OPTIVUE 500 and OPTIVUE 1000ST
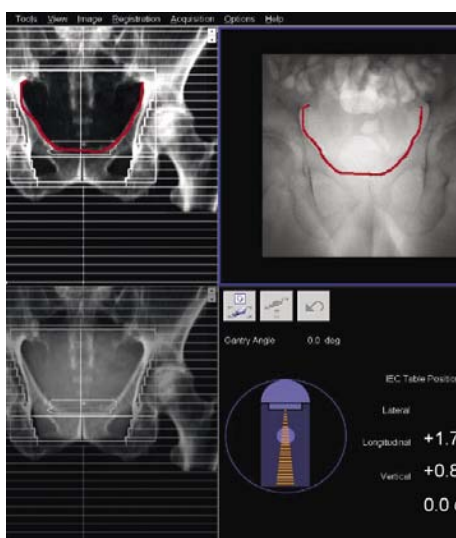
Outstanding Image Quality for Accurate Patient Position Verification

SIEMENS

medical

OPTIVUE 500 and OPTIVUE 1000ST

Auto-Assisted Patient Positioning Systems

OPTIVUE™ 500 and OPTIVUE 1000ST Patient Positioning Sytems are designed to be true patient positioning systems, allowing users to deliver treatments and facilitate corrections for patient or anatomical displacement – ultimately decreasing patient on-table time and increasing efficiency and treatment accuracy. The OPTIVUE 1000ST provides superior soft-tissue contrast and a faster frame readout, making this flat panel compatible with megavoltage cone beam (MVCB) imaging.

With a few mouse clicks, a therapist can automatically calculate 2D or 3D patient offset values, send these values to the treatment couch to compensate for the measured offset, and continue with the treatment. OPTIVUE enables the entire process to be performed quickly, while still achieving a high level of accuracy.

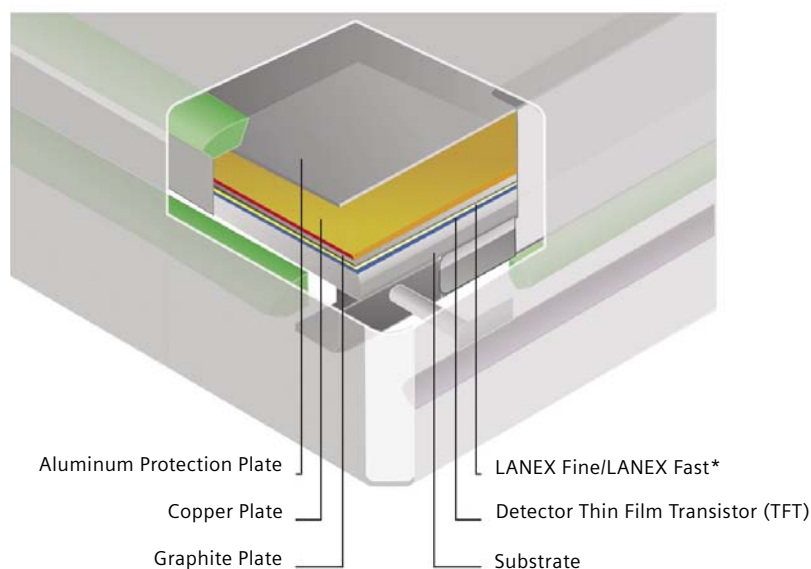| Model	Detector Size	Compatibility
OPTIVUE 500	41 cm x 41 cm	PRIMUS™ with PRIMEVIEW™ 3*i* ONCOR™ Impression with *syngo*® RT Therapist*
OPTIVUE 1000ST[1]	41 cm x 41 cm	PRIMUS with PRIMEVIEW 3*i*; ONCOR Impression, Avant-Garde, and Expression with *syngo* RT Therapist*

1. Compatible with MVCB imaging

As a result of OPTIVUE's integration with *syngo* RT Therapist or PRIMEVIEW 3*i*, users have a unique platform that provides:

- Access to the patient database through the Oncology Information System

- Complete Record and Verify (R&V) capabilities

- Control of the OPTIVUE patient positioning device, from auto-deployment to automatic position correction calculations, even in an Auto Field Sequenced (AFS) treatment delivery

With Siemens unique application software, the OPTIVUE Patient Positioning System is protected from direct irradiation of the detector electronics.

