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Preva Dental X-Ray System

User Manual

KIT #30-A2086 **00-02-1576 Rev. S**

REV. T **ECN: P2506**

More Than Imaging. Excellence.

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Lincolnshire, Illinois 60069 U.S.A.
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General Information

Indications for Use

The Preva Intraoral Dental X-Ray System is to be used as an extraoral source of x-rays in Dental radiography.

Contraindications

None known

Warnings / Precautions

Radiation Safety	Only qualified and authorized personnel may operate this equipment observing all laws and regulations concerning radiation protection. • The operator at all times must remain 6ft. (2m) from the focal spot and the X-ray beam for operator protection. • Full use must be made of all radiation safety features on the equipment. • Full use must be made of all radiation protection devices, accessories and procedures available to protect the patient and operator from x-ray radiation.
Electrical Safety	• Only qualified and authorized service personnel should remove covers on the equipment. • This equipment must only be used in rooms or areas that comply with all applicable laws and recommendations concerning electrical safety in rooms used for medical purposes, e.g., IEC, US National Electrical code, or VDE standards concerning provisions of an additional protective earth (ground) terminal for power supply connection. • Before cleaning or disinfecting, this equipment must always be disconnected from the main electrical supply. • The Preva Dental X-Ray System is ordinary type medical equipment without protection against ingress of liquids. To protect against short-circuit and corrosion, no water or any other liquid should be allowed to leak inside the equipment.
Explosion Safety	This equipment must not be used in the presence of flammable or potentially explosive gases or vapors, which could ignite, causing personal injury and/or damage to the equipment. If such disinfectants are used, the vapor must be allowed to disperse before using the equipment.

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Attention:

The equipment must only be installed and operated in accordance with the safety procedures and operating instructions given in this manual and in the User Manual for the purposes and applications for which it was designed. Modifications and/or additions to the equipment may only be carried out by Progeny, A Midmark Company or by third parties expressly authorized by Progeny Dental to do so. Such changes must comply with legal requirements as well as with the generally accepted technical rules. It is the responsibility of the user to ensure that existing legal regulations regarding installation of the equipment with respect to the building are observed.

Caution:

Do not hang lead aprons on the horizontal extension arm.

X-RAY PROTECTION:

X-ray equipment may cause injury if used improperly.

The instructions contained in this manual must be read and followed when operating the Preva. Your Progeny Dental dealer will assist you in placing the Preva in operation.

The Preva Dental X-Ray System provides a high degree of protection from unnecessary x-radiation. However, no practical design can provide complete protection nor prevent operators from exposing themselves or others to unnecessary radiation.

Product Description

The Preva Dental X-Ray System is a state-of-the-art, high-frequency intra-oral x-ray machine. The Preva consists of five components, as shown in Figure 1 Component Diagram: the Control Unit, the Tubehead, the Articulating Arm, the Horizontal Arm, the Cone, and the Remote Control option.

Control Unit	The Control Unit provides for the input power connection and control of the Tubehead and Operator Panel. It provides automatic line voltage compensation, kVp control, and exposure time control. The Control Unit consists of the mounting base and Operator Panel.
Tubehead	The Tubehead contains the x-ray tube, high voltage circuit, and Cone. The Tubehead is shipped already assembled to the Articulating Arm. **Note:** There is a small hole in the plastic handle covering the back of the Tubehead. Under no circumstances should this hole be blocked as it provides an air vent to allow the Tubehead oil to expand and contract as the unit is operated.
Articulating Arm	The Articulating Arm provides the articulation support for the Tubehead and the reach and coverage of the Tubehead to the patient. The Articulating Arm allows smooth movement for precise positioning and does not drift or vibrate when left in position.
Horizontal Arm	The Horizontal Arm helps provide the necessary reach for the Preva. The Horizontal Arm pivots smoothly around a shaft inserted in the top of the Control Unit. The Horizontal Arm contains an access cover to connect the cable from the Horizontal Arm to the Control Unit. The Horizontal Arm is available in four lengths, providing reaches of 56, 66, 76 and 82 inches.
Cone	The Cone establishes the distance from the x-ray tube to the patient's skin. It provides positioning assistance and collimates the x-ray beam to within a defined circle at its end. The Preva is shipped with the standard 8 inch Cone attached to the Tubehead. A 12 inch Cone (30-A2033) can be ordered as an option.
Remote Control	An optional component, the remote control switch is used to make exposures in addition to or replacing the use of the exposure button.
Mobile Unit	An optional device, the mobile unit supports pre-programmed technique selections and x-ray acquisition. See Appendix A for the installation instructions for the mobile unit.
Installation and Service	The Preva Dental X-Ray System should only be installed and serviced by approved Progeny dealer personnel. Contact Progeny – A Midmark Company at (888) 924-3800 if you need assistance locating an approved dealer.

