Prostyle Intra

USER'S MANUAL

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 authorized personnel

- electrical installations are carried out according to the appropriate requirements such as IEC364

- equipment is used according to the operating instructions.

1   INTRODUCTION

This manual describes how to use the PLANMECA Prostyle Intra x-ray unit and the Prostyle Intra equipped with Dixi digital x-ray system. Please read this manual carefully before using the equipment.

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

NOTE   This manual is valid for software revisions 1.20 or later.

NOTE   The use of Prostyle Intra x-ray unit is allowed only under supervision of dental care professional.

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

$C\epsilon_{0537}$ Prostyle Intra x-ray unit fulfills the requirements of Directive 93/42/EEC.

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.
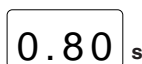
$\boxed{0.80}$ s   The display values shown in this manual are only examples and should not be interpreted as recommended values unless otherwise stated.

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.

2   SYMBOLS

Type B equipment (Standard IEC 601-1).

Alternating current (Standard IEC-417).

Attention, consult accompanying documents (Standard IEC 601-1).

Intermediate focal spot (Standard IEC-417).

Radiation filter or filtration (Standard IEC-417).

3   CHECK LIST BEFORE USING THE X-RAY UNIT

NOTE 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.

- Make sure that you are fully acquainted with the appropriate radiation protection measures and this user's manual before using the unit.

- Always use fresh film. Store and handle the film according to the manufacturer's instructions.

- Make sure that the film processor is in working order and is ready for use.

- Make sure that you are using the correct film processing chemicals for the film you are using.

- Make sure that the processing chemicals you are using are fresh and are at the correct processing temperatures and concentrations.

4   MAIN PARTS

Support arm

Scale for cone angle

Tube head

Generator box
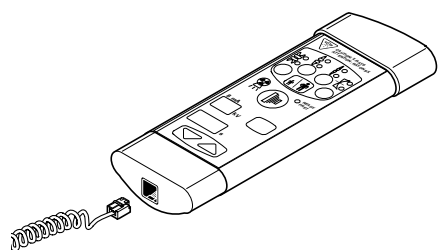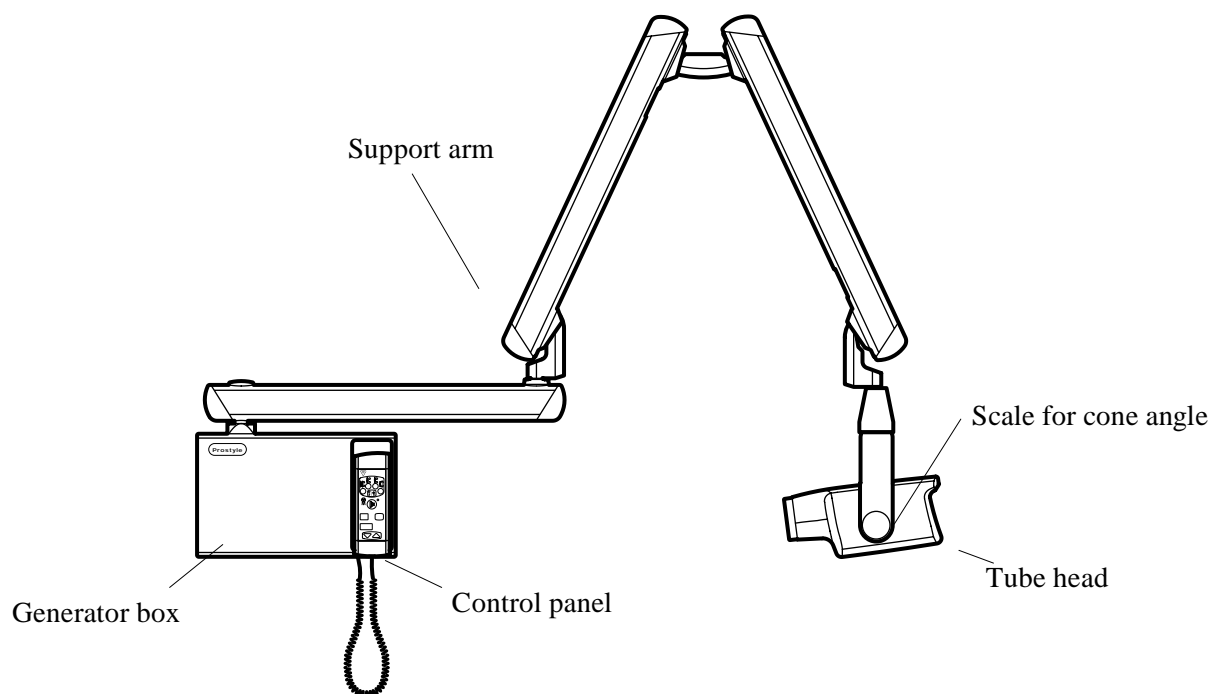
Control panel

One end of the control panel cable is connected to the terminal at the under-side 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.*

Horizontal tube head stiffness adjustment screw

Adjust the stiffness of the tube head horizontal movement by turning the adjustment screw on the support axle manually or with a wrench tool.

The stiffness of the tube head horizontal movement has been preadjusted at the factory, and can be changed by the user, if necessary.

Turn the adjustment screw 0,5 - 1 rounds clockwise if you want to tighten the tube head and 0,5 - 1 rounds counterclockwise to loosen it.

