XRADIUS
TRIO

Due to our policy of constant technological upgrading, the technical specifications may be subject to change without prior notice.

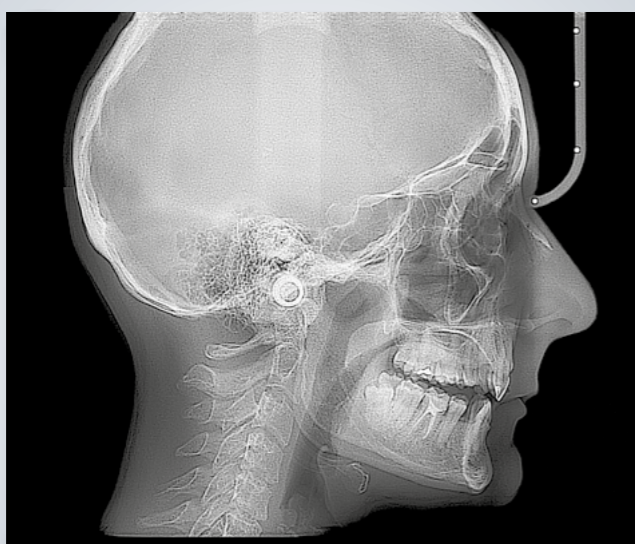Clinically superior, 2D and 3D diagnostics

CASTELLINI
PASSION FOR DENTISTRY SINCE 1935

X RADIUS
TRIO

CASTELLINI

X-Radius Trio is the ultimate answer to all your two and three dimensional radiographic imaging requirements in the dental surgery.
An easy-to-use, quick-to-upgrade 3 in 1 solution, X-Radius Trio is a lasting investment enabling 2D panoramic imaging, cephalometric exams and cone beam 3D imaging with up to Ø 11 cm full arch volumetric scan capability.

Multiple, modular, multi-dimensional imaging platform

Ready for today's needs and all set for tomorrow's evolution

With the X-Radius Trio open platform concept, you can upgrade in no time at all for tomorrow's evolving requirements. In addition to its comprehensive range of standard and specialised 2D examinations, X-Radius Trio is ready to incorporate cephalometric options and everything needed to obtain clinical 3D radiographic images, whenever you wish.


2D exams

An extensive range of bidimensional examinations also covering specific requirements such as orthogonal projections, bitewing exposures, advanced TMJ views.

Cephalometrics

To perform cephalometric projections, you can opt for a second sensor, but the option of a relocatable sensor is also possible. The single sensor can be switched to and from the ceph arm and incorporates a no-risk safety device to prevent it being dislodged accidentally.

3D radiography

A straightforward upgrade to volumetric examinations is a no more than a step away from your initial purchase. With 3D capability, one scan generates a wealth of data taking you into a wider realm of diagnostic imaging.