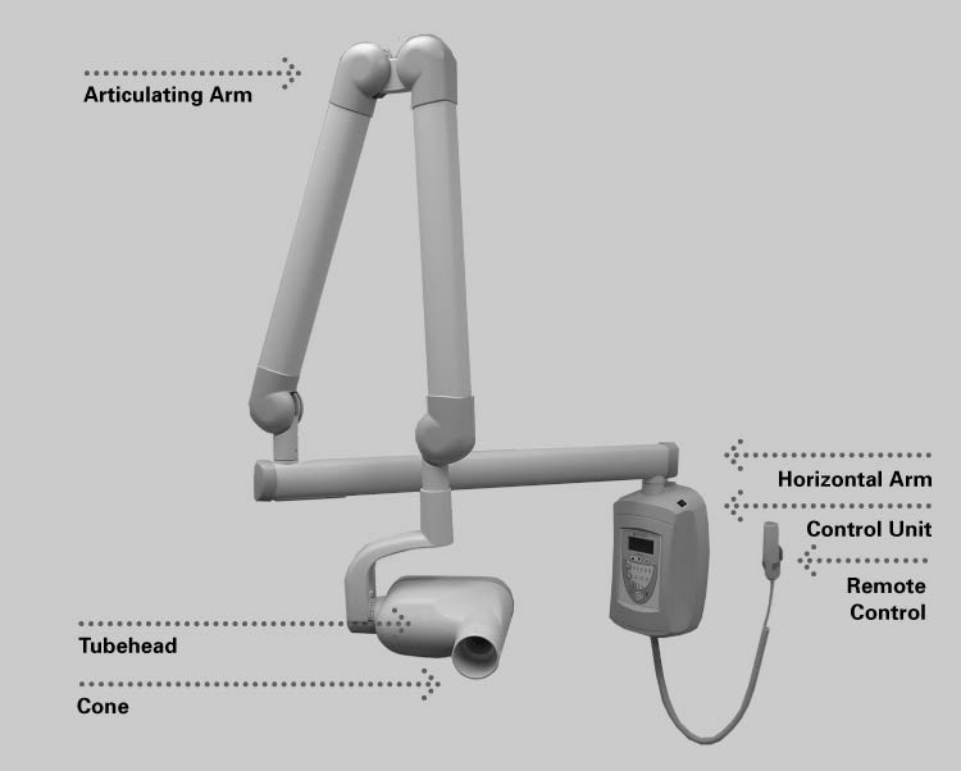

Figure 1 Component Diagram

Caution:

Do not hang lead aprons on the horizontal extension arm.

Compliance with Applicable Standards

Radiation Protection	The certified components of the Preva Dental X-Ray System comply with Radiation Performance Standards 21 CFR, Subchapter J, at the time of manufacture. The certified components of the Preva Dental X-Ray System comply with IEC 60601-1-3 Radiation protection/x-ray equipment.
UL 2601-1 File Number: E181750	Classified by Underwriters Laboratories Inc. with respect to electrical shock, fire and mechanical hazards only in accordance with UL 2601-1, and CAN/CSA C22.2 NO, 601.1-M90, and to the following particular standards, IEC60601-2-7, IEC60601-2-28.
EMI/EMC	IEC60601-1-2

Certified Components

Component	Reference Number
Tubehead	30-A1027
Control Unit	30-A0010
Cone 8 in.	30-A2016
Cone 12 in.	30-A2033
Cone 8 in. Rectangular	30-A2041
Cone 12 in. Rectangular	30-A2112
Cone 59 mm	30-A2107
Cone 60 mm	30-A2101

EC Declaration of Conformity

Name and Description of Product

Progeny Preva

Catalog Model	P7018, 82 inch reach 30-A0010, Control 30-A2164, Extension Arm, Extra Long
Catalog Model	P7017, 76 inch reach 30-A0010, Control 30-A2071, Extension Arm, Long
Catalog Model	P7016, 66 inch reach 30-A0010, Control 30-A2073, Extension Arm, Short
Catalog Model	P7015, 56 inch reach 30-A0010, Control 30-A2074, Extension Arm, Compact
Catalog Model	P7017-MG, Mobile 30-A0010, Control
Class: IIb	

Reference Numbers to which Conformity is Declared

The following regulatory documents apply:
UL 2601-1
IEC 60601-1-2
IEC 60601-1-3
IEC 60601-2-7
IEC 60601-2-28
IEC 60601-2-32
Medical Device directive
ISO 13485

FDA 510K File Number K043092

Declaration

Midmark Corporation declares that the products described herein meet all the applicable Essential Requirements of the EC Medical Device Directive 93/42/EEC in Annex I. For Class IIb products described herein, the product is manufactured, inspected, tested and released in accordance with the approved quality assurance system established in accordance with ISO 13485 and Annex II of the EC Medical Device Directive under the Supervision of the SGS United Kingdom Ltd., a Notified Body.

Contact

Technical Support
techsupport@progenydental.com

Authorized Representatives

North America	Midmark Corporation 675 Heathrow Dr. Lincolnshire, Illinois 60069 U.S.A. Phone: 888-924-3800 Fax: 847-415-9801
Europe	CE Partner 4U Esdoornlaah 13 3951DB Maarn The Netherlands Phone: +31.343.442.524 Fax: +31.343.442.162

Explanation of Symbols on Technical Labels

	Type B: Protection against electric shock (IEC 60601.1-1988)
	Consult written instructions in User's Manual.
	ATTENTION RAYONS-X: OPERATION SEULEMENT PAR DU PERSONNEL AUTORISE. VOIR MANUEL DE L'OPERATEUR.
	WARNING X-RAY THIS X-RAY UNIT MAY BE DANGEROUS TO PATIENT AND OPERATOR UNLESS SAFE EXPOSURE FACTORS AND OPERATING INSTRUCTIONS ARE OBSERVED.
	X-RAY EMISSION
L	Mains HOT WIRE
N	Mains NEUTRAL WIRE
	Earth Ground

Obtaining Technical Support

Contact

Progeny – A Midmark Company
675 Heathrow Dr.
Lincolnshire, Illinois 60069 U.S.A.
Phone: 888-924-3800
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techsupport@progenydental.com

Operating the Preva Dental X-Ray System

Using the Operator Panel

Power On Settings

When the Preva Dental X-Ray System is powered on, the Operator Panel selections are those that were in use when the system was last powered off.