NOTE *Do not turn the adjustment screw too much counterclockwise to avoid the screw to come loose.*

Horizontal tube head stiffness adjustment screw

5 CONTROL PANEL

Preprogrammed setting
keys and indicator lights

Adult/child selection key
and indicator light

Exposure warning
indicator light

Ready indicator light

Exposure key

kV display

Select key

Time display

Digital imaging mode
selection (C-) key

Parameter adjustment keys
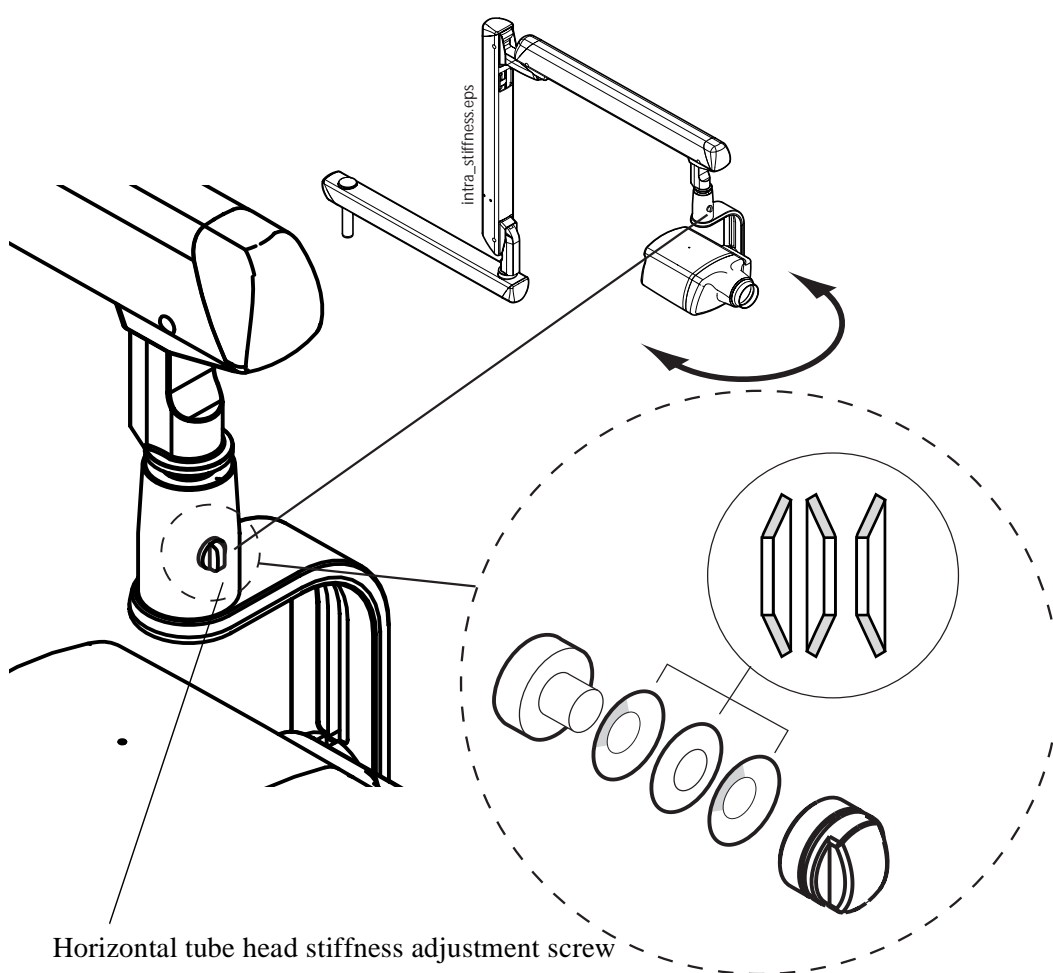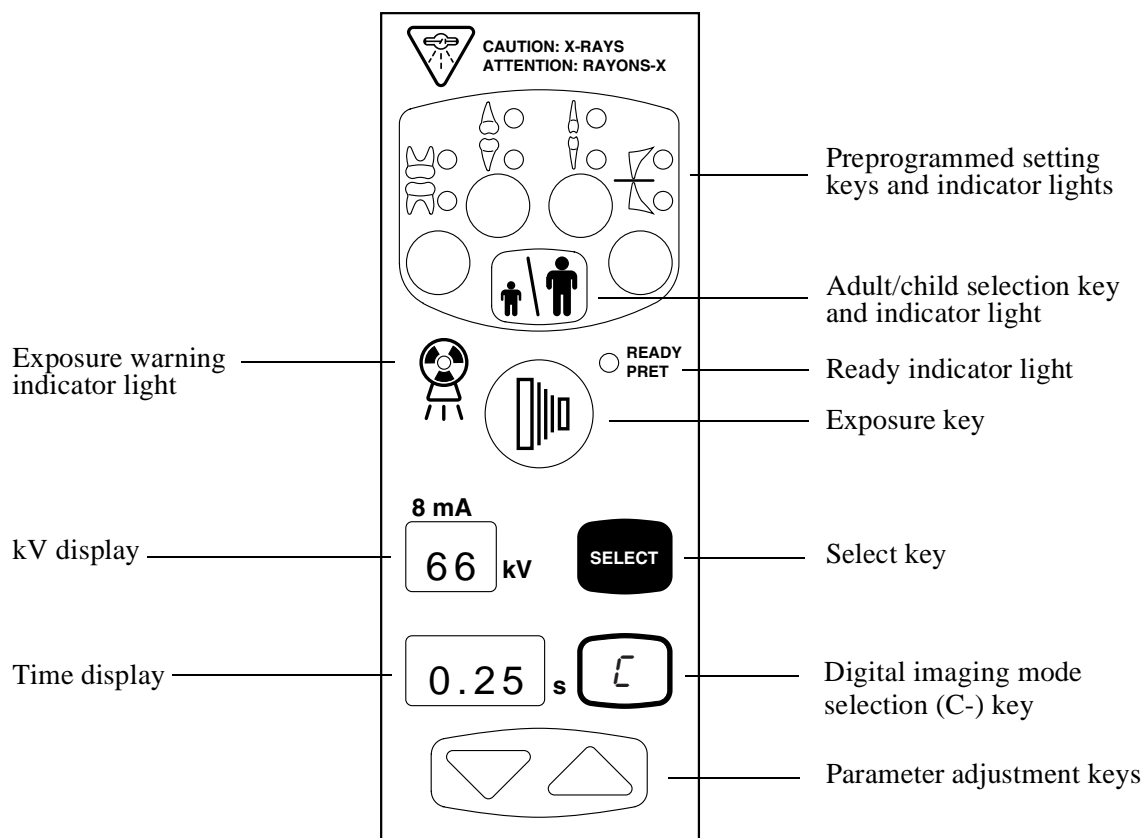
5.1 Displays

kV display

8 mA
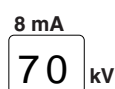
7 0 kV

The selected kV value is shown on the kV display. There are eight different values that can be selected: 50, 52, 55, 57, 60, 63, 66 and 70 kV.

