

New as of:

10.2010

ORTHOPHOS XG 3D

Quality inspection

English

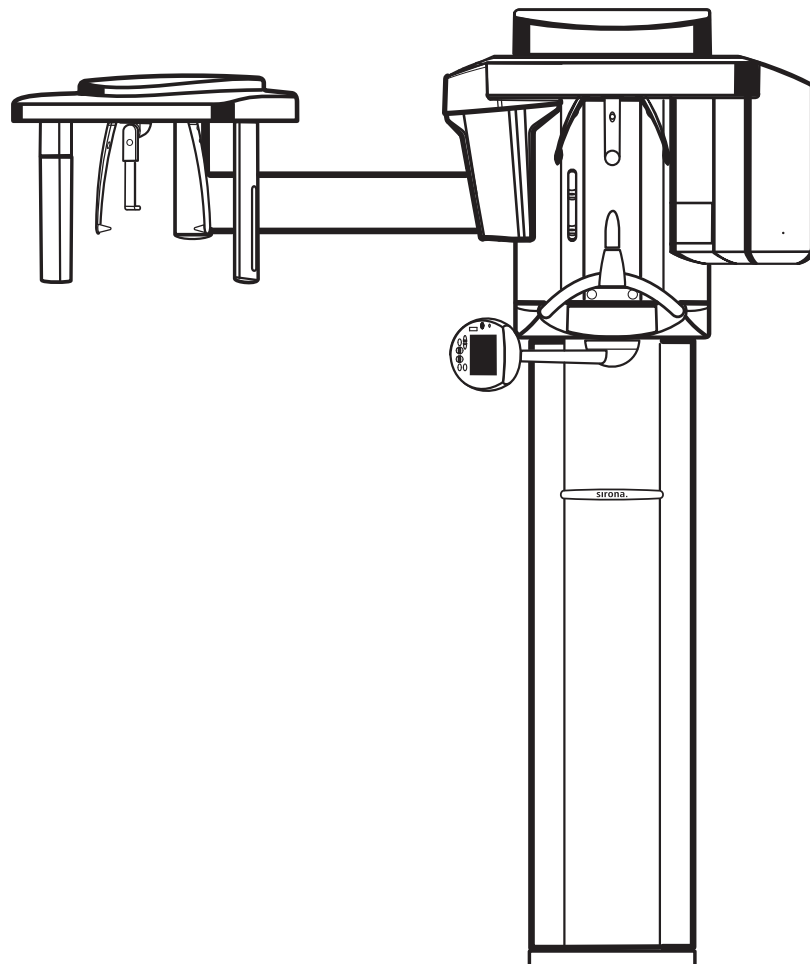


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1 Quality test

1.1 General

Explanation

SIRONA offers this quality test in order to ensure image quality.

Recommendation

The service engineer who performed the unit adjustment should enter the dose value determined during unit adjustment in the Chapter "Unit data and dose value [→ 38]".

The user should see to it that a constancy test is performed once a month within the scope of quality assurance.

Prerequisites

A reference image for the constancy test must be taken first.

It should be taken by the service engineer who performed the unit adjustment.

Alternatively, it could also be taken by the responsible administrator in possession of the required password.

1.2 Structure of the document

1.2.1 Identification of danger levels

To prevent personal injury and material damage, please observe the warning and safety information provided in this document. Such information is highlighted as follows:

DANGER

An imminent danger that could result in serious bodily injury or death.

WARNING

A possibly dangerous situation that could result in serious bodily injury or death.

CAUTION

A possibly dangerous situation that could result in slight bodily injury.

NOTICE

A possibly harmful situation which could lead to damage of the product or an object in its environment.

IMPORTANT

Application instructions and other important information.

Tip: Information on making work easier.

1.2.2 Formats and symbols used

The symbols and character formats used in the present manual have the following meaning:

<ul style="list-style-type: none"> ✓ Prerequisite 1. First action step <li style="padding-left: 20px;">CAUTION! Warning on action step 2. Second action step <li style="padding-left: 20px;">or <li style="padding-left: 40px;">➤ Alternative action ↵ Result 	Requests you to do something.
See "Formats and symbols used"	Identifies a reference to another text passage and specifies its page number.
<ul style="list-style-type: none"> • List 	Identifies a list.
"Command/menu item"	Identifies commands, menu items or quotations.

2 2D constancy test (panoramic tomography and cephalometry)

2.1 Explanation

Table of contents

This chapter explains how to perform a constancy test.

Prerequisite

- Reference images must be available in order to perform a constancy test.
 - The reference images must be taken by a service engineer (password-protected area)
 - The chapter entitled "Reference images for the constancy test" describes how to take these reference images.
 - The work steps for taking the reference images are referred to as "Acceptance test" in the relevant document and in the software.

Test results

The **TEST RESULTS** form is used to document the results of the constancy test.

There are two ways to document test results.

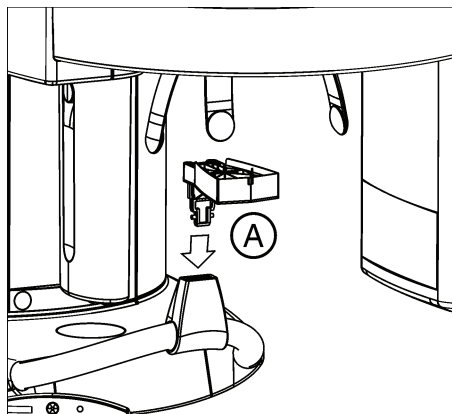
- **Option 1:**
 - The test results are to be entered by hand on paper.
 - They are attached to the end of this document.
- **Option 2:**
 - Have the test results entered by the constancy test program.
 - This generates a PDF document, which then has to be printed out.
 - For more information, refer to the section "Test results and TEST REPORT as a PDF document".

Test results of reference images

The test results of the reference images have to be compared to the test results of the constancy test.

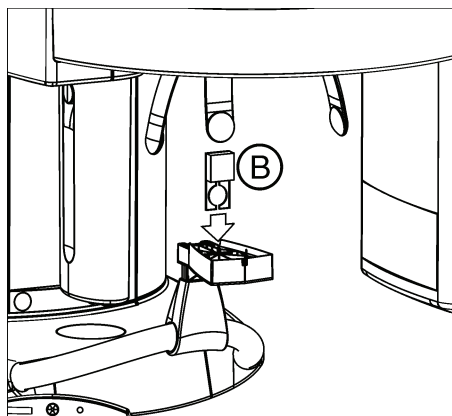
2.2 Panoramic

2.2.1 Preparing the X-ray unit



✓ The panoramic sensor must be plugged into the sensor holder.

1. Plug the needle phantom (A) into the bite block holder.



2. Plug the contrast element (B) into the slot on the needle phantom provided for that purpose.

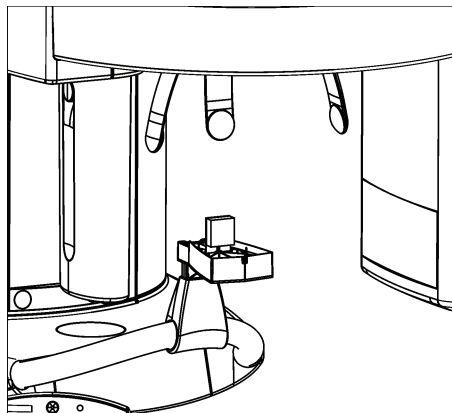
NOTICE

The aluminum plate of the contrast element must be facing away from the column of the unit.

Do not attach any additional aluminum plate to the unit.



3. Press the **R key** (Return key).



↩ The unit moves to its starting position.

↩ The X-ray unit is now ready.

2.2.2 Selecting the reference image for the constancy test

NOTICE

Recording of the acceptance test always serves as the point of departure for the constancy test.



1. Click the *"Select image"* button in the left tool bar
or
Click the *"Select..."* menu option on the *"Test"* menu bar
 2. Select *"Acceptance test 1"*.
 3. Acknowledge with *"OK"*.
- ↳ The test phantom image of *"Acceptance test 1"* appears

2.2.3 Making the PC ready for an exposure

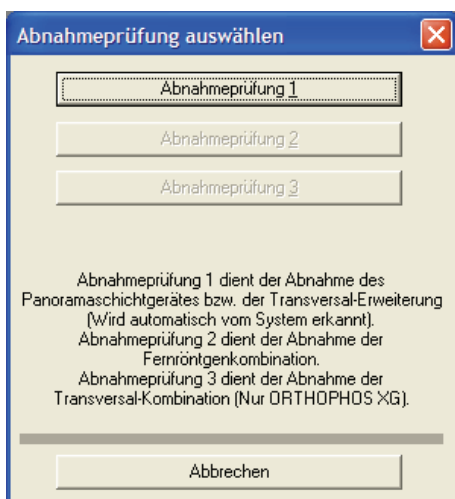


1. Click the *"XC XP"* button on the left tool bar.
Alternative activation:
On the menu bar *"Test"* click the *"Panoramic X-ray"* option.

