Carestream DENTAL

CS 9600

Safety, Regulatory and Technical Specifications User Guide

Notice

The Regulatory Information and Technical Specifications User Guide for the CS 9600 includes information on the safety instructions, regulatory information and the technical specifications of the devices. We recommend that you thoroughly familiarize yourself with this guide to make the most effective use of your system.

The information contained in this guide may be subject to modification without notice, justification or notification to the persons concerned.

U.S. Federal law restricts this device to sale by or on the order of a dentist or physician.

This document is originally written in English.

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The CS 9600 complies with Directive 93/42/EEC relating to medical devices.

CE
0086

Contents

1 Safety Information

Indications for Use

CS 9600 is extraoral system intended to produce two-dimensional and three-dimensional digital X-ray images of the dento-maxillofacial, ENT (Ear, Nose and Throat), cervical spine and wrist regions at the direction of healthcare professionals as diagnostic support for pediatric and adult patients.

CAUTION
Do NOT use on patient who are about 5 years old and below and who are less than about 21 kg (46 lb) in weight and 113 cm (44.5 in) in height.

CAUTION
Do NOT use cone beam imaging for routine or screening examinations. Consider using other diagnostic tools. You must justify that the imaging method that you use to examine each patient demonstrates that the benefit outweighs the risks.

Conventions in this Guide

The following special messages emphasize information or indicate potential risk to personnel or equipment:

WARNING: Warns you to avoid injury to yourself or others by following the safety instructions precisely.

CAUTION: Alerts you to a condition that might cause serious damage.

Important: Alerts you to a condition that might cause problems.

Note: Emphasizes important information.

Tip: Provides extra information and hints.

Note to the User

WARNING: X-rays can be harmful and dangerous if not used properly. The instructions and warnings contained in this guide must be followed carefully.

As a manufacturer of radiology units that conform to stringent radiological protection standards in force throughout the world, we guarantee as low as reasonably achievable degree of protection against radiation hazards. Nonetheless, you are handling a radiology unit specially designed to emit X-ray doses in order to carry out a medical diagnosis.

The room in which your radiology unit is to be installed must comply with all official regulations applicable to protection against radiation. You must install your radiology unit in a room protected against X-ray emission.

Your local representative will assist you in the initial use of your radiology unit and will supply any relevant information you may require.

To use and operate the unit you must follow the instructions contained in this guide.

Warning and Safety Instructions

When operating the unit, observe the following warning and safety instructions:

DANGER OF ELECTRIC SHOCK
This is an electrical unit. Do NOT expose it to water spray. Such action may cause an electric shock or a malfunction of the unit.

WARNINGS

Unit:

- **Read and understand this Safety Information before using the unit**
- **You are responsible for the operation and maintenance of this unit. Only legally qualified persons can operate this unit. They MUST have training to use the radiological equipment. Do NOT open the cover of the unit. When necessary, have a trained authorized service technician carry out inspection and maintenance operations.**
- **Install this unit in an X-ray room that complies with current installation standards. From this location, you must be able to maintain visual or audio communication with the patient and be able to access the Acquisition interface module during exposure.**
- **This unit must be permanently connected to the ground with a fixed power supply cable. To avoid the risk of electric shock, this equipment must ONLY be connected to a mains supply with protective earth.**
- **Do NOT operate the unit if there is the threat of an earthquake. Following an earthquake, ensure that the unit is operating satisfactorily before using it again. Failure to observe this precaution may expose patients to hazards.**
- **X-ray equipment is hazardous to patients and the operator if you do not observe the exposure safety factors and operating instructions.**
- **Considering radiation safety of pediatric population, protocol for Acquisition on Pediatric patients must be followed. For more information on imaging pediatric patients more safely and effectively, refer to FDA Pediatric X-ray Imaging webpage: http://www.fda.gov/radiation-emittingproducts/radiationemittingproductsandprocedures/medicalimaging/ucm298899.htm**
- **Do NOT place objects within the field of operation of the unit.**
- **The patient should wear a protective lead-lined shoulder apron, unless other Radiation Protection Protocols apply locally.**
- **While adjusting the height of the unit, ensure that the patient is kept clear of the mechanism.**
- **When the unit is not in use, ensure that the ON/OFF switch is set to OFF (O).**
- **If the unit develops a fault, switch it to off (O), display an "Unserviceable" notice and contact a service technician.**
- **To dispose of the unit or its components, contact a service technician.**
- **Ask the patient to refrain from moving during the entire period of exposure.**
- **Ask the patient to remain still until the unit arm has stopped moving and the RESET movement has completed.**
- **Do NOT use this unit in conjunction with oxygen-rich environments. This unit is not intended for use with flammable anesthetics or flammable agents.**
- **It is not recommended to use accessories other than those specified in this document and sold by Carestream Dental.**
- **If the touchscreen does not work, do NOT operate the unit and contact a service technician.**
- **If the installation of the Product is not carried out by qualified personnel or if the Product is installed incorrectly and as a result is not operating correctly or is damaged, it is the responsibility of the Distributor. The above will lead to an expiration of the warranty and the liability of Carestream Dental; Carestream Dental accepts no responsibility for failures caused by sub-standard or incorrect installations.**

Computer:

- **Do NOT place the computer and the peripheral equipment connected to it in the immediate vicinity of the patient in the unit. Leave at least 1.50 m distance from the unit. The computer and the peripheral equipment must conform to the IEC 60950 standard.**
- **See your computer installation guide for details of the data processing system and screen. Leave a sufficient amount of clear space around the CPU to ensure that it is properly ventilated.**
- **To obtain maximum image quality and visual comfort, position the screen to avoid direct light reflections from internal or external lighting.**
- **Always use Microsoft Windows Update to make sure that the latest security patches are correctly installed.**

Cleaning and Disinfection

Cleaning the CS 9600 Unit and Accessory with no patient contact

To clean the unit and accessory with no patient contact such as the 3D bite block support, follow these steps:

1. Switch off the unit.

2. Remove all visible soil, if any, with disposable cloth or paper wipe.

Note: No disassembly shall be performed on the unit

3. Dampen (not soak) a lint-free cloth with soap and running water.

4. Thoroughly clean manually all accessible parts of the unit, including the temporal head clamps, and if applicable the 3D bite block support with the dampened lint-free cloth.

5. Dry with hygienic disposable cloth.

6. Dampen (not soak) a lint-free cloth with a low-level disinfectant that is U.S. Environmental Protection Agency (EPA)-registered or low-level disinfectant that is recognized by your Local Authority (for example, quaternary ammonium compounds and some phenolics). An EPA-registered hospital disinfectant or any other low-level disinfectant must have clear label claims for intended use.

7. Wipe thoroughly on all accessible parts of the unit with the dampened lint-free cloth. **You must follow the disinfectant's manufacturer instructions for use, especially with respect to contact time.**

8. Allow to dry in the open air for a minimum of 5 minutes.

9. Visually inspect the unit for signs of deterioration. If any damage is noted, do not use the unit and contact a service technician.

CAUTION

Avoid applying any cleaning liquid to the inside parts of the unit.

Cleaning and Disinfecting the Accessories

Cleaning and disinfecting the accessories that have contact with the mucous membranes

CAUTION
You MUST cover the panoramic bite blocks with FDA-cleared or CE mark protective sheaths that are available from distributors to use them between each patient.
We recommend that you cover the TMJ nose rest and the 3D bite block with FDA-cleared or CE mark protective sheaths that are available from distributors to use them between each patient.

The following accessories must first be cleaned and then steam-sterilized between each patient use:

- TMJ nose rest
- Panoramic standard bite block
- Bite block for edentulous patient
- Frankfort guide bite block for panoramic (optional accessory)
- 3D bite blocks

Note: It is recommended that the accessory be reprocessed as soon as reasonably practical following use.

Cleaning

To clean the accessories that have contact with the mucous membranes, follow these steps:

1. Remove and discard the protective sheath from the accessory.

2. Remove all visible soil by with disposable cloth or paper wipe.

3. Rinse at least 1 minute under running water to thoroughly clean the accessory from any excess soil.

4. Using a soft brush, apply medical enzyme detergent solutions (basically with a multi-enzymatic formula) to all surfaces of the accessory. **Detergent manufacturer's directions must be strictly adhered to.**

5. Rinse thoroughly under running water for at least 1 minute to remove detergent residue.

6. Dry the accessory with compressed air or hygiene disposable cloth.

7. Visually inspect the accessory for residual soil. If soil is visible, either repeat steps 2 to 5, or safely dispose of the accessory.

Disinfecting with Steam Autoclave

To steam autoclave the accessory, once cleaning is complete, follow these steps:

CAUTION
You must use a medical autoclaving equipment cleared by the FDA in the USA or that is recognized by your Local Authority.
You must always follow the operating parameters recommended by the manufacturer of the autoclaving equipment.
Use FDA cleared or CE mark standard packaging material.

1. Wrap the cleaned accessory using a standard packaging material for autoclaving.

2. Steam autoclave at 132°C (270°F) for 4 minutes in the USA or depending on your local regulation you can steam autoclave at 134°C (273°F) for 18 minutes.

3. Visually inspect the accessory for signs of deterioration. If any damage is noted, do not use the accessory and contact your representative.

4. Once sterilized, the accessory can be used immediately or stored dry and dust-free in its sterilization wrapping under temperature specified in section “CS 9600 Environmental Requirements” of the present guide.

Cleaning and disinfecting the components and accessories that have skin contact

The following accessories must first be cleaned and then disinfected between each patient use:

- Panoramic and sinus chin rest
- 3D frontal head rest
- Wrist support (optional accessory)
- Facial scanner support (optional accessory)

Note: It is recommended that the accessory be reprocessed as soon as reasonably practical following use.

Cleaning

To manually clean the component or accessory that have skin contact, follow these steps:

1. Remove all visible soil by with disposable cloth or paper wipe.

2. Rinse at least 1 minute under running water to thoroughly clean the component/accessory from any excess soil.

3. Using a soft brush, apply medical enzyme detergent solutions (basically with a multi-enzymatic formula) to all surfaces of the component/accessory. **Detergent manufacturer’s directions must be strictly adhered to.**

4. Rinse thoroughly under running water for at least 1 minute to remove detergent residue.

5. Dry the component/accessory with compressed air or hygiene disposable cloth.

6. Visually inspect the component/accessory for residual soil. If soil is visible, either repeat steps 1 to 4, or safely dispose of the accessory.

