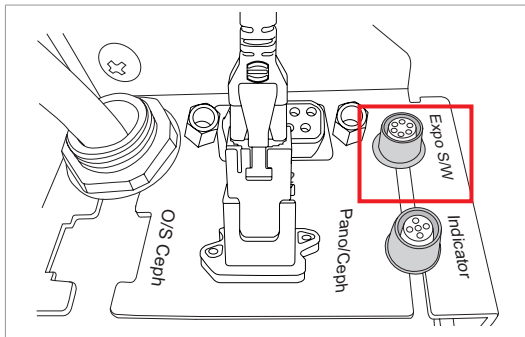


Front

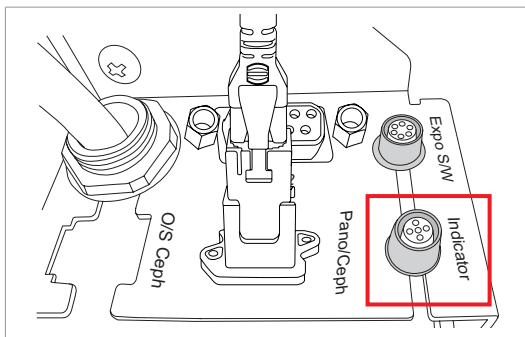
1. Insert the cables through the opening from the back. Then pull them out from front side.



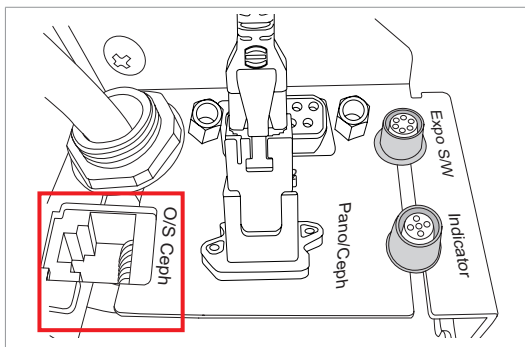
2. Connect the RS-232 cable (**Part No.: 25**).



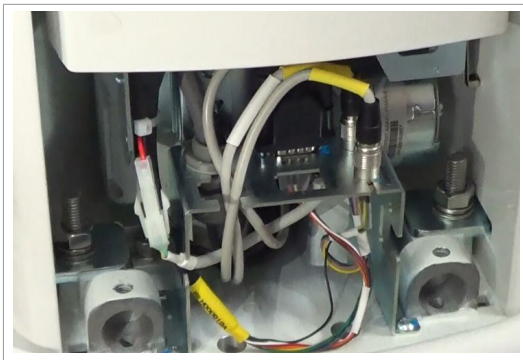
3. Connect the exposure switch (Part No.: 2).



4. Connect the warning control system (Part No.: 28)



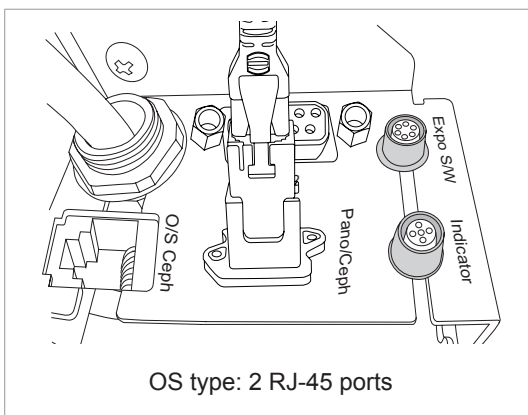
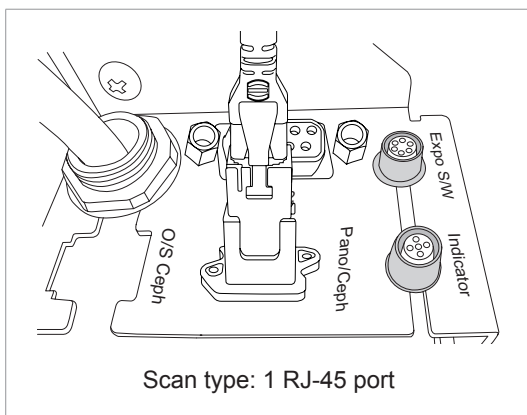
5. (Optional) Connect the LAN cable (Part No.: 26), if the one shot sensor for the CEPH is installed



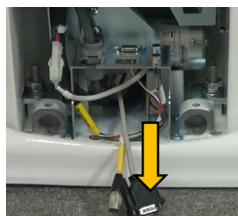
6. Arrange the cable carefully and if necessary, tie them with the cable tie (Part No.: 10)

B. The LAN cable in use: Crong board

Connector layout



Rear



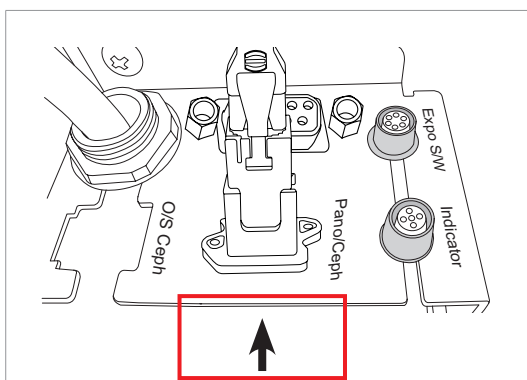
Front

1. Insert the cables through the opening from the back. Then pull them out from front side.

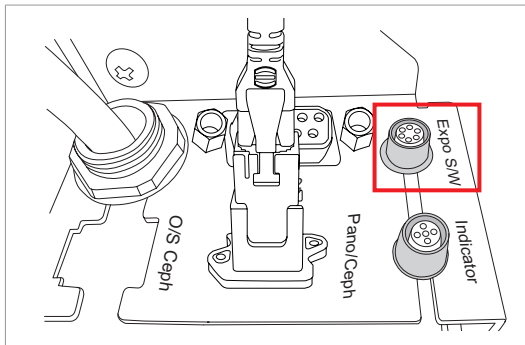


NOTE

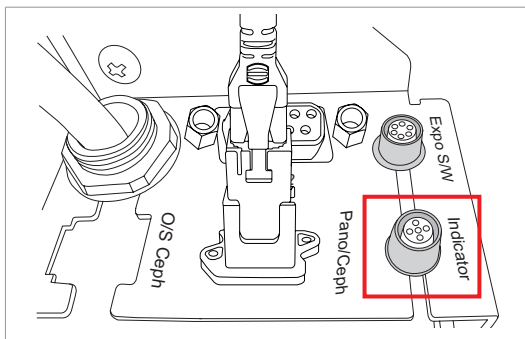
The image may be different from actual product.



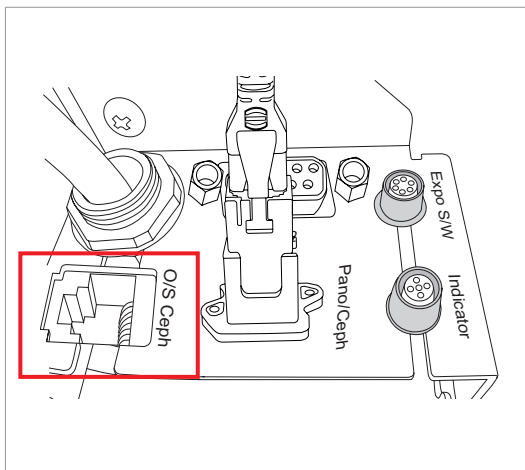
2. Connecting the ethernet cable (CAT6): **Part No.: 25.**



3. Connect the exposure switch (**Part No.: 2**).



4. Connect the warning control system (**Part No.: 28**).



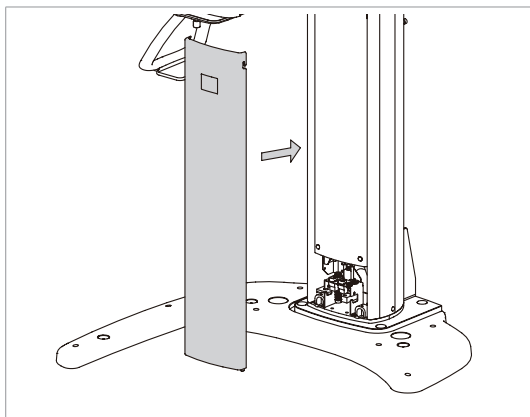
5. (Optional) Connect the LAN cable (Part No.: 26), if the one shot sensor for the CEPH is installed.



NOTE

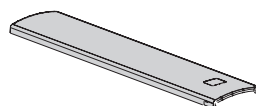
When the crong board with the OS(one shot) CEPH sensor is used, two RJ-45 connectors are required from the back of PC: one for PANO, one for OS sensor

5.2 Assembling the Front Column Cover

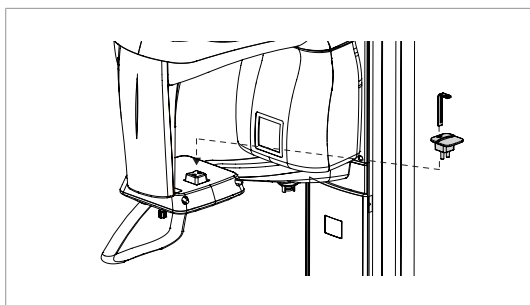


1. Assemble the front column cover.

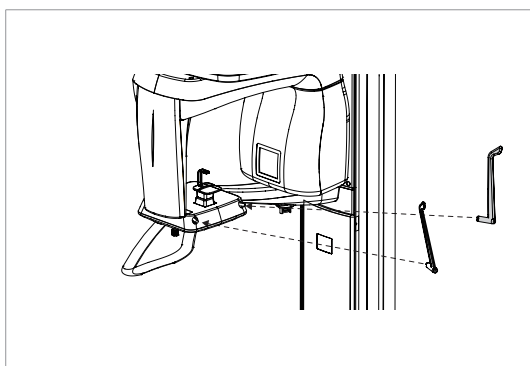
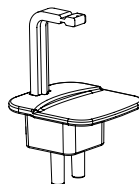
Case column Front



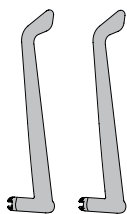
5.3 Assembling Temple and Chin Supports



1. Insert the normal chin support and bite block (Normal) (**Part No.: 4 and 5**).



2. Insert 2 temple supports (**Part No.: 11**) and ear rod caps (**Part No.: 15**).

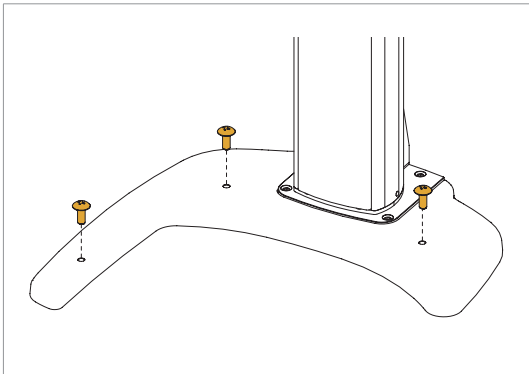
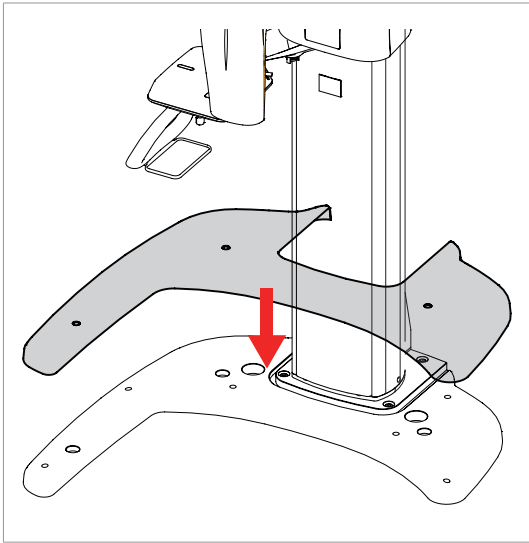


Left Right



Caps

5.4 Assembling the Base Cover





1. Assemble the base cover.

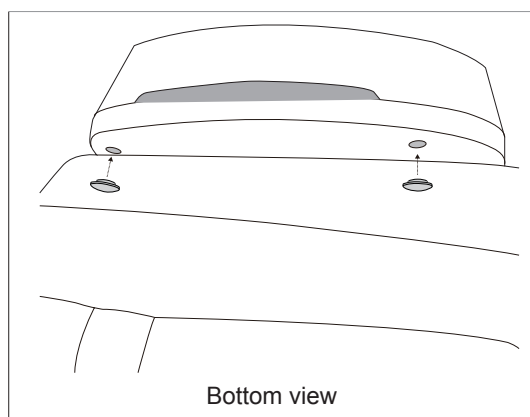
Base Cover	
------------	--

2. If there are holes on the base cover, assemble 3 truss bolts (**Part No.: 23, M5 x 8**) as shown in the illustration. (When there are no holes on the base cover, you don't need to assemble truss bolts.)on lifting the CEPH unit up slightly.

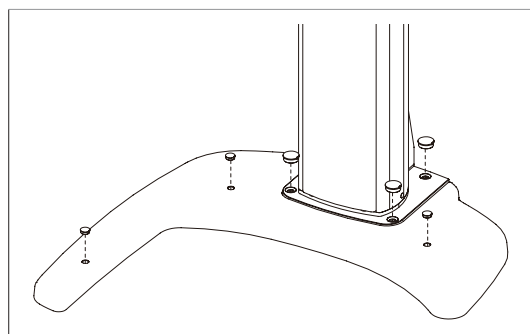
Truss Bolts	M5 x 8	
	Part NO. : 23	
	Qty : 3	

5.5 Covering the Holes

Item	Part No.	Figure
Base caps	19	
Silicone caps(A, B)	16,17	





1. Cover the vertical frame holes with 2 white silicone caps (Part No.: 16).



2. Cover the base unit holes with 7 level foot hole caps (**Part No.: 19**).

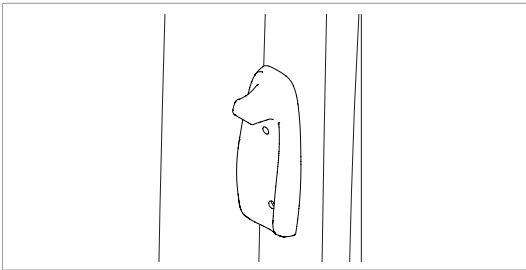
(When there are no holes on the base cover, you don't need to do this step.)

5.6 Installing the Switch Holders

Item	Part No.	Figure	Qty	Comment
SWITCH HOLDER (Exposure switch)	2		1	w/sticker and 3 screws
SWITCH HOLDER (Up/Down switch: Optional)	3		1	w/sticker

UP/DOWN switch holder

1. Peel off the paper from both sides.

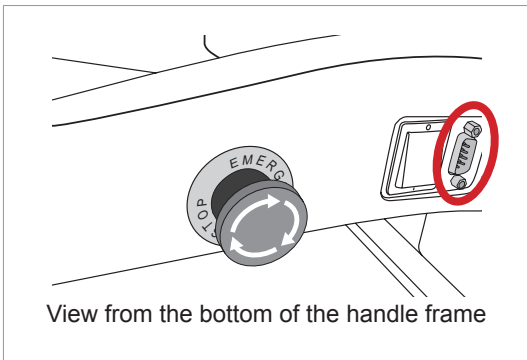


2. Attach the UP/DOWN switch holder on the left side of the column at the appropriate position.

Exposure switch holder

1. Locate the exposure switch holder (Part No.: 12) with a sticker and 3 screws.
2. Install the switch holder on the wall at the appropriate height using 3 screws.

Attaching the UP/DOWN switch (Optional)



If the Up/Down switch (Part No.: 3) is to be installed, connect it to the following connector.

5.7 The Leftover Components

The following list summarizes the leftover components after the hardware installation has been completed.

The components for the user

Item	Figure	Comments
Handrest set (if CEPH unit installed)		For CEPH unit
Bite cover		
Chin support: Edentulous		
Chin support: Sinus		
Chin support :TMJ		
Installation CD		
Manuals		
Carrying handle		Keep the handles in a safe place, so that they are reused when the equipment needs to be moved.

6

Installing the Equipment: Wall Mount

6.1	Installing the Equipment.....	84
6.2	Installing the Cephalometric Unit (Optional).....	95
6.3	Leveling the Equipment.....	95
6.4	Tightening the Nuts firmly after Leveling is Obtained	97
6.5	The Rest of Works.....	97

6.1 Installing the Equipment

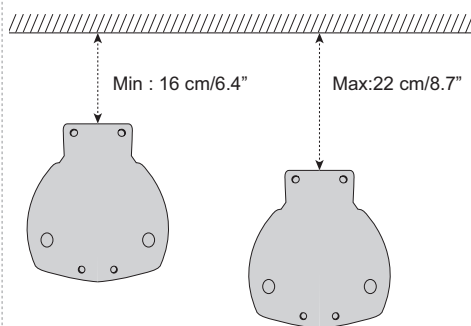
You are advised to plan and study the installation environment carefully in advance before proceeding, since the installation involves drilling the wall and floor. Pre-installation planning is crucial to a successful installation.

An accurate marking is of critical importance for a successful installation.

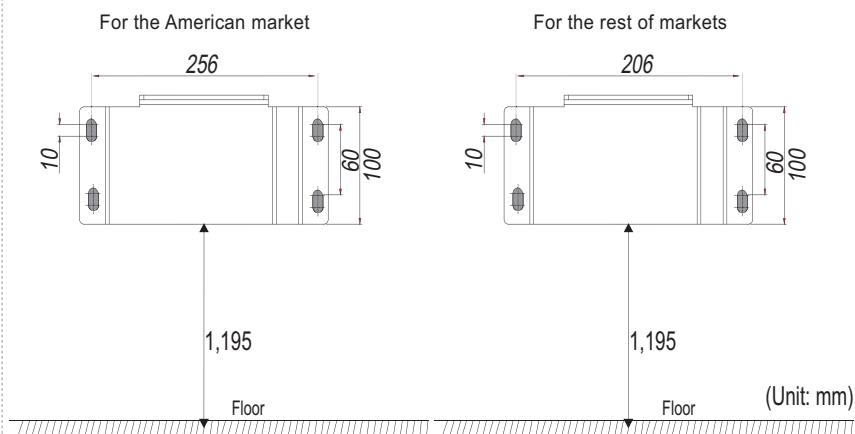
Two methods are available. Which one is preferred over the other depends on the situation of the installation site.

1. Marking in advance using the template provided

Distance between the wall and the template:



Height from the ground:

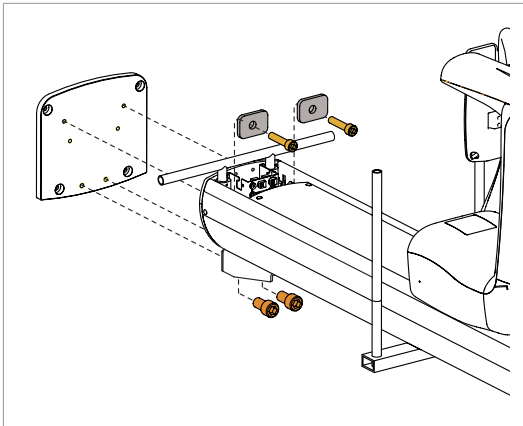


2. Marking after the equipment is moved to the wall, with two brackets combined (this method is explained in the manual).

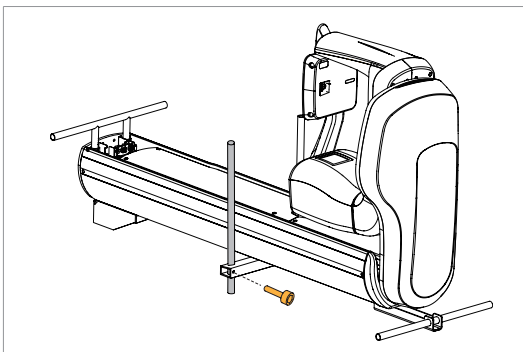
Unloading the equipment

1. To unload the equipment from the crate, take the steps from **1** to **4** specified in the **section 3.3**.

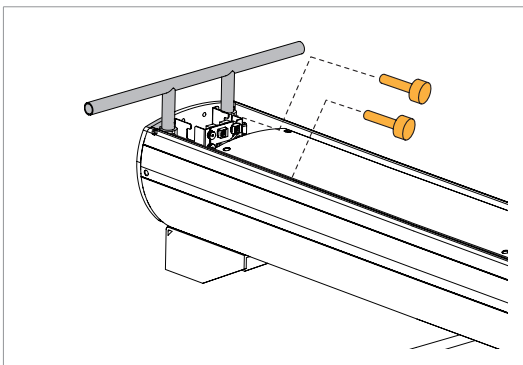
Replacing the carrying handle with system supports



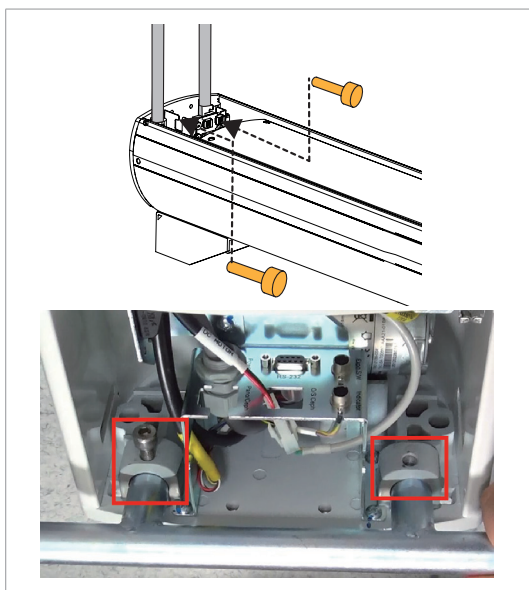
1. Separate the base plate as shown in the illustration. Leave 2 column support blocks to use in step 5 .