- ↳ The *"Select X-ray device"* dialog box appears.
2. Select the desired X-ray device.
 3. Press the *"OK"* button.
↳ The *"Select test type"* dialog box appears.
 4. Click the *"Constancy test"* button.
↳ The *"Select Constancy test"* dialog box appears.
 5. Click the *"Constancy test 1"* button.
↳ The *"Acceptance test / Constancy test"* dialog box appears
↳ The *"Constancy test Panorama"* option is selected.
 6. Press the *"Image acquisition"* button.
↳ The temple supports close automatically.
↳ The exposure readiness dialog box opens.

The following exposure data is displayed:

- Display on the Easypad
 - Exposure values: 73 kV / 8 mA / 14.1s
 - Program: S11 / 3



2.2.4 Releasing the exposure

1. Release an exposure.
↳ The unit automatically performs a rotation.
↳ The **test phantom image** appears on the SIDEXIS XG screen.
↳ The brightness and contrast controls on the right toolbar are automatically set to their center positions (50%/50%).

NOTICE

As this is a low-contrast and high-contrast display with minimum dose (in the limit range), the noise component is dominant in the image. The image quality is correspondingly noisy!

2. After completing the exposure, remove the contrast element and needle phantom.

2.2.5 How to handle invalid exposures

Explanation

You may repeat the test phantom exposure for the constancy test as often as required, e.g. if you have chosen wrong exposure data.

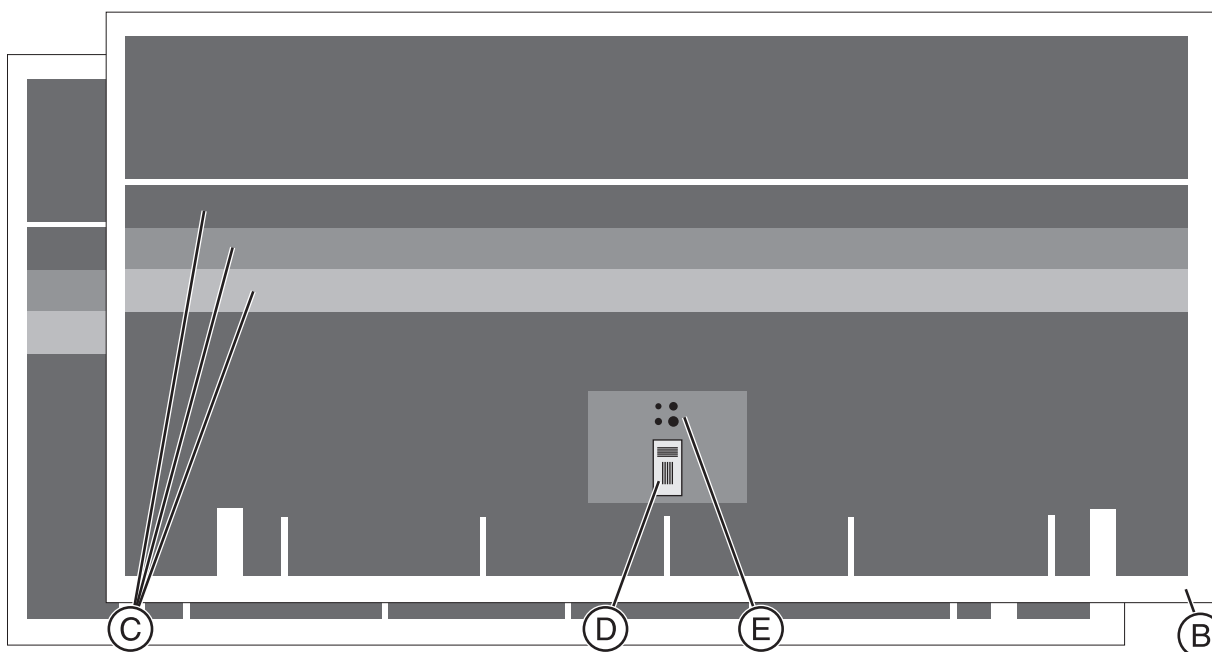
IMPORTANT

Invalid constancy tests containing errors cannot be deleted or overwritten.

2.2.6 Comparing the constancy test image to the acceptance test 1 image

IMPORTANT

The reference image for constancy test 1 is always the acceptance test 1 image.



1. Arrange the open acceptance test image and the generated constancy test image side by side as illustrated.
2. Compare the following criteria:
 - **Gray scale values (C)**

Are all 3 gray levels of the test phantom visible and distinguishable with a brightness setting of 50% and a contrast setting of 50%?

The gray levels must not differ by more than one level from the reference image.

NOTICE

Possible false diagnosis

The brightness/contrast settings must be identical on both images so as to allow for comparison.

- **Useful beam (B)**

An unexposed border surrounding the image must be visible on at least two opposite sides.

IMPORTANT

It is permissible for contrast elements to display these at a 1:1 ratio. Use the "Zoom in" button for this purpose.

- **Maximum contrast (D)**

Are the lines of the contrast element visible (2.5 Lp/mm)?
(With any brightness and contrast setting).

- **Minimum contrast (E)**

Are at least 2 of the 4 holes visible?
(With any brightness and contrast setting).

NOTICE

Procedure in case of a fault

If the tests show errors, please contact your service engineer immediately.

For display enhancement, you can use tools such as the region of interest from the menu bar or the filter functions from the right toolbar, like with SIDEXIS XG (see document "SIDEXIS XG Operator's Manual"). These display adjustments cannot be saved with the image, though.

2.2.7 Storing the image



- > Click the "Close image" button on the left toolbar.
- or
- > Close the image by activating the "Close" option on the "Test" menu bar.
- ↵ The image is now stored.

⚠ CAUTION

If any test phantom images are not OK

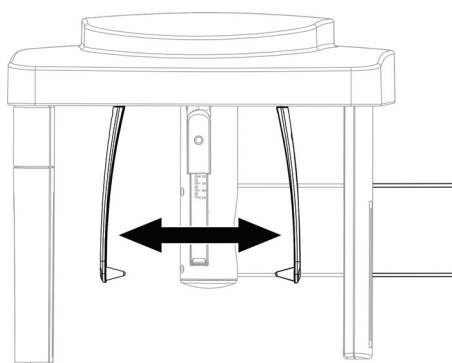
If the test phantom image does not comply with the requirements specified, you must remedy the problem.

- ✓ E.g. check the unit adjustments.
- Subsequently you must repeat the acceptance test.

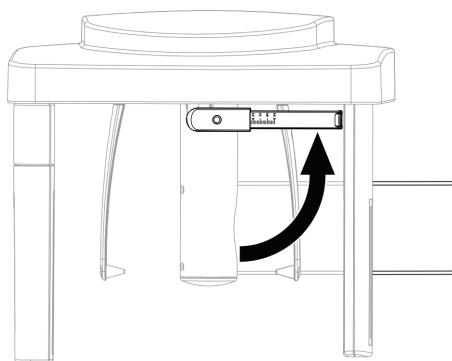
2.3 Cephalometry (ceph)

2.3.1 Preparing the X-ray unit

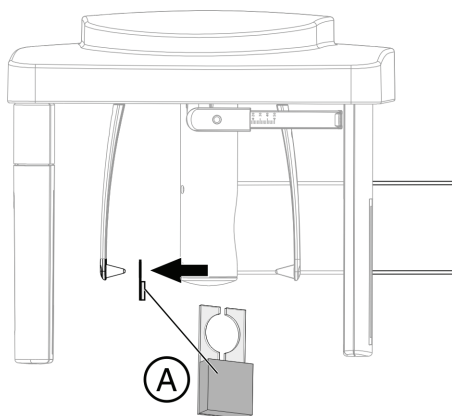
1. Remove the needle phantom from the bite block holder.
2. Push the image receptor you want to check into the CEPH holder until it snaps into place.
3. Open the ear plug holders completely.
4. Turn the ear plug holders so that one ear plug is directly in front of the image receptor.
5. The image receptor is positioned upright.

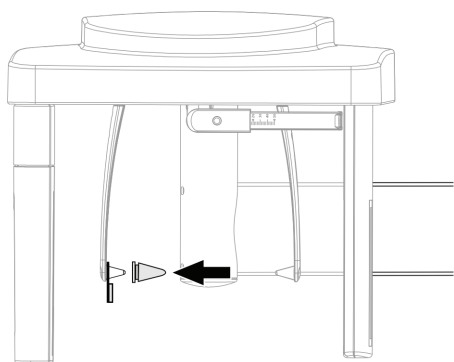


6. Fold up the nose support.

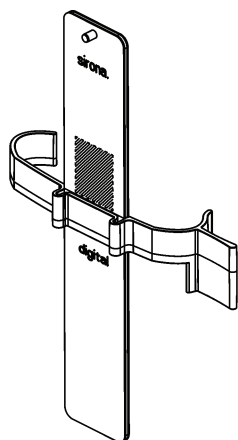


7. Fit the contrast element (A) with its hole onto the ear plug.
8. The aluminum plate of the contrast element must face the X-ray tube assembly.