Disinfecting

To disinfect the component or accessory, once the cleaning is complete, follow these steps:

1. Disinfect the accessory by using an EPA-registered hospital disinfectant for low-level activity or low-level disinfectant that is recognized by your Local Authority (for example, quaternary ammonium compounds and some phenolics). **You must follow the disinfectant's manufacturer instructions for use, especially with respect to contact time.**

CAUTION

If there is a visible contamination with blood, you must clean the accessory with an EPA-registered hospital disinfectant for intermediate-level disinfectant or intermediate-level disinfectant that is recognized by your Local Authority that has claim for activity against hepatitis B after cleaning. The disinfectant's manufacturer instructions for use must always be followed, especially with respect to contact time.

Marking and Labeling Symbols

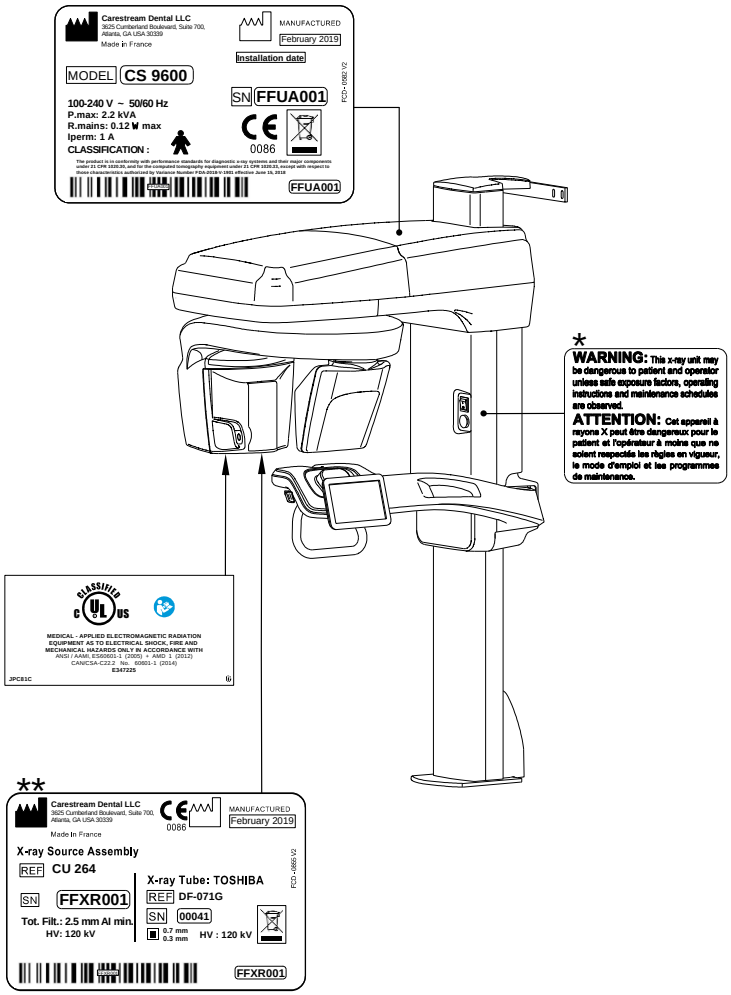
	Type B device symbol complying with the IEC 60601-1 standard
	In the European Union, this symbol indicates: Do NOT discard this product in a trash receptacle; use an appropriate recovery and recycling facility. Contact your local sales representative for additional information on the collection and recovery programs available for this product
	WARNING Attention, consult accompanying document
	IONIZING RADIATION symbol warn you about radiation dangers.
	The ON/OFF button
	Refer to instruction manual/booklet
	Manufactured Date
	Manufacturer’s address

Label Locations

CS 9600 Labels

The following figure illustrates the label locations.

Figure 1 CS 9600 Label Locations



Important:
* Only for USA this warning appears in the Parameter pane of the Acquisition interface.
****** X-ray tube can be CEI OX/120-0307 or Canon DF-071G

Table 1 Label Definition

Label	Definition
MODEL	Defines the unit's model
Installation Date	Defines the date that the unit was installed
This product is in conformity with performance standards for diagnostic x-ray systems and their major components under 21 CFR 1020.30, and for computed tomography equipment under 21 CFR 1020.33, except with respect to those characteristics authorized by Variance Number FDA-2018-V-1901 effective June 15, 2018	Defines the unit's compliance with the US FDA radiation standards

2 Regulatory Information

General Regulatory Information

Compliance with European and International Standards	
EN/IEC 60601-1	Medical Electrical Equipment - Part 1: General Requirements for basic safety and essential performance.
EN/IEC 60601-1-2	Medical Electrical Equipment, Part 1-2: General requirements for basic safety and essential performance - Collateral Standard: Electromagnetic Disturbances – Requirements and tests.
EN/IEC 60601-1-3	Medical Electrical Equipment, Part 1-3: General requirements for basic safety and essential performance - Collateral Standard: Radiation protection in diagnostic X-ray equipment.
EN/IEC 60601-1-6	Medical Electrical Equipment, Part 1-6: General requirements for basic safety and essential performance - Collateral Standard: Usability.
EN/IEC 62366	Medical devices - Application of usability engineering to medical device.
EN/IEC 62304	Medical device software - Software life cycle processes.
EN/IEC 60601-2-63	Medical Electrical Equipment - Part 2-63: Particular requirements for the basic safety and essential performance of dental extra-oral X-ray equipment.
EN ISO 15223-1	Medical devices – Symbols to be used with medical device labels, labeling and information to be supplied – Part 1: General requirements.
EN 1041	Information supplied by the manufacturer of medical devices.
EN ISO 10993-1	Biological evaluation of medical devices - Part 1: Evaluation and testing.
EN ISO 14971	Medical devices - Application of risk management to medical devices.
CAN/CSA C22.2 N°60601-1	Medical Electrical Equipment - Part 1: General Requirements For Safety and essential performance.
ANSI/AAMI ES60601-1	Medical Electrical Equipment - Part 1: General Requirements For Safety and essential performance.

Classification in Accordance with EN/IEC 60601-1	
Type of protection against electric shock	Class 1 equipment
Degree of protection against electric shock	Type B
Protection against harmful ingress of water	Ordinary equipment
Operation mode	Continuous operation with intermittent loading
Flammable anesthetics	Not suitable for use in presence of flammable anesthetics or a mixture of flammable anesthetics with air or oxygen or nitrous oxide

Conformity with EN/IEC 60601-1-2
Group I, class B

CS 9600 is intended to be used in a professional healthcare facility environment.

Compliance of the CS 9600 has been achieved using the following cables:

- One main supply cable (maximum length 3 m)
- One Ethernet cable (maximum length 10 m)
- One X-ray switch cable (maximum length 10 m)

Conformity with EN/IEC 60601-1-2

Electromagnetic Compatibility Precautions

- Medical electrical equipment requires special precautions regarding electromagnetic compatibility (EMC).
- The CS 9600 must be installed and put into service according to the EMC information provided in this document.
- The CS 9600 may interfere with other equipment even if that other equipment complies with CISPR emission requirements.
- Portable and Mobile RF communications equipment can affect medical electrical equipment.

WARNINGS

- **Use limitation: the use of accessories, cables, or transducers other than those specified in the user's guide with the exception of cables, accessories or transducers sold by Carestream Dental LLC, as replacement parts of internal components may result in increased emissions or decreased immunity of the CS 9600 system.**
- **The CS 9600 system should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the CS 9600 system should be observed to verify normal operation in the configuration in which it will be used.**
- **Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 1 m (39 in) to any part of the CS 9600 including cables specified by Carestream. Otherwise, it could result in degradation of the performance of the CS 9600 equipment.**

WARNING: The room in which your radiology unit is to be installed must comply with all official regulations applicable to protection against radiation. You must install your radiology unit in a room protected against X-ray emission.

Guidance and Manufacturer's Declaration - Electromagnetic Emissions (IEC 60601-1-2)		
The CS 9600 system is intended for use in the electromagnetic environment specified below. The customer or the user of the CS 9600 system should assure that it is used in such an environment.		
Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF emissions CISPR 11	Group 1	The CS 9600 system uses RF energy only for their internal function. Therefore, their RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The CS 9600 system is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and Manufacturer's Declaration - Electromagnetic Immunity		
The CS 9600 system is intended for use in the electromagnetic environment specified below. The customer or the user of the CS 9600 system should assure that it is used in such an environment. The essential performance concerns accuracy of loading factors (mA, kV), if the ESSENTIAL PERFORMANCE is lost or degraded due to EM DISTURBANCES, the system stops the examination and the user is notified of the error.		
Immunity Test	IEC 60601 Test Level	Electromagnetic Environment - Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0 % UT for 0.5 cycle at 8 angles At 0°, 0 % UT for 1 cycle and 70 % UT for 25 cycles	Mains power quality should be that of a typical commercial or hospital environment. If the user of the CS 9600 system requires continued operation during power mains interruptions, it is recommended that the CS 9600 system be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment
NOTE: UT is the a.c. mains voltage prior to application of the test level.		

Guidance and Manufacturer's Declaration - Electromagnetic Immunity (IEC 60601-1-2)		
The CS 9600 system is intended for use in the electromagnetic environment specified below. The customer or the user of the CS 9600 system should assure that it is used in such an environment.		
Immunity Test	IEC 60601 Test Level	Electromagnetic Environment - Guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz and 6V at ISM Frequencies and amateur radio frequencies	Environment of a care facility professional health
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz Test levels and frequencies according to table 9 from IEC 60601-1-2: 2014	WARNING: Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the CS 9600 including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result
NOTE: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.		
a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the CS 9600 system is used exceeds the applicable RF compliance level above, the CS 9600 system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the CS 9600.		

Compliance with International Regulations

- Medical Device Directives 93/42/EEC, Class IIb as amended by 2007/47/EC.
- Directive 2011/65/EU on the Restriction Of use of certain Hazardous Substances in electrical and electronic equipment (RoHS).
- FDA Center for Device & Radiological Health: This product is in conformity with performance standards for diagnostic x-ray systems and their major computed tomography equipment under 21 CFR 1020.30, and for computed tomography equipment under 21 CFR 1020.33, except with respect to those characteristics authorized by Variance Number FDA-2018-V-1901 effective June 15, 2018 (USA).
- Radiation Emitting Devices Act – C34 (Canada).
- Medical Devices Regulations (Canada).