Full arch volumetric scans for complete diagnostic data

The most important aspect of 3D imaging is linked to the field of view (FOV). Small FOV are fine for localised diagnostics, whereas full arch 3D scans of adult dentition are only technically possible with an adequate field of view, which is at least ∅ 10 cm. Castellini goes even further to give you a ∅ 11 cm FOV.
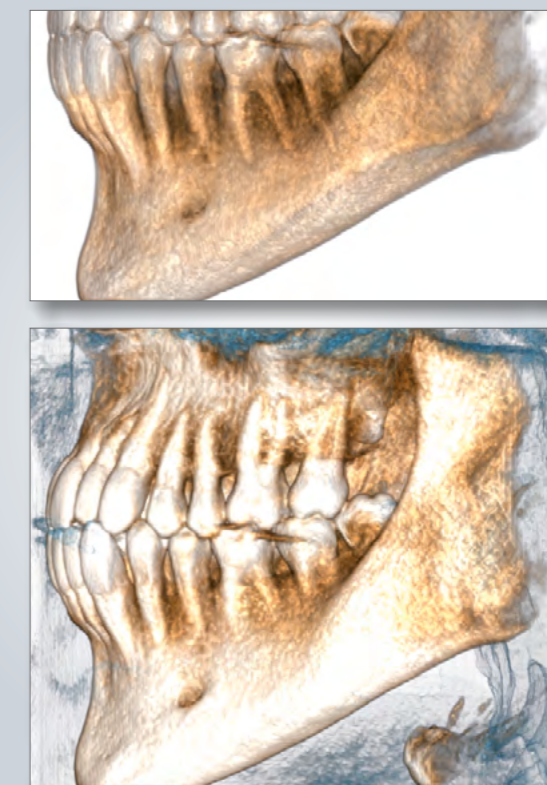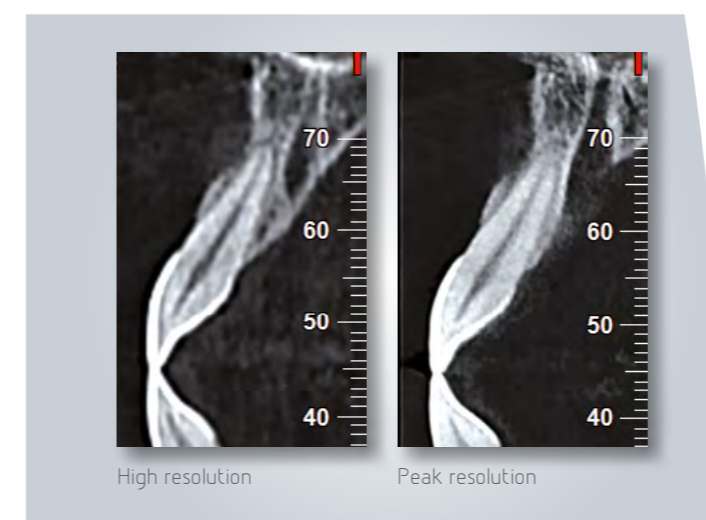
LARGE CB3D IMAGE DETECTOR		SMALL CB3D IMAGE DETECTOR	
ø cm	height cm	ø cm	height cm
11	13*	11	8*
11	8	11	5
8	8	8	5
11	5	5	5
8	5		
5	5		

*Extended View This extended FOV is obtained via a single acquisition with dual exposure times.

High resolution   Peak resolution
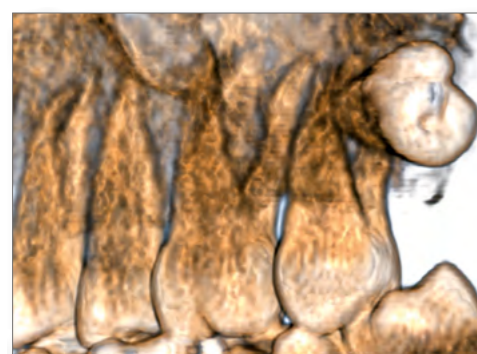
Reduced FOV for specific needs

Proper adjustment of the FOV means your patients receive considerably lower X-ray doses.
A reduced FOV is recommended for full arch scans of children's upper and lower jaws.
A 5 x 5 cm ∅ FOV is suitable for localised diagnostic requirements, as in the case of single implant planning, certain endodontic procedures or third molar extractions.

High resolution, low emission

X-Radius Trio offers two different volumetric scan modes for each FOV:
• Peak resolution with 75µm voxel images achieved with an exposure time of just 9 seconds (pulsed mode emission).
• High resolution images with an extremely low radiogenic dose thanks to pulsed mode exposure totalling a mere 3.6 seconds.

FOV and image detector to suit your needs

X-Radius Trio allows you the chance to choose a small or large image detector when you equip your surgery.
This determines the height of the 3D scans you make, going from 5 to 8 cm.
With a ∅ 11 cm FOV, the region examined will cover third molars and their surrounding bone structure, allowing you to plan multiple implants, also with the use of surgical drilling guides.
With the Extended View function, the height of the examined area is set at 8 cm enabling simultaneous scanning of both upper and lower jaw.
When equipped with a large image detector, the Extended View function allows the height of the examined area to be increased to 13 cm, also making it possible to acquire the maxillary sinuses at the same time.