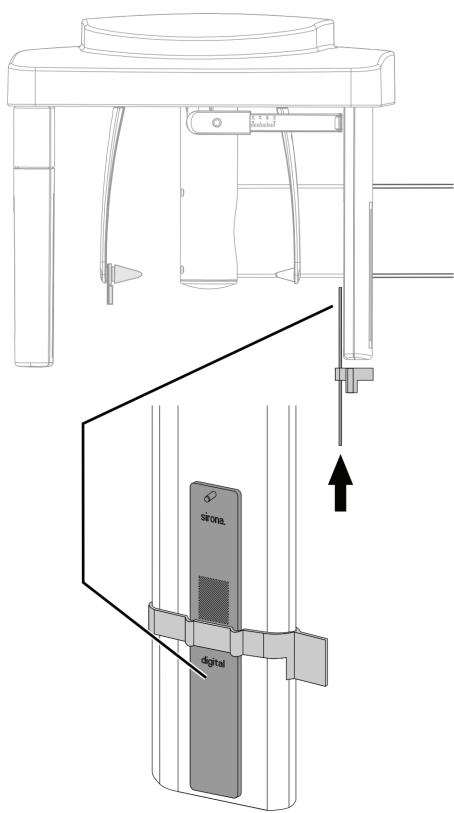




9. Secure the contrast element using a hygienic cap.



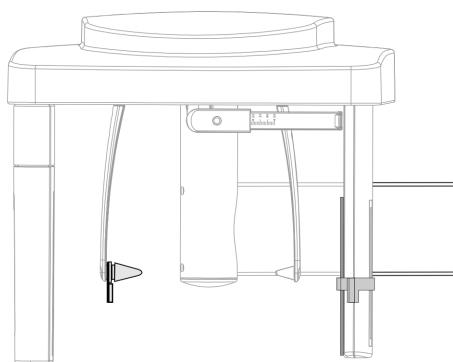
10. Attach the ceph test phantom to the clip provided for that purpose.



11. Slip the ceph test phantom together with the clip from below over the secondary diaphragm of the cep arm.

IMPORTANT

The clip must engage into the opening on the secondary diaphragm provided for that purpose.



12. Select the ceph operating mode on the Easypad.



13. Press the **R key** (Return key).

↳ The unit moves to its starting position.

↳ The X-ray unit is now ready.

2.3.2 Selecting the reference image for the constancy test

NOTICE

Recording of the acceptance test always serves as the point of departure for the constancy test.

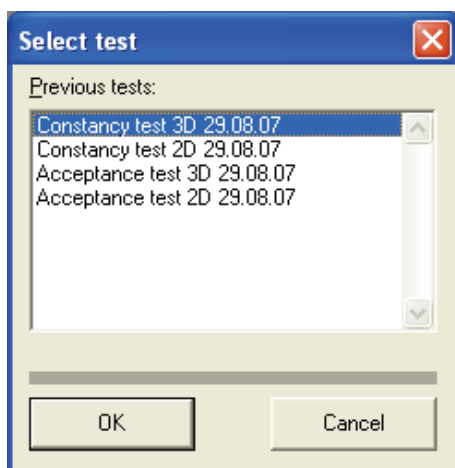


1. Click the *"Select image"* button in the left tool bar
or
Click the *"Select..."* menu option on the *"Test"* menu bar

2. Select *"Acceptance test 2"*.

3. Acknowledge with *"OK"*.

↳ The test phantom image of *"Acceptance test 2"* appears



2.3.3 Making the PC ready for an exposure



1. Click the *"XC XP"* button on the left tool bar.

Alternative activation:

On the menu bar *"Test"* click the *"Panoramic X-ray"* option.

↳ The *"Select test type"* dialog box appears.

2. Click the *"Constancy test"* button.

↳ The *"Select Constancy test"* dialog box appears.

3. Click the *"Constancy test 2"* button.
 - ↳ The *"Acceptance test / Constancy test"* dialog box appears
 - ↳ The *"Constancy test Ceph"* option is selected.
4. Press the *"Image acquisition"* button.
 - ↳ The exposure readiness dialog box opens.

The following exposure data is displayed:

- Display on the Easypad
 - Exposure values: 80 kV / 14 mA / 14.9s
 - Program: S11 / 4

2.3.4 Releasing the exposure

1. Release an exposure.
 - ↳ The unit automatically executes a scan sequence.
 - ↳ The **test phantom image** appears on the SIDEXIS XG screen.
 - ↳ The brightness and contrast controls on the right toolbar are automatically set to their center positions (50%/50%).
2. Remove the contrast element.

2.3.5 How to handle invalid exposures

Explanation

You may repeat the test phantom exposure for the constancy test as often as required, e.g. if you have chosen wrong exposure data.

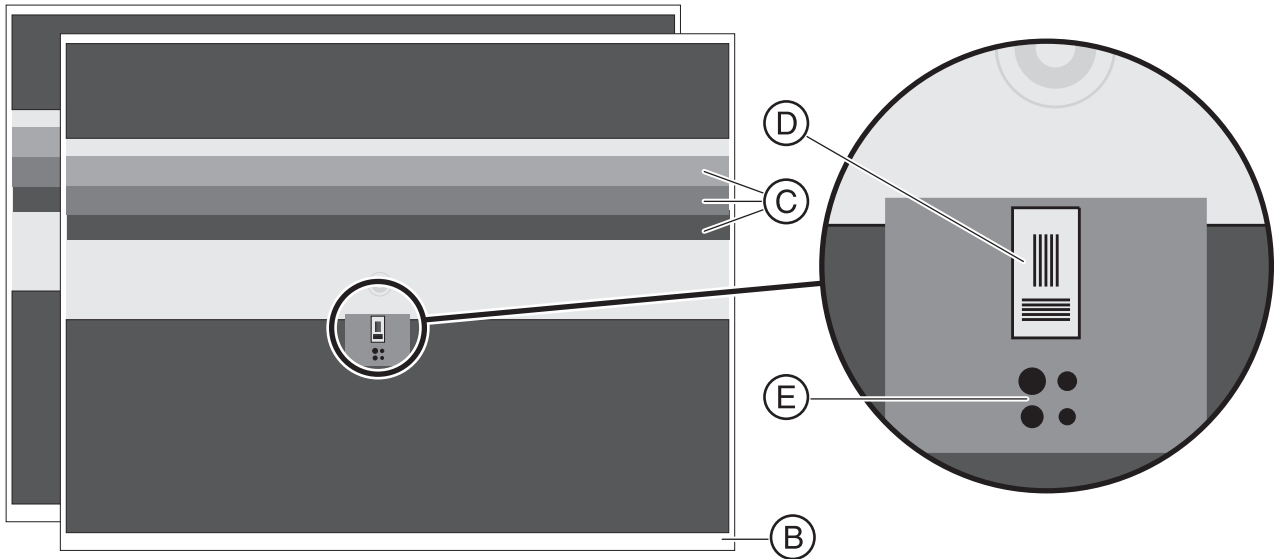
IMPORTANT

Invalid constancy tests containing errors cannot be deleted or overwritten.

2.3.6 Comparing the constancy test image to the acceptance test 2 image

IMPORTANT

The reference image for constancy test 2 is always the acceptance test 2 image.



1. Arrange the open acceptance test image and the generated constancy test image side by side as illustrated.
2. Compare the following criteria:

- **Gray scale values (C)**

Are all 3 gray levels of the test phantom visible and distinguishable with a brightness setting of 50% and a contrast setting of 50%?

The gray levels must not differ by more than one level from the reference image.

NOTICE

Possible false diagnosis

The brightness/contrast settings must be identical on both images so as to allow for comparison.

- **Useful beam (B)**

An unexposed border surrounding the image must be visible on at least two opposite sides.

IMPORTANT

It is permissible for contrast elements to display these at a 1:1 ratio. Use the "Zoom in" button for this purpose.

- **Maximum contrast (D)**

Are the lines of the contrast element visible (2.5 Lp/mm)?

(With any brightness and contrast setting).

- **Minimum contrast (E)**

Are at least 1 of the 4 holes visible?

(With any brightness and contrast setting).

NOTICE

Procedure in case of a fault

If the tests show errors, please contact your service engineer immediately.

For display enhancement, you can use tools such as the region of interest from the menu bar or the filter functions from the right toolbar, like with SIDEXIS XG (see document "SIDEXIS XG Operator's Manual"). These display adjustments cannot be saved with the image, though.

2.3.7 Storing the image



- Click the "*Close image*" button on the left toolbar.
- or
- Close the image by activating the "*Close*" option on the "*Test*" menu bar.
- ↪ The image is now stored.

⚠ CAUTION

If any test phantom images are not OK

If the test phantom image does not comply with the requirements specified, you must remedy the problem.

- ✓ E.g. check the unit adjustments.
- Subsequently you must repeat the acceptance test.

3 3D constancy test (DVT)

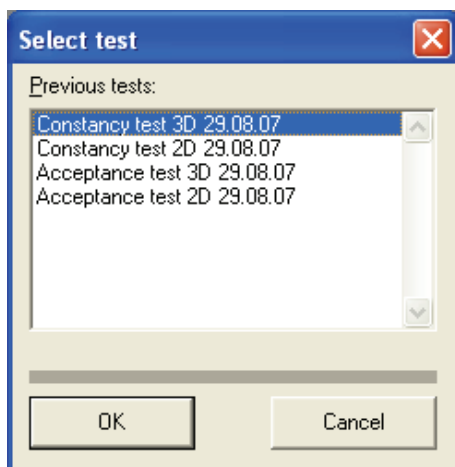
3.1 Selecting the reference image for the constancy test

NOTICE

Recording of the acceptance test always serves as the point of departure for the constancy test.