3 Technical Specifications

Factory

TROPHY

4, rue F. Pelloutier, Croissy-Beaubourg

77435 Marne la Vallée Cedex 2, France

Manufacturer

Carestream Dental LLC
3625 Cumberland Boulevard, Suite 700,
Atlanta, GA USA 30339

Model

CS 9600

CS 9600 Technical Specifications

Table 2 CS 9600 Technical Specifications

Components	X-ray Generator
Tube voltage	60 – 90 kV 60 – 120 kV (optional)
Tube current	2 - 15 mA
Frequency	140 kHz
Tube focal spot (IEC 60336)	0.3 or 0.7 mm
Total filtration	> 2.5 mm eq. Al

Panoramic Modality	
Sensor technology	CMOS
Image field	6.4 x 140 mm (for adult patient size) 6.4 x 120 mm (for child patient size) 120 x 140 mm (for sinus one-shot exam)
Gray scale	16384 - 14 bits
Magnification	1.28

Panoramic Modality	
Radiological exams	Full panoramic Segmented panoramic Bitewing Maxillary sinus Lateral TMJ x 2 Lateral TMJ x 4 Sinus AP / PA / Lateral Orthogonal panoramic
Exposure time	0.5 to 13 s
Exposure mode	4 patient sizes (child, small adult, medium adult, large adult) 3 dental arch morphology (normal, square, sharp)

Panoramic modality is not available in Australia when the device is installed only with the 3D modality.

3D Modality	
Technology	Dental Volumetric Reconstruction (DVR)
Sensor technology	CMOS
Volume Field Of View (FOV) diameter x height (cm)	4 x 4 5 x 5 5 x 8 6 x 6 8 x 5 8 x 8 10 x 5[1] 10 x 10*[1] 12 x 5[1] 12 x 10*[1] 16 x 6[1] 16 x 10*[1] 16 x 12[1] 16 x 17 *[1] *with tip of the volume
Radiological exams	Tooth / Teeth Full, upper or lower jaw TMJ Face ENT Upper cervical spine Wrist
Gray scale	16384 - 14 bits
Magnification	1.4
Voxel Size	75 µm minimum
Exposure time	5.5 to 40 s (2 x 20 s)
Scan mode	Continuous

[1] *In Ontario (Canada), the use by dentists, of FOVs that are over 8x8 is subject to conditions.*

Components	CS 9600
Input voltage (AC)	100-240 V – 50/60 Hz
Unit dimensions	1284 (L) x 1669 (D) x 2526 mm (H)
Required space	1500 (L) x 2000 (D) x 2200 (H) mm (without optional Stool or when Stool installed on the left) 1900 (L) x 2000 (D) x 2200 (H) mm (with optional Stool installed on the right)
Weight	210 kg

Minimum Computer System Requirement

The computer and the peripheral equipment must conform to the IEC 60950 standard.
The computer for acquisition is delivered with CS 9600.
The following table provides the minimum computer system requirement for the computer intended to be used to review acquired images.

Item	Viewing
CPU	Intel Core i7-2600 (2nd generation)
RAM	8 GB 16 GB (PDIP option) 32 GB (for CS MAR option)
Graphic board	Any GPU with 1Go RAM that is compatible with Open GL 3.2.
Display	1024 x 768 minimum screen resolution 32 bits color mode
Operating system	Windows 7 (64 bits) Windows 8/8.1 (64 bits) Windows 10 (64 bits)
Ethernet interface	100Mbps minimum but recommended 1 Gbps
CD/DVD drive	A DVD-BURNER drive is required.
Backup Media	Removable/portable, external hard disk drive
Mouse	A mouse with 2 buttons and a scroll wheel is required

Note: Always use Microsoft Windows Update to make sure that the latest security patches are correctly installed.

X-ray Dose Emission Information

Radiation protection

CAUTION
This device is NOT intended for use on patients who are less than 21 kg (46 lb) (approximately) in weight and 113 cm (44.5 in) in height. These measurements correspond approximately to that of an average 5 year old US child. The use of equipment and exposure settings designed for adults of average size can result in excessive radiation exposure for a smaller patient. Studies have shown that pediatric patients may be more radiosensitive than adults (i.e. the cancer risk per unit dose of ionizing radiation is higher), and so unnecessary radiation exposure is of particular concern for pediatric patients.

The relevant radiation protection regulation and measures must be observed. Use only approved radiation protection equipment. To reduce patient radiation exposure, the user instructions require that the patient wear a lead apron.
With the exception of the patient, no other persons without radiation protection should stay in the room during an exposure.
During an exposure, the operator is prompted to leave the X-ray room and close the door while keeping visual contact with the patient during acquisition.
If problem arise and required you to stop the acquisition, release the exposure button of the remote control or press the red emergency stop button.

Recommendations for pediatric population

Compared to middle-aged adults, children and adolescents are three times more at risk from radiation. You must state and establish that the health benefits of using the X-ray method outweighs the risk posed by radiation. Consider using other methods with similar health benefits but does not involve any, or only low-level exposure to radiation when weighing up the situation.
Medical radiation exposure as part of dental care for children and adolescents must produce sufficient benefits, whereby radiation exposure resulting from X-ray examination is to be limited as much as acceptable within the requirements of medical science (as defined by the ALARA principle).
CS 9600 offers many options that can reduce radiation exposure for adults, and especially for children and adolescents, to a necessary minimum.

Table 3 Dose reduction options

Selecting the appropriate patient size for children/adolescent	
The two smallest patient size icons represent the exposure values for children and adolescent patients. Both patient sizes are associated to reduced kV / mA values which may reduces the dose related to these exposure parameters.	
Child Patient size 	Recommended for the children population of between 5 to 12 year old [~ 21 kg (46 lb); 113 cm (44.5 in) to ~52 kg (115 lb) ; 156 cm (61.5 in)].
Adult Small Patient size 	Recommended for the adolescent population of approximately ~ 52 kg (115 lb); 156 cm (61.5 in).

Selecting the low dose for a quick exam
 The low dose imaging mode reduces the dose by minimizing the exposure parameters.

Selecting the appropriate Field of View for children/adolescent	
By reducing the Field of View used when doing 3D exam on children or adolescent, you can reduce the exposed area and therefore reduce the dose received by the patient. Recommended Field of View to be used for children/adolescent are indicated below.	
Standard Field of View	Recommended Field of View for children/adolescent
5x5	4x4
6x6	5x5
10x5	8x5
10x10	8x8
12x5	10x5
12x10	10x10
16x17	16x12

CS 9600 provides additional options that help to simplify X-ray acquisitions of children and adolescents:

- Children and adolescents can be more still and stable in the seated position. The CS 9600 can be brought down for an exposure in the seated position.

- If you want to do some preliminary explanations to assure the patient, you can use the radiation free test cycle at any time from the acquisition interface with the icon 

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- Face to face positioning helps to minimize the fear of confined space in the unit for children and adolescent patients.

Panoramic mode

Table 4 Patient Dose information for panoramic modality

Jaw arch	Program	ADULT LARGE			
		T(s)	kV	mA	DAP* mGy.cm.cm
all	MAXILLARY SINUS	7	76	10	93.7
	SINUS PA *WATERS*	0.996	90	10	331.9
	SINUS AP / PA *FRONTAL*	0.996	90	10	331.9
	SINUS LATERAL *SPHENOID*	0.996	90	5	166
Ellipsoid	FULL PANORAMIC	13	76	10	174.3
	FULL ORTHOGONAL PANORAMIC	13	76	10	174.3
	FULL PANORAMIC *LOW DOSE*	9.7	76	10	130.0
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	9.8	76	10	131.4
	FULL PANORAMIC *REDUCED*	10.2	76	10	136.7
	FULL ORTHOGONAL PANORAMIC *REDUCED*	10.6	76	10	142.1
	FULL PANORAMIC *REDUCED LOW DOSE*	7.9	76	10	105.9
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.9	76	10	105.9
	SEGMENTED PANORAMIC *MOLARS R and L*	11.6	76	10	155.5
	ORTHOGONAL PANORAMIC *MOLARS R and L*	10.6	76	10	142.1
	SEGMENTED PANORAMIC *MOLARS R or L*	5.8	76	10	77.7
	ORTHOGONAL PANORAMIC *MOLARS R or L*	5.3	76	10	71.0
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	8.8	76	10	118.0
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	8.4	76	10	112.6
	BITEWING *R and L*	8.4	76	10	112.6
	BITEWING *R or L*	4.2	76	10	56.3
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	4.4	76	10	59.0
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	4.2	76	10	56.3
	SEGMENTED PANORAMIC *INCISIVE*	3.3	76	10	44.2
	ORTHOGONAL PANORAMIC *INCISIVE*	4.5	76	10	60.3
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	8.1	76	10	108.6
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.5	76	10	113.9
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	6.7	76	10	89.8
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.3	76	10	97.9
	LATERAL TMJx2	4.6	76	10	61.7
	LATERAL TMJx4	4.6	76	10	61.7
Upsiloid	FULL PANORAMIC	13	76	10	174.3
	FULL ORTHOGONAL PANORAMIC	13	76	10	174.3
	FULL PANORAMIC *LOW DOSE*	9.7	76	10	130.0
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	9.7	76	10	130.0
	FULL PANORAMIC *REDUCED*	10.3	76	10	138.1
	FULL ORTHOGONAL PANORAMIC *REDUCED*	10.6	76	10	142.1
	FULL PANORAMIC *REDUCED LOW DOSE*	7.7	76	10	103.2
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.8	76	10	104.6
	SEGMENTED PANORAMIC *MOLARS R and L*	11.5	76	10	154.2
	ORTHOGONAL PANORAMIC *MOLARS R and L*	10.5	76	10	140.7
	SEGMENTED PANORAMIC *MOLARS R or L*	5.7	76	10	76.4
	ORTHOGONAL PANORAMIC *MOLARS R or L*	5.3	76	10	71.0
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	8.7	76	10	116.6
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	8.4	76	10	112.6
	BITEWING *R and L*	8.4	76	10	112.6
	BITEWING *R or L*	4.2	76	10	56.3
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	4.4	76	10	59.0
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	4.2	76	10	56.3
	SEGMENTED PANORAMIC *INCISIVE*	3.6	76	10	48.3
	ORTHOGONAL PANORAMIC *INCISIVE*	4.5	76	10	60.3
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	8.3	76	10	111.3
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.6	76	10	115.3

