

Orthopantomograph® Orthoceph®

OP200 – digital and film



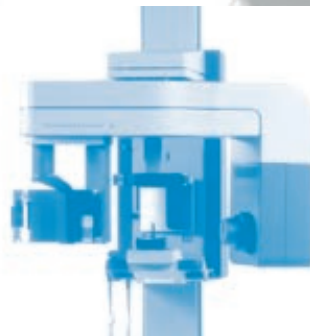
VT – Volumetric Tomography

Another new imaging standard at your fingertips

A proven leader

Leading the way through the decades

- 1946 Professor Y.V. Paatero published his first paper on Panoramic Tomography
- 1951 "Pantomography" equipment was first presented
- 1961 The first dental panoramic x-ray, Orthopantomograph® OP1, is developed
- 1964 Commercialization of Orthopantomograph® begins with models OP2 and OP3
- 1978 Orthopantomograph® is the leading name in the dental panoramic imaging producing models OP5/OC5, OP6 and OP10/OC10
- 1992 New innovations, such as lifting cassette head and linear tomography were introduced along with the OP100 product family
- 1999 Introduction of the direct digital Orthopantomograph® OP100 product family
- 2006 New Orthopantomograph® OP200 family
- 2007 Narrow Beam Volumetric Tomography



1951

1961

1984

1992



in dental imaging

An establisher and proven leader of panoramic x-ray imaging has news for you. Now there's a new standard.

The new 200-generation of the Instrumentarium Dental Orthopantomograph® x-ray family represents everything you would expect from a high quality dental extraoral imaging unit – and more. It carries forward the reputation of reliability and clinical excellence that all Orthopantomograph® units have earned since their first introduction more than 40 years ago. Reliability and durability have always been one of our main design and manufacturing principles.

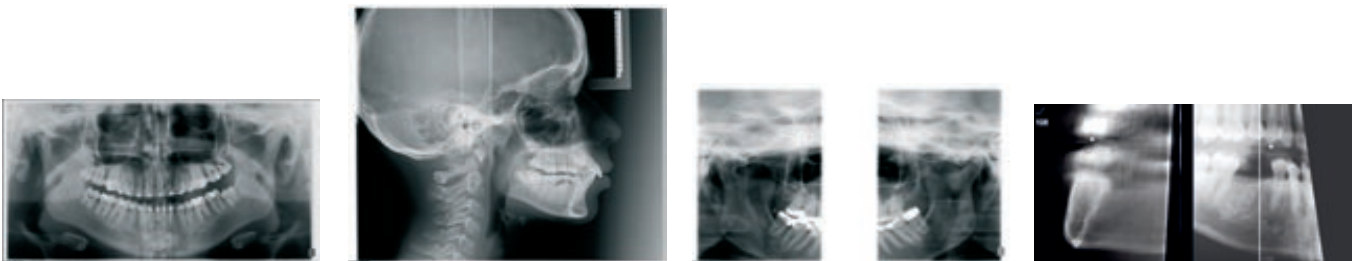
The OP products have also long been one of the most versatile extraoral x-ray units, with a number of installation options designed to fit each individual user's needs. Upgradeability has been our standard since the first OP100 product in 1992.

We have also always valued long-term partnerships with our local distributors in order to provide the purchasers of our product with quality installation and support.

A wise investment for today and tomorrow

Now there is a new standard – Orthopantomograph® OP200 family

- ➔ A new era of usability
- ➔ Unsurpassed image quality – time after time through experience and innovation
- ➔ Volumetric Tomography, now available for everyone
- ➔ We care for your patients' well-being
- ➔ Uncompromised diagnostic details for professional results
- ➔ Optimized cephalometric results with minimized patient dose
- ➔ The most adaptable configuration for your specific needs



All the important imaging tools in one premium quality unit



*New
completely
integrated
system*



➔ **SmartPad™ full-color touch screen**

The SmartPad™ produces an easy to read and follow menu with simple and intuitive navigation through the operations.

➔ **Animated patient positioning guide**

The user can select patient positioning animations specific to each imaging program to ensure proper patient position.

➔ **New compact handcontrol unit**

The OP200 can be configured for the unit to be alternatively operated from a handcontrol instead of the SmartPad™.

A new era of usability

➔ New completely integrated system

The OP200 digital unit has available a built-in medical computer designed specifically for maximum performance of the OP200. Through innovative engineering, the computer has been directly integrated into the system. No additional computer is required for image capturing.

➔ Intelligent interactive navigator

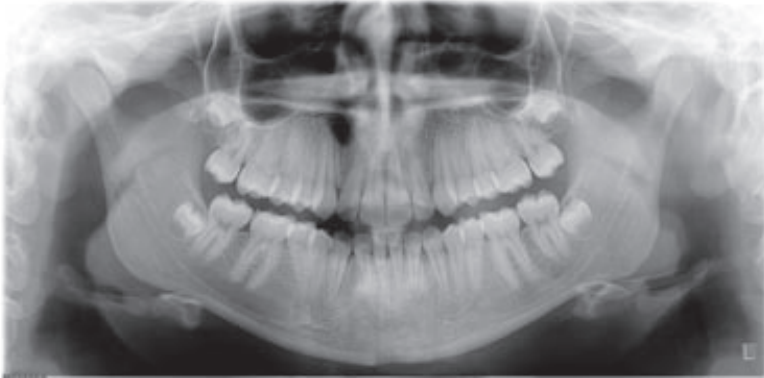
The SmartNav™ navigation software provides easy selection of imaging programs, arch sections, lateral scanning start position, and more. The user can easily set the desired OP200 user parameters in SmartNav™. All information is displayed and described in an understandable way.

➔ Instant dynamic help

This feature provides quick and convenient information related to the imaging programs, such as the purpose of the program selected. Complete user manuals are also included in SmartNav™.



