A step forward in diagnostics: ORTHOPHOS panoramic X-ray systems.

ORTHOPHOS
ORTHOPHOS Plus
ORTHOPHOS Plus Ceph, ORTHOPHOS Plus DS
ORTHOPHOS Plus DS Ceph
A major step forward: ORTHOPHOS panoramic X-ray systems.

Versatile performers: the ORTHOPHOS family

The ORTHOPHOS Plus and ORTHOPHOS Plus Ceph use conventional film cassettes. In the case of the ORTHOPHOS Plus DS and ORTHOPHOS Plus DS Ceph all the imaging, processing and archiving functions are performed digitally. If you want to enter the digital age at a later date – no problem. All the models in the new ORTHOPHOS series can be upgraded to digital technology.

Panoramic X-rays have now become standard practice in first-time examinations. However, as soon as the patient’s symptoms are associated with the mandibular joints and/or the maxillary sinuses you have no option but to extend the scope of the X-ray investigation to these regions. Such complex applications are beyond the capabilities of conventional panoramic X-ray units.

The ORTHOPHOS Plus, ORTHOPHOS Plus Ceph, ORTHOPHOS Plus DS and ORTHOPHOS Plus DS Ceph offer a choice of 16 different programs covering the entire spectrum of oral and maxillofacial X-ray imaging regions.

Accurate diagnosis and effective treatment are prerequisites for a successful dental practice. The ORTHOPHOS X-ray systems offer a broad range of programs and thus foster a comprehensive diagnostic approach. Their razor-sharp images provide a sound and meaningful basis for clearly focused therapy.

Simple operation and upgrading

The ORTHOPHOS X-ray systems are designed for optimum user-friendliness. Thanks to the 3-point fixing device, patient positioning involves only a few simple steps. The multitimer initiates the imaging process quickly and safely. Upgrading is a quick and simple procedure. All the new-generation film-based ORTHOPHOS models can be converted to digital imaging at a later date. Updates to the operating software and application programs are supplied on convenient memory cards (a feature common to all the ORTHOPHOS models).

All in keeping with the changing needs of your dental practice.

ORTHOPHOS Plus – a major step forward in diagnostics.

The benefits in brief

- Reliable diagnosis
- 16 panoramic programs
- Brilliant image quality
  - Automatic exposure pre-selection
  - Image preprocessing respectively
- Multi-purpose generator
- Easy operation
- Multitimer
- Cost-effective
  - Study construction
  - Tried-and-tested technology
- Future-compatible
  - Digitally upgradeable
  - Memory card technology

A major step forward: ORTHOPHOS panoramic X-ray systems.
Pinpoint accuracy

The imaging unit orbits around the patient’s head in a smoothly coordinated sequence of movements. Each orbit is offset against the previous one. A system of microprocessors calculates the correct orbits for each individual patient. Precision you can see with your own eyes.

Any exposure errors are corrected by the automatic image preprocessing system. The multipulse generator ensures excellent definition and an evenly balanced image density. This makes repeat exposures a thing of the past. You can process the image on the monitor in any way you choose. The original image remains stored in the computer memory. The computer archives the X-ray images for future reference.

Repeat X-rays cost time and money. All the film-based ORTHOPHOS models offer automatic exposure preselection in the standard panorama program. The dose levels are determined individually for each patient in turn based on measurements carried out at the beginning of the X-ray procedure. The X-ray images therefore turn out right every time.

Digital image processing and archiving

The digital ORTHOPHOS Plus Ds and ORTHOPHOS Plus Ds Ceph models offer the user digital image acquisition, processing and archiving functions.

The benefits in brief

- Razor-sharp images
- Automatic exposure preselection/image preprocessing
- Computer-controlled orbits
- Highly integrated microprocessors
- Consistently hard radiation
- Multipulse generator
- Reduced radiation dose

Seeing is believing: the ORTHOPHOS X-ray systems deliver razor-sharp images every time. The multipulse generator emits consistently “hard” radiation, while automatic image preselection/image preprocessing ensures optimum exposures. The result? Brilliant X-rays that provide the basis for accurate diagnosis.

Top right: An indispensable diagnostic aid: the standard panoramic X-ray.

Bottom right: ORTHOPHOS always selects the correct orbit, irrespective of whether the patient has a large, normal or small-sized jaw.

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The imaging unit orbits around the patient’s head in a smoothly coordinated sequence of movements. Each orbit is offset against the previous one. A system of microprocessors calculates the correct orbits for each individual patient. Precision you can see with your own eyes.
ORTHOPHOS – continuous motor-driven height adjustment.