Jaw arch	Program	ADULT LARGE			
		T(s)	kV	mA	DAP* mGy.cm.cm
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	6.9	76	10	92.5
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.4	76	10	99.2
	LATERAL TMJx2	4.6	76	10	61.7
	LATERAL TMJx4	4.6	76	10	61.7
Paraboloid	**FULL PANORAMIC**	13	76	10	174.3
	FULL ORTHOGONAL PANORAMIC	13	76	10	174.3
	FULL PANORAMIC *LOW DOSE*	9.7	76	10	130.0
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	9.7	76	10	130.0
	FULL PANORAMIC *REDUCED*	10.3	76	10	138.1
	FULL ORTHOGONAL PANORAMIC *REDUCED*	10.6	76	10	142.1
	FULL PANORAMIC *REDUCED LOW DOSE*	7.8	76	10	104.6
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.7	76	10	103.2
	SEGMENTED PANORAMIC *MOLARS R and L*	11.6	76	10	155.5
	ORTHOGONAL PANORAMIC *MOLARS R and L*	10.8	76	10	144.8
	SEGMENTED PANORAMIC *MOLARS R or L*	5.8	76	10	77.7
	ORTHOGONAL PANORAMIC *MOLARS R or L*	5.4	76	10	72.4
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	8.9	76	10	119.3
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	8.2	76	10	109.9
	BITEWING *R and L*	8.2	76	10	109.9
	BITEWING *R or L*	4.1	76	10	55.0
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	4.5	76	10	60.3
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	4.1	76	10	55.0
	SEGMENTED PANORAMIC *INCISIVE*	3.1	76	10	41.6
	ORTHOGONAL PANORAMIC *INCISIVE*	4.5	76	10	60.3
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	8.1	76	10	108.6
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.5	76	10	113.9
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	6.7	76	10	89.8
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.3	76	10	97.9
	LATERAL TMJx2	4.8	76	10	64.3
	LATERAL TMJx4	4.8	76	10	64.3

* DAP: Dose Area Product. The accuracy of DAP in the table above is +/- 30% when compared with the values that could be measured.

Note: The information in the table above may be subject to modification. Without notice or justification to those concerned.

Jaw arch	Program	ADULT MEDIUM			
		T(s)	kV	mA	DAP* mGy.cm.cm
all	**MAXILLARY SINUS**	7	73	8	69.3
	SINUS PA *WATERS*	0.896	90	10	298.6
	SINUS AP / PA *FRONTAL*	0.896	90	10	298.6
	SINUS LATERAL *SPHENOID*	0.896	90	5	149.3
Ellipsoid	**FULL PANORAMIC**	12.3	73	8	121.7
	FULL ORTHOGONAL PANORAMIC	12.3	73	8	121.7
	FULL PANORAMIC *LOW DOSE*	9.2	73	8	91.1
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	9.8	73	8	97.0
	FULL PANORAMIC *REDUCED*	10.2	73	8	101.0
	FULL ORTHOGONAL PANORAMIC *REDUCED*	10.1	73	8	100.0
	FULL PANORAMIC *REDUCED LOW DOSE*	7.5	73	8	74.2
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	8.1	73	8	80.2
	SEGMENTED PANORAMIC *MOLARS R and L*	11.2	73	8	110.9
	ORTHOGONAL PANORAMIC *MOLARS R and L*	9.7	73	8	96.0
	SEGMENTED PANORAMIC *MOLARS R or L*	5.6	73	8	55.4
	ORTHOGONAL PANORAMIC *MOLARS R or L*	4.9	73	8	48.5
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	9.1	73	8	90.1
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	8	73	8	79.2
	BITEWING *R and L*	8	73	8	79.2
	BITEWING *R or L*	4	73	8	39.6
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	4.5	73	8	44.5
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	4	73	8	39.6
	SEGMENTED PANORAMIC *INCISIVE*	3.5	73	8	34.6
	ORTHOGONAL PANORAMIC *INCISIVE*	4.3	73	8	42.6
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	7.9	73	8	78.2
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.4	73	8	83.1
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	6.8	73	8	67.3
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.3	73	8	72.3
	LATERAL TMJx2	3.7	73	8	36.6
	LATERAL TMJx4	3.7	73	8	36.6
Upsiloid	**FULL PANORAMIC**	12.3	73	8	121.7
	FULL ORTHOGONAL PANORAMIC	12.3	73	8	121.7
	FULL PANORAMIC *LOW DOSE*	9.2	73	8	91.1
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	9.4	73	8	93.0
	FULL PANORAMIC *REDUCED*	10.1	73	8	100.0
	FULL ORTHOGONAL PANORAMIC *REDUCED*	10.2	73	8	101.0
	FULL PANORAMIC *REDUCED LOW DOSE*	7.5	73	8	74.2
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.8	73	8	77.2
	SEGMENTED PANORAMIC *MOLARS R and L*	11.2	73	8	110.9
	ORTHOGONAL PANORAMIC *MOLARS R and L*	9.6	73	8	95.0
	SEGMENTED PANORAMIC *MOLARS R or L*	5.6	73	8	55.4
	ORTHOGONAL PANORAMIC *MOLARS R or L*	4.8	73	8	47.5
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	9	73	8	89.1
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	8	73	8	79.2
	BITEWING *R and L*	8	73	8	79.2
	BITEWING *R or L*	4	73	8	39.6
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	4.5	73	8	44.5
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	4	73	8	39.6
	SEGMENTED PANORAMIC *INCISIVE*	4.4	73	8	43.6
	ORTHOGONAL PANORAMIC *INCISIVE*	4.3	73	8	42.6
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	8.3	73	8	82.2
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.5	73	8	84.1
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.2	73	8	71.3
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.4	73	8	73.2

Jaw arch	Program	ADULT MEDIUM			
		T(s)	kV	mA	DAP* mGy.cm.cm
	LATERAL TMJx2	3.5	73	8	34.6
	LATERAL TMJx4	3.5	73	8	34.6
Paraboloid	**FULL PANORAMIC**	12.3	73	8	121.7
	FULL ORTHOGONAL PANORAMIC	12.3	73	8	121.7
	FULL PANORAMIC *LOW DOSE*	9.2	73	8	91.1
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	9.2	73	8	91.1
	FULL PANORAMIC *REDUCED*	9.6	73	8	95.0
	FULL ORTHOGONAL PANORAMIC *REDUCED*	10	73	8	99.0
	FULL PANORAMIC *REDUCED LOW DOSE*	7.5	73	8	74.2
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.4	73	8	73.2
	SEGMENTED PANORAMIC *MOLARS R and L*	10.8	73	8	106.9
	ORTHOGONAL PANORAMIC *MOLARS R and L*	10	73	8	99.0
	SEGMENTED PANORAMIC *MOLARS R or L*	5.4	73	8	53.4
	ORTHOGONAL PANORAMIC *MOLARS R or L*	5	73	8	49.5
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	8.1	73	8	80.2
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	7.9	73	8	78.2
	BITEWING *R and L*	7.9	73	8	78.2
	BITEWING *R or L*	4	73	8	39.6
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	4.1	73	8	40.6
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	4	73	8	39.6
	SEGMENTED PANORAMIC *INCISIVE*	3.4	73	8	33.7
	ORTHOGONAL PANORAMIC *INCISIVE*	4.3	73	8	42.6
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	7.9	73	8	78.2
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.2	73	8	81.2
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	6.5	73	8	64.3
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7	73	8	69.3
	LATERAL TMJx2	4.4	73	8	43.6
	LATERAL TMJx4	4.4	73	8	43.6

* DAP: Dose Area Product. The accuracy of DAP in the table above is +/- 30% when compared with the values that could be measured.

Note: The information in the table above may be subject to modification. Without notice or justification to those concerned.

Jaw arch	Program	ADULT SMALL			
		T(s)	kV	mA	DAP* mGy.cm.cm
all	**MAXILLARY SINUS**	7	72	6.3	53
	SINUS PA *WATERS*	0.796	90	10	265.3
	SINUS AP / PA *FRONTAL*	0.796	90	10	265.3
	SINUS LATERAL *SPHENOID*	0.796	90	5	132.6
Ellipsoid	**FULL PANORAMIC**	11.6	72	6.3	87.9
	FULL ORTHOGONAL PANORAMIC	11.6	72	6.3	87.9
	FULL PANORAMIC *LOW DOSE*	8.7	72	6.3	65.9
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	9.5	72	6.3	72.0
	FULL PANORAMIC *REDUCED*	9.9	72	6.3	75.0
	FULL ORTHOGONAL PANORAMIC *REDUCED*	9.9	72	6.3	75.0
	FULL PANORAMIC *REDUCED LOW DOSE*	7.2	72	6.3	54.5
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	8	72	6.3	60.6
	SEGMENTED PANORAMIC *MOLARS R and L*	9.3	72	6.3	70.4
	ORTHOGONAL PANORAMIC *MOLARS R and L*	8.2	72	6.3	62.1
	SEGMENTED PANORAMIC *MOLARS R or L*	4.6	72	6.3	34.8
	ORTHOGONAL PANORAMIC *MOLARS R or L*	4.1	72	6.3	31.1
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	7.6	72	6.3	57.6
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	6.6	72	6.3	50.0
	BITEWING *R and L*	6.6	72	6.3	50.0
	BITEWING *R or L*	3.3	72	6.3	25.0
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	3.8	72	6.3	28.8
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	3.3	72	6.3	25.0
	SEGMENTED PANORAMIC *INCISIVE*	4.7	72	6.3	35.6
	ORTHOGONAL PANORAMIC *INCISIVE*	4.1	72	6.3	31.1
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	8.2	72	6.3	62.1
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.6	72	6.3	65.1
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.3	72	6.3	55.3
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.7	72	6.3	58.3
	LATERAL TMJx2	2.8	72	6.3	21.2
	LATERAL TMJx4	2.8	72	6.3	21.2
Upsiloid	**FULL PANORAMIC**	11.6	72	6.3	87.9
	FULL ORTHOGONAL PANORAMIC	11.6	72	6.3	87.9
	FULL PANORAMIC *LOW DOSE*	8.7	72	6.3	65.9
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	8.9	72	6.3	67.4
	FULL PANORAMIC *REDUCED*	8	72	6.3	60.6
	FULL ORTHOGONAL PANORAMIC *REDUCED*	10	72	6.3	75.7
	FULL PANORAMIC *REDUCED LOW DOSE*	7.2	72	6.3	54.5
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.4	72	6.3	56.1
	SEGMENTED PANORAMIC *MOLARS R and L*	9.6	72	6.3	72.7
	ORTHOGONAL PANORAMIC *MOLARS R and L*	8	72	6.3	60.6
	SEGMENTED PANORAMIC *MOLARS R or L*	4.8	72	6.3	36.4
	ORTHOGONAL PANORAMIC *MOLARS R or L*	4	72	6.3	30.3
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	7.9	72	6.3	59.8
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	6.3	72	6.3	47.7
	BITEWING *R and L*	6.3	72	6.3	47.7
	BITEWING *R or L*	3.1	72	6.3	23.5
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	3.9	72	6.3	29.5
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	3.1	72	6.3	23.5
	SEGMENTED PANORAMIC *INCISIVE*	4.3	72	6.3	32.6
	ORTHOGONAL PANORAMIC *INCISIVE*	4.1	72	6.3	31.1
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	8	72	6.3	60.6
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.8	72	6.3	66.7
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.1	72	6.3	53.8
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.9	72	6.3	59.8