Laser-guided positioning

Thanks to laser guides, lining up the patient is fast and precise. 4 laser positioning guides are available for 3D and 2D projections; 1 laser positioning guide for teleradiographic projections (Frankfurt Plane).

A dedicated sensor for each imaging modality

Nothing is left to chance when the right technology is at hand. Dedicated 14-bit image detectors for 2D imaging and 16-bit Amorphous Silicon detectors for 3D scans ensure the sharpest of images thanks to a specific dynamic range for each imaging modality.

360° scan

The best way to avoid artefacts in the resulting image: volumetric acquisition based on a full 360° scan.

Steadiness first

A rigid positioning system with no less than 7 support points, including a chin rest, an adjustable forehead support and a replaceable bite block, ensures constant stability during the scan, an essential pre-requisite for sharp volumetric images.

Simple, speedy positioning system

Thanks to the innovative positioning system, designed to maximise comfort for both patient and operator, the former can be aligned using a highly flexible procedure that involves just a few simple steps, thus ensuring examinations are carried out correctly whatever the projection.

A better experience for the best results

When you can count on a relaxed patient, the positioning process is not only faster and friendlier, it also leads to more accurate results in terms of image quality. No walls, panels or mirrors. No claustrophobic feelings to make your patients anxious or fidgety. Just you to reassure them and help achieve the best possible results.
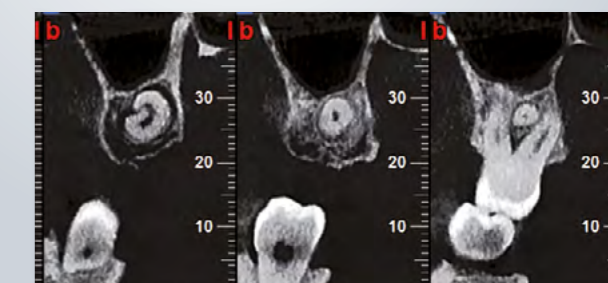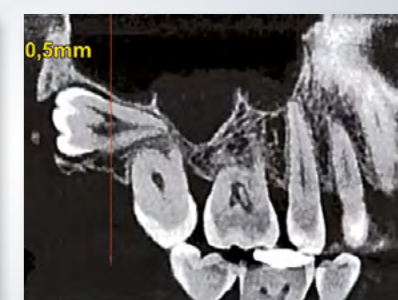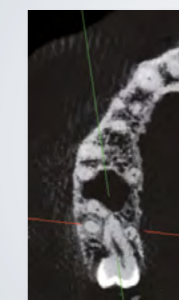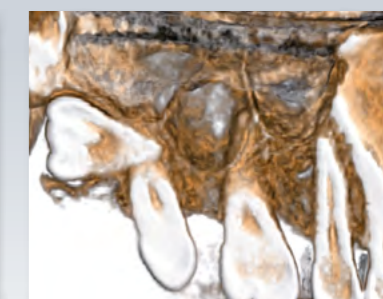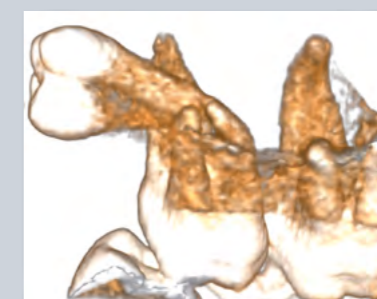
Panoramic projections

A sampler of three very different morphologies: a child, an adult and an elderly patient benefiting from Wide Focus panoramic projection.
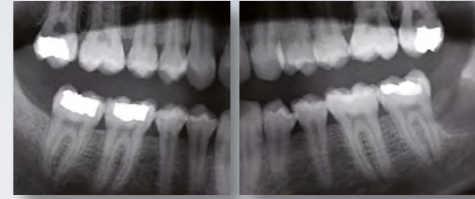
Unerupted maxillary third molar

Thorough radiographic assessment, showing the intricate roots in sharp detail, this level of diagnosis is achieved without multiple radiographic projections, one exam does it all.