SmartPad™ – everything at your fingertips



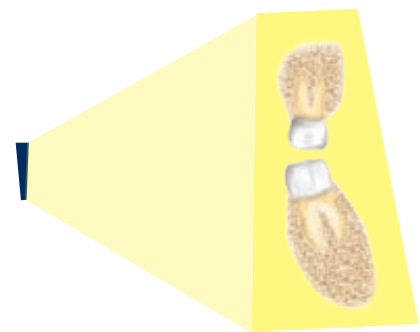
➤ Correct imaging values – automatically

Instrumentarium Dental's unique and patented method of dose controlled Automatic Exposure Control (AEC) and individual Automated Spine Compensation (ASC) generates correct imaging values using the full CCD dynamic range at the lowest possible patient dose. This ensures outstanding image quality with any size patient exposure after exposure.

➤ Clinically proven imaging geometry

Instrumentarium Dental's experience and understanding of imaging geometries ensures optimum imaging results.

The patented V-shaped x-ray beam adapts to the human anatomy, providing even greater detail and a wider mandibular image layer. V-shape beam also allows more penetrating power for the maxilla.



Yellow area represents the focal trough depth.



Digital OP200

➤ Accurate and stable patient positioning

Correct patient positioning is assured by three positioning laser lights. Frankfurt and mid-sagittal lights aid in the correct angulation of the patient's head and the occlusion correction light ensures proper anterior positioning.

For easy adjustment, both the user and the patient can view the mid-sagittal plane in the curved mirror. A rigid 5-point positioning system including forehead support, chin rest and bite fork eliminates patient movement. The open design allows easy viewing and positioning of the patient from either the left or right side.

The film-based version of the OP200 uses a unique, patented panoramic cassette identification system to prevent incorrect placement of the cassette into the cassette holder. The film-based OP200 also has a built-in Quality Assurance program to verify proper film processing, one of the most common problems in obtaining excellent films.



OP200 film unit

➤ The latest digital technology

The supersensitive Orthopantomograph® 200-series CCD sensor with hi-speed fiber optics and sophisticated software algorithms generates high quality, real time x-ray capture with a new larger image field. This is combined with an advanced high-frequency generator, small focal spot and smooth movements to produce excellent high resolution digital radiographs with reduced dose.



Unsurpassed image quality

Unsurpassed image quality
time after time
through experience
and innovation

➔ **Essentials for excellent panoramic imaging:**

- Advanced high frequency generator technology
- Small focal spot
- Clinically correct imaging geometry
- V-shaped x-ray beam
- Latest CCD technology
- Dose controlled Automatic Exposure Control (AEC)
- Automatic Spine Compensation (ASC)
- Accurate and stable 5 point patient positioning:
 - Open view of the patient
 - Side positioning
 - Three clear laser positioning lights
- Professional software tools

Volumetric Tomography – an advanced tool for implant

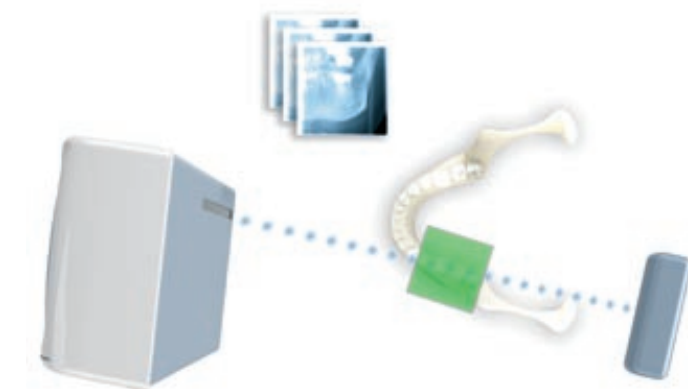
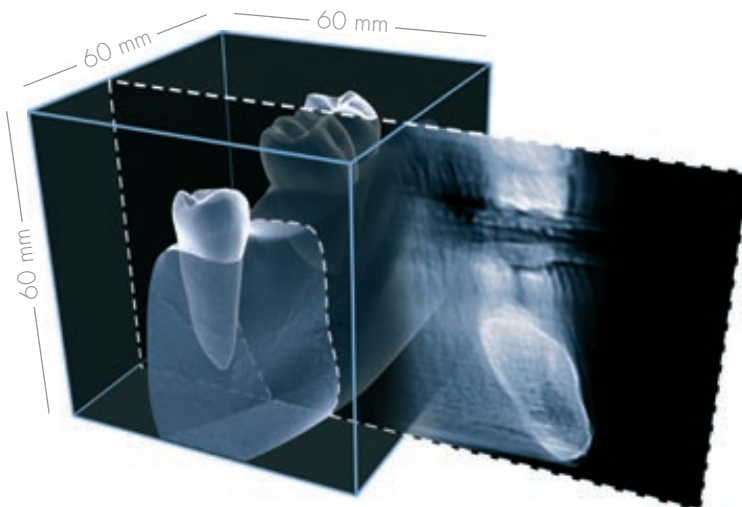
VT option is a *Narrow Beam Volumetric Tomography (NBVT)* imaging tool that provides digital tomography with reliable measurements and excellent image quality for implant site evaluation.

➔ What does VT do?

One VT image covers a cubical area of 60 mm per side, producing 256 cross-sectional slices with a minimum slice thickness of 0.23 mm.

➔ How does VT do this?

The resulting 3D model is reconstructed from a set of projection images targeted only on the region of interest. The reconstructed, wide volumetric view offers 256 slices, from which the optimal slice or any number of slices can be viewed.



➔ Excellent image quality

Our unique Statistical Inversion (SI) reconstruction method enables high-quality imaging using the standard panoramic sensor and a narrow x-ray beam.

SI – developed and patented by Instrumentarium Dental – has been proven to give better image quality than other known reconstruction methods.

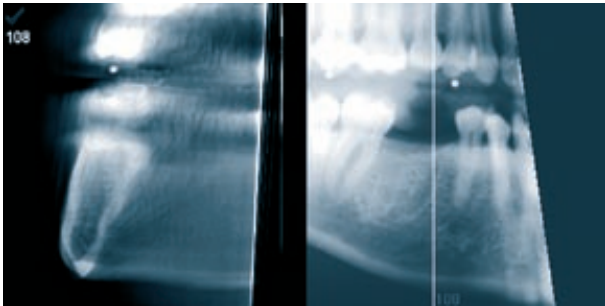
➔ *Accurate magnification is obtained by keeping the focal spot stationary and the source-to-object distance constant during each projection scan. This ensures constant and equal magnification both in horizontal and vertical dimensions.*

tology



➔ **VT – the cost effective solution**

The Orthopantomograph® OP200 model with Orthoceph® and VT offers you all the important imaging tools in one premium quality unit. There is no need to learn to use several different products and software when one unit can fulfill all your needs. Cost effective VT option field upgrades are available for most existing Orthopantomograph® units.