Jaw arch	Program	ADULT SMALL			
		T(s)	kV	mA	DAP* mGy.cm.cm
	LATERAL TMJx2	2.9	72	6.3	22.0
	LATERAL TMJx4	2.9	72	6.3	22.0
Paraboloid	**FULL PANORAMIC**	11.6	72	6.3	87.9
	FULL ORTHOGONAL PANORAMIC	11.6	72	6.3	87.9
	FULL PANORAMIC *LOW DOSE*	8.7	72	6.3	65.9
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	8.7	72	6.3	65.9
	FULL PANORAMIC *REDUCED*	10.2	72	6.3	77.3
	FULL ORTHOGONAL PANORAMIC *REDUCED*	9.9	72	6.3	75.0
	FULL PANORAMIC *REDUCED LOW DOSE*	7.4	72	6.3	56.1
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.2	72	6.3	54.5
	SEGMENTED PANORAMIC *MOLARS R and L*	9	72	6.3	68.2
	ORTHOGONAL PANORAMIC *MOLARS R and L*	8	72	6.3	60.6
	SEGMENTED PANORAMIC *MOLARS R or L*	4.5	72	6.3	34.1
	ORTHOGONAL PANORAMIC *MOLARS R or L*	3.7	72	6.3	28.0
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	7.6	72	6.3	57.6
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	6	72	6.3	45.4
	BITEWING *R and L*	6	72	6.3	45.4
	BITEWING *R or L*	3	72	6.3	22.7
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	3.8	72	6.3	28.8
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	3	72	6.3	22.7
	SEGMENTED PANORAMIC *INCISIVE*	4.7	72	6.3	35.6
	ORTHOGONAL PANORAMIC *INCISIVE*	4.1	72	6.3	31.1
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	8.1	72	6.3	61.4
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.2	72	6.3	62.1
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.4	72	6.3	56.1
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.4	72	6.3	56.1
	LATERAL TMJx2	2.5	72	6.3	18.9
	LATERAL TMJx4	2.5	72	6.3	18.9

* DAP: Dose Area Product. The accuracy of DAP in the table above is +/- 30% when compared with the values that could be measured.

Note: The information in the table above may be subject to modification. Without notice or justification to those concerned.

Jaw arch	Program	CHILD			
		T(s)	kV	mA	DAP* mGy.cm.cm
all	**MAXILLARY SINUS**	7	68	6.3	37.6
	SINUS PA *WATERS*	0.496	90	10	165.2
	SINUS AP / PA *FRONTAL*	0.496	90	10	165.2
	SINUS LATERAL *SPHENOID*	0.496	90	5	82.6
Ellipsoid	**FULL PANORAMIC**	10.9	68	6.3	58.5
	FULL ORTHOGONAL PANORAMIC	10.9	68	6.3	58.5
	FULL PANORAMIC *LOW DOSE*	8.2	68	6.3	44.0
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	8.2	68	6.3	44.0
	FULL PANORAMIC *REDUCED*	9.3	68	6.3	49.9
	FULL ORTHOGONAL PANORAMIC *REDUCED*	9.7	68	6.3	52.1
	FULL PANORAMIC *REDUCED LOW DOSE*	6.7	68	6.3	36.0
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.1	68	6.3	38.1
	SEGMENTED PANORAMIC *MOLARS R and L*	8.3	68	6.3	44.6
	ORTHOGONAL PANORAMIC *MOLARS R and L*	6.7	68	6.3	36.0
	SEGMENTED PANORAMIC *MOLARS R or L*	4.2	68	6.3	22.6
	ORTHOGONAL PANORAMIC *MOLARS R or L*	3.4	68	6.3	18.3
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	6.7	68	6.3	36.0
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	5.4	68	6.3	29.0
	BITEWING *R and L*	5.4	68	6.3	29.0
	BITEWING *R or L*	2.7	68	6.3	14.5
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	3.3	68	6.3	17.7
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	2.7	68	6.3	14.5
	SEGMENTED PANORAMIC *INCISIVE*	4.7	68	6.3	25.2
	ORTHOGONAL PANORAMIC *INCISIVE*	3.8	68	6.3	20.4
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	7.8	68	6.3	41.9
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.8	68	6.3	47.3
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7	68	6.3	37.6
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	8.2	68	6.3	44.0
	LATERAL TMJx2	2.6	68	6.3	14.0
	LATERAL TMJx4	2.6	68	6.3	14.0
Upsiloid	**FULL PANORAMIC**	10.9	68	6.3	58.5
	FULL ORTHOGONAL PANORAMIC	10.9	68	6.3	58.5
	FULL PANORAMIC *LOW DOSE*	8.2	68	6.3	44.0
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	8.2	68	6.3	44.0
	FULL PANORAMIC *REDUCED*	9.9	68	6.3	53.2
	FULL ORTHOGONAL PANORAMIC *REDUCED*	9.7	68	6.3	52.1
	FULL PANORAMIC *REDUCED LOW DOSE*	6.8	68	6.3	36.5
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.1	68	6.3	38.1
	SEGMENTED PANORAMIC *MOLARS R and L*	9.1	68	6.3	48.9
	ORTHOGONAL PANORAMIC *MOLARS R and L*	6.7	68	6.3	36.0
	SEGMENTED PANORAMIC *MOLARS R or L*	4.5	68	6.3	24.2
	ORTHOGONAL PANORAMIC *MOLARS R or L*	3.3	68	6.3	17.7
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	7.4	68	6.3	39.7
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	5.3	68	6.3	28.5
	BITEWING *R and L*	5.3	68	6.3	28.5
	BITEWING *R or L*	2.6	68	6.3	14.0
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	3.7	68	6.3	19.9
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	2.6	68	6.3	14.0
	SEGMENTED PANORAMIC *INCISIVE*	4	68	6.3	21.5
	ORTHOGONAL PANORAMIC *INCISIVE*	3.8	68	6.3	20.4
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	6.3	68	6.3	33.8
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.6	68	6.3	46.2
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	6.7	68	6.3	36.0
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	8	68	6.3	43.0

Jaw arch	Program	CHILD			
		T(s)	kV	mA	DAP* mGy.cm.cm
	LATERAL TMJx2	2.6	68	6.3	14.0
	LATERAL TMJx4	2.6	68	6.3	14.0
Paraboloid	**FULL PANORAMIC**	10.9	68	6.3	58.5
	FULL ORTHOGONAL PANORAMIC	10.9	68	6.3	58.5
	FULL PANORAMIC *LOW DOSE*	8.2	68	6.3	44.0
	FULL ORTHOGONAL PANORAMIC *LOW DOSE*	8.2	68	6.3	44.0
	FULL PANORAMIC *REDUCED*	9.4	68	6.3	50.5
	FULL ORTHOGONAL PANORAMIC *REDUCED*	9.7	68	6.3	52.1
	FULL PANORAMIC *REDUCED LOW DOSE*	6.8	68	6.3	36.5
	FULL ORTHOGONAL PANORAMIC *REDUCED LOW DOSE*	7.1	68	6.3	38.1
	SEGMENTED PANORAMIC *MOLARS R and L*	7.8	68	6.3	41.9
	ORTHOGONAL PANORAMIC *MOLARS R and L*	6.3	68	6.3	33.8
	SEGMENTED PANORAMIC *MOLARS R or L*	3.9	68	6.3	20.9
	ORTHOGONAL PANORAMIC *MOLARS R or L*	3.6	68	6.3	19.3
	SEGMENTED PANORAMIC *REDUCED MOLARS R and L*	6.3	68	6.3	33.8
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R and L*	6	68	6.3	32.2
	BITEWING *R and L*	6	68	6.3	32.2
	BITEWING *R or L*	3	68	6.3	16.1
	SEGMENTED PANORAMIC *REDUCED MOLARS R or L*	3.2	68	6.3	17.2
	ORTHOGONAL PANORAMIC *REDUCED MOLARS R or L*	3	68	6.3	16.1
	SEGMENTED PANORAMIC *INCISIVE*	4.9	68	6.3	26.3
	ORTHOGONAL PANORAMIC *INCISIVE*	3.8	68	6.3	20.4
	SEGMENTED PANORAMIC *INCISIVE MOLARS R or L*	7.9	68	6.3	42.4
	ORTHOGONAL PANORAMIC *INCISIVE MOLARS R or L*	8.3	68	6.3	44.6
	SEGMENTED PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.1	68	6.3	38.1
	ORTHOGONAL PANORAMIC *INCISIVE REDUCED MOLARS R or L*	7.6	68	6.3	40.8
	LATERAL TMJx2	2.5	68	6.3	13.4
	LATERAL TMJx4	2.5	68	6.3	13.4

* DAP: Dose Area Product. The accuracy of DAP in the table above is +/- 30% when compared with the values that could be measured.

Note: The information in the table above may be subject to modification. Without notice or justification to those concerned.