12 Panoramic Examinations

- Standard Panoramic and Reduced Panoramic for children
- Panoramic with wider focal trough in anterior region
- Orthogonal projection for dentition only, to reduce overlapping of crowns
- Hemi-panoramic and hemi-dentition, optimised dedicated projections
- Frontal dentition, dedicated projection with wide focal trough
- 4-segments Bitewing exposures limited to crowns, to detect inter-proximal caries

Bitewing exposures limited to crowns, to detect interproximal caries, can be a comfortable alternative to intraoral imaging, appreciated by patients with a strong gag reflex.

A hemi-dentition projection achieved with a very low X-ray dose, showing a wealth of clinical detail.

10 Cephalometric Examinations

- Latero-Lateral Ceph projections, selectable length of 18 to 30cm
- Latero-Lateral Ceph projection, short scan reduced in height for children, reduced X-ray dose
- Antero-Posterior or Postero-Anterior Ceph projections
- Submentovertex projection, including Waters and reverse Towne positions
- Carpus projection

Latero-Lateral teleradiography, highlighting both bony structures and soft tissue profile, suitable for Cephalometry.

14 TMJ Examinations (open or closed mouth)

- Lateral projection of both TMJs
- Postero-Anterior projection of both TMJs
- Multi-angle (x3) Lateral projection of one TMJ
- Multi-angle (x3) Postero-Anterior projection of one TMJ
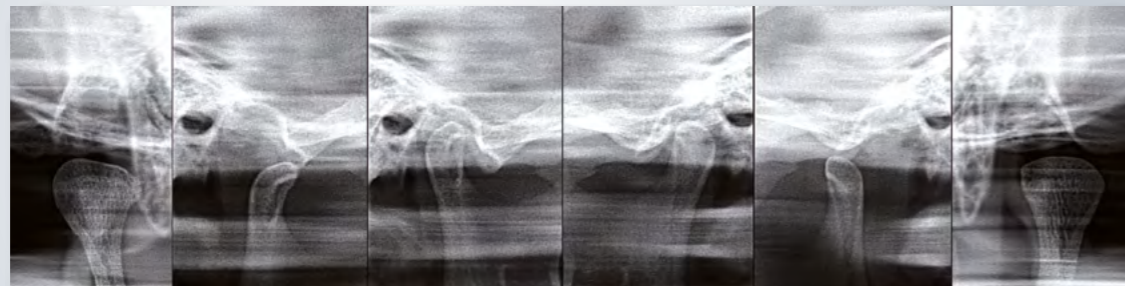
A thorough investigation of left and right TMJs, combining Lateral projections of TMJ in open and closed mouth positions and Postero-Anterior projections. Such an outcome is achieved thanks to a precise identification of the position of condyles, using laser guides.

3 Maxillary Sinus Examinations

- Frontal or Lateral view of Left and Right maxillary sinuses

Frontal view of maxillary sinuses.

Outstanding panoramic imagery made simple

X-Radius Trio offers dozens of different examination types covering all possible 2D requirements. For each single program, radiographic data acquired is based on a dedicated radiogenic trajectory. This means optimised data, not cropped views based on more generic trajectories.

X-Radius Trio:
1 rotary movement and 2 simultaneous translatory movements
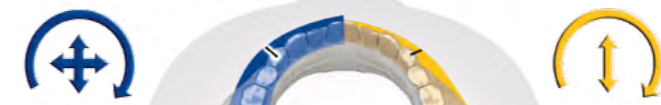
Competitor equipment:
1 rotary movement and 1 simultaneous translatory movement only.
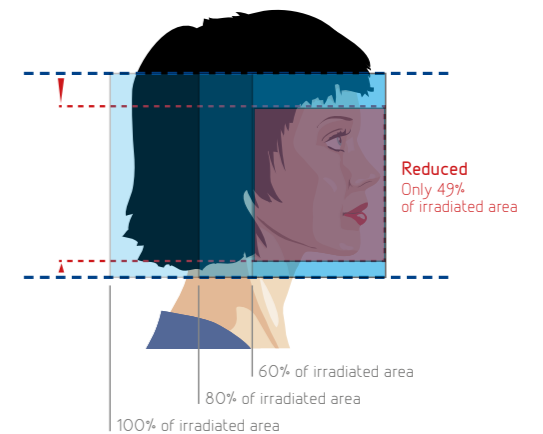
constant magnification   uneven magnification