The used mA value, 8 mA, is shown above the kV display.

NOTE *The kV range can be 50-60, 55-70, 60-70, 66-70 or 70 depending on the local requirements.*

Time display

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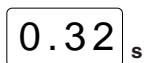
The selected exposure time is shown on the time display. After taking an exposure a waiting time starts to flash on the time display which indicates the delay before the next exposure can be taken.

c.20 s
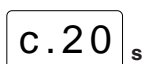
In the digital imaging mode the exposure time is shown with prefix c, and the exposure time is always less than one second, i.e. the maximum exposure time is 0.80 seconds.

$$\boxed{\text{d } 3}_s$$

$$\boxed{\text{c } -3}_s$$

If the density selection mode is selected, the density value, indicated with "d", is shown on this display. In the digital imaging mode the density selection mode is indicated with "c".

5.2 Keys and indicator lights

Preprogrammed setting keys and indicator lights

Premolars
and canines   Incisors

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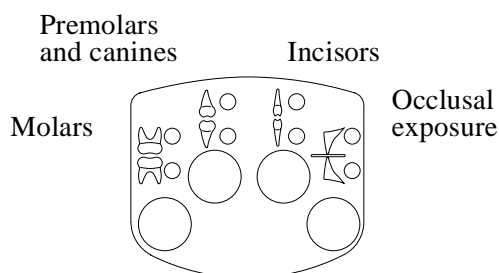
The unit is preprogrammed with exposure parameters - time and kV values - which can be selected by pressing these keys. There are nine sets of parameters for both the child mode and the adult mode: one for each exposure region and one default exposure values, which are in use when an exposure region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

The selections that can be made are: *molars, premolars & canines, incisors and occlusal exposure.*

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.

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

The preprogrammed settings can be changed by the user, see section 10 "PROGRAMMING THE EXPOSURE VALUES" on page19.

Adult/child mode selection key and indicator light

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

Press the key again to return to the adult mode. The indicator light will go out.

Select key

SELECT

Press the select key briefly to select the parameter - kV or exposure time - to be changed.

Press and **hold down** the select key until you have heard two signal tones (about 4 seconds) to enter the program mode. In the programming mode also the density can be selected, refer to the section 10.1 "Programming the default exposure and density values" on page 19.

Digital imaging mode selection (C-) key

$$\boxed{\text{c}}$$

$$\boxed{\text{c.20}}_s$$

Press the C-key for 2 seconds to enter the digital imaging mode. The exposure time with prefix "c" appears on the time display. All the keys function as in the normal mode, only the density scale (0 ... -9) is different than in the normal mode (5 ... -5).

Parameter adjustment keys
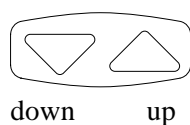
Press the parameter adjustment keys to change the value of the selected parameter. The up key increases the value and the down key decreases it.

down   up

Ready indicator light

○ READY
  PRET

The ready indicator light will come on when the unit is ready to take an exposure. The waiting time between exposures is 15 times exposure time, but always at least 6 seconds.

Exposure key

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

Exposure warning indicator light

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

6 PREPARATIONS FOR THE EXPOSURE

6.1 Switching the unit on
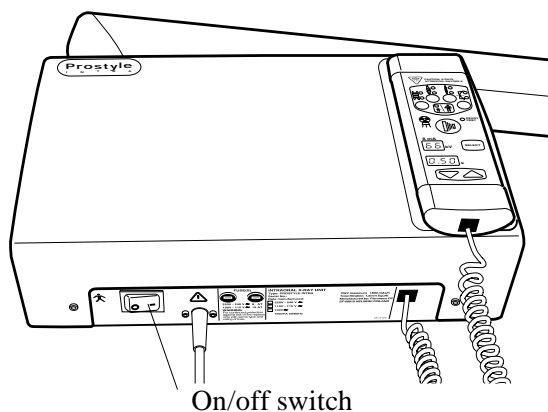
On/off switch

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.

8 mA

0.16 **s** 70 **kV**

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 10.1 "Programming the default exposure and density values" on page 19.

NOTE ***There are two sets of default exposure values: one for the adult mode and the other for the child mode. The unit is always in the adult mode when it is switched on.***

6.2 Selecting the cone

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

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.

HAWE film holder

Rectangular collimator
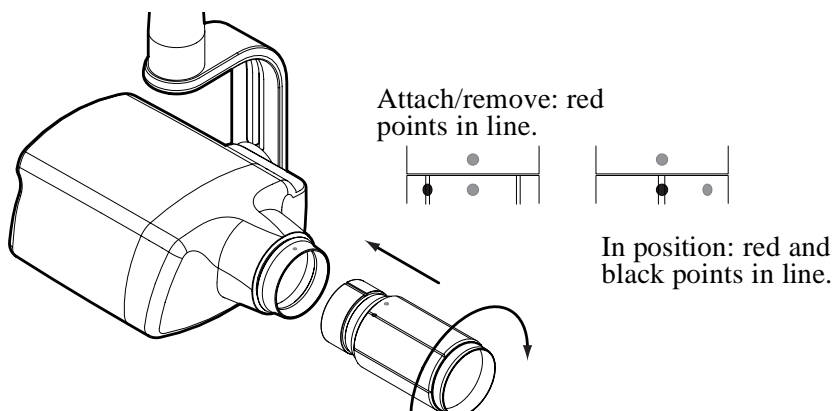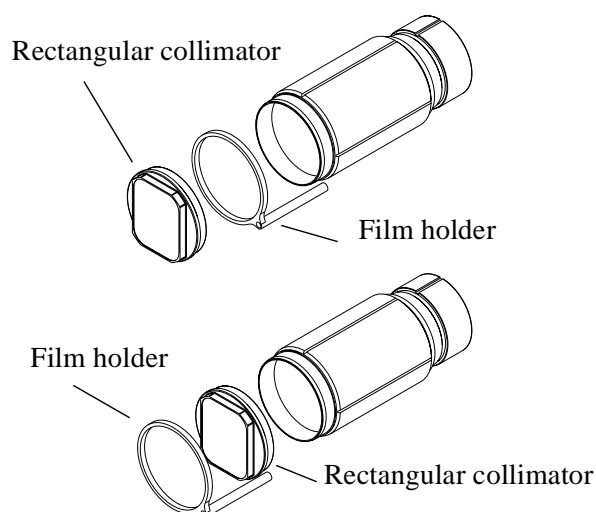
Film holder

The rectangular collimator can be attached to the long cone either before the film holder or after it. When the collimator is attached before the film holder, the film holder rotates when the collimator is rotated.

