



Digital Panoramic X-ray Unit

[REF] DP300IMII

209480 rev 2

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Language

This is the original English language version of the manual (2013-02).

This installation manual is for units with serial number,
S/No **GO1300001** and above.

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1. Introduction

1.1 About this manual

This manual explains how to install and set up the **GXDP-300** digital panoramic dental x-ray unit (the unit).

You will need to operate the unit during the alignment checking procedure. Make sure that you know how to operate the unit before starting to install and set up the unit.

It is also essential that person installing and setting up the unit should have attended the manufacturer's service training course.

1.2 Associated documentation

The **GXDP-300** User's manual.

The **GXDP-300** Service manual (not supplied in the delivery).

GxPicture Software Driver documentation.

The documentation supplied with **VixWin** or any other dental imaging software that will be used with the device.

1.3 Warnings and precautions

During installation

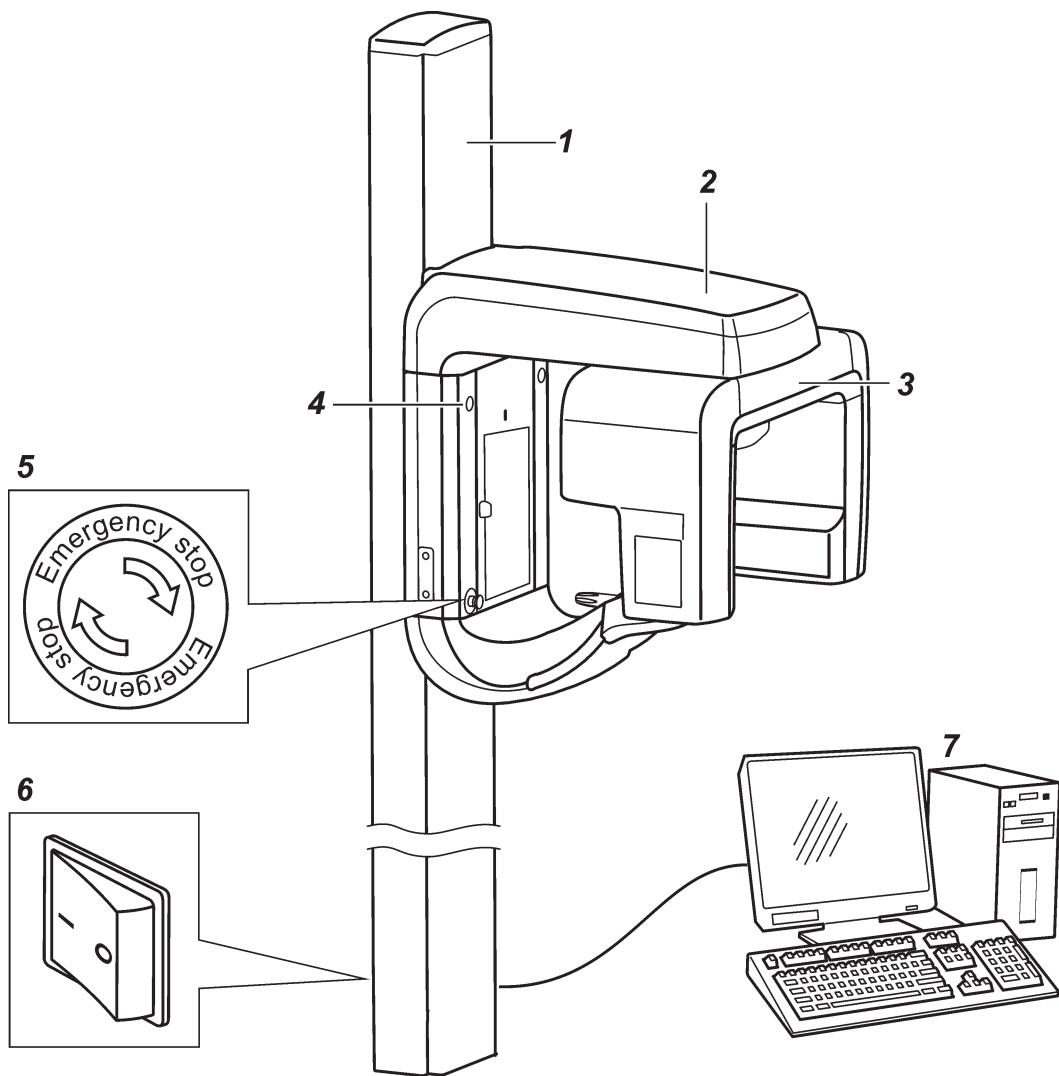
- When installing the unit always observe local and national safety regulation concerning the installation and use of dental x-ray equipment.
- Failure to install the unit in an approved location according to these installation instructions may cause the device to be dangerous to both patient and operator.
- The aperture plate in the collimator is made of lead (Pb) which is a toxic material. Do not touch it with your bare hands.
- Be careful when working on the unit when the covers have been removed.
 - Some mechanical parts have sharp edges that can cause injuries if mishandled.
 - Some internal components become hot during operation. Take suitable precautions to avoid burning yourself.
 - Some electric components are high voltage and can be lethal if touched. Whenever you are making adjustments to the unit disconnect it from the main power supply before making the adjustment.
- If the unit is to be used with a 3rd party imaging application software, not produced or supplied by Gendex Imaging Systems, the 3rd party imaging software must comply with all applicable local laws and regulations on patient information software. This includes, for example, the Medical Device Directive 93/42/ EEC and / or the FDA.

During unit operation

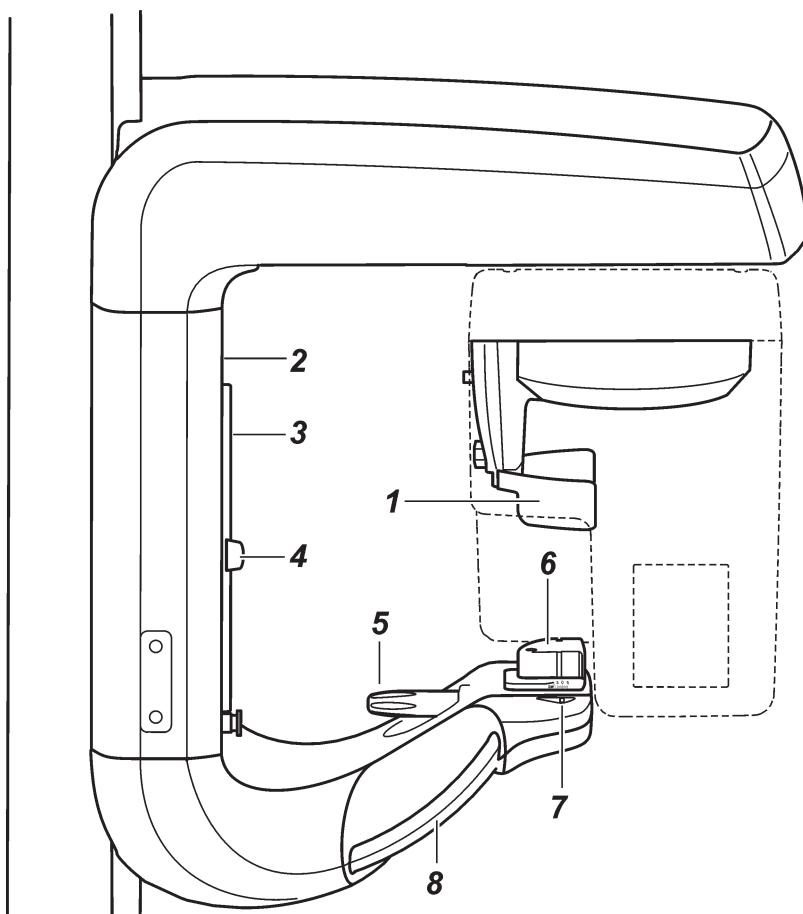
- Read and familiarize yourself with the warnings and precautions in the unit User's Manual.
- When checking the alignment of the radiation beam protect yourself from radiation.
- After the unit has been installed and set up, advise the people who will operate the unit to familiarize themselves with the warnings and precautions in the User's Manual.

1.4 Unit description

Main parts

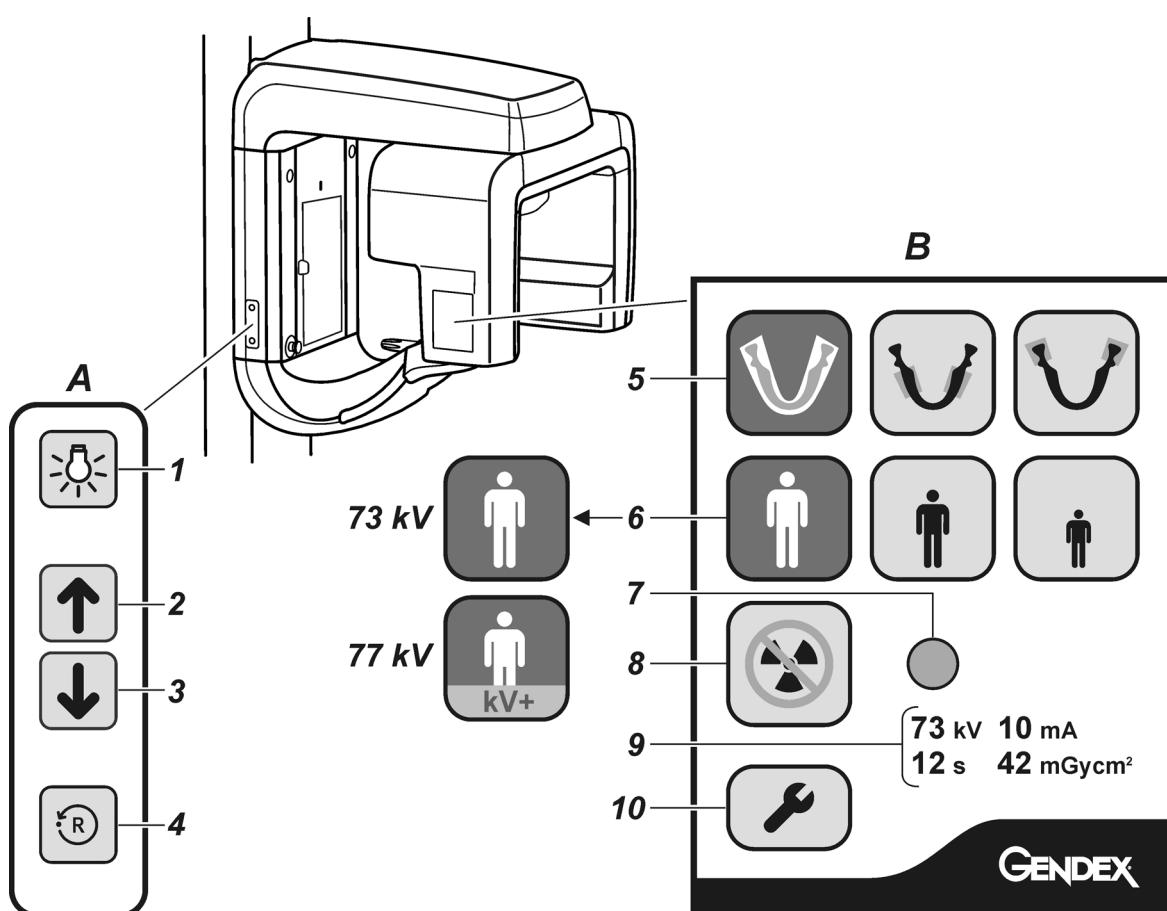


- 1 Column
- 2 Motorized carriage
- 3 Rotating unit
- 4 Exposure warning lights
- 5 **Emergency stop button** - Press to stop, rotate to release.
- 6 On / off switch (rear of column)
- 7 **PC (NOT SUPPLIED)** with MDD approved dental imaging software



- 1 Head support
- 2 Midsagittal laser
- 3 Mirror
- 4 Frankfort laser and laser positioning knob
- 5 Cupid positioning knob
- 6 Chin rest
- 7 Cupid laser
- 8 Patient handgrips

Unit controls



1.5 Disposal of the transportation packaging

The unit is transported in a corrugated cardboard box that is attached to a wooden pallet. Inside the box preformed expanded polystyrene packaging material protects the unit from shock and damage.

Packaging material	Weight (lb)	(kg)
Cardboard box and lid	46.3	21.0
Wooden pallet	16.3	7.4
Expanded polystyrene	16.8	7.6
Total weigh	79.4	36.0

When disposing of the transportation packaging materials make sure that you follow all local, national and international regulations regarding the correct and safe disposal and/or recycling of these materials.

Some transportation packaging materials may be non-environmentally friendly. These transportation packaging materials must be disposed of in accordance with all local, national and international regulations regarding the disposal of non-environmentally friendly materials.

NOTE:

It is advisable to keep some transportation packaging so that units can be repacked and easily and safely moved to new locations if required.

2. Pre-installation requirements

2.1 The Unit

- The unit is supplied in one box on a pallet. The dimensions of the box with pallet are:-

Length	Width	Height
76"	34"	41"
191 cm	85 cm	103 cm

- The assembled unit weighs 265 lb (120 kg). Make sure that the floor where the unit is to be installed can support this weight.
- The unit must be permanently attached to the wall and, if required, to the floor. If this is not possible use the show stand.
- If the area where the unit is to be installed is subject to earthquakes, the unit must be permanently attached to the wall and the base of the column must be permanently attached to the floor. If this is not possible use the show stand.
- The fixing hardware (NOT SUPPLIED) to be used to permanently attach the unit to the wall/floor must be of the correct type for the wall/floor materials.
WALL hardware MUST be 3/8" (10 mm).
FLOOR hardware MUST be 5/16" (8 mm).
DO NOT use smaller diameter fixing hardware
Refer also to section 2.7 for more information.
- Make sure that the fixing hardware to be used to attach the unit to the wall and the wall itself can withstand a continuous pull-out force of at least 660 lb (300 kg).