The focal trough adapts to morphology and misses out on none of the vital details. The simultaneous translatory movements keep the X-ray detector at a constant distance from the midline of the dental arch, throughout the entire scan, so that the image magnification is constant and uniform in the resulting radiograph.

Superior kinematics

X-Radius Trio adopts a specially coordinated movement pattern comprising one rotary movement combined with two simultaneous translatory movements. This ensures constant magnification in all projections, resulting in highly reliable diagnostic images. Simple kinematics with just one translatory movement would result in uneven magnification.

Reduced dosage through targeted collimation

The primary servo-controlled collimator allows you to select the appropriate area for X-ray exposure. This makes it possible to minimise radiation whenever possible.
The secondary collimator is concealed within the rotating module, allowing more space for both operator and patient.

Reduced
Only 49%
of irradiated area

60% of irradiated area
80% of irradiated area
100% of irradiated area

Step-by-step acquisition process

Improving workflow, either through a user-friendly interface, purpose-oriented software or pre-acquisition tools to guide you is part of our philosophy.

Touch screen panel showing user-selected favourites

Servo-controlled chinrest up/down keys to select upper/lower arch CB3D exam

Equipment positioning reset key and dummy run command to simulate exposure

Servo-controlled adjustment of patient head orientation

Servo-controlled adjustment of the focal trough

USB port for mobile data storage

Navigate and select your settings for each exam using the easy-to-follow symbols and clear visual icons.

Onboard controls for simple procedures

Available for both 2D and 3D scans, Morphology Recognition Technology avoids all needs to manually program exposure times, kV or mA technical factors or even choose patient size. Clear graphics and straightforward controls reduce time while your patient stands ready for the scan. Simplicity in all imaging modes makes for faster procedures and a more relaxed patient experience.

Scout Method

Prior to 3D scans, a two dimensional preview image is obtained to identify the exact region of interest. Thanks to its servo-controlled kinematics, X-Radius Trio will automatically reposition the FOV according to any adjustments made by the operator with a simple mouse click. These scout images are acquired at extremely low dosage and ensure that acquisition will not need to be repeated due to possible alignment errors.

Ultra-high-speed processing and easy-to-use software

With the supplied software, you can select the interface most suited to your professional needs, from oral and maxillofacial surgery for dental surgeons to the more specific needs of a radiologist.

Real time data evaluation

Even 3D data is processed in less than a minute, but what really matters is that you can navigate between all different views without requiring the software to re-process the previously generated data.
Thanks to multiple desktop management the software system conserves all views on screen, so you can skip from one set of data to another on screen.2D and 3D images can be viewed simultaneously, making subsequent surgery safer and simpler thanks to the precision and amount of available data.

Implant planning

Data comprising bone density, position of the mandibular canal and virtual implant models will make implant surgery a faster process.

Pre-loaded libraries

A selection of implant models are pre-loaded, but you can also generate your own made-to-measure models.

Third party compatibility

Data is exported in DICOM® standard format and has been validated by all major and most widely-used third party implant systems.

DICOM is the registered trademark of the National Electrical Manufacturers Association for its standards publications relating to digital communications of medical information.

