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PLANMECA



Planmeca ProX™

EN

user's manual

10029963_7

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The manufacturer, assembler and importer are responsible for the safety, reliability and performance of the unit only if:

- installation, calibration, modification and repairs are carried out by qualified authorised personnel
- electrical installations are carried out according to the appropriate requirements such as IEC 60364
- equipment is used according to the operating instructions.

Planmeca pursues a policy of continual product development. Although every effort is made to produce up-to-date product documentation this publication should not be regarded as an infallible guide to current specifications. We reserve the right to make changes without prior notice.

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1 INTRODUCTION

The Planmeca ProX X-ray unit produces intraoral X-ray images for the diagnosis of teeth and adjacent structures. The unit is allowed to be used only under supervision of a dental/health care professional.

This manual describes how to operate the Planmeca ProX intraoral X-ray unit equipped with Planmeca ProSensor digital X-ray system. Please read these instructions carefully before using the unit.

Note that if you use the Planmeca ProSensor digital X-ray system, you need a PC with a Planmeca Romexis imaging software to save, view and modify the radiographs. The Planmeca Romexis software has a separate manual, which should be used in conjunction with this manual.

CAUTION

FOR US USERS:
Federal law restricts this device to sale by or on the order of a health care professional.

NOTE

This manual is valid for software revisions 4.00 or later.

NOTE

The Planmeca ProX intraoral X-ray unit is allowed to be used only under supervision of a dental/health care professional.

CE 0598

The Planmeca ProX intraoral X-ray unit fulfils the requirements of Directives 93/42/EEC and 2011/65/EU (RoHS).



All key illustrations indicate that the key should be pressed or, where indicated, pressed and held down. Pressing a key will either switch a function on or off, depending on the original setting, or change the indicated value.



The display values shown in this manual are only examples and should not be interpreted as recommended values unless otherwise stated.

Make sure that you are fully acquainted with the appropriate radiation protection measures and these instructions before using the unit.

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2 ASSOCIATED DOCUMENTATION

The Planmeca ProX X-ray unit is supplied with the following manuals:

- User's manual (10029963)
- Installation manual (10029964)
- Technical manual (10029965)

These manuals are intended to be used in conjunction with the documentation for the Planmeca Romexis imaging software. The imaging software package contains the following manuals:

- User's manual (10014593)
- Technical manual (10037884)

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3 SYMBOLS ON PRODUCT LABELS



Type B equipment (Standard IEC 601-1).



Alternating current (Standard IEC-417).



Attention, consult accompanying documents (Standard ISO7010-M002).



Warning, electricity (Standard ISO 7010-W012).



Intermediate focal spot (Standard IEC-417).



Separate collection for electrical and electronic equipment according to Directive 2002/96/EC (WEEE).



No pushing (Standard ISO 7010)

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4 SAFETY PRECAUTIONS

4.1 Explanations for note, caution and warnings statements

NOTE

Note messages are used to indicate information which may be helpful or of special interest to the reader.

CAUTION

Caution statements alert the user to the possibility of a problem with the unit associated with its use or misuse. Such problems include unit malfunction, unit failure, damage to the unit or damage to other property.



WARNING

Warning statements alert the user to the possibility of personal injury to the user or the patient, or other serious damage associated with the use or misuse of the unit.

4.2 Notes, cautions and warnings



WARNING

Make sure that you are fully acquainted with the appropriate radiation protection measures and these instructions before using the unit.



WARNING

Failure to install the Planmeca ProX X-ray unit in an approved location may be dangerous to both patient and operator.



WARNING

No modification of this equipment is allowed. Do not modify this equipment without authorization of the manufacturer. If this equipment is modified, appropriate inspection and testing must be conducted to ensure continued safe use of equipment.



WARNING

To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

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WARNING

IT IS VERY IMPORTANT THAT THE PLACE WHERE THE UNIT IS TO BE USED AND THE POSITION FROM WHICH THE USER IS TO OPERATE THE UNIT ARE CORRECTLY SHIELDED. SINCE RADIATION SAFETY REQUIREMENTS VARY FROM COUNTRY TO COUNTRY AND STATE TO STATE IT IS THE RESPONSIBILITY OF THE USER TO ENSURE THAT ALL LOCAL SAFETY REQUIREMENTS ARE MET.



WARNING

To protect the user from stray radiation control of the X-ray unit must be from a distance of not less than 2 metres from the focal spot or X-ray beam.



WARNING

This X-ray unit may be dangerous to both patient and operator unless safe exposure values are used and correct operating procedures are observed.

CAUTION

The SIP/SOP shall not be used in Planmeca ProX, but only for connecting Planmeca ProSensor device.

CAUTION

Do not connect a multiple portable socket outlet (MPSO) or extension cord to the system.

CAUTION

Do not connect items which are not specified as part of the system.

CAUTION

Do not spill water on the X-ray unit.

NOTE

Electromagnetic interference between the equipment and other devices can occur in very extreme conditions. Do not use the equipment in close conjunction with sensitive devices, or devices creating high electromagnetic disturbances.

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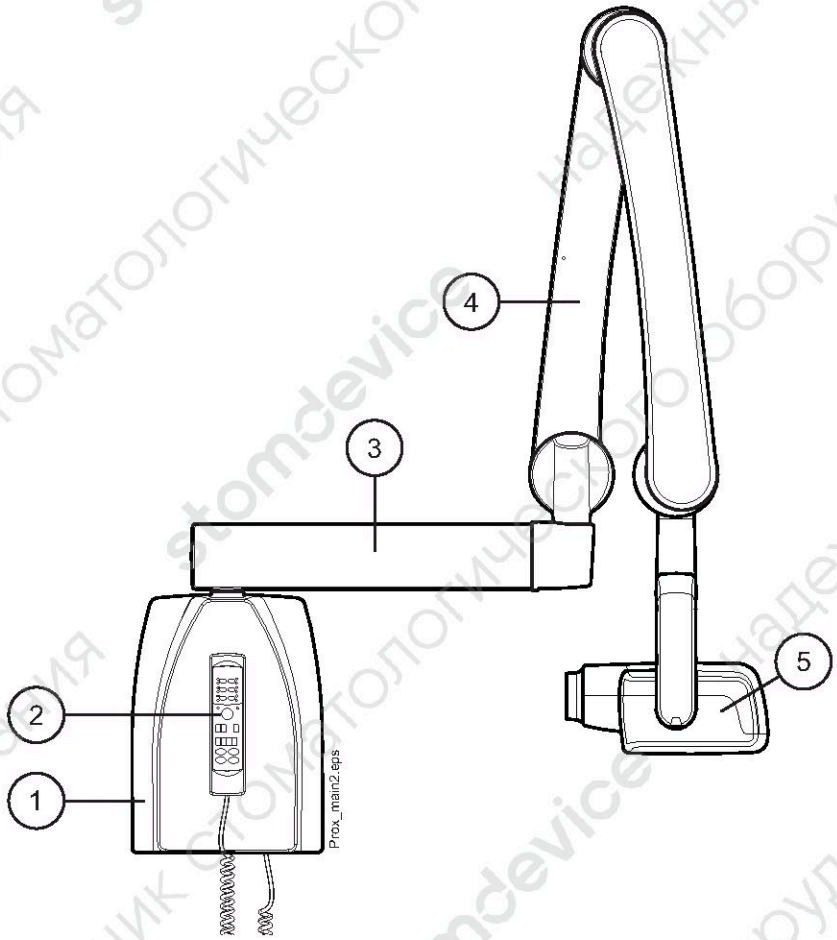
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5 CHECKLIST - BEFORE USING THE UNIT

- Make sure that you are fully acquainted with the appropriate radiation protection measures and these instructions before using the unit.

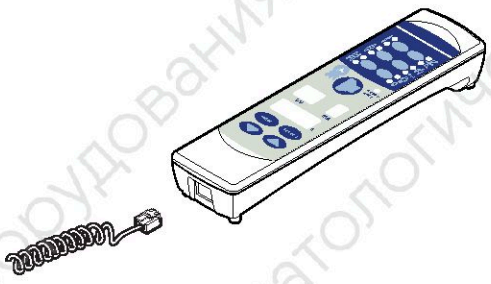
6 MAIN PARTS

6.1 General view of the X-ray unit



1 Generator box 2 Control panel 3 Extension arm 4 Support arm 5 Tube head

6.2 Control panel



One end of the control panel cable is connected to the terminal at the underside of the generator box, and the other end to the control panel.

CAUTION

Do not connect any other equipment to the control panel's terminal.

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6.3 Mobile base

CAUTION

The Planmeca ProX mobile X-ray unit has to be in transport position when on surface inclined 5° or more.

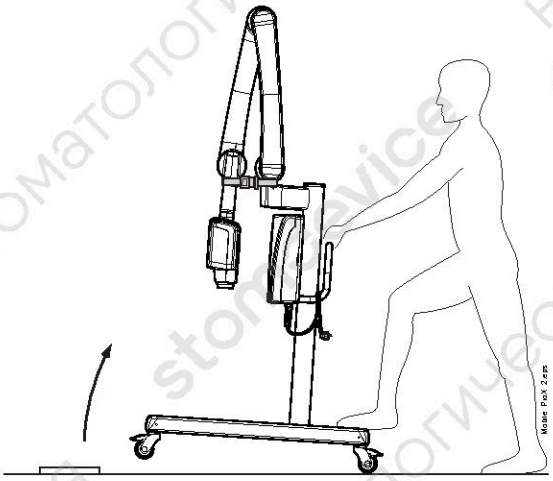
6.3.1 Transporting Planmeca ProX mobile x-ray unit

1. Secure the support arm to the transport position with strap.

CAUTION

Never move the Planmeca ProX mobile x-ray unit without first securing the support arm to the transport position.

2. Disconnect the Planmeca ProX from the power supply and loop the cable around the handle.
3. Transport the Planmeca ProX Mobile X-ray unit carefully from the handle.



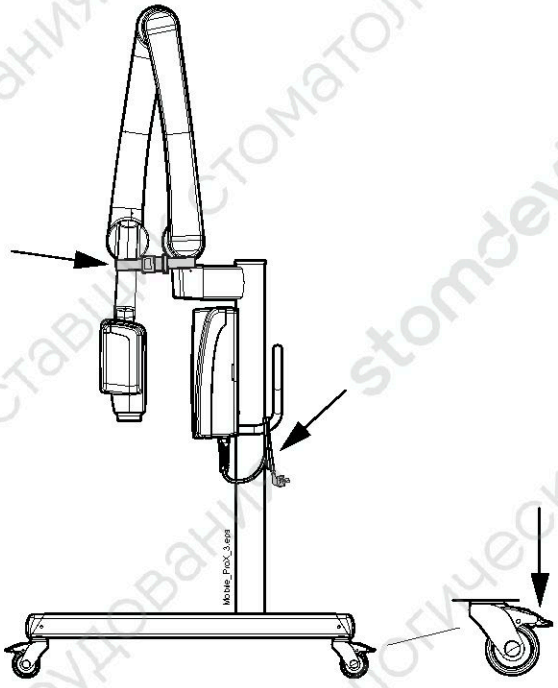
CAUTION

The mobile Planmeca ProX X-ray unit is to be moved only from the handle. Not moving from the handle might cause the mobile unit to overbalance.

NOTE

If you have to move the ProX Mobile X-ray unit over a low obstacle, tilt the base slightly by pressing the back of the wheel assembly with your foot.

4. When the unit has been transported to the desired area lock the wheels by pressing the lever down to prevent the unit from moving.

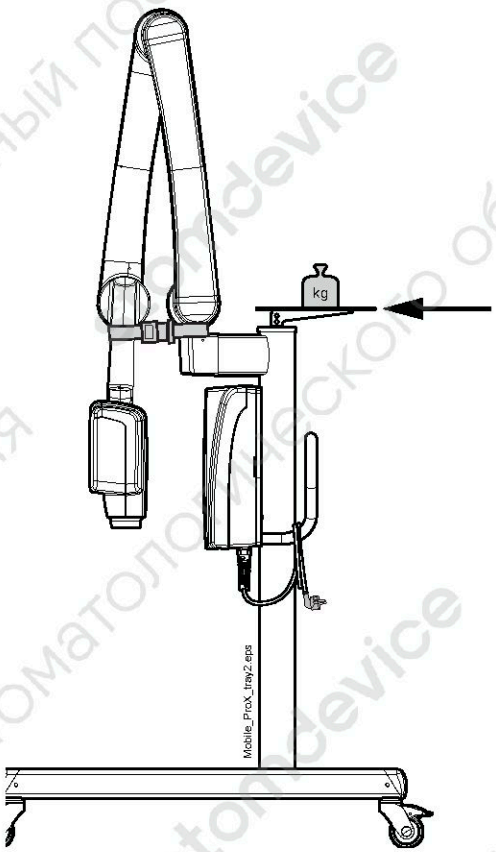


CAUTION

Always lock at least two of the four wheels before taking your hand off the handle.

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6.3.2 Tray (optional)



CAUTION

The maximum allowed weight on the optional mobile tray is 3kg (7lbs).

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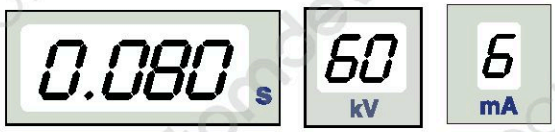
7 BEFORE EXPOSURE

7.1 Switching the unit on



On/off switch

The on/off switch is located under the generator box. When the unit is switched on it will carry out an automatic self-test during which the Display CPU software version is shown on the kV display, and the Tube head CPU software version on the time display.



After the self-test is completed the default exposure values will appear on the displays.

The default exposure values can be reprogrammed by the user, see section 16.1 “Programming default exposure values” on page 34.