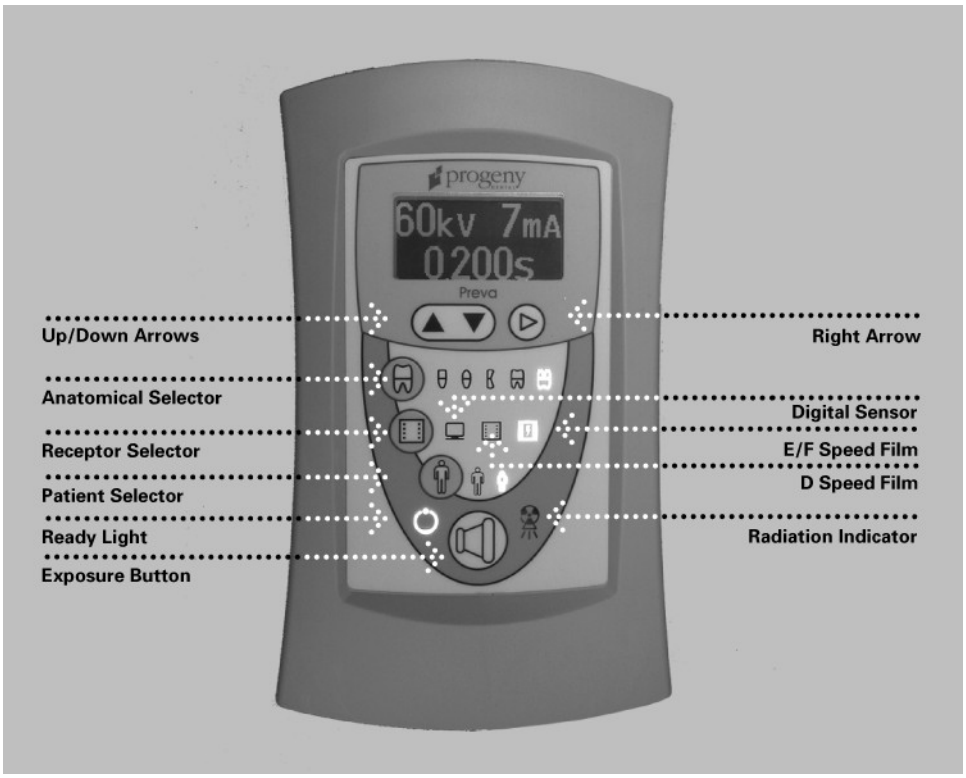

Figure 2
Preva Operator Panel

Exposure Settings

When the system is powered on, the Operator Panel, Figure 2, displays the exposure settings (kV, mA, and seconds) for the currently selected tooth, image receptor type, and patient size. Use the Tooth Selection, Image Receptor Type, and Patient Size buttons to select other exposure settings.

- For a table of the factory-programmed exposure settings, refer to the Pre-programmed Exposure Settings tables later in this manual.

Adjusting Exposure Settings

Preset exposure settings can be adjusted prior to making an exposure. Use the right arrow to select the exposure setting to adjust. Then use the up and down arrow buttons to adjust the value.

- To save new presets, use System Configuration mode described later in this manual.

Exposure Button and Ready Indicator

The Exposure button is used to initiate an x-ray exposure. For a complete exposure, the button must be pressed and held until the Radiation Indicator no longer illuminates and the audible signal is no longer heard. Releasing the Exposure button immediately terminates the x-ray exposure.

CAUTION!
Releasing the Exposure button prior to the completion of the x-ray exposure will result in an incomplete exposure of the image. This may require the operator to re-take the radiograph. When a premature release of the Exposure button occurs, the system will notify the operator momentarily, then return to operating mode.

Ready Indicator

The Ready Indicator illuminates when the system is ready to make an exposure. Immediately after an exposure, the Ready Indicator flashes until the x-ray tube cools down sufficiently to make the next exposure. When the Ready Indicator is flashing, no exposure can be made.

Radiation Indicators

The Preva has a visible and an audible Radiation Indicator. When an exposure is in progress, the Radiation Indicator on the Operator Panel is illuminated and an audible tone is heard. The exposure is complete when the Radiation Indicator is extinguished and the audible tone is no longer heard.

Taking an X-Ray

1. Turn the power switch, located at the upper right of the Control Unit, to the “On” position. The Ready Indicator on the front of the Operator Panel, Figure 2, will light.
2. Verify that the unit is set for the correct Image Receptor Type. The icon for the currently selected Image Receptor Type is illuminated. To change the Image Receptor type, press the Image Receptor Type button until the correct Image Receptor Type is selected.
3. Verify that the system is set for the appropriate Patient Size. The icon for the currently selected Patient Size is illuminated. The change the Patient Size, press the Patient Size button until the correct Patient Size is selected.
4. Verify that the unit is set for the Tooth to be imaged. The icon for the currently selected Tooth is illuminated. To change the Tooth Selection, press the Tooth Selection button until the correct Tooth is selected.
5. If desired, preset exposure settings for the combination of Image Receptor Type, Tooth Selection, and Patient size, selected in steps 2-4, can be adjusted prior to making an exposure. Use the right arrow to select the exposure setting to adjust. Then use the up and down arrow buttons to adjust the value. Skip this step if you are using pre-programmed exposure settings.
   Note: When exposure settings are being adjusted, the Tooth Selection, Image Receptor Type, and Patient Size buttons are turned off.
6. Position the Tubehead to the patient using standard accepted positioning procedures.
7. Press and hold the Exposure button until the audible signal is no longer heard and the Radiation Indicator is no longer illuminated. Releasing the Exposure button or coil-cord hand switch at any time will immediately terminate the exposure.
   Note: When using the coil-cord hand switch, it is recommended that the operator exit the operatory if possible.
   Note: In order to comply with regulations and good safety practices, the technique factors must be visible to the operator from the remote location.
8. Return the Tubehead to the storage position.
   Note: Be careful not to strike the Tubehead on the wall when returning it to the storage position.

It may be necessary to increase or decrease the kV, mA, or time from the preset values for one exposure. To do so:

1. Press the Enter button to highlight the value to change.
2. Use the up or down button to increase or decrease the value (no lights on the display will be lit to indicate the preset values).
3. Press the Exposure button.
4. Press any other button (Tooth, Film, Patient Size) to return the display to the preset values.

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Using the 12 inch Cone (30-A2033)

The Preva Dental X-Ray System is factory set for use with the standard supplied 8 inch (20 cm) Cone. The 12 inch (30 cm) Cone (30-A2033) is available. Using the longer cone requires longer exposure times. See the System Configuration section of this manual for instructions to set the system to use the longer cone.

Recommended Maintenance

Regular Maintenance

In the interest of equipment safety, a regular maintenance program must be established. This maintenance program should consist of annual system function checking. It is the owner's responsibility to arrange for this service and to assure that the personnel performing this are fully qualified to service Progeny Dental x-ray equipment.

Cleaning and Disinfecting

Cleaning / Disinfecting

Employ personal protective equipment to prevent the spread of infections
Clean the outside of the system using a damp towel or non-alcohol based disinfectant.