Complex data made simple

Feeling at ease when you are manipulating complex 3D data is reassuring.
The quantity and quality of the information X-Radius Trio provides and the simple way you can manage that data makes for a clearer diagnosis and helps effective planning, ready for efficient treatment.
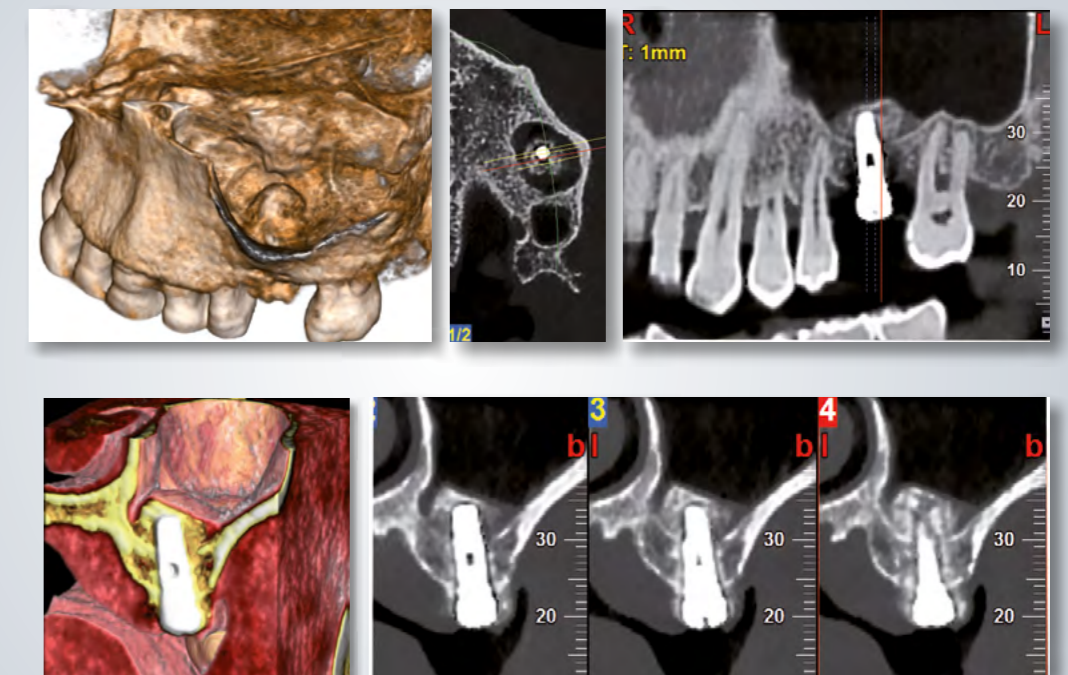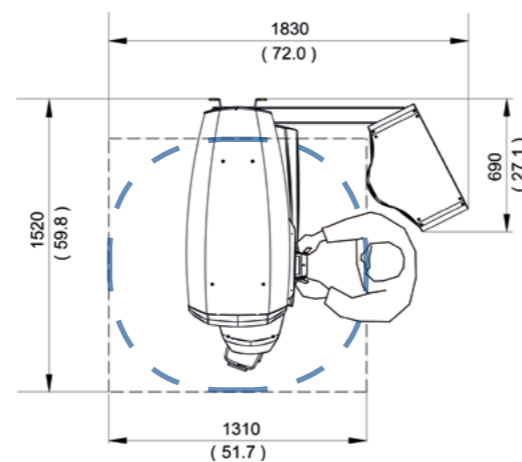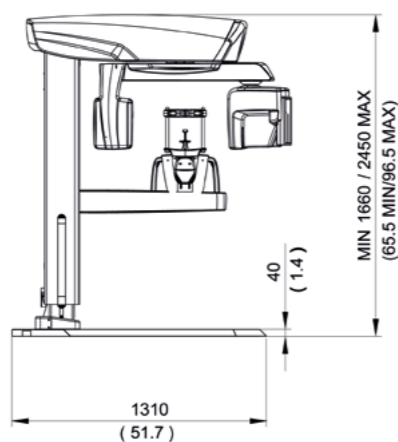
Implant case with sinus lift