Thanks to the 3-point fixing system the patient has no trouble in keeping still. The special bite segment and the chin, temple and forehead supports ensure ideal positioning. Light localizers provide a quick and precise means of determining the Frankfort horizontal and the mid-sagittal planes.

At the touch of a button the motor drive adjusts the ORTHOPHOS to the individual height of the patient. The bite segments and the hygienic protective sleeves are stored in the built-in drawer, where they are immediately accessible.

Convenient features:
Light localizers and multitimer

In panoramic radiography a single millimeter can make a big difference. Patient positioning has a determining influence on image quality. For this reason the ORTHOPHOS X-ray units deploy light localizers. The 3-point patient fixing system prevents kinetic blurring and “technical” asymmetries.

In addition, the patient’s cranial circumference is measured via the temple and forehead support. The ORTHOPHOS unit then automatically selects the optimum orbital curve. In the event of anomalies in the patient’s anterior teeth you can determine yourself to what extent the orbital curve should be corrected. A final glance in the mirror – and you’re ready to start. The exposure procedure is triggered using the multitimer control unit. With its easy-to-understand icons the multitimer is child’s play to operate. It is available as a hand-held unit attached to a spiral cable or as a permanently installed remote control.

Digital recording

At the end of the X-ray procedure the ORTHOPHOS units present a readout of all the various settings (e.g. exposure time) in the digital display. The digital models ORTHOPHOS Plus DS and ORTHOPHOS Plus DS Ceph store this data as well as other major parameters (height setting, forehead support setting, temple width) together with the X-ray image. This enables you to reproduce X-rays under identical conditions.

A triple benefit:
The three-point patient fixing system.
The digital dimension: ORTHOPHOS Plus DS and ORTHOPHOS Plus DS Ceph.

The future of radiology lies in digital technology. In addition to saving space it significantly reduces the amount of radiation. The X-ray image appears immediately on the monitor. The built-in computer automatically compensates for any exposure errors. This means that you receive flawless images every time. The software package SIDEXIS takes care of image archiving and patient data management and – if required – can interface directly with your practice management program.

The darkroom is thus rendered superfluous. In place of a conventional film cassette these digital X-ray units feature a two-dimensional line sensor. Prior to triggering the X-ray you simply enter the patient’s name on the PC and select the desired program on the ORTHOPHOS unit. After a mere 60–100 seconds the image appears on the high-resolution PC monitor. The X-ray image and the relevant exposure data (radiation time, mA, kV, etc.) are stored automatically in the patient file index. It goes without saying that each image (both the original and any post-processed versions) can be recalled within seconds.

SIDEXIS: convincing images
A picture says more than a thousand words. With just a few mouse clicks the SIDEXIS software enlarges important details and creates inverse, pseudo-color or relief images in line with your specific needs. Such processed X-ray images make it a lot easier to explain to patients the need for complex courses of treatment.

In addition, SIDEXIS is fully network-capable and interfaces with the widely available practice management programs as well as with orthodontic analysis software. The image capture card is integrated directly into the ORTHOPHOS unit. In other words, you’re not dependent on any particular PC in your practice network. And this results in greater flexibility.

Your local dealer will be glad to supply further details.

Equipped for the future
All the film-based models in the new ORTHOPHOS series can be upgraded to digital technology at a later date.

Digital technology reduces radiation doses. In the case of panoramic X-rays the dose can be up to 50% lower by comparison with conventional film-based units. In the case of digital cephalometric X-rays the radiation dose can be reduced by as much as 70%.

The benefits in brief
- Razor-sharp real-time images
  - No film processing, no scanning, no readouts
- Environmental protection
  - No darkroom, no chemicals
- Reduced radiation doses
  - Radiation dose reductions ranging from 50% (panoramic) to 70% (cephalometric)
- SIDEXIS software
  - Simple and effective image processing; automatic patient-related archiving; interfaces with practice management and orthodontic measurement programs
- Future-oriented
  - Subsequent upgrading to digital technology; memory card technology

Face page: ORTHOPHOS digital – brilliant real-time images; reduced radiation doses.
Cephalometric and panoramic radiography in a single unit. The ORTHOPHOS Plus Ceph produces film-based images, the ORTHOPHOS Plus DS Ceph is fully digital. Both models offer a choice of 16 panoramic programs, plus sophisticated cephalometric capabilities. This puts you in the position to fulfill all orthodontic and oral surgery requirements. You can choose from a wide variety of cephalometric techniques: lateral; posterior-anterior or anterior-posterior in the direction of radiation; hand X-rays.