Film holder

Rectangular collimator
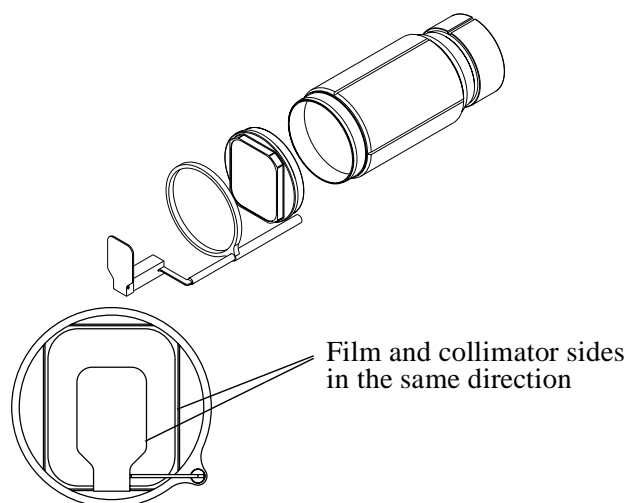
When attaching the film to the holder make sure that the film is in the same direction as the rectangular collimator.

Film and collimator sides in the same direction

NOTE ***The exposure values must be selected according to the cone used in the exposure, refer to the section 9 "EXPOSURE VALUES" on p a g e17.***

NOTE ***The film holder can be used with the long cone only.***

RINN film holder
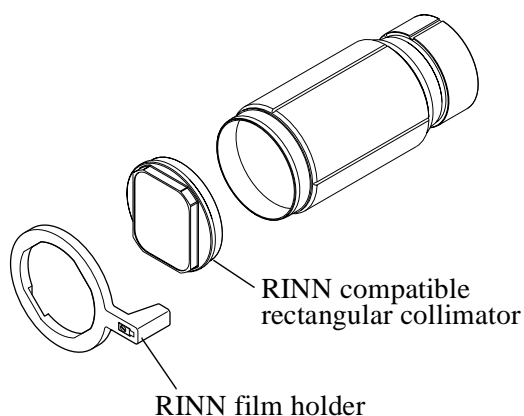
NOTE ***The RINN film holder can be used only with the green RINN compatible rectangular collimator.***

Attach the RINN compatible rectangular collimator to the long cone and then attach the film holder to the collimator.

RINN compatible rectangular collimator

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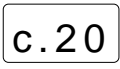
Long rectangular cone
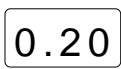
Push the rectangular cone into the short cone so that the red dots on the short cone and on the rectangular cone are in line (1), and rotate the cone 180°, until the black dot on the rectangular cone and the red dot on the short cone are in line (2). The cone can be now rotated in its position ±90°.

trotonen 310197

1.

2.

180°

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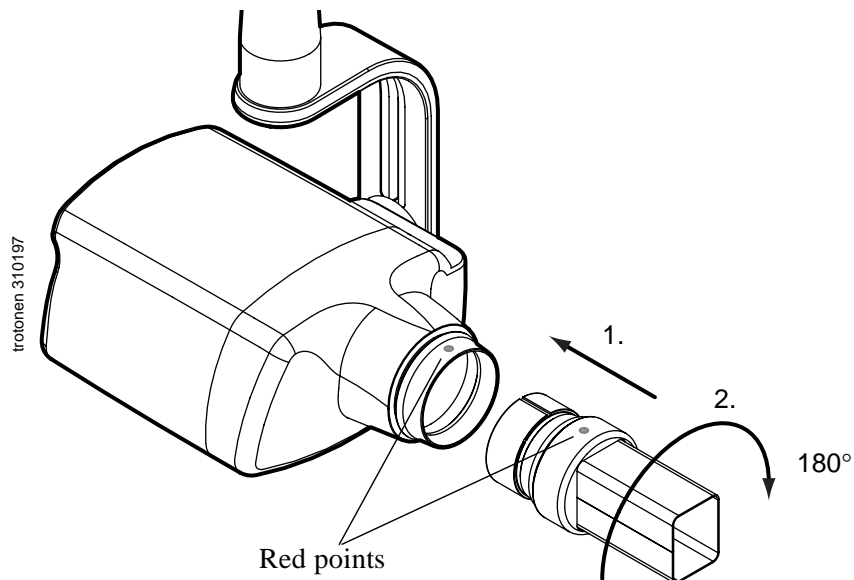
The rectangular cone can be removed when the red dots on the short cone and on the rectangular cone are in line.

6.3   Selecting the exposure parameters

The preprogrammed exposure values are shown on section 9 "EXPOSURE VALUES" on page 17.

$\boxed{\text{c.20}}$ s

Digital
imaging mode

$\boxed{\text{0.20}}$ s

Film-based
imaging mode

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

$\boxed{\text{C}}$

The imaging mode can be changed by pressing the C-key for two seconds.
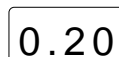
Child   Adult

Select the adult or child mode. Note, that the indicator light is on when the child mode is selected.
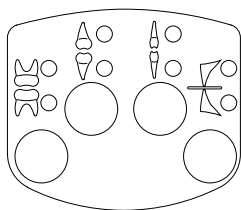
Select the exposure region with the preprogrammed setting keys. Press the desired key once to select the projection of the maxilla, and press the key twice to select the projection of the mandible. The indicator light of the selected projection will come on.