- If the wall is made of thin material, you may have to use a reinforcing plate on the rear side of the wall to hold the fixing hardware.
- If the wall is not strong enough to support the unit or if you are not sure if the wall will support the unit, use the show stand.
- The place where the unit is to be installed and the position from where the user will take exposures must be correctly shielded from the radiation that is generated when the unit is operated. Since radiation safety requirements vary from country to country and state to state it is the responsibility of the installer to ensure that all safety requirements are met.
- Do not install the unit in environments where there are corrosive or explosive vapours.
- Special steps regarding EMC need to be taken when installing the unit. For more information refer to the EMC declaration in the user's manual.
- The unit must be installed at least 73" (1.85 m) away from any non-medical electrical or electromechanical equipment.
- The unit must be connected to its own dedicated power supply:
 - 100 – 120 VAC or
 - 220 – 240 VAC
- Extension cables MUST NOT be used with the unit.

2.2 The PC

- The PC to be used with the unit must be installed in a location that meets all local and national safety requirements with regards the connection of a PC to an x-ray device.
- The connection of the unit to the PC must meet EN60601-1 requirements. The PC must be positioned at least 73" (1.85 m) away from the unit.
- The use of ACCESSORY equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:
 - use of the accessory in the PATIENT VICINITY
 - evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate IEC 601-1 and/or IEC 601-1-1 harmonized national standard.

2.3 The dental imaging software

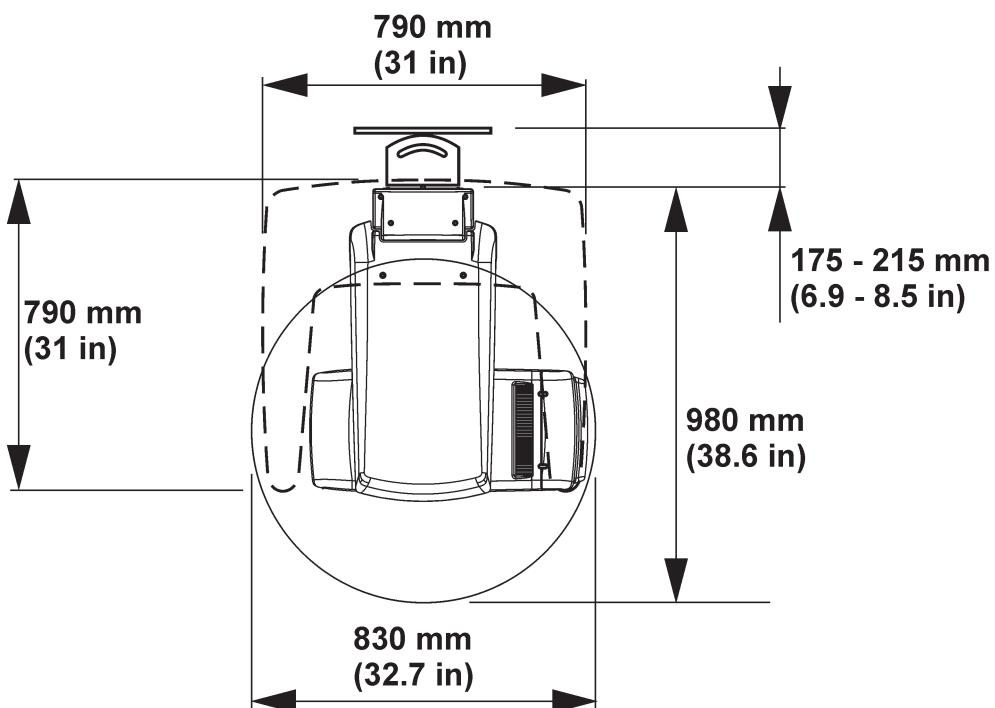
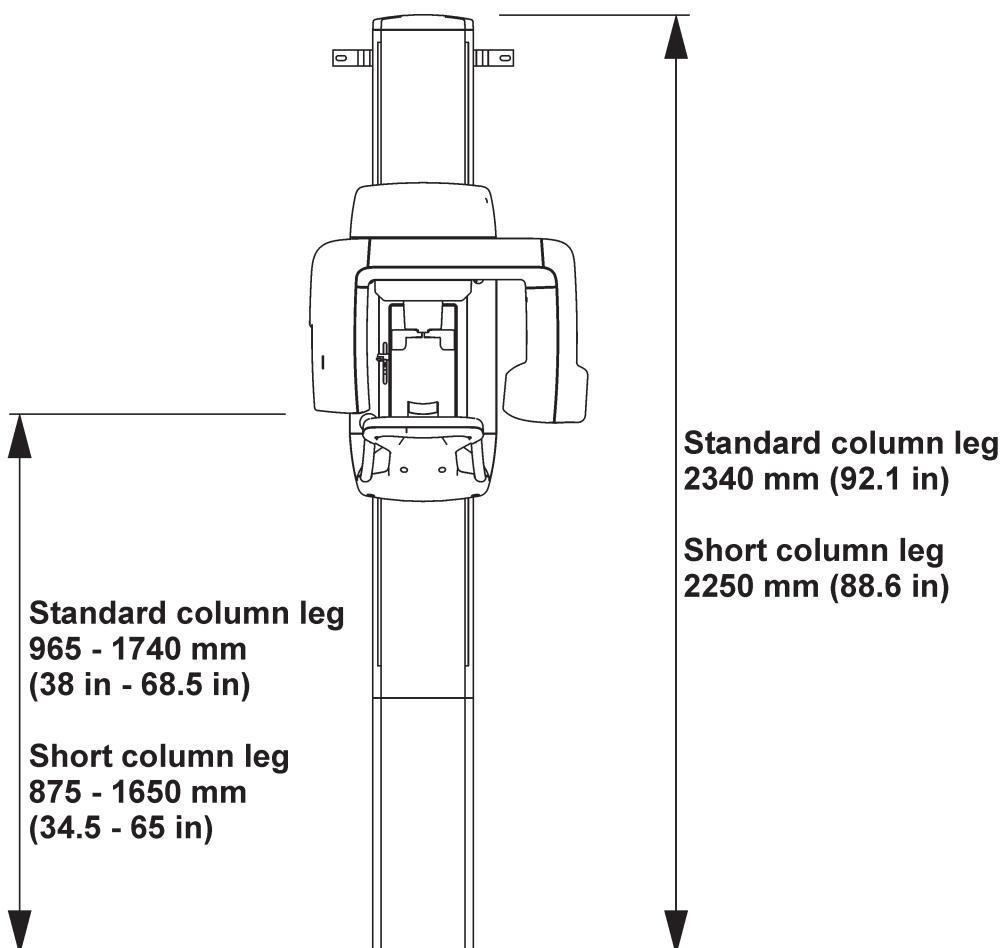
The dental imaging software, for example VixWin, that is installed in the PC used with the unit must be MDD compliant.

2.4 Space requirements

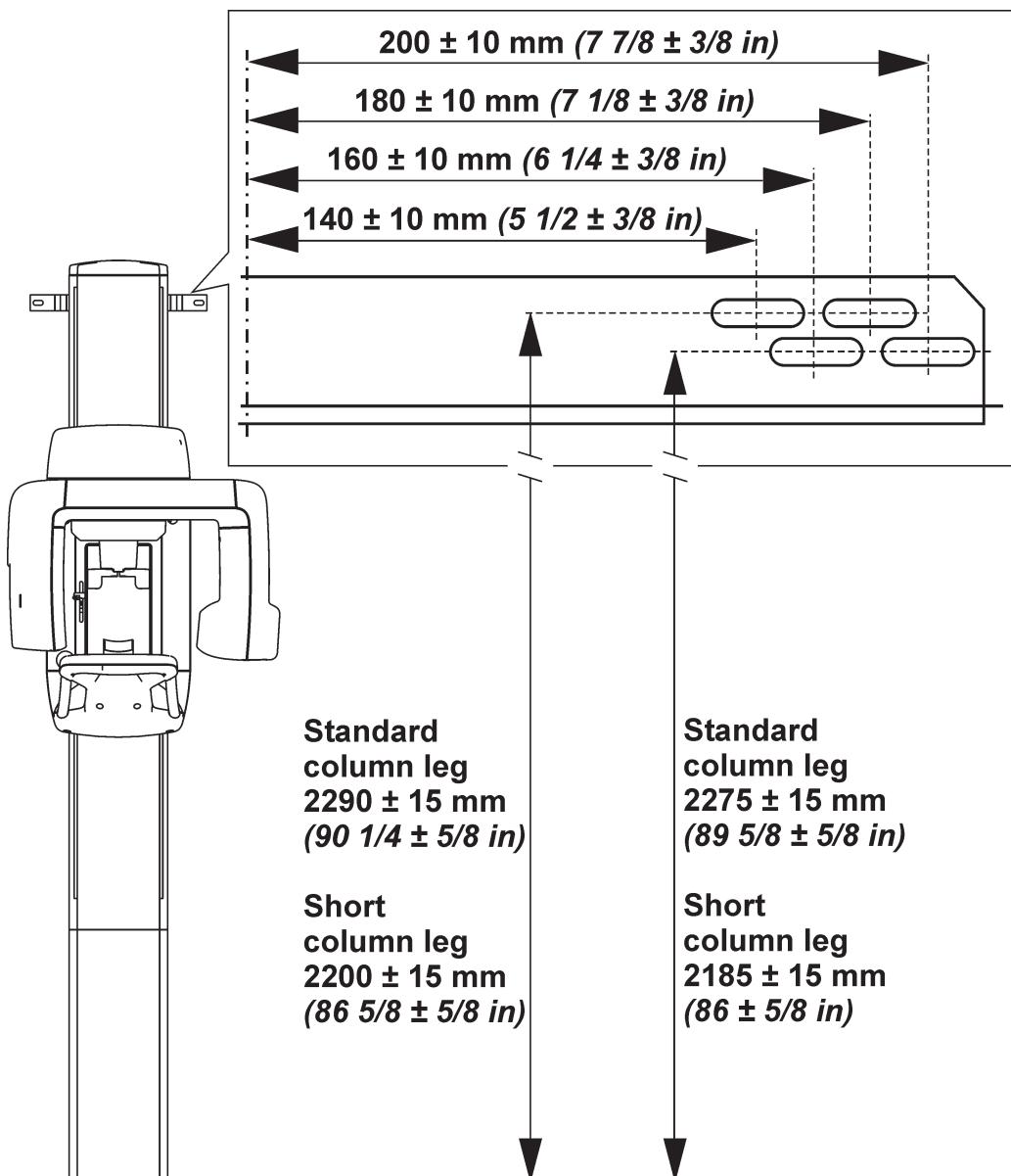
When installing the unit make sure that:

- there is enough space at the front and sides of the unit to allow patients to enter and exit the unit easily. Patients in wheelchairs will require more space than standing patients.
- the unit is positioned at least 73" (1.85 m) away from any non-medical electrical or electromechanical equipment.
- the unit is positioned so that the operator, when protected from radiation, can see and hear the patient during an exposure.

2.5 Unit dimensions



2.6 Fixing hole dimensions



2.7 Fixing hardware and installation and setup tools

The following tools and hardware are required to install and set up the unit.

NOTE:

THESE ARE NOT INCLUDED IN THE DELIVERY OF THE UNIT, UNLESS OTHERWISE STATED.

Fixing hardware

WALL attachment requires:

- 2 x 3/8" (10 mm) diameter sets of fixing hardware.

WALL and FLOOR attachment requires:

- 2 x 3/8" (10 mm) diameter sets of fixing hardware (for the wall)

and

- 2 x 5/16" (8 mm) diameter sets of fixing hardware (for the floor).

CAUTION:

DO NOT use smaller diameter fixing hardware.

The type and length of hardware to be used will depend on the wall material and floor material to which the unit is to be attached.

Different wall and floor materials may require different fixing hardware. Make sure that you use the correct fixing hardware for the wall material and the floor material.

IMPORTANT NOTE:

Fixing hardware is not required if the unit is to be attached to and used with the show stand. Refer to the separate instructions supplied with the show stand.

Installation tools

- Electric drill
- Spanners (wrenches) 7, 10, 17 (two) mm AF
- Hexagon socket wrenches (Allen keys) 1.5 - 8 mm
- Slot blade screwdrivers 0.5 x 3mm, 0.6 x 3.5
- Torx screwdrivers T20, T25, T30
- Spirit level
- Pliers and wire cutters
- Scissors / Knife
- Transportation wheels
(Optional, not supplied with the unit)

Calibration and setup tools

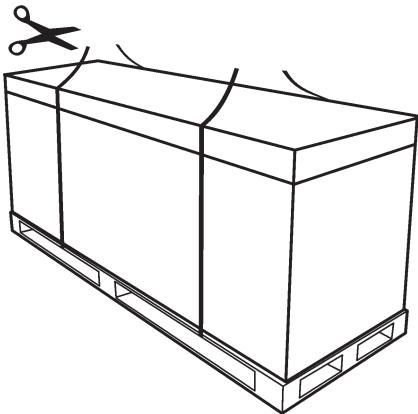
- Ball-pin tool
- Laser alignment tool
- Line pair phantom digital test tool for countries where this calibration tool is required.

3. Installing the unit

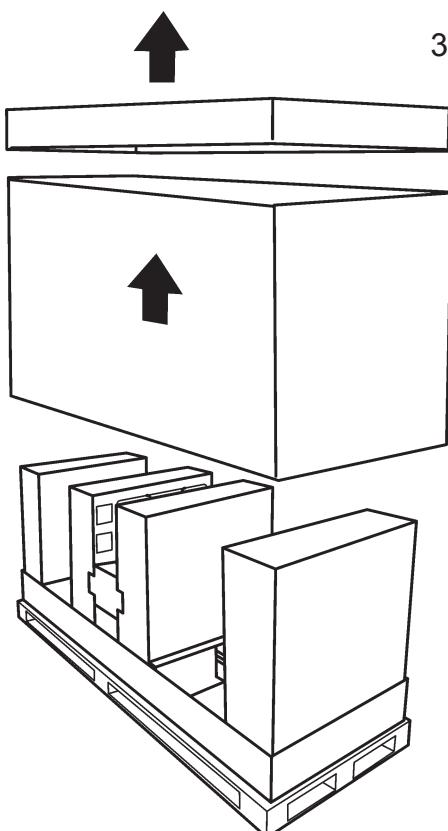
3.1 Preparing the unit for installation

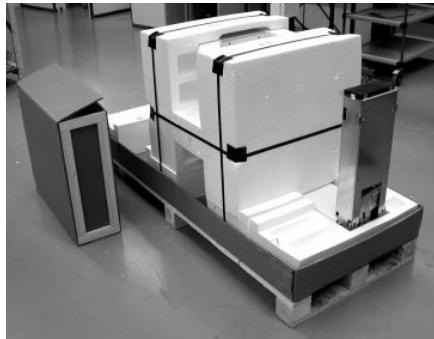
1. Transport the boxed to the location where the unit is to be installed.