1. Click on the *"Select image"* button in the left toolbar
or
click in the menu bar *"Test"* on the menu item *"Select..."*
 2. Select *"3D acceptance test"*.
 3. Confirm with *"OK"*.
- ↳ The test phantom image of the *"3D acceptance test"* appears

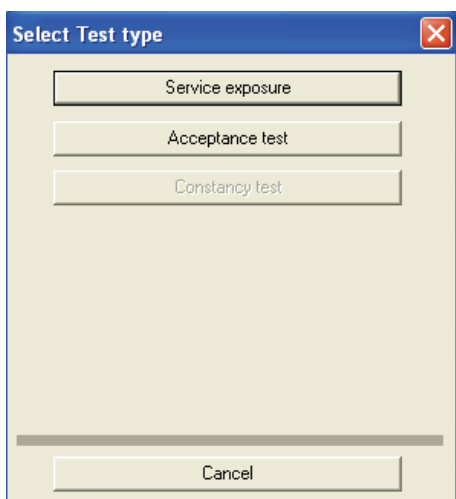


3.2 Making the PC ready for an exposure

Call



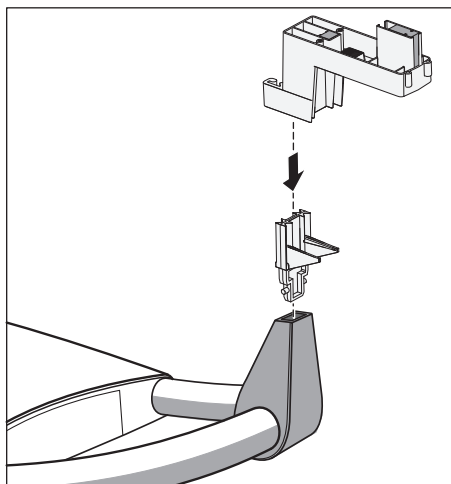
1. Click the *"3D image"* button in the left tool bar
or
Click the *"3D X-ray"* menu option on the *"Test"* menu bar
- ↳ The *"Select test type"* dialog box appears.



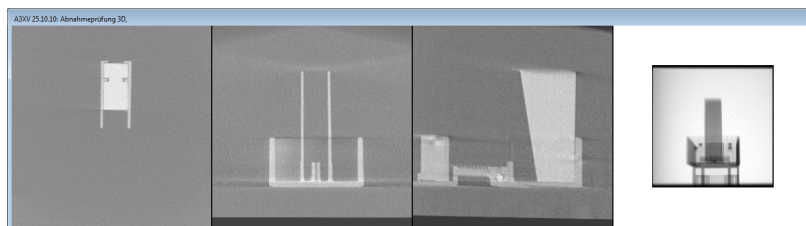
2. Click the "Constancy test" button.
↳ The "Acceptance test / Constancy test" dialog box appears.
3. Select the option "Constancy test 3D".
4. Press the "Image acquisition" button.
↳ The exposure readiness dialog box opens.

3.3 Taking and evaluating exposures

3.3.1 Exposure



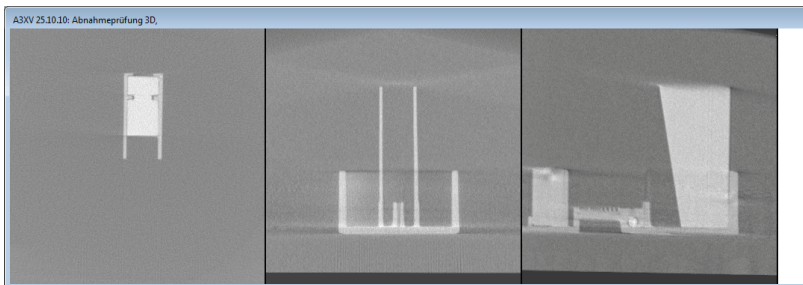
1. Insert the test phantom in the bite block holder.
2. Move the X-ray unit to its starting position (Press Return key **R** on the user interface).
3. Release an exposure.
↳ The X-ray exposure of the 3D constancy test is displayed on the user interface.



- ↳ On completion of the exposure, the program performs measurements. If these measurements check out OK, the results are displayed in the test field.
4. Enter the result of the gray level measurement ("Result GW:") and the value of the "Gray Val:" field in the **TEST RESULTS 3D (DVT)** form.
5. Enter the result of the pixel noise measurement ("Result SNR:") and the value of the "SNR:" field in the **TEST RESULTS 3D (DVT)** form.
6. Enter the result of the low contrast measurement ("Low Contrast") in the **TEST RESULTS 3D (DVT)** form.
7. Enter the result of the modulation transfer function measurement ("Result MTF:") in the **TEST RESULTS 3D (DVT)** form.

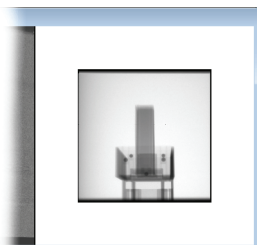
3.3.2 Visual check

Artifacts



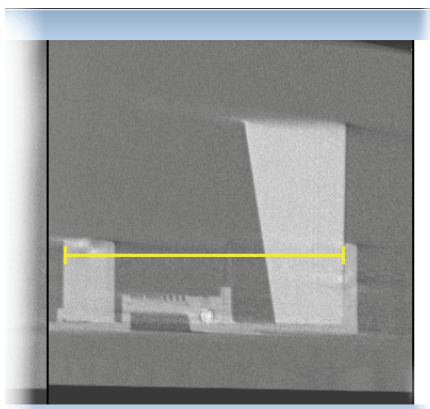
- ✓ The X-ray images of the 3D acceptance test and the 3D constancy test are open.
- 1. Compare the X-ray images of the 3D constancy test with those of the 3D acceptance test. No new or stronger artifacts should occur in the X-ray exposures of the constancy test in comparison to the acceptance test.
- 2. Acknowledge a positive result via the *"No/few artifacts visible"* check box and enter the result in the **TEST RESULTS 3D (DVT)** form.

Checking the diaphragm border



- 1. Check the preview image for the diaphragm border. A surrounding diaphragm border must be visible.
- 2. Acknowledge a positive result via the *"Rotating diaphragm edge visible"* check box and enter the result in the **TEST RESULTS 3D (DVT)** form.

Length measurement



- 1. Select the *"Measure lengths"* menu option on the *"Analysis"* menu bar.
- 2. Determine the starting point of the length measurement with the mouse pointer.
- 3. While holding the left mouse button down, drag the mouse pointer to the end point of the length measurement.
- 4. The distance between the two points in millimeters is displayed in the status bar at the bottom edge of the program window.
- 5. Enter this value in the *"Length measurement"* text box.
- 6. Enter the value measured in millimeters in the **TEST RESULTS 3D (DVT)** form.
- 7. Enter the serial number of the test phantom used in the *"Serial number test body"* text box.
- 8. Press the *"Check and save values"* button.

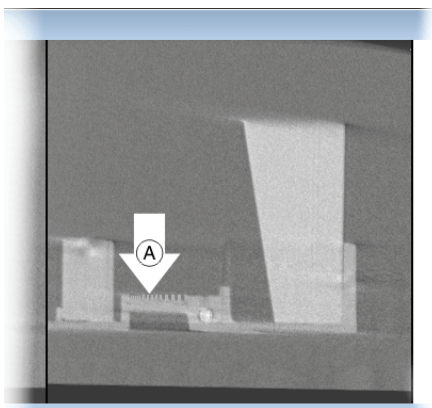
3.3.3 Checking the high contrast resolution

Explanation

In addition to the electronic measurement value logging of the constancy test, the X-ray image must be checked visually.

Check

- High contrast resolution:
 - The lines in the middle segment of the 3D test phantom (A) must be visible (1.4 Lp/mm).
- ✓ The part to be examined (see illustration) is sufficiently magnified in the software user interface.
- ✓ The center lines of the comb-shaped test element (A) must be visible (1.4 Lp/mm).
- 1. Check the high contrast resolution of the comb-shaped test element (A).
- 2. Enter the result for the high contrast resolution in the **TEST REPORT (DVT)** under **Item 5.1**.



Completion

1. Quit the "Constancy test" dialog box by clicking the "Exit" button.
2. Remove the test phantom from the bite block holder.

3.3.4 Storing the image



- Click the "Close image" button on the left toolbar.
- or
- Close the image by activating the "Close" option on the "Test" menu bar.
- ↵ The image is now stored.

⚠ CAUTION

If any test phantom images are not OK

If the test phantom image does not comply with the requirements specified, you must remedy the problem.

- ✓ E.g. check the unit adjustments.
- Subsequently you must repeat the acceptance test.

4 Exiting the constancy test program

NOTICE

You must terminate all test programs before exiting the constancy test program.

NOTICE

Exiting SIDEXIS XG

Before exiting SIDEXIS XG, you must exit the constancy test program.

- To exit the constancy test program, click "*Services*" on the menu bar, followed by "*Constancy test*" in the menu window.