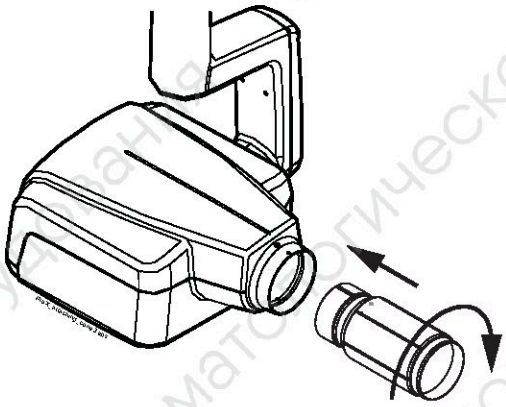
NOTE

There are two sets of default exposure values: one for the adult mode and one for the child mode. When switched on the unit is always in the adult mode.

7.2 Selecting the cone

Select the cone to be used in the exposure. It is recommended to use the optional long cone in order to keep the absorbed dose to the patient as low as possible.

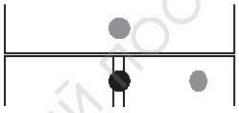
7.2.1 Long 30 cm (12”) cone



The long cone is attached into its position by pushing it into the short cone and rotating it so that the red point on the short cone and the black point on the long cone are in line.



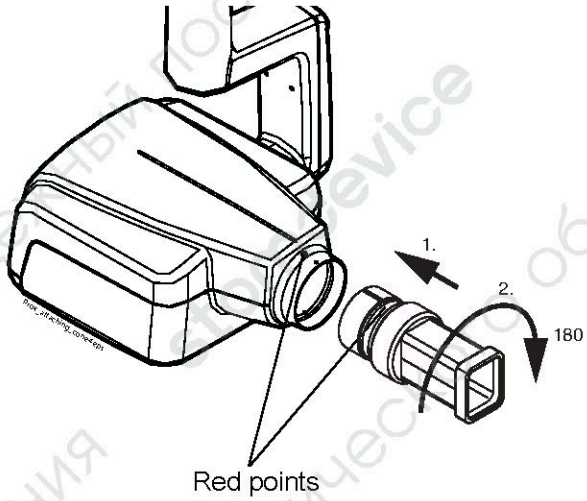
Attach/remove:
red points in line



In position:
red and black points in line

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7.2.2 Long rectangular cone



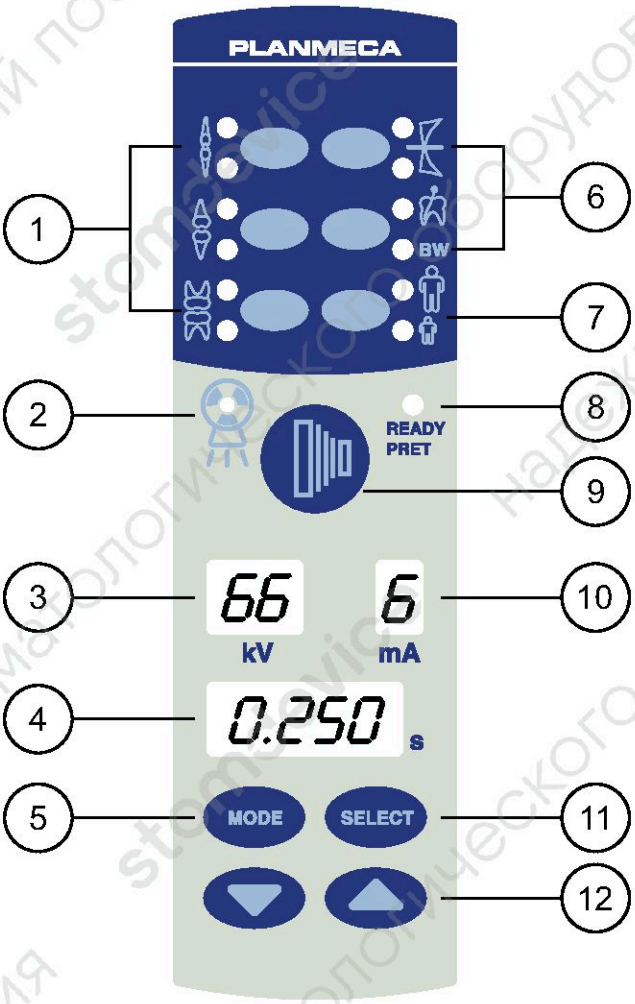
Push the rectangular cone into the short cone so that the red dots on the short cone and on the rectangular cone are in line (1), and rotate the cone 180°, until the black dot on the rectangular cone and the red dot on the short cone are in line (2). The cone can be now rotated in its position ±90°.

The rectangular cone can be removed when the red dots on the short cone and on the rectangular cone are in line.

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8 CONTROL PANEL



1 Preprogrammed setting keys and indicator lights

2 Exposure warning indicator light

3 kV display

4 Time display

5 MODE key

6 Preprogrammed setting keys and indicator lights

7 Adult/child selection key and indicator lights

8 Ready indicator light

9 Exposure key

10 mA display

11 SELECT key

12 Parameter adjustment keys

8.1 Displays

8.1.1 kV display



The selected kV value is shown on the kV display. There are four different values that can be selected: 60, 63, 66 and 70 kV.

NOTE

The kV range can be 60-70, 66-70, 60-68, 66-68 or 68 depending on the local requirements.

8.1.2 mA display



The selected mA value is shown on the mA display. There are seven different values that can be selected: 2 - 8 mA.

NOTE

The minimum available mA value depends on the local requirements.

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8.1.3 Time display

The selected exposure time is shown on the time display. After taking an exposure a waiting time starts to flash on the time display which indicates the delay before the next exposure can be taken.



In the digital imaging mode the exposure time is shown with the prefix *d.*



In the imaging plate mode the exposure time is shown with the prefix *P.*.



In the film mode there is no prefix in the exposure time field.

After exposure the WAIT time appears on the display. The wait time is 15 times the time of exposure, however always at least 6 seconds.

If the DAP display is activated (service mode parameter 24=1 or 3) the WAIT time display changes to DAP display after a few seconds. In this case the beam limiting device number (between 1 and 12) appears on the *kV* display. The letter A is shown in the *mA* display and the DAP value (0.1 - 9.9, 10 - 9999 mGy*cm2) appears on the s (time) display.



The beam limiting devices can be selected using the arrow keys.

Table 1: Beam limiting devices

kV display	mA display	Sensor type	Explanation	Part number
1	A	-	No tube	-
2	A	-	Round tube without supplementary limiting device	-
9	A	Planmeca ProSensor	Round tube + S0 black, size 0	10021314
10	A		Round tube + S1 black, size 1	10021315
11	A		Round tube + S2 black, size 2	10021316
12	A	-	Rectangular tube without supplementary limiting device	-

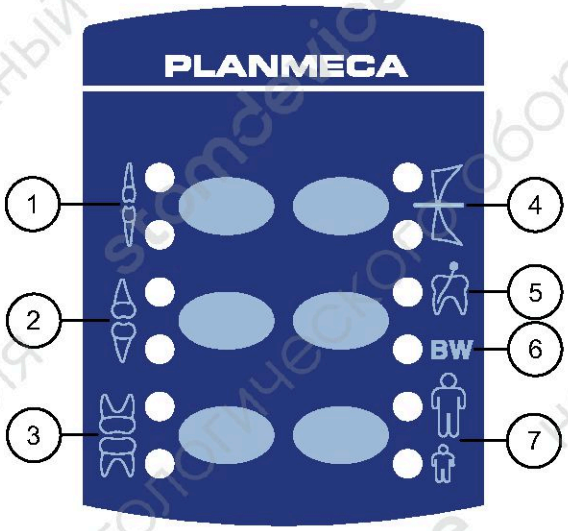
See also the technical manual for DAP values of the 1, 2 and 12 beam limiting devices.

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8.2 Keys and indicator lights

8.2.1 Preprogrammed settings keys and indicator lights



The unit is preprogrammed with exposure parameters - time, kV and mA values - which can be selected by pressing these keys. There are ten sets of parameters for both the child mode and the adult mode: one for each exposure region and one for default exposure values, which are in use when an exposure region is **not** selected.

The selections that can be made are:

1 Incisors
2 Premolars and canines
3 Molars
4 Occlusal exposure
5 Endodontic exposure
6 Bite-wing exposure
7 Adult/child mode

Press the desired key once to select the projection of the maxilla. The indicator light of the selected projection will come on.Press the key twice to select the projection of the mandible. The indicator light of the selected projection will come on.

Pressing the key a third time will recall the default exposure values.

The preprogrammed settings can be changed by the user, see section 16.1 “Programming default exposure values” on page 34.

8.2.2 Adult/child mode selection key and indicator light



Press the adult/child mode selection key once to select the child mode. The indicator light of the child mode will come on.

Press the key again to return to the adult mode. The indicator light of the adult mode will come on.

8.2.3 SELECT key



Press the SELECT key briefly to select the parameter - kV, mA or exposure time - to be changed. When the parameter value is flashing on the display, the parameter can be changed. After adjusting the kV or mA value or exposure time the unit will return automatically to the time adjustment mode after 5 seconds time.

Press and **hold down** the SELECT key (about 4 seconds) until you have heard two signal tones to enter the programming mode. For more information about programming refer to chapter 16.1 “Programming default exposure values” on page 34.

Press the SELECT key to clear the error from the display.

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8.2.4 MODE key









To select the exposure parameters for digital, phosphor plate or film imaging press and hold down the MODE key for 2 seconds.

In the film-based imaging mode no prefix is shown on the display. To enter the digital imaging mode from the film-based mode press and hold down the MODE key for 2 seconds. The exposure time with prefix *d.* appears on the time display. All the keys function as in the film-based imaging mode.

To enter the imaging plate mode from the digital imaging mode press the MODE key and hold it down for 2 seconds. The exposure time with prefix *P.* appears on the time display in the imaging plate mode. All the keys function as in the film-based imaging mode.

All the exposure parameters remain selected after the exposure until the user changes the parameters or until the unit is switched off. The selected mode stays in the unit memory even in case of power failure.

If the DAP display is activated (service mode parameter 24 = 2 or 3) by pressing the MODE key briefly the DAP value mGy*cm2 appears on the time display, the beam limiting device value between 1 and 12 appears on the kV display and the letter *A* on the mA display. The beam limiting device value can be changed using the arrow up/ down keys.

If the exposure count display is activated (service mode parameter 23=2) by pressing briefly the MODE key the exposure count value (00000 - 50000) appears on the mA and time displays. The text EC appears on the kV display.

To return to the exposure value (kV, mA, sec) displays press briefly the SELECT key.

8.2.5 Parameter adjustment keys



Down Up

Press the SELECT key briefly to select the parameter - kV, mA, exposure time or density - to be changed.

When the parameter value is flashing on the display, the parameter can be changed with the parameter adjustment keys. The up key increases the value and the down key decreases it.

After adjusting the kV or mA value or exposure time the unit will return automatically to the time adjustment mode after 5 seconds time.

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8.2.6 Ready indicator light



The green ready indicator light will come on when the unit is ready to take an exposure. The waiting time between exposures is 12 times exposure time, but always at least 6 seconds.

In the programming mode the ready light will start to flash.

NOTE

You can set the unit so that the Ready indicator light will only come on when Planmeca Romexis is ready for the exposure, i.e. the message *Waiting for exposure* appears on the computer screen. To change the settings of the unit contact your Planmeca technical support.

8.2.7 Exposure key



When you take an exposure you must press and **hold down** the exposure key for the entire duration of the exposure.

8.2.8 Exposure warning indicator light



The yellow exposure warning light will come on when you take an exposure. You will also hear an audible warning sound during the exposure.

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9 MOLAR EXPOSURE

9.1 Selecting exposure parameters

The preprogrammed exposure values are shown in section 15 “EXPOSURE VALUES” on page 30.

Check that you are in the desired imaging mode: digital, imaging plate or film-based imaging mode.

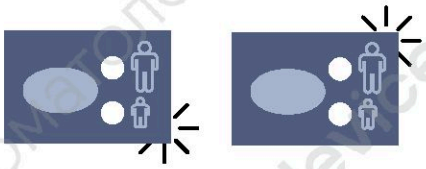


Digital maging mode Imaging plate mode



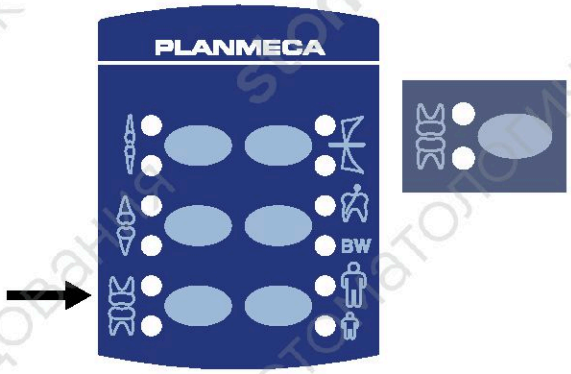
Film based imaging mode

The imaging mode can be changed by pressing the MODE key for 2 seconds.

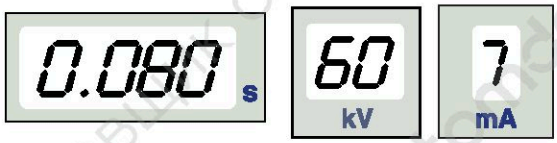


Child Adult

Select the adult or child mode. The indicator light of the selected projection will come on.



Select the molar exposure region with the preprogrammed setting keys. Press the molar key once to select the projection of the maxilla, and press the key twice to select the projection of the mandible. The indicator light of the selected projection will come on.



The preprogrammed time, kV and mA values appear on the respective displays.