2. Remove the straps that hold the box to the pallet.



3. Lift off the top of the box and then the sides.





4. Remove all the accessories, the accessory box and as much packaging material as possible.

NOTE:

DO NOT remove the packaging material that protects the upper shelf and the rotating unit.



5. Fold down the end of the box that is nearest the hinged section part of the column and then slide the unit over the edge of the pallet so that you can access the underside of the hinged section of the column.



6. **Support the hinged column section before loosening the screws that hold it to prevent it falling and causing damage or injury.**
Loosen the screws (the securing nuts are inside the column) on the sides of the column that hold the hinged column section in the vertical position. Turn the hinged column section down so that it is horizontal. Secure it in position with the two screws supplied (M10 x 16), the fixing holes are on the underside (rear) of the column.

Tighten the two screws (M10 x 16) on the sides of the column.

IMPORTANT NOTE:

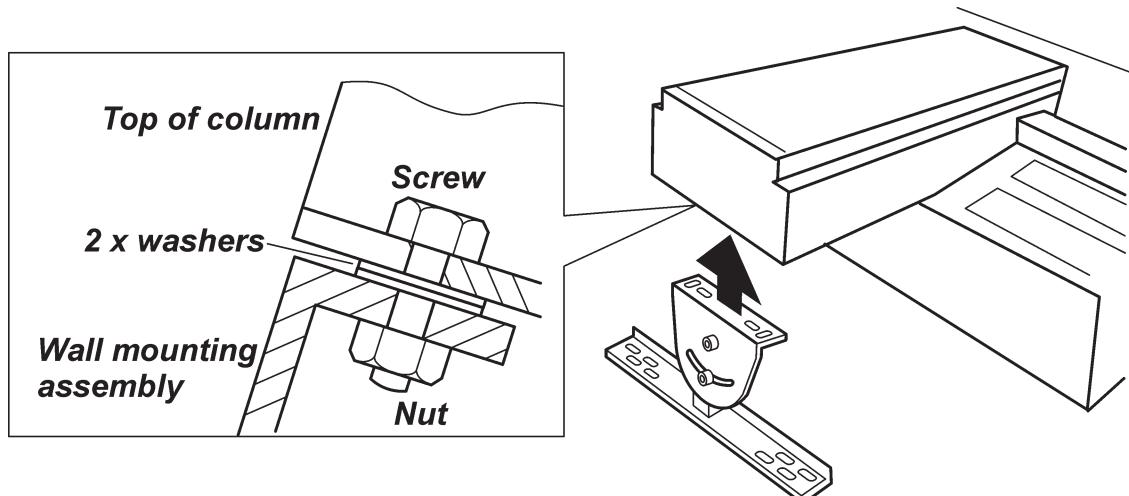
If the unit is to be attached to the show stand, refer to the separate installation instructions supplied with the show stand.

7. Lift the top of the column and slide the packing piece that supported it underneath so that you can access the underside of the column.

Attach the wall mounting assembly to the back of the column with the screws, nuts and washers supplied (M10).

NOTE:

The 4 x M10 washers must be positioned BETWEEN the wall mounting assembly and the rear of the column.



The wall mounting assembly is adjustable so that the unit can adjusted in the backwards/forwards direction. Make sure that the wall mounting assembly is in the mid position of its adjustment.

To do this loosen the two screws that hold the bracket part of the wall mounting assembly (attached to the column) to the support bar (to be attached to the wall) and position it to the mid position. Retighten the screws.

3.2 Attaching the unit to the wall

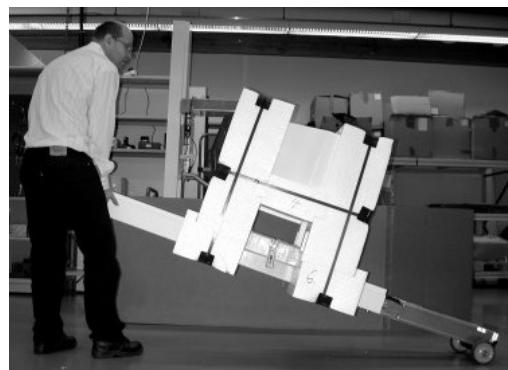
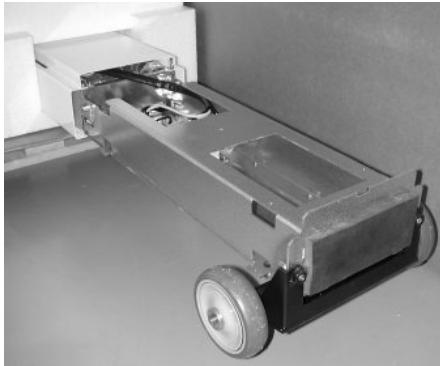
1. CAUTION - HEAVY OBJECT

A minimum of two persons are required for the following task.

Transport the unit to the place where it is to be installed.

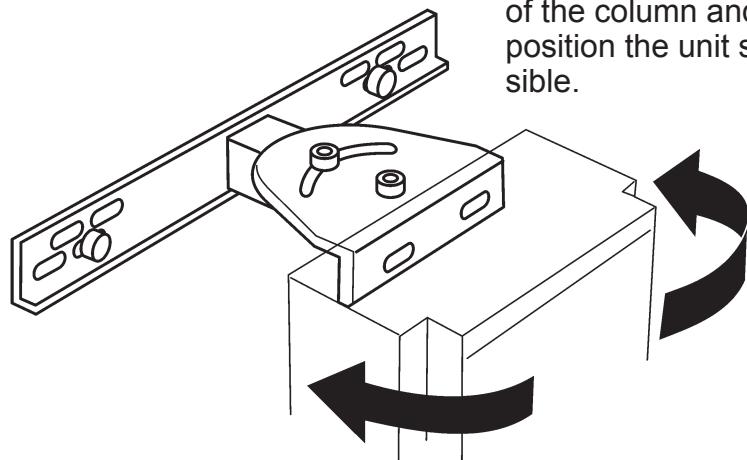
NOTE:

The transportation wheels (optional) are attached to the base of the column with two M10 screws. The transportation wheels can be used to wheel the unit to the place where it is to be used.



2. Mark the position of the two fixing holes on the wall according to the dimensions given in the section **2.6 Fixing hole dimensions**.

Alternatively, lift the unit into the position where it is to be used and then, using the wall bar as a template, mark the positions where the holes must be drilled. Hold a spirit level on the side of the column and then on the front to help to position the unit so that it is as vertical as possible.



3. Drill two holes with diameters suitable for the 3/8" (10 mm) fixing hardware being used and then attach the unit to the wall with the appropriate fixing hardware. Do not fully tighten the screws yet.
4. Remove the packaging material that protects the rotating unit and vertical carriage and remove the cover from the upper shelf (4 x M4 screws).



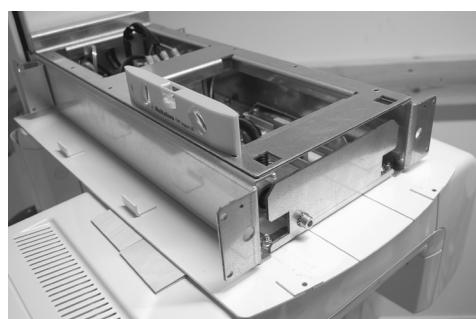
5. Place the spirit level widthwise on the upper shelf and level the unit in the left/right direction.

Level the unit by moving the base of the column to the left or to the right.

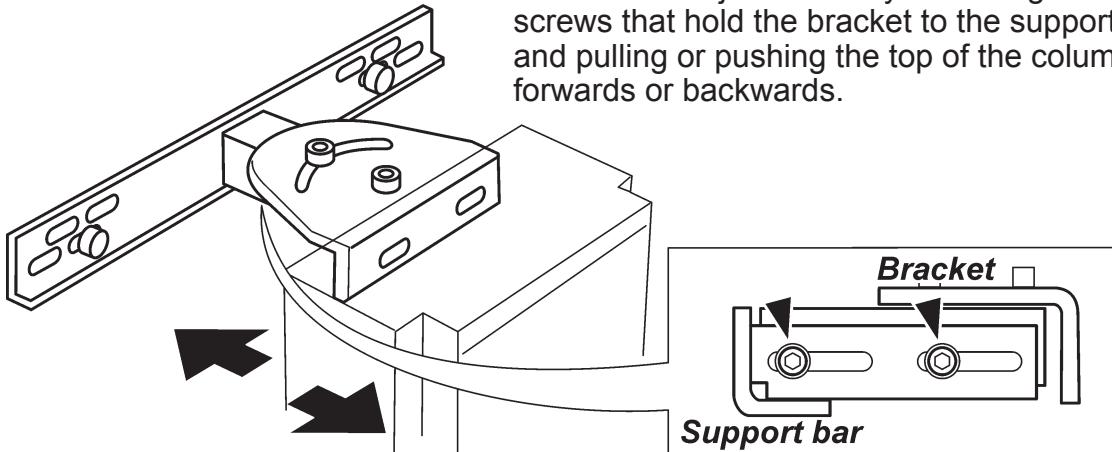


6. When the unit is level in the left/right direction place the spirit level lengthwise on the upper shelf and level the unit in the forwards/backwards direction.

Make large adjustments by moving the base of the column backwards or forwards.



Make small adjustments by loosening the two screws that hold the bracket to the support bar and pulling or pushing the top of the column forwards or backwards.



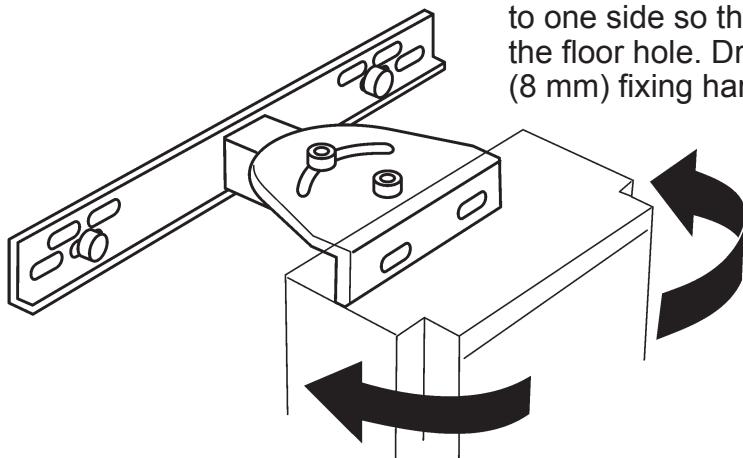
NOTE

If the wall bracket alone does not hold the unit in position rigidly enough, or the unit is to be used in an area prone to earthquakes attach the base of the column to the floor.

To do this, make sure that the unit is level and then mark the positions of the two fixing holes on the floor.



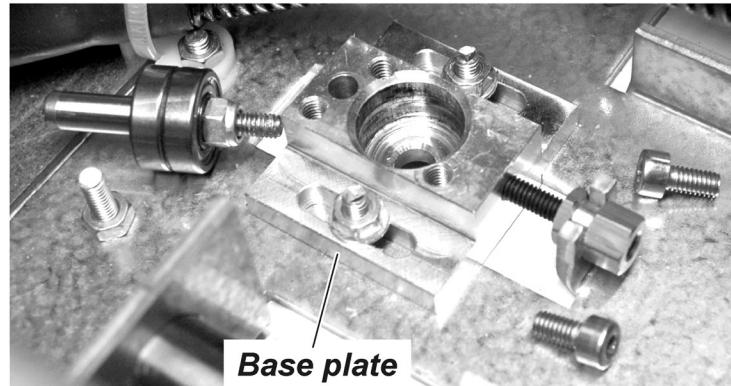
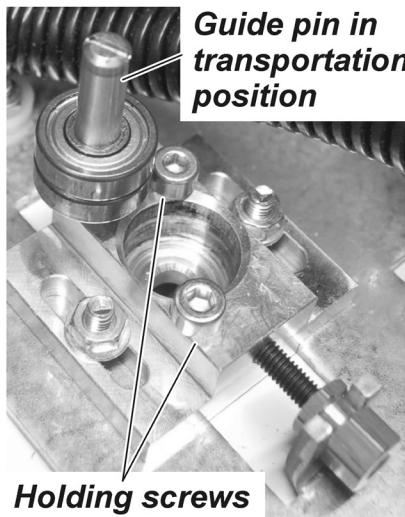
Then loosen the two screws that hold the bracket to the support bar and rotate the unit to one side so you can access the mark for the floor hole. Drill a hole suitable for the 5/16" (8 mm) fixing hardware being used.



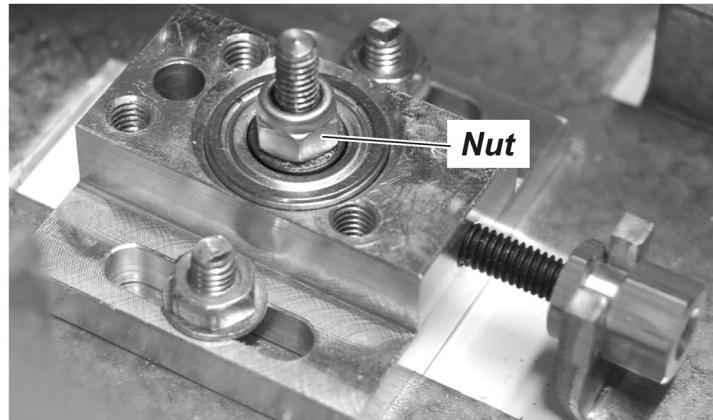
Rotate the unit to the other side and drill the second hole.

Turn the unit back to the original position and then attach the unit to the floor with the fixing hardware.