5 Reference images for constancy tests

Prerequisites

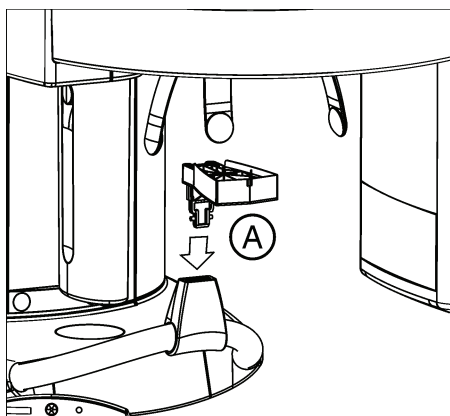
The reference images for the constancy tests should be taken by the service engineer who performed the unit adjustment.

Alternatively, it could also be taken by the responsible administrator in possession of the required password.

5.1 Reference image for the 2D constancy test (panoramic tomography and cephalometry)

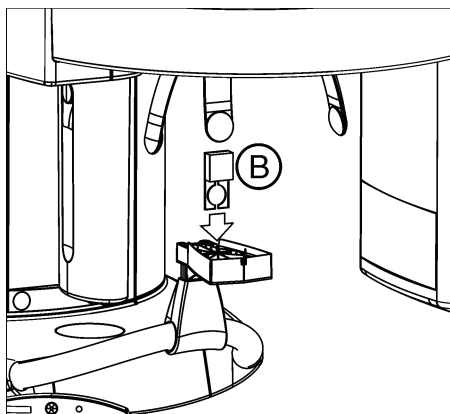
5.1.1 Panoramic

5.1.1.1 Preparing the X-ray unit



✓ The panoramic sensor must be plugged into the sensor holder.

1. Plug the needle phantom (A) into the bite block holder.



2. Plug the contrast element (B) into the slot on the needle phantom provided for that purpose.

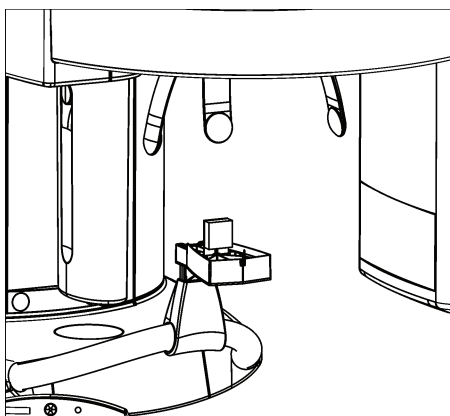
NOTICE

The aluminum plate of the contrast element must be facing away from the column of the unit.

Do not attach any additional aluminum plate to the unit.



3. Press the **R key** (Return key).



↩ The unit moves to its starting position.

↩ The X-ray unit is now ready.

5.1.1.2 Starting the constancy test program

Reminder

If more than 30 days (configuration under *"Extras" / "System setup..." / "Constancy test"*) have elapsed since the acceptance test or the last constancy test, a dialog box reminding you that the constancy test is overdue may appear after the start of SIDEXIS XG.

➤ Acknowledge with *"OK"*.

NOTICE

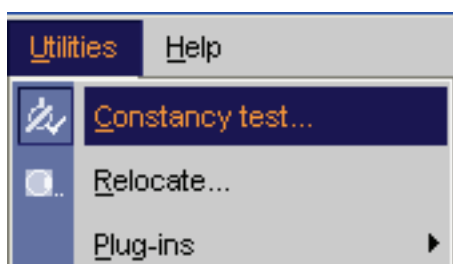
The time interval refers to the last constancy test that was performed on this PC.

The program makes no distinction between different X-ray devices.

The system owner is responsible for determining which X-ray device is due for a new constancy test.

Start

1. Start SIDEXIS XG.
 2. Click the *"Constancy test"* menu option on the *"Extras"* menu bar.
- ↩ The test program starts.

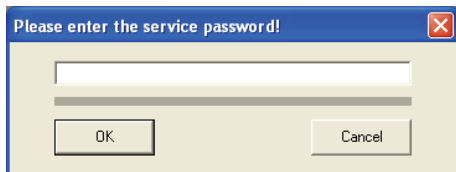


5.1.1.3 Registering the X-ray device on the PC

Registering

➤ Click the *"New"* menu option on the *"X-ray device"* menu bar.

Entering the service password



1. Enter the service password.
 - ↳ Your input appears hidden behind placeholders.

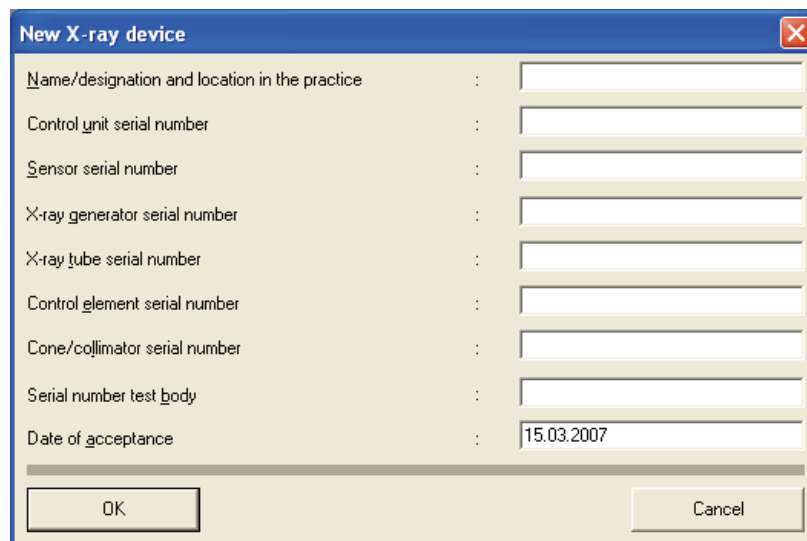
NOTICE

To obtain the service password, please refer to the SIDEXIS Service Manual.

2. Confirm with "OK".
 - ↳ If you have entered a wrong password, you may repeat your input.

Entering data

The "New X-ray device" window opens.



The current date automatically appears in the "Date of acceptance" text box.

- Make sure to fill in all the text boxes.
 - To jump from one text box to the next, press the "Return" key.
 - Please enter a "-" (hyphen) for any missing data.
- Acknowledge with "OK".
 - ↳ The window closes.
 - ↳ The name/designation, location within the practice, several serial numbers and the date are displayed on the title bar.
 - ↳ The unit is now registered.

For the test report:

This data must be entered in the **TEST REPORT** form (upper box).

5.1.1.4 Making the PC ready for an exposure



1. Click the "XC XP" button on the left tool bar.
Alternative activation:
On the menu bar "Test" click the "Panoramic X-ray" option.

↳ The "Select X-ray device" dialog box appears.

2. Select the desired X-ray device.

3. Press the "OK" button.

↳ The "Select test type" dialog box appears.

4. Click the "Acceptance test" button.

↳ The "Select Acceptance test" dialog box appears.

5. Click the "Acceptance test 1" button.

↳ The "Acceptance test / Constancy test" dialog box appears

↳ The "Acceptance test Panorama" option is selected.

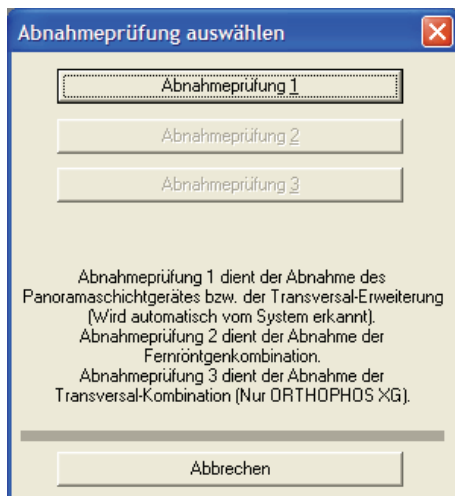
6. Press the "Image acquisition" button.

↳ The temple supports close automatically.

↳ The exposure readiness dialog box opens.

The following exposure data is displayed:

- Display on the EasyPad
 - Exposure values: 73 kV / 8 mA / 14.1s
 - Program: S11 / 3



For the TEST REPORT (2D). Item 3.5:

➤ Enter the exposure data in TEST REPORT (2D) Item 3.5.

5.1.1.5 Releasing the exposure

1. Release an exposure.

↳ The unit automatically performs a rotation.

↳ The **test phantom image** appears on the SIDEXIS XG screen.

↳ The brightness and contrast controls on the right toolbar are automatically set to their center positions (50%/50%).