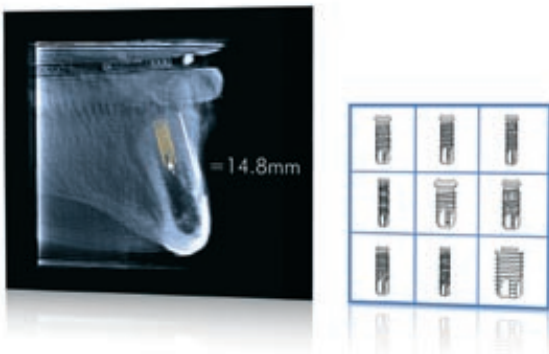


Stack of 256 slices

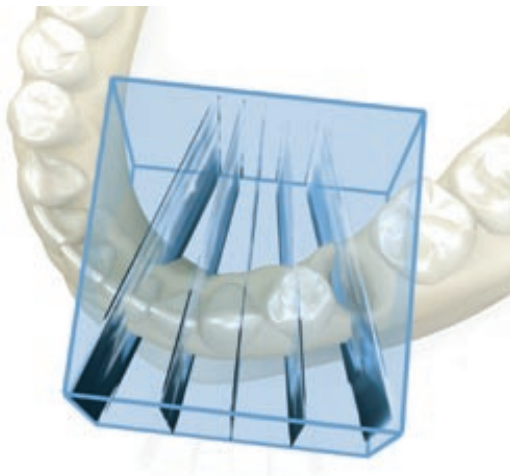
➔ Easy navigation of slices

The VT stack view provides accurate and valuable information especially for implant planning. The precise location of the cross-sectional slice is always known.

➔ *Cross-sectional images linked to a navigation view result in an easy-to-understand image.*



➔ *The Implant planning tool helps you to easily determine the correct implant for treatment. The tool contains implant models from various manufacturers. The software provides necessary measuring tools.*



➔ Automatically perpendicular to the jaw

CliniView™ Software automatically adjusts the slice angle with the bone resulting in perpendicular cuts. Any desired slice can be easily selected and the angulation of the slices can further be adjusted if necessary.

Volumetric imaging is now available for everyone!



ORTHOPANTOMOGRAPH® OP200 D

➔ Efficient and easy operation

An innovative positioning system allows easy and consistent patient positioning. Selection of the region of interest is guided by five pre-selected positions, eliminating the need for lengthy and cumbersome patient positioning. The OP200 D SmartNav™ controller software allows an easy selection of imaging parameters and has helpful patient positioning animations.



Very easy and forgiving patient positioning



No measuring of patient or marking of impressions required

We care for your patient's well-being

➔ Unique automatic patient dose recording

The Orthopantomograph® OP200 uses a built-in dose calculator to show the dose amount after every exposure. This dose information is automatically stored with other exposure parameters in the CliniView™ software.

➔ Quick workflow and less retakes

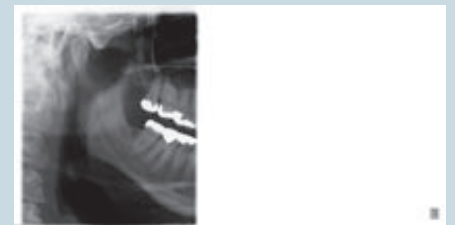
Our long experience in panoramic imaging has allowed us to design a system that is non-intimidating to the patient as well as easy and efficient to use. This results in consistent diagnostic information that allows you to provide the very best care for your patients.

➔ User controllable radiation field



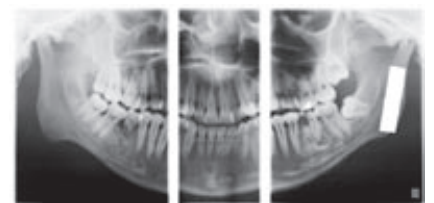
Selecting the OP200 pediatric program automatically reduces the radiation dose to small patients by incorporating a specially designed image layer geometry and limiting the exposure time. A special pediatric collimator automatically limits the vertical field of exposure and further reduce the radiation that the patient receives.

When a full panoramic image is not required, 1 to 5 segments of the horizontal image can be selected to expose only regions of diagnostic interest.



➔ Special geometry

The Ortho Zone program provides special geometry to solve two common imaging problems: metal artefacts in the molar region of the condyle, and the need for an exceptionally wide anterior layer for patients with malocclusion.





The very best care for your patients

➔ Low dose tomography

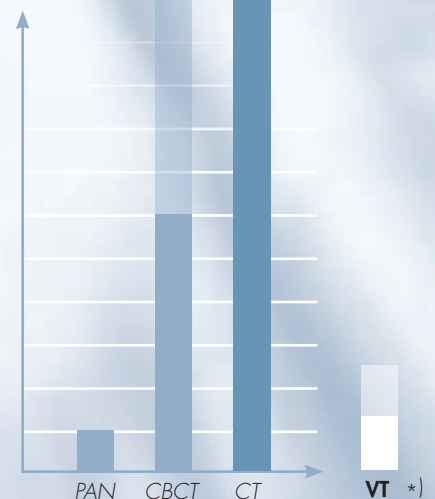
VT exposes only the selected region of interest. Patient dose is further reduced by using a narrow beam and limited number of projections.

Retakes are practically unnecessary as reconstruction compensates automatically for movement artifacts between projection images.

*) VT dose equals approximately 1–2 panoramic images depending on the number of projection images taken.

Dose comparison

Dosimetry of 3 CBCT devices for oral and maxillofacial radiology, Dentomaxillofacial Radiology (2006) 35





Uncompromised diagnostic details for professional results

➔ Maximized visibility of diagnostic information

The CliniView™ software, when combined with the OC200 D, adds value to the system by providing the optimum image display. Selecting the 16-bit image format in the software along with the adjustable sharpening or edge enhancement tool improves the visibility of important orthodontic reference points. These enhancement tool settings, stored in the software, are automatically applied each time.