7. Check once more that the unit is vertical and then tighten all the fixing screws and wall bracket fastenings.
8. From the upper shelf, unscrew the guide pin and two holding screws from the base plate. DO NOT remove the base plate or loosen the nuts that attach it to the unit



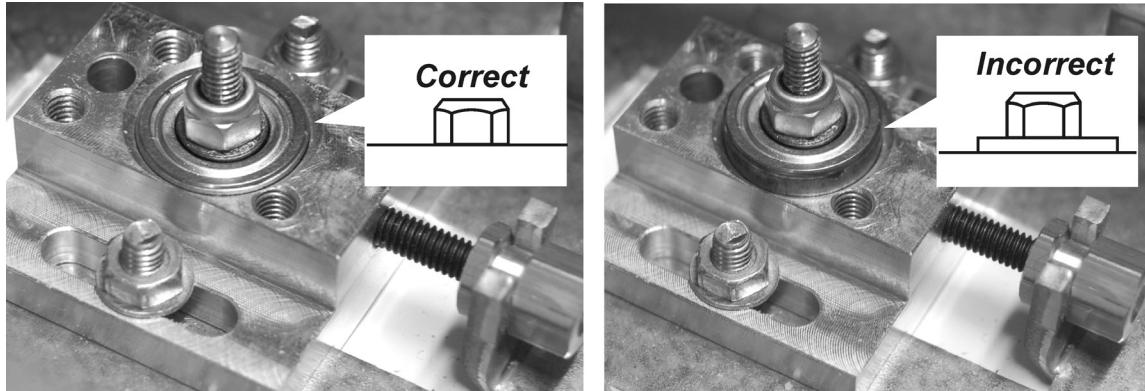
9. Rotate the guide pin and insert it into the hole in the base plate.
Note that the plain section of the guide pin must be downwards and the nut on top.



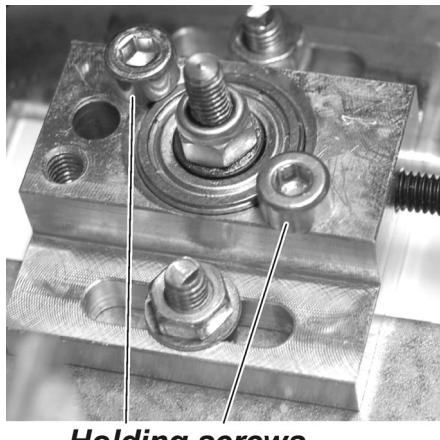
IMPORTANT NOTE:

If the guide pin does not fully enter the hole in the base plate (the top of bearing is NOT level with the top of the base plate) the rotating unit must be moved slightly.

To do this remove the transportation screws and packing pieces (see step 11), and then slide the rotating unit gently backwards or forwards until the guide pin drops into place.

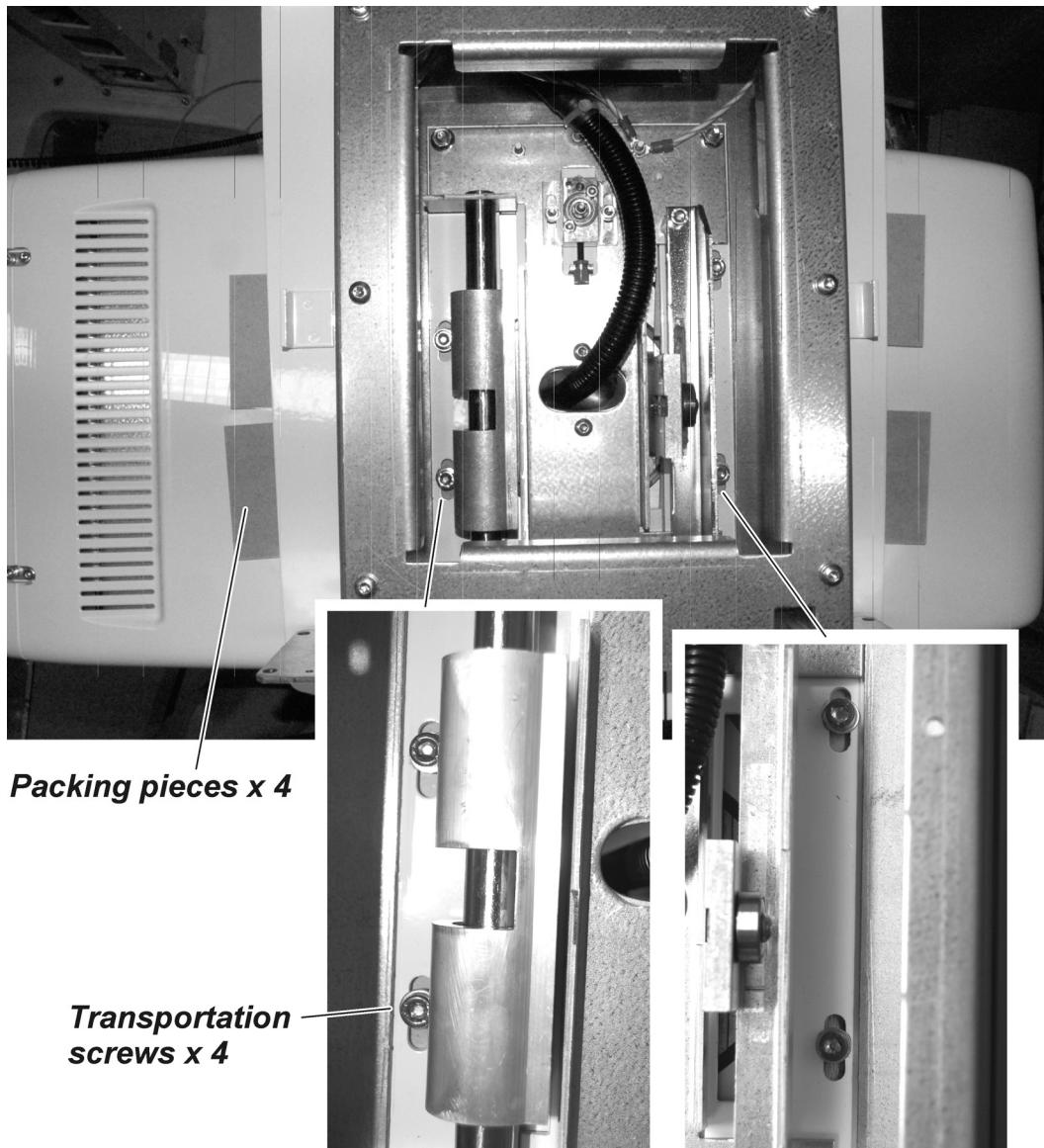


10. Secure the guide pin in position with the two holding screws.



11. Remove the four (4) transportation screws (painted RED) and four (4) packing pieces that hold the rotating unit to the upper shelf.

Now rotate the rotating unit to the **patient entry** position. Refer to the user manual.

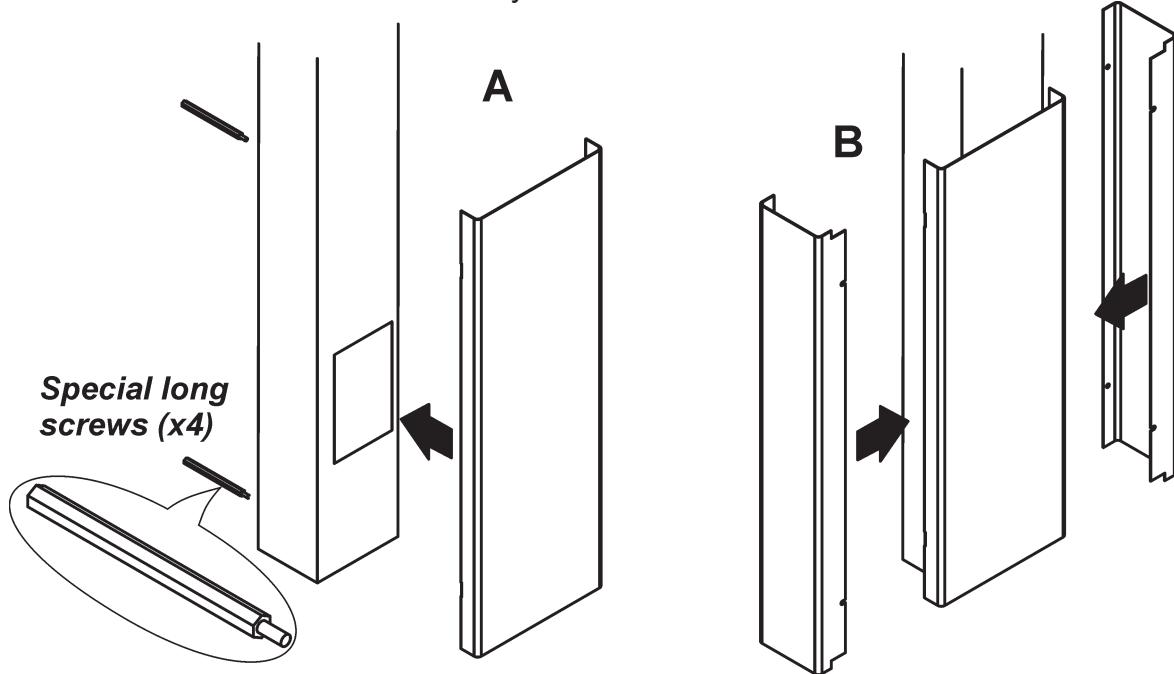


IMPORTANT NOTE:

If the unit ever has to be relocated replace the packing pieces, transportation screws and the guide pin assembly (step 8) BEFORE removing the unit from the wall or exhibition stand.

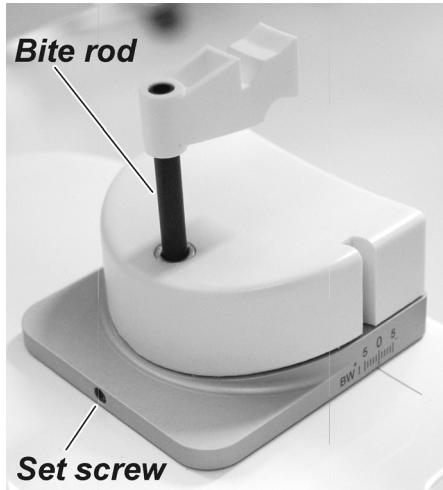
12. Attach the covers to the bottom of the column.

Attach the Front Cover, **A**, to the front of the column with the special long screws (4), they are inserted from the rear. Do not tighten them yet.



Attach the Side Covers, **B**, to the sides of the column. Note that the front edge of the Side Covers is positioned between the column and the Front Cover. The rear edge is attached to the back of the column with two screws. Tighten all the screws.

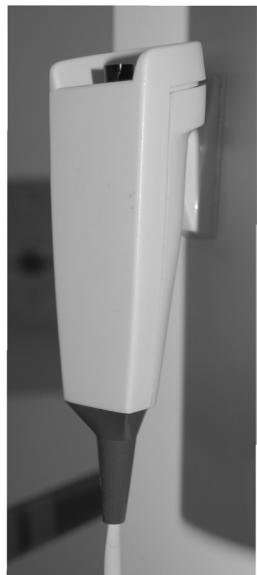
12. Check that the bite rod can be inserted into the chin rest easily and that it stays in position when released. If it is too tight or too loose adjust the tightness with the set screw (slot blade screwdriver 0.5 x 3mm).



3.3 Exposure switch

NOTE:

If the exposure switch is to be used with the remote option, refer to the section **3.4 Installing the remote exposure switch**.



1. The exposure switch hook allows the exposure switch to be attached to any flat smooth vertical surface. The exposure switch hook has double-backed tape so that it can be positioned wherever the user prefers, on the unit or somewhere else.

If the user wants the exposure switch positioned on the unit it is recommended that it is placed on the left-hand side of the column. Make sure that when the user is using the exposure switch they can protect them self from radiation and can see the patient during an exposure.

If the user does not want the exposure switch positioned on the unit make sure that it is positioned so that they can protect them self from radiation and can see the patient during an exposure. Also make sure that the exposure switch is positioned so that it is within the extension range of the spiral cable.

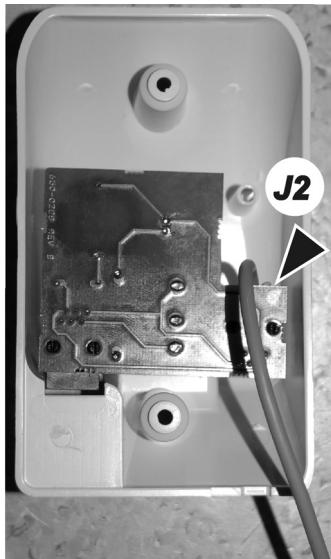
Make sure that the surface to which the switch hook is attached is flat, smooth and free from dirt and grease.



2. Connect the exposure switch cable to the connector at the bottom rear of the column and then place the exposure switch on the exposure switch hook.

3.4 Installing the remote exposure switch

1. Connect one end of the remote exposure switch extension cable to connector J2 inside the remote exposure switch

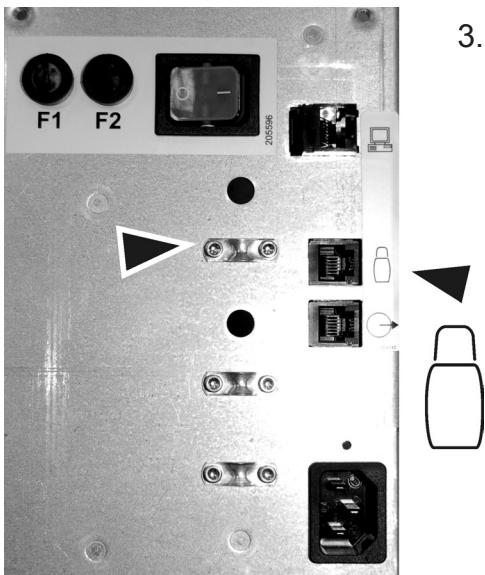


2. Attach the remote exposure switch to the wall in the required position (2 screws). Make sure that the cable from J2 is positioned in the small cut-out in the bottom of the remote exposure switch housing. Also make sure that the cable does not press against the circuit board when the housing is attached to the wall.