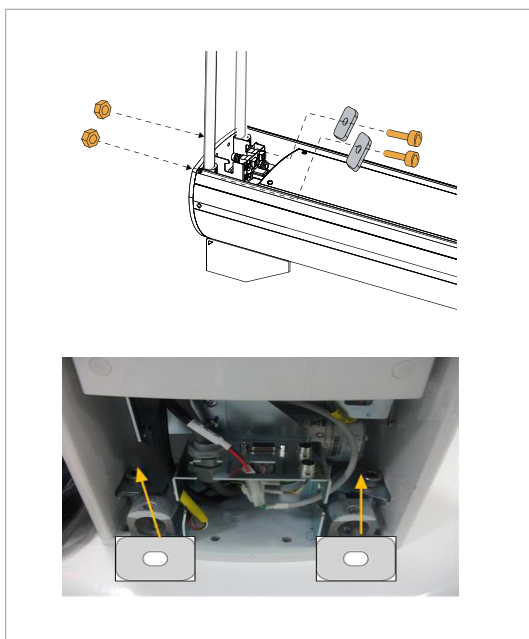
2. Separate the jig in the middle of the column.



3. Separate the carrying handle from the bottom of the column.

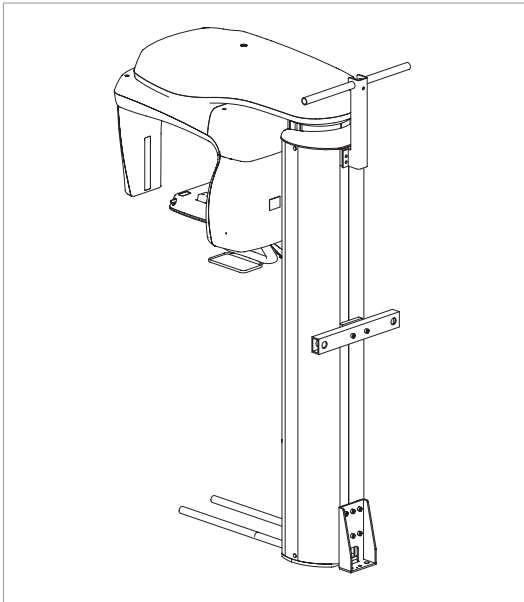


4. Attach the carrying handles (detached at step 1) to the bottom of column re-using the same wrench bolts.



5. Assemble 2 column support blocks to the bottom of column in the manner, as illustrated in the figure.

Wrench bolts	M8 x 20 w/ spring and flat washers Two Nuts Part No.: 36	
Column support blocks	Qty: 2	
Allen wrench Monkey wrench		

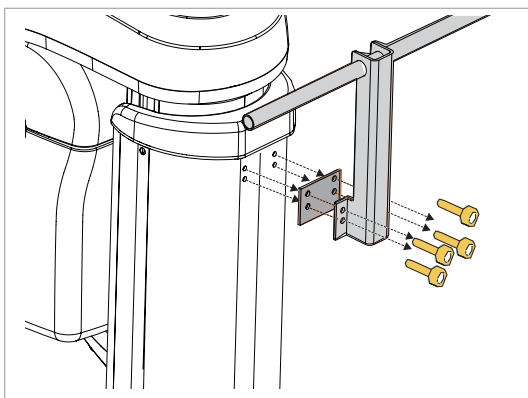


6. Erect the equipment in an upright position.



Immediately after erecting the equipment, one installer should hold the vertical frame area (front indicated) with both hands. Never hold the sensor or tube head area.

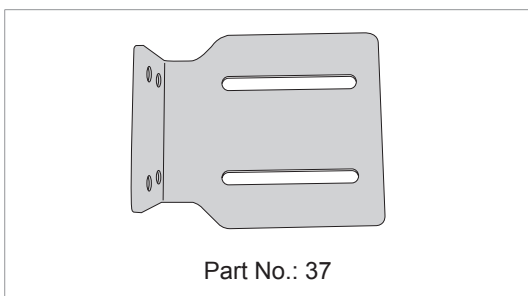
Installing the Column Bracket on the Back of the Equipment



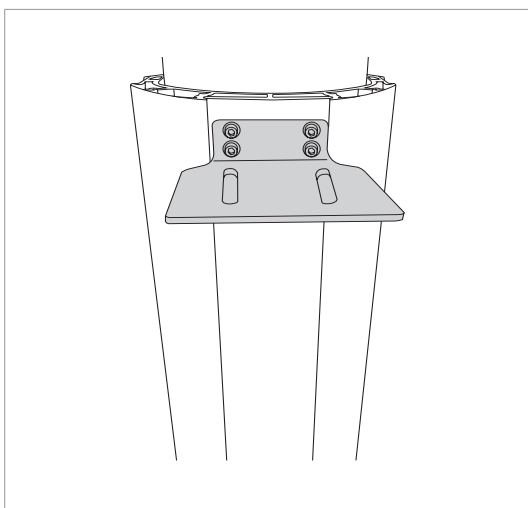
1. Separate the carrying handle on the top.



One installer should hold the front, while the other is separating the handle.



2. Prepare the wall bracket(part No.: 37).



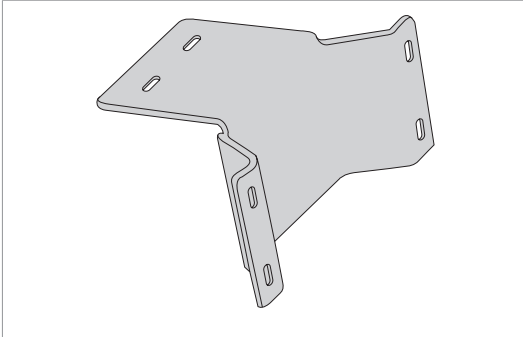
3. Attach the above bracket to the back of the column unit with the 4 bolts(part No.: 36).

Wrench
bolts w/2
SEMS

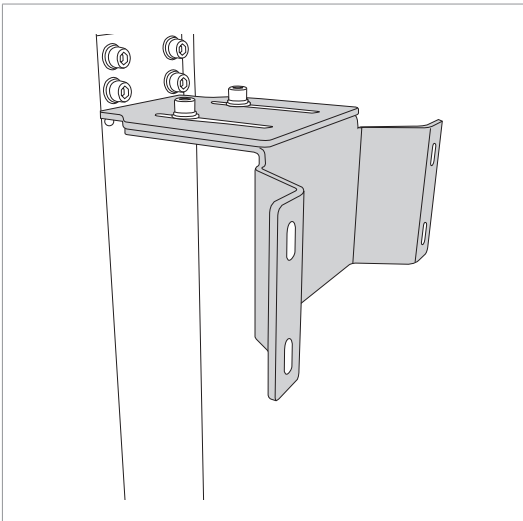
M8 x 20
Part No.: 36
Qty:4



Combining column and wall brackets



1. Prepare the wall bracket(Part No.: 38).



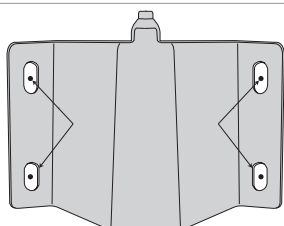
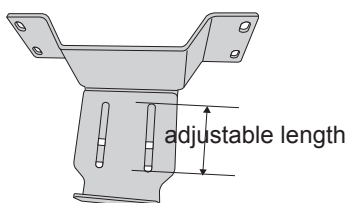
2. Combine the column and wall brackets in the following manner with the 2 wrench bolts(part No.: 36)



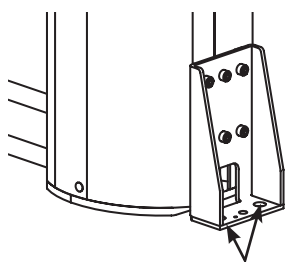
IMPORTANT

Do not tighten the bolts yet.

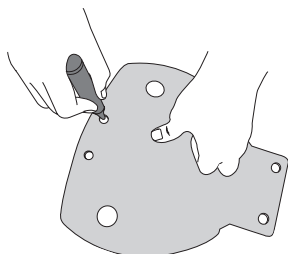
Marking 4 locations on the floor and 4 on the wall



On the wall: 4 locations (right and left)



On the floor: 2 locations (rear)



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 4 anchor bolts locations on the wall and 2 (rear only) on the concrete floor.

4. Move the equipment aside so as to mark the other 2 locations (front).



Move the equipment aside a little farther from the installer to make enough space to drill the floor.

Drilling 8 locations on the floor and wall

1. Put the alignment plate (Part No.: 39) aside from the ground.

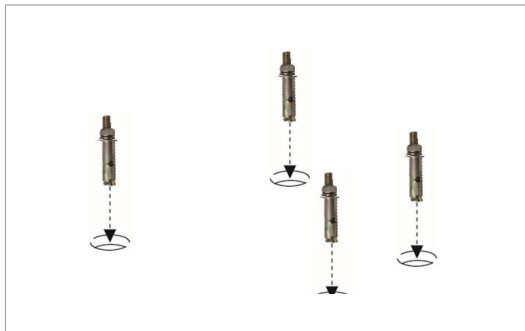


2. Drill the ground and wall holes of size 10.5 mm x 30 mm (depth) using the concrete hammer drill.

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

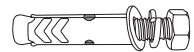
4. Anchor the bolts (M8 x 30, Part No. 35) with the hammer (ground and wall).

Verify that the anchors are secured



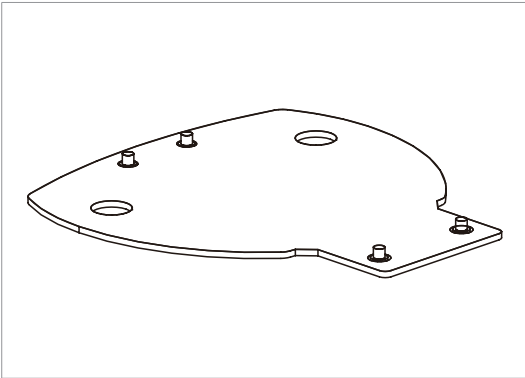
Anchor
bolts

M8 type
Part No.: 35

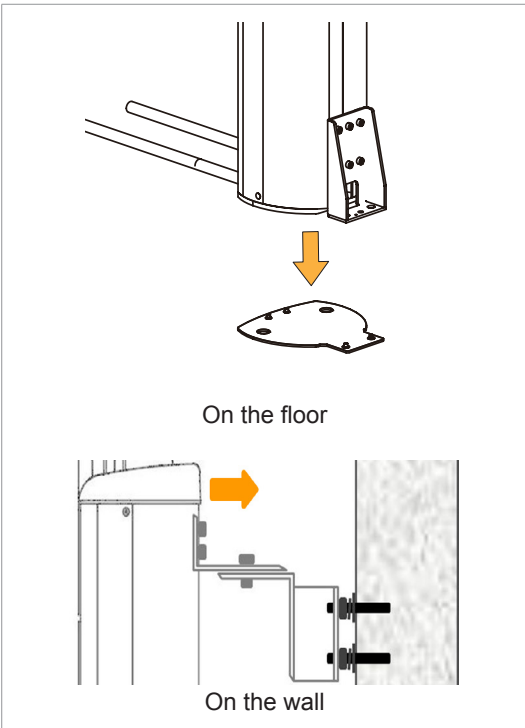


5. Remove the washers and bolts from the anchor bolts.

Combining the equipment with the anchor bolts



1. Place the alignment plate through 4 anchor bolts.



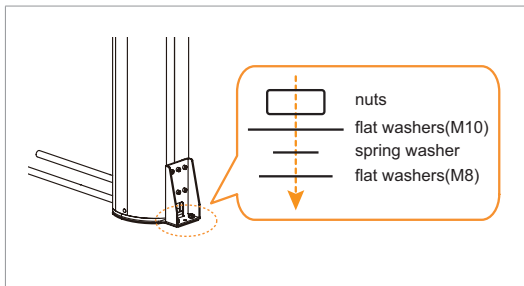
2. Place the equipment onto the alignment plate, while observing 8 anchor bolts are being inserted properly through each hole.

Installers required	3
---------------------	---

Securing the equipment (8 locations)

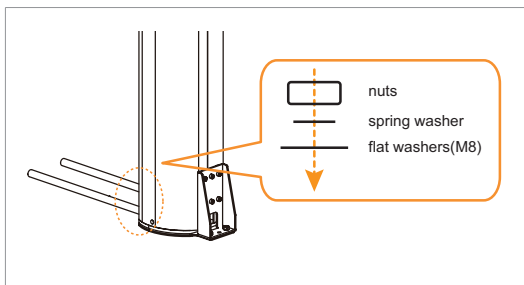


During the following procedures(1-3), do not tighten the nuts completely until you are asked to do so later when leveling the equipment



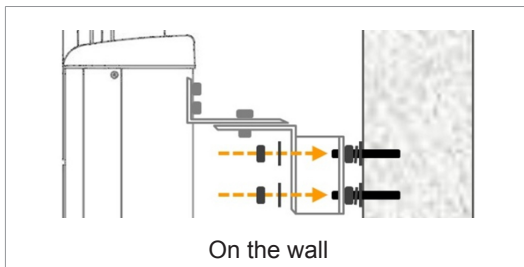
1. Fix the rear of the column bottom to the floor with 2 nuts, 2 flat washers(M8), 2 spring washers which come with the anchor bolts, and 4 flat washer(M10).

Rear side: 2 locations



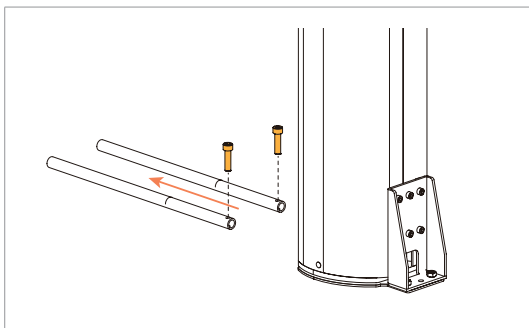
2. Insert the column support block (Part No.: 40) and fix the front of the column bottom with 2 nuts, 2 flat washers(M8) and 2 spring washers which come with the anchor bolts.

Front side: 2 locations

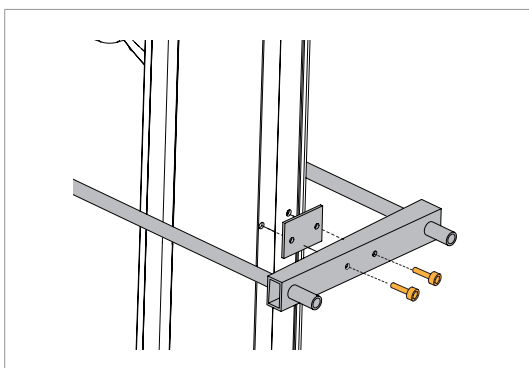


3. Fix the column bracket to the wall with 4 nuts and 4 flat washers(Part No. 35).

On the wall: 4 locations



4. Separate the system supports from the column.



5. Remove the handle in the middle.

Removing the Security Bolt from Rotating Unit

1. Open the vertical frame cover, if not opened yet.
2. To do this works, refer to the section: **4.3 Removing the transportation safety bolt.**

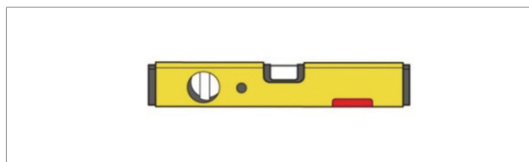
6.2 Installing the Cephalometric Unit (Optional)

For the Cephalometric unit installation, including the cabling between units, refer to the **section 4.4**.

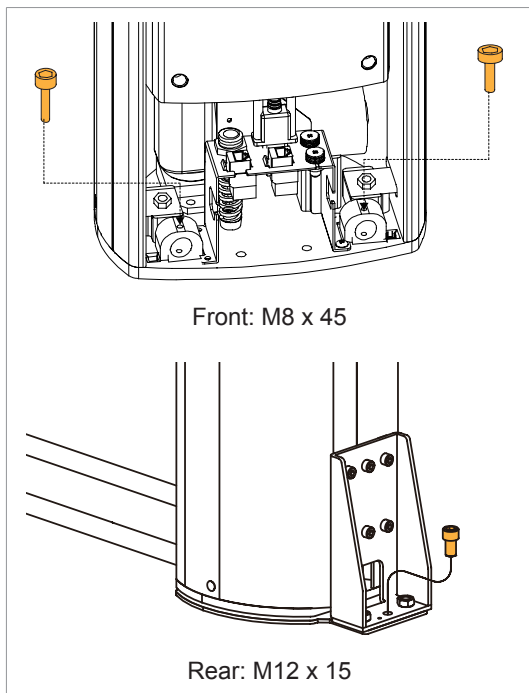
6.3 Leveling the Equipment



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. Screw 3 wrench bolts (Part No.:41) loosely.

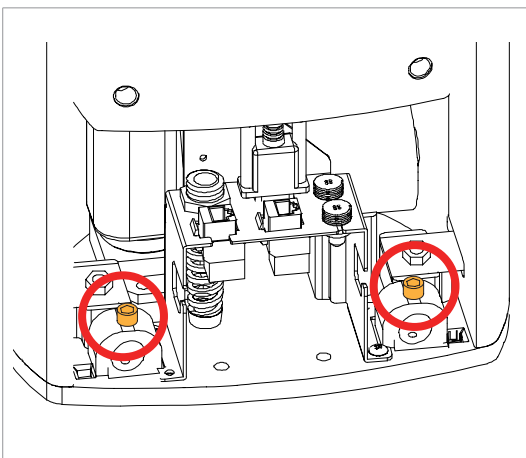
Allen
wrench

6 mm/ 0.23"
10 mm/0.4 "



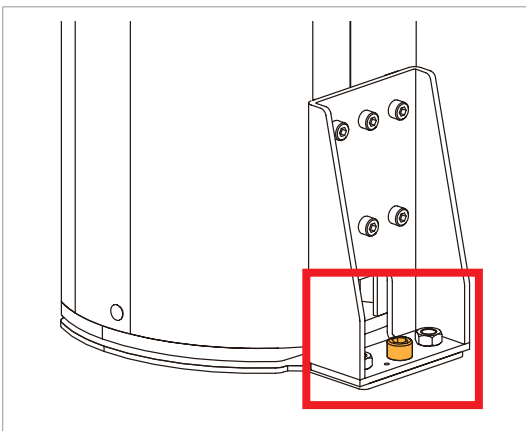


3. Position the rotating unit so that the X-Ray tube head faces the front.



Left and Right

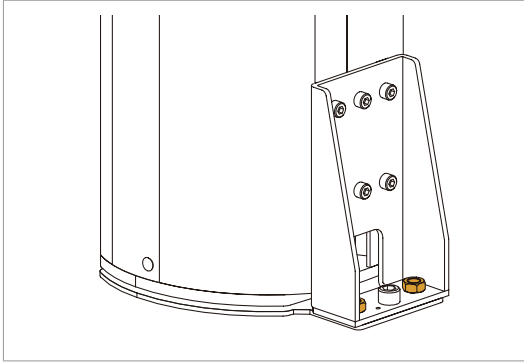
4. Positions of the spirit level are the same as those in the case of the base standing type. Refer to that chapter for the details.
5. Adjust the 2 bolts until the bubble on the spirit level centers in the middle, by turning the above screws clockwise or vice versa.



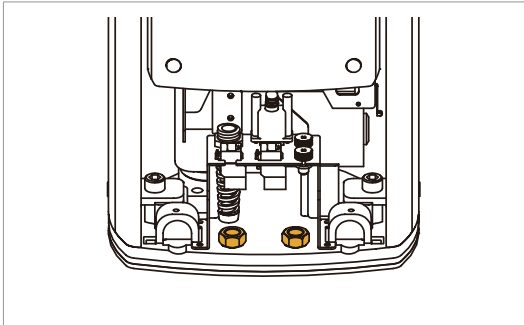
Front and Rear

6. Positions of the spirit level are the same as those in the case of the base standing type. Refer to that chapter for the details.
7. Adjust the one bolt until the bubble on the spirit level centers in the middle, by turning the following screw clockwise or vice versa.

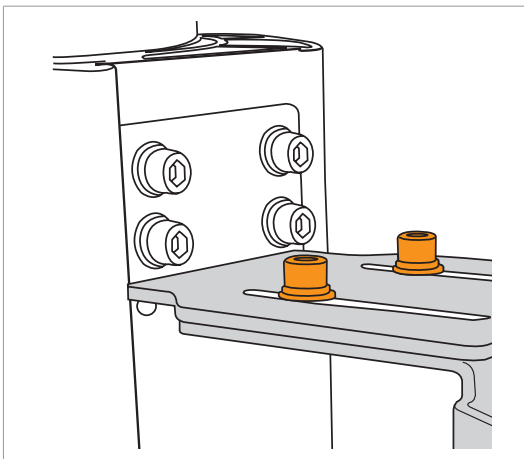
6.4 Tightening the Nuts firmly after Leveling is Obtained



1. Tighten the 2 nuts at the bottom of the column unit.



2. Tighten the 2 nuts at the front bottom.



3. Tighten 2 nuts at the joint of 2 brackets.

6.5 The Rest of Works

They are the same as those for the base installation type.