CAUTION:

- Do not allow liquids to drip into the system electronics.
- Do not spray cleaner or disinfectant directly onto the machine.
- Protect the system from contamination using barriers available from dental distributors.
- Follow the disinfectant manufacturer's recommendations when using their cleaner or disinfectant.

Cleaning Methods

If not using a barrier, between each patient, perform the following cleaning and disinfecting steps.

1. Remove gross bio-burden from the cone, handles and structure with a disposable towel moistened with water.
2. Dry the cone, handles and structure with disposable towels.
3. Wipe the cone, handles and structure with a germicidal broad spectrum disinfectant product following the disinfectant manufacturer's instructions.
4. Clean any remaining disinfectant residue from the system with a disposable towel moistened with water. This additional step prevents possible product discoloration or corrosion.
5. Dry the cone, handles and structure with paper towels.

Caution!
The Preva Dental X-Ray System is not waterproof. Use only moistened, not saturated, towels.

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Checking System Functions

The following checks must be performed to complete the installation of the Preva Dental X-Ray System and as part of the recommended maintenance as indicated in the User Manual. Failure to perform these checks may result in an installation that does not comply with U.S. Radiation Performance Standards 21 CFR Subchapter J.

CAUTION!
If the Preva Dental X-Ray System does not perform the functions below, advise the owner that the system is not to be used. See the Troubleshooting section of this manual or contact Progeny's Technical Support.

System Function Checklist		✓
Wall Mounting	Ensure that the wall support is adequate and that the system is properly mounted to the wall.	
Labels	Ensure that all certified components bear labels that include the model and serial number, date of manufacture and a statement of certification as noted elsewhere in this manual.	
Tubehead	Check for oil leaks or other evidence that could indicate internal damage. Replace the Tubehead, if necessary.	
Tubehead Rotation	Ensure that the Tubehead maintains its position around the horizontal axis while remaining easy to rotate and position. Also check the vertical pivot of the Tubehead for easy movement while remaining in position after moving.	
Suspension	Check that all movements are smooth and quiet. Verify that the Tubehead is properly counterbalanced for vertical drift and that the Horizontal and Articulating Arms do not drift horizontally.	
Power Switch	Verify that the switch is working properly and that the Ready Indicator is illuminated when the power switch is in the ON position.	
Operator Panel Controls	With the power switch, located at the upper right of the Control Unit, in the ON position, verify that technique factors appear on the Operator Panel. Also, check the function of the selection buttons for Tooth Selection, Image Receptor Type and Patient Size. Pressing a selection button should cause indicator lamps to indicate the selected item.	
Exposure Button	Verify that the Exposure button on the Operator Panel is functioning properly. To make an exposure, press and hold the Exposure button until the Radiation Indicator is extinguished and the audible signal is no longer heard.	
Exposure Indicators	Make several exposures and verify that the Radiation Indicator illuminates and the audible signal is heard.	
Premature Termination	Select the longest exposure time possible using the up and down arrows. Initiate an exposure but release the Exposure button after a brief period of time before the timer terminates the exposure. Verify that the display indicates “Pre-termination Error” and returns to normal operating mode.	
Coil-cord Hand Switch Option	If a coil-cord hand switch is used, inspect the switch housing and coil cord for damage or wear. Replace if evidence of damage is present.	
User Information	Make certain that the user of the system has received the User Manual.	

New Tube Seasoning Procedure

X-ray tubes that sit dormant for several months can become electrically unstable. To remedy this condition, it is recommended you perform a “new tube seasoning procedure.” This process establishes stable high voltage operation and will ultimately extend the life of the tube. Repeat this procedure before returning to normal operation any time the system has been unused for more than two months.

1. Verify system operation.
2. Energize the system.
3. Select 60 kilovolts, 7 milliamperes, and the exposure time of one second.
4. Make five exposures at this level, observing the normal cooling time.
5. Select 65 kilovolts, 7 milliamperes, and the exposure time of one second.
6. Make five exposures at this level, observing the normal cooling time.
7. Select 70 kilovolts, 6 milliamperes, and the exposure time of one second.
8. Make five exposures at this level, observing the normal cooling time.

Solving Performance Issues

Performance Issues

Light or Dark X-Ray Images	1. Adjust the selected exposure time, kilovoltage or tube current to produce an acceptable image. If necessary, reprogram the techniques factors, as explained in the System Configuration section of this manual. 2. Verify the kilovoltage and tube current during an exposure using the diagnostic mode, as explained in the System Configuration section of this manual. Alternatively, you may employ a non-invasive meter to evaluate kilovoltage and exposure time. 3. Inspect the condition of the remaining imaging chain components such as the film, chemistry and processor, or the condition of the x-ray sensor and computer.
No X-Ray	If no x-ray is produced, check the following: 1. Verify that the line cord (if one is in use) is properly connected. 2. Verify that the power switch is in the ON position.
Pre-termination Error	Early release of the exposure switch will cause a pre-termination error to occur. After five seconds, the system will return to the normal operating condition. Be advised that this will result in an underexposed image.

Obtaining Technical Support

Contact	Progeny – A Midmark Company 675 Heathrow Dr. Lincolnshire, Illinois 60069 U.S.A. Phone: 888-924-3800 Fax: 847-415-9801

Pre-programmed Exposure Times

The tables below show the factory default exposure settings for each combination of Tooth, Image Receptor Type, and Patient Size on the Operator Panel. These exposure settings can be modified using the System Configuration mode. See the System Configuration section for details.