The preprogrammed time, kV and mA values can be temporarily changed with the parameter adjustment keys. This will not affect the preprogrammed values.



Select the parameter to be adjusted with the SELECT key.



When the parameter value is flashing on the kV display, the anode voltage can be changed with the parameter adjusting keys.

When the parameter value is flashing on the mA display, the anode current can be changed with the parameter adjusting keys.

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When the parameter value on the kV or mA display is **not** flashing, the exposure time value can be changed with the parameter adjusting keys.

NOTE

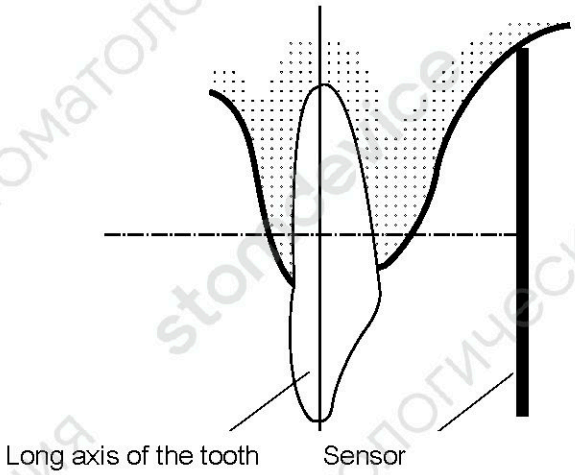
After adjusting the kV or mA value the unit will return automatically to the time adjustment mode after 5 seconds time.

9.2 Patient positioning

Ask the patient to sit down. Place a protective lead apron over the patient's chest.

9.2.1 Positioning the sensor

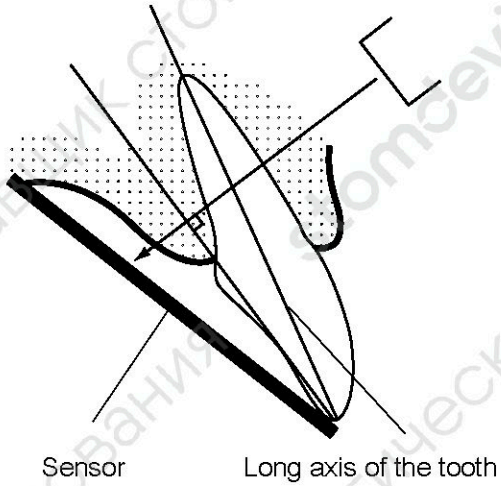
Paralleling technique (recommended)



The sensor is placed to a sensor holder which is used to align the sensor parallel to the long axis of the tooth.

Use a long cone for the paralleling technique.

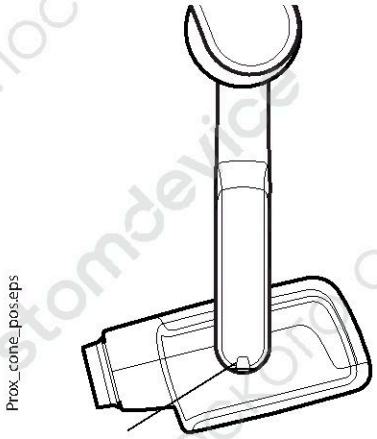
Bisecting angle technique (optional)



The patient holds the sensor in place with his finger. The X-ray beam is directed perpendicularly towards an imaginary line which bisects the angle between the sensor plane and the long axis of the tooth.

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9.2.2 Positioning the cone



Scale for the cone angle

The angle of the cone is indicated on the scale located on the vertical joint of the tube head.

The optional long cone can be attached into the short cone. Refer to chapter 7.2 “Selecting the cone” on page 9.

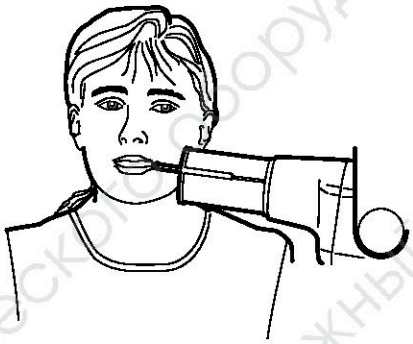
Select the cone angle from the table below.

TEETH		ANGLE OF INCLINATION
Molars	Maxilla	+35°
Molars	Mandible	-5°

Position the cone according to the figures below.



Maxillary molar

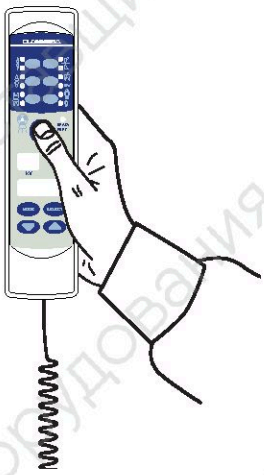


Mandibular molar

9.3 Taking an exposure

Ask the patient to remain as still as possible. Move as far away from the X-ray tube as the length of the cable from the control panel permits. The distance must be at least 2 meters (6.6 ft) from the X-ray tube.

No one except the patient may remain in the radiation area while the exposure is taken.





NOTE

Maintain audio and visual contact with the patient and unit during the exposure.

Check that the ready light is on.

Press and hold the exposure key on the control panel for the duration of the exposure.

The exposure warning light will come on. You will also hear the radiation warning tone during the exposure.

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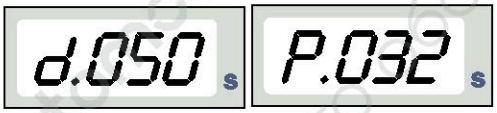
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10 PREMOLAR AND CANINE EXPOSURE

10.1 Selecting the exposure parameters

The preprogrammed exposure values are shown in section 15 “EXPOSURE VALUES” on page 30.

Check that you are in the desired imaging mode: digital, imaging plate or film-based imaging mode.



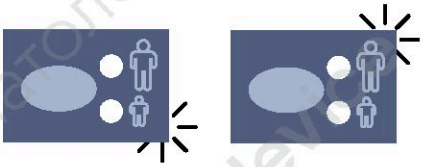
Digital maging mode Imaging plate mode



Film based imaging mode

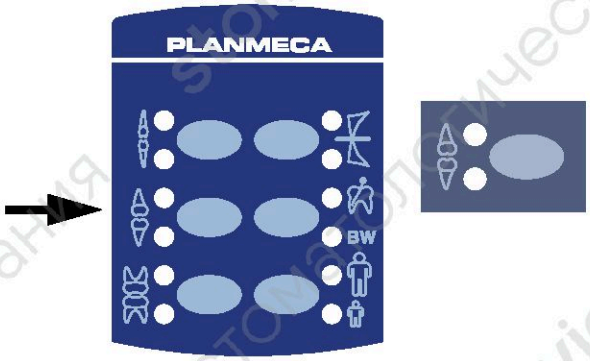


The imaging mode can be changed by pressing the MODE key for 2 seconds.

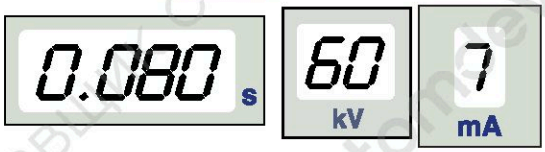


Child Adult

Select the adult or child mode. The indicator light of the selected projection will come on.



Select the premolar and canine exposure region with the pre-programmed setting keys. Press the premolar and canine key once to select the projection of the maxilla, and press the key twice to select the projection of the mandible. The indicator light of the selected projection will come on.



The preprogrammed time, kV and mA values appear on the respective displays.



The preprogrammed time, kV and mA values can be temporarily changed with the parameter adjustment keys. This will not affect the preprogrammed values.



Select the parameter to be adjusted with the SELECT key.



When the parameter value is flashing on the kV display, the anode voltage can be changed with the parameter adjusting keys.

When the parameter value is flashing on the mA display, the anode current can be changed with the parameter adjusting keys.

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When the parameter value on the kV or mA display is **not** flashing, the exposure time value can be changed with the parameter adjusting keys.

NOTE

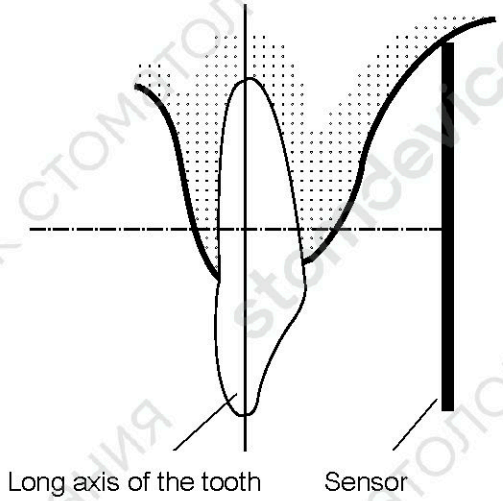
After adjusting the kV or mA value the unit will return automatically to the time adjustment mode after 5 seconds time.

10.2 Patient positioning

Ask the patient to sit down. Place a protective lead apron over the patient's chest.

10.2.1 Positioning the sensor

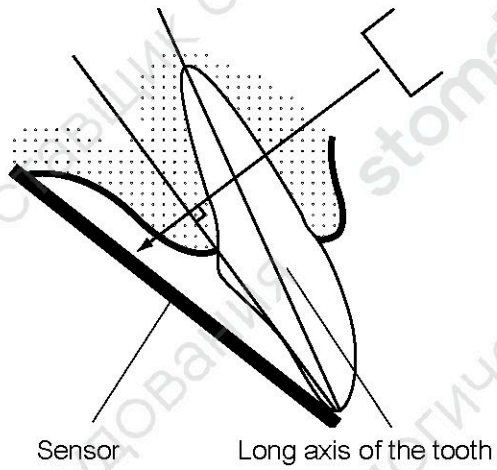
Paralleling technique (recommended)



The sensor is placed to a sensor holder which is used to align the sensor parallel to the long axis of the tooth.

Use a long cone for the paralleling technique.

Bisecting angle technique (optional)

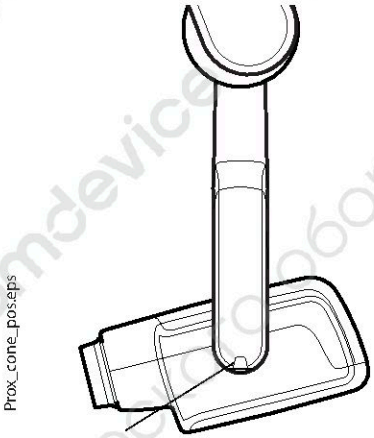


The patient holds the sensor in place with his finger. The X-ray beam is directed perpendicularly towards an imaginary line which bisects the angle between the sensor plane and the long axis of the tooth.

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10.2.2 Positioning the cone



Scale for the cone angle

The angle of the cone is indicated on the scale located on the vertical joint of the tube head.

The optional long cone can be attached into the short cone. Refer to chapter 7.2 “Selecting the cone” on page 9.

Select the cone angle from the table below.

TEETH		ANGLE OF INCLINATION
Premolars and canine teeth	Maxilla	+45°
	Mandible	-10°

Position the cone according to the figure below.

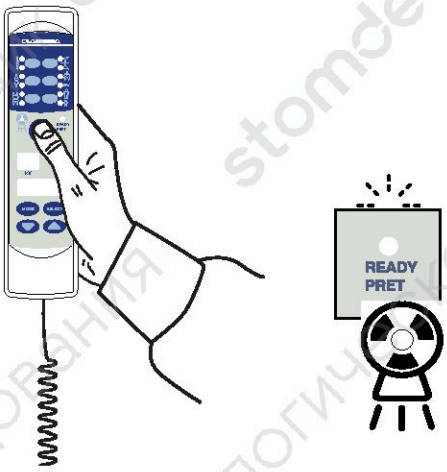


Maxillary premolar and canine



Mandibular premolar and canine

10.3 Taking an exposure



Ask the patient to remain as still as possible. Move as far away from the X-ray tube as the length of the cable from the control panel permits. The distance must be at least 2 meters (6.6 ft) from the X-ray tube.

No one except the patient may remain in the radiation area while the exposure is taken.

NOTE

Maintain audio and visual contact with the patient and unit during the exposure.

Check that the ready light is on.

Press and hold the exposure key on the control panel for the duration of the exposure.

The exposure warning light will come on. You will also hear the radiation warning tone during the exposure.

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11 INCISOR EXPOSURE

11.1 Selecting the exposure parameters

The preprogrammed exposure values are shown in section 15 “EXPOSURE VALUES” on page 30.

Check that you are in the desired imaging mode: digital, imaging plate or film-based imaging mode.

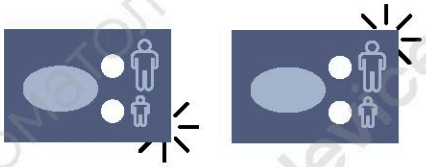


Digital maging mode Imaging plate mode



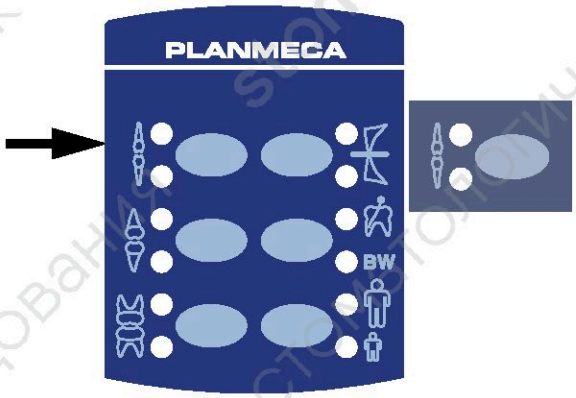
Film based imaging mode

The imaging mode can be changed by pressing the MODE key for 2 seconds.