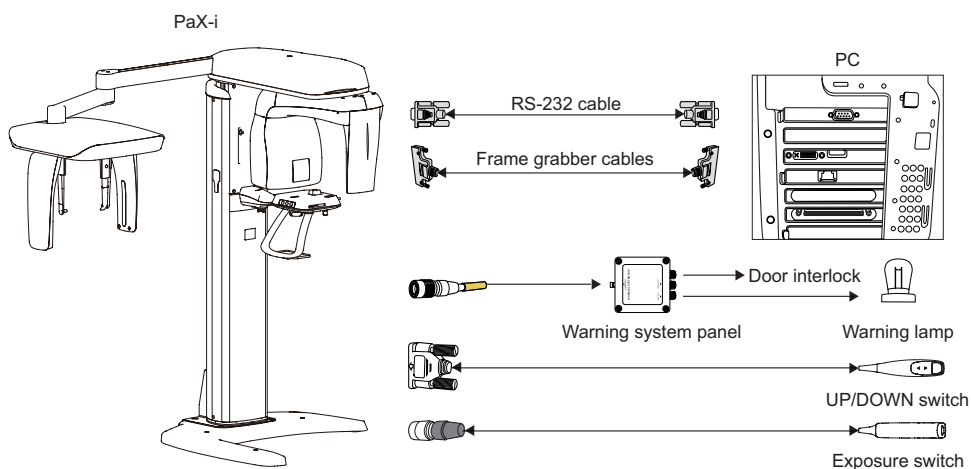
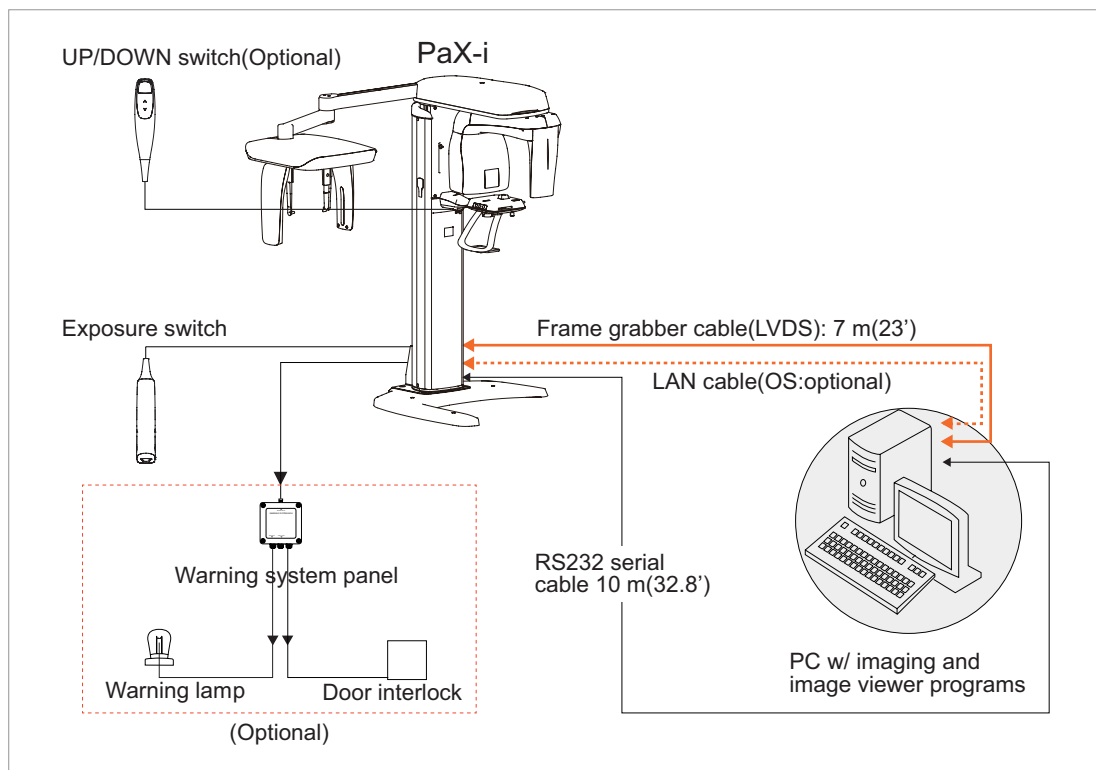
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Setting up PC System

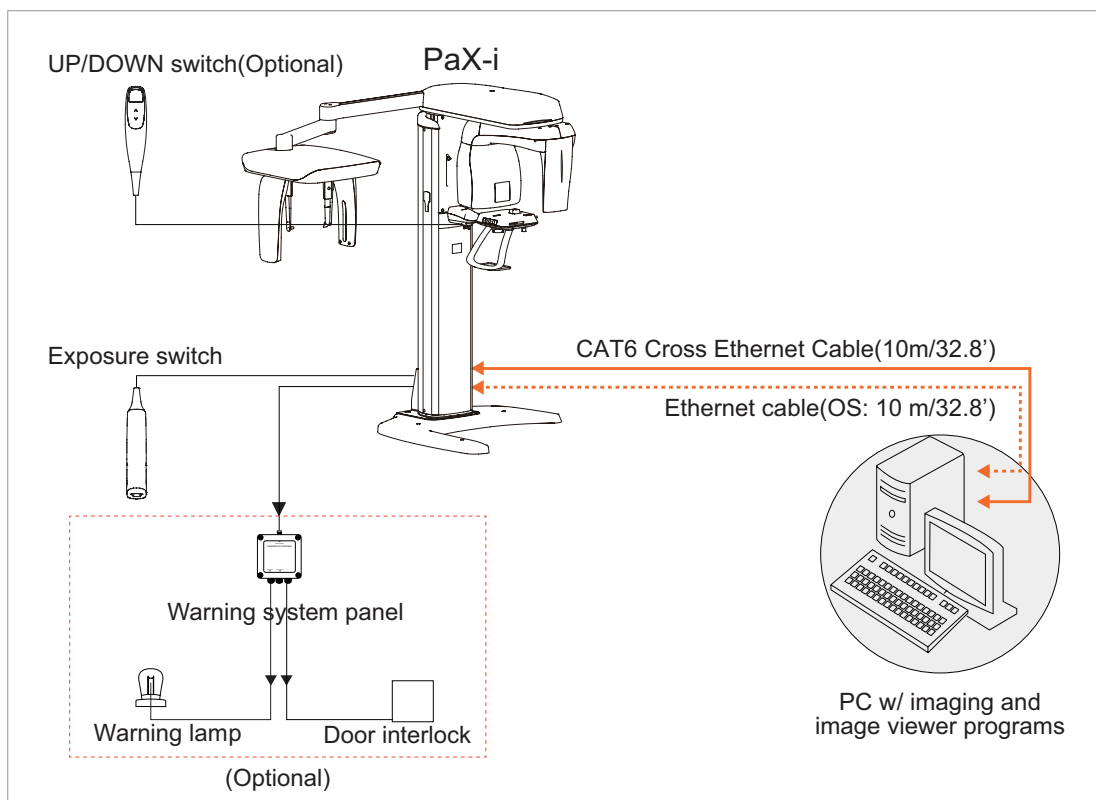
7.1	Direct Connection Diagram	100
7.2	The Recommended PC Requirements	102
7.3	Installing the Internal Peripherals	104
7.4	Connecting the Cables to PC	106

7.1 Direct Connection Diagram

A. LVDS cable in use



B. LAN cable in use: Crong board



RS232 cable: Used to command the unit and sometimes display the current status of the unit like parameter settings on the HyperTerminal program.

Frame grabber cable & LAN cable: used to transfer image data to the PC.

Warning system panel: Used to provide a visible indicator: light when the equipment is irradiating X-Ray.

7.2 The Recommended PC Requirements



1. It is mandatory to ensure that the PC system configuration is compatible with the PC system requirements for the imaging and image viewer software.
2. Since image quality may be deteriorated by lack of resources, observe the requirement guideline specified the following table.
3. The PC components shall be approved by UL/CSA
4. The PC shall be grounded well protectively
5. The multiple portable socket-outlets shall not be placed on the floor
6. The UPS is strongly recommended to be installed together with the PC system

An insufficient memory could cause the image reconstruction failure in the UHD (ultra-high definition) mode.

The PC system provided with the PaX-i undergoes the rigorous test for software compatibility before shipping. Any subsequent changes to the hardware and/or software may cause malfunction.

Item	HP	LENOVO
CPU	Intel® Core® i3-2120 3.3GHz	Intel® Core® i3-2120 3.3GHz
RAM	4GB (2GB*2) DDR3-1333 ECC RAM	4GB (2GB*2) DDR3 1333MHz UDIMM – Non ECC
Hard disk drive	500GB SATA 7200 1st HDD	500GB SATA 7200 1st HDD
GPU	Intel®HD Graphics	ATI HD7350 512M(DVI+DP)
Ethernet interface	Realtek RTL8171E Gigabit Ethernet	Intel®82579 Gigabit Ethernet
Serial port	1 (On board)	1 (On board)
Power supply	≥ 300 Watts (85 % Efficiency)	≥ 320 Watts (85% Efficiency)
PCI slots	1 PCI Express x 1 Slot 1 PCI Express x 16 Slot	1 PCI Express x 1 Slot 1 PCI Express x 16 Slot
	2 PCI Slots	2 PCI Slots
CD/DVD drive	SuperMulti DVD Drive	SATA DVD-ROM/DVD Recordable
Monitor	19" 1280 x 1024 screen resolution	19" 1280 x 1024 screen resolution
Operating system	Windows 7 Home Premium 64-Bit OS	Windows 7 Professional 64-Bit OS
Recommended system	Pro 3330	M82

7.3 Installing the Internal Peripherals



Allow enough time to dissipate remnant energy after unplugging the power cord from the main outlet or PC.



Unplug the power cord from the main outlet or PC before starting the following works.

It is strongly recommended to use the Ethernet card with slot type PCI Express x1 interface.

Whenever handling the frame grabber board:

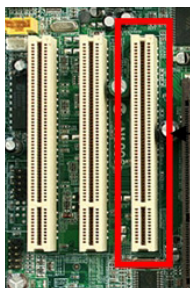
1. Wear the ant-static gloves.



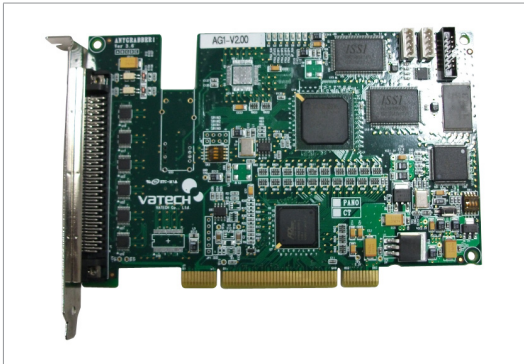
2. Do not wear the likes of a thick jacket.

Installing frame grabber board : LVDS type

1. Unplug the power cable from the back of PC.
2. Open the PC cover.
3. Locate the empty universal PCI type slot inside the PC for the frame grabber card.



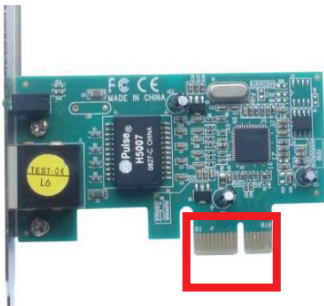
Universal PCI slot



4. Insert the frame grabber board : AnyGrabber board (**Part No.: 27**) firmly into that slot.

5. Tighten the card holder firmly with the screw.

Installing the Ethernet card (LAN type: Crong board)

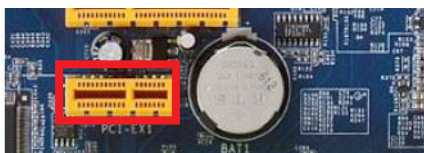


PCI-E x1 type interface



In case that the OS sensor is installed, two RJ-45 ports are required, in which case an additional LAN card needs to be installed.

Use the PCI Express x1 type LAN card.



PCI Express x1 type slot

1. Locate the PCI Express x1 type slot on the motherboard.
2. Insert the LAN card carefully into that slot.
3. Tighten the card holder firmly with the screw.

7.4 Connecting the Cables to PC

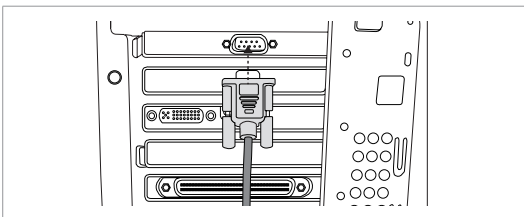


Always check the cable condition visually. Surprisingly, unexpected errors affecting image acquisition arise from the bad cable or its bad contact condition.

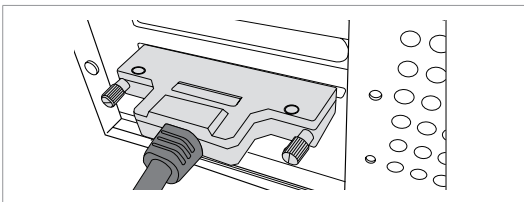


Connect the regular cables for PC: keyboard, mouse, and video in advance.

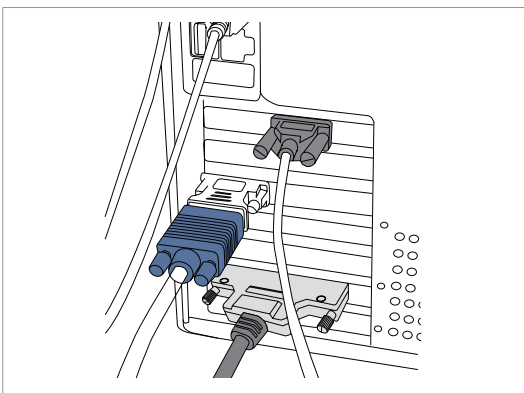
A. The LVDS cable in use



1. Connect the RS-232 cable.



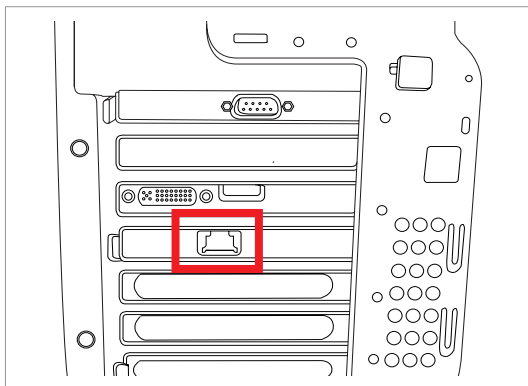
2. Connect frame grabber cable(LVDS type).



3. (Optional) Connect the LAN cable if the OS sensor is installed.

Rear view of the PC after all the cables attached

B. The LAN cable : Crong board



1. Connect the LAN cable.

2. (Optional) Connect another LAN cable if the OS sensor is installed.



NOTE

When the crong board with the OS(one shot) CEPH sensor is used, two RJ-45 ports are required from the back of PC: one for PANO, one for OS sensor

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Setting up Windows Environment Variables

8.1	Before Beginning	110
8.2	Checking PC BIOS Settings.....	110
8.3	Setting Folder Exclusions with Anti-virus Software	111
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8.5	Setting up the Power Mangement Options	114
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8.7	Reallocating Memory Space (32-bit OS only)	117

8.1 Before Beginning



The PC system supplied with the equipment is intended to be used as an image acquisition and its view only. For the purpose of the PC server for image management, use of a different PC is strongly recommended.

The programs related to 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

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

Ensure that the emergency stop switch is in OFF position.

Before InstallShield installation, ensure that the video card driver installed on PC is the most up-to-date version. To check this, go to the website of the graphic card manufacturer.

8.2 Checking PC BIOS Settings

The PC is shipped, with its BIOS settings, as specified in the Appendix **E: Checking PC BIOS Settings**. Before proceeding to the next sections, check the BIOS status.

8.3 Setting Folder Exclusions with Anti-virus Software



1. Set the virus scan exception for the files and folder related to this equipment.
2. Do not run the memory-resident background programs unrelated to the equipment.
3. Running the virus scan is recommended to be performed only when equipment is idle.
4. Turn the firewall off.
5. Always use the blank USB drive, whenever possible.

Some files used by the PaX-i are incorrectly recognized as virus(es)/trojan(s) 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 PaX-i, the following folder and files should be excluded with the virus scan.

Files	Path
C:\Program Files\Vatech	C:\VCaptureSW

For example: Suppose the Anti-virus program from McAfee is running in the background.

Note: The procedure to set folder exclusions is similar for most anti-virus programs.

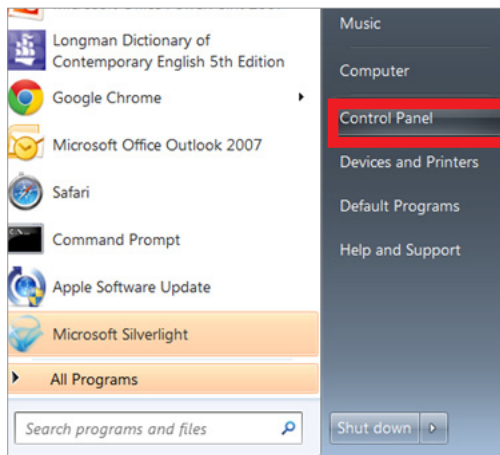
1. Open the McAfee Anti-Virus program, and select the "VirusScan".
2. Right-click on the "On-Access Scan" menu option, and left-click on the "Properties" tab.
3. Select the "**All Processes** → **Detection** → **Exclusions**" menu option, and choose the "**Add**" menu button.
4. Navigate to the folder or the files you want to designate an exclusion path for, and select the check box to "Also Exclude Subfolders". Click "OK" when complete, and exit McAfee for the path exclusion to be complete.

8.4 Turning the firewall off

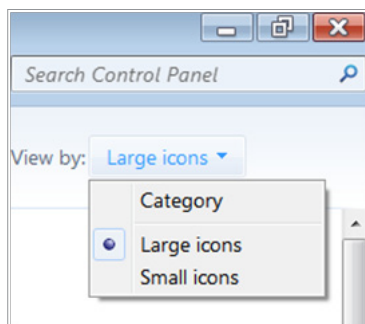
The LAN port and/or local IP may be blocked by the Windows firewall property, leading to interruptions in imaging acquisition and data transmission. For this reason, it is required that you disable the Windows Firewall by using the following procedure

For Windows 7 users:

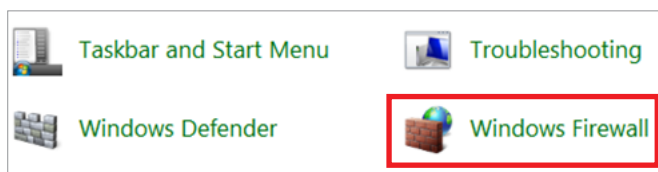
1. From the desktop, click **Start** → **Control**



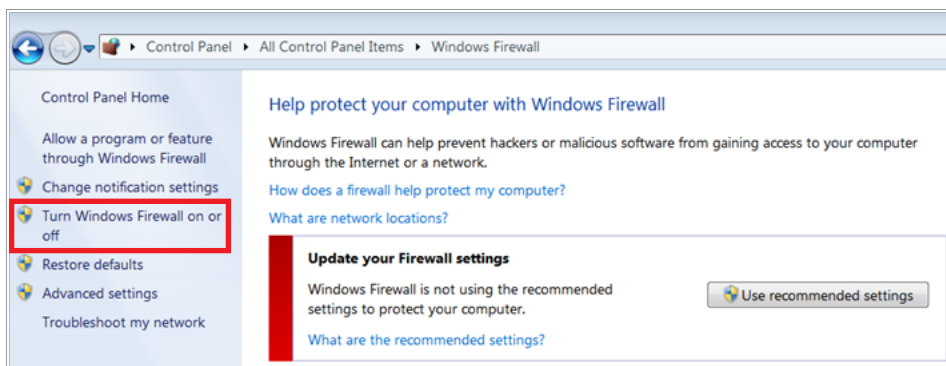
2. Click the **View by** field on the upper right corner and select **Large icons**.



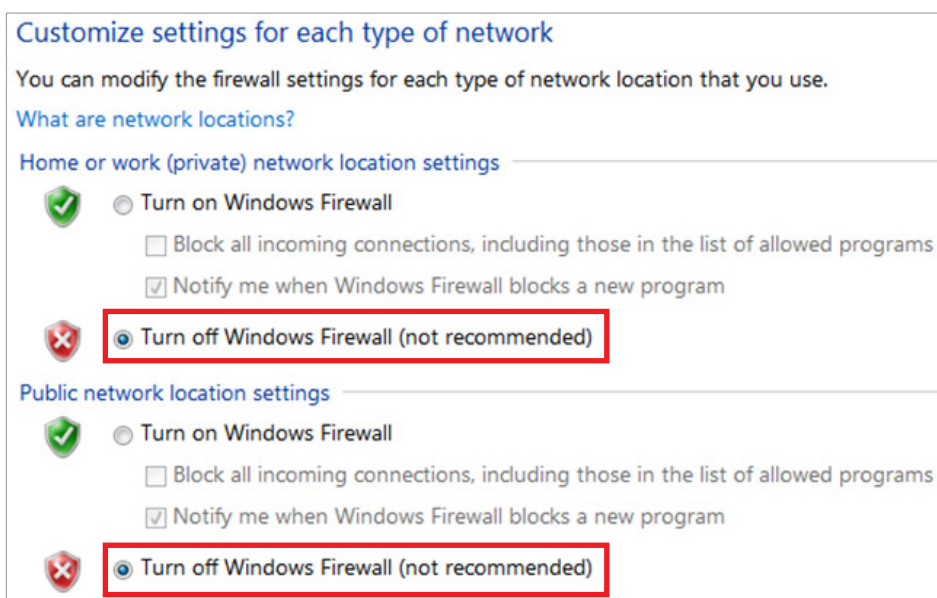
3. Double click on the Windows Firewall.