ORTHOPHOS Plus DS Ceph: Low radiation dose thanks to short exposure times
In conventional cephalometric applications the entire skull is exposed to a pyramid-shaped X-ray beam. The ORTHOPHOS Plus DS Ceph technique offers a unique method: The motorized image receptor scans the patient’s head for approx. 15 seconds using a flat fan-shaped beam. The actual exposure time, however, is only 270 milliseconds. Compared with a film-screen combination with a sensitivity of S = 250, the radiation dose can be reduced by up to 70%. By comparison with a S = 400 film-screen combination the dose reduction is in the region of 50%.

Save valuable time: interfacing with orthodontic analysis software
Using our software package SIDEXIS you can transfer the X-ray images directly to your orthodontic analysis program – e.g. Computer Forum’s “Dental Vision”. This program is available as an optional extra together with the ORTHOPHOS Plus DS Ceph. The images can be measured directly on your PC (either immediately or at a later date). Once again, you have the chance to save valuable time for your practice. Ask your local dealer whether your preferred analysis program is already compatible with SIDEXIS.

The benefits in brief
Cephalometric radiography
- Panoramic and cephalometric radiography
  Combined in a single unit
- Panoramic or cephalometric radiography
  Quick and easy change-over
- Film-based or digital
  Digital technology is available ex works or as a retrofit option

Digital cephalometric radiography
- Radiation dose reduction
  Up to 70%
- Patient-related image archiving
  Fully automatic
- Software interfaces
  For practice management and orthodontic measurement programs
- Razor-sharp real-time images
  No film processing, no scanning, no readouts
- Environmental protection
  No darkroom, no chemicals
Visible benefits: the 16 ORTHOPHOS programs.

Panoramic X-rays have become an indispensable tool in the area of dental diagnostics. This is especially true in the case of first-time examinations, due to the large number of pathological findings and secondary findings that this X-ray technique reveals.

By comparison with a series of individual exposures, the standard panoramic X-ray (Fig. 1) extends the diagnosable region by approx. 70 % and reduces the skin surface dose by approx. 90 %.

The additional projection techniques supported by the ORTHOPHOS Plus/Plus Cephal and the ORTHOPHOS Plus DS/Plus DS Cephal facilitate the comprehensive diagnosis of the entire jaw region – i.e. temporomandibular joints, maxillary sinuses and the anterior teeth. These sophisticated X-ray systems also offer special programs for implantology and for low-dose follow-up X-rays.

**Visible benefits:** the 16 ORTHOPHOS programs.

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**Program 1:** Standard panoramic image

**Program 2:** Normal image, restricted to the dentition region without ascending branches

**Program 3:** Maxillary sinuses, plus images on one film

**Program 4:** Lateral view of the temporomandibular joints, ascending branches

**Program 5:** Temporomandibular joints in direction of irradiation, posterior/anterior

**Program 6.1/6.2:** Lateral view of the temporomandibular joints, closed/open mouth on one film

**Program 7.1/7.2:** Temporomandibular joints in direction of irradiation, posterior/anterior, open/closed mouth on one film

**Program 8:** Lateral multi-layer image of the temporomandibular joints
Program 9: Multi-layer image of the temporomandibular joints in direction of irradiation, posterior/anterior

Program 10: Normal X-ray for children (considerable dose reduction)

Program 11: Normal X-ray with constant 1.25 fold magnification for measuring applications

Program 12: Thick layer, anterior region

Program 13: Paranasal sinuses

Program 14: Left side reduced-dose follow-up X-ray

Program 15: Right side reduced-dose follow-up X-ray

Program 16: Multi-layer image of the lateral tooth region

Transverse layer extension kit – also available in a digital version

The special programs for transverse tomosgrams create an enhanced decision-making basis in the area of oral surgery and implantology. Sirona has realized an extremely low depth of field (in some programs less than 0.9 mm). In other words, you receive X-ray images of outstanding diagnostic relevance.

The extension kit is available factory-fitted or else as a retrofit option.

An extension kit is also available for the digital ORTHOPHOS Plus D5 and ORTHOPHOS Plus D5 Ceph X-ray units. Existing systems can be upgraded at a later date. The special Sirona sensor ensures very low depths of field and hence excellent image quality.

For further information please order our brochure “Transverse Layers”.

Various adjustment devices are available for quick and precise patient positioning purposes – for example, the new TSA rule.
In addition to the 16 panoramic programs the ORTHOPHOS Plus Ceph and ORTHOPHOS Plus DS Ceph offer you the choice of four cephalometric projections, thus making these X-ray units genuine all-rounders for orthodontics and oral surgery.