3D mode

Table 5 Patient Dose information in 3D Mode

120kV is optional

HR = High resolution – STD = Standard – LD = Low Dose

FILTRATION 0.7mm Cu		T(s)	ADULT LARGE kV	mA	DAP* mGy.cm.cm	ADULT MEDIUM kV	mA	DAP* mGy.cm.cm	ADULT SMALL kV	mA	DAP* mGy.cm.cm	CHILD kV	mA	DAP* mGy.cm.cm
4 x 4	HR	19.0	120	8	539	120	6.3	424	120	3.2	215	100	4	154
	STD	10.0	120	8	283	120	6.3	223	120	3.2	113	100	4	81
	LD	5.5	105	2	26	100	2	22	95	2	19	91	2	16
5 x 5	HR	19.0	120	8	803	120	6.3	632	120	3.2	321	100	4	229
	STD	10.0	120	8	424	120	6.3	334	120	3.2	169	100	4	121
	LD	5.5	105	2	39	100	2	33	95	2	28	91	2	24
6 x 6	HR	19.0	120	8	1136	120	6.3	894	120	3.2	454	100	4	324
	STD	10.0	120	8	598	120	6.3	471	120	3.2	239	100	4	171
	LD	5.5	105	2	55	100	2	47	95	2	40	91	2	34
5 x 8	HR	19.0	120	8	1282	120	6.3	1009	120	3.2	513	100	4	366
	STD	10.0	120	8	676	120	6.3	532	120	3.2	270	100	4	193
	LD	5.5	105	2	62	100	2	53	95	2	45	91	2	38
8 x 5	HR	18.8	120	8	1245	120	6.3	981	120	3.2	498	100	4	356
	STD	15.0	120	5	620	120	4	496	120	2	248	100	2.5	177
	LD	5.5	105	2	61	100	2	52	95	2	44	91	2	38
8 x 8	HR	18.8	120	8	1998	120	6.3	1573	120	3.2	799	100	4	591
	STD	15.0	120	5	995	120	4	796	120	2	398	100	2.5	294
	LD	5.5	105	2	100	100	2	86	95	2	73	91	2	63
10 x 5	HR	20.0	120	8	854	120	8	854	120	6.3	673	100	8	506
	STD	20.0	120	8	854	120	6.3	673	120	3.2	342	100	4	253
	LD	12.0	105	2	88	100	2	76	95	2	64	91	2	56
10 x 10	HR	20.0	120	8	1457	120	8	1457	120	6.3	1147	100	8	862
	STD	20.0	120	8	1457	120	6.3	1147	120	3.2	583	100	4	431
	LD	12.0	105	2	150	100	2	129	95	2	110	91	2	95
12 x 5	HR	20.0	120	8	1034	120	6.3	814	120	3.2	414	100	4	306
	STD	12.0	120	6.3	489	120	5	388	120	2.5	194	100	3.2	147
	LD	12.0	105	2	107	100	2	92	95	2	78	91	2	67
12 x 10	HR	20.0	120	8	1713	120	6.3	1349	120	3.2	685	100	4	507
	STD	12.0	120	6.3	810	120	5	643	120	2.5	321	100	3.2	243
	LD	12.0	105	2	177	100	2	152	95	2	129	91	2	111
16 x 6	HR	20.0	120	8	1610	120	6.3	1268	120	3.2	644	100	4	476
	STD	12.0	120	6.3	761	120	5	604	120	2.5	302	100	3.2	229
	LD	12.0	105	2	166	100	2	143	95	2	121	91	2	105
16 x 10	HR	20.0	120	8	2124	120	6.3	1673	120	3.2	850	100	4	629
	STD	12.0	120	6.3	1004	120	5	797	120	2.5	398	100	3.2	302
	LD	12.0	105	2	219	100	2	189	95	2	160	91	2	138
16 x 12	HR	40.0	120	5	2182	120	5	2182	120	3.2	1397	100	4	1033
	STD	24.0	120	6.3	1650	120	5	1309	120	2.5	655	100	3.2	496
	LD	24.0	105	2	360	100	2	310	95	2	263	91	2	227

FILTRATION 0.7mm Cu			ADULT LARGE			ADULT MEDIUM			ADULT SMALL			CHILD		
		T(s)	kV	mA	DAP* mGy.cm.cm	kV	mA	DAP* mGy.cm.cm	kV	mA	DAP* mGy.cm.cm	kV	mA	DAP* mGy.cm.cm
16 x 17	HR	40.0	120	5	2646	120	5	2646	120	3.2	1693	100	4	1253
	STD	24.0	120	6.3	2000	120	5	1587	120	2.5	794	100	3.2	601
	LD	24.0	105	2	437	100	2	376	95	2	318	91	2	275

* DAP: Dose Area Product. The accuracy of DAP in the table above is +/- 30% when compared with the values that could be measured.

Note: The information in the table above may be subject to modification. Without notice or justification to those concerned.

HR = High resolution – STD = Standard – LD = Low Dose

FILTRATION 0.15mm Cu			ADULT LARGE			ADULT MEDIUM			ADULT SMALL			CHILD		
		T(s)	kV	mA	DAP* mGy.cm.cm	kV	mA	DAP* mGy.cm.cm	kV	mA	DAP* in mGy.cm.cm	kV	mA	DAP* mGy.cm.cm
4 x 4	HR	19.0	90	8	843	90	6.3	664	90	3.2	337	80	4	323
	STD	10.0	90	8	444	90	6.3	350	90	3.2	178	80	4	170
	LD	5.5	90	3.2	98	90	2.5	76	90	2	61	80	2.5	58
5 x 5	HR	19.0	90	8	1291	90	6.3	1017	90	3.2	516	80	4	495
	STD	10.0	90	8	681	90	6.3	536	90	3.2	272	80	4	261
	LD	5.5	90	3.2	150	90	2.5	117	90	2	94	80	2.5	90
6 x 6	HR	19.0	90	8	1808	90	6.3	1424	90	3.2	723	80	4	693
	STD	10.0	90	8	952	90	6.3	750	90	3.2	381	80	4	365
	LD	5.5	90	3.2	209	90	2.5	164	90	2	131	80	2.5	125
5 x 8	HR	19.0	90	8	1989	90	6.3	1567	90	3.2	796	80	4	762
	STD	10.0	90	8	1049	90	6.3	826	90	3.2	420	80	4	402
	LD	5.5	90	3.2	231	90	2.5	180	90	2	144	80	2.5	138
8 x 5	HR	18.8	90	8	1990	90	6.3	1567	90	3.2	796	80	4	763
	STD	15.0	90	5	991	90	4	793	90	2	396	80	2.5	380
	LD	5.5	90	3.2	233	90	2.5	182	90	2	145	80	2.5	139
8 x 8	HR	18.8	90	8	3198	90	6.3	2518	90	3.2	1279	80	4	1229
	STD	15.0	90	5	1593	90	4	1274	90	2	637	80	2.5	612
	LD	5.5	90	3.2	374	90	2.5	292	90	2	234	80	2.5	224
10 x 5	HR	20.0	90	10	1774	90	10	1774	90	6.3	1118	80	8	1091
	STD	20.0	90	8	1419	90	6.3	1118	90	3.2	568	80	4	545
	LD	12.0	90	3.2	341	90	2.5	266	90	2	213	80	2.5	204
10 x 10	HR	20.0	90	10	2911	90	10	2911	90	6.3	1834	80	8	1789
	STD	20.0	90	8	2328	90	6.3	1834	90	3.2	931	80	4	895
	LD	12.0	90	3.2	559	90	2.5	437	90	2	349	80	2.5	335
12 x 5	HR	20.0	90	8	1701	90	6.3	1340	90	3.2	680	80	4	654
	STD	12.0	90	6.3	804	90	5	638	90	2.5	319	80	3.2	314
	LD	12.0	90	3.2	408	90	2.5	319	90	2	255	80	2.5	245
12 x 10	HR	20.0	90	8	2722	90	6.3	2144	90	3.2	1089	80	4	1046
	STD	12.0	90	6.3	1286	90	5	1021	90	2.5	510	80	3.2	502
	LD	12.0	90	3.2	653	90	2.5	510	90	2	408	80	2.5	392
16 x 6	HR	20.0	90	8	2632	90	6.3	2073	90	3.2	1053	80	4	1011
	STD	12.0	90	6.3	1244	90	5	987	90	2.5	494	80	3.2	485
	LD	12.0	90	3.2	632	90	2.5	494	90	2	395	80	2.5	379

FILTRATION 0.15mm Cu		T(s)	ADULT LARGE kV	mA	DAP* mGy.cm.cm	ADULT MEDIUM kV	mA	DAP* mGy.cm.cm	ADULT SMALL kV	mA	DAP* in mGy.cm.cm	CHILD kV	mA	DAP* mGy.cm.cm
16 x 10	HR	20.0	90	8	3398	90	6.3	2676	90	3.2	1359	80	4	1306
	STD	12.0	90	6.3	1606	90	5	1274	90	2.5	637	80	3.2	627
	LD	12.0	90	3.2	816	90	2.5	637	90	2	510	80	2.5	490
16 x 12	HR	40.0	90	6.3	4449	90	6.3	4449	90	3.2	2260	80	4	2170
	STD	24.0	90	6.3	2669	90	5	2118	90	2.5	1059	80	3.2	1042
	LD	24.0	90	3.2	1356	90	2.5	1059	90	2	847	80	2.5	814
16 x 17	HR	40.0	90	6.3	5352	90	6.3	5352	90	3.2	2718	80	4	2611
	STD	24.0	90	6.3	3211	90	5	2549	90	2.5	1274	80	3.2	1253
	LD	24.0	90	3.2	1631	90	2.5	1274	90	2	1019	80	2.5	979

EARS ONLY

FILTRATION 0.15mm Cu		T(s)	ADULT LARGE kV	mA	DAP* mGy.cm.cm	ADULT MEDIUM kV	mA	DAP* mGy.cm.cm	ADULT SMALL kV	mA	DAP* mGy.cm.cm	CHILD kV	mA	DAP* mGy.cm.cm
6 x 6	HR	19.0	120	6.3	2493	120	5	1979	120	2.5	989	100	3.2	901
	STD	10.0	120	6.3	1312	120	5	1041	120	2.5	521	100	3.2	474
	LD	5.5	105	2	179	100	2	163	95	2	147	91	2	134
16 x 6	HR	20.0	120	6.3	3627	120	5	2878	120	2.5	1439	100	3.2	1310
	STD	12.0	120	5	1727	120	4	1382	120	2	691	100	2.5	614
	LD	12.0	105	2	540	100	2	491	95	2	442	91	2	404
6 x 6	HR	19.0	90	10	2261	90	8	1808	90	4	904	80	5	866
	STD	10.0	90	10	1190	90	8	952	90	4	476	80	5	456
	LD	5.5	90	4	262	90	3.2	209	90	2.5	164	80	3.2	160
16 x 6	HR	20.0	90	10	3290	90	8	2632	90	4	1316	80	5	1264
	STD	12.0	90	8	1579	90	6.3	1244	90	3.2	632	80	4	607
	LD	12.0	90	4	790	90	3.2	632	90	2.5	494	80	3.2	485

* DAP: Dose Area Product. The accuracy of DAP in the table above is +/- 30% when compared with the values that could be measured.

Note: The information in the table above may be subject to modification. Without notice or justification to those concerned.

User Dose information

Stray radiation

Stray radiation measures are highly dependent on environmental conditions, such as the composition of walls and their locations, therefore in certain circumstances the values may be significantly different.