4. Select the **Turn Windows Firewall on or off**.



5. Select the **Turn off Windows Firewall** for both settings: Work and Public networks.



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

8.5 Setting up the Power Management Options

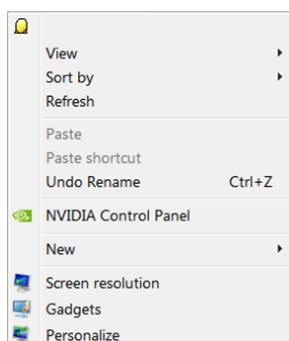
The following statements are based on the windows 7 environment. Depending on the operating system employed, the figures on your system may appear different slightly.

To avoid disruptive and abnormal operation while acquiring image, it is required to reconfigure some parameters on the Windows operating system.

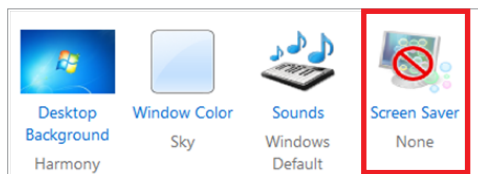
Disabling the screen saver

From the desktop,

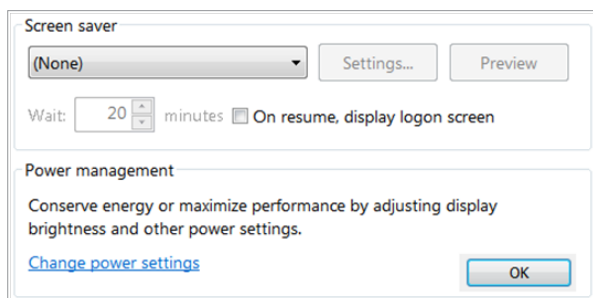
1. Click the right mouse button and select **Personalize**.



2. Locate and click the screen saver.



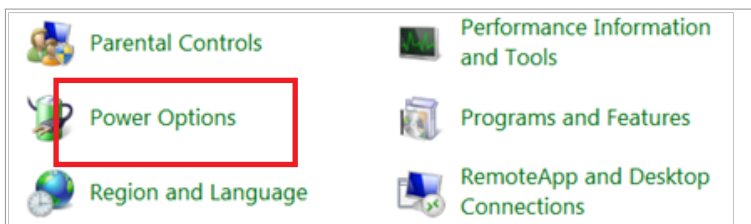
3. Select **None** in the pull-down menu.



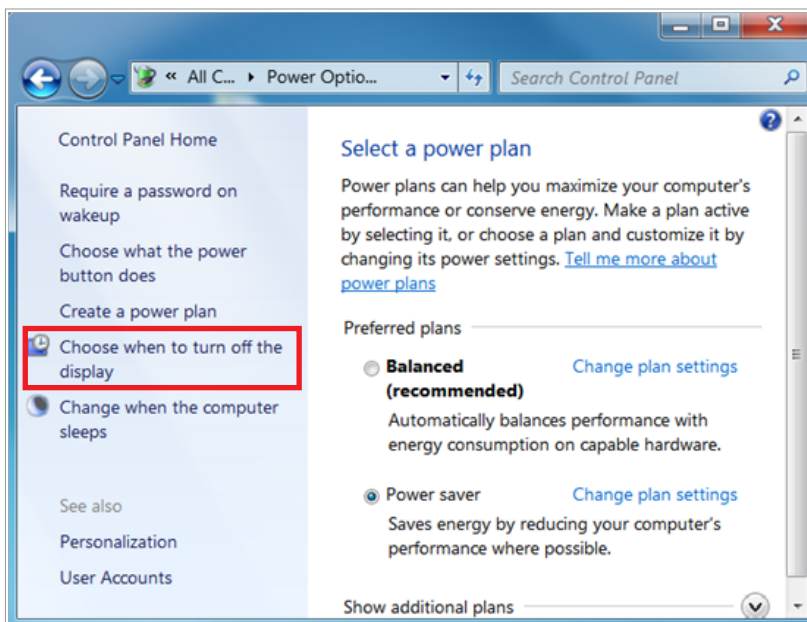
4. Click **OK**.

Selecting the power options: monitor and system

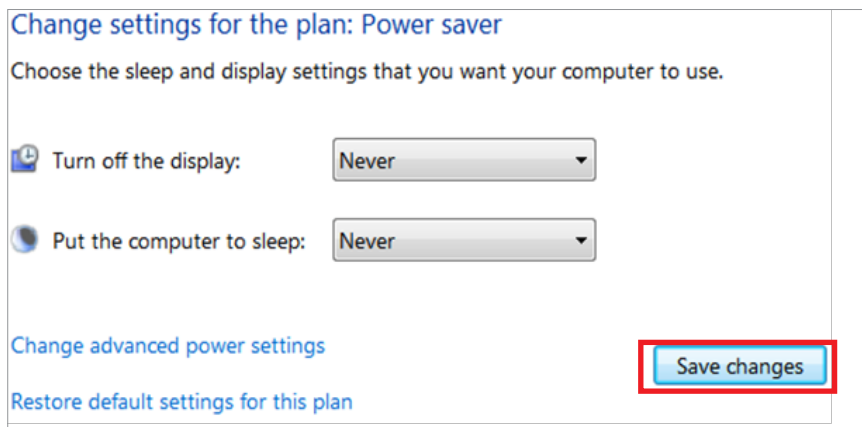
1. Go to the **Control Panel**.
2. Double click on the **Power Options** icon.



3. Select **“Choose when to turn off the display”**.



4. Select **“Never”** for both fields.



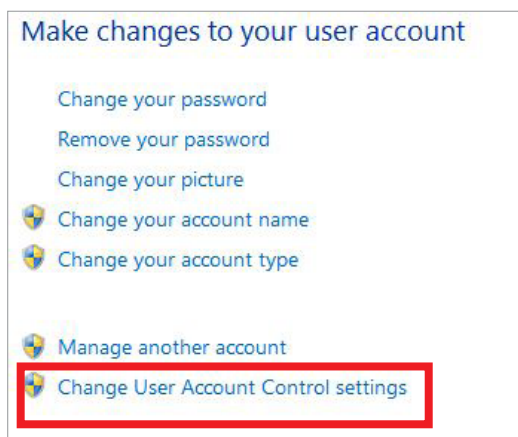
5. Click **“Save changes”**.

8.6 Turning off the User Account Control

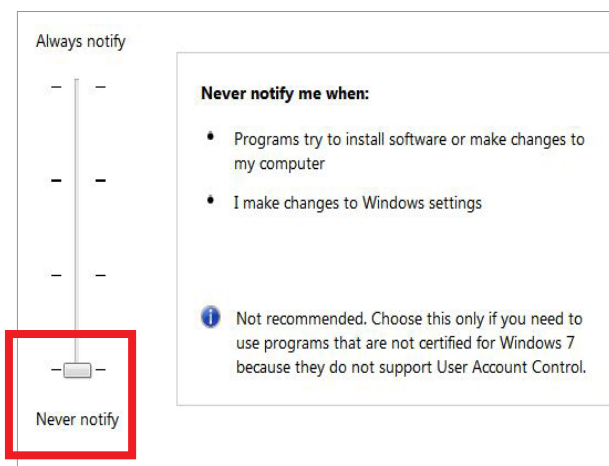
1. Open the control panel of Windows.
2. Click the User Account icon.



3. Click on the 'Change User Account Control settings'.



4. Disable the UAC by moving the slider bar down to the bottom, **Never notify**.



5. Click 'OK' and restart the PC.

8.7 Reallocating Memory Space (32-bit OS only)

For the details on how to reconfigure the memory space, refer to the appendix **F: Reallocating Memory Space**.

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Installing Software

9.1	Installing the InstallShield.....	120
9.2	Installing the Frame Grabber Driver (64-bit):LVDS	134
9.3	Setting up the User-specific Information	136
9.4	Setting up the IP Address for the Crong Board	146
9.5	Setting up the IP Address for the OS CEPH Sensor(Optional)...	149

9.1 Installing the InstallShield



Ensure that the emergency stop switch is in OFF position prior to starting installShield installation.

The image viewer program such as EasyDent or the one from the 3rd party should be installed in advance of the InstallShield installation.

Before InstallShield installation, ensure that the video card driver installed on PC is the most up-to-date version. To check this, go to the website of the graphic card manufacturer.

Perform virus scan for the PC and InstallShield program with the anti-virus program prior to proceeding with its installation.

Do not install the programs irrelevant to image acquisition and view together with imaging program on the same PC. There may be subtle conflicts between them.

For the first time installation

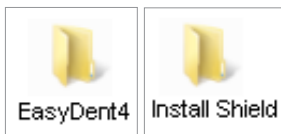


The EasyDent viewer program should be installed in advance before proceeding with installation.

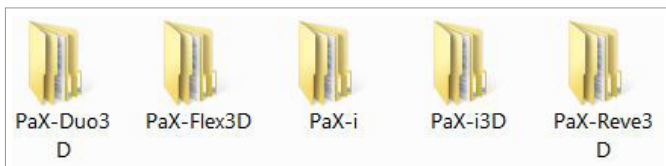
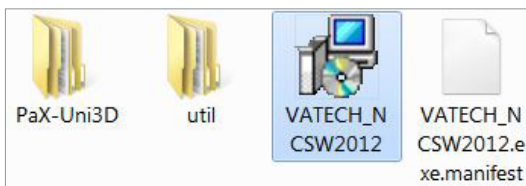
A. LVDS cable in use

To install the imaging software and the other drivers for the first time, go to the folder where the following files are in.

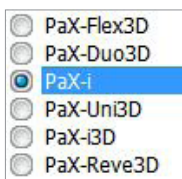
1. Turn On the PC and Equipment.
2. Insert the CD into CD-ROM drive and go to the folder: InstallShield.



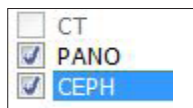
3. Double click on the **VATECH_NCSW2012**



4. Select the equipment model: PaX-i and then click **Next**.



5. Select the modality and click **Next**. Note that if the CEPH feature comes with the equipment, also check the **CEPH**.



6. Select the **AnyPano(HQ)** for panorama and click Next.

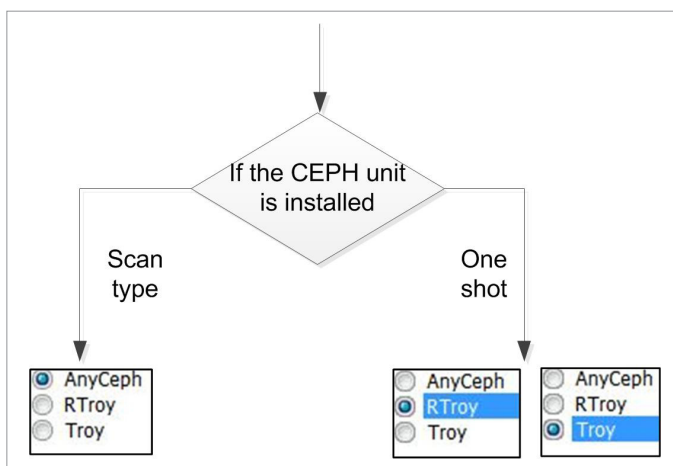


The AnyPano(HQ) should be selected. Otherwise erroneous image could be acquired. The AnyPano and AnyCeph are used for the other equipment.

7. Select the CEPH sensor, if it is installed.



Select an AnyCeph for scan type, or RTroy/Troy for the one shot type.



8. Select the default port number: **COM1**.



Select the port No.: **COM1**

The same COM port No. should be used between the equipment and PC.

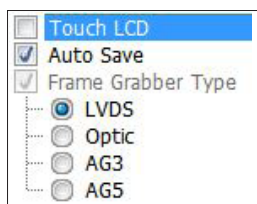
And click **Next**.

9. Select the language and click **Next**.

10. Select the image viewer program, where the EasyDent is the software developed by **VATECH**. If the third-party software is to be used, select the **SDK**.

Click **Next** to continue.

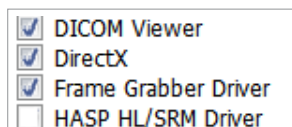
11. Uncheck the Touch LCD. Select Auto Save and LVDS. Note that, when the Auto Save is checked, the image data acquired is saved automatically.



12. The following is a list of various software components that can be installed on as-needed basis. For the first time installation, select all.



1. For the PaX-i installation, uncheck the HASP HL/SRM Driver.
2. If the Frame Grabber board driver for Windows 7 64-bit is to be installed, you should install it manually. For details, see the section 10.2: Installing the frame grabber driver for Windows 7 64-bit. Uncheck the Frame Grabber Driver.



13. The following figure displays the information entered so far. If necessary, you can modify it by clicking **Back** button.

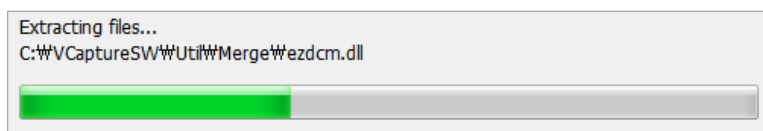
```

Install log
=====
Model = PaX-i
Sensors = PANO(AnyPano(HQ)) CEPH(AnyCeph)
COM port = 1
Language = English
Connection = EasyDent (En)
Using Auto Save.
Frame Grabber Type = LVDS
Installs DICOM Viewer.
Installs DirectX
Installs FrameGrabber Driver

```

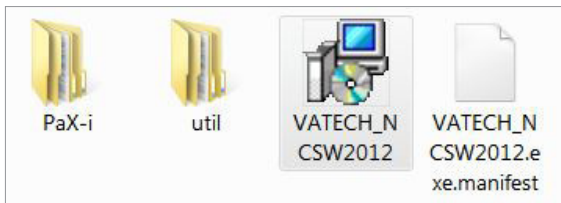
Click **Install** to continue.

Now extracting the files in the folder **C:/VCaptureSW/**.



B. LAN cable in use: Crong board

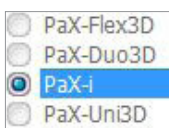
1. Double click on the **VATECH_NCSW2012**.



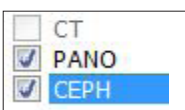
2. Click the **Next** from the following screen.



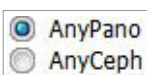
3. Select the PaX-i.



4. Select the modality and click Next. Note that if the CEPH feature comes with the equipment, check the CEPH.



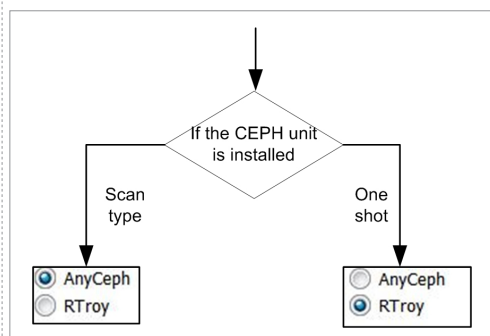
5. Select the PANO. Sensor type.



6. Select the CEPH sensor, if it is installed.



Select an AnyCeph for scan type, or RTroy for the one shot type.\



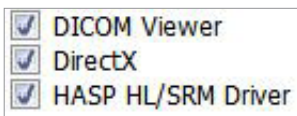
7. Select the language and click **Next**.

8. Select the image viewer program. The EasyDent is the software developed by **VATECH**. If the third-party software is to be used, select the **SDK**.

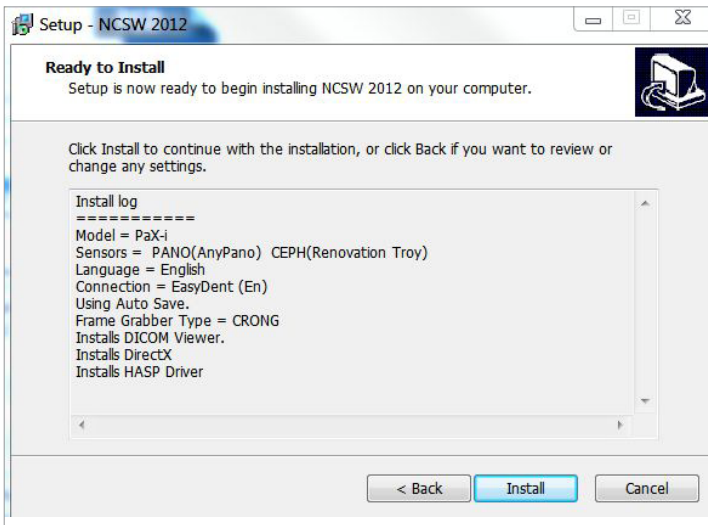
Click **Next** to continue.

9. Select Auto Save. Note that, when the Auto Save is checked, the image data acquired is saved automatically.

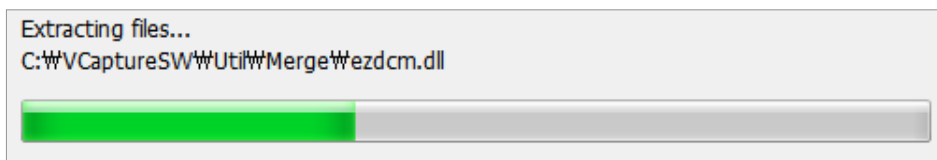
10. Select the device drivers. For the first time installation, select all.



11. The components information is displayed in the log file. Check that all are correct. Otherwise, go back and modify the related component(s) by clicking the Back button. If correct, click Install.



Now extracting the files: **C:\VCaptureSW\.**

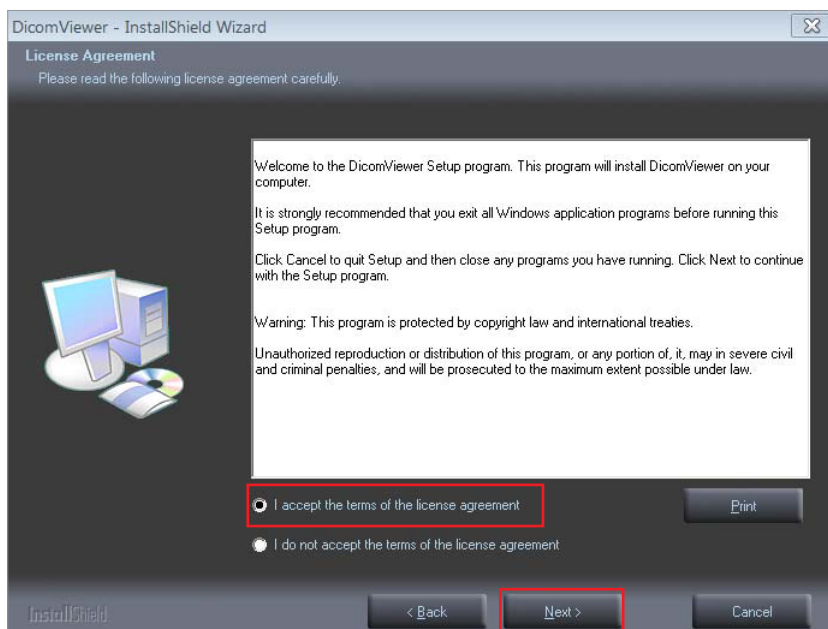


Installing the DICOM viewer

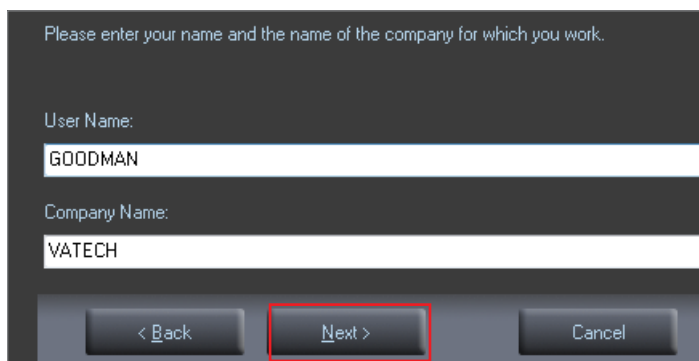
1. Click **Next** to install DICOM viewer.



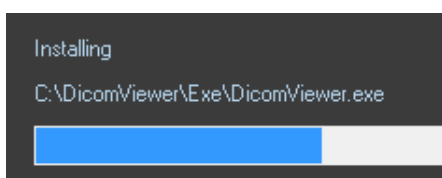
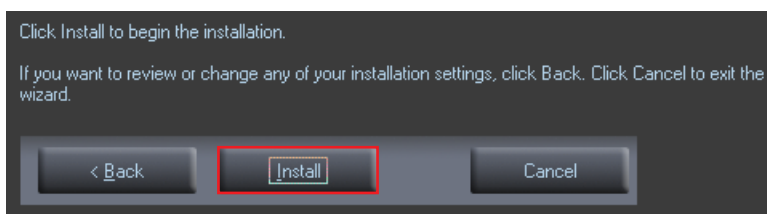
2. Select "I accept the terms of the license agreement" and click **Next**.



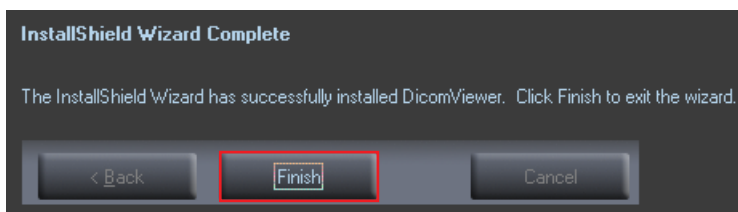
3. Enter the names of user and clinic and click **Next**.