Cable to unit

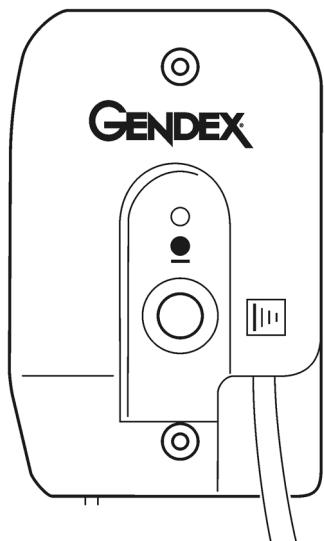
3. Route the remote exposure switch extension cable to the rear of the unit and then secure the cable in position under one of the cable clamps before connecting the cable to the unit. This will ensure that the cable cannot be accidentally disconnected





4. Attach the exposure switch hook to any flat smooth vertical surface. The exposure switch hook has double-backed tape.

Make sure that exposure switch is positioned so that the user can protect them self from radiation and can see the patient during a exposure.



Exposure switch cable

5. Connect the exposure switch to the remote exposure switch. (OPTIONAL)
Exposures can be taken either with the exposure switch or the button on the remote exposure switch.

3.5 Connecting the unit to the power supply

The unit must be connected to its own dedicated power supply:

- 100 – 120 VAC or
- 220 – 240 VAC

No other equipment should be connected to the same power supply.

Extension cables **MUST NOT** be used to connect the unit to the power supply.

1. The power supply must be equipped with an approved type circuit breaker.
 - 100 – 120 VAC, min. 16 A 250 VAC
 - 220 – 240 VAC, min. 10 A 250 VAC.
2. Connect one end of the power lead to the back of the unit and the other end to the power supply.
Observe any national and local requirements with regards the connection of dental x-ray equipment to a power supply.

3.6 Preparing the PC

NOTE:

The PC and any other external device(s) connected to the system must meet the IEC 60950 standard (minimum requirements). Devices that do not meet the IEC 60950 standard must not be connected to the system as they may pose a threat to operational safety.

1. Position the PC to be used with the unit at least 1.85 m (73 in) away from the unit.

NOTE:

If the unit and PC are to be part of a dental system make sure that all the other system components and devices are installed, connected and configured correctly. Refer to the documentation supplied with the other components and devices for information on how to do this.

2. Switch the PC on and install GxPicture, supplied with the device, then install VixWin or other dental imaging software that will be used with the device.

For information on how to do these refer to the GxPicture manual and the documentation supplied with the dental imaging software you are installing.

IMPORTANT NOTE:

During the installation when the **Select Features** window appears, make sure that you select the **GXDP-300** option.

3.7 Connecting the unit to the PC

The unit supports 10Base-T/100Base-TX Ethernet connections.

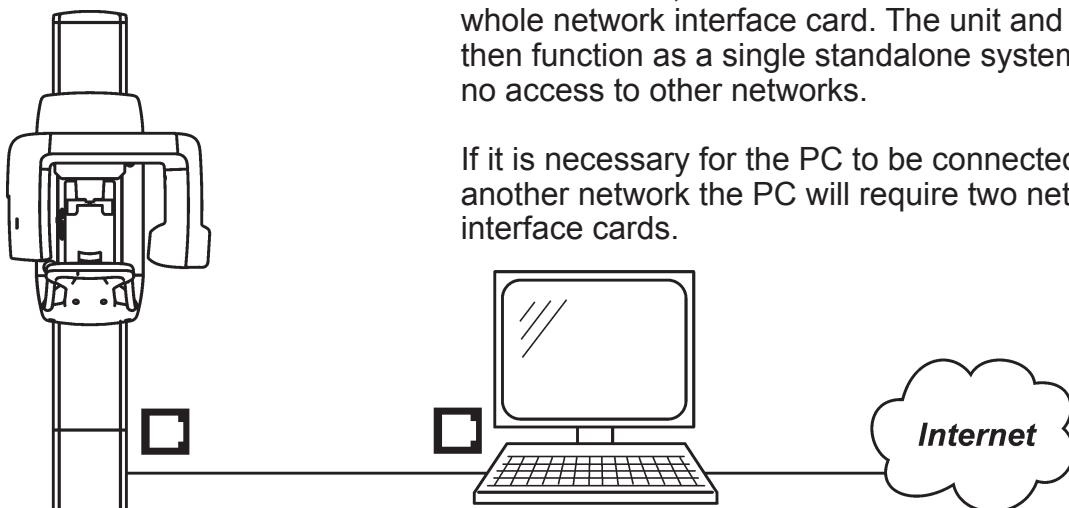
The PC must be connected to the unit in accordance with IEC 60601-1-1.

Connection options

Standalone

With the standalone configuration the unit is connected to a PC, and the unit then reserves the whole network interface card. The unit and PC then function as a single standalone system with no access to other networks.

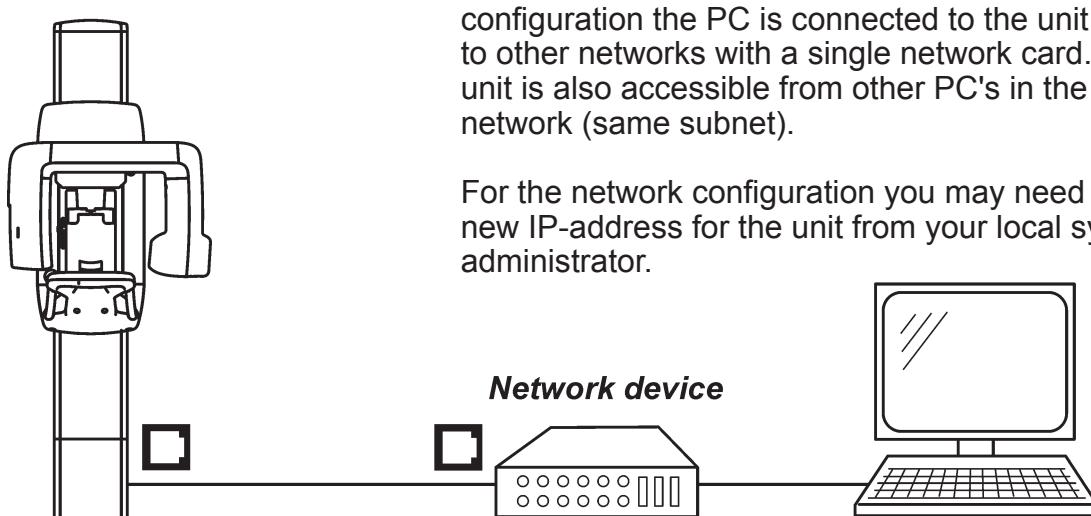
If it is necessary for the PC to be connected to another network the PC will require two network interface cards.



Network

With the network configuration the unit is connected to the PC via a network device. With this configuration the PC is connected to the unit and to other networks with a single network card. The unit is also accessible from other PC's in the same network (same subnet).

For the network configuration you may need a new IP-address for the unit from your local system administrator.



Connection method

The unit is connected to the PC using an **IP based connection** method.

This connection method allows the unit to be used in either a Standalone or a Network Configuration.

IP based connection uses IP Protocol to establish a connection between the unit and the PC. It requires the IP-addresses of both the unit and the PC to be configured correctly.

IMPORTANT NOTE:

The default IP-address of the unit is:

194.9.227.251 and the subnet mask is fixed to 255.255.255.0.

The unit offers two alternatives for configuring its IP-address, **Remote** and **Manual**. With the **Remote** alternative the unit receives its IP-address from the PC. With the **Manual** alternative the user sets the IP-address of the unit using the Graphical User Interface (GUI) of the unit.

It is recommended that **Remote** alternative is used when configuring the IP-address of the unit. However, if problems occur, due to firewalls etc., use **Manual** alternative instead.

The **Remote** alternative is explained as part of the section **Connection using IP based connection method**.

The **Manual** alternative is explained in section **Manually changing the IP-address**.

IMPORTANT NOTE:

The unit can have any IP-address but the unit and PC must always be in the same subnet. For example IP for PC 194.9.227.250 and IP for the unit 194.9.227.251 and the subnet mask is fixed to 255.255.255.0

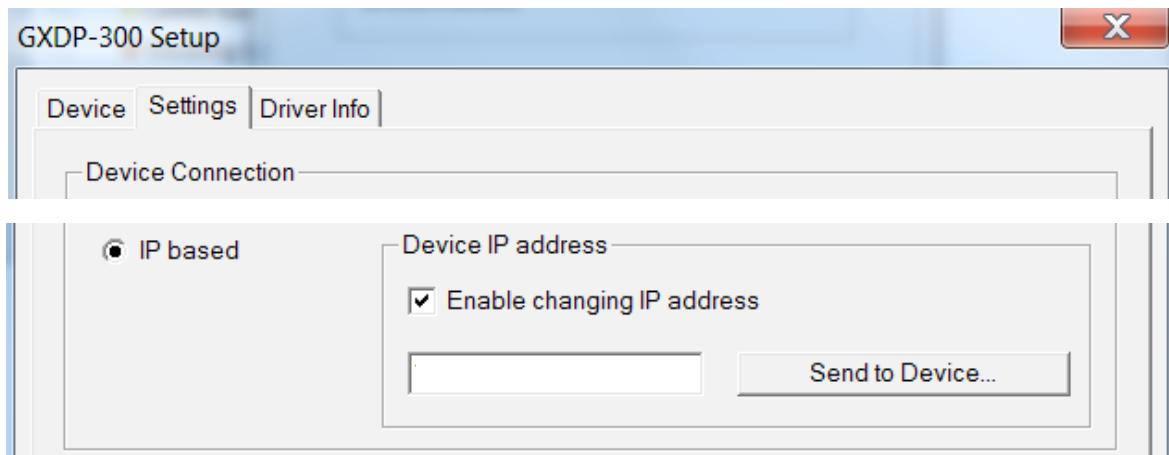
Connection using the IP based method



1. **Standalone configuration:** Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the PC.

Network configuration: Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the network.

2. Switch the Unit on.
3. **PC:** Start the PC and then open GxPicture Software Driver. Open the GXDP-300 setup window. Refer to the documentation supplied with GxPicture Software Driver for information on how to do this.
4. **PC:** In the **Device Connection** section, click the **IP based** radio button to select it and then click the **Enable changing IP-address** check box to activate the IP-address field.

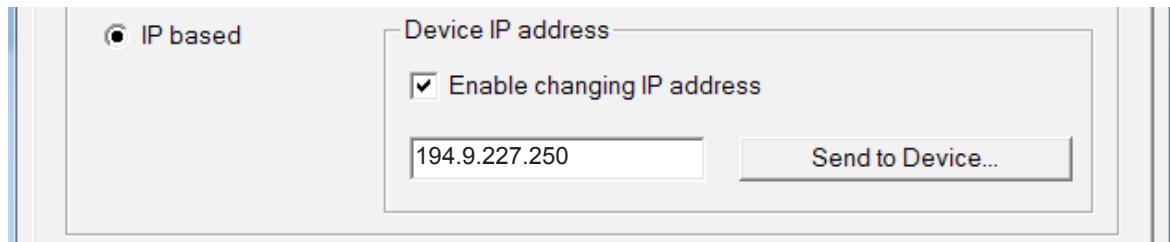


5. Stand alone configuration:

PC: Key in the desired IP-address of the unit, for example 194.9.227.250, into the IP-address field.

Network configuration:

PC: Key in the new IP-address (obtained from the network administrator) into the IP-address field.

**IMPORTANT NOTE:**

The unit can have any IP-address but the unit and PC must always be in the same subnet. The subnet mask of the unit is fixed to 255.255.255.0.

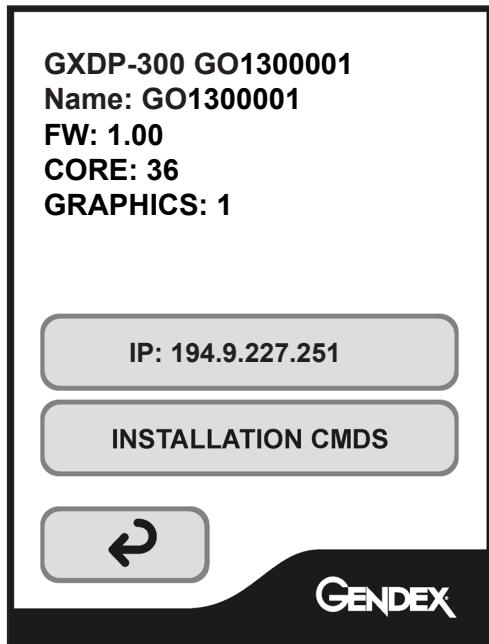
NOTE:

With **network configuration** the default IP-address of the unit must be changed to the IP-address obtained from your local IP administrator.

With **standalone configuration**, you can avoid changing the IP-address of the unit by setting the IP-address of the PC to the same sub net as the default value of the unit. After changing the PC IP-address in this way you can proceed directly to step 12 to finish the configuration.

6. Touch the service button on the main control panel of the unit.





7. The configuration screen will appear on the display. It shows the unit serial number and firmware version numbers.

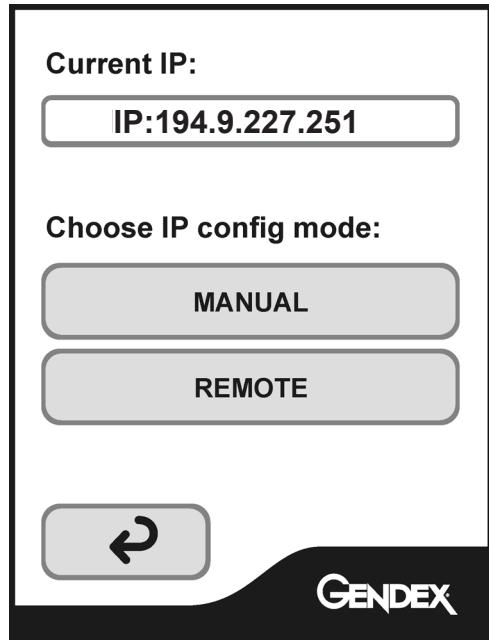
Also there are two function buttons, **IP: 194.9.227.251** (IP configuration) and **INSTALLATION CMDS** (Installation commands).