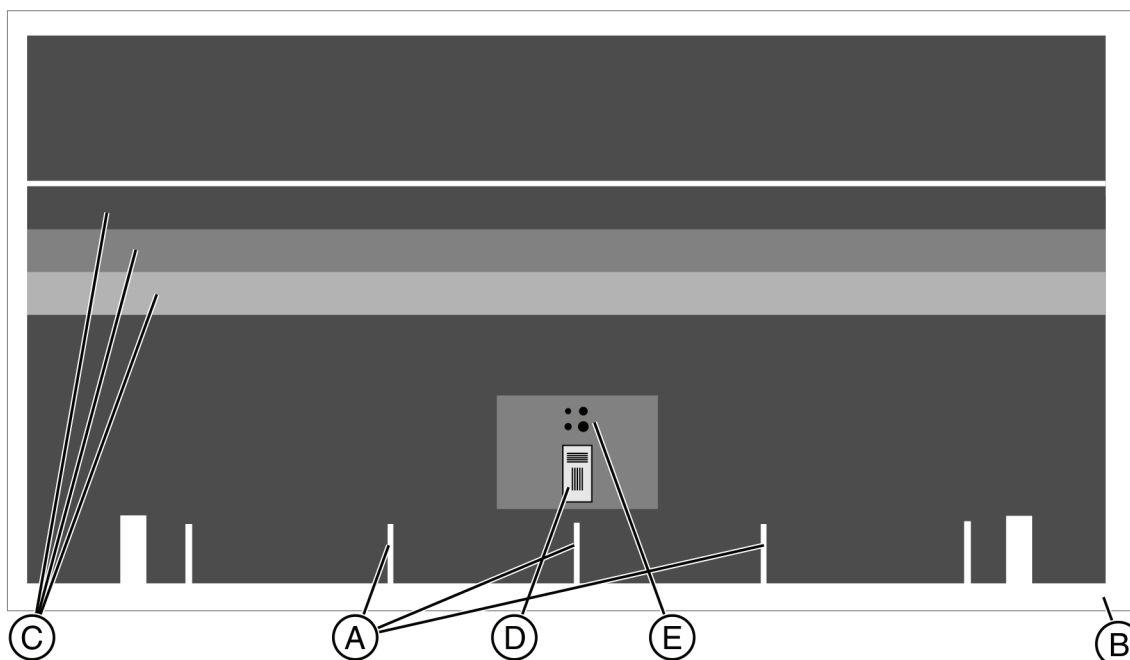
NOTICE

As this is a low-contrast and high-contrast display with minimum dose (in the limit range), the noise component is dominant in the image. The image quality is correspondingly noisy!

2. After completing the exposure, remove the contrast element and needle phantom.

5.1.1.6 Evaluating the image

Sample image: ORTHOPHOS XG 3D



Exposure sequence

For the 2D TEST REPORT. Item 1.7:

- ✓ Does the unit perform an even rotation? (No conspicuous brightness variations with a brightness and contrast setting of 50%).
- Enter the result in the **2D TEST REPORT** under item 1.7.

Slice position

For the 2D TEST REPORT. Item 1.8:

- ✓ Are the 3 pins (**A**) clearly visible?
- 1. Check the position of the pins **A** in accordance with the drawing provided in the Installation Instructions using the measurement tool of the constancy test program.
- 2. Enter the result in the **2D TEST REPORT** under item 1.8.

Useful beam

For the 2D TEST REPORT. Item 3.1:

- ✓ An unexposed border (**B**) surrounding the image must be visible on at least two opposite sides.
- Enter the result in the **2D TEST REPORT** under item 3.1.

Gray scale comparison

For the 2D TEST REPORT. Item 3.2:

- ✓ Are all 3 gray levels (**C**) of the test phantom visible and distinguishable with a brightness setting of 50% and a contrast setting of 50%?
- Enter the result in the **2D TEST REPORT** under item 3.2.

Maximum contrast

For the 2D TEST REPORT. Item 3.3:



✓ Are the lines (D) of the contrast element visible (2.5 LP/mm) (With any brightness and contrast setting)?

1. Display the area of the contrast elements at a 1:1 ratio. Press the "XXXZoom inXXX" button for this purpose.
2. Enter the result in the **2D TEST REPORT** under item **3.3**.

Minimum contrast

For the 2D TEST REPORT. Item 3.4:

✓ Are at least 2 of the 4 holes (E) visible (With any brightness and contrast setting)?

- Enter the result in the **2D TEST REPORT** under item **3.4**.

Printing an image**NOTICE**

If you want to document the acceptance test with a hardcopy, it is advisable to print the test phantom image as a negative. The unexposed surrounding border is then displayed in black on white paper.

5.1.1.7

Storing the image

- Click the "Close image" button on the left toolbar.

or

- Close the image by activating the "Close" option on the "Test" menu bar.

↵ The image is now stored.

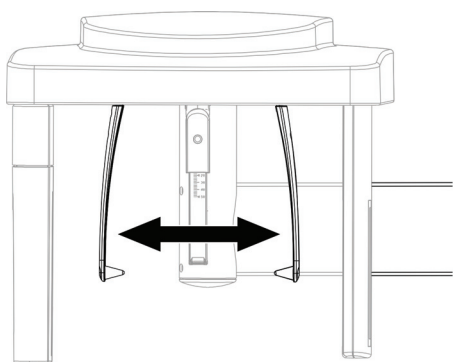
⚠ CAUTION**If any test phantom images are not OK**

If the test phantom image does not comply with the requirements specified, you must remedy the problem.

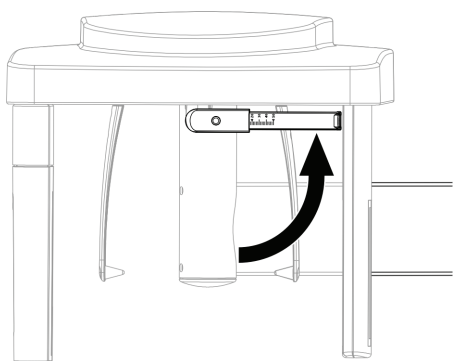
- ✓ E.g. check the unit adjustments.
- Subsequently you must repeat the acceptance test.

5.1.2 **Cephalometry (ceph)**5.1.2.1 **Preparing the X-ray unit**

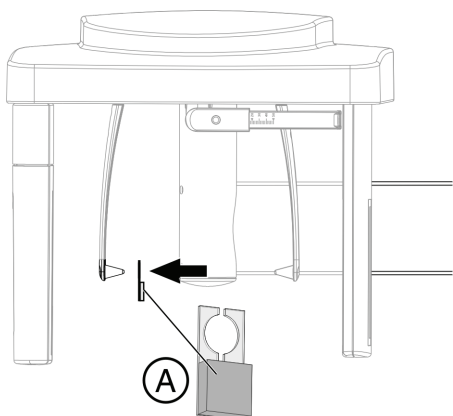
1. Remove the needle phantom from the bite block holder.
2. Push the image receptor you want to check into the CEPH holder until it snaps into place.



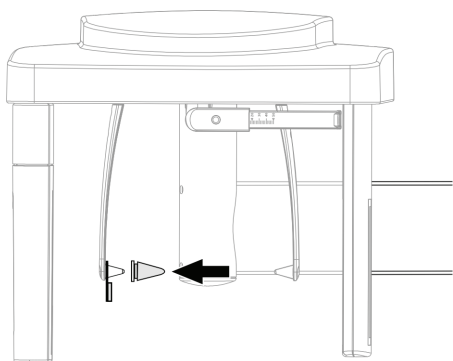
3. Open the ear plug holders completely.
4. Turn the ear plug holders so that one ear plug is directly in front of the image receptor.
5. The image receptor is positioned upright.



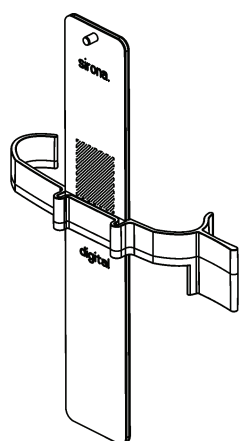
6. Fold up the nose support.



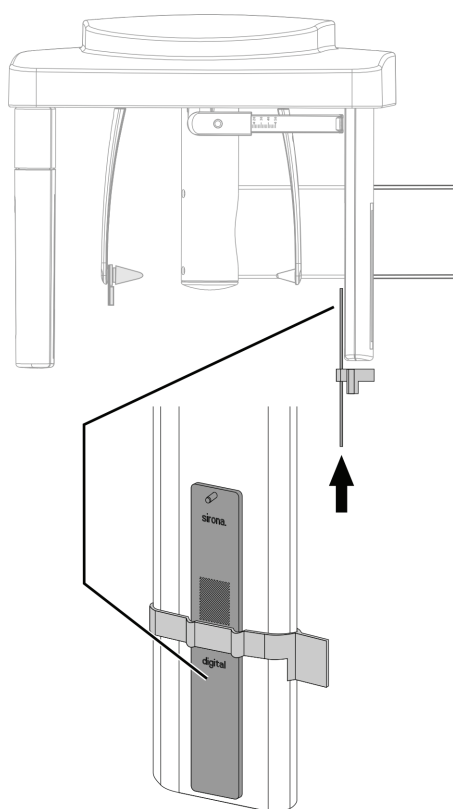
7. Fit the contrast element **(A)** with its hole onto the ear plug.
8. The aluminum plate of the contrast element must face the X-ray tube assembly.



9. Secure the contrast element using a hygienic cap.



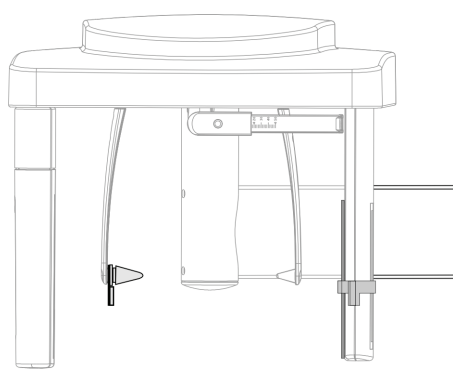
10. Attach the ceph test phantom to the clip provided for that purpose.