4. From the following screen, click **Install**.

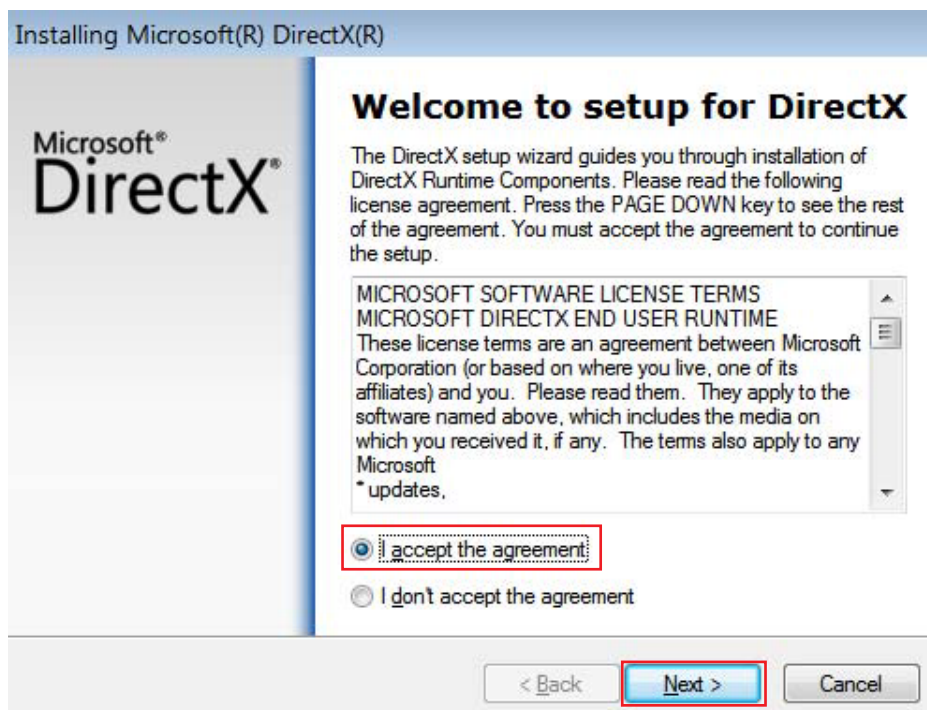


5. Click **Finish** to finish.

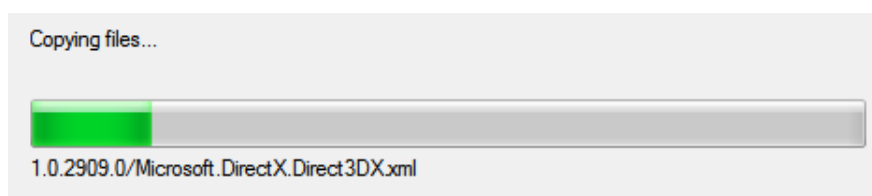


Installing the DirectX

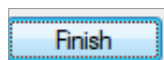
1. Now installing the **DirectX**: select "I accept the agreement".



2. Click **Next** to continue. Now installing...



3. Click **Finish**.



Installing frame grabber driver : LVDS 32-bit only

1. Click **Next** from the welcome screen.

Welcome to the InstallShield Wizard for Vatech Anygrabber2 Board 2009A 1.4.0.2

The InstallShield Wizard will install Vatech Anygrabber2 Board 2009A 1.4.0.2 on your computer.
To continue, click Next.

2. Select the folder in which the files are copied.

Target Folder
: C:\Vatech_Anygrabber2_Board_2009A_1402\

3. Click Install button to continue.



4. Installation has been completed.

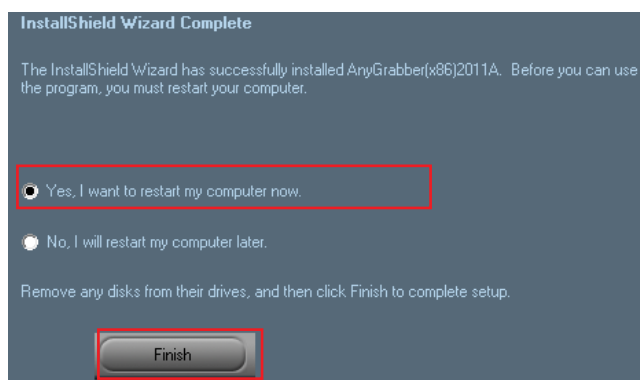
Finish Vatech Anygrabber2 Board 2009A 1.4.0.2 Installation

Vatech Anygrabber2 Board 2009A 1.4.0.2 Setup is almost complete.

5. The installshield installation has been completed.



6. Restart the PC by clicking **Finish** button.



Verifying that all Components are Properly Installed

1. Locate the file: **NCSW 2012_Install_Log.txt** on the desktop.

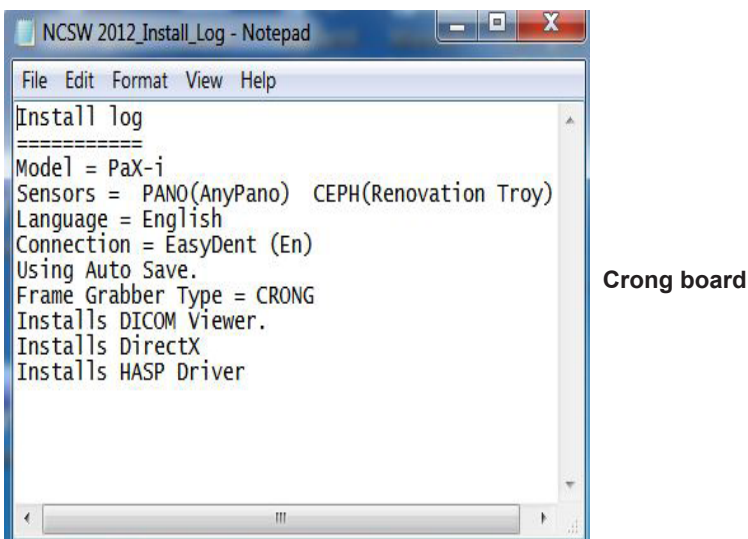


2. Open it to check the file. You can find out that all components are installed.

```

Install log
=====
Model = PaX-i
Sensors = PANO(AnyPano(HQ)) CEPH(AnyCeph)
COM port = 1
Language = English
Connection = EasyDent (En)
Using Auto Save.
Frame Grabber Type = LVDS
Installs DICOM Viewer.
Installs DirectX
Installs FrameGrabber Driver
  
```

LVDS

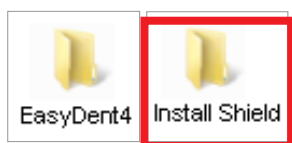


9.2 Installing the Frame Grabber Driver (64-bit):LVDS

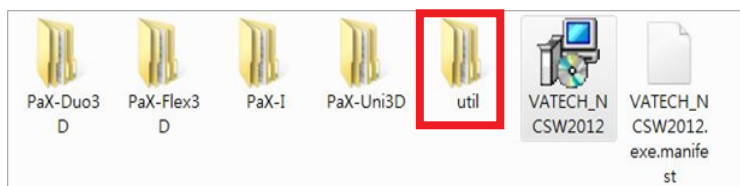


This frame grabber driver for Windows 7 64-bit requires the 64-bit processor.

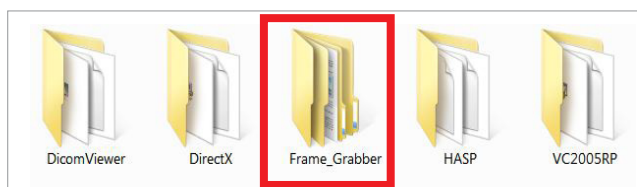
1. Insert the CD into CD-ROM drive and go to the folder: InstallShield. Double click on the Installshield.



2. Double click on the **util** icon.



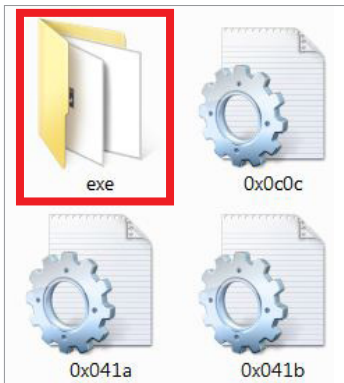
3. Double click on the **Frame_Grabber** icon.



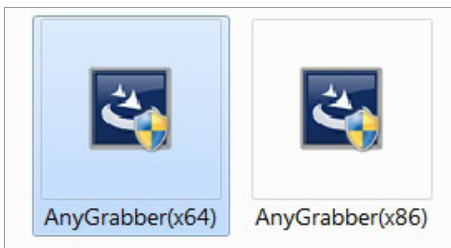
4. Select the **Frame_Grabber_2011A** folder.

Name	Date modified	Type	Size
Frame_Grabber_2009A	4/4/2012 3:16 PM	File folder	
Frame_Grabber_2011A	4/4/2012 3:16 PM	File folder	

5. Select the **exe** folder.



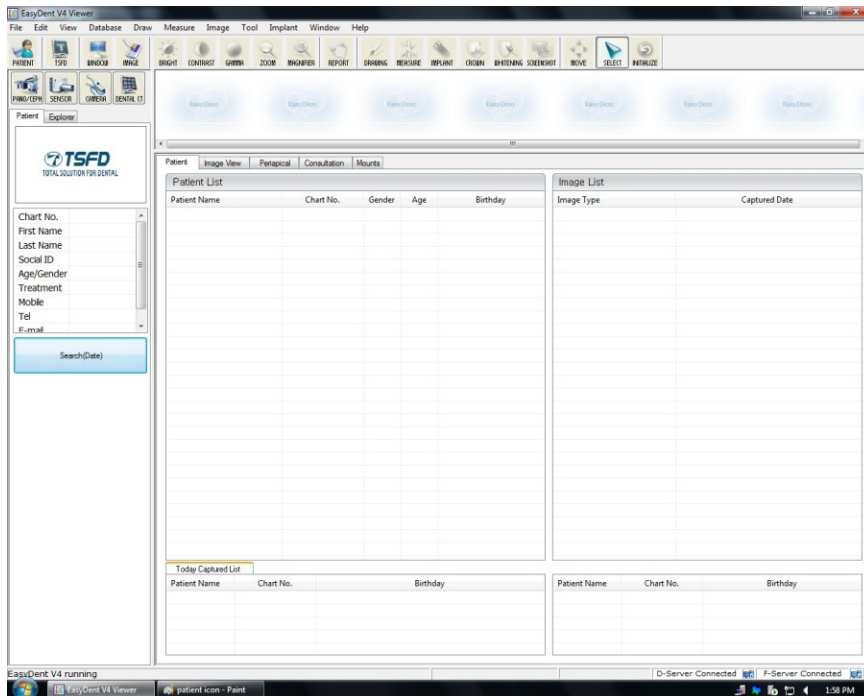
6. Click the **AnyGrabber(x64)**.



9.3 Setting up the User-specific Information

Running the image viewer

1. Run the image viewer. On your desktop, double-click **EasyDent** or click **Start** → **All Programs** → **EasyDent**. The **EasyDent** main window will be displayed.

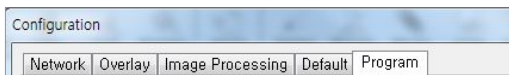


Interfacing EasyDent and imaging programs

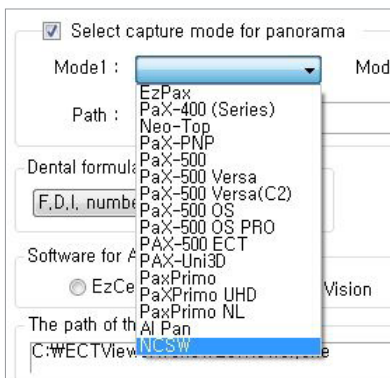
1. From the main screen of EasyDent, click the Help menu and select Configuration.



2. Click the Program tab.



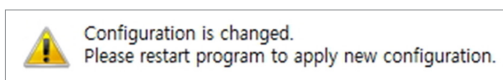
3. Check 'Select capture mode for panorama' select the NCSW



4. Click **Apply**



5. When the following message appears, click **OK** to restart the program.

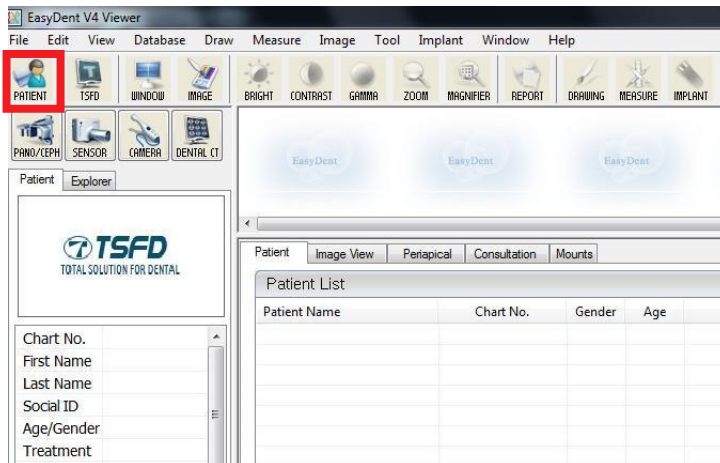


6. Re-run the EasyDent program and check the change has been reflected.

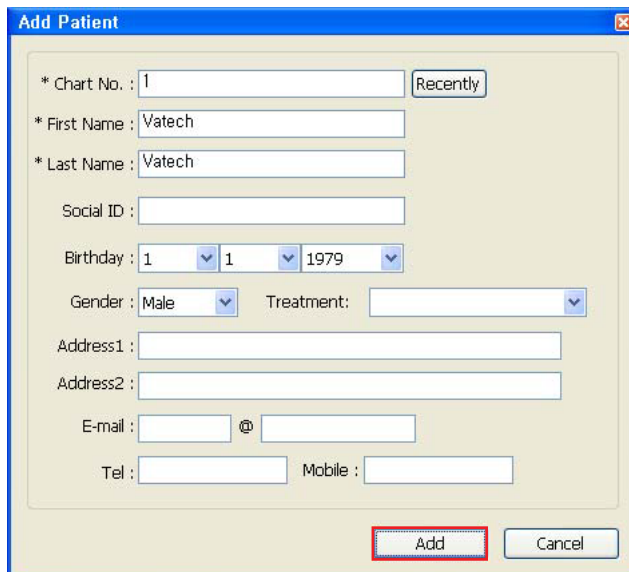


Creating a new patient record

1. Click the Patient icon () on the upper left corner of the EasyDent's main GUI window.



The following dialog box will open.



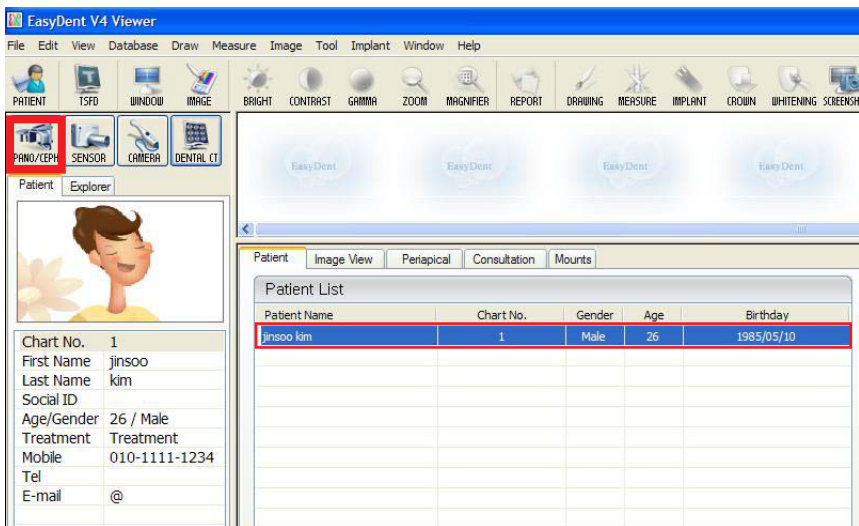
The 'Add Patient' dialog box contains the following fields and controls:

- * Chart No. : 1 (with a 'Recently' button)
- * First Name : Vatech
- * Last Name : Vatech
- Social ID : (empty text box)
- Birthday : 1 / 1 / 1979 (with dropdown arrows)
- Gender : Male (with a dropdown arrow)
- Treatment : (empty dropdown menu)
- Address1 : (empty text box)
- Address2 : (empty text box)
- E-mail : (empty text box) @ (empty text box)
- Tel : (empty text box) Mobile : (empty text box)
- Buttons: Add (highlighted with a red box), Cancel

2. Enter the required patient information. **Chart Number**, **First Name**, and **Last Name** are required fields which must be filled in. All other fields are optional, but it is recommended that they be filled in.
3. Click **Add** to save the patient record.

Initiating the Imaging Program

1. First, select the patient information in the patient list, and click the **PANO/CEPH** icon to open the imaging program.



The error code E033 (red box in the figure above), indicating that the equipment is still in the packing mode, should disappear when the command of exiting the packing mode is executed. See the next 'Disabling the packing mode'

Disabling the packing mode



PaX-i has a unique feature— packing mode— built in the system to prevent the unit from being damaged while shipping and transporting. Thus it is in the packing mode by factory default. The unit is required to exit the packing mode at this step for successful installation.



Unless the packing mode disabled, no operation will happen even after the equipment is turned on.

1. From the main GUI window, click the setup icon highlighted by the red box in the figure below.

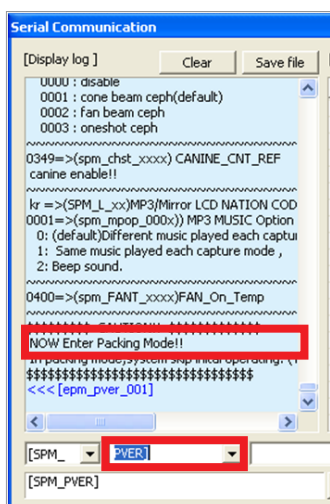


2. When the following screen appears, select Engineer. Then enter password in the Password field.
Password: vatech

3. Click **General tab** → **Connect**

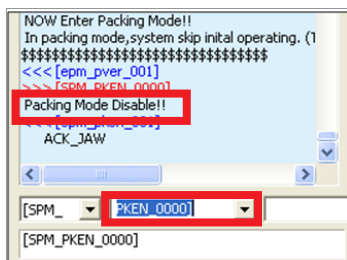
Serial interface type	Ethernet interface type
Serial Port: Checked Port : COM1 Baud rate: 19,200	

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



5. Enter the command **PKEN_0000]** to exit the packing mode. Now note that the equipment is out of the packing mode.

Note: to re-enter the packing mode, use the command: **PKEN_0001]**.



6. Click **Exit** button and terminate the control panel.
7. Exit the imaging program (main GUI): important!
8. **Reset the equipment to take the changes into effect**

Configuring the parameters



The following information should be entered, in accordance with the user requirements

1. Run EasyDent and call the imaging program.
2. Click the setup icon to enter in control panel.

License

☐ Use License String

License String: PaX-i

DAP

☐ Show DAP Value

DAP Unit: mGy x Cm^2

Language

Arabic

Send to Machine

Capture Count

CBCT: [8888888] Reset

PANO: [8888888] Reset

CEPH: [8888888] Reset

3. Click **User** tab.

User | Default Set | General | PANO / CEPH | CBCT | Align | Phantom Align | Master

4. Set the Use License String option in the License field. When checked, the character string in the **License String** field is displayed on the left of the image. By default, the equipment name is displayed.

License

☒ Use License String

License String: PaX-i

5. Set the unit for the DAP (Dose Area Product) value which is displayed on the screen. You can expand the menu to see more units.

DAP

☒ Show DAP Value

DAP Unit: mGy x Cm^2

6. Select your language, followed by **Send to Machine**.

Language

English ▼

Send to Machine

English ▼

- Arabic
- Chinese (Simplified)
- Chinese (Traditional)
- English
- French
- German
- Italian
- Japanese
- Korean
- Portuguese
- Russian
- Spanish

7. Click '**General**' tab and enter the serial number of the equipment.

Machine Information

Manufacturer: Vatech Company Limited

Model Name: PaX-i ▼

Serial Number: 1234567890

8. Click the Default Set button.

User **Default Set** General PANO / CEPH CBCT Align Phantom Align Master

Imaging program: default	
PANO	Normal, HD
CEPH(Optional)	Form : Lateral, Multi FOV : Large

Control Panel

User General CBCT PANO / CEPH Align Phantom Align Master **Default Set**

Pano Default Setting

Type ☒ Normal

Image Quality ☐ UHD ☒ HD ☐ Normal

Ceph Default Setting

Form ☒ Lateral ☐ PA ☐ SMV ☐ Waters View ☐ Carpus

Multi FOV ☒ Large ☐ Medium ☐ Small

CBCT Default Setting

SCAN Time ☐ High ☒ Standard

Voxel ☐ Standard ☒ Application

Metal ☒ Skip ☐ Apply

Selecting an Announcement Mode: Music or Beep (Optional)

When the need to select an announcement between music and beep arises, take following procedures.