In addition to the normal image enhancement tools CliniView™ software provides excellent special functions for diagnosis. The region of interest tool contains a magnifying glass with equalizer function to optimize the area to be diagnosed. The isodensity and colorization tools can be used for patient education.

➔ Stable patient positioning

The Frankfurt horizontal plane laser light, nasion support and rigid ear rods with locking system make patient positioning easy and convenient. Motorized vertical movement controls are located on the cephalostat secondary collimator for easy access. Exposure values and the correct program are automatically selected along with the image projection.

➔ Clinically correct image geometry

In order to produce equal and accurate horizontal and vertical magnification, the OC200 D uses a patented method of synchronized tube head horizontal sweep and sensor movements while keeping the focal spot in the same position. This results in clinically correct imaging geometry equivalent to traditional film imaging and allows easy determination of orthodontic reference points and comparison with film images. Any focal spot movement during the scan would produce unequal magnification in the vertical and horizontal dimension.



➔ Essentials for excellent cephalometric imaging:

- Clinically correct imaging geometry
- Fast adjustable lateral scan
- Automatic Facial Contour (AFC)
- Frankfurt horizontal plane laser light
- Stable patient positioning with ear holder locking
- Professional software tools
- Single and dual sensor options
- Right or left handed versions
- TWAIN connectivity
- Small footprint

Optimized cephalometric results with minimized patient dose

➔ Fully adjustable horizontal lateral scan

The adjustable cephalometric scanning time correlated to the patient size ensures the optimal exposure time. Furthermore, the OC200 D incorporates an advanced user-adjustable lateral scan method to expose only the desired portion of the skull to be visualized. This method reduces the scanning time to a minimum of 5 seconds and reduces the patient dose considerably.

The OC200 D uses the patented method of Automatic Facial Contour (AFC) for soft tissue enhancement in lateral views. The unit automatically adjusts the exposure values during the scan for better soft tissue definition. This results in improved dynamic range of the image and lower patient dose.



Dose reduction depends on patient size and is compared to full lateral scan without AFC. This feature is available with OC200 digital model. By exposing only the necessary area, patient safety is greatly increased.

48 to 62% dose reduction



➔ Full range of projections

The Orthoceph® patient positioning system provides a variety of imaging projections for cephalometric radiography. It is a comprehensive diagnostic device that includes lateral, facial, posterioranterior and oblique projections, as well as the possibility for hand and wrist imaging.

➔ Professional software tools

CliniView™ digital imaging software provides versatile tools, such as advanced print editor, which enables multiple images to be printed along with image information. If measurements are done from the prints, the magnification factor can be separately selected and is shown together with printed images.



Most adaptable solutions

➔ Easy software connectivity

Special orthodontics software can also be used together with Orthopantomograph® OC200 D panoramic unit with cephalometric attachment. Our OC200 D TWAIN software integration enables image capture with any TWAIN-compliant 3rd party software without special interface solutions.

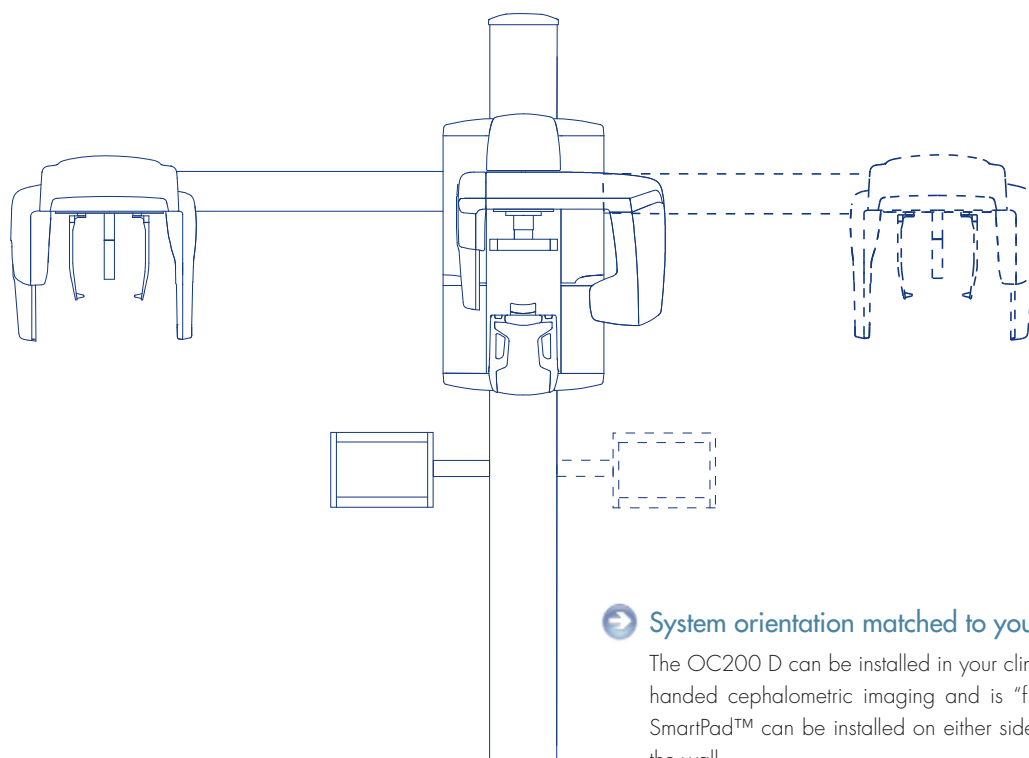
The Orthopantomograph® ImageTWAIN contains its own image control functions to provide excellent image quality. Measurement calibration checks can also be done from the Orthopantomograph® position support mm scale.

➔ Optimum use of available space

A standard wall mount with swivel joint allows the OC200 D to be installed at an angle for optimum use of room space and convenient patient positioning. Volumetric Tomography option does not require any additional space.