8-inch Cone

	Setting	Progeny® Adult	Progeny® Child	Schick Adult	Schick Child	Dexis® Adult	Dexis® Child	Ph. Plate Adult	Ph. Plate Child	D Speed Adult	D Speed Child	E/F Speed Adult	E/F Speed Child
Incisor	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.100	0.050	0.080	0.040	0.125	0.064	0.200	0.100	0.320	0.160	0.160	0.080
Bicuspid	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.100	0.050	0.080	0.040	0.125	0.064	0.200	0.100	0.320	0.160	0.160	0.080
Bitewing	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.125	0.064	0.100	0.050	0.160	0.080	0.250	0.125	0.400	0.200	0.200	0.100
Lower Molar	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.125	0.064	0.100	0.050	0.160	0.080	0.250	0.125	0.400	0.200	0.200	0.100
Upper Molar	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.160	0.080	0.125	0.064	0.200	0.100	0.320	0.160	0.500	0.200	0.250	0.100

12-inch Cone

	Setting	Progeny Adult	Progeny Child	Schick Adult	Schick Child	Dexis® Adult	Dexis® Child	Ph. Plate Adult	Ph. Plate Child	D Speed Adult	D Speed Child	E/F Speed Adult	E/F Speed Child
Incisor	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.200	0.100	0.160	0.080	0.250	0.125	0.500	0.250	0.640	0.320	0.320	0.160
Bicuspid	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.200	0.100	0.160	0.080	0.250	0.125	0.500	0.250	0.640	0.320	0.320	0.160
Bitewing	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.250	0.125	0.200	0.100	0.320	0.1600	0.640	0.320	0.800	0.400	0.400	0.200
Lower Molar	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.250	0.125	0.200	0.100	0.320	0.160	0.640	0.320	0.800	0.400	0.400	0.200
Upper Molar	KV	65	65	65	65	60	60	65	65	60	60	60	60
	MA	7	7	7	7	7	7	7	7	7	7	7	7
	Seconds	0.320	0.160	0.250	0.125	0.400	0.200	0.800	0.400	1.000	0.400	0.500	0.200

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Other Digital Exposure Settings

The tables below show other exposure settings for each combination of Tooth, Image Receptor Type and Patient Size on the Operator Panel. These exposure settings can be programmed, see the System Configuration section for details; "Changing Pre-programmed Exposure Setting"; "Change Presets Individually".

8 inch Cone

	Setting	Dentrix Adult	Dentrix Child	Gendex® Adult	Gendex® Child	Kodak® Adult	Kodak® Child	Sirona® Adult	Sirona® Child	Suni® Adult	Suni® Child	Den-Optix Adult	Den-Optix Child
Incisor	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.080	0.040	0.050	0.025	0.125	0.064	0.080	0.040	0.032	0.020	0.100	0.064
Bicuspid	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.080	0.040	0.064	0.032	0.125	0.064	0.080	0.040	0.050	0.032	0.125	0.080
Bitewing	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.125	0.064	0.080	0.040	0.160	0.080	0.100	0.050	0.080	0.040	0.250	0.125
Lower Molar	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.080	0.040	0.080	0.040	0.160	0.080	0.100	0.050	0.080	0.040	0.125	0.080
Upper Molar	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.100	0.050	0.100	0.050	0.200	0.100	0.125	0.064	0.100	0.050	0.160	0.100

12 inch Cone

	Setting	Dentrix Adult	Dentrix Child	Gendex® Adult	Gendex® Child	Kodak® Adult	Kodak® Child	Sirona® Adult	Sirona® Child	Suni® Adult	Suni® Child	Den-Optix Adult	Den-Optix Child
Incisor	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.160	0.080	0.100	0.050	0.250	0.125	0.160	0.080	0.064	0.032	0.250	0.160
Bicuspid	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.160	0.080	0.125	0.064	0.250	0.125	0.160	0.080	0.100	0.050	0.320	0.250
Bitewing	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.250	0.125	0.160	0.080	0.320	0.160	0.200	0.100	0.160	0.080	0.640	0.320
Lower Molar	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.160	0.080	0.160	0.080	0.320	0.160	0.200	0.100	0.160	0.080	0.320	0.200
Upper Molar	KV	70	70	65	65	60	60	60	60	65	65	60	60
	MA	6	6	7	7	7	7	7	7	7	7	7	7
	Seconds	0.200	0.100	0.200	0.100	0.400	0.200	0.250	0.125	0.200	0.100	0.400	0.250

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Changing Language

Five languages are preprogrammed in the display panel. To change follow the steps below.

1. Push and hold the Tooth and Patient selection switches, a menu screen will appear after about 5 seconds. (See Figure 34A)
2. Using the down arrow highlight “Configure Unit” and press the right arrow key. (See Figure 34)
3. “Select Languages” on the next screen is highlighted press the right arrow key.
4. Select the desired language and press the right arrow key. If you do not see your desired language listed arrow down to “More” and press the right arrow key.
5. After selection arrow down to Exit and press the right arrow key then repeat this procedure to return to the main screen.

Figure 34A Preva Operator Panel

System Configuration

System Configuration Mode

About System Configuration Mode

The Preva Dental X-Ray System has a software-driven system configuration mode. When the Preva is in system configuration mode, you can perform the following procedures:

- Adjusting the Display
- Changing Pre-programmed Exposure Settings
- Changing the Cone Size
- Showing Current System Configuration
- Displaying Diagnostic Data

Using System Configuration Mode

1. To enter system configuration mode, depress the Tooth Selection and Patient Size Selection buttons on the Operator Panel simultaneously for 5 seconds. The display shows the Main System Configuration menu, as shown in Figure 3, and the Ready Indicator blinks.
2. To select menu items while in system configuration mode, use the up and down arrows to highlight a menu option. Then use the right arrow button as an Enter button to select the highlighted option. When changing presets, the right arrow button is also used to select the technique factor.
3. After selecting a menu option, use the up and down arrows to increase or decrease values.

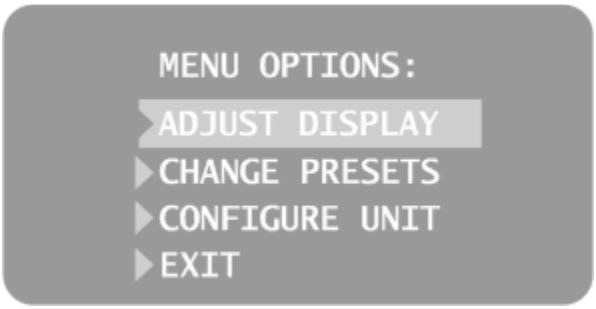

Figure 3
Main System Configuration Menu

Adjusting the Display

The Preva Dental X-Ray System allows the operator to adjust the display image.