8 mA

$\boxed{\text{0.20}}$ s $\boxed{\text{70}}$ kV

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

NOTE ***The bite-wing exposures are taken with the default exposure values. Pressing the preprogrammed settings key a third time will recall these values.***

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

$\boxed{\text{SELECT}}$

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

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

7 POSITIONING THE PATIENT

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

7.1 Positioning the film/sensor

NOTE *The standard cone is suitable for the bisecting angle technique, and the long cone is used for the paralleling technique.*

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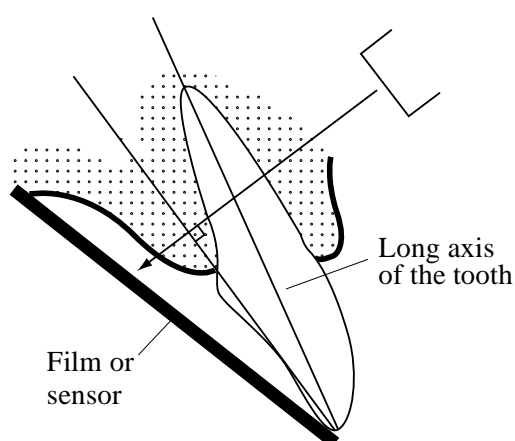
The patient holds the film or sensor in place with his finger. The x-ray beam is directed perpendicularly towards an imaginary line which bisects the angle between the film plane and the long axis of the tooth.

Long axis of the tooth

Film or sensor

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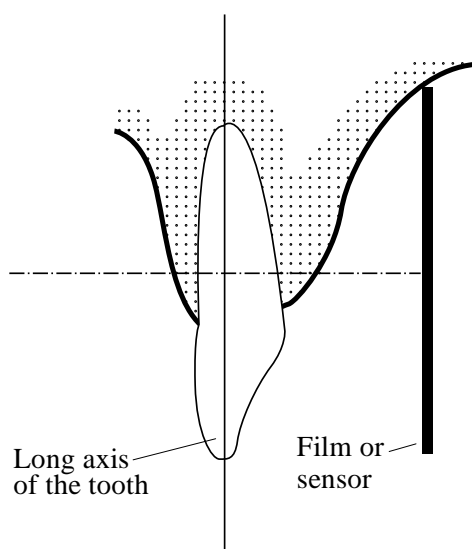
The film or sensor is placed to a film holder which is used to align the film parallel to the long axis of the tooth.

Long axis of the tooth

Film or sensor

Bite-wing exposures

In the bite-wing exposures the patient closes the teeth during the exposure on the film's tab or on the film/sensor holder.

Occlusal exposures

In the intraoral occlusal exposures the film or sensor is positioned between patients upper and lower teeth.

7.2   Positioning the cone

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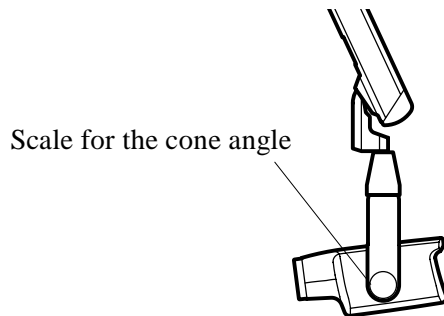
The angle of the cone is indicated on the scale located on the vertical joint of the tube head.

Select the cone angle from the table below.

Table 1:Angle of inclination of the exposure cone to the horizontal plane

Teeth		Angle of inclination
Maxilla	Molars	+35°
	Premolars and canine teeth	+45°
	Incisors	+55°
	Occlusal exposure	+75°
Mandible	Occlusal exposure	-60°
	Incisors	-20°
	Premolars and canine teeth	-10°
	Molars	-5°
Bite-wing exposure		5°

Position the cone according to the figures below.
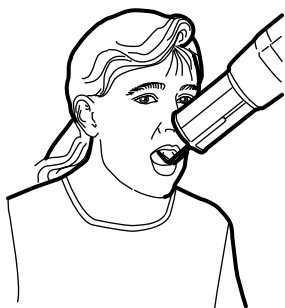
Maxillary anterior

Maxillary molar

Mandibular anterior

Mandibular canine
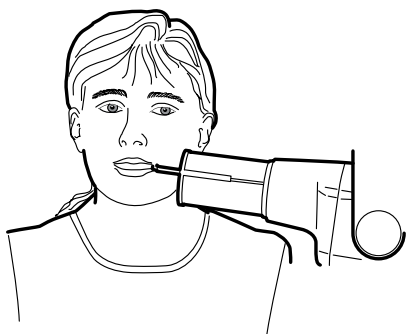
Mandibular molar
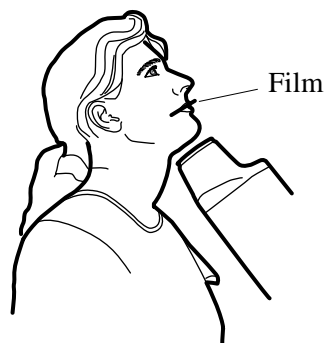
Mandibular occlusal

Film
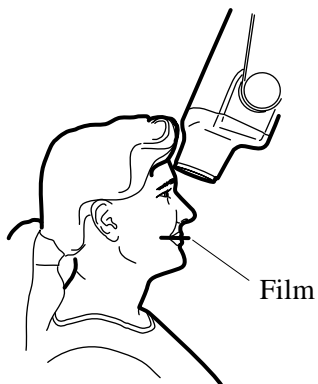
Maxillary occlusal

Film

Bite-wing

8   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.

No one, except the patient may remain in the radiation area while the exposure is taken. Maintain visual contact with the patient and the unit during the exposure.

Check that the ready light is on.
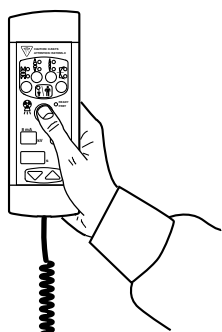
Press and hold the exposure key on the control panel for the duration of the exposure.

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

9   EXPOSURE VALUES

9.1   Default exposure values

When the unit is switched on, the default exposure values appear on the displays. These preprogrammed values are used for the bite-wing exposures.

These values can be programmed by the user, see section 10.1 "Programming the default exposure and density values" on page 19.