➔ Selectable sensor configuration

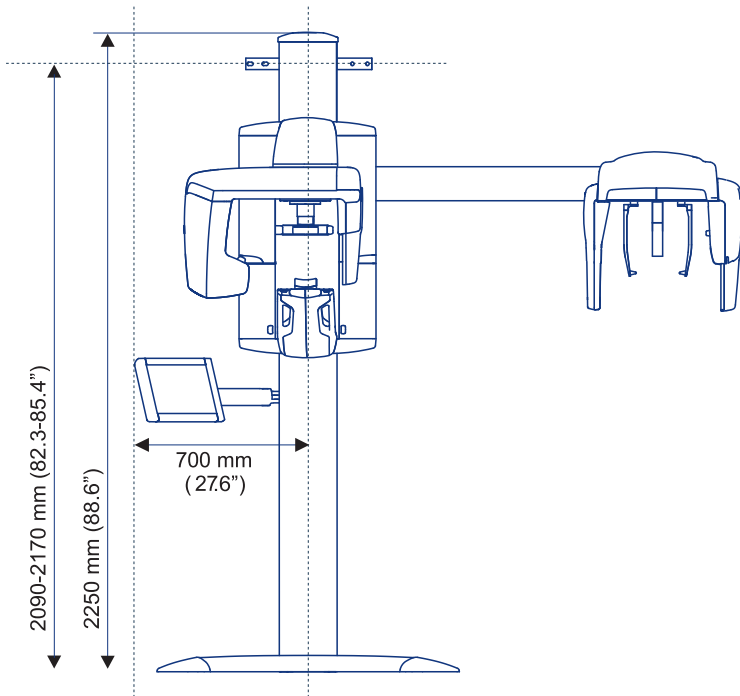
The use of two separate sensors (one for panoramic and one for cephalometric imaging) allows easier and quicker changeover between the two modalities. This eliminates the need to handle and move the sensor. A single interchangeable pan/ceph sensor system is also available as an option.



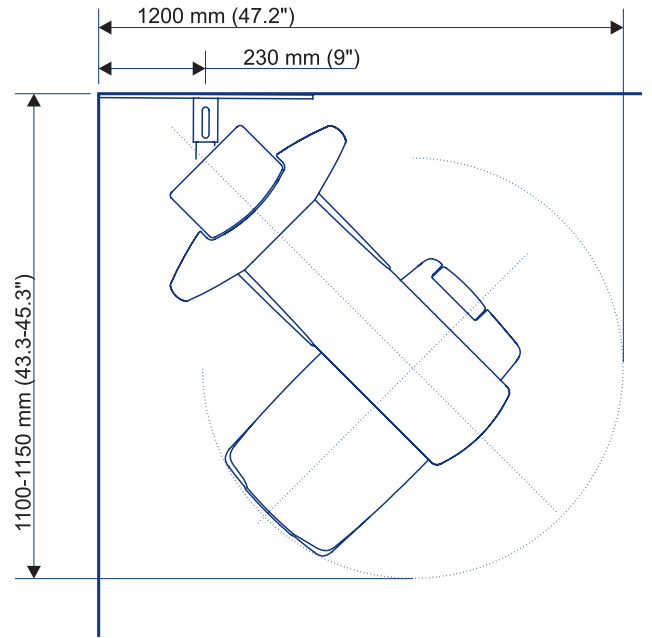
➔ System orientation matched to your preferences

The OC200 D can be installed in your clinic for right- or left-handed cephalometric imaging and is “field changeable”. SmartPad™ can be installed on either side of the unit or on the wall.

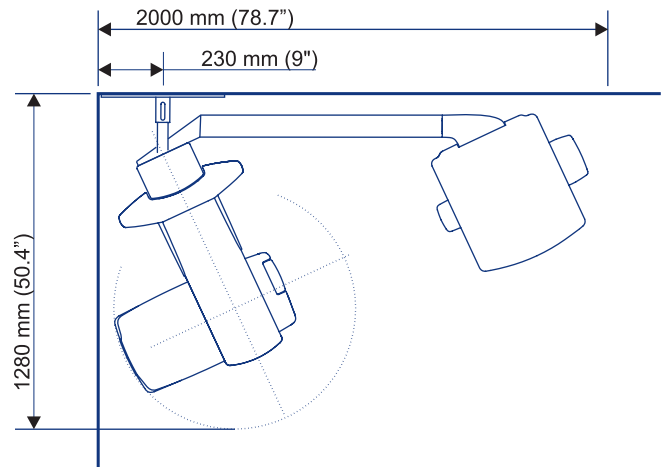
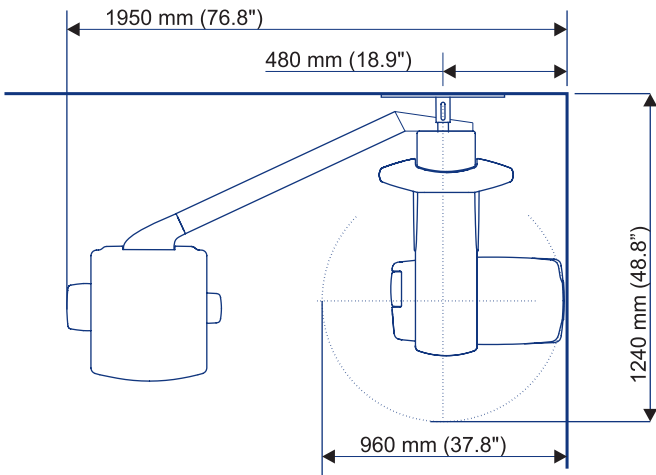
Film and digital unit height and SmartPad™ width