Technical Data: Detector

Aluminum Protection Plate

Copper Plate

Graphite Plate

LANEX Fine/LANEX Fast*

Detector Thin Film Transistor (TFT)

Substrate

Detector Cross Section

With the largest a-Si detector size available today and enhanced image post-processing techniques, OPTIVUE provides excellent image quality.

*For the OPTIVUE 1000ST

| Feature	OPTIVUE 500	OPTIVUE 1000ST
Detector weight (Kg)	19.9	23
Detector size (mm)	672 x 599 x 44	672 x 599 x 44
Active detection area (cm²)	41 x 41	41 x 41
Maximum acquisition rate (fps)	3.5	7
Image display time	Near real time	Near real time
Detector efficiency (port only)	Max. recommended dose: 3 MU	Max. recommended dose: 3 MU
Detector non-linearity	<±3% for free-run acquisition	<±2% for free-run acquisition
	<±4% for triggered acquisition	<±3% for triggered acquisition
Detection method	Indirect	Indirect
Matrix size (pixels)	512 x 512	1024 x 1024
Pixel size (µm)	800	400
Pixel bit depth	16	16
Spatial resolution (f_{50} in lp/mm)[1]	≥0.33	≥0.41
Contrast/noise ratio[1,2] (port during)	≥720 @ 100 MU (512 x 512)	≥600 @ 50 MU (1024 x 1024)
Contrast/noise ratio[1,2] (port only)	100 @ 1 MU (512 x 512)	125 @ 1 MU (1024 x 1024)

1. These are minimum specifications; below these values, the detectors are rejected.
2. As measured using the PIPSpro QC-3V phantom.

Technical Data: Robotic Positioner

The positioner on the OPTIVUE 500 and OPTIVUE 1000ST is a highly accurate robotic arm that features unique integrated control functionalities.

A user can automatically bring the detector into acquisition position from inside or outside the treatment room. As a result, the user does not need to enter the treatment room multiple times to manually deploy and park the positioner. For AFS treatments, the positioner can also automatically bring the detector into various scripted acquisition positions without any additional user interaction.
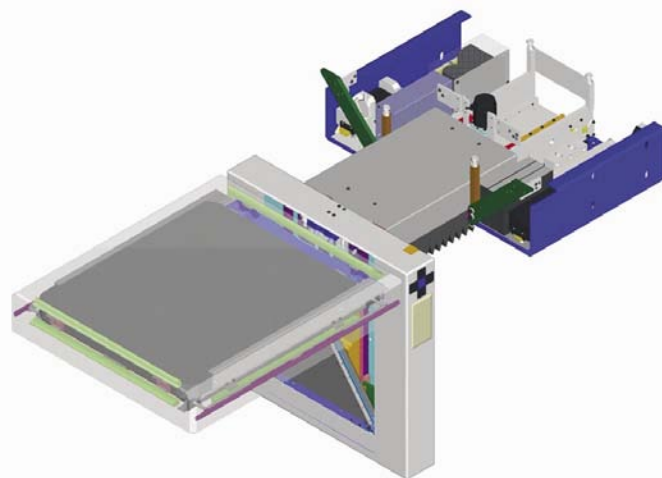
| Feature	Specification
Deployment time at any gantry angle	10 seconds to 146 cm source-to-image (SID)
Park time at any gantry angle	12 seconds from 146 cm (SID)
Acquisition height range	115 cm to 160 cm from source (SID)
Maximum time for vertical course	15 seconds
Positioning accuracy	2 mm, in any direction
Positioning repeatability	1 mm, in any direction
Collision detection system	Yes
Motion control a)	Local control on positioner
Motion control b)	Remote control from linear accelerator hand control
Motion control c)	Remote control from linear accelerator control console: manual, automatic within AFS treatment

Software

Patient Positioning Verification – A Quick, Automated Procedure

Both *syngo* RT Therapist and PRIMEVIEW 3*i* enable users to acquire, analyze, and compare reference images (such as Digitally Reconstructed Radiographs [DRRs] from a treatment planning system) and portal images acquired from the OPTIVUE Patient Positioning System.

Unlike nonintegrated electronic portal imaging devices (EPIDs), the OPTIVUE patient positioning software can perform tasks such as automatic image blending and offset calculation. Because the *syngo* RT Oncologist* workspace uses the same imaging tools, it is possible to have offline patient position approval without having to interrupt the operation of the linear accelerator.