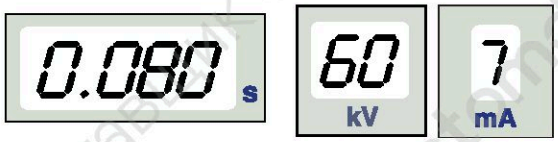


Child Adult

Select the adult or child mode. The indicator light of the selected projection will come on.



Select the incisor exposure region with the preprogrammed setting keys. Press the incisor key once to select the projection of the maxilla, and press the key twice to select the projection of the mandible. The indicator light of the selected projection will come on.



The preprogrammed time, kV and mA values appear on the respective displays.



The preprogrammed time, kV and mA values can be temporarily changed with the parameter adjustment keys. This will not affect the preprogrammed values.



Select the parameter to be adjusted with the SELECT key.



When the parameter value is flashing on the kV display, the anode voltage can be changed with the parameter adjusting keys.

When the parameter value is flashing on the mA display, the anode current can be changed with the parameter adjusting keys.

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When the parameter value on the kV or mA display is **not** flashing, the exposure time value can be changed with the parameter adjusting keys.

NOTE

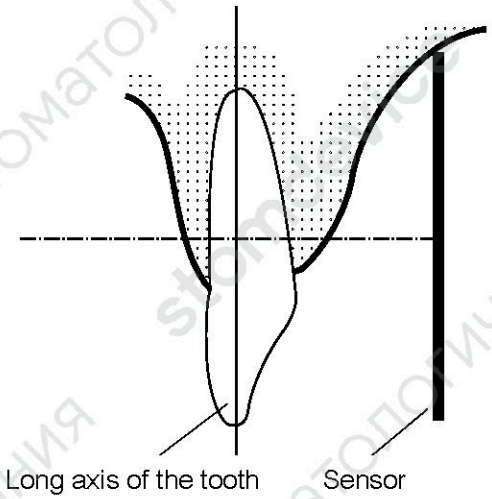
After adjusting the kV or mA value the unit will return automatically to the time adjustment mode after 5 seconds time.

11.2 Patient positioning

Ask the patient to sit down. Place a protective lead apron over the patient's chest.

11.2.1 Positioning the sensor

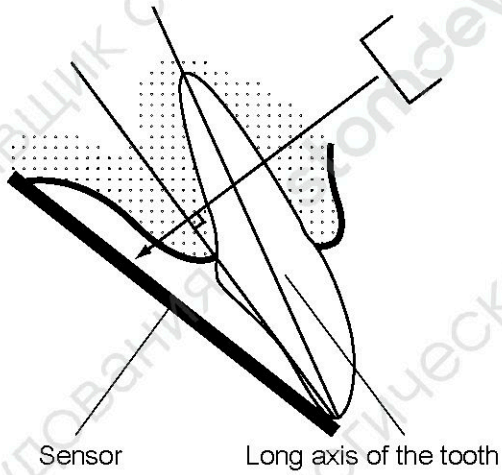
Paralleling technique (recommended)



The sensor is placed to a sensor holder which is used to align the sensor parallel to the long axis of the tooth.

Use a long cone for the paralleling technique.

Bisecting angle technique (optional)

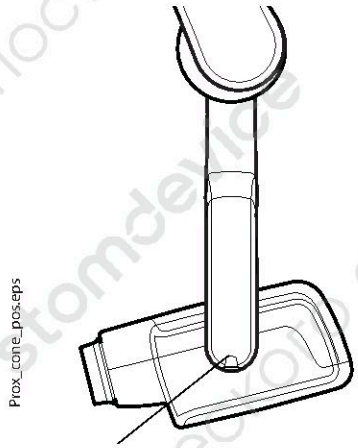


The patient holds the sensor in place with his finger. The X-ray beam is directed perpendicularly towards an imaginary line which bisects the angle between the sensor plane and the long axis of the tooth.

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11.2.2 Positioning the cone



Scale for the cone angle

The angle of the cone is indicated on the scale located on the vertical joint of the tube head.

The optional long cone can be attached into the short cone. Refer to chapter 7.2 "Selecting the cone" on page 9.

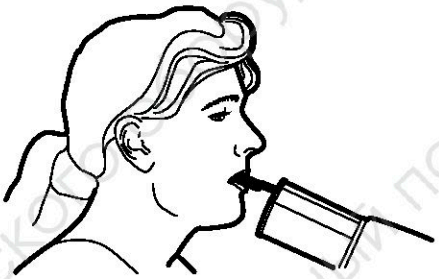
Select the cone angle from the table below.

TEETH		ANGLE OF INCLINATION
Incisors	Maxilla	+55°
	Mandible	-20°

Position the cone according to the figures below.

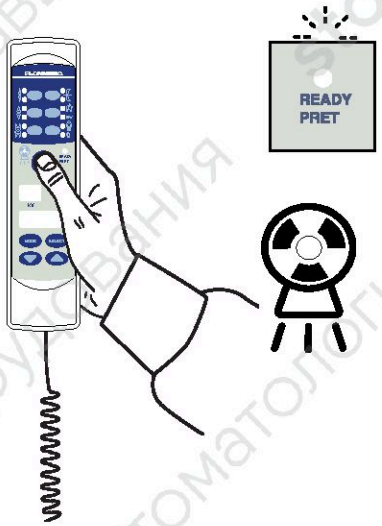


Maxillary anterior



Mandibular anterior

11.3 Taking an exposure



Ask the patient to remain as still as possible. Move as far away from the X-ray tube as the length of the cable from the control panel permits. The distance must be at least 2 meters (6.6 ft) from the X-ray tube.

No one, except the patient may remain in the radiation area while the exposure is taken.

NOTE

Maintain audio and visual contact with the patient and unit during the exposure.

Check that the ready light is on.

Press and hold the exposure key on the control panel for the duration of the exposure.

The exposure warning light will come on. You will also hear the radiation warning tone during the exposure.

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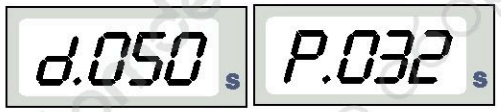
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12 OCCLUSAL EXPOSURE

12.1 Selecting the exposure parameters

The preprogrammed exposure values are shown in section 15 “EXPOSURE VALUES” on page 30.

Check that you are in the desired imaging mode: digital, imaging plate or film-based imaging mode.

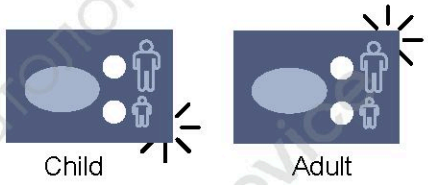


Digital maging mode Imaging plate mode



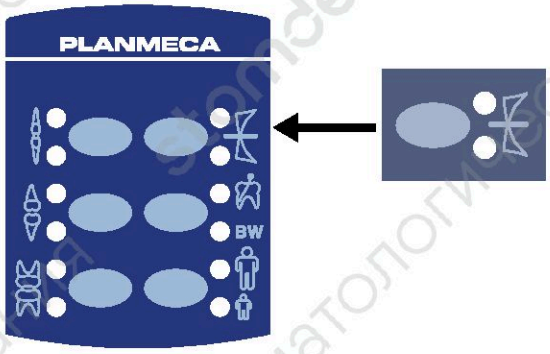
Film based imaging mode

The imaging mode can be changed by pressing the MODE key for 2 seconds.

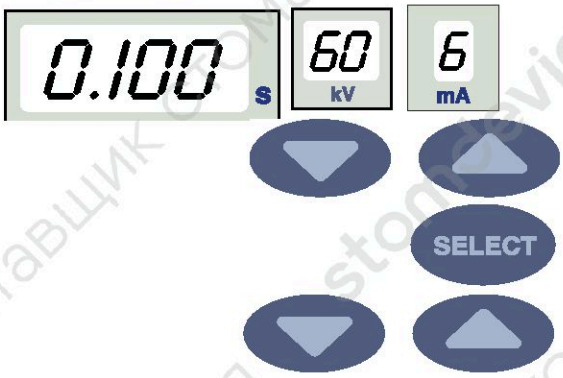


Child Adult

Select the adult or child mode. The indicator light of the selected projection will come on.



Select the occlusal exposure region with the preprogrammed setting keys. Press the occlusal exposure key once to select the projection of the maxilla, and press the key twice to select the projection of the mandible. The indicator light of the selected projection will come on.



The preprogrammed time, kV and mA values appear on the respective displays.

The preprogrammed time, kV and mA values can be temporarily changed with the parameter adjustment keys. This will not affect the preprogrammed values.

Select the parameter to be adjusted with the SELECT key.

When the parameter value is flashing on the kV display, the anode voltage can be changed with the parameter adjusting keys.

When the parameter value is flashing on the mA display, the anode current can be changed with the parameter adjusting keys.

When the parameter value on the kV or mA display is **not** flashing, the exposure time value can be changed with the parameter adjusting keys.

NOTE

After adjusting the kV or mA value the unit will return automatically to the time adjustment mode after 5 seconds time.

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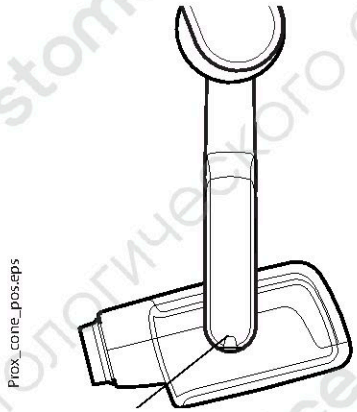
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12.2 Patient positioning

Ask the patient to sit down. Place a protective lead apron over the patient's chest.

In the intraoral occlusal exposures the sensor is positioned between patient's upper and lower teeth.

12.2.1 Positioning the cone



Scale for the cone angle

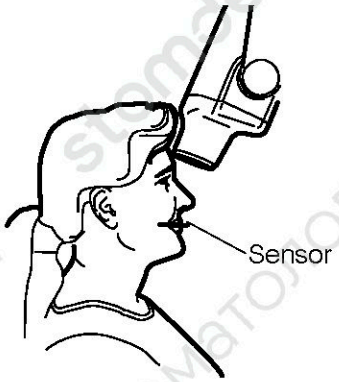
The angle of the cone is indicated on the scale located on the vertical joint of the tube head.

The optional long cone can be attached into the short cone. Refer to chapter 7.2 "Selecting the cone" on page 9.

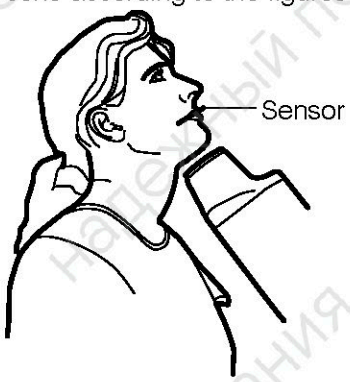
Select the cone angle from the table below.

TEETH		ANGLE OF INCLINATION
Occlusal exposure	Maxilla	+75°
	Mandible	-60°

Position the cone according to the figures below.

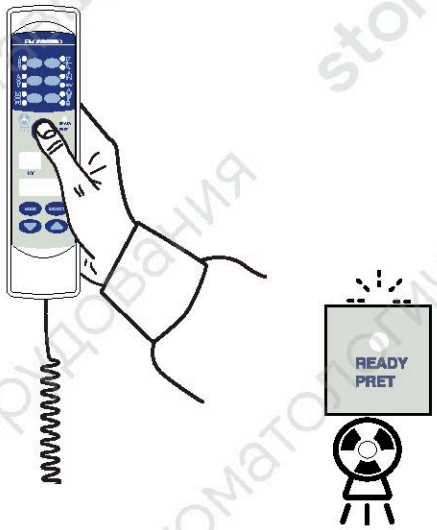


Maxillary occlusal



Mandibular occlusal

12.3 Taking an exposure



Ask the patient to remain as still as possible. Move as far away from the X-ray tube as the length of the cable from the control panel permits. The distance must be at least 2 meters (6.6 ft) from the X-ray tube.

No one except the patient may remain in the radiation area while the exposure is taken.

NOTE

Maintain audio and visual contact with the patient and unit during the exposure.

Check that the ready light is on.

Press and hold the exposure key on the control panel for the duration of the exposure.

The exposure warning light will come on. You will also hear the radiation warning tone during the exposure.

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13 ENDODONTIC EXPOSURE

When you are taking an endodontic exposure use the same exposure parameters and patient positioning methods as with the molar, premolar & canine and incisor exposures. See chapters 9 “MOLAR EXPOSURE” on page 16, 10 “PREMOLAR AND CANINE EXPOSURE” on page 19 and 11 “INCISOR EXPOSURE” on page 22 for more information.

It is possible to program two sets of exposure parameters with the endodontic exposure; adult and child.

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14 BITE-WING EXPOSURE

14.1 Selecting the exposure parameters

The preprogrammed exposure values are shown in section 15 “EXPOSURE VALUES” on page 30.

Check that you are in the desired imaging mode: digital, imaging plate or film-based imaging mode.

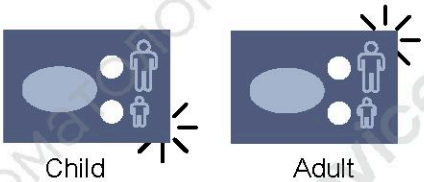


Digital maging mode Imaging plate mode



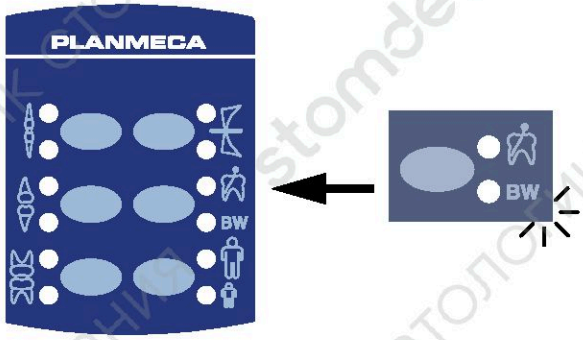
Film based imaging mode

The imaging mode can be changed by pressing the MODE key for 2 seconds.