11. Slip the ceph test phantom together with the clip from below over the secondary diaphragm of the ceph arm.

IMPORTANT

The clip must engage into the opening on the secondary diaphragm provided for that purpose.



12. Select the ceph operating mode on the Easypad.



13. Press the **R key** (Return key).

↩ The unit moves to its starting position.

☞ The X-ray unit is now ready.

5.1.2.2 Making the PC ready for an exposure



1. Click the "XC XP" button on the left tool bar.

Alternative activation:

On the menu bar "Test" click the "Panoramic X-ray" option.

☞ The "Select test type" dialog box appears.

2. Click the "Acceptance test" button.

☞ The "Select Acceptance test" dialog box appears.

3. Click the "Acceptance test 2" button.

☞ The "Acceptance test / Constancy test" dialog box appears

☞ The "Acceptance test Ceph" option is selected.

4. Press the "Image acquisition" button.

☞ The exposure readiness dialog box opens.

The following exposure data is displayed:

- Display on the Easypad
 - Exposure values: 80 kV / 14 mA / 14.9s
 - Program: S11 / 4

For the TEST REPORT (2D). Item 3.5:

➤ Enter the exposure data in **TEST REPORT (2D) Item 3.5.**

5.1.2.3 Releasing the exposure

1. Release an exposure.

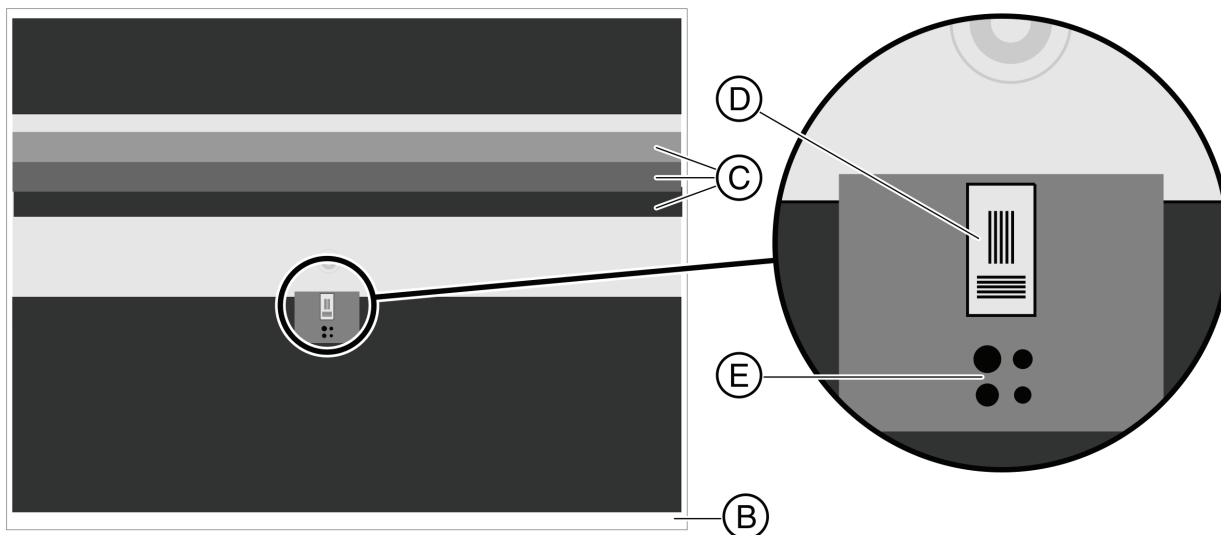
☞ The unit automatically executes a scan sequence.

☞ The **test phantom image** appears on the SIDEXIS XG screen.

☞ The brightness and contrast controls on the right toolbar are automatically set to their center positions (50%/50%).

2. Remove the contrast element.

5.1.2.4 Evaluating the image



Exposure sequence

For the 2D TEST REPORT. Item 1.7:

- ✓ Does the unit perform an even scan? (No conspicuous brightness variations with a brightness and contrast setting of 50%).
- Enter the result in the **2D TEST REPORT** under item 1.7.

Useful beam

For the 2D TEST REPORT. Item 3.1:

- ✓ An unexposed border (**B**) surrounding the image must be visible on at least two opposite sides.
- Enter the result in the **2D TEST REPORT** under item 3.1.

Gray scale comparison

For the 2D TEST REPORT. Item 3.2:

- ✓ Are all 3 gray levels (**C**) of the test phantom visible and distinguishable with a brightness setting of 50% and a contrast setting of 50%?
- Enter the result in the **2D TEST REPORT** under item 3.2.

Maximum contrast

For the 2D TEST REPORT. Item 3.3:



- ✓ Are the lines (**D**) of the contrast element visible (2.5 LP/mm) (With any brightness and contrast setting)?
- 1. Display the area of the contrast elements at a 1:1 ratio. Press the "XXXZoom inXXX" button for this purpose.
- 2. Enter the result in the **2D TEST REPORT** under item 3.3.

Minimum contrast

For the 2D TEST REPORT. Item 3.4:

- ✓ Are at least 1 of the 4 holes (**E**) visible (With any brightness and contrast setting)?
- Enter the result in the **2D TEST REPORT** under item 3.4.

Printing an image

NOTICE

If you want to document the acceptance test with a hardcopy, it is advisable to print the test phantom image as a negative. The unexposed surrounding border is then displayed in black on white paper.

5.1.2.5 Storing the image



- > Click the "Close image" button on the left toolbar.
- or
- > Close the image by activating the "Close" option on the "Test" menu bar.
- ↪ The image is now stored.

CAUTION

If any test phantom images are not OK

If the test phantom image does not comply with the requirements specified, you must remedy the problem.

- ✓ E.g. check the unit adjustments.
- > Subsequently you must repeat the acceptance test.

5.2 Reference images for the 3D X-ray constancy test (DVT)

5.2.1 Preparing the X-ray device

NOTICE

Observe Operating Instructions!

Make sure that no foreign particles are located in the beam path of the X-ray device and that the X-ray device is in its starting position.

- > Remove the bite block from the bite block holder.

5.2.2 Starting the constancy test program

Reminder

If more than 30 days (configuration under "Extras" / "System setup..." / "Constancy test") have elapsed since the acceptance test or the last constancy test, a dialog box reminding you that the constancy test is overdue may appear after the start of SIDEXIS XG.

- > Acknowledge with "OK".

NOTICE

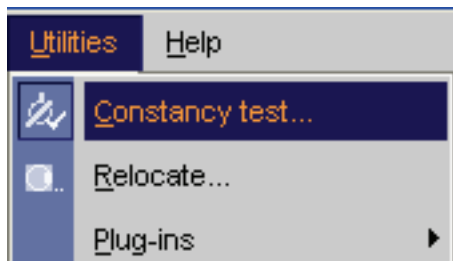
The time interval refers to the last constancy test that was performed on this PC.

The program makes no distinction between different X-ray devices.

The system owner is responsible for determining which X-ray device is due for a new constancy test.

Start

1. Start SIDEXIS XG.
2. Click the *"Constancy test"* menu option on the *"Extras"* menu bar.
↳ The test program starts.

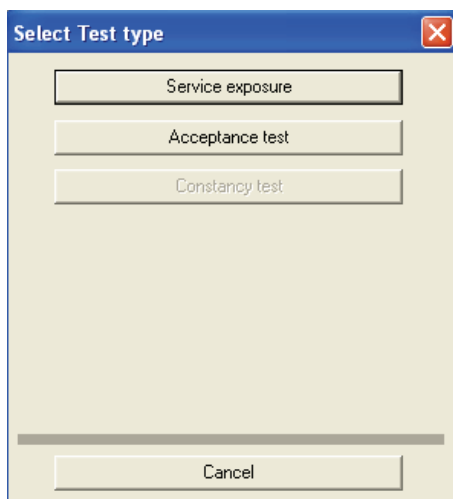


5.2.3 Making the PC ready for an exposure

Call

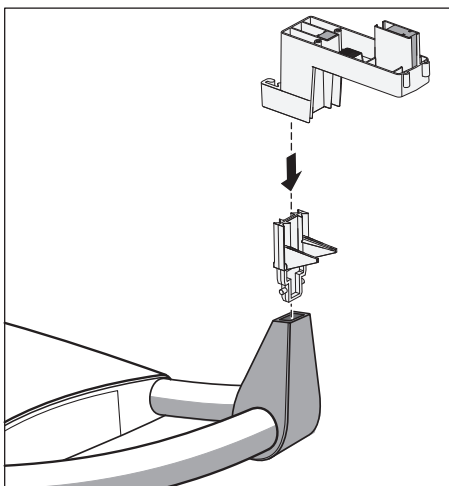


1. Click the *"3D image"* button in the left tool bar
or
Click the *"3D X-ray"* menu option on the *"Test"* menu bar
↳ The *"Select test type"* dialog box appears.
2. Click the *"Acceptance test"* button.
↳ The *"Acceptance test / Constancy test"* dialog box appears.
3. Select the option *"Acceptance test 3D"*.
4. Press the *"Image acquisition"* button.
↳ The exposure readiness dialog box opens.