NOTE   The exposure values are programmed corresponding the normal mode density value 0 (factory preset value). In the digital imaging mode the exposure time values are automatically scaled according to the density value used in digital imaging mode. The factory preset density value in the digital imaging mode is -4.

If the density setting has been altered by the user (see section 10.1 "Programming the default exposure and density values" on page19), the default exposure values are changed automatically. 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. The time values are shown in section 12 "EXPOSURE VALUE TABLES" on page23.

NOTE   These values are for speed D films (Kodak Ultraspeed) and for digital imaging. For the speed E films (Kodak Ektaspeed) select three steps shorter exposure time, and for the speed F films (Kodak Insight) five steps shorter exposure time.

Table 2:Default exposure values with 20 cm (8") cone

PATIENT	kV	time
Adult	63	0.20
Child	60	0.16

NOTE   The preprogrammed default exposure values are for the 20 cm (8") cone. When using the 30 cm long cone, use the exposure values given in the table below.

Table 3:Default exposure values with 30 cm (12") cone

PATIENT	kV	time
Adult	63	0.40
Child	60	0.32

NOTE   When using a film holder select 1-2 steps longer exposure time.

9.2   Preprogrammed settings values

NOTE *Two sets of exposure values (time/kV) have been pro-grammed for each exposure region: one for adult mode and one for child mode.*

NOTE *The exposure values are programmed corresponding the normal mode density value 0 (factory preset value).*

NOTE *In the digital imaging mode the exposure time values are automatically scaled according to the density value used in digital imaging mode. The factory preset density value in the digital imaging mode is -4.*

These values can be programmed by the user, see section 10.2 "Programming the preprogrammed settings" on page 20. The recommended exposure values are given in section 12 "EXPOSURE VALUE TABLES" on page 23.

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.

NOTE *These values are for speed D films (Kodak Ultra-speed) and for digital imaging. For the speed E films (Kodak Ektaspeed) select three steps shorter exposure time, and for the speed F films (Kodak Insight) five steps shorter exposure time.*

Table 4:Preprogrammed settings values with 20 cm (8") cone

		INCISORS		PREMOLARS AND CANINES		MOLARS		OCCLUSAL EXPOSURE	
		kV	time	kV	time	kV	time	kV	time
Adult	Maxilla	60	0.20	63	0.20	63	0.25	70	0.20
	Mandible	60	0.16	63	0.16	63	0.20	70	0.20
Child	Maxilla	60	0.12	60	0.16	60	0.20	66	0.16
	Mandible	60	0.10	60	0.12	60	0.16	66	0.16

When using the 30 cm long cone program the values according to the table given in section 12 "EXPO-SURE VALUE TABLES" on page 23.

10   PROGRAMMING THE EXPOSURE VALUES

10.1   Programming the default exposure and density values

The default exposure values can be programmed for both the adult and child mode. When the indicator light is on, the unit is in the child mode. The current exposure values are shown on the time and kV displays.

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

NOTE   *The exposure parameters - time and kV - are programmed corresponding to the normal mode density value 0. The time value will be automatically changed according to the selected density value in both the normal and digital imaging mode when you exit the programming mode.*

0 . 1 6 s

c . 1 6 s
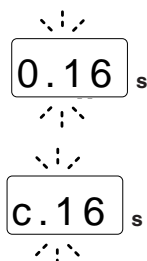
SELECT

Press and **hold down** the select key until you have heard two signal tones (about 4 seconds) to enter the program mode. The time display will start to flash, the default exposure values will appear on the displays and the ready light will start to flash.

The exposure time value is changed with the parameter adjustment keys. The exposure times are shown in section 12 "EXPOSURE VALUE TABLES" on page23.
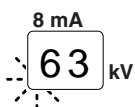
8 mA

6 3 kV

SELECT

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.

Programming the density values

d   1 s

c -4 s
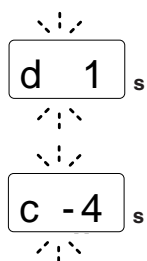
SELECT

When the select key is pressed a second time **briefly**, the current density value starts to flash on the time display and the kV value is stored in the memory.

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.

d 1 s
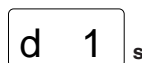
In the normal mode the type of the film processor, processing chemicals and temperatures used will affect the film density. The density has 11 steps from -5 (light exposures) to +5 (dark exposures).

c -4 s
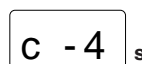
In the digital imaging mode the density has 10 steps from -9 to 0.

OR **SELECT**

Select the child/adult mode and program it 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 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.

10.2 Programming the preprogrammed settings

NOTE Two sets of exposure values (time/kV) can be programmed for each exposure region: one for adult mode and one for child mode. When the indicator light is on, the unit is in the child mode.

NOTE The exposure parameters - time and kV - are programmed corresponding to the normal mode density value 0. The time value will be automatically changed according to the selected density value in both the normal and digital imaging 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.

c.20 s **0.20** s **8 mA** **70** kV
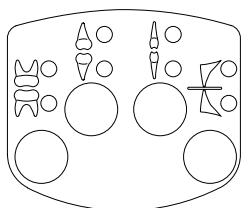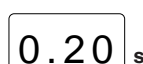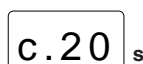
The current time and kV values appear on the respective displays.
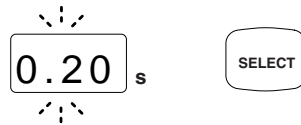
0.20 s

SELECT

Press and **hold down** the select key until you have heard two signal tones (about 4 seconds) to enter the program mode. The time display and the ready light will start to flash.
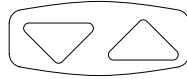
The exposure time value is changed with the parameter adjustment keys.

8 mA

63 kV

SELECT

Press the select key **briefly**, the kV display will start to flash and the exposure time value is stored in the memory.
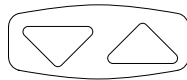
The kV value can now be changed with the parameter adjustment keys.

SELECT

You can now select a new exposure region or exit the programming mode by pressing and holding down the select key. The new kV value is stored in the memory.

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.*

11   MAINTENANCE

11.1 Cleaning

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.

Film holder

The film holder can be autoclaved up to 145 °C or cleaned with alcohol-based solution.