Measured with a PMMA phantom cylinder (Φ 16 cm x h 16 cm) at 1.0 m from the central phantom axis.

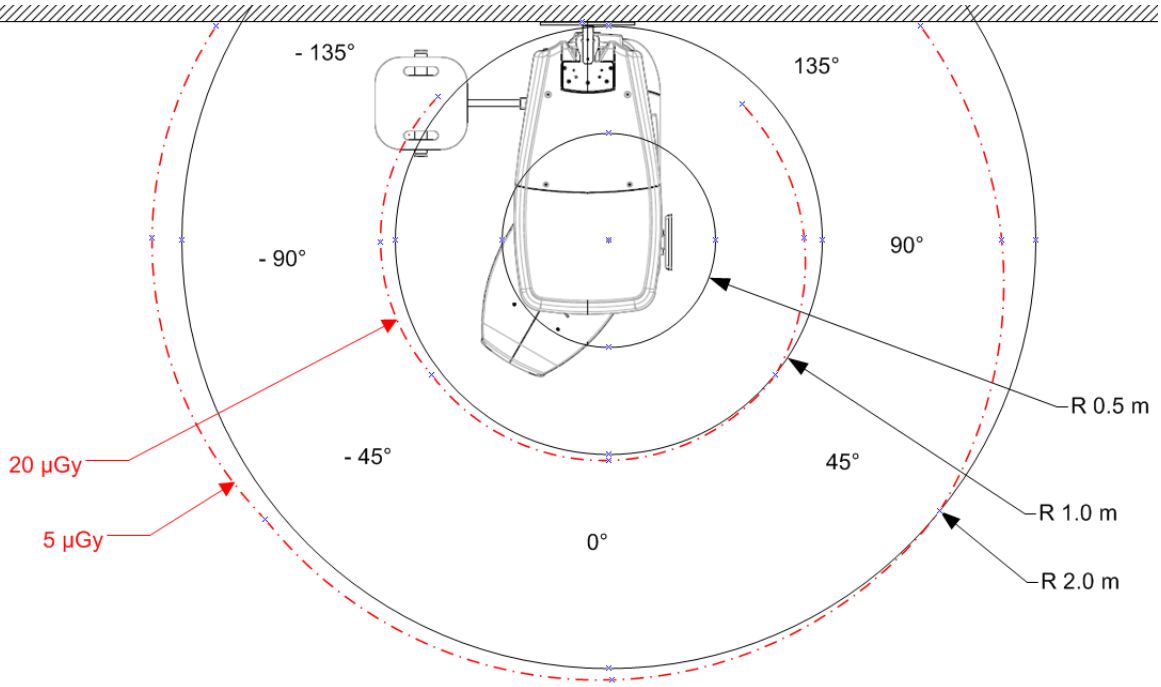
3D Mode

Stray radiation for one exam 16 x 10 HR @ 120 kV or 90 kV - 6.3 mAs – 20 s (add. filt. 0.7 mm Cu or 0.15 mm Cu)								
ANGLE	Deg.	-135	-90	-45	0	45	90	135
Stray radiation*	µGy	22	23	21	21	20	17	16

Stray radiation 16 x 10 HR @ 120 kV or 90 kV- maximum output power (60W – 14 x exams per hour) (add. filt. 0.7 mm Cu or 0.15 mm Cu)								
ANGLE	Deg.	-135	-90	-45	0	45	90	135
Stray radiation*	µGy	314	329	300	300	286	243	229

*Maximum values measured 20 cm below the horizontal cross sectional plane with chin rest. Other values in the vertical axis are lower than these values.

3D isodose curves for one exam.



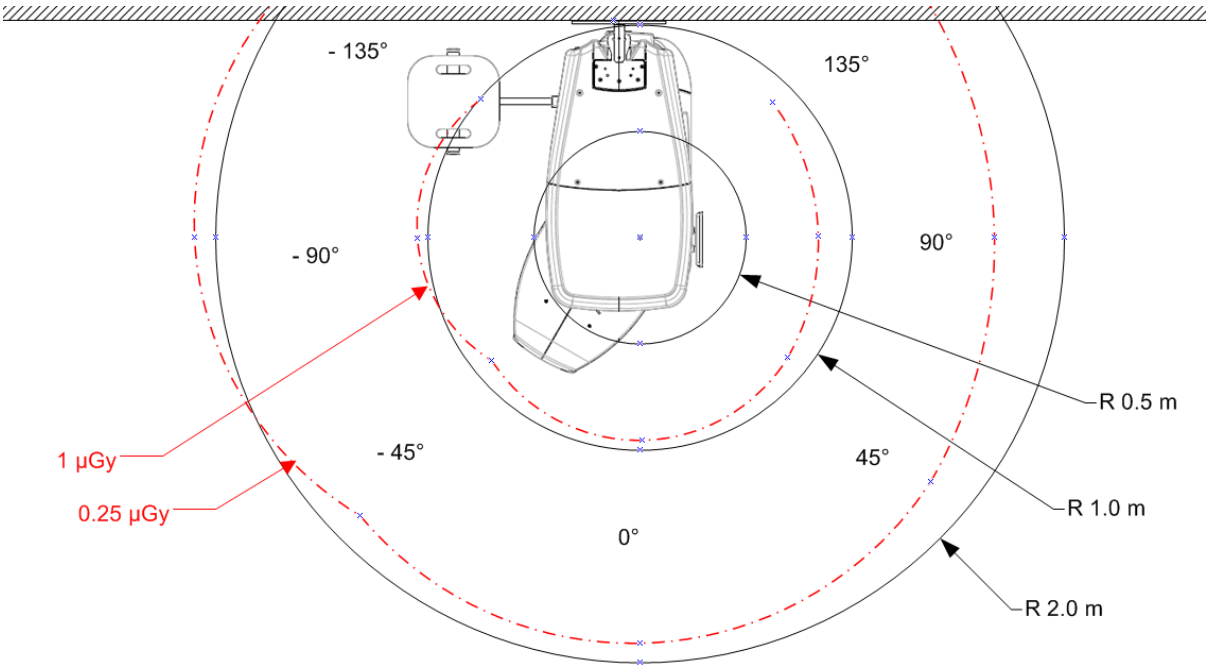
Panoramic Mode

Stray radiation for one exam PANORAMIC STD @ 73 kV - 8 mA - 12.3 s (add. filt. 1.5 mm Al)								
ANGLE	Deg.	-135	-90	-45	0	45	90	135
Stray radiation*	µGy	1	1.1	0.8	0.9	0.8	0.7	0.8

Stray radiation PANORAMIC STD @ 73 kV - maximum output power (60W – 30 x exams per hour) (add. filt. 1.5 mm Al)								
ANGLE	Deg.	-135	-90	-45	0	45	90	135
Stray radiation*	µGy	30	33	24	27	24	21	24

*Maximum values measured 20 cm below the horizontal cross sectional plane with chin rest. Other values in the vertical axis are lower than these values.

Panoramic isodoses curves for one exam.



Imaging Performance Information

Panoramic

Line Pair Resolution*: 2.5 lp/mm minimum.
Low Contrast Resolution*: a minimum of 2 low contrast steps
*Using a dental phantom for digital image acquisition that complies with the IEC 61223-3-4:2000 standard.

3D

The value of the Modulation Transfer Function** (MTF) at 10 % is superior to 1 lp/mm.
The Signal-to-Noise Ratio (SNR) measured in an homogeneous 1 mm thick slice of PMMA*** material is greater than 10.
** Using a dental phantom for digital image acquisition that complies with the DIN 6868-161 standard.
***Polymethyl methacrylate (PMMA) is a transparent thermoplastic material.
CS 9600 does not provide Computed Tomography (CT) numbers, therefore, conventional analyses using CT numbers cannot be made.

Controlling the Image Quality

For optimum results, perform a control test of the image quality. To do this, see the User Guide, Chapter "**Controlling the Image Quality**".

CS 9600 Environmental Requirements

Ambient Operating Conditions	
Temperatures	10 – 35 °C
Relative humidity	30 – 80 %
Atmospheric pressure	700 – 1060 hpa
Altitude	Up to 3000 m

Storage Conditions	
Temperatures	-10 – 60 °C
Relative humidity	10 – 90 %
Atmospheric pressure	700 – 1060 hpa

Transport Conditions	
Temperatures	-10 – 60 °C
Relative humidity	10 – 90 %
Atmospheric pressure	700 – 1060 hpa

CS 9600 Electrical Specifications

Type of Electrical Power Supply	100-240 V ~ (±10 %) 50/60 Hz, Single-Phase
Acceptable fluctuation	±10 %
Apparent resistance of the power supply circuit	0.12 Ω (max)
Permanent absorbed current	1.0 A
Current absorbed during the X-ray emission	10 A
Maximum absorbed power	2.2 kVA
Protection for the power supply system	By shutter release at a maximum current of 16 A and a differential current of 30 mA
Nominal high voltage	120 kV
Maximum corresponding tube current	8 mA
Nominal tube current	15 mA
Maximum corresponding high voltage	80 kV
Tube current/voltage combination for maximum output power	80 kV, 15 mA

Selection of the Load Parameters:	
kV (in increments of 1 kV)	From 60 to 120 kV
mA (in increments of 25 %)	From 2 to 15 mA

Accuracy of the Load Parameters	
High voltage	kV ± 10 %
Current in the tube	mA ± 20 %
Exposure time seconds	± (5% + 50 ms)
Measurement Conditions	
kV	Indirect on the peak kilovolt meter
mA	Direct measurement in the circuit using an oscilloscope
Exposure time	Measurement at 75 % of the kV values with peak kilovolt meter

X-ray Tube Assembly Technical Specifications

Table 6 Filtration of the Material in the X-ray Field

Standard	Compliance
IEC 60601-1-3	Compliant
Nominal value of the inherent filtration at 70 kV	2.5 mm (0.10”) eq. Al
Nominal value of the supplementary filtration at 70 kV	1.5 mm Al or 2.0 mm Al or 0.15 mm Cu or 0.7 mm Cu
Nominal value of the total filtration at 70 kV	>2.5 mm (0.10”) eq. Al
Filtration value for the enclosure of the X-ray tube (at 100 kV)	0.2 mm (0.008")
Filtration value for the enclosure of the image receiver unit (at 100 kV)	0.2 mm (0.008")
Filtration value for the sensor case	0.3 mm (0.012") eq. Al

The X-ray generator comprises the following:

- A transformer and an X-ray tube and their associated electronic components immersed in oil.
- An aluminum filter, which enhances the quality of the beam and reduces the dose received by the patient.
- A lead collimator, which limits the size of the beam at the image receiver unit.
- A thermal cutout, which trips at an operating temperature between 63 to 70 °C (±5 °C).
- Copper filter.