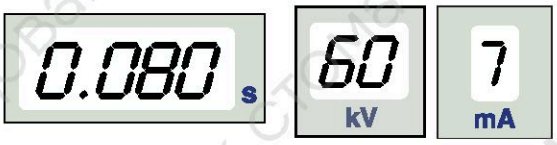


Child Adult

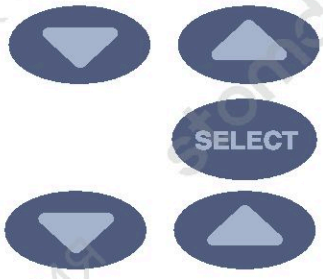
Select the adult or child mode. The indicator light of the selected projection will come on.



Select the bite-wing exposure region with the preprogrammed setting keys. Press the bite-wing key once to select the projection of the endo, and press the key twice to select the projection of the bite-wing. The indicator light of the selected projection will come on.



The preprogrammed time, kV and mA values appear on the respective displays.



The preprogrammed time, kV and mA values can be temporarily changed with the parameter adjustment keys. This will not affect the preprogrammed values.

Select the parameter to be adjusted with the SELECT key.

When the parameter value is flashing on the kV display, the anode voltage can be changed with the parameter adjusting keys.

When the parameter value is flashing on the mA display, the anode current can be changed with the parameter adjusting keys.

When the parameter value on the kV or mA display is **not** flashing, the exposure time value can be changed with the parameter adjusting keys.

NOTE

After adjusting the kV or mA value the unit will return automatically to the time adjustment mode after 5 seconds time.

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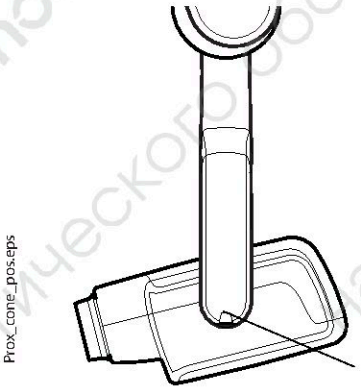
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14.2 Patient positioning

Ask the patient to sit down. Place a protective lead apron over the patient's chest.

In the bite-wing exposures the patient closes the teeth during the exposure on the sensor holder.

14.2.1 Positioning the cone



The angle of the cone is indicated on the scale located on the vertical joint of the tube head.

The optional long cone can be attached into the short cone. Refer to chapter 7.2 "Selecting the cone" on page 9.

Select the cone angle from the table below.

TEETH	ANGLE OF INCLINATION
Bite-wing exposure	5°

Scale for the cone angle

Position the cone according to the figure below.



Bite-wing

14.3 Taking exposure



Ask the patient to remain as still as possible. Move as far away from the X-ray tube as the length of the cable from the control panel permits. The distance must be at least 2 meters (6.6 ft) from the X-ray tube.

No one, except the patient may remain in the radiation area while the exposure is taken.

NOTE

Maintain audio and visual contact with the patient and unit during the exposure.

Check that the ready light is on.

Press and hold down the exposure key on the control panel for the duration of the exposure.

The exposure warning light will come on. You will also hear the radiation warning tone during the exposure.

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15 EXPOSURE VALUES

15.1 Default exposure values

When the unit is switched on, the default exposure values appear on the displays.

These values can be programmed by the user, see section 16.1 "Programming default exposure values" on page 34.

NOTE

The exposure values are programmed corresponding the density value 0 (factory preset value). The exposure time values are automatically scaled according to the density value.

NOTE

These values are for digital sensor and speed F films.

The following table shows the default exposure values for Planmeca ProSensor and Planmeca ProScanner with no target selected.

Planmeca ProSensor HD (and F speed film)				Planmeca ProScanner			
	Short cone				Short cone		
	kV	mA	s		kV	mA	s
Adult	63	8	0,1	Adult	63	8	0,125
Child	60	8	0,08	Child	60	8	0,1
	Long cone				Long cone		
	kV	mA	s		kV	mA	s
Adult	63	8	0,2	Adult	63	8	0,25
Child	60	8	0,16	Child	60	8	0,2

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15.2 Preprogrammed settings values

NOTE

The exposure time values are programmed corresponding the present density value.
The exposure time values are automatically scaled according to the density value. If you select a density value other than 0, the new values are shown both in programming and exposure mode.

These values can be programmed by the user, see section 16.3 “Programming the preprogrammed settings” on page 36. The recommended exposure values are given in section “X= ±0.5 mm (sideways) Y= ±0.5 mm (in depth) Z= ±0.5 mm (in height)” on page 51.

15.2.1 Planmeca ProSensor HD

NOTE

These values are for digital sensor and speed F films.

NOTE

The values in the following tables correspond to the density value 0.

Short cone 20 cm (8”)

		INCISORS			PREMOLARS AND CANINES			MOLARS		
		kV	mA	time	kV	mA	time	kV	mA	time
Adult	Maxilla	60	8	0.080	63	8	0.1	63	8	0.125
	Mandible	60	8	0.063	63	8	0.08	63	8	0.1
Child	Maxilla	60	8	0.063	60	8	0.08	60	8	0.1
	Mandible	60	8	0.050	60	8	0.063	60	8	0.08

		OCCLUSAL EXPOSURE			ENDODONTIC			BITE-WING		
		kV	mA	time	kV	mA	time	kV	mA	time
Adult	Maxilla	70	8	0.08	60	8	0.08	60	8	0.125
	Mandible	70	8	0.08						
Child	Maxilla	66	8	0.063	60	8	0.063	60	8	0.1
	Mandible	66	8	0.063						

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Long cone 30 cm (12”)

When using the 30 cm long cone program the values according to the table given in section 17 “EXPOSURE VALUE TABLES” on page 38 or select three steps darker density (longer exposure time)

		INCISORS			PREMOLARS AND CANINES			MOLARS		
		kV	mA	time	kV	mA	time	kV	mA	time
Adult	Maxilla	60	8	0,16	63	8	0.2	63	8	0.25
	Mandible	60	8	0,125	63	8	0.16	63	8	0.2
Child	Maxilla	60	8	0,125	60	8	0.16	60	8	0.2
	Mandible	60	8	0,1	60	8	0.125	60	8	0.16

		OCCLUSAL EXPOSURE			ENDODONTIC			BITE-WING		
		kV	mA	time	kV	mA	time	kV	mA	time
Adult	Maxilla	70	8	0,16	60	8	0.16	60	8	0.25
	Mandible	70	8	0,16						
Child	Maxilla	66	8	0,125	60	8	0.125	60	8	0.2
	Mandible	66	8	0,125						

15.2.2 Planmeca ProScanner

Short cone (8”)

		INCISORS			PREMOLARS AND CANINES			MOLARS		
		kV	mA	time	kV	mA	time	kV	mA	time
Adult	Maxilla	60	8	0.1	63	8	0.125	63	8	0.16
	Mandible	60	8	0.08	63	8	0.1	63	8	0.125
Child	Maxilla	60	8	0.08	60	8	0.1	60	8	0.125
	Mandible	60	8	0.063	60	8	0.08	60	8	0.1

		OCCLUSAL EXPOSURE			ENDODONTIC			BITE-WING		
		kV	mA	time	kV	mA	time	kV	mA	time
Adult	Maxilla	70	8	0.1	60	8	0.1	70	8	0.16
	Mandible	70	8	0.1						
Child	Maxilla	66	8	0.08	60	8	0.08	70	8	0.125
	Mandible	66	8	0.08						

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Long cone 30 cm (12”)

When using the 30 cm long cone program the values according to the table given in section 17 “EXPOSURE VALUE TABLES” on page 38 or select three steps darker density (longer exposure time).

		INCISORS			PREMOLARS AND CANINES			MOLARS		
		kV	mA	time	kV	mA	time	kV	mA	time
Adult	Maxilla	60	8	0.2	63	8	0.25	63	8	0.32
	Mandible	60	8	0.16	63	8	0.2	63	8	0.25
Child	Maxilla	60	8	0.16	60	8	0.2	60	8	0.25
	Mandible	60	8	0.125	60	8	0.16	60	8	0.2

		OCCLUSAL EXPOSURE			ENDODONTIC			BITE-WING		
		kV	mA	time	kV	mA	time	kV	mA	time
Adult	Maxilla	70	8	0.2	60	8	0.2	70	8	0.32
	Mandible	70	8	0.2						
Child	Maxilla	66	8	0.16	60	8	0.16	70	8	0.25
	Mandible	66	8	0.16						

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16 PROGRAMMING EXPOSURE VALUES

16.1 Programming default exposure values



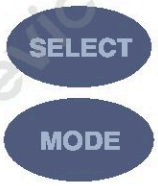
The default exposure values can be programmed for both the adult and child mode. The indicator light of the selected projection will come on. The current exposure values are shown on the time, kV and mA displays.

NOTE

Make sure that no exposure region is selected, i.e. no preprogrammed setting indicator light is on.

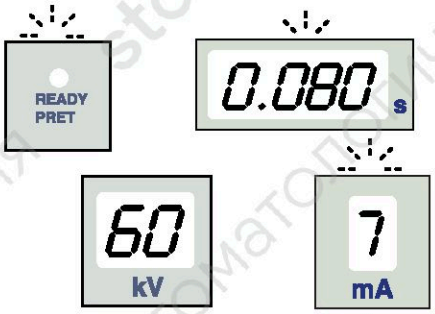
NOTE

The exposure parameters - time, kV and mA - are programmed according to the density value 0. The time value will be automatically changed according to the selected density value in the film-based imaging mode, in the digital imaging mode and in the imaging plate mode when you exit the programming mode.



Press and **hold down** the SELECT key (about 4 seconds) until you have heard a signal tone to enter the programming mode.

The imaging mode can be changed by pressing the MODE key briefly.

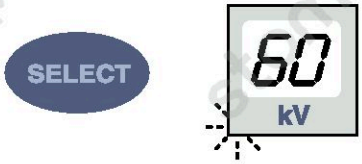


The kV range can be modified in Service mode. For more information see Planmeca ProX Technicl manual.

The ready light will start to flash. The time display will start to flash and the default exposure values will appear on the displays.



The exposure time value is changed with the parameter adjustment keys. The exposure times are shown in section 17 "EXPOSURE VALUE TABLES" on page 38.



Press the SELECT key **briefly**, the kV display will start to flash and the exposure time value is stored in the memory.



The kV value can now be changed with the parameter adjustment keys.



Press the SELECT key **briefly**, the mA display will start to flash and the kV value is stored in the memory.



The mA value can now be changed with the parameter adjustment keys.

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16.2 Programming the density values

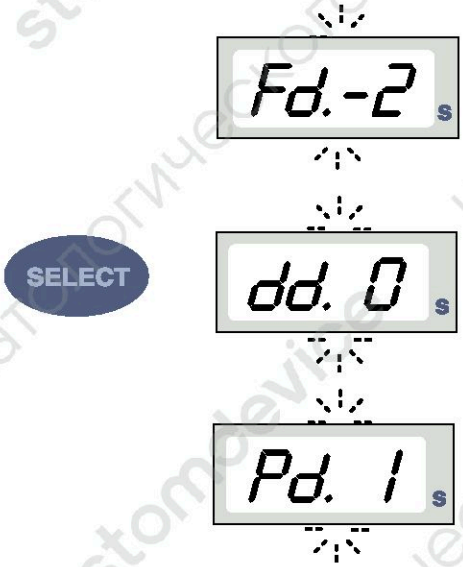
By changing the density value all the preprogrammed values can be changed. This can be used for example when the cone is being changed.

NOTE

Make sure that no exposure region is selected, i.e. no preprogrammed setting indicator light is on.

Changing the density value will change the selected time value as follows: one density step equals to one time step. The negative density value shortens the selected time value, whereas the positive value lengthens it.

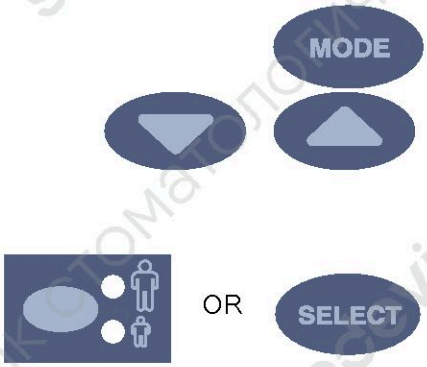
When the SELECT key is pressed a third time **briefly**, the current density value starts to flash on the time display and the mA value is stored in the memory.



The imaging mode can be changed by pressing the MODE key briefly.

The density value can now be changed with the parameter adjustment keys. Note that the density value will affect the time value both in adult and in child mode.

The density has 11 steps from -9 (light exposures) to +9 (dark exposures).



Select the child/adult mode and program its settings as described above or exit the programming mode by pressing and holding down the SELECT key. The density value is stored in the memory.

NOTE

Both the child and adult mode have the same density values.

NOTE

If you interrupt programming for over 45 seconds, the unit automatically exits the programming mode, and the current values will be stored in the memory.