1. Image Acquisition and Review
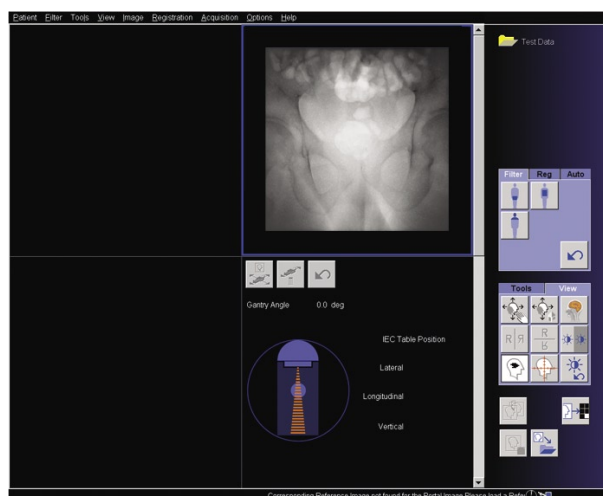
1. Automatic acquisition with auto-deployment of OPTIVUE.

Image Acquisition and Review

- Image format for portal images: DICOM-RT

- Image format for reference images: DICOM-RT, DICOM-SC, DICOM-CR, DICOM-DX

- Several acquisition modes: single exposure, double exposure, and continuous acquisition

- Display panes: reference image, portal image, blended image, beam geometry display

- Image enhancement: generic imaging filters (e.g., Gaussian, Median), complex filters (e.g., CLAHE, edge enhancement), all with anatomy-specific customizable settings

- Image processing and review: windowing, pixel lens, zoom, pan, image inversion, distance/angle measurements, annotation, drawing editor, port display, and software reticule display

- Customizable image sizes: from 1024 x 1024 or 512 x 512 for better contrast-to-noise ratio (OPTIVUE 1000ST only)

* The COHERENCE™ Oncologist Workspace is currently being rebranded to *syngo* RT Oncologist. The new name and any future functionalities (not included in this data sheet) are pending FDA 510(k) market clearance and presently not for sale in the US. Features mentioned in this data sheet may be purchased under the COHERENCE brand name.

2. Patient Position Verification
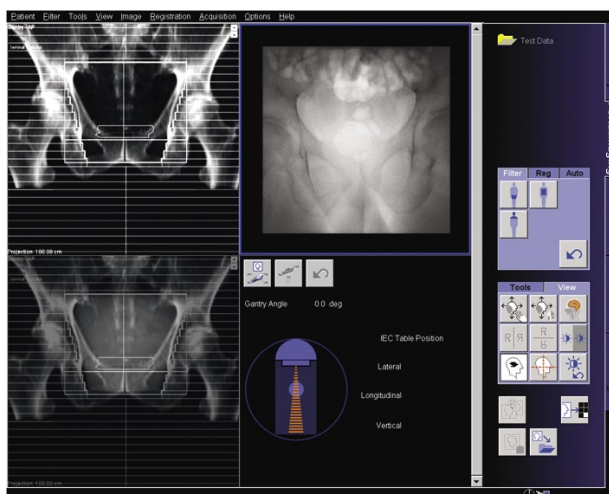
2. Auto-load of associated reference image – blended image automatically generated after auto-scaling and centering of portal image.

Patient Position Verification*

- Automated image acquisition

- Automatic and manual reference image association with portal image

- Automatic and manual image centering

- Automatic and manual image scaling

- Reference and portal images automatically blended with blending ratio control

- User-defined reference points and structures for comparison of reference and position verification images

- Automated position correction calculator: 2D (based on one port), 3D (based on orthogonal pair of ports, MVCB, or CT)

- Oncologist notification for image approval/ rejection by DICOM worklist (with *syngo* RT Oncologist)

*Some features are optional with PRIMEVIEW 3*i*

3. Workflow
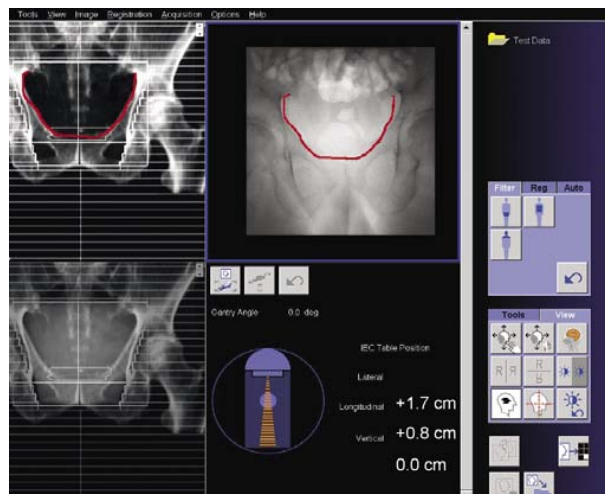
3. Computer-assisted registration and automatic patient offset calculation.