1. From the system configuration main menu, shown in Figure 3, select ADJUST DISPLAY. You will see the Display Options menu shown in Figure 4.
2. Selecting EXIT returns the display to the Main System Configuration menu shown in Figure 3.

Adjusting Contrast

1. Select ADJUST CONTRAST from the menu. You will see the Progeny logo.
2. Use the up and down arrows to increase or decrease the contrast between the menu text and the display background.
3. Press the right arrow to save your settings.

Reversing the Image

1. Select REVERSE IMAGE from the menu. The text and display background colors will be swapped.
2. Press the right arrow to save your settings.

Figure 4 Display Options Menu

Changing Pre-programmed Exposure Settings

The Preva Dental X-Ray System allows the operator to increase or decrease image density for all presets for a receptor simultaneously or to change each of the technique factors for a preset individually. You can also restore factory default settings. For charts of the factory default settings, refer to Factory Default Exposure Settings later in this manual.
Note: If the 12 inch cone is going to be used, configure the Preva for use with the 12 inch cone before changing pre-programmed exposure settings. Configuring the Preva for use with the 12 inch cone will reset exposure settings to the default settings used with the 12 inch cone.
Note: Before changing presets, use the table below to write down the presets you are programming.

Displaying the Preset Options Menu

1. From the Main System Configuration menu, shown in Figure 3, select CHANGE PRESETS. You will see the Preset Options menu shown in Figure 5.
2. Selecting EXIT returns the display to the Main System Configuration menu shown in Figure 3.

Figure 5
Preset Options Menu

Changing All Receptor Settings Globally

1. Select ALTER DENSITIES from the Preset Options menu. The first Image Receptor Type illuminates. The display shows the selected Image Receptor Type and current density.
2. Using the Image Receptor Type button, select the image receptor to adjust.
3. Use the up and down arrow buttons to specify a percentage by which densities will be increased or decreased for the selected receptor. Densities can be increased or decreased according to values provided on the display.
4. Press Enter to save your settings.

Preprogramming to Digital Sensors

1. Energize the system.
2. Press the Tooth Selection and Patient Size Selection buttons for five full seconds.
3. Select CHANGE PRESETS from the Menu Options screen.
4. Select SELECT RECEPTOR from the Preset Options menu (Figure 5).
5. Press the up or down button to highlight the sensor or phosphor plate to change, and press Enter.
6. Select YES or NO on the Verification screen.
7. Exit the Preset Options menu.
8. Exit the Menu Options menu. A message of “Saving Settings” will display briefly, and then the system will return to the normal operational mode.

Note: When you are working in service mode, the green light next to the exposure button will blink.

Changing Presets Individually

1. Select EDIT PRESETS from the Preset Options menu. The display notifies you that you are entering Edit Preset Mode, and Tooth Size, Image Receptor Type, and Patient Size are illuminated.
2. Use the Tooth Selection, Image Receptor Type, and Patient Size Selection buttons to select the preset to change. The display shows the current values for the preset.
3. Use the right arrow button to display the technique factor to change.
4. Use the up and down arrow buttons to set the value for the selected technique factor and preset.
5. Repeat steps 2-4 to change additional presets.
6. When you have completed all changes, press the Tooth Selection and Patient Size Selection buttons simultaneously for 5 seconds to record the change.

Recall Presets

1. To return all presets to factory defaults, select RECALL PRESETS from the Preset Options menu. The menu will ask you to confirm your choice.
2. Select YES using the up arrow button and return all presets to factory default settings. **Selecting YES will erase any custom presets that have been set up.**
3. Select NO using the down arrow button and retain current presets. To retain the presets, select YES.

Record Your Pre-programmed Exposure Settings

If the pre-programmed exposure settings do not produce the density desired, adjust the settings using System Configuration mode. Record your settings in the table below.

8 inch (20 cm) Cone		Digital Receptor		D-speed Film		E/F Speed Film	
Tooth Selection	Setting	Adult	Child	Adult	Child	Adult	Child
Incisor	kV						
	mA						
	seconds						
Bicuspid	kV						
	mA						
	seconds						
Bitewing	kV						
	mA						
	seconds						
Lower Molar	kV						
	mA						
	seconds						
Upper Molar	kV						
	mA						
	seconds						

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12 inch (20 cm) Cone		Digital Receptor		D-speed Film		E/F Speed Film	
Tooth Selection	Setting	Adult	Child	Adult	Child	Adult	Child
Incisor	kV						
	mA						
	seconds						
Bicuspid	kV						
	mA						
	seconds						
Bitewing	kV						
	mA						
	seconds						
Lower Molar	kV						
	mA						
	seconds						
Upper Molar	kV						
	mA						
	seconds						

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Showing Current System Configuration

The Preva Dental X-Ray System displays the current system configuration. This display is informational only.

1. From the Main System Configuration menu, shown in Figure 3, select CONFIGURE UNIT. You will see the Configuration menu shown in Figure 6.
2. Select SHOW CONFIG. The display will show:
   - Current software version
   - Cone size
   - Diagnostic mode on or off
3. Press any button on the Operator Panel to return to the Configuration menu.

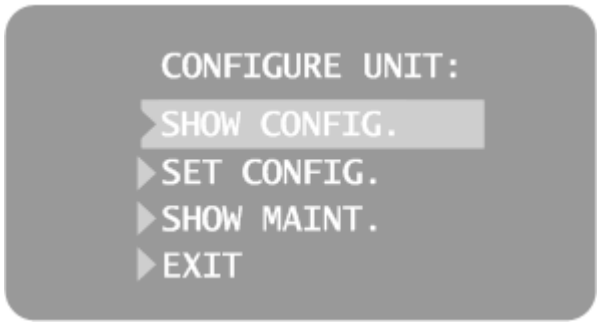

Figure 6
Configuration Menu

Changing the Cone Size

Selecting SET CONFIG. from the Configuration menu, shown in Figure 6, displays the Set Configuration menu, Figure 7, with options to change the cone size. The Preva Dental X-Ray System is factory set for use with the standard supplied 8 inch (20 cm) Cone. The 12 inch (30 cm) Cone (30-A2033) is available. Using the longer Cone requires longer exposure times, which the Preva automatically selects when you change the Cone size in the Set Configuration menu.