sampler of views, extracted from the same CB3D dataset acquired right after surgery, showing the correct relationship between implant, bone, augmented sinus membrane and mucosa.
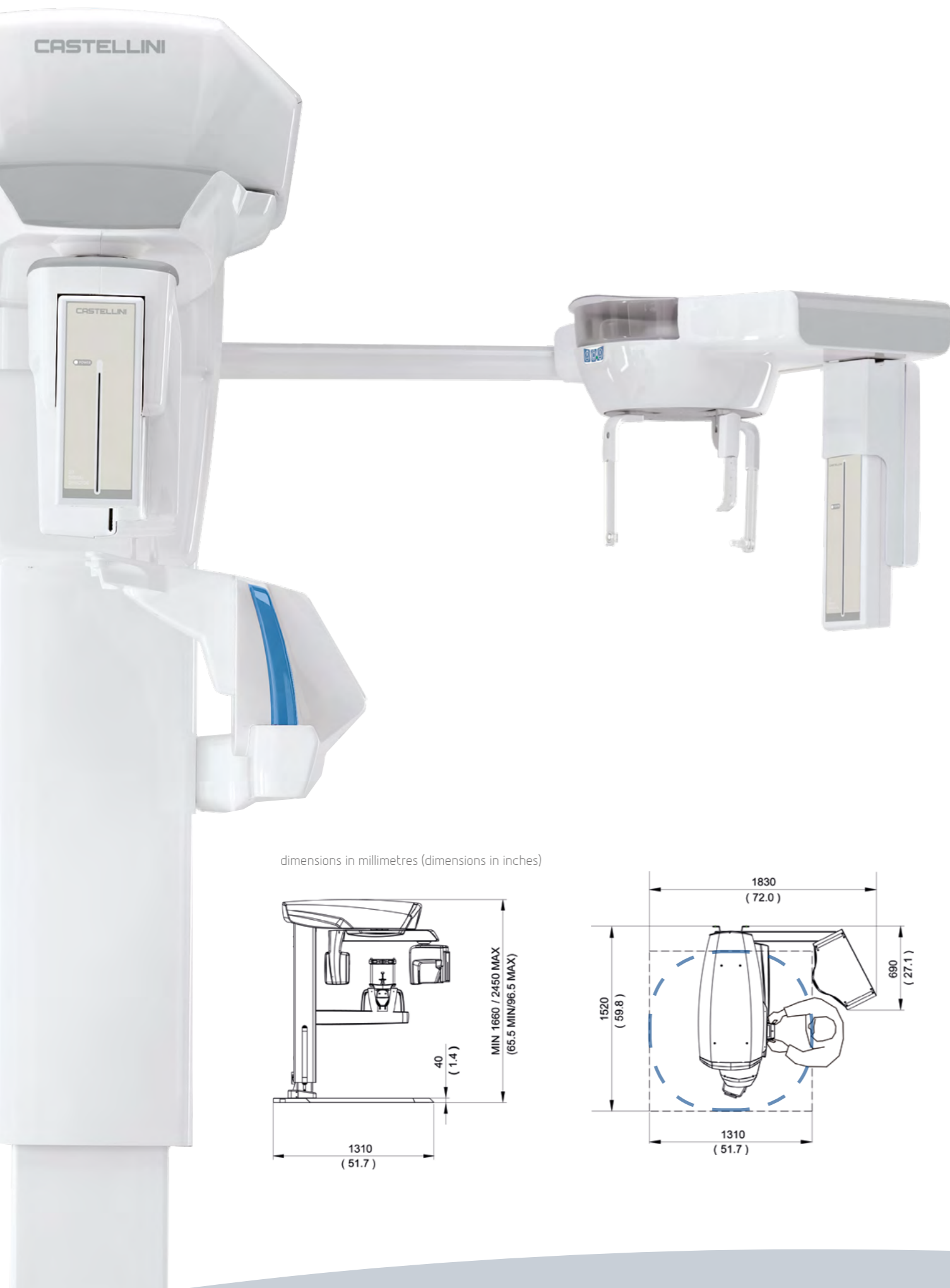
Technical specifications