Press **IP: 194.9.227.251** button (The current IP-address of the unit is shown).

NOTE:

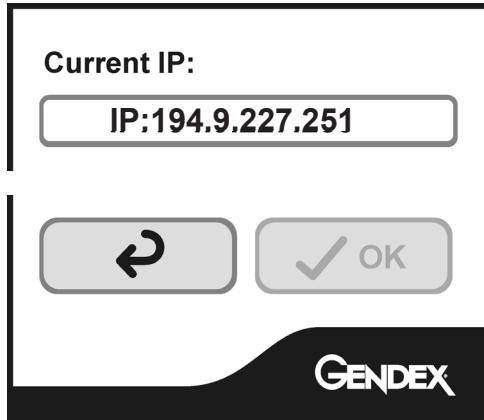
See section 4 for information about **Installation Commands**.

8. The IP configuration modes will appear on the display, **Remote** or **Manual**.

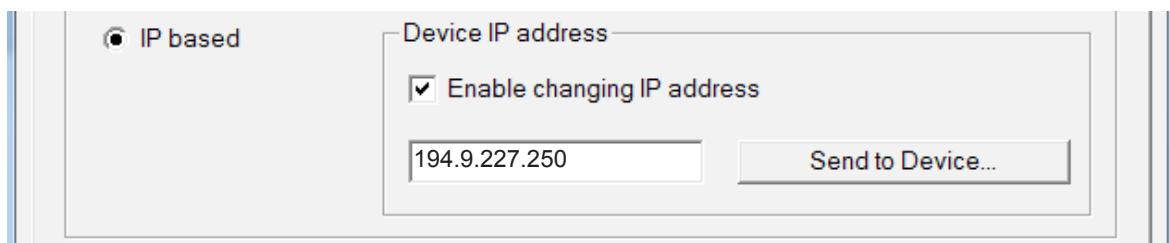


Select **Remote**.

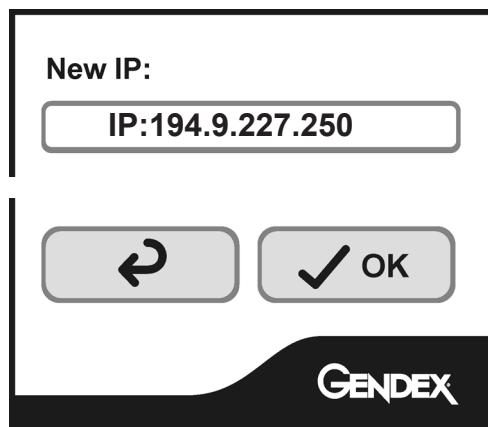
9. The IP-address window will appear which shows the current IP-address of the unit.



10. PC: Press the **Send to Device...** button.



11. The new IP-address will appear on the display.



Touch the **OK** button to accept the IP-address and then the **Arrow** button to return to the main display.

12. PC: Click the **OK** button to close the settings window.

NOTE:

If the remote IP-address setting fails use the **MANUAL** method. See section **Manually changing the IP-address**.

Manually changing the IP-address

The IP-address of the unit can be changed manually.

NOTE:

Always set the IP-address of the PC before changing the IP-address of the unit.



1. Touch the service button on the main control panel of the unit.
2. The configuration screen will appear on the display. It shows the unit serial number and the firmware version numbers.

GXDP-300 GO1300001
Name: GO1300001
FW: 1.00
CORE: 36
GRAPHICS: 1

Also there are two function buttons,
IP: 194.9.227.251 (IP configuration) and
INSTALLATION CMDS (Installation commands)

IP: 194.9.227.251

INSTALLATION CMDS

Press **IP: 194.9.227.251** button (The current IP-address of the unit is shown).

NOTE:

See section 4 for information about **Installation Commands**.

3. The IP configuration modes will appear on the display, Remote or Manual.

Current IP:

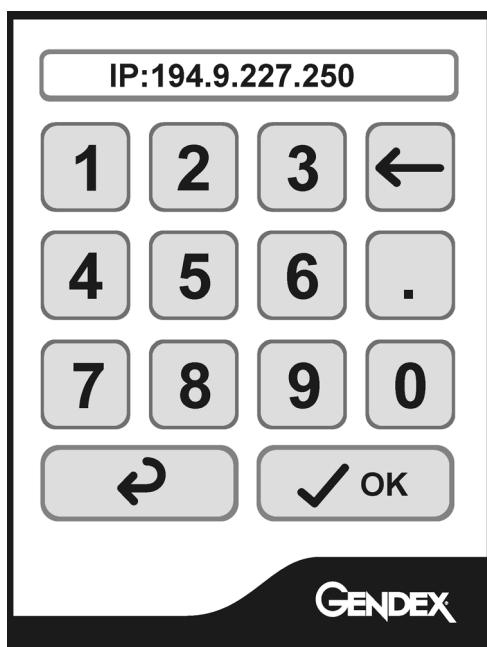
IP:194.9.227.251

Choose IP config mode:

MANUAL

REMOTE

Touch the **Manual** button.



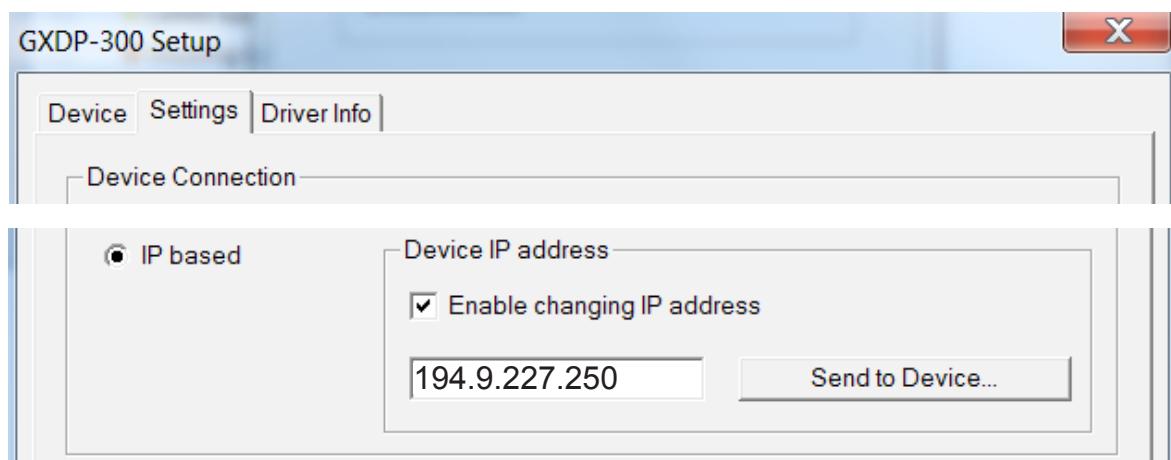
4. The Manual IP-address configuration screen will appear.
Key in the new IP-address.

When the new IP-address has been keyed in the **OK** button will become active.

Touch the **OK** button to accept the change and return to the main display.

Touch **Arrow** button to discard the change and return to the main display.

5. **PC:** Open the GXDP-300 setup window. Refer to the documentation supplied with GxPicture Software Driver for information on how to do this.
In the **Device Connection** section, click the **IP based** radio button to select it. Then click the **Enable changing IP-address** check box to activate the IP-address field.

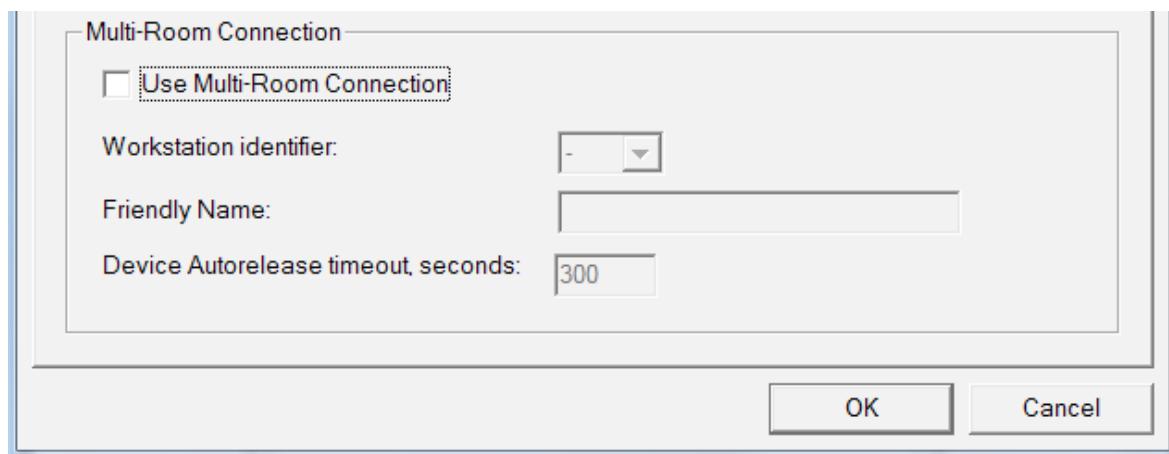


6. **PC:** Key in the new IP-address of the unit into the IP-address field.
7. **PC:** Click the **OK** button to close the settings window.

Multi-room Connection

Multi-room Connection allows the unit to be used by several PCs within a network. A PC must "re-reserve" the unit before it can be used.

1. **PC:** In the **GXDP-300 Setup** window select the **Settings** page.
2. **PC:** Click the **Use Multi-room Connection** check box to select it and then, from the drop down list, select a unique **Workstation identifier** number (between 1 and 8) for the PC being configured.
Additional workstation information, for example, user name, location etc, can be entered into the **Friendly Name** field.



The **Device Autorelease timeout** is the length of time that the unit will remain reserved and usable by a PC. After the set time elapses the PC automatically releases the unit so that it can be used by another PC in the network (the unit can be reserved in advance from another PC).

The default setting is 300 seconds. This can be changed by keying in a new value.

3. **PC:** Click OK to connect the PC to the unit
NOTE:
An automatic technique will automatically locate the unit within the local area network and connect the PC.
4. **PC:** Repeat the above process for all the other PCs in the network.
Make sure that you define the **IP-address** of the unit in each PC and that the **workstation identifier** selected is not used in more than one PC.
5. Check the installation by starting image capture using the imaging software.
If the **Use Multi-room Connection** was selected the Workstation identifier of the PC (1 - 8) being used will appear on the unit display.

4. Checking the alignment and finishing the installation

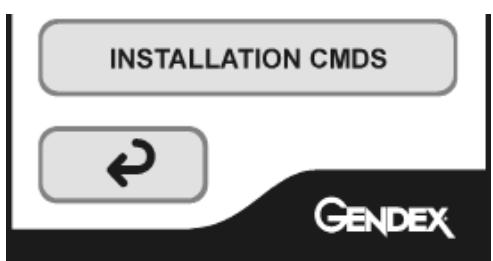
4.1 Checking the alignment of the CCD Sensor

1. **PC:** Prepare the unit for an exposure.
NOTE:
 If the dental imaging software prompts an error message "Please calibrate the device" on startup, perform CCD re-calibration as described in section 5.4.

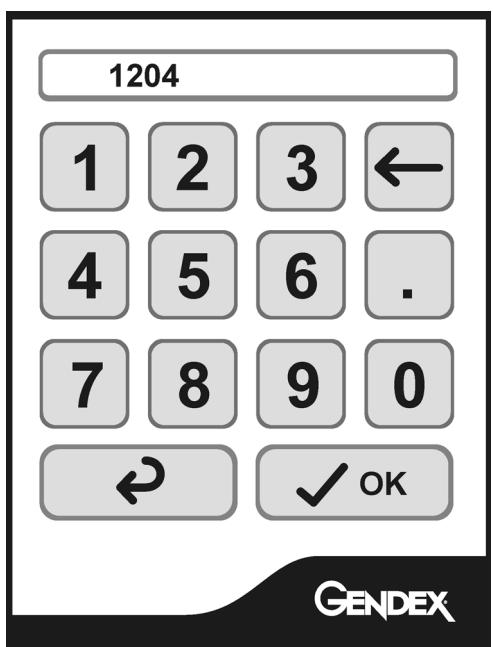
2. Remove the chin rest.



3. Touch the service button on the main control panel of the unit to open the configuration window.



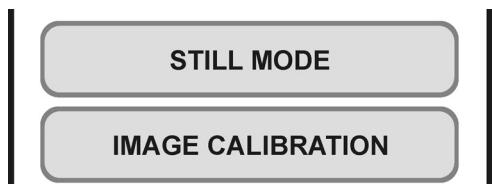
4. Select **INSTALLATION CMDS**.



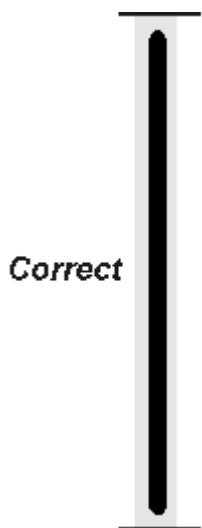
5. The PIN number screen will appear. This is a security feature to prevent the user from accidentally accessing the installation / service commands.

Key in **1204** and touch the **OK** key.

6. The service function will appear on the screen.
Select **STILL MODE**.



7. **Protect yourself from radiation.**
Press and hold down the exposure switch to take an exposure.



8. **PC:** Use the dental imaging software to examine the image that appears.

If the CCD sensor is correctly positioned the image will show a vertical black line (the beam) in the middle of a vertical light gray area (the CCD aperture).

Both the beam (black line) and the CCD aperture (light gray area) must be vertical and the bottom edge of the beam (black line) must be between 0.1 and 2 mm from the bottom edge of the image.

If the beam (black line) is not in the middle of the CCD aperture (the gray area) or the CCD aperture (gray area) is not vertical, the CCD sensor must be adjusted. See 5.1 Aligning the CCD sensor.