Commands specification:

Command format: [SPM_MPOP_XXXX]			
XXXX	Imaging Modes	Announcement mode	Comments
0000	PANO/CEPH	music	Different for each imaging mode
0001	PANO/CEPH	music	The same for both modes
0002 (Default)	PANO/CEPH	Beep	The same for both modes

1. Click the **General** tab.
2. After verifying the parameters below, click **Connect**.

Serial interface type	Ethernet interface type
<p>Serial Port: Checked</p> <p>Port : COM1</p> <p>Baud rate: 19,200</p>	
<div> Networking & LCD <div> Protocol Type <input checked="" type="checkbox"/> Serial Port <input type="checkbox"/> Ethernet Port </div> <div> Machine IP <div>0 . 0 . 0 . 0</div> </div> <div> LCD IP <div>192 . 168 . 33 . 100</div> </div> <div> Serial Port No. <div>COM 1</div> </div> <div> Baud Rate <div>19200</div> </div> <div>Connect</div> </div>	<div> Networking & LCD <div> Protocol Type <input type="checkbox"/> Serial Port <input checked="" type="checkbox"/> Ethernet Port </div> <div> Machine IP <div>10 . 42 . 43 . 10</div> </div> <div> LCD IP <div>192 . 168 . 33 . 100</div> </div> <div> Serial Port No. <div>COM 3</div> </div> <div> Baud Rate <div>19200</div> </div> <div>Connect</div> </div>

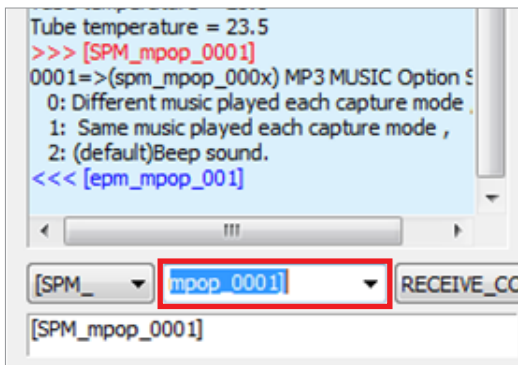
3. Send the command in accordance with the command specification, as specified in the table above.

Here are some examples.

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

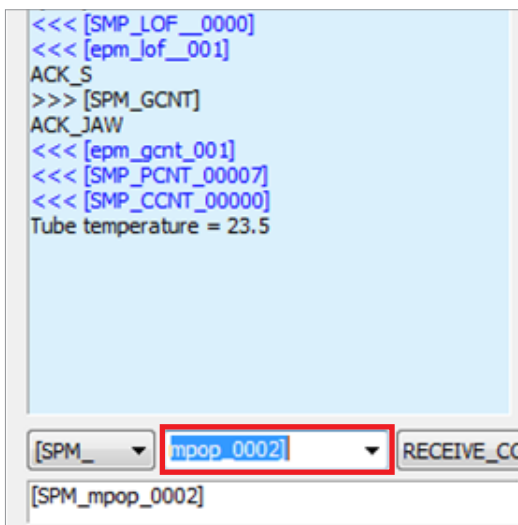
When the same music announcement is desired for CEPH and PANO imaging modality

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



When the same beep announcement is desired for CEPH and PANO imaging modality

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



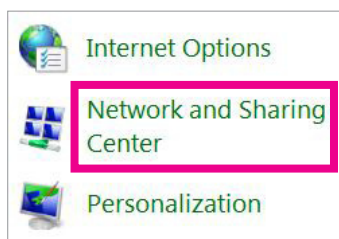
Finalizing the Parameters Settings

1. Click **Exit** → **Save->Close** button and terminate the control panel.
2. **Exit the imaging program (main GUI): important!**
3. **Reset the equipment to take the changes into effect**

9.4 Setting up the IP Address for the Crong Board

Changing adaptor settings

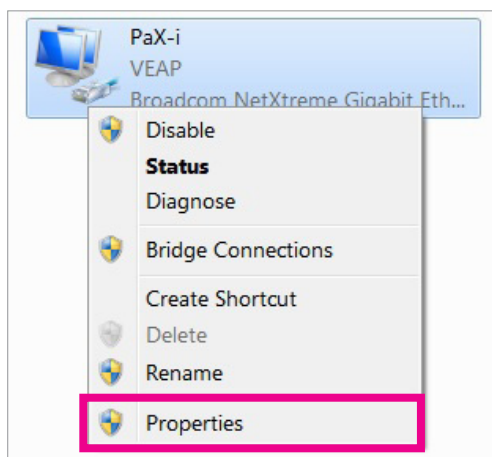
1. Open Windows control panel.
2. Locate the **Network and Sharing Center**.



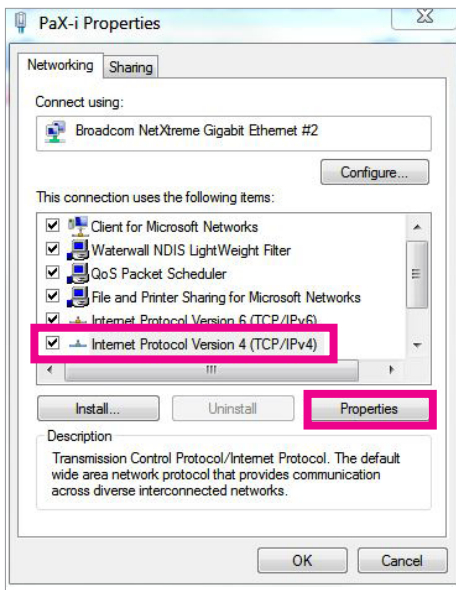
3. Click the **Change adaptor settings**.



4. Rename the Network, e.g., **PaX-i** and click on the mouse right button. Then select Properties.



5. Select Internet Protocol Version 4. Then click Properties.

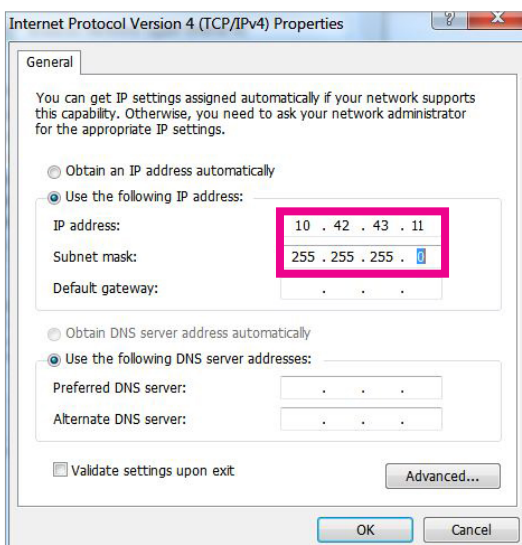


Entering new IP Address

- From the following control box, enter new IP address. Leave the other fields as default.

IP address: 10.42.43.11(recommended)

Subnet mask: 255.255.255.0



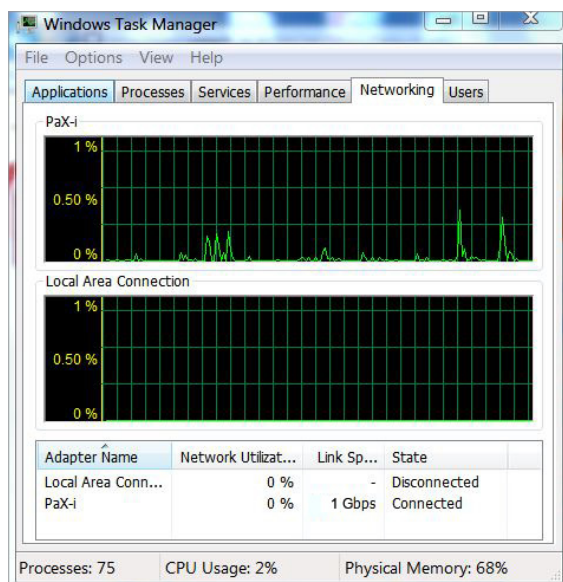
- Click **OK**.

Verifying the status of connection between crong board and PC



Note that it is perfectly normal to have the yellow exclamation mark on LAN network icon, even when communication connection is being established successfully.

1. Ensure PC and the equipment are connected through LAN cable.
2. Ensure the equipment is ON.
3. Start **Task Manager** from the desktop and click **Networking** tab.



4. Check that the link speed is 1 Gbps.

Adapter Name	Network Utilizat...	Link Sp...	State
Local Area Conn...	0 %	-	Disconnected
PaX-i	0 %	1 Gbps	Connected

Processes: 75 CPU Usage: 2% Physical Memory: 68%

5. If not, it indicates that connection is not established correctly.

To solve this problem, do take the following procedures.

5-1 Turn OFF both PC and the equipment.

5-2 Reboot PC system

5-3 Turn On the equipment and wait for 1 minute. Then look into the connection status again.

6. If solved. OK. Otherwise. Check the followings.

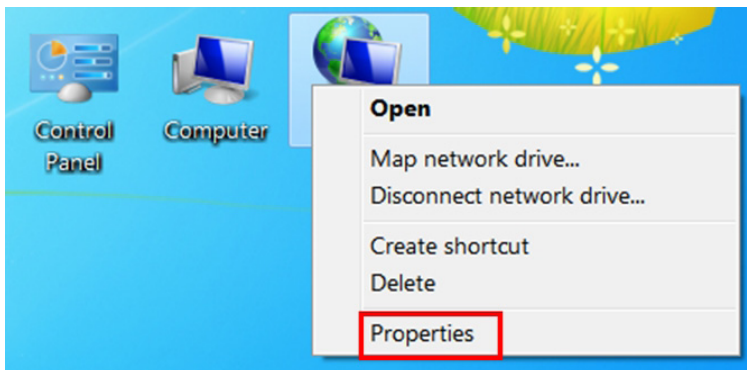
6-1 Try with another LAN cable and check the connection points.

6-2 Replace the LAN card with one that VATECH recommends.

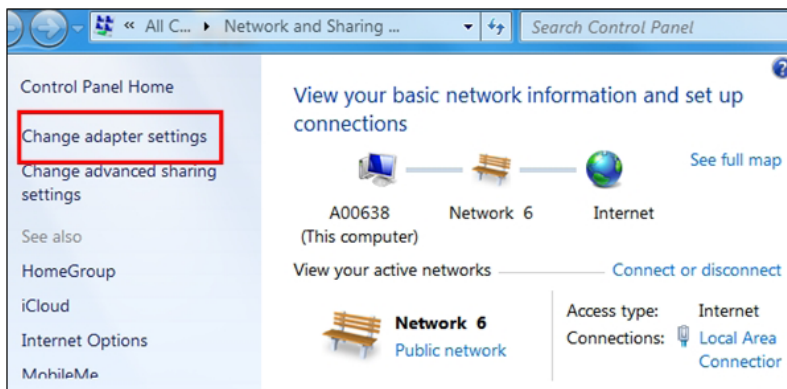
9.5 Setting up the IP Address for the OS CEPH Sensor(Optional)

In order for the **OS CEPH** sensor to communicate with the **PC**, the proper IP address should be set on the PC. The following screenshots are taken in the Windows 7.

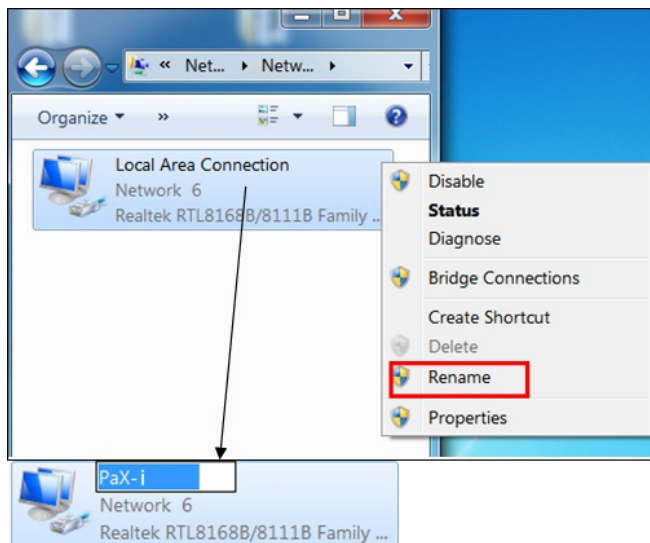
1. From the desktop, click the right button of the mouse on the **Network** icon.



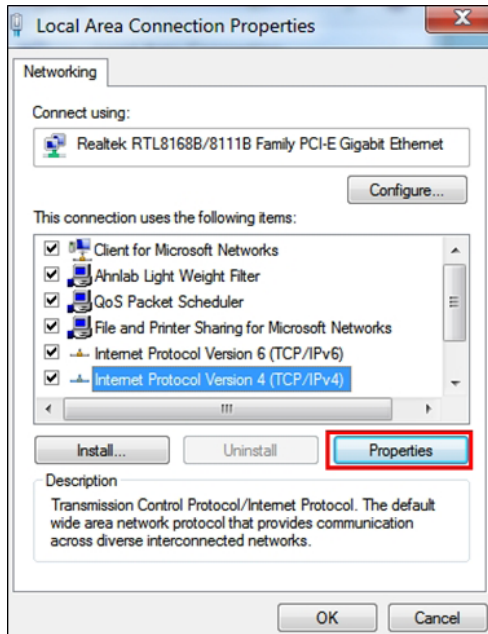
2. Double click the **Properties**.
3. Select the “**Change adapter settings**”.



4. Click the right mouse button on the **Local Area Connection** and select the **Rename** to change its network name to **PaX-i**.



5. From the following figure, select the Internet Protocol Version 4 and click Properties.

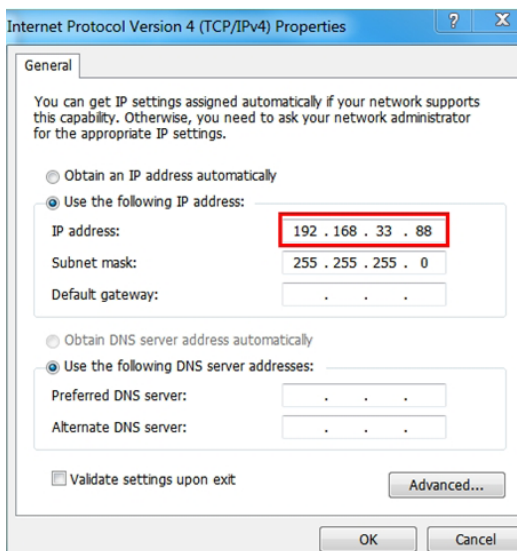


6. To set the new IP address.

6-1. Move to **Use the following IP address**.

6-2. Enter the IP address: **192.168.33.88** and leave the other fields at the default.

6-3. Click **OK**.



7. Reset the PC and equipment.

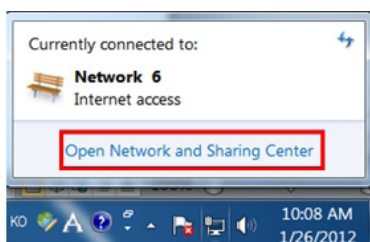
Checking connection status

8. Check the connection status between PC and the touchpad screen in the following manner.

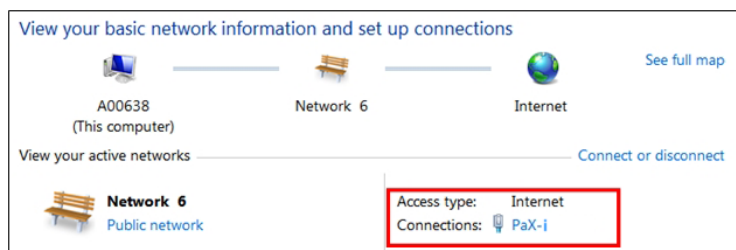
8-1. Click the left button of mouse on the network icon of the task bar.



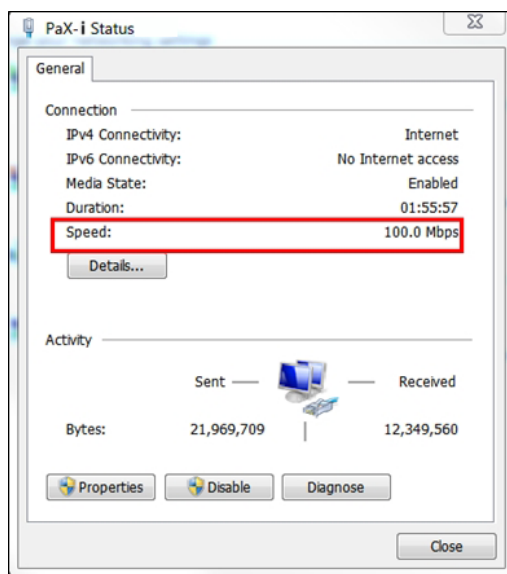
8-2. Select **Open Network**.



8-3. Click the **PaX-i** from the following figure.



8-4. Check the speed: 100.0 Mbps. If it is, a connection is successful.



9. Reset the equipment to take the changes into effect.

10

Acquiring the Test Image

Acquiring the test image

1. Perform the test image acquisition after the software is installed.
2. Ensure that collimator is well aligned.



When collimator is misaligned, the correct test image can't be obtained, in which case the alignment correction must be performed first, according to the technical manual.

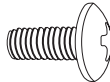
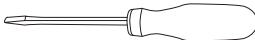
3. Acquire the test image. For the further details about the image acquisition, refer to the accompanying user manual.

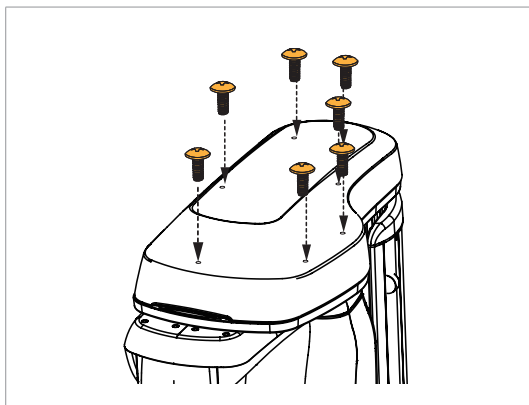


For the equipment with Cephalometric unit, if the noisy image on the lower part appears, this is caused by the improper leveling between the CEPH and the column units. Level the CEPH unit again.

For other issues related to the image, refer to the section(s) regarding to X-Ray alignment in the accompanying service manual.

Assembling the vertical frame cover

Truss bolts	M4 x 8 Part No.: 24 Qty : 9	
Cross head screw driver w/ magnetic tip	L=200 mm(7.9")	



1. Assemble the vertical top cover and fix it with 7 truss bolts(Part No.: 24).

Technical Specifications

Mechanical Specifications

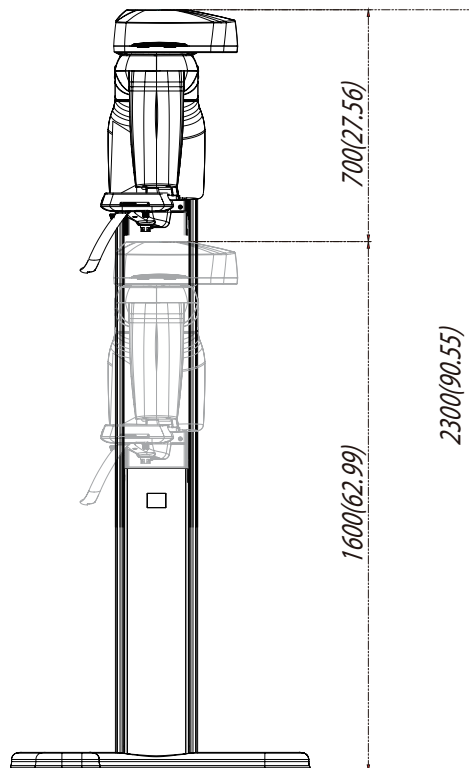
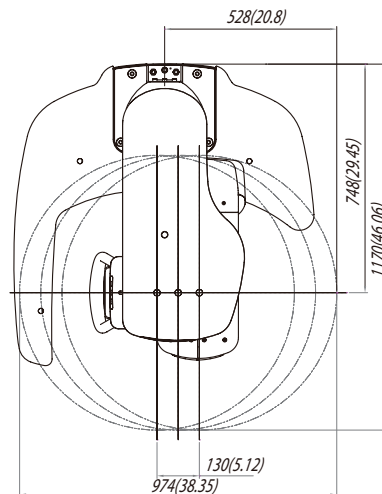
Image Magnification

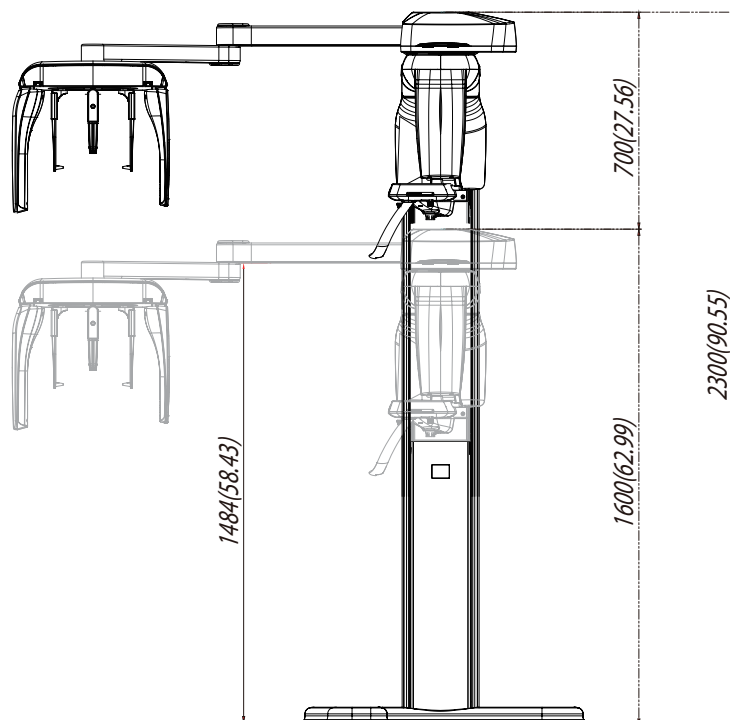
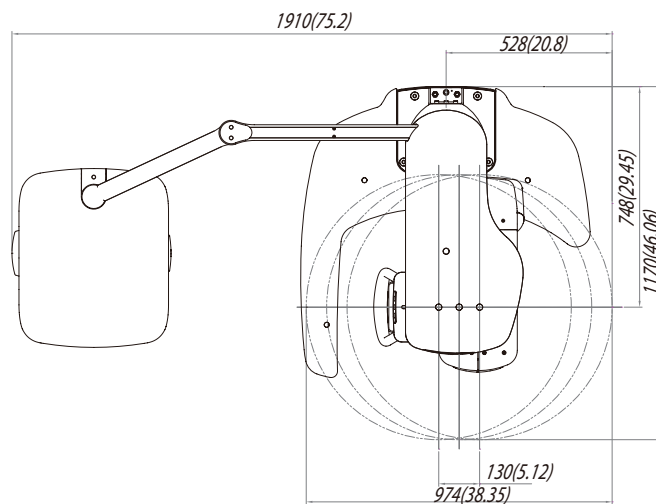
Mode	FDD (mm)	FOD (mm)	ODD (mm)	Magnification
PANO	490.3	375.5	114.8	1.3 constant
CEPH	1,745	1,524	221	1.14 constant