Workflow

- Auto-send of acquired images to the *syngo* Imaging XS** archive system

- *Send to* button for convenient image transfer to any DICOM network node, e.g., *syngo* RT Oncologist

**The COHERENCE™ RT Archive is currently being rebranded to *syngo* Imaging XS. The new name and any future functionalities (not included in this data sheet) are pending FDA 510(k) market clearance and presently not for sale in the US. Features mentioned in this data sheet may be purchased under the COHERENCE brand name.

Image Enhancement

New Post-Processing Filters for OPTIVUE Images

Siemens' digital imaging expertise has produced a new generation of portal imaging tools that deliver outstanding image quality for accurate patient position verification and adjustment.

The Image Enhancement feature from Siemens offers advanced post-processing filters, which greatly improve anatomical details for each localization and for all OPTIVUE Systems. Image Enhancement enables more precise determination of the actual position of the reference and target structures. As a result, patient setup can be performed more confidently, and even the smallest of treatment fields are better visualized.

With Image Enhancement, all of the post-processing tools are directly applied, making the process time-efficient and automated. Crisper images help streamline analysis and clinical decision-making processes, ultimately improving patient throughput and increasing the quality of patient care.

Image Enhancement provides automatic, post-processing tools to achieve unmatched image quality – bringing greater confidence in patient-positioning accuracy and repeatability.

Specific Filter: Pelvis

Customizable filter settings achieve optimum results for even small fields
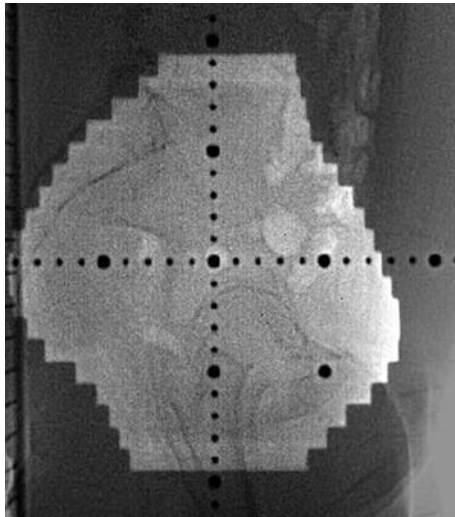
Prostate
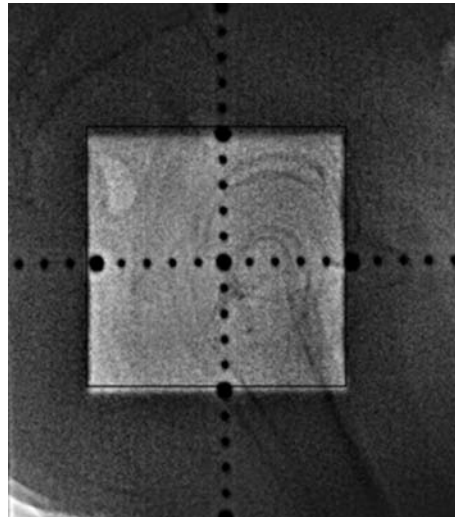
Prostate
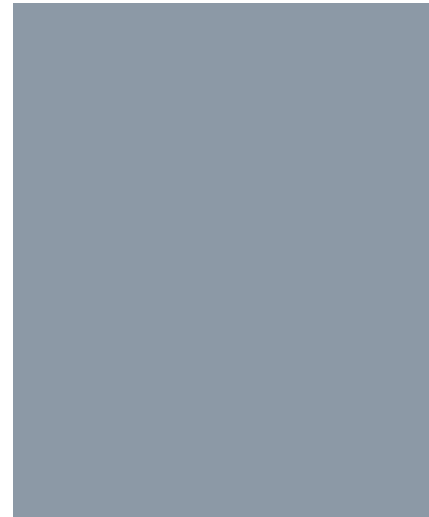
Well-suited for large patients
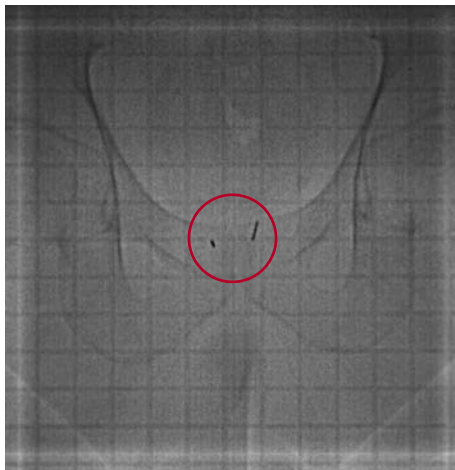
Prostate