9. Touch the **Arrow** button to exit the **Still Mode** and return to the main menu.

4.2 Checking the image geometry (ball-pin phantom test)

1. PC: Prepare the unit for an exposure.

2. Replace the chin rest.

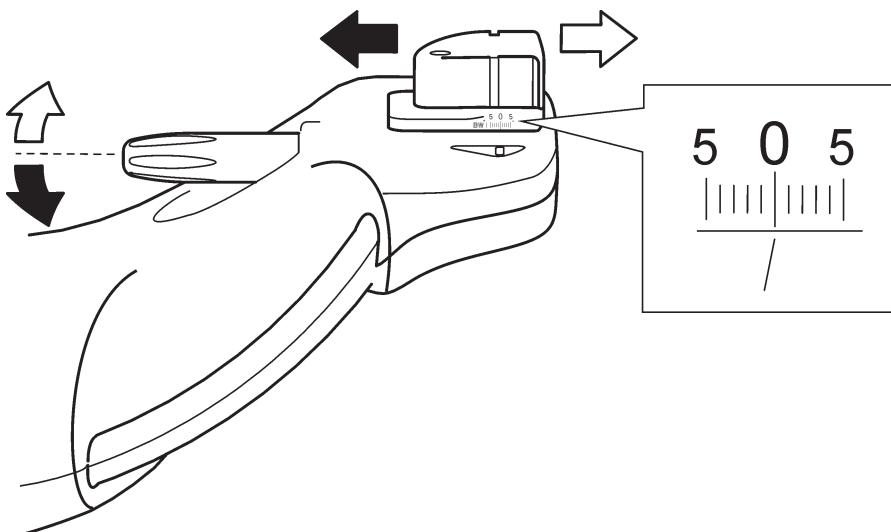
PAN



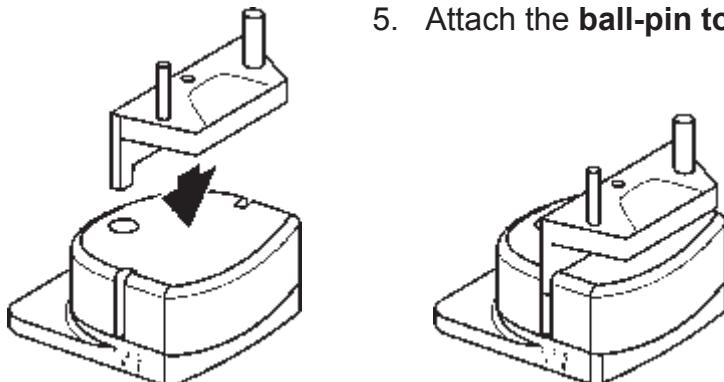
66 kV

3. Set up the unit to take an **panoramic** exposure at **66 kV**. (Panoramic small)
Refer to the unit user's manual for information on how to do this.

4. Set the chinrest to the zero (0) position.



5. Attach the **ball-pin tool** to the chin support.



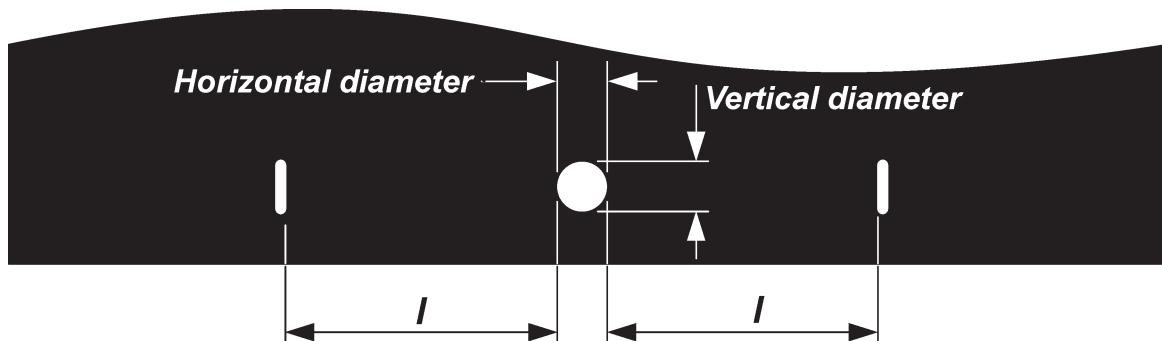


6. **Protect yourself from radiation.**
Press and hold down the exposure switch to take an exposure.

7. **PC:** Use the measuring tools in the dental imaging software to examine the dimensions of the pins and ball that appear on the image. Magnify the image so that you can accurately measure the dimensions.

If the image geometry is correct the center ball must be round with a difference of no more than **0.2 mm** between the horizontal diameter and the vertical diameter.

Also the distances (*I*) from the side of the center ball to the inner edges of pins must be equal with a difference of no more than **0.5 mm** between the two distances.



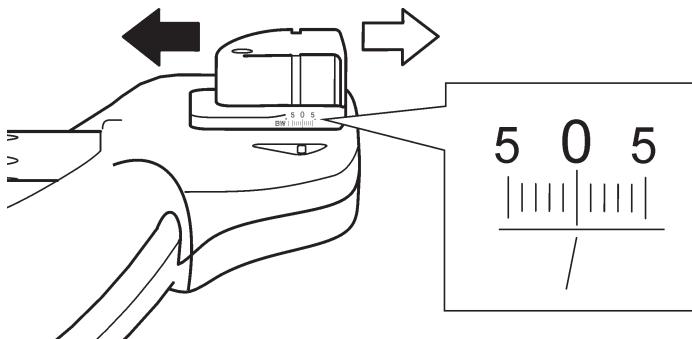
If the center ball is NOT ROUND and/or the distances between the pins and the center ball are NOT WITHIN THE TOLERANCE, then the rotating unit (RU) or the chin rest must be adjusted.
See 5.2 Adjusting the image geometry.

IMPORTANT NOTE:

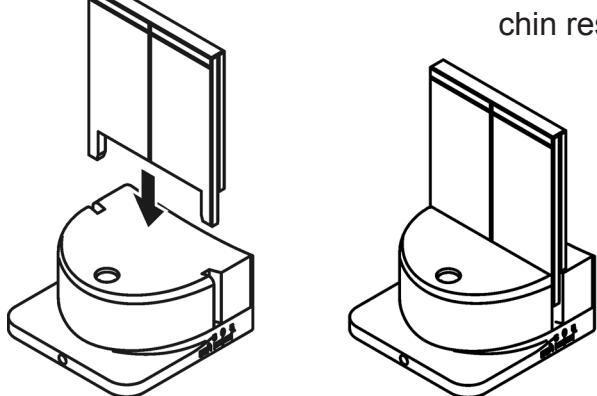
In some cases you may have to adjust the position of both the rotating unit AND the chin rest.

4.3 Checking the positioning lasers

1. Position the chin rest to the 0 position.



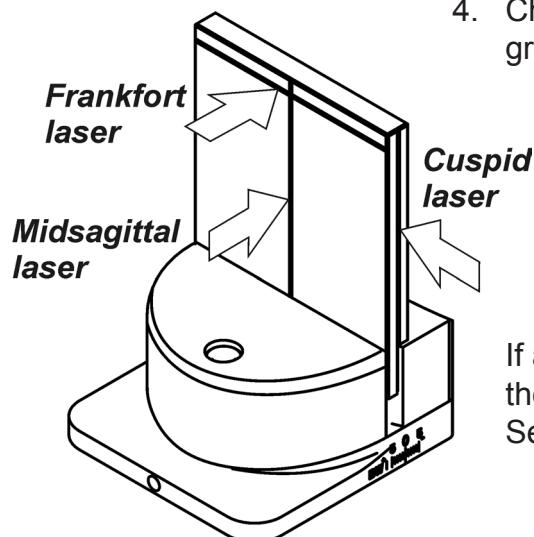
2. Place the laser alignment tool (supplied) in the chin rest.



3. Press the laser key.



4. Check that the lasers hit the corresponding grooves on the laser alignment tool.



If any of the lasers are not positioned correctly their positions must be adjusted.
See 5.3 Aligning the lasers.

4.4 Completing the Installation

Check that the unit functions correctly:

- Take a test exposure to verify that the unit operates correctly and the image is transferred successfully to the PC.

Protect yourself from radiation when taking the exposure.



- Check the up/down keys drive the unit up and down.
- Check that the light key switches the positioning lights on and off.
- Check that when the emergency switch is pressed the unit stops operating.

Finally replace all the covers that were removed

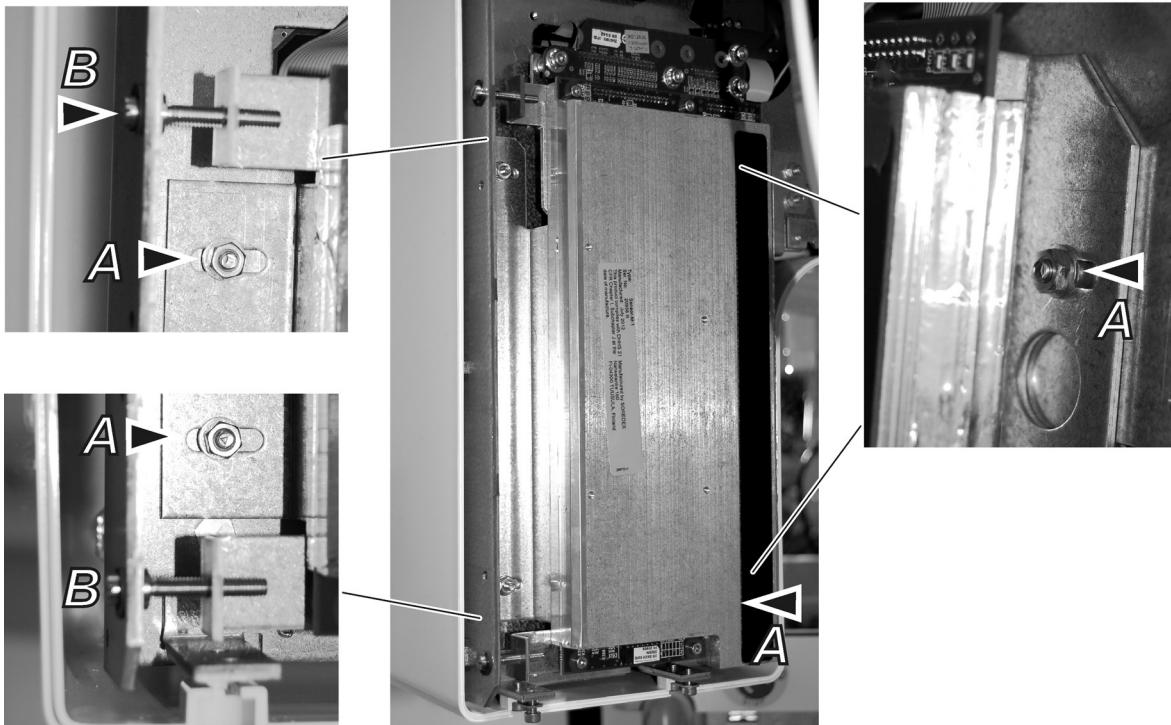
5. Aligning the unit

5.1 Aligning the CCD Sensor

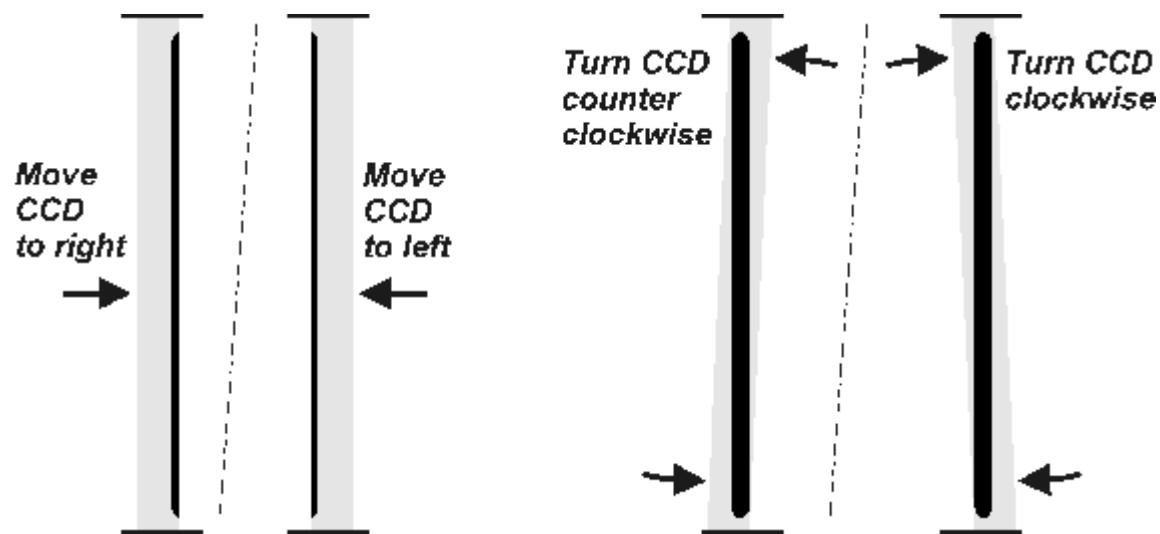
If the sensor was not correctly aligned after carrying out the alignment check (4.1 Checking the alignment of the CCD Sensor) the sensor must be repositioned and new beam images taken to confirm that it is correctly positioned.

1. Remove the inner sensor cover from the rotating unit. It is held in place with four (4) screws

2. To adjust the CCD sensor loosen the four nuts (A) that hold the CCD sensor in place and then adjust its position with the two screws (B) on the left-hand side.



Adjust and recheck the position of the CCD sensor until the beam is vertical and centered in the middle of the CCD aperture.



3. Touch the **Arrow** button to exit the Still Mode and return to the main menu.

5.2 Adjusting the image geometry

IMPORTANT NOTE:

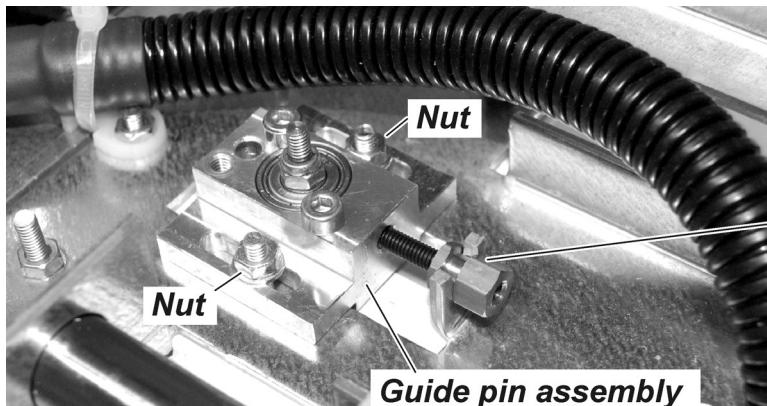
In some cases you may have to adjust the position of both the rotating unit AND the chin rest.