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16.3 Programming the preprogrammed settings

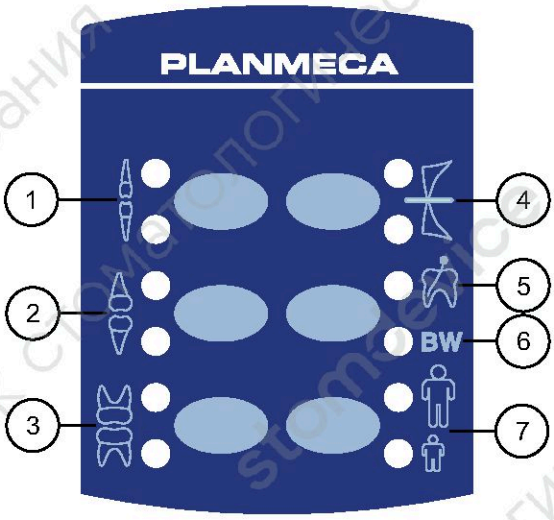


NOTE

Two sets of exposure values (time/kV/mA) can be programmed for each exposure region: one for adult mode and one for child mode. The indicator light of the selected projection will come on.

NOTE

The exposure parameters - time, kV and mA - are programmed corresponding to the density value 0. The time value will be automatically changed according to the selected density value in the film-based imaging mode, in the digital imaging mode and in the imaging plate mode when you exit the programming mode.



Select the exposure region with the preprogrammed setting keys. Press the desired key once to select the projection of the maxilla, and press the key twice to select the projection of the mandible. The indicator light of the selected projection will come on.

1 Incisors
2 Premolars and canines
3 Molars
4 Occlusal exposure
5 Endodontic exposure
6 Bite-wing exposure
7 Adult/child mode



The current time, kV and mA values appear on the respective displays.



Press and **hold down** the SELECT key (about 4 seconds) until you have heard a signal tone to enter the programming mode. The time display and the ready light will start to flash.



The imaging mode can be changed by pressing the MODE key briefly.



The exposure time value is changed with the parameter adjustment keys.



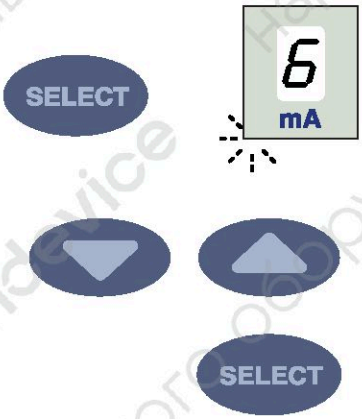
Press the SELECT key **briefly**, the kV display will start to flash and the exposure time value is stored in the memory.



The kV value can now be changed with the parameter adjustment keys.

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Press the SELECT key again **briefly**, the mA display will start to flash and the kV value is stored in the memory.

The mA value can now be changed with the parameter adjustment keys.

You can now select a new exposure region or exit the programming mode by pressing and holding down the SELECT key (about 4 seconds). You will hear a signal tone.

NOTE

If you interrupt programming for over 45 seconds, the unit automatically exits the programming mode, and the current values will be stored in the memory.

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17 EXPOSURE VALUE TABLES

NOTE

In the digital imaging mode the highest time value that can be selected is 0.80 seconds.

17.1 Planmeca ProSensor, Planmeca Dixi2 V3 sensors and F-speed films

Select the digital imaging mode of the unit or adjust the exposure time according to the table.

Short cone 20 cm (8") exposure values

Jaw	mA	TIME	0.010s	0.012s	0.016s	0.020s	0.025s	0.032s	0.040s	0.050s	0.063s	0.080s	0.100s	0.125s	0.160s	0.200s	0.250s	0.320s	0.400s	0.500s	0.630s	0.800s
MAXI	8 mA	70 kV/ child						I	P	M												
MAND							I	P	M													
MAXI	8 mA	66 kV/ child							I	P	M											
MAND								I	P	M												
MAXI	8 mA	63 kV/ child								I	P	M										
MAND									I	P	M											
MAXI	8 mA	60 kV/ child									I	P	M									
MAND										I	P	M										
MAXI	8 mA	70 kV/ adult							I	P	M											
MAND								I	P	M												
MAXI	8 mA	66 kV/ adult								I	P	M										
MAND										I	P	M										
MAXI	8 mA	63 kV/ adult									I	P	M									
MAND										I	P	M										
MAXI	8 mA	60 kV/ adult										I	P	M								
MAND											I	P	M									

Long cone 30 cm (12") exposure values

Jaw	mA	TIME	0.010s	0.012s	0.016s	0.020s	0.025s	0.032s	0.040s	0.050s	0.063s	0.080s	0.100s	0.125s	0.160s	0.200s	0.250s	0.320s	0.400s	0.500s	0.640s	0.800s
MAXI	8 mA	70 kV/ child									I	P	M									
MAND										I	P	M										
MAXI	8 mA	66 kV/ child										I	P	M								
MAND											I	P	M									
MAXI	8 mA	63 kV/ child											I	P	M							
MAND												I	P	M								
MAXI	8 mA	60 kV/ child												I	P	M						
MAND													I	P	M							
MAXI	8 mA	70 kV/ adult										I	P	M								
MAND											I	P	M									
MAXI	8 mA	66 kV/ adult											I	P	M							
MAND												I	P	M								
MAXI	8 mA	63 kV/ adult												I	P	M						
MAND													I	P	M							
MAXI	8 mA	60 kV/ adult													I	P	M					
MAND														I	P	M						

I = INCISORS, **M** = MOLARS, **P** = PREMOLARS AND CANINES

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17.2 Planmeca ProScanner

Select the digital imaging mode of the unit or adjust the exposure time according to the table.

Short cone 20 cm (8") exposure values

Jaw	mA	TIME	0.010s	0.012s	0.016s	0.020s	0.025s	0.032s	0.040s	0.050s	0.063s	0.080s	0.100s	0.125s	0.160s	0.200s	0.250s	0.320s	0.400s	0.500s	0.630s	0.800s
MAXI	8 mA	70 kV/ child				I			I	P	M											
MAND			I			P		I	P	M												
MAXI	8 mA	66 kV/ child				I			P	I	P	M										
MAND			I			P			I	P	M											
MAXI	8 mA	63 kV/ child					I		P	M	I	P	M									
MAND				I			P		M	I	P	M										
MAXI	8 mA	60 kV/ child							I	P	M	I	P	M								
MAND							I		P	M	I	P	M									
MAXI	8 mA	70 kV/ adult					I		P	I	P	M										
MAND				I			P		I	P	M											
MAXI	8 mA	66 kV/ adult							I	P	I	P	M									
MAND							I		P	I	P	M										
MAXI	8 mA	63 kV/ adult								I	P	I	P	M								
MAND									I	P	I	P	M									
MAXI	8 mA	60 kV/ adult									I	P	I	P	M							
MAND										I	P	I	P	M								

Long cone 30 cm (12") exposure values

Jaw	mA	TIME	0.010s	0.012s	0.016s	0.020s	0.025s	0.032s	0.040s	0.050s	0.063s	0.080s	0.100s	0.125s	0.160s	0.200s	0.250s	0.320s	0.400s	0.500s	0.640s	0.800s
MAXI	8 mA	70 kV/ child							I			I	P	M								
MAND						I			P		I	P	M									
MAXI	8 mA	66 kV/ child							I			P	I	P	M							
MAND						I			P			I	P	M								
MAXI	8 mA	63 kV/ child								I		P	M	I	P	M						
MAND							I			P		M	I	P	M							
MAXI	8 mA	60 kV/ child												I	P	M						
MAND													I	P	M							
MAXI	8 mA	70 kV/ adult										I	P	M								
MAND											I	P	M									
MAXI	8 mA	66 kV/ adult											I	P	M							
MAND												I	P	M								
MAXI	8 mA	63 kV/ adult												I	P	M						
MAND													I	P	M							
MAXI	8 mA	60 kV/ adult													I	P	M					
MAND														I	P	M						

I = INCISORS, **M** = MOLARS, **P** = PREMOLARS AND CANINES

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18 ERROR CODES



The error code is displayed on the time display.



Press the SELECT key to clear the error from the display.

ERROR CODE	ERROR MESSAGE EXPLANATION
Er.00	Exposure key was released too early during the exposure.
Er.10	X-ray tube Anode voltage (kV) overshoot.
Er.11	X-ray tube Anode voltage (kV) dropped suddenly.
Er.12	X-ray tube cathode filament preheating voltages are not calibrated.
Er.13	Filament preheating voltage calibration failed.
Er.29	Membrane keyboard key short-circuited/pressed during the self test or faulty display board.
Er.30	kV value does not reach or it exceeds the given value (difference more than 5%).
Er.31	X-ray tube Anode current (mA) missing, or not in specified limits.
Er.33	X-ray tube Filament voltage (V) missing, or outside the range (too low or too high).
Er.34	X-ray tube Anode voltage (kV) missing, or below the specified limit.
Er.36	Too long exposure.
Er.37	kV feedback signal open circuit or short circuit.
Er.38	mA feedback signal open circuit or short circuit.
Er.50	Tube head temperature sensor short circuit.
Er.51	Tube head temperature sensor open circuit.
Er.52	Filament voltage feedback not in specified limits.
Er.57	Exposure key pressed during self test.
Er.60	± 15VDC voltage is out of limits.
Er.61	Communication error between control panel and tube head CPU.
Er.71	FLASH memory check-sum error (tube head CPU).
Er.81	EEPROM memory defective (tube head CPU).
Er.83	Config register error (tube head CPU).

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19 CLEANING

19.1 Surfaces

NOTE

When cleaning the unit surfaces, always disconnect the unit from mains.

The unit surfaces can be cleaned with a soft cloth damped in a mild cleaning solution.

Stronger agents can be used for disinfecting the surfaces. We recommend Dürr System-hygiene FD 322 or respective disinfecting solution.

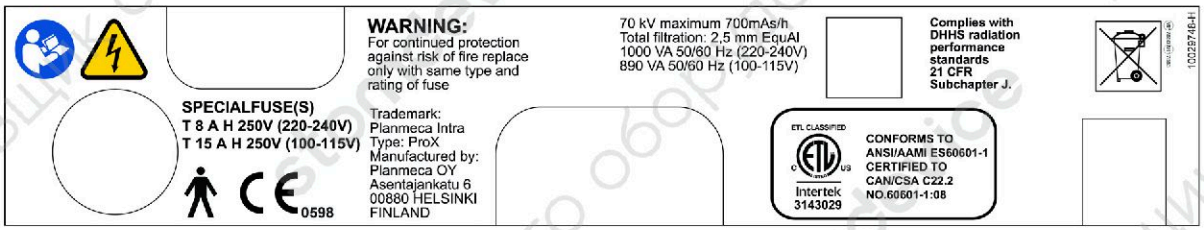
19.2 Sensor holders

See the manufacturer's instructions for cleaning.

20 SERVICE

To guarantee user and patient safety and to ensure image quality the unit must be checked and recalibrated by a qualified PLANMECA service technician once a year or after every 10 000 exposures if this is sooner. Please refer to the **Planmeca Prox Technical Manual** for complete servicing information.

21 DEVICE LABEL



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22 TECHNICAL SPECIFICATIONS

22.1 Technical data

Generator	Constant potential, microprocessor controlled, operating frequency 66 kHz
X-ray tube	Toshiba D-041SB
Focal spot size	▣ 0.4 mm according to IEC 60336
Cone diameter	60 mm (2.36 in.) Rectangular 36 x 45 mm (1.42 x 1.77 in.)
Max. symmetrical radiation field	ø 60 mm at SSD 200 mm ø 60 mm at SSD 300 mm according to IEC 806
Total filtration	min. 2.5 mm Al equivalent at 70 kV according to IEC 60522
Inherent filtration	1 mm Al equivalent at 70 kV, according to IEC 6052
Anode voltage	2-8 mA: 60, 63, 66, 70 kV, ±2 kV
Anode current	8, 7, 6, 5, 4, 3, 2 mA, ± (5% + 0,2 mA)
Target material	Tungsten
Target angle	12.5°
Exposure times	0.01- 2 sec. ±(5% + 0.001 sec.), 24 steps
Reference current time product	8 mAs at 70 kV, 8 mA, 1 sec.
Lowest current time product	0.02 mAs at 2 mA, 0.01 sec.
Max. nominal anode voltage	70 kV
Power input	1000 VA (220-240 V) 890 VA (100-115V)
Max. electrical output	560 W at 70 kV, 8 mA
Electrical output at 0.1 sec.	560 W at 70 kV, 8 mA
Max. loading energy	1987 mAs/h at 70 kV
SID (Source - Image receptor Distance)	min. 200 mm (8 in.)
SSD (Source-Skin Distance) Standard/Long Long with rectangular collimator	 200 mm (8 in.)/ 300 mm (12 in.) 306 mm (12.04 in.)
Mains voltage	100 V~/220-240 V~
Apparent resistance	0.3 ohms 100-115 V~ / 0.8 ohms 220-240 V~
Mains frequency	50/60 Hz

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Fusing	units with 100V~ or 110-115V~ voltage setting: 15AT, 250V, slow blow (6.3x32mm) (special fuse, manufacturer Bussmann, type MDA) units with 220-240V~ voltage setting: 8AT, 250V, slow blow (6.3x32mm) (special fuse, manufacturer Bussmann, type MDA)
Duty cycle	1:13,5 automatic control, at least 6 s automatic control
Electrical classification	Class I Type B

Mechanical data

Weight	total 33 kg (73 lbs) tube head 4.2 kg (9.3 lbs) with standard cone 4.5 kg (10 lbs) with long cone
Color	RAL 9016

Environmental requirements

Temperature	operating +5°C - +40°C storage -10°C - +50°C transport -10°C - +50°C
Humidity	25% - 75%
Atmospheric pressure range	700 hPa - 1060 hPa

External mains fuse recommendation

The recommendation for the external mains fuses are:

- units with 100V~ or 115V~ voltage setting: 16A, time lag
- units with 220-240V~ voltage setting: 10A, time lag

No other equipment should be connected to the same fused mains line as the x-ray unit. In some countries an additional external fault current guard is also required.