3D detector specs
• Detector technology: Amorphous Silicon (a-Si)
• X-ray conversion method: CsI (Cesium Iodide) Scintillator
• Image voxel size: 75µm
• Dynamic range: 16bit
• Gray shades: 65535
• Minimum slice thickness: 0.075mm
• Dataset format: iRYS proprietary and DICOM 3.0
• Large Detector
    Field of view, Diameter x Height: 108x80mm
    Available FOV sizes (DxH):
    11x13 – 11x8 – 8x8 – 11x5 – 8x5 – 5x5cm
    Image dataset, largest size: 720MB
• Small Detector
    Field of view, Diameter x Height: 108x50mm
    Available FOV sizes (DxH):
    11x8 – 11x5 – 8x5 – 5x5cm
    Image dataset, largest size: 450MB

2D detector specs
• Detector technology: CCD (Charge Coupled Device)
• X-ray conversion method: CsI (Cesium Iodide) Scintillator
• Protection from direct X-ray exposure: FOP (Fibre Optics Plate)
• Pixel size: 48µm
• Dynamic range: 14bit
• Gray shades: 16383
• Detector resolution: 10.4lp/mm
• Signal To Noise Ratio: minimum 74dB - typical 86dB
• Original file format: TIFF, 16bit
• Image resolution: more than 5lp/mm
• Pan
    Detector height: 146mm
    Image pixel matrix, max.: 1528x2797
    Image file, largest size: 8MB
• Ceph
    Detector height: 220mm
    Image pixel matrix, max.: 2291x3125
    Image file, largest size: 14MB

X-ray generator specs
• Generator type: Constant potential (DC)
• X-ray emission type: Pulsed, square shaped pulses
• Anode Voltage: 60 - 90kV
• Anode Current: 1 - 10mA
• Exposure time range: 160ms - 14s (R10 scale)
• Focal spot dimension, IEC 60336-1993: 0.5mm

• Exposure Control: Automatic
• Exposure Control Method: Morphology Recognition Technology
• Compensation of Spine absorption: Automatic
• mA and kV pattern modulated in real time during X-ray exposure
• Anode Current and Voltage are automatic or manually selectable in steps of 1, in the whole kV range
• Duty cycle at full power operation (85kV, 10mA): 1:20
• Inherent filtration at 85kV (mm eq. Al.): 3.2

X-ray exposure
• Embedded X-ray shielding behind receptor, conforming to IEC60601-1-3
• X-ray exposure time
    CB3D, High Resolution: 3.6s
    CB3D, Peak Resolution: 9.0s
    Adult HD Panoramic: 13s
    Child Dentition: 7.5s
    Child Ceph Lateral: 3.4s
• Minimum scan time for CB3D: 18s
• Minimum render time for CB3D dataset: 15s
• Typical effective dose (ICRP 103)
    CB3D 11x8, High Resolution: 33.5µSv
    CB3D 11x8, Peak Resolution: 78.6µSv
    Panoramic: 6.7µSv
    Dentition only: 4.3µSv
    Ceph Lateral, Reduced: 1.0µSv

Equipment dimensions
• Minimum required operation dimensions,
    Width x Depth: 1310x1520mm
    Including ceph (W x D): 1830x1520mm
• Motorised column, adjustable height: 1610-2400mm
• Packed dimensions,
    Crate, no Ceph (H x W x D): 1515x1750x670mm
    Ceph option, cardboard: 822x1430x580mm
• Weight, no Ceph: 170Kg - 375lbs
• Weight with teleradiographic arm: 190Kg - 419lbs
• Wall or floor support, free standing base available
• Accessible for patients on wheelchair

Power supply specification
• Automatic adaptation for voltage and frequency
• Voltage: 115 - 240 Vac, ± 10%
• Frequency: 50 / 60 Hz ± 2 Hz
• Current, nominal temporary peak absorption: 7A at 240V, 15A at 115V
• Maximum current absorption in standby mode: 1A

dimensions in millimetres (dimensions in inches)

MIN 1660 / 2450 MAX
(65.5 MIN/96.5 MAX)

40
(1.4)

1310
(51.7)

1830
(72.0)

690
(27.1)

1520
(59.8)

1310
(51.7)