Center ball not round

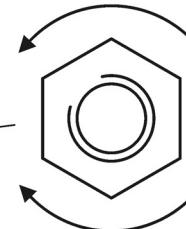
If the center ball is NOT ROUND then the position of the rotating unit (RU) must be adjusted.

1. Loosen the two nuts that hold the guide pin assembly in place.

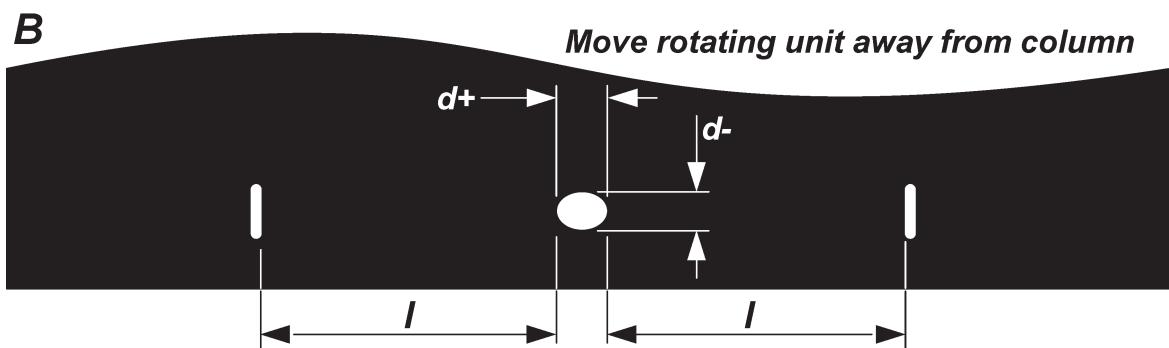
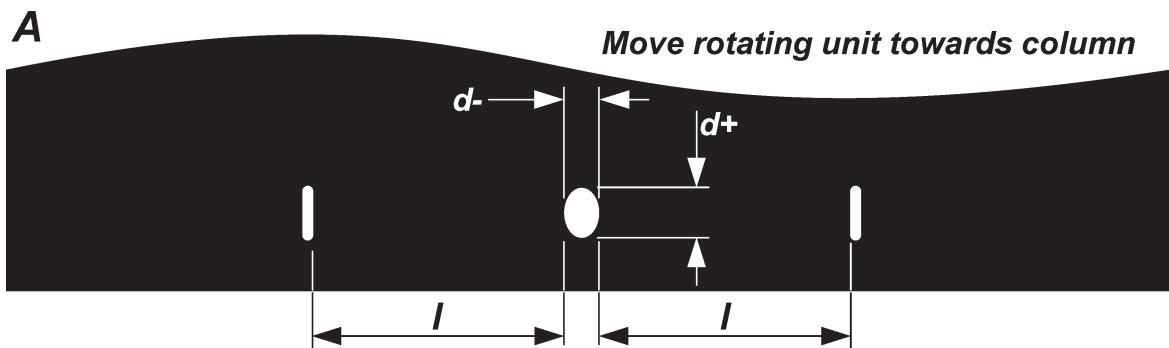
Turn the adjusting nut counter clockwise to move the rotating unit towards the column and clockwise to move it away from the column.



A - move RU towards column



B - move RU away from column

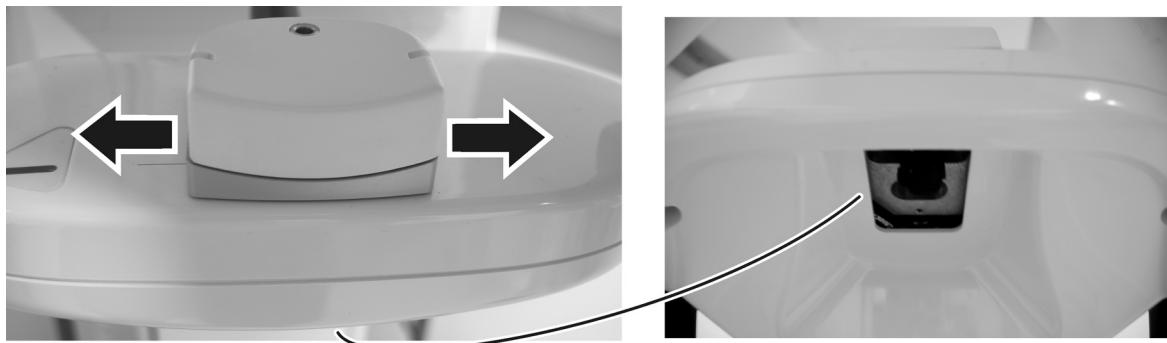


2. Re-tighten the guide pin assembly nuts after the adjustment.
3. Take another ball-pin exposure to confirm the center ball is round. Also verify that the distances from center ball to left and right pins are equal, if not proceed to the next section, Distances between left and right pins not equal.

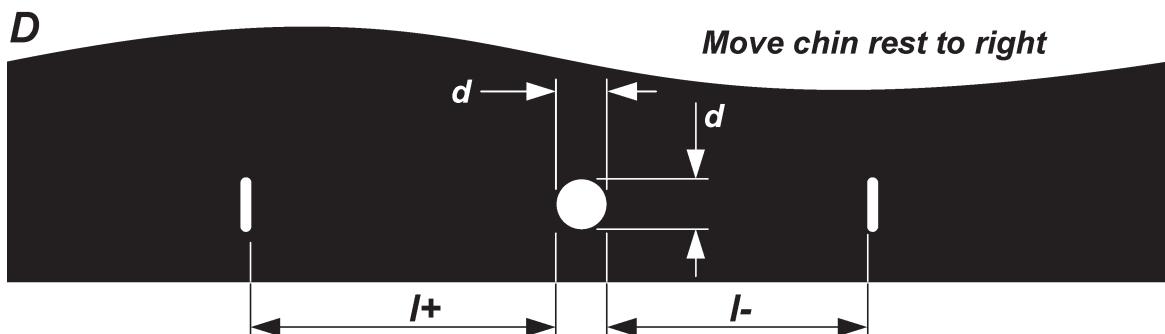
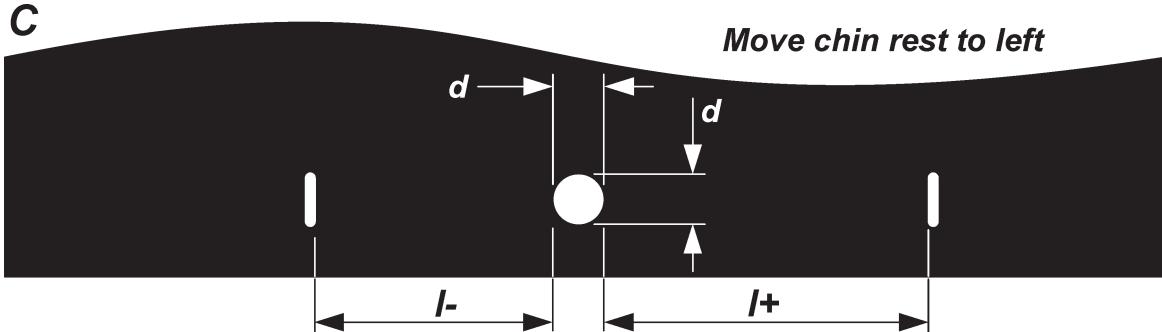
Distances between center ball and left and right pins not equal

If the center ball is round but the distances between the pins and the ball are DIFFERENT then the chin rest must be must be adjusted.

1. Loosen the two screws that hold the chin rest in place (on the underside of the patient support).



2. If the right-hand distance ($I+$ in picture **C**) is greater than the left-hand distance ($I-$), move the chin rest to the left.
If the left-hand distance ($I+$ in picture **D**) is greater than the right-hand distance ($I-$), move the chin rest to the right.



3. Take another ball-pin exposure to confirm the unit is now correctly aligned. Readjust if required.
4. After the adjustment has been done re-tighten the two screws that hold the chin rest in place.

5.3 Aligning the lasers

Midsagittal and frankfort



1. Loosen the screw that holds the frankfort laser positioning knob in position and then remove the knob.



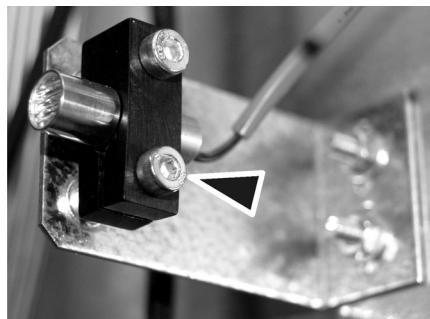
2. Remove the corner cover from the unit. It is held in position with magnets.



3. Remove the mirror cover from the unit. It is held in position with magnets and must be removed by pulling from the top



4. Loosen the clamping screws on the laser module and then rotate the laser to position beam vertically.

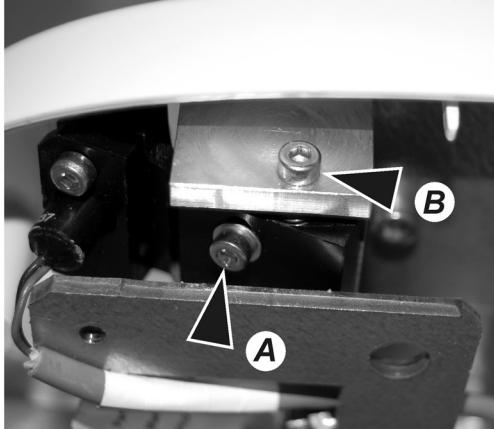


Cuspid

1. Remove the bottom cover from the lower shelf (6 screws)



2. To move the laser backwards or forwards loosen the clamp screw A and then adjust the position of the laser with adjusting screw B.



3. Check the positions of the lasers again and then replace all the covers and adjusting knob

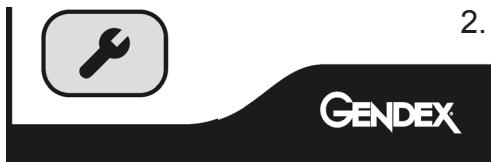
5.4 Calibrating the CCD sensor

NOTE:

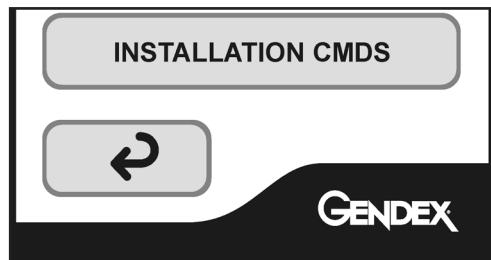
The CCD sensor is calibrated at the factory and thus does not normally need to be calibrated again.

However, if the dental imaging software prompts an error message "Please calibrate the device" on startup, perform CCD re-calibration as instructed below.

1. **PC:** Prepare the unit for an exposure.
2. Touch the service button on the main control panel of the unit to open the configuration window.



3. Select **INSTALLATION CMDS**.



4. The personal identification number (PIN) screen will appear.
Key in **1204** and touch the **OK** key.
Then select **IMAGE CALIBRATION**.



5. Remove the chin rest and make sure that there is nothing between the sensor and tube-head.



6. Protect yourself from radiation, and take an exposure.

7. **PC:** Use the dental imaging software to examine the image. It should be evenly grey all over with no granularity nor horizontal lines/stripes. If the image is not evenly gray repeat the calibration until it is. If artefacts appear on the image make sure that there is nothing between the sensor and the tubehead.
8. Touch the **Arrow** button to exit the CALIBRATION MODE.

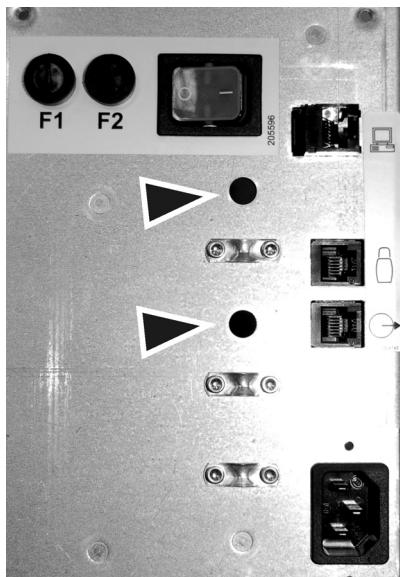
6. Installing accessories

6.1 Remote exposure warning light (optional)

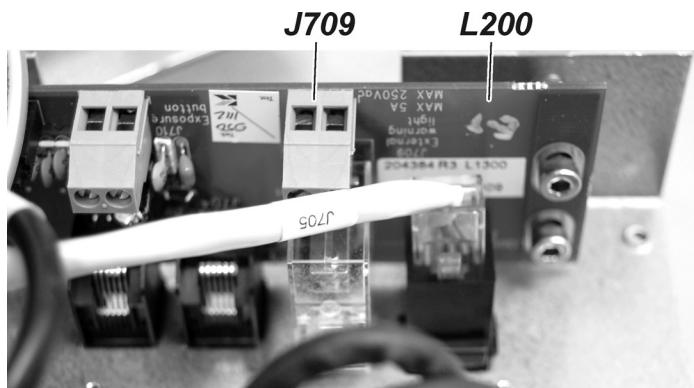
CAUTION:

The warning light assembly must be positioned outside the room in which the unit is used in the location where it can be clearly seen by the person using the unit.

1. Make sure that the unit is switched off and disconnected from the main power supply.
2. Remove the board mounting plate assembly from the back of the column (4 screws).
3. Route the cable that comes from the remote exposure light through one of the holes in the board mounting plate assembly to the rear of the assembly.



4. Connect cable that comes from the remote exposure light to connector J709 on L1300.



5. Replace the board mounting plate assembly and secure the cable that goes to the remote exposure warning light in position under one of the cable clamps.