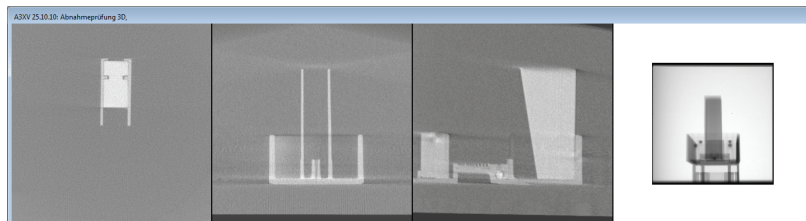


5.2.4 Taking and evaluating exposures

5.2.4.1 Exposure



1. Insert the test phantom in the bite block holder.
2. Move the X-ray unit to its starting position (Press Return key **R** on the user interface).
3. Release an exposure.
 - ↳ The X-ray exposure of the 3D acceptance test is displayed on the user interface.

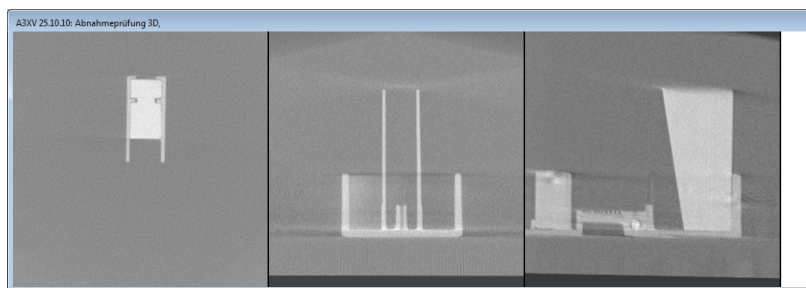


- ↳ On completion of the exposure, the program performs measurements. If these measurements check out OK, the results are displayed in the test field.

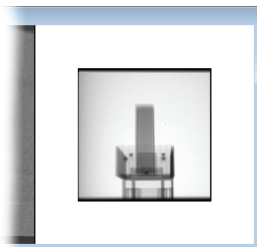
4. Enter the result of the gray level measurement ("*Result GW:*") and the value of the "*Gray Val:*" field in the **3D TEST REPORT (DVT)** under **Item 3.1**.
5. Enter the result of the pixel noise measurement ("*Result SNR:*") and the value of the "*SNR:*" field in the **3D TEST REPORT (DVT)** under **Item 3.2**.
6. Enter the result of the low contrast measurement ("*Low Contrast*") in the **3D TEST REPORT (DVT)** under **Item 4.1**.
7. Enter the result of the modulation transfer function measurement ("*Result MTF:*") in the **3D TEST REPORT (DVT)** under **Item 4.2**.

5.2.4.2 Visual check

Artifacts

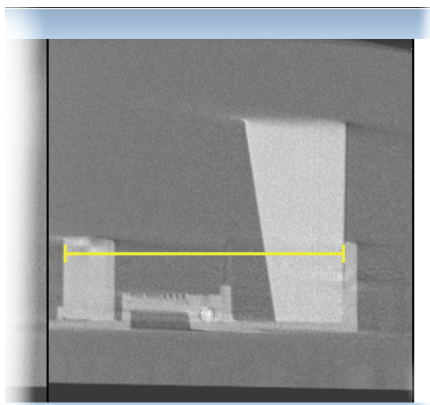


1. Check the X-ray images of the 3D acceptance test. No strong artifacts should be evident.
2. If the result is positive, activate the "*No/few artifacts visible*" check box and enter the result in the **3D TEST REPORT (DVT)** under **Item 4.3**.



Checking the diaphragm border

1. Check the preview image for the diaphragm border. A surrounding diaphragm border must be visible.
2. If the result is positive, activate the *"Rotating diaphragm edge visible"* check box and enter the result in the **3D TEST REPORT (DVT)** under **Item 4.4**.



Length measurement

1. Select the *"Measure lengths"* menu option on the *"Analysis"* menu bar.
2. Determine the starting point of the length measurement with the mouse pointer.
3. While holding the left mouse button down, drag the mouse pointer to the end point of the length measurement.
4. The distance between the two points in millimeters is displayed in the status bar at the bottom edge of the program window.
5. Enter this value in the *"Length measurement"* text box.
6. Enter the value measured in millimeters in the **3D TEST REPORT (DVT)** under **Item 4.5**.
7. Enter the serial number of the test phantom used in the *"Serial number test body"* text box.
8. Press the *"Check and save values"* button.

5.2.4.3 Checking the high contrast resolution

Explanation

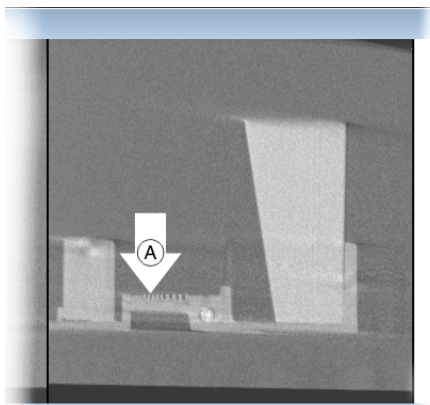
For the TEST REPORT (DVT), Item 5.1

In addition to the electronic measurement value logging of the acceptance test, the high contrast resolution of the generated X-ray image also must be checked visually.

A comb-shaped test element (**A**) inside the test phantom is used for this purpose.

Check

- ✓ The part to be examined (see illustration) is sufficiently magnified in the software user interface.
 - ✓ The center lines of the comb-shaped test element (**A**) must be visible (1.4 Lp/mm).
1. Check the high contrast resolution of the comb-shaped test element (**A**).
 2. Enter the result for the high contrast resolution in the **TEST REPORT (DVT)** under **Item 5.1**.



Completion

1. Quit the acceptance test dialog box by clicking the "Exit" button.
2. Remove the test phantom from the bite block holder.

5.2.5 Storing the image



- Click the "Close image" button on the left toolbar.
- or
- Close the image by activating the "Close" option on the "Test" menu bar.
- ↵ The image is now stored.

CAUTION

If any test phantom images are not OK

If the test phantom image does not comply with the requirements specified, you must remedy the problem.

- ✓ E.g. check the unit adjustments.
- Subsequently you must repeat the acceptance test.

5.3 Exiting the constancy test program

NOTICE

You must terminate all test programs before exiting the constancy test program.

NOTICE

Exiting SIDEXIS XG

Before exiting SIDEXIS XG, you must exit the constancy test program.

- To exit the constancy test program, click "Services" on the menu bar, followed by "Constancy test" in the menu window.

6 Unit data and dose value

Unit data

Serial numbers

Complete unit	
X-ray tube unit	
X-ray tube	
Panoramic sensor	
*Cephalometric sensor	
3D X-ray detector	
Test phantom	

*if available

Dosimetry

Enter the dose reading taken during the unit adjustment here:

.....mGy / nom. values: 85 kV, 35 mAs (7mA, 5s)

7 2D TEST REPORT

Explanation

The results of the reference image for the constancy test are recorded in the **test report**.

The results must be noted or checked .

The generation of the reference image is described in the section "Reference image for the 2D constancy test (panoramic tomography and cephalometry) [→ 23]".

Panoramic exposure

Test item 3.1 yes no
Useful beam:

Is an unexposed border surrounding the image visible on at least two opposite sides?

Test item 3.2 yes no
Gray scale comparison:

Are all three gray levels visible and distinguishable?

Test item 3.3 yes no
Maximum contrast:

Are the lines of visible (2.5 Lp/mm)?

Test item 3.4 yes no
Minimum contrast:

Are at least 2 holes visible?

Test item 3.5
Exposure data: kV mA

SIDEXIS brightness / contrast setting (default 50/50): /

Serial No. of test phantom:
.....

Cephalometric image (if available)

Test item 3.1 yes no
Useful beam:

Is an unexposed border surrounding the image visible on at least two opposite sides?

Test item 3.2 yes no
Gray scale comparison:

Are all three gray levels visible and distinguishable?

Test item 3.3
Maximum contrast: yes no

Are the lines of visible (2.5 Lp/
mm)?

Test item 3.4
Minimum contrast: yes no

Is at least one hole visible?

Test item 3.5
Exposure data: kV mA

SIDEXIS brightness / contrast
setting (default 50/50): /

Serial No. of test phantom:
.....

8 3D TEST REPORT (DVT)

Explanation

The results of the reference image for the constancy test are recorded in the **test report**.

The results must be noted or checked .

The generation of the reference image is described in the section "Reference images for the 3D X-ray constancy test (DVT) [→ 33]".

3D X-ray exposure

Test item 3.1: yes (true) no (false)
Gray level (GW) OK?
"Gray Val.:"
.....

Test item 3.2: yes (true) no (false)
Pixel noise (SNR) OK?
"SNR.:"
.....

Test item 4.1: yes (true) no (false)
Low contrast resolution
"Low Contrast":?

Test item 4.2: yes (true) no (false)
Modulation transfer function
(MTF10)?
"MTF Value.:"

Test item 4.3: yes no
No/few artifacts?

Test item 4.4: yes no
Surrounding border of diaphragm
visible?

Test item 4.5: mm
Length test?

Checking the high contrast resolution

Test item 5.1: yes no
Are the center lines of the comb-
shaped test element visible (1.4 Lp/
mm)?

We reserve the right to make any alterations which may be required due to technical improvements.

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