Figure 2 Location of the Reference Axis

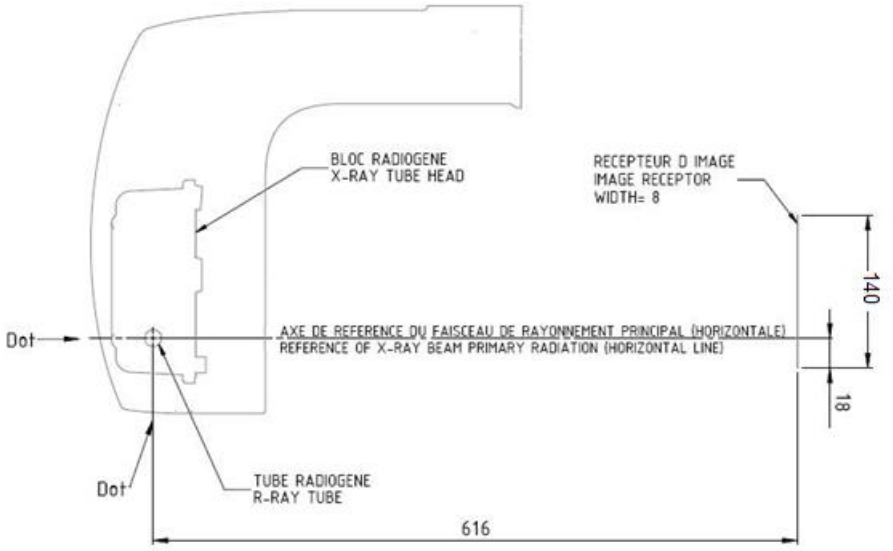


Table 7 Technical Specifications of the X-ray tube Assembly

Standard	Compliance
Manufacturer	Trophy
Degree of protection against electric shock	Class I
Degree of patient protection from the parts applied to the leakage current	Type B
Operation mode	Continuous operation with intermittent loading
Maximum accumulated heat	33 kJ
Maximum continuous heat dissipation	60 W
Tolerances on the position of the focal spot	± 1.5 mm
Continuous Anode Input Power that corresponds to the maximum specified energy input to the Anode	60 W
Radiation leakage after one hour's operation (maximum utilization rate of 60W)	< 1 mGy
Weight	8.2 kg
Dimensions	235 x 245 x 120 mm

IMPORTANT

To increase the operating life of the X-ray tube, at the first loading or if the unit has not been used for a month, you must follow the following procedures before use:

1. In the **3D Acquisition** interface**.**
2. Select the following series of parameter settings:

- 70 kV – 6.3 mA
- 80 kV – 10 mA
- 85 kV – 10 mA
- 100kV – 8 mA
- 120 kV – 8 mA

3. Leave the X-ray room and close the door. For each parameter setting, from the X-ray remote control, press and hold the button to launch the X-ray

The unit is now ready to be used for acquisition.

Figure 3 Heating and Cooling Curves of the X-ray Tube DF-071G

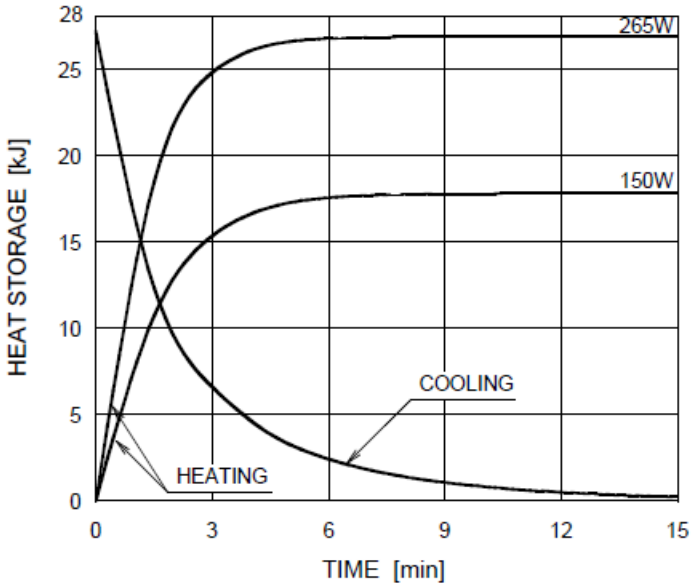


Figure 4 Heating and Cooling Curves of the X-ray Tube OX/120-0307

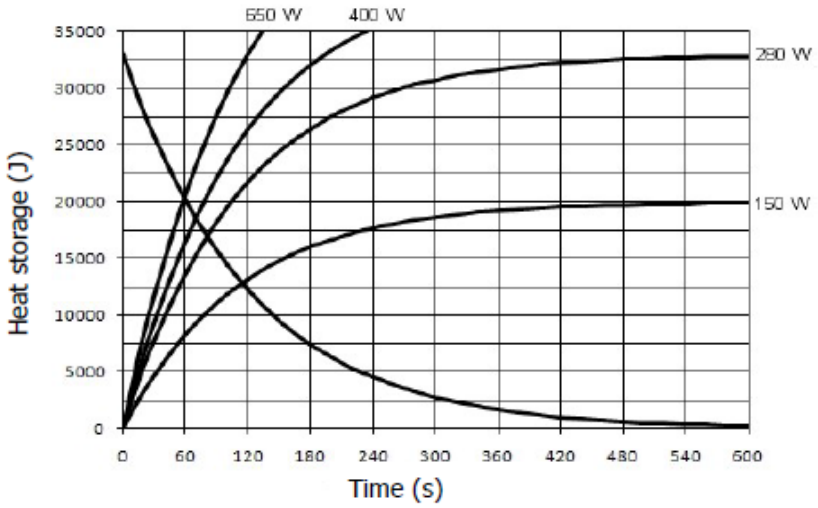


Table 8 Beam Limitations of the X-ray Tube Assembly

Manufacturer	Trophy
Type	Rigidly mounted unit with fixed window dimensions, not removable, and integrated x-ray generator
Maximum symmetrical field of radiation in panoramic mode at a distance of 616 mm from the focal point	6.4 mm x 140 mm
Maximum symmetrical field of radiation in panoramic mode (sinus exam) and in 3D mode at a distance of 616 mm from the focal point	120mm x 140mm
Location of the reference axis	See Figure 3

Table 9 Characteristics of the X-ray Tube

Manufacturer's name	Toshiba or Canon	CEI
Type	DF-071G	OX/120-0307
Nominal high voltage	120 kV	120 kV
Nominal anode input power (at 1.0 s)	1360 W for Large Focus 440 W for Small Focus	1900 W for Large Focus 500 W for Small Focus
Anode heat storage capacity	28 kJ	33 kJ
Nominal focal spot size (EN 60336)	0.7 mm for Large Focus 0.3 mm for Small Focus	0.7 mm for Large Focus 0.3 mm for Small Focus
Anode materials	Tungsten	Tungsten
Target angle	12°	12°
Inherent filtration	0.8 mm (0.032") eq. Al	0.5 mm (0.028") eq. Al

Figure 5 X-ray tube drawing: DF-071G

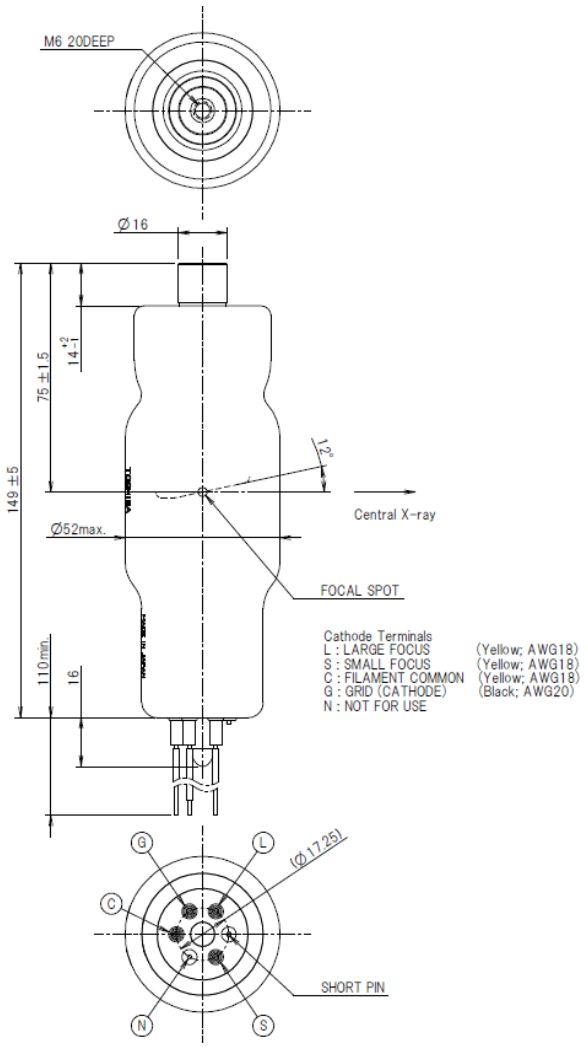
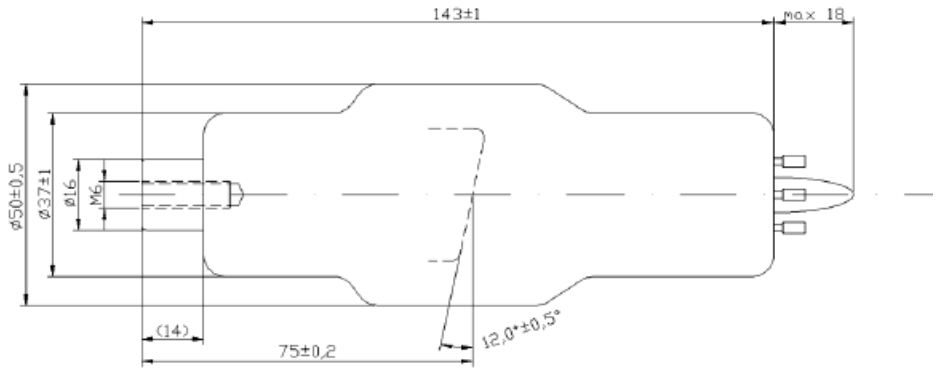


Figure 6 X-ray tube drawing: OX/120-0307



4 Contact Information

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