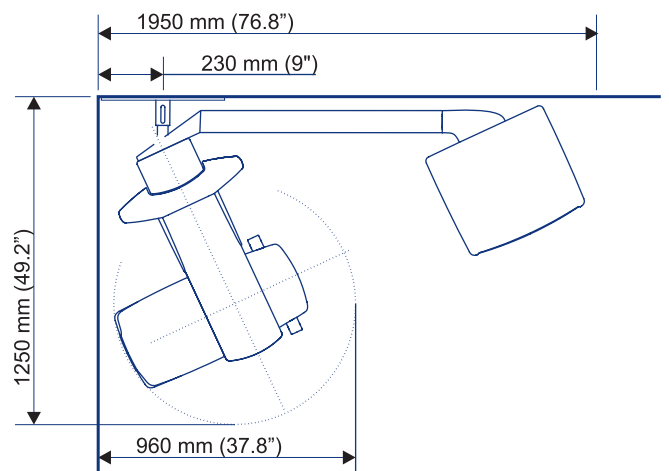
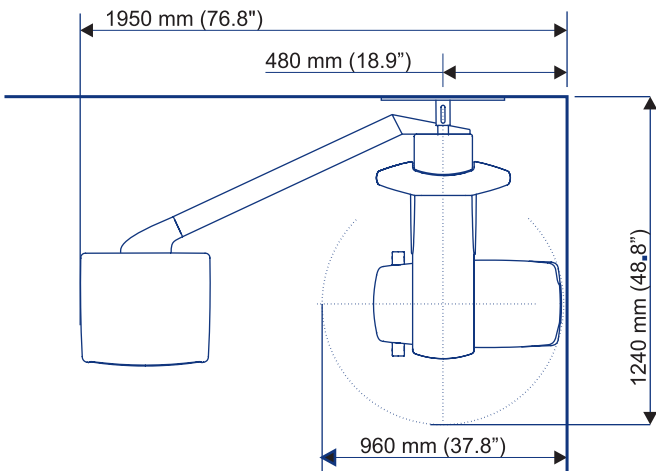
Panoramic unit corner installation
(SmartPad™ may have to be installed on the wall)



Minimum space requirement for digital unit including built-in PC and the SmartPad™ mounted on cephal side.



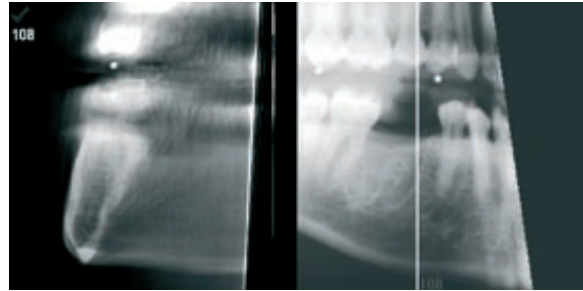
Minimum space requirement for film unit



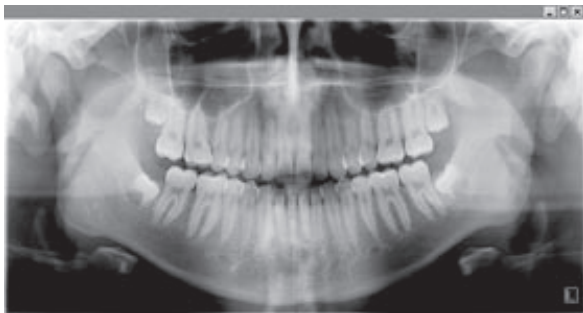
Imaging programs

Versatile imaging programs

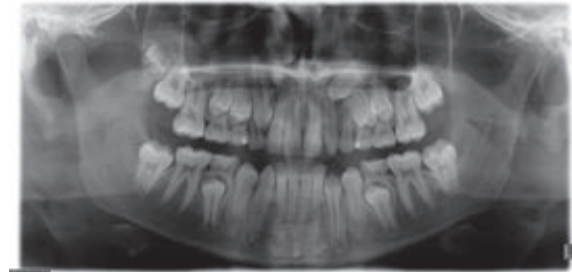
In addition to the many standard panoramic programs, special imaging programs are available to facilitate easy diagnosis even with difficult clinical conditions:



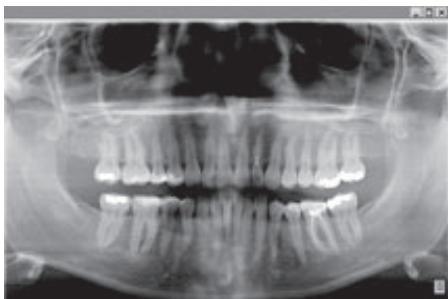
VT The Volumetric Tomography stack view and slice navigator. Optional modality.



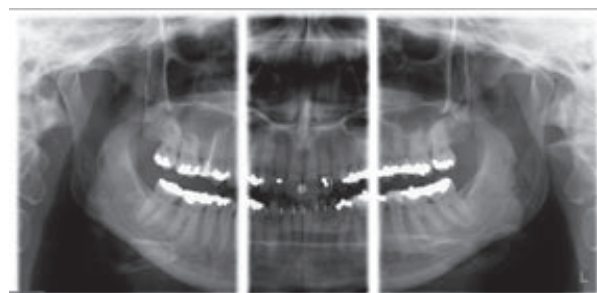
P1 Standard panoramic imaging program P1 provides clear image of adult patients.



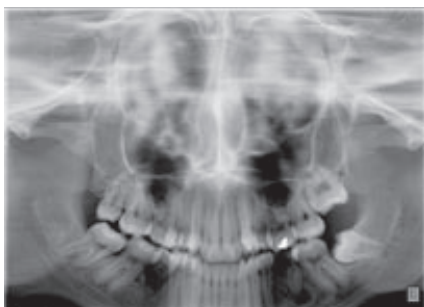
P2 Pediatric panoramic program has clinically adapted image layer and reduced image height for child patients.



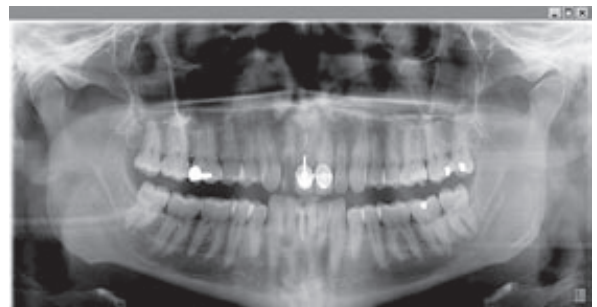
P4 The Orthogonal program reduces overlapping of the teeth.