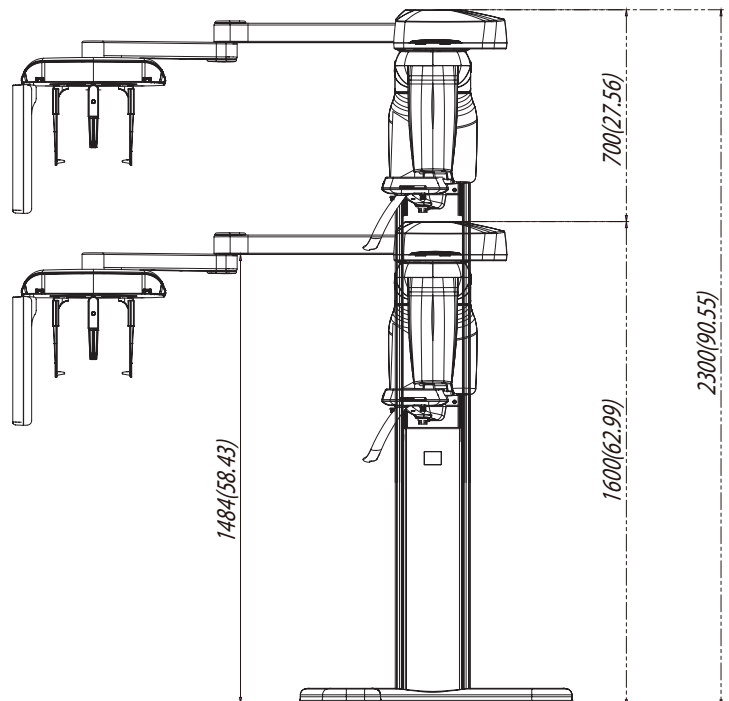
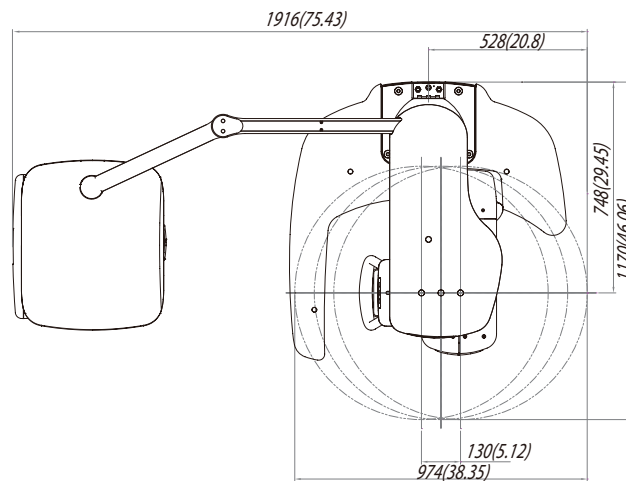
- **FDD** : Focal Spot to Detector Distance
- **FOD** : Focal Spot to object Distance
- **ODD** : Object to Detector Distance (ODD = FDD – FOD)
- **Magnification** = FDD / FOD

Dimension of the Equipment

Item		Description
Weight	Without CEPH unit	90 kg (198.4 lbs)
		With base: 137 kg (302 lbs)
	With CEPH unit (Scan type)	120 kg (264.5 lbs)
		With base: 167 kg (368.1 lbs)
	With CEPH unit (One shot type)	130 kg (286.6 lbs)
		With base: 177 kg (390.2 lbs)
Total height		Max. 2,300 mm (90.55 in.)
Vertical column movement		Max. 700 mm (Max. 27.56 in.)
Length x Width x Height	Without CEPH unit	1,060(L) x 1,200(W) x 2,300(H) mm (41.73(L) x 47.24(W) x 90.55(H) in.)
	With CEPH unit (Scan Type)	1,920(L) x1,200(W) x 2,300(H) mm (75.19(L) x 47.24(W) x90.55(H) in.)
	With CEPH unit (One shot Type)	1,930(L) x1,200(W) x 2,300(H) mm (75.98(L) x 47.24(W) x90.55(H) in.)
Type of installation		Base Stand / Wall Mount

Without cephalometric unit

With cephalometric unit: Scan Type Sensor

With cephalometric unit: One shot Type Sensor

X-Ray Generator Specifications

Item			Description
Model			HDG-07B10T2
Rated output power			0.9 KW
High voltage Generator	Type		40 KHz Inverter Type
	Normal/ Pulse	kV	50 ~ 90
		mA	4 ~ 10
	Cooling		Automatically controlled / Protect $\geq 60^{\circ}\text{C}$ Option: Air Cooling
	Total filtration		2.8 mm Al eq.
X-Ray Tube	Manufacturer		TOSHIBA
	Model		D- 052SB (Stationary Anode Type)
	Focal spot size		0.5 mm (IEC60336)
	Target angle		5 °
	Inherent filtration		At least 0.8 mm Al equivalent at 50 kV
	X- Ray coverage		95 x 380 mm at SID 550 mm
	Anode heat content		35 kJ
	Duty cycle		1:60 or more (Exposure time : interval time)

Serial No. notation

S/N	XXXX Size (mm)	XXX	XX	XX	XX	XXX	XXXX
	Model	Tube	Inverter ver.	F/W ver.	Weekly code	Yearly code	serial

Electrical Specifications

Item	Description
Power supply voltage	AC100-120 V / 200-240 V
Frequency	50/ 60 Hz (Single)
Power rating	Max.2.0 kVA

- The input line voltage depends on the local electrical distribution system.
- Allowable input voltage fluctuation requirement: $\pm 10\%$.

Environmental Specifications

Item	Description
During operating	Temperature
	10 ~ 35 °C (50 ~ 95 °F)
	Relative humidity
Transport and storage	30 ~75 %
	Atmospheric pressure
	860 ~ 1060 hPa
Transport and storage	Temperature
	-10 ~ +60 °C(14~ 140 °F)
	Relative humidity
	10 ~ 75% non-condensing
	Atmospheric pressure
	860 ~ 1060 hPa

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Appendix

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A. Installing the Warning Lamp and Door Interlock Switch

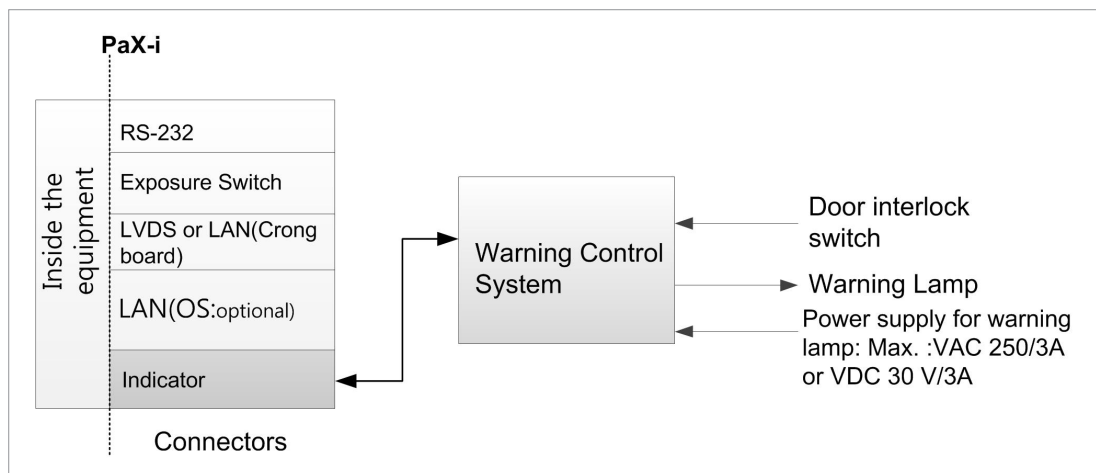
Requirements:

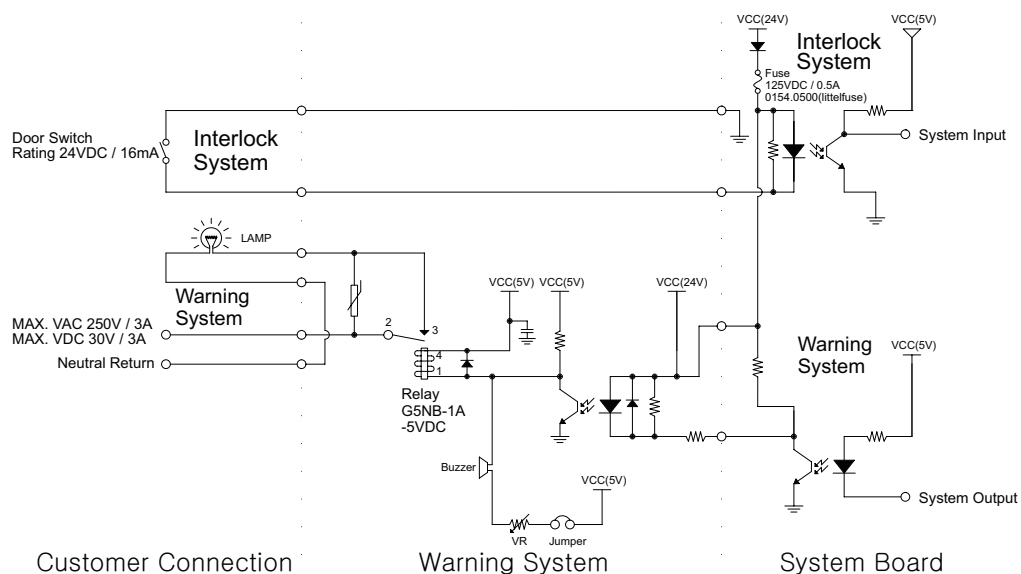
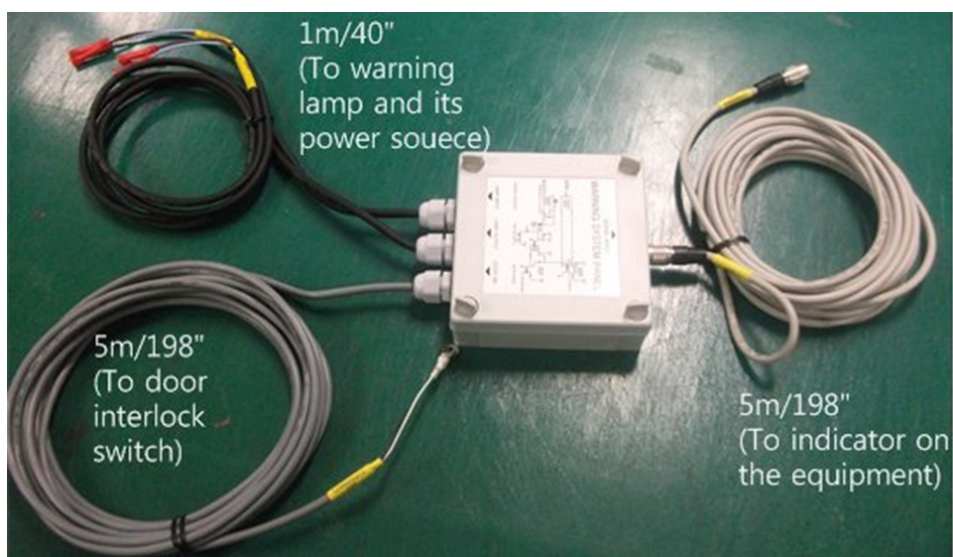
1. The warning control system shall be connected to the ERB (earth reference bar) of the room that it is associated with.
2. The switching arrangements, location, height, and number of illuminated warning signs shall be agreed with the local radiation protection advisor (RPA).(customer)
3. A fluorescent 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 the further details, refer to the accompanying volume: Specification for Electrical Installation

Block diagram:

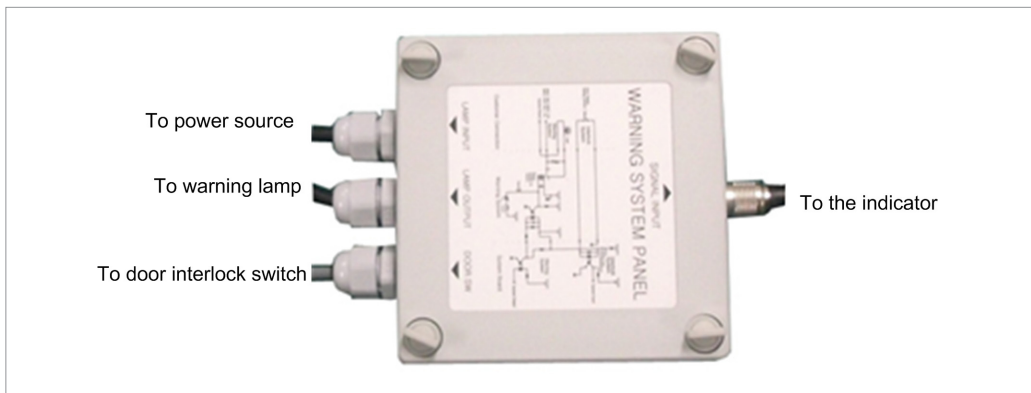


Schematic diagram:**Components supplied:**

Procedures:

The individual cable length:

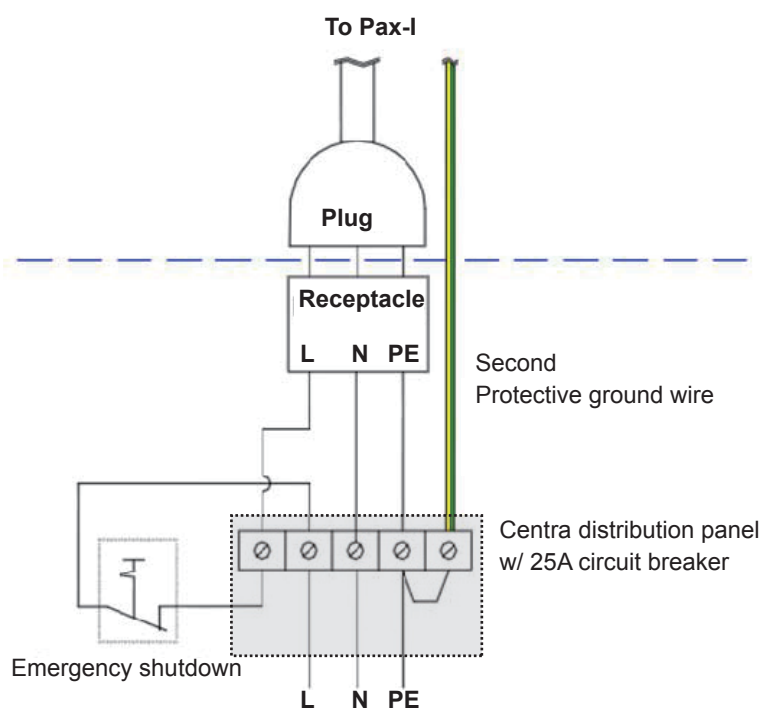
- Signal cable: 5m/198"
- Door interlock cable: 5m/198"
- Warning lamp: 1m/40"
- Power source cable: 1m/40"



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 Switch

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



1. The cable sizes: N, L and PE ≥ 12 AWG($3 \times 4 \text{ mm}^2$).
2. The cable to emergency switch shall be the same size as the power cable itself.
3. Install the socket connector terminal for the 2nd protective ground wire.

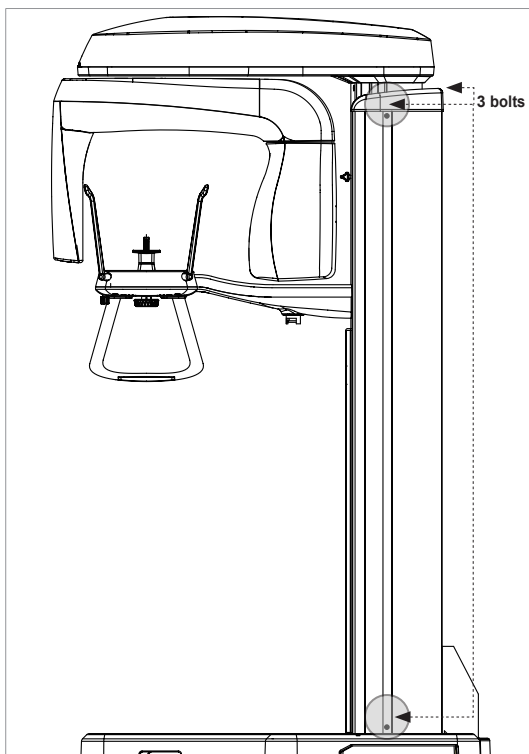
C. Limiting the Column Height

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

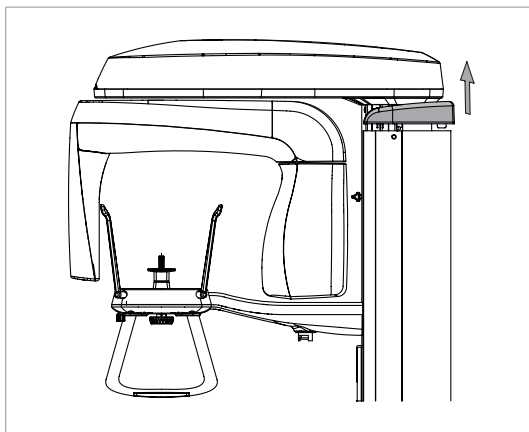
1. Measure the ceiling height in the X-Ray shield room : H_{ceiling}

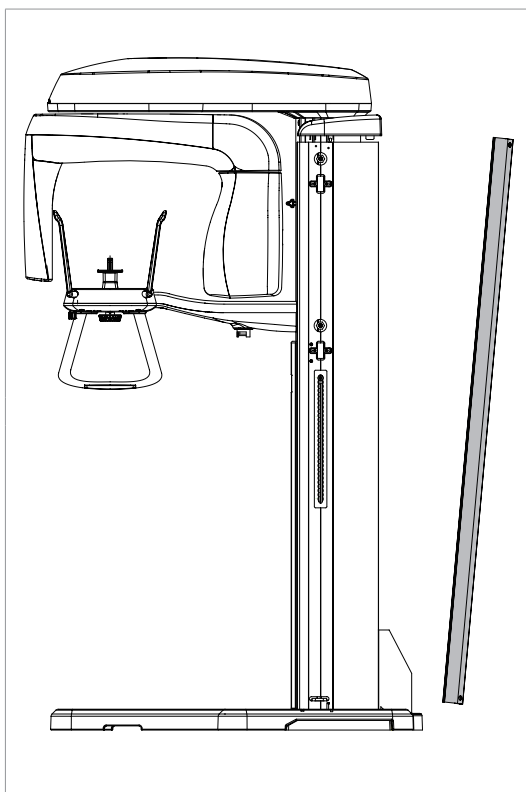
Removing the side cover

2. Remove 3 bolts at the following locations.



3. Lift the cover up and remove.





4. Separate the side cover.

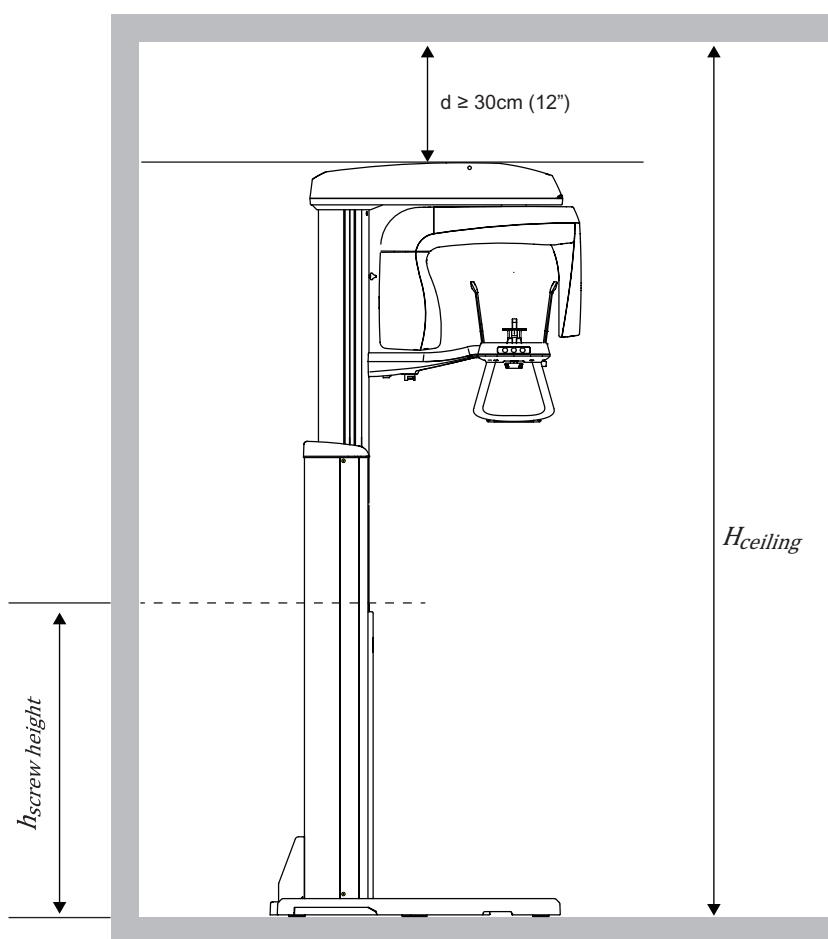
Determining the height

1. Determine the screw height using the following formula.

$$h_{\text{screw height}} = H_{\text{ceiling}} - d$$

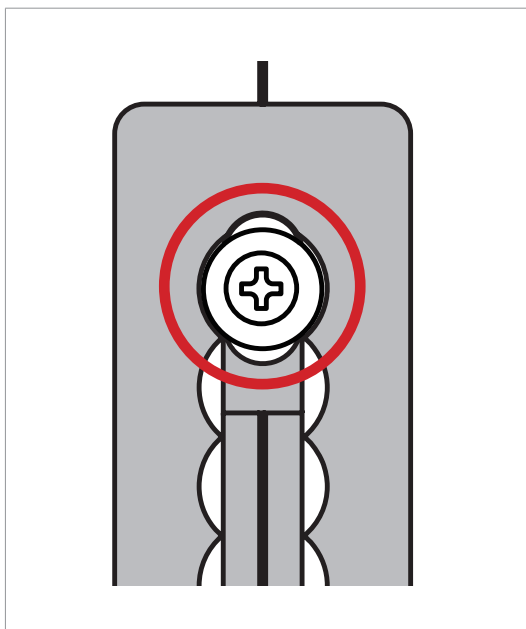
, where d is the distance between ceiling and the top of the equipment when the column is fully extended (at least 30 cm (12") is desired).