Original manufacturer

PLANMECA OY

Asentajankatu 6

FIN-00880

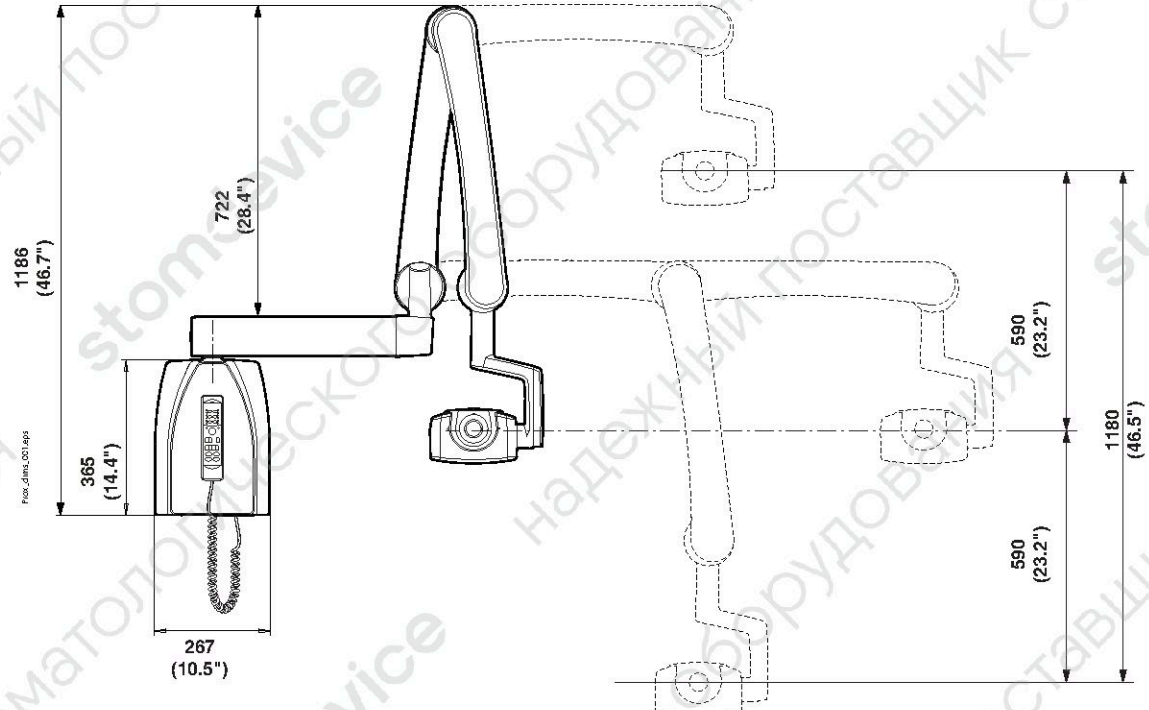
Helsinki

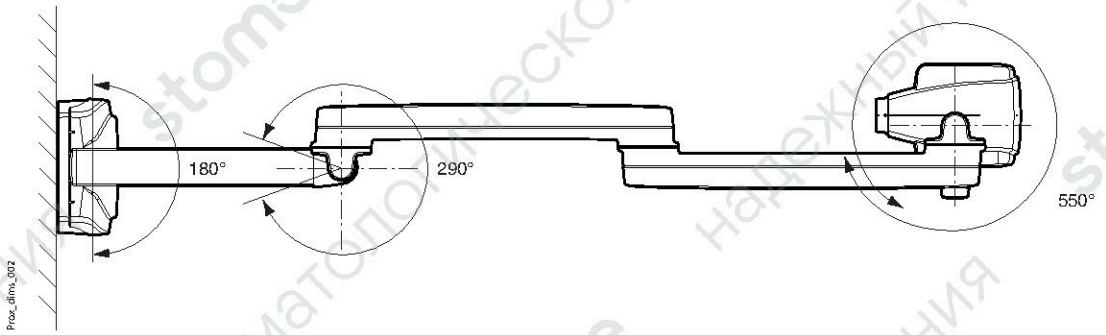
FINLAND

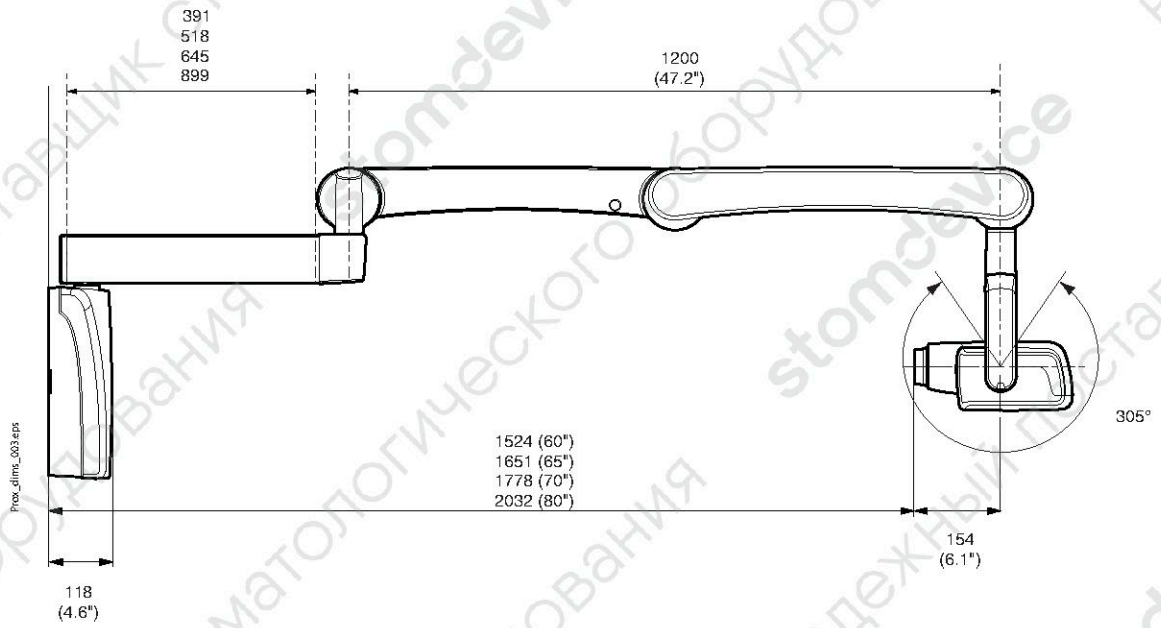
Phone: +358-20-7795 500

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22.2 Dimensions (in mm)



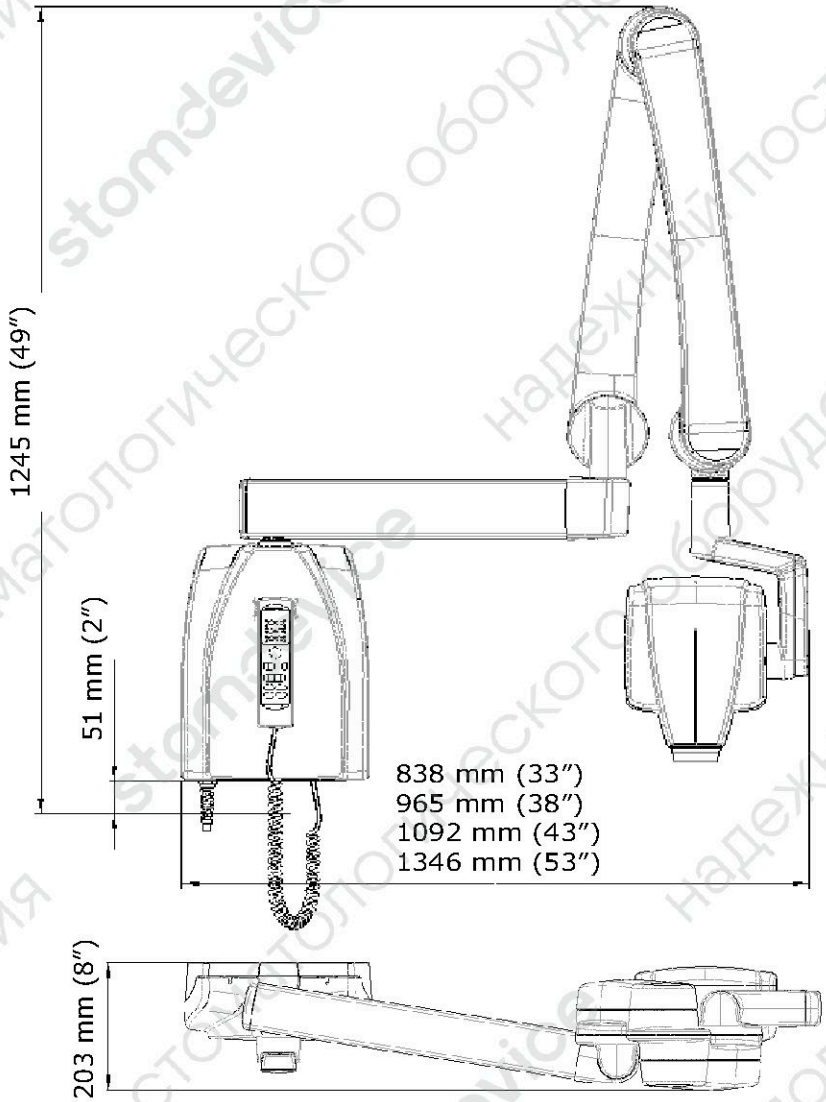




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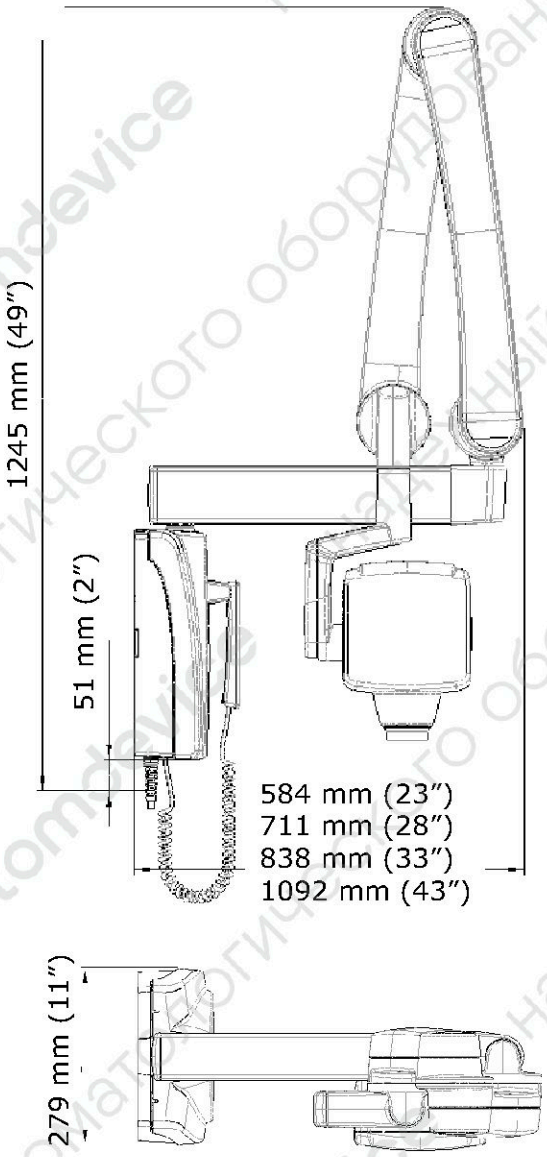
22.3 Planmeca ProX minimum dimensions

Thin



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Narrow

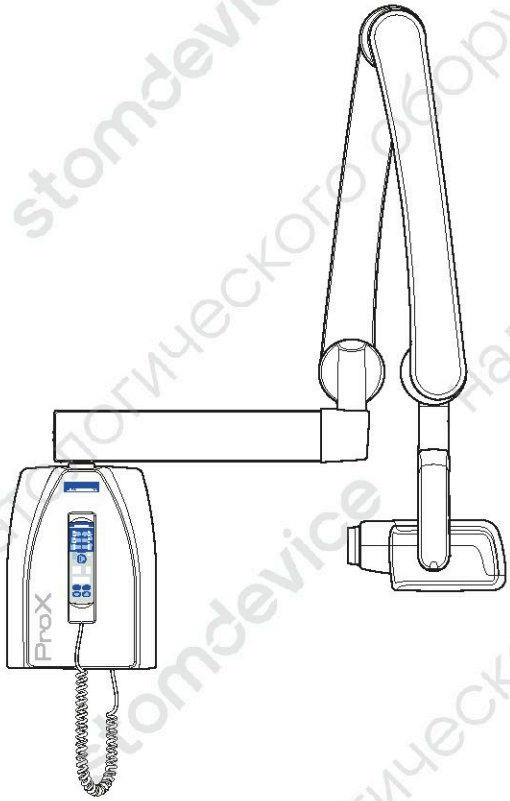


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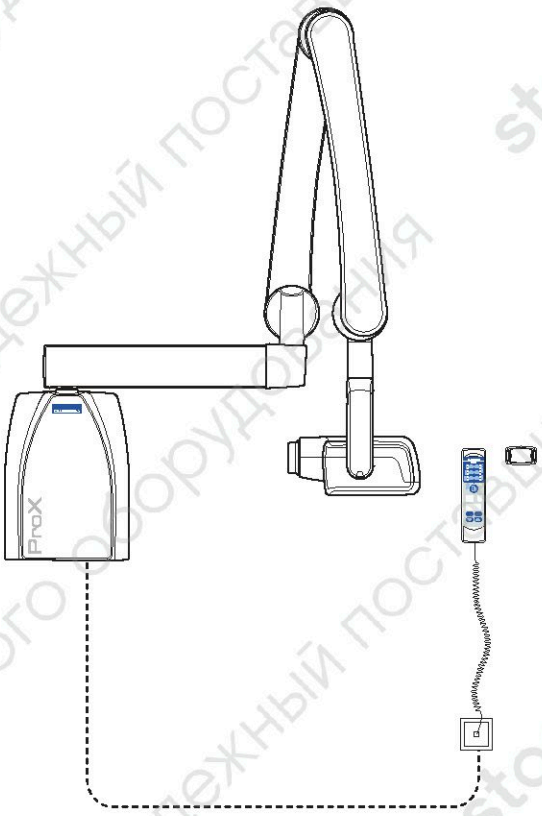
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22.4 Installation options