Prostate

Excellent visualization of the Visicoil XL for an obese patient weighing 320 lbs/145 kg.
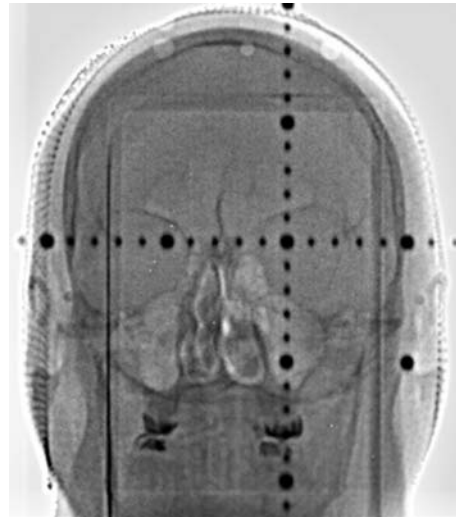
Visicoil dimensions: markers are 1 and 2 cm in length and 1.1 mm in diameter.
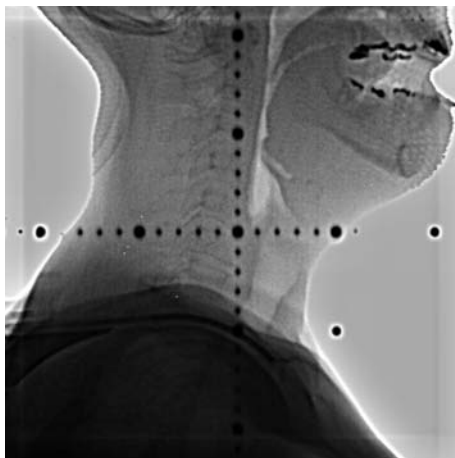
Specific Filter: Head and Neck

The flexibility of the filter parameter settings for each of the targeted anatomies maximizes the visibility of the target volume and the surrounding anatomy – enabling more precise position verification and more effective dose escalation while sparing critical organs.
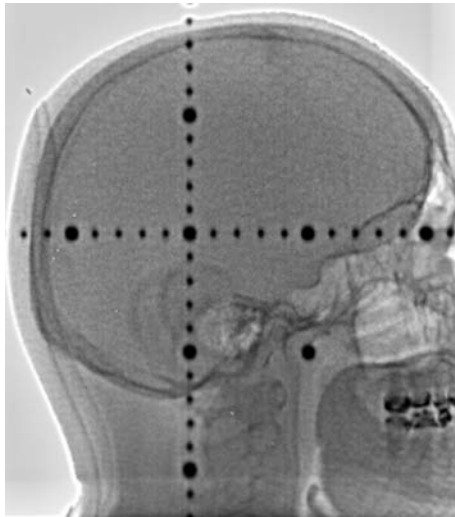
Brain

Brain

Neck
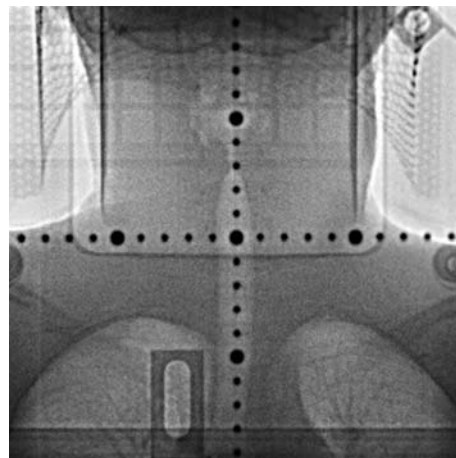
Neck

Specific Filter: Thorax

Esophagus

Lung

Lung

Lung

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