11.2 Preventive maintenance

To guarantee operator and patient safety and to ensure image quality the unit must be checked by a qualified service technician once a year or after every 10,000 exposures if this is sooner.

12   EXPOSURE VALUE TABLES

NOTE *These values are for speed D films (Kodak Ultraspeed) and for digital imaging. For the speed E films (Kodak Ektaspeed) select three steps shorter exposure time, and for the speed F films (Kodak Insight) five steps shorter exposure time.*

NOTE *In the digital imaging mode scale the exposure time with the digital imaging mode density value, or select a corresponding, shorter exposure time.*
The factory preset density value in the digital imaging mode is -4.

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

Table 5:Exposure values with 20 cm (8") cone

TIME		0.01s	0.02s	0.03s	0.04s	0.05s	0.06s	0.08s	0.10s	0.12s	0.16s	0.20s	0.25s	0.32s	0.40s	0.50s	0.64s	0.80s	1.00s	1.25s	1.60s	2.00s	2.50s	3.20s
70 kV/ child	MAXILLA						I	P	M	O														
	MANDIBLE					I	P	M		O														
66 kV/ child	MAXILLA						I	P	M	O														
	MANDIBLE					I	P	M		O														
63 kV/ child	MAXILLA							I	P	M	O													
	MANDIBLE						I	P	M	O														
60 kV/ child	MAXILLA							I	P	M	O													
	MANDIBLE						I	P	M	O														
57 kV/ child	MAXILLA								I	P	M	O												
	MANDIBLE							I	P	M	O													
55 kV/ child	MAXILLA								I	P	M	O												
	MANDIBLE							I	P	M	O													
52 kV/ child	MAXILLA									I	P	M	O											
	MANDIBLE								I	P	M	O												
50 kV/ child	MAXILLA									I	P	M	O											
	MANDIBLE								I	P	M	O												
70 kV/ adult	MAXILLA						I	P	M	O														
	MANDIBLE					I	P	M		O														
66 kV/ adult	MAXILLA							I	P	M	O													
	MANDIBLE						I	P	M	O														
63 kV/ adult	MAXILLA							I	P	M	O													
	MANDIBLE						I	P	M	O														
60 kV/ adult	MAXILLA								I	P	M	O												
	MANDIBLE							I	P	M	O													
57 kV/ adult	MAXILLA									I	P	M	O											
	MANDIBLE								I	P	M	O												
55 kV/ adult	MAXILLA									I	P	M	O											
	MANDIBLE								I	P	M	O												
52 kV/ adult	MAXILLA										I	P	M	O										
	MANDIBLE									I	P	M	O											
50 kV/ adult	MAXILLA										I	P	M	O										
	MANDIBLE									I	P	M	O											

Table 6:Exposure values with 30 cm (12") cone

TIME	0.01s	0.02s	0.03s	0.04s	0.05s	0.06s	0.08s	0.10s	0.12s	0.16s	0.20s	0.25s	0.32s	0.40s	0.50s	0.64s	0.80s	1.00s	1.25s	1.60s	2.00s	2.50s	3.20s
70 kV/child — MAXILLA									I	P	M	O											
70 kV/child — MANDIBLE								I	P	M		O											
66 kV/child — MAXILLA										I	P	M	O										
66 kV/child — MANDIBLE								I	P	M		O											
63 kV/child — MAXILLA										I	P	M	O										
63 kV/child — MANDIBLE									I	P	M		O										
60 kV/child — MAXILLA											I	P	M	O									
60 kV/child — MANDIBLE									I	P	M		O										
57 kV/child — MAXILLA											I	P	M	O									
57 kV/child — MANDIBLE										I	P	M		O									
55 kV/child — MAXILLA												I	P	M	O								
55 kV/child — MANDIBLE										I	P	M		O									
52 kV/child — MAXILLA												I	P	M	O								
52 kV/child — MANDIBLE											I	P	M		O								
50 kV/child — MAXILLA													I	P	M	O							
50 kV/child — MANDIBLE											I	P	M		O								
70 kV/adult — MAXILLA														I	P	M	O						
70 kV/adult — MANDIBLE													I	P	M		O						
66 kV/adult — MAXILLA															I	P	M	O					
66 kV/adult — MANDIBLE													I	P	M		O						
63 kV/adult — MAXILLA															I	P	M	O					
63 kV/adult — MANDIBLE														I	P	M		O					
60 kV/adult — MAXILLA																I	P	M	O				
60 kV/adult — MANDIBLE														I	P	M		O					
57 kV/adult — MAXILLA																I	P	M	O				
57 kV/adult — MANDIBLE															I	P	M		O				
55 kV/adult — MAXILLA																	I	P	M	O			
55 kV/adult — MANDIBLE															I	P	M		O				
52 kV/adult — MAXILLA																	I	P	M	O			
52 kV/adult — MANDIBLE																I	P	M		O			
50 kV/adult — MAXILLA																		I	P	M	O		
50 kV/adult — MANDIBLE																I	P	M		O			

I INCISORS   **P** PREMOLARS AND CANINES
M MOLARS   **O** OCCLUSAL EXPOSURE

NOTE When using the film holder select 1-2 steps longer exposure times.

13   ERROR CODES

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

14   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.

Disposal of Prostyle Intra X-ray Unit
X = action, (X) = action in cases where processing is available

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

15   TECHNICAL SPECIFICATIONS

Generator	Constant potential, microprocessor controlled, operating frequency 66 kHz
X-ray tube	Toshiba D-0711SB
Focal spot size	■ 0.7 mm according to IEC 336
Cone diameter	60 mm (2.36 in.) Rectangular 35 x 45 mm (1.38 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 mm Al equivalent at 70 kV according to IEC 522
Inherent filtration	1 mm Al equivalent at 70 kV according to IEC 522
Anode voltage	50, 52, 55, 57, 60, 63, 66, 70 kV, ±2 kV
Anode current	8 mA
Target angle	16°
Exposure times	0.01-3.20 sec., 23 steps
Reference current time product	8 mAs at 70 kV, 8 mA, 1 sec.
Lowest current time product	0.08 mAs at 8 mA, 0.01 sec.
Max. nominal anode voltage	70 kV
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	1800 mAs/h at 70 kV
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~/110-115 V~/220-240 V~ ±10%
Mains frequency	50/60 Hz ±10%
Fusing	8 AT at 220-240V~ 15 AT at 100 V~/110-115 V~
Duty cycle	1:15, automatic control
Electrical classification	Class I, type B
Weight	total 23 kg (51 lbs) tube head 4.5 kg (10 lbs)
Ambient temperature	operating +5°C - +40°C storage -10°C - +50°C
Humidity	25% - 75%