Ex): Let $d=30$ cm, $H_{\text{ceiling}}=250$ cm (99"), then $h_{\text{screw height}}=H_{\text{ceiling}}-d=250-30=220$ cm, which means that the screw should be installed at this height.



Adjusting the screw height

We know the screw height is 220 cm from the previous example. So we will move the screw from the default (current) position to new one.

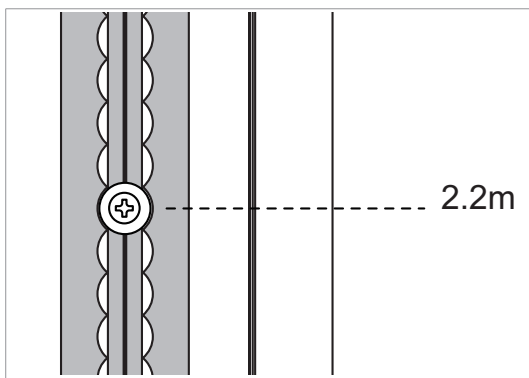
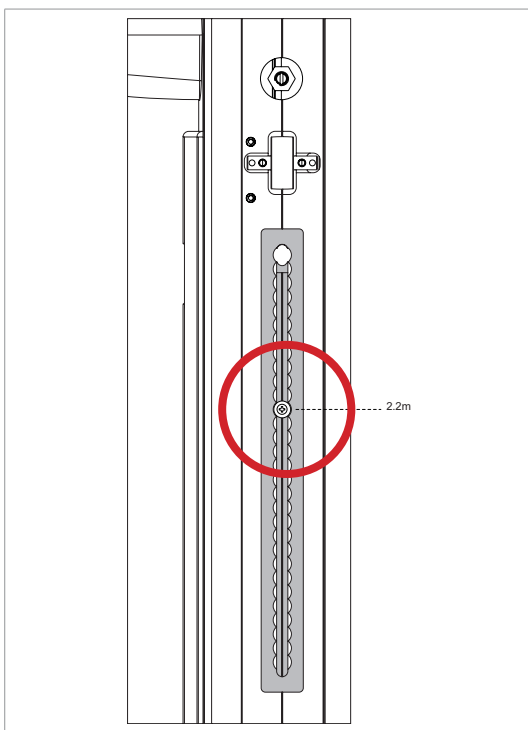
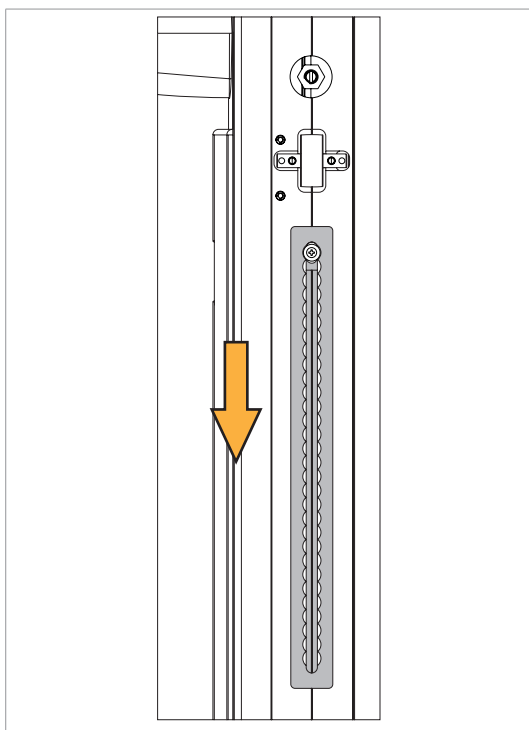


1. Loosen the bolt halfway (**important!**).



IMPORTANT

Do not unscrew completely the bolt or it could drop into the column, causing a big trouble to retrieve it out.



2. Looking up the scale (shaded area), slide the screw down to new location (220 cm) and fix it back.

Putting the cover back

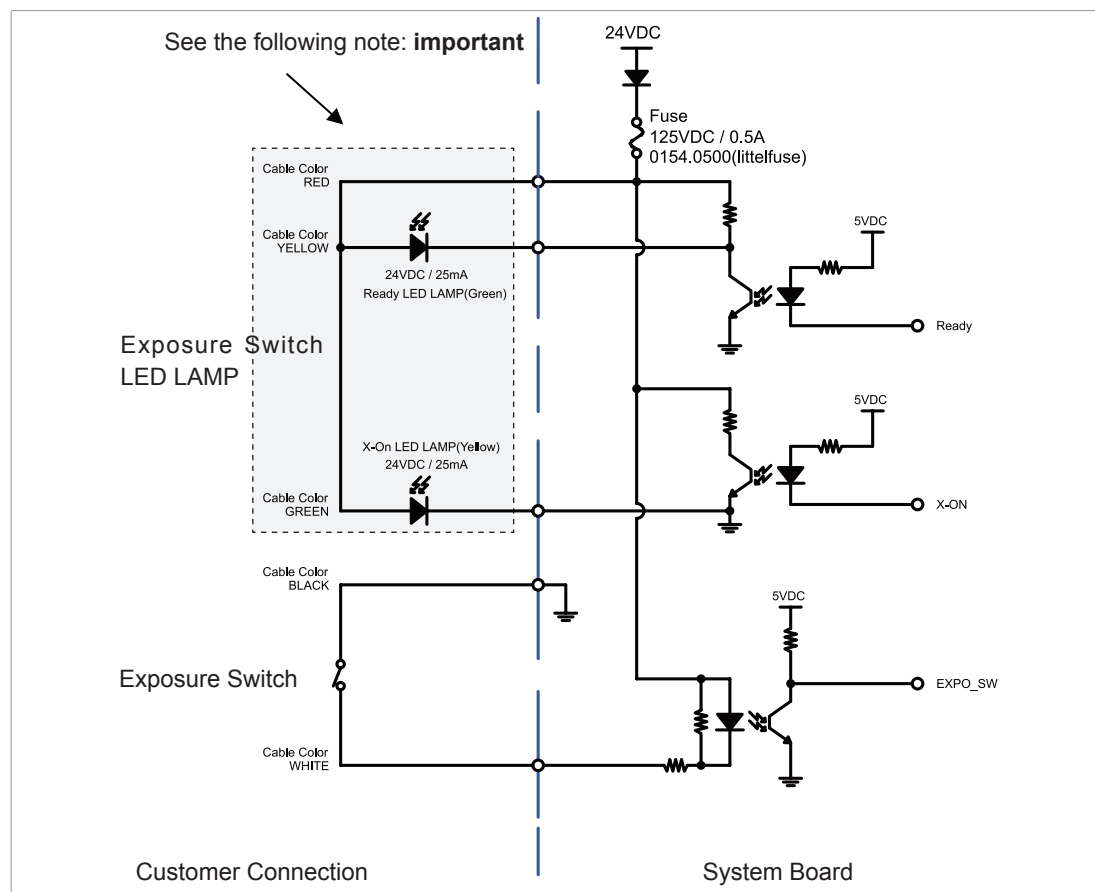
3. Put the covers back in reverse order.
4. Fix them with 3 bolts.

D. Connecting the Third-party Exposure Switch(Optional)

This section explains on 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.



Note: tape the end of each unused wire to prevent the wires from causing an inadvertent short circuit

E. Checking PC BIOS Settings

Lenovo PC BIOS Setup

PC Model : Lenovo M82

PC BIOS default			
Main Menu	Sub1 Menu	Sub2 Menu	Setup Value
Devices	Network Setup	Boot Agent	[Disable]
Power	Enable Power Saving		[Disable]
Power	Automatic Power On	Wake on LAN	[Disable]
Advanced	CPU Setup	Hyper Threading Technology	[Disable]

HP PC BIOS Setup

PC Model : HP Z420

PC BIOS default			
Main Menu	Sub1 Menu	Sub2 Menu	Setup Value
Security	Network Service Boot		Disable
Power	OS Power Management	Run Time Power anagement	Disable
Power	Automatic Power On	Idle Power Saving	Normal
Power	Automatic Power On	USB Wake on Device	Disable
Advanced	Device Option	S5 Wake on LAN	Disable

F. Reallocating Memory Space

Background:

The 32-bit memory space of the Microsoft Windows operating system based on the virtual memory Scheme is divided into two regions: **User space** and **Kernel space**, each having 2GB.

These spaces are adjustable within 4 GB limit. Thus for the applications handling heavy data the expanded memory space sometimes needs to be allocated beyond the 2 GB limit.

Problem:

For the case of reconstructing the acquired image in the CT mode, which manages with the huge, voluminous data generated by the PaX-Reve3D, PaX-Zenith3D or PaX-Duo3D Plus, it is necessary to expand the user space to have 3 GB of virtual memory.

In this scenario the problem would arise when the graphic card with more than 512 MB memory on board is used in this circumstance (less than 1GB memory for the OS).

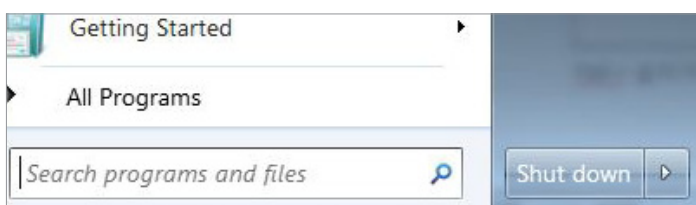
Solution:

For the Windows Vista or 7 user.

1. Click **Start**.

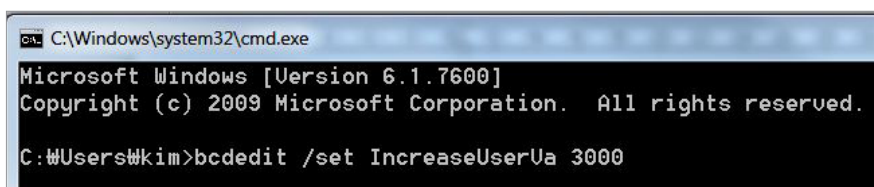


2. In the command line window, enter **CMD**.



3. From the console window, enter the following line of commands followed by **Enter**.

```
bcdedit /set IncreaseUserVa 3000
```

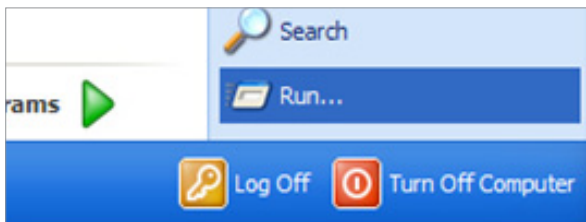


4. Reboot the system.

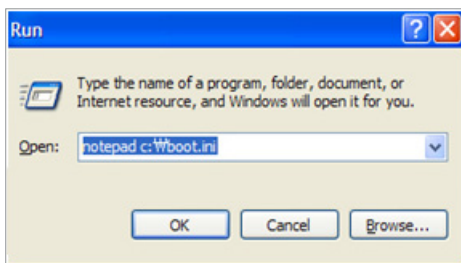
For the Windows XP user.

We need to edit the boot.ini, which is the hidden system file in the folder of Windows in C: drive. To edit this file, do the following.

1. From the desktop, click **Start**.
2. Click **Run**.

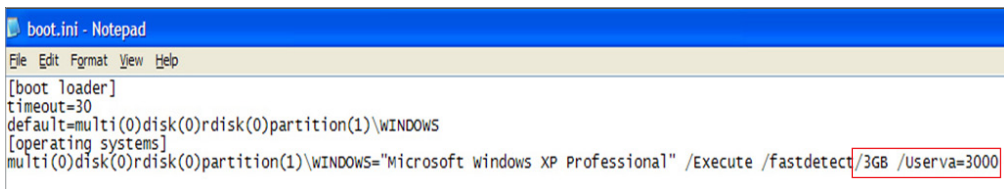


3. Enter "notepad c:/boot.ini" and click **OK**.



Then the current configuration on the PC is shown.

4. Add the **"/3GB /USERVA=3000"**.



5. Save it by clicking **file**.
6. Reboot the system.

G. 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?	<input type="checkbox"/>	<input type="checkbox"/>
Is the freight elevator available?	<input type="checkbox"/>	<input type="checkbox"/>
Is the security guard, if any, notified of the installation in advance?	<input type="checkbox"/>	<input type="checkbox"/>
Are two installers, including the helpers, available to move and unload the equipment?	<input type="checkbox"/>	<input type="checkbox"/>

4. Before installation:

Site check list

	Yes	No
Is the room large enough?. At minimum, with CEPH unit 2,200 mm x 2200 mm x 2,600 mm/ 87" x 87" x 103. Without CEPH unit, 2,200 mm x 1,400 mm x 2,600 mm/ 87" x 55" x 103"	<input type="checkbox"/>	<input type="checkbox"/>
Is the door entrance wider than 800mm (32")?	<input type="checkbox"/>	<input type="checkbox"/>
Is a radiation protection plan in place?	<input type="checkbox"/>	<input type="checkbox"/>
Does equipment and PC use same dedicated circuit?	<input type="checkbox"/>	<input type="checkbox"/>
Does the electrical input conditions to installation site meet the MEIGaN requirements?	<input type="checkbox"/>	<input type="checkbox"/>
Is the local Network IP address of clinic 192.168.33.xx?	<input type="checkbox"/>	<input type="checkbox"/>
Is compressor or air conditioner suction located right next to X-ray Room?	<input type="checkbox"/>	<input type="checkbox"/>
Is the floor flat and level?	<input type="checkbox"/>	<input type="checkbox"/>
Is the carpet on the floor? If so, remove it	<input type="checkbox"/>	<input type="checkbox"/>

Before opening Boxes

	Yes	No
Did delivery company carry and handle with caution?	<input type="checkbox"/>	<input type="checkbox"/>
Did installers take pictures of boxes before opening?	<input type="checkbox"/>	<input type="checkbox"/>
Did installer make sure there are not any suspicious holes or scratches on the box?	<input type="checkbox"/>	<input type="checkbox"/>
Is the ShockWatch indicator red?	<input type="checkbox"/>	<input type="checkbox"/>
Is the TiltWatch indicator red?	<input type="checkbox"/>	<input type="checkbox"/>

After opening Boxes

	Yes	No
Did installers make sure there are not any scratches or broken surface on equipment?	<input type="checkbox"/>	<input type="checkbox"/>
Are all accessories and cases included in the box?	<input type="checkbox"/>	<input type="checkbox"/>
Have you read the installation manual out in its entirety Before starting installation?	<input type="checkbox"/>	<input type="checkbox"/>
Did installer take pictures after opening the boxes?	<input type="checkbox"/>	<input type="checkbox"/>
Did installer make sure there are not any suspicious holes or scratches on the box after opening?	<input type="checkbox"/>	<input type="checkbox"/>

5. While installing equipment

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

6. After installation

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

7. Software compatibility

	Yes	No
Anti-virus software installed?	<input type="checkbox"/>	<input type="checkbox"/>
A firewall installed? If yes, indicate software or hardware	<input type="checkbox"/>	<input type="checkbox"/>
	Type :	
Are the third-party software installed? If yes, indicate name(s) and versions	<input type="checkbox"/>	<input type="checkbox"/>
Are they compatible with software from VATECH? If No, indicate name(s) and versions	Version :	

8. Eletrical requirements:

	Yes	No
Is the circuit breaker installed and tested in distribution panel for over-current protection w/ 20A?	<input type="checkbox"/>	<input type="checkbox"/>
Is internal line impedance checked? $Z_{input} \leq 0.5\Omega$	<input type="checkbox"/>	<input type="checkbox"/>
Does equipment and PC use same dedicated circuit?	<input type="checkbox"/>	<input type="checkbox"/>

9. Network Configuration:

	Yes	No
Is network configured with 1 Gbit/s of CAT5?	<input type="checkbox"/>	<input type="checkbox"/>
Is the equipment connected with network?	<input type="checkbox"/>	<input type="checkbox"/>
Is the network installation company identified?	<input type="checkbox"/>	<input type="checkbox"/>
What is the TCP/IP address assigned?	Address :	
What is the subnet masking address?	Address :	
Is there DHCP server?	<input type="checkbox"/>	<input type="checkbox"/>

Installation Report



Date of Installation		Reporter		Company	
----------------------	--	----------	--	---------	--

A. Installation Site Information

Name of a clinic		Name of a doctor	
Address		E-mail of a doctor	
City		State & Zip code	
Contact Info.		Country	

B. Equipment Information

Model & System SN.		2D / 3D	2D <input type="checkbox"/> 3D <input type="checkbox"/>
--------------------	--	---------	---

C. Electrical Requirements

*Voltage(V)	V	* Ground Connection Status	YES <input type="checkbox"/> NO <input type="checkbox"/>
-------------	---	----------------------------	--

D. Check lists(Installers)

NO.	Confirmation	Installer	Customer
1	Informed of the installation procedures before the installation	YES <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
2	Product has been delivered safely to the customer	YES <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
3	Power grounding status has been checked and the customer was informed of the necessity of it	YES <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
4	Normal image has been acquired during test image acquisition	YES <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
5	Informed the usage of a product and software after the installation	YES <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
6	Arranged the working environment after the installation. (PC Cable arrangement/Cleaning)	YES <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
7	The customer has been informed of C/S contact information.	YES <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>

E. Check Lists(Customers)

NO.	Confirmation	Customer rating
	Please rate your satisfaction with each of the following : 5 very satisfied, 1 very dissatisfied	
1	Product design	1 ----- 2 ----- 3----- 4 ----- 5
2	Training for usage of the product	1 ----- 2 ----- 3----- 4 ----- 5
3	Training for usage of the software	1 ----- 2 ----- 3----- 4 ----- 5
4	Captured image of PANO(CEPH/CT)	1 ----- 2 ----- 3----- 4 ----- 5
5	Usability of the product	1 ----- 2 ----- 3----- 4 ----- 5
6	Usability of the software	1 ----- 2 ----- 3----- 4 ----- 5
7	Comprehensibility of User's Manual	1 ----- 2 ----- 3----- 4 ----- 5

F. Customer Agreement for Collection and Use of Personal Information**Collection of Personal Information:**

We, Vatech, collect personal information when installing equipment as an essential data to improve our services as well as the communication with the customers. (Name of a clinic, name of a doctor, address of a clinic, contact information and e-mail address).

Purpose of Collection and Use of Personal Information:

1. Develop new services and offer the customized services.
2. Resolve the customer claims and provide information about promotion and events and opportunities to participate.
3. Survey the customer satisfaction on our equipment to understand the customers' needs.

Signature for Agreement

- | | | |
|---|------------------------------|-----------------------------|
| 1. I agree with the collection of the personal information for the supply of customized service and customer service. | YES <input type="checkbox"/> | NO <input type="checkbox"/> |
| 2. I agree to receive emails about customer satisfaction survey and common information | YES <input type="checkbox"/> | NO <input type="checkbox"/> |

Name

Signature

G. Signature for Installation Completion Confirmation

*Name of Installer (Signature)		*Name of Customer (Signature)	
-----------------------------------	--	----------------------------------	--

***Please send installation completion report to the subsidiaries (agent offices) and the headquarters, with the images captured during installation.**

E-mail : gcs@vatech.co.kr / FAX : +82-02-576-2210

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We reserve the right to make any alterations which may be required due to technical improvement. For the most current information, contact your VATECH representative.

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Factory: 23-4, Seogu-dong, Hwaseoung-si, Gyeonggi-do, Korea



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 II b device.



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