Using a 12 inch Cone

1. From the Main System Configuration menu, shown in Figure 3, select CONFIGURE UNIT. You will see the Configuration menu shown in Figure 6.
2. Select SET CONFIG. You will see the Set Configuration menu, shown in Figure 7.
3. From the Set Configuration menu, use the up and down arrows to highlight 12” CONE SIZE.
4. Press the right arrow button to select the 12” CONE. The display warns you that selecting the 12 inch Cone will override custom presets with the default factory settings for the 12 inch Cone.
5. Using the up arrow, select YES to install presets for the 12 inch Cone.

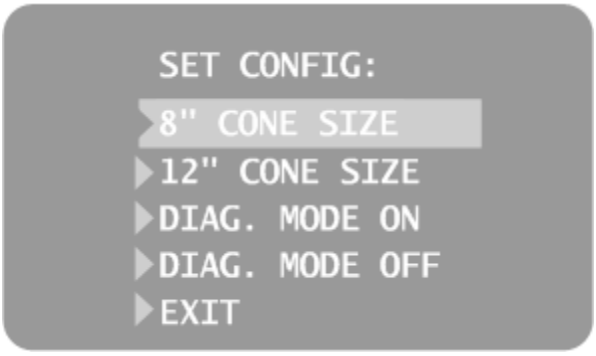

Figure 7
Set Configuration Menu

Diagnostic Mode

About Diagnostic Mode

The Preva Dental X-Ray System has a diagnostic mode in which you can display a summary of maintenance data or display feedback values after each exposure.

Showing the Maintenance Summary

1. From the Main System Configuration menu, shown in Figure 3, select CONFIGURE UNIT. You will see the Configuration menu shown in Figure 6.
2. Select SET CONFIG. You will see the Set Configuration menu, shown in Figure 7.
3. To display a summary of maintenance data, highlight select SHOW MAINT. The following maintenance data are displayed:
    - Total KJ (kilojoules—total system heat on x-ray tube)
    - Exposure Count
    - Reboots (power up cycles)
    - OT Counts (over-threshold counts)
4. Press any button on the Operator Panel to return to the Configuration menu.

Showing Feedback Values After an Exposure

If you take an x-ray while in diagnostic mode, the display shows feedback values for that exposure. Until you exit diagnostic mode, the display will continue to show feedback values after each exposure.

1. From the Main System Configuration menu, shown in Figure 3, select CONFIGURE UNIT. You will see the Configuration menu shown in Figure 6.
2. Select SET CONFIG. You will see the Set Configuration menu, shown in Figure 7.
3. From the Set Configuration menu, use the up and down arrows to highlight DIAG MODE ON. Press the right arrow button to turn on diagnostic mode.
4. Exit System Configuration mode by highlighting and selecting EXIT in the Configuration and Main menus.
5. Make an exposure. The display will show the following feedback values:
    - kV
    - mA
    - Filament current
6. Press any button on the Operator Panel to clear the feedback values from the display.
7. To exit diagnostic mode, depress the Tooth Selection and Patient Size Selection buttons simultaneously for 5 seconds to display the Main System Configuration menu. From the Main System Configuration menu, highlight and select CONFIGURE UNIT. Then highlight and select SET CONFIG. On the Set Configuration menu, highlight and select DIAG MODE OFF.

Specifications

Preva Dental X-Ray System

The following specifications contain information required to be provided to the user per Federal Regulation 21 CFR.

Line Voltage	110-230 VAC +/- 10% 50/60 Hz
Line Load	Max. current 5 amps
Maximum Rated Tube Potential	70 KVp
kVp Accuracy	+/- 5% selectable
Tube Current	4-7 mA +/- 1 mA
Exposure Time	10 ms through 2.00 seconds
Timer Accuracy	5% +/- 1 ms
Source to Skin Distance	8 inch (20 cm) 12 inch (30 cm)
Minimum Half Value Layer	1.7 mm Aluminum equivalent at 70 kVp
Minimum Inherent Filtration	2 mm Aluminum equivalent @ 70 kVp
Focal Spot	0.4 mm (IEC 336)
Automatic Cooling Time	15 times the exposure time wait before the next exposure can begin
Leakage Technique Factors	0.4 mA at 70 kVp
Target Angle	12.5 degrees
Operating Temperature	+50 F/+95 F (+10 C/+35 C)
Storage Temperature	-31F/+150 F (-35 C/+66 C)
Maximum Altitude	12,000 ft
Cone Focal Length	8 inch (20 cm) for bisecting angle technique 12 inch (30 cm) for paralleling technique
Diameter of X-Ray	2.7 inch (6.9 cm) at the end of the Cone Specifications for optional cones differ

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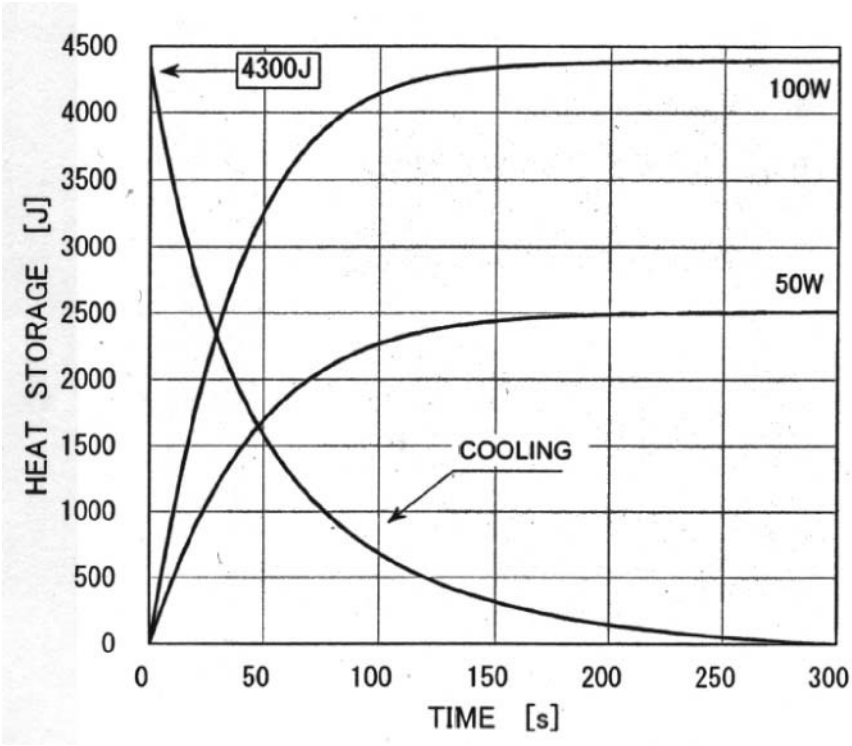