The settings are precise, stable and reproducible at any time – thanks to the motor-driven height adjustment and the patient fixing system consisting of ear tip supports and nose support. The ORTHOPHOS features an individually adjustable soft-tissue filter. In the ORTHOPHOS Plus DS Ceph this function is performed electronically. In both cases you have access to easily recognizable patient profiles – a prerequisite for high-quality lateral/posterior-anterior/ anterior-posterior X-rays and hand X-rays.

Sirona’s many years of experience with sensor-based digital panoramic and cephalometric X-ray systems are a guarantee for optimum reliability. Thousands of installed systems worldwide – including more than 1,000 ORTHOPHOS Plus DS Ceph units – provide convincing practical proof.

Standard formats supported by the ORTHOPHOS Plus Ceph and ORTHOPHOS Plus DS Ceph: 18 x 24 cm asymmetrical, 18 x 24 cm symmetrical.
## Technical data

<table>
<thead>
<tr>
<th></th>
<th>ORTHOPHOS units</th>
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<tbody>
<tr>
<td>Radiation generator</td>
<td>Multipulse generator</td>
</tr>
<tr>
<td>X-ray tube</td>
<td>SR 90/15 FN</td>
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<tr>
<td>Focal spot size</td>
<td>0.5 mm x 0.5 mm</td>
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<tr>
<td>Total filter</td>
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<td>Tube voltage</td>
<td>60 – 90 kV</td>
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<tr>
<td>Tube current</td>
<td>9 – 16 mA</td>
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<tr>
<td>Nominal voltage</td>
<td>230 V, 50 – 60 Hz</td>
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<tr>
<td>Nominal current</td>
<td>12 A</td>
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<tr>
<td>Line internal resistance</td>
<td>max. 0.8 Ohm</td>
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<tr>
<td>Fuse</td>
<td>16 A (slow blowing)</td>
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<tr>
<td>Power consumption</td>
<td>2.8 kW</td>
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<tr>
<td>Permissible line voltage</td>
<td>+6, –10 %</td>
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<tr>
<td>Panoramic rotation times</td>
<td>19 s – 108 s</td>
</tr>
<tr>
<td>Panoramic exposure times</td>
<td>4.9 s – 25.3 s</td>
</tr>
<tr>
<td>Ceph film switching times</td>
<td>0.1 s – 4.0 s (17 steps)</td>
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### Ceph Digital

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<table>
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<tbody>
<tr>
<td>Radiation time</td>
<td>15.7 s</td>
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<tr>
<td>Effective exposure time</td>
<td>approx. 270 ms</td>
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## Dimensions

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<thead>
<tr>
<th>ORTHOPHOS Plus, Plus DS</th>
<th>1100 x 1490 – 2120 x 1160 mm*</th>
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<tbody>
<tr>
<td>ORTHOPHOS Plus Ceph</td>
<td>1855 x 1490 – 2120 x 1160 mm*</td>
</tr>
<tr>
<td>ORTHOPHOS Plus DS Ceph</td>
<td>1800 x 1490 – 2120 x 1180 mm*</td>
</tr>
</tbody>
</table>

* (width x height x depth)
### Equipment features

<table>
<thead>
<tr>
<th></th>
<th>ORTHOPHOS Plus</th>
<th>ORTHOPHOS Plus Ceph</th>
<th>ORTHOPHOS Plus DS</th>
<th>ORTHOPHOS Plus DS Ceph</th>
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</thead>
<tbody>
<tr>
<td><strong>Panoramic programs</strong></td>
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<tr>
<td>1 – 16</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Transverse layers (17–23), digital (17–26)</td>
<td>▲</td>
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<td><strong>Cephalometric radiography</strong></td>
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<td>Image/cassette format 18 x 24 symm./asymm.</td>
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<tr>
<td>Cassette format 24 x 30</td>
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<tr>
<td>Digital</td>
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<tr>
<td>Digitally upgradable</td>
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<td><strong>Patient positioning</strong></td>
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<tr>
<td>Light localizer for FH and mid-sagittal plane</td>
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<tr>
<td>Precise layer position determination by automatic measurement of the skull width</td>
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<tr>
<td>Automatic exposure preselection</td>
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<tr>
<td>Automatic image preprocessing for optimum exposure in all programs</td>
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<tr>
<td>Compensation for anomalies in the anterior tooth region</td>
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<td>Digital displays for height adjustment, forehead support position, anomaly compensation, exposure values, help messages</td>
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<td><strong>Operation, service, upgradability</strong></td>
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<td>Multitimer</td>
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<td>Remote Control</td>
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<tr>
<td>Memory card technology</td>
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</table>

* ● standard  ▲ optional*