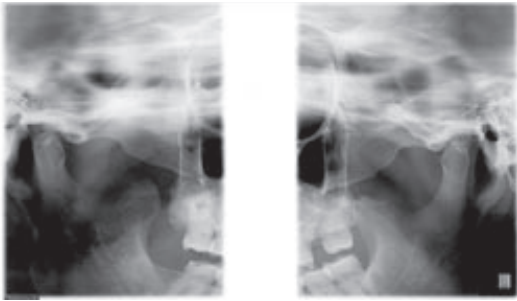
P3 The Ortho Zone provides special geometry for an exceptionally wide anterior image layer.



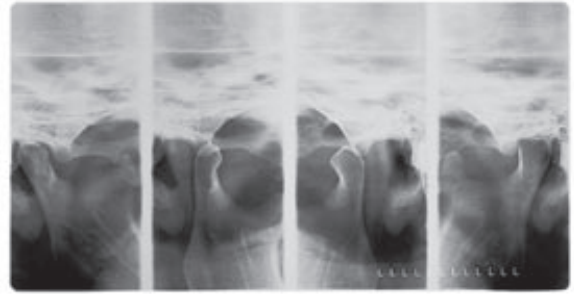
P8 Sinus maxillary imaging program. P10 with film unit.



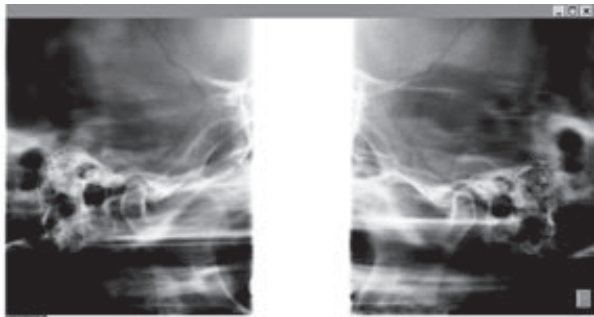
P5 The Wide Arch program is appropriate for the patients with wider than average dental anatomy.



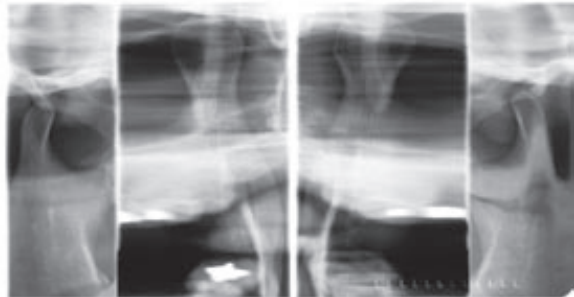
P6 *Temporo-mandibular joint (TMJ) lateral view can be taken with mouth closed or open.*



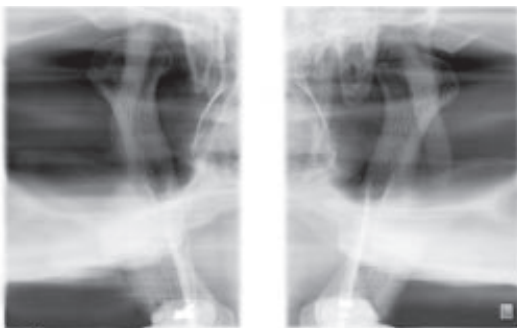
P7 *With the film unit a special program is provided for taking both open and closed TMJ views on same film.*



P6 *The standard lateral TMJ program can be replaced with the alternative Ortho TMJ program for obtaining a corrected lateral condylar angle view.*



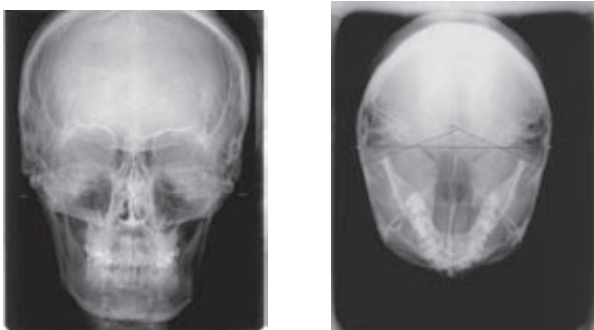
P9 *With the film unit, a special TMJ program provides both lateral and PA views on same film.*



P7 *TMJ PA projection gives clear view of condyles with 1.8 magnification. P8 with film unit.*



P9 *Cephalostat lateral view. P11 with film unit.*



P10 *The Orthoceph® patient positioning system enables variety of imaging projections for cephalometric radiography. It includes facial, posterioranterior and Submentovertex projections among others. P12 with film unit.*



P11 *Carpus imaging with cephalostat units. Optional in some markets.*

Orthopantomograph® Orthoceph® digital



Handcontrol can be used instead of the SmartPad™.

Left handed digital ceph comes with additional positioning mirror.

Optional carpus holder for accurate wrist imaging with digital ceph.

OC200 D unit shown with optional SmartPad™, embedded computer and base plate for free standing.

Technical specifications

generator	high frequency DC, 75-150 kHz
x-ray tube	D-051S
focal spot size	0,5 mm, according to IEC 336
total filtration	minimum 2.5 mm Al
tube voltage	57 - 85 kV
tube current	2 - 16 mA
nominal voltage	110/230 VAC +/- 10% 50/60 Hz
main fuses	10 A @ 230 VAC, 15 A @ 110 VAC
power consumption	2.3 kVA @ 230 VAC, 1.65 kVA @ 110 VAC

	OP200 D	OC200 D	OP200	OC200
patient positioning lights	3	4	3	3
dose controlled AEC	yes (P1-P5)	yes (P1-P5)	yes (P1-P5)	yes (P1-P5)
nominal magnification	1.3	1.14 (ceph)	1.3	1.08 - 1.14 (ceph)
number of imaging programs	8	10	10	12
imaged area variations	31	9	31	3
automatic spine compensation ASC	yes (P1-P5)	yes (P1-P5)	yes (P1-P5)	yes (P1-P5)
occlusion correction	yes	yes	yes	yes
automatic facial contour AFC	n/a	yes	n/a	semi-automatic
exposure time	2.7 - 17.6 s	5 - 20 s	2.7 - 17.6 s	0.1 - 3.2 s
automatic dose recording	yes	yes	yes	yes
control device	SmartPad™/handcontrol	SmartPad™/handcontrol	handcontrol	handcontrol
weight approx.	175 kg / 385 lbs	210 kg / 465 lbs	175 kg / 385 lbs	210 kg / 465 lbs