Dimensions (in mm)

PLANMECA
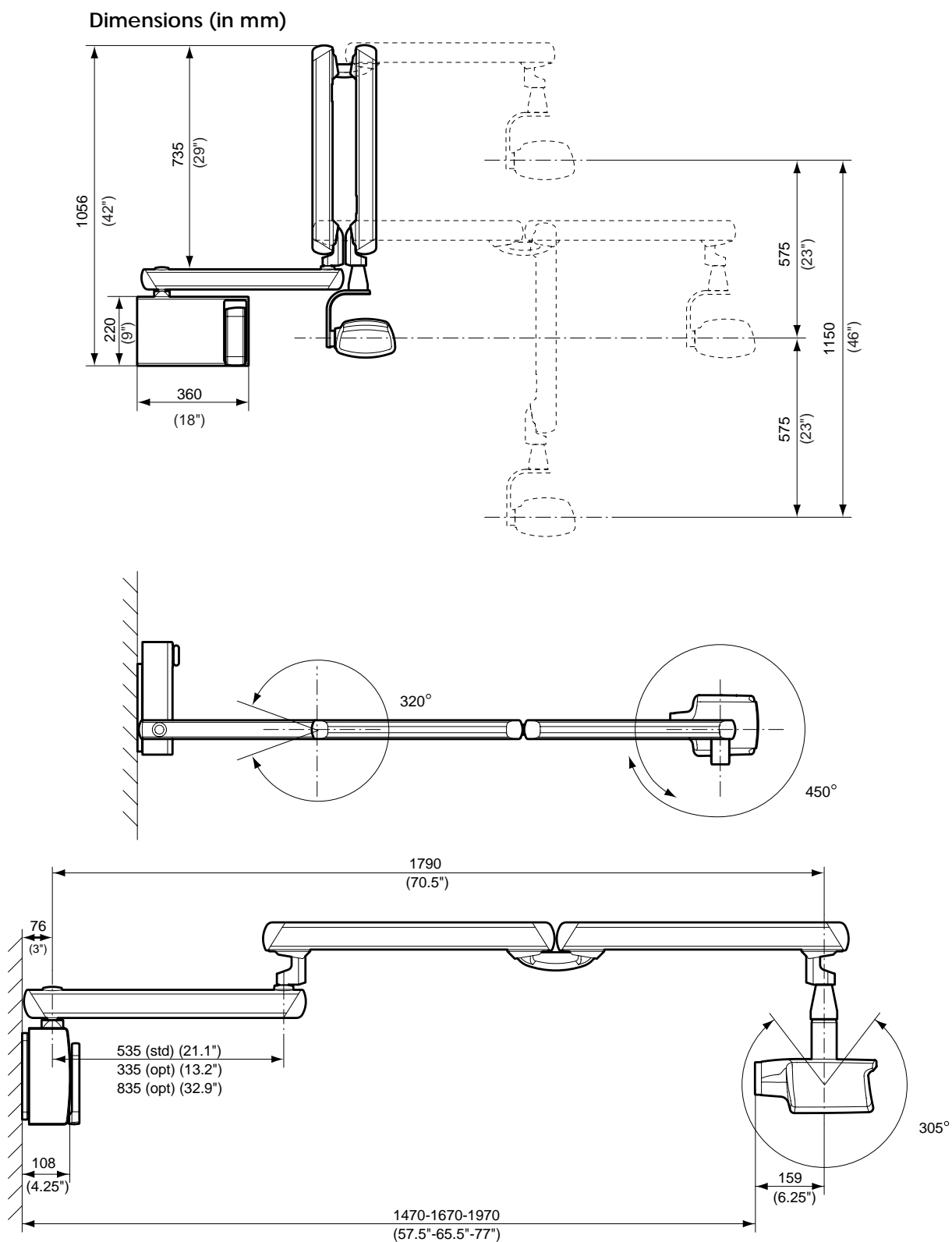
PLANMECA *Group*

Head Office Planmeca Oy
Asentajankatu 6
00810 Helsinki
Finland
Tel. +358 9 759 05500
Fax + 358-9-759 05 555
www.planmeca.com
e-mail: sales@planmeca.com

Planmeca Germany
Hindenburgstr. 158
D-22297 Hamburg
Tel. +49 40 513 20633

Planmeca Italy
Via Santa Rita da Cascia, 33
20143 Milano
Tel. +39 02 891 22868

Planmeca USA
1250 Greenbriar, Suite A
Addison, IL 60101
Tel. +1 630 953 2368

Planmeca Denmark
Egedal 1 C
2690 Karlslunde
Tel. +45 46 155 251

Planmeca Middle East
Al-Moosa Tower II,
Sheikh Zayed Road
P.O. Box 28826
Dubai
UAE
Tel. + 971 4 3327 668

Plandent Group

Head Office Plandent Oyj
Asentajankatu 6
00810 Helsinki
Finland
Tel. +358 9 759 05200

Davis Healthcare Services, U.K.
Summit House
Summit Road
Potters Bar
Hertfordshire EN6 3EE.
Tel. +44 1707 646 433

Plandent Sweden
P.O. Box 134
12723 Skärholmen
Tel. +46 8 979 730

AS Norsk Dental Depot, Norway
Østensjøveien 40
N-0667 Oslo
Tel. +47 2207 2727

Plandent Estonia
Toompuiestee 4
EE 0001 Tallinn
Tel. +372 6 311 307

Plandent Lithuania
Gedimino g. 15
3000 Kaunas
Tel. +370 7 323 227

Plandent/Protecta SIA, Latvia
Brivibas Street 40, Suite 41
LV-1050 Riga
Tel. +371 7 283 321