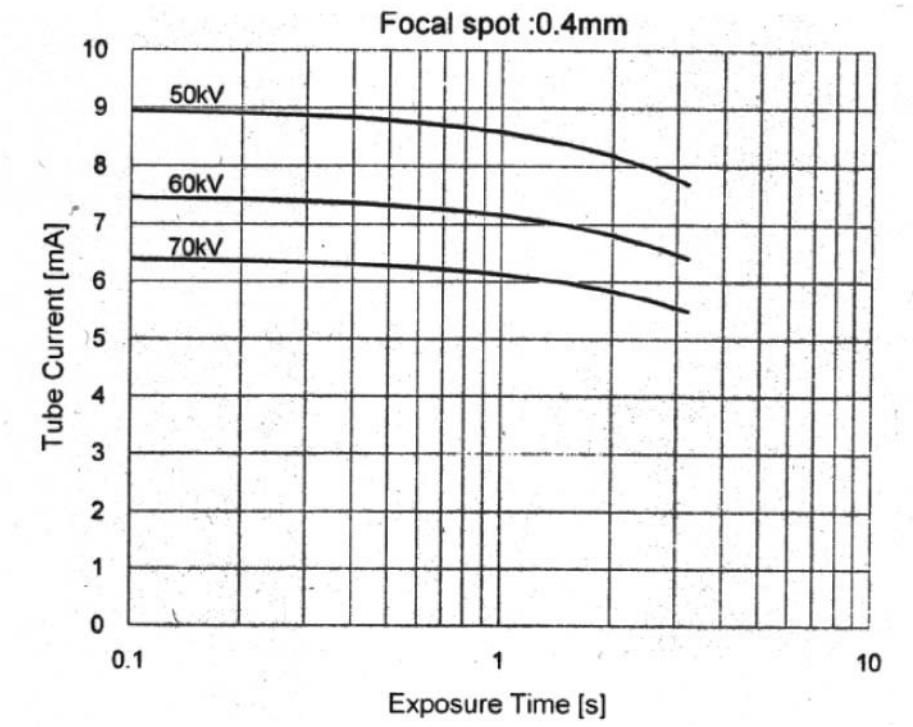
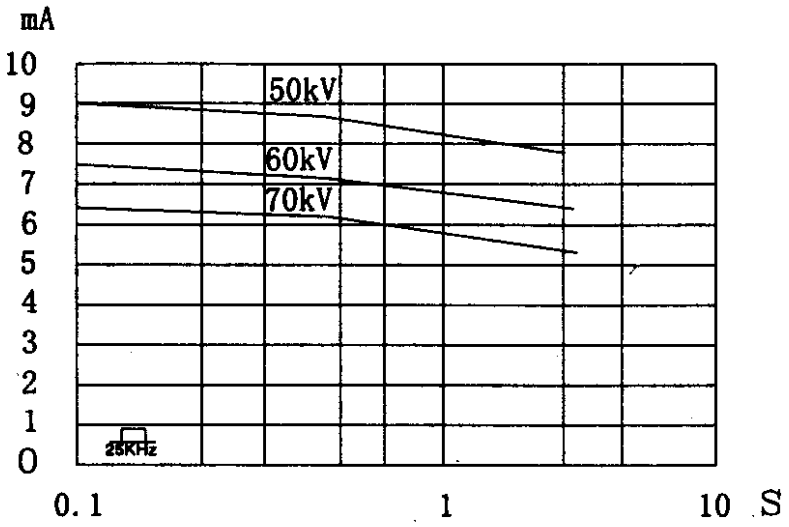
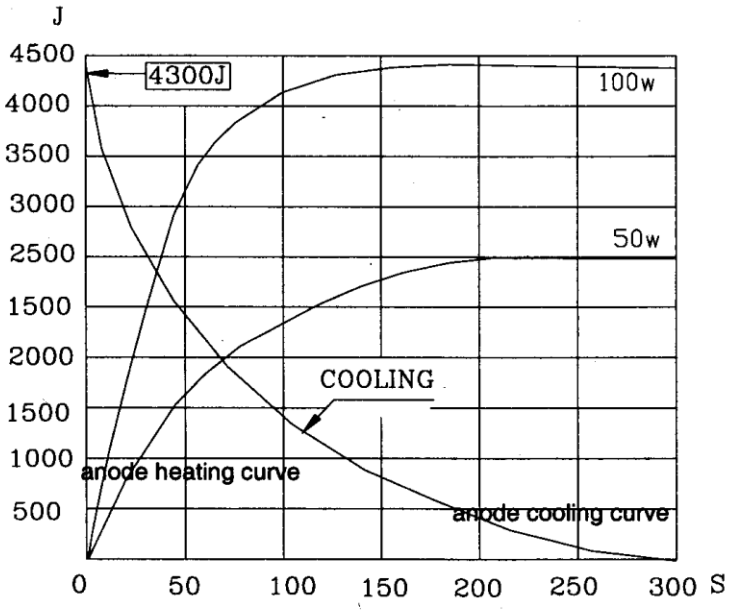


Figure 8
Toshiba Tube Rating Charts



Rating Chart



Thermal Characteristics Chart

Figure 9
Kailong Tube
Rating Charts

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