VT specification

X-ray beam	fan beam
Volumetric image size	60 x 60 x 60 mm
Number of slices	256
Slice thickness	0.23 mm
Dose	1.3 x panoramic image *)
Reconstruction	Statistical Inversion method
Space requirement	OP space requirement

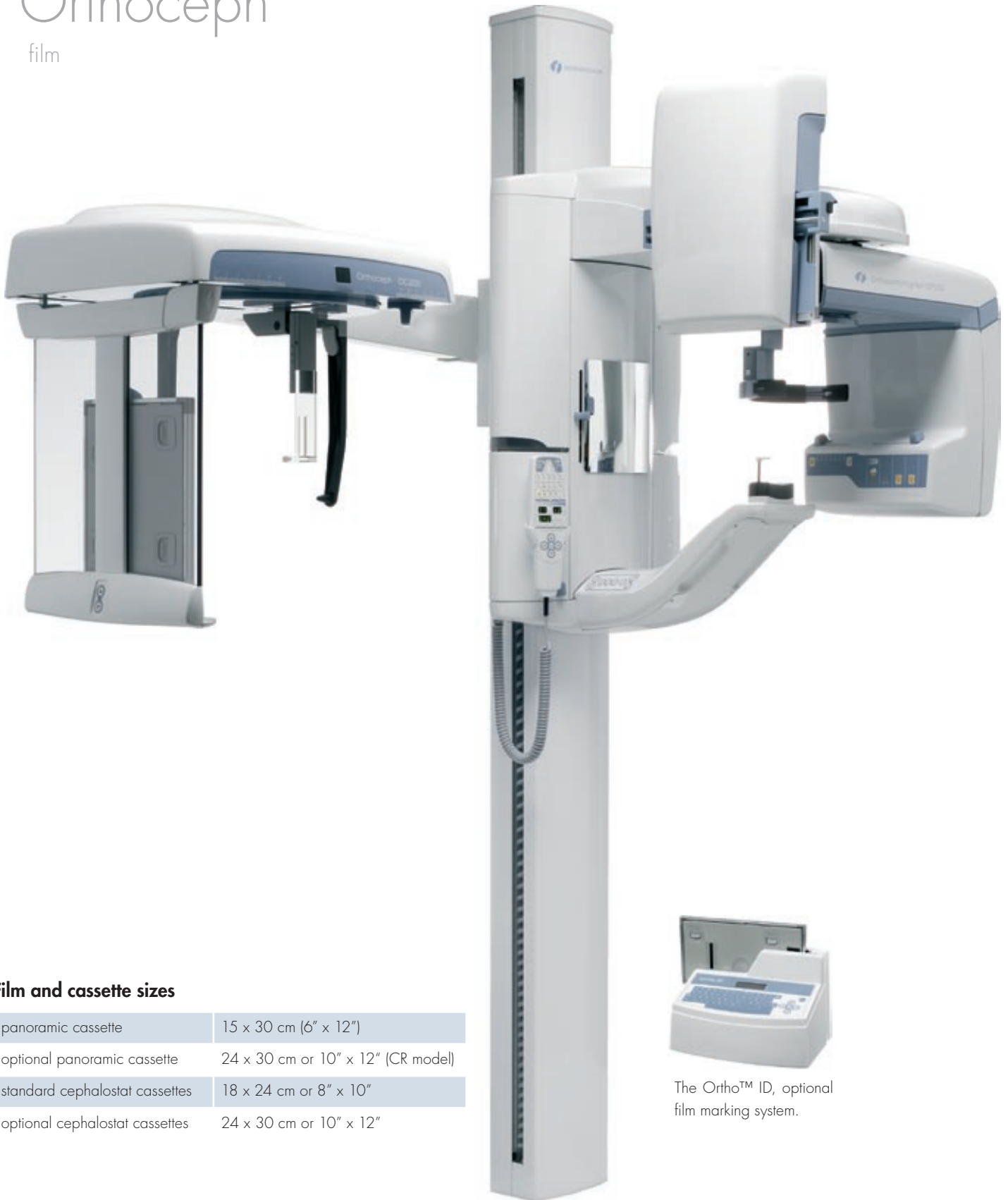
Digital specification

	OP200 D	OC200 D
sensor pixel size	48 x 48 µm	48 x 48 µm
image pixel size	96 x 96 µm	96 x 96 µm
image field height	5.8 inches / 147 mm 4.7 inches / 120 mm pediatric (P2)	8.7 inches / 221 mm
PC minimum requirement for image capture	Pentium 800 Mhz or equivalent, 256 Mb, 40 Gb, 1 PCI slot	Pentium 800 Mhz or equivalent, 256 Mb, 40 Gb, 1 PCI slot
operating system	WIN 2000 / XP / 2003 Server	WIN 2000 / XP / 2003 Server
DICOM compatibility	optional	optional
TWAIN connectivity	optional	optional
embedded computer	optional	optional
SmartPad™	optional	optional



*) Depending on number of projection images

Orthopantomograph® Orthoceph® film



Film and cassette sizes

panoramic cassette	15 x 30 cm (6" x 12")
optional panoramic cassette	24 x 30 cm or 10" x 12" (CR model)
standard cephalostat cassettes	18 x 24 cm or 8" x 10"
optional cephalostat cassettes	24 x 30 cm or 10" x 12"



The Ortho™ ID, optional film marking system.

Imagination turned into reality
Orthopantomograph® OP200 D





INSTRUMENTARIUM



Extraoral panoramic imaging



Extraoral cephalometric imaging



Intraoral imaging

INSTRUMENTARIUM DENTAL develops and manufactures premium quality dental imaging solutions. Present models of legendary Orthopantomograph® – OP200, OC200, OP200 D and OC200 D – serve demanding panoramic and cephalometric diagnostic needs both in film and digital environment. FOCUS™ x-ray and SIGMA™ sensors combine an intelligent solution for advanced intraoral imaging.

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