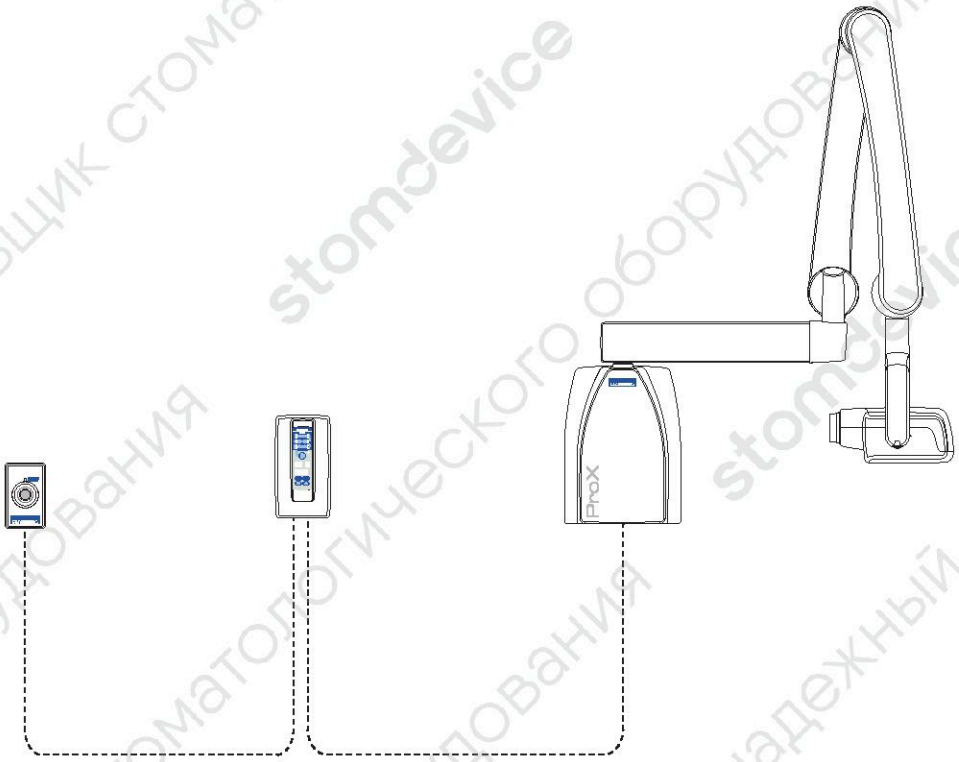
Standard wall mount



Remote control panel



Fixed control panel with double exposure button



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22.5 User's statement for Planmeca Prox

Radiation leakage technique factors

The maximum rated peak tube potential is 70 kV and the maximum rated continuous tube current is 0.14 mA for the maximum rated peak tube potential.

Minimum filtration

The radiation port contains an added 1.5 mm aluminium filtration. The measured half-value is 0.50 - 0.55 at 70 kV. The measured value corresponds to an aluminium equivalent of 2.5 mm.

Rated line voltage

100, 110-117, 220-240 V~ ±10%. Line voltage regulation 10%.

Maximum line current

5A at 230V, 7,4A at 115V

Technique factors that constitute the maximum line current condition

70 kV, 8 mA

Generator rating and duty cycle

0,8 kW, duty cycle 1:13,5. The wait period is controlled automatically by calculating it according to the formula tw = n.13,5 x, min. 6s

Maximum deviation of peak tube potential from indicated value

± 2.0 kV

Maximum deviation of tube current from indicated value

± (5% + 0.2 mA)

Maximum deviation of exposure time from indicated value

± (5% + 0.001 sec)

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DEFINITION OF MEASUREMENT CRITERIA

Exposure time

The beginning and end points of the exposure time are defined at 70% of the peak radiation waveform measured with a calibrated x-ray monitor.

Peak tube potential

Is defined as the high voltage mean value measured with a calibrated non-invasive kVp meter.

Tube current

Is defined using the voltage over the feedback resistor measured with a calibrated multimeter. The mA value is calculated by dividing the voltage by the resistance value.

The nominal x-ray voltage together with the highest x-ray tube current obtainable from the high-voltage generator when operated at its highest x-ray tube voltage

70 kV, 8 mA

The nominal x-ray tube current when operated at the highest x-ray tube voltage

8 mA, 70 kV

The x-ray tube voltage and tube current which result in the highest electric output power

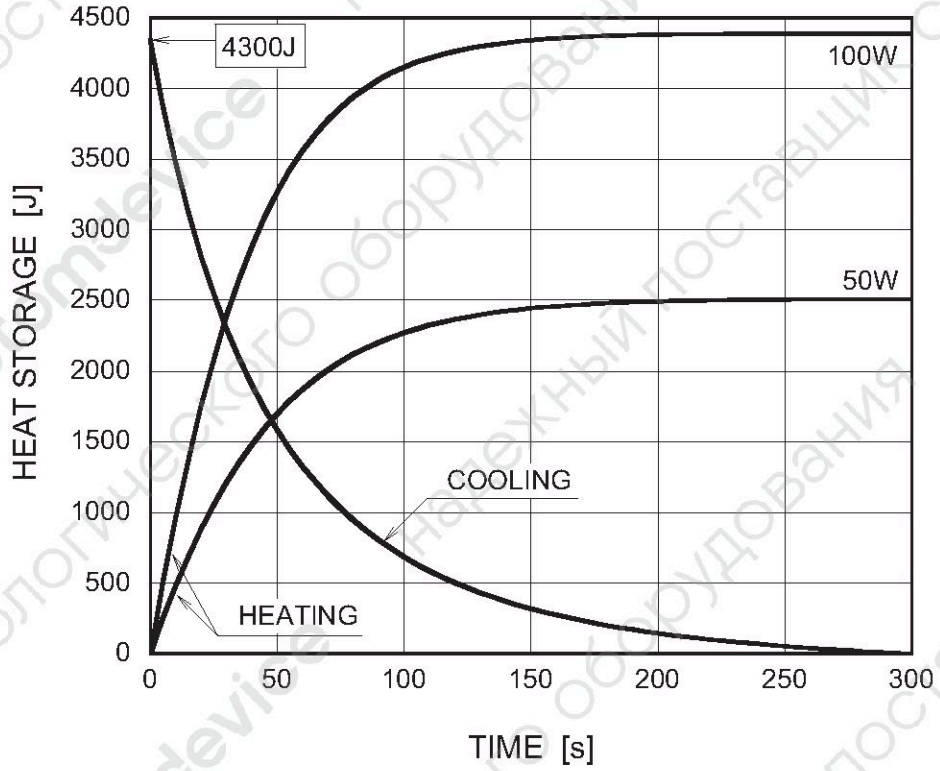
70 kV, 8 mA

The nominal electric power for a load time of 0.1 sec and at the nominal x-ray tube voltage

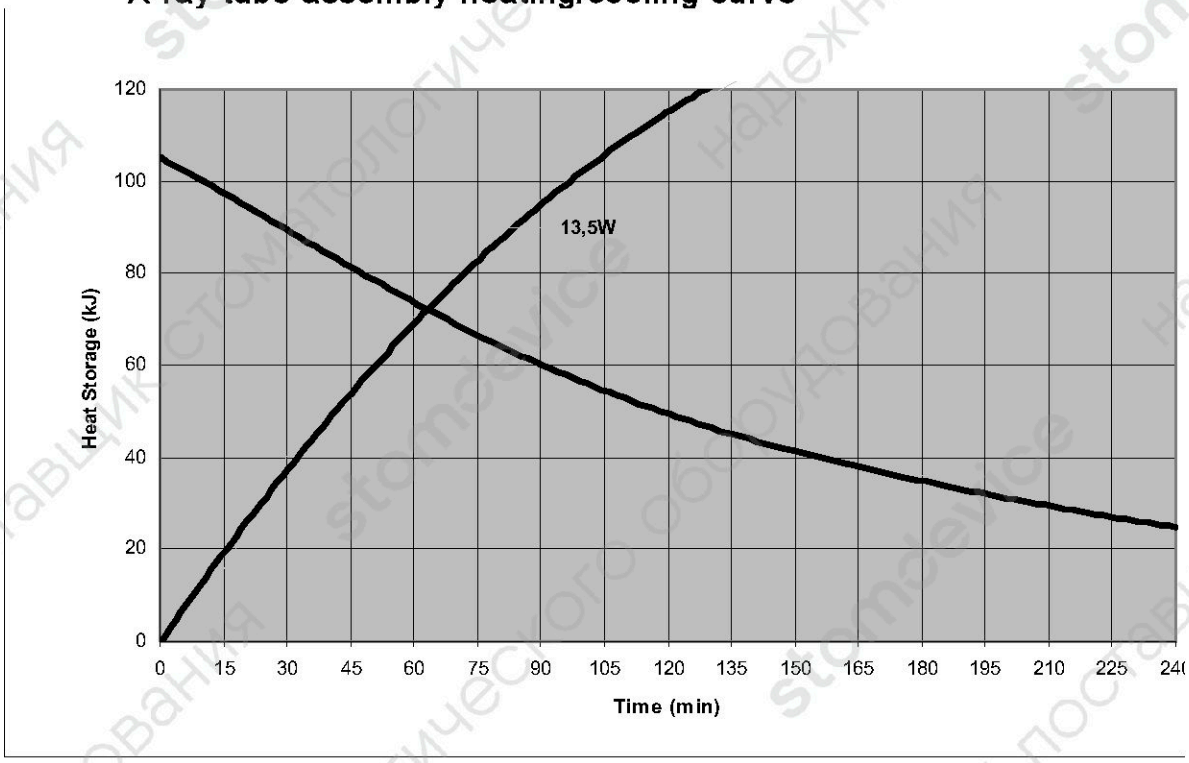
1.4 kW at 70 kV, 8 mA

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Anode heating/cooling curve of the X-ray tube



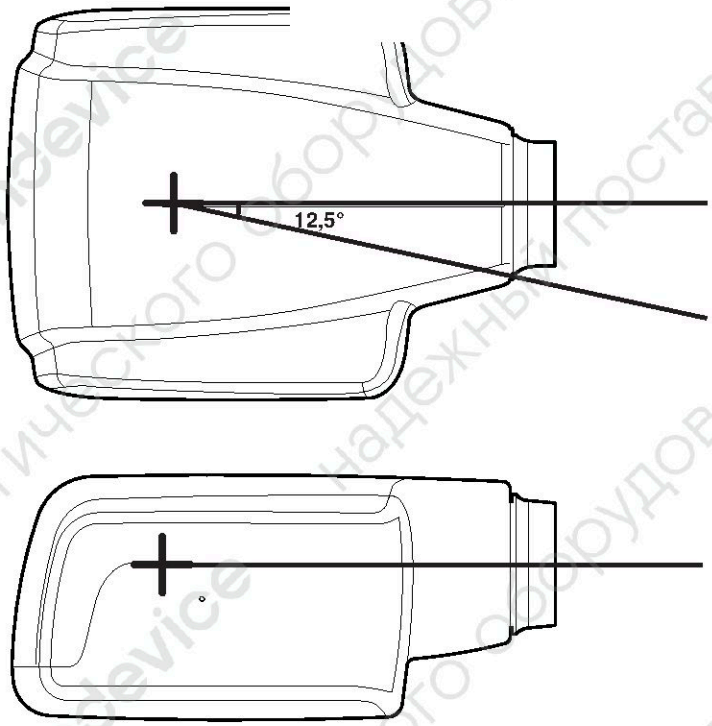
X-ray tube assembly heating/cooling curve



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Reference axis to which the target angle and the focal spot characteristics of the tube head assembly refer



Target angle with respect to the reference axis

12.5°

Dimensions of the tube head assembly

(WxHxD) 175mm x 105mm x 165mm

Weight of the tube head assembly

3.1 kg

Values of loading factors concerning leakage radiation

70 kV, 8 mA

Tolerances of the focal spot on the reference axis

X= ±0.5 mm (sideways)
Y= ±0.5 mm (in depth)
Z= ±0.5 mm (in height)

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23 DISPOSAL OF THE UNIT

In order to reduce the environmental load over the product's entire lifecycle, PLANMECA's products are designed to be as safe as possible to manufacture, use and dispose of.

Parts which can be recycled should always be taken to the appropriate processing centres, after hazardous waste has been removed. Disposal of obsolete units is the responsibility of the waste possessor.

All parts and components containing hazardous materials must be disposed of in accordance with waste legislation and instructions issued by the environmental authorities. The risks involved and the necessary precautions must be taken into account when handling waste products.

Part	Main materials for disposal	Recyclable material	Waste disposal site	Hazardous waste (separate collection)
Frame and covers - metal				
	Aluminium,	X		
	galvanized steel,	X		
	lead			X
- plastic				
	PEI,	X		
	PC, ABS	X		
	ASA + PC	X		
- rubber			X	
Motors		(X)		
Component boards		(X)		
Cables, transformers	Copper,	X		
	steel,	X		
	transformer oil		X	
X-ray tube				X
Packing	Wood,	X		
	cardboard,	X		
	paper,	X		
	polystyrene	X		
Other parts			X	

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ISO 9001

ISO 14001

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