A human care company, Elekta pioneers significant innovations and clinical solutions for treating cancer and brain disorders. Elekta provides intelligent and resource-efficient technologies that improve, prolong and save patient lives. We go beyond collaboration seeking long-term relationships built on trust with a shared vision, offering confidence to healthcare providers and their patients.

www.elekta.com

Human Care Makes the Future Possible

Corporate Head Office:

Elekta AB (publ)
Box 7593, SE-103 93 Stockholm, Sweden
Tel +46 8 587 254 00
Fax +46 8 587 255 00
info@elekta.com

Regional Sales, Marketing and Service:

North America

Tel +1 770 300 9725
Fax +1 770 448 6338
info.america@elekta.com

Europe, Middle East, Africa, Eastern Europe, Latin America

Tel +46 8 587 254 00
Fax +46 8 587 255 00
info.europe@elekta.com

Asia Pacific

Tel +852 2891 2208
Fax +852 2575 7133
info.asia@elekta.com

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Monaco® 5

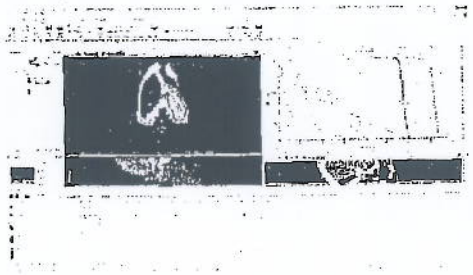
Treatment planning system
Accuracy accelerated

Monaco is a next-generation treatment planning system. A comprehensive range of techniques is now supported in Monaco, including 3D conformal radiation therapy, IMRT, VMAT, stereotactic MLC and cone, 4D and Siemens mARC (rIMRT).

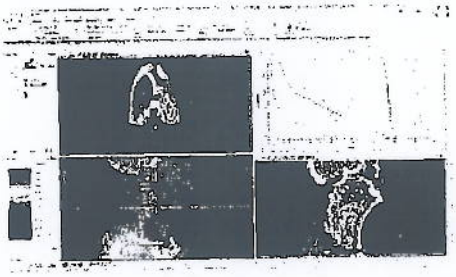
IMRT

Monaco includes intuitive and leading edge features for generating and evaluating IMRT plans. Biological cost functions and constrained optimization lead to predictable results with evaluation tools for where to improve the overall plan.

- Multiple cost function support
  - Biological: EUD for tumor volumes and serial organs, isoeffective volume for parallel organs
  - Physical: Dose volume based constraints for tumor volumes and organs at risk
- Multi-criterial when selected will automatically try to achieve better normal tissue sparing by tightening constraints during the optimization
- Enhanced voxel definition tools controls and patient model improve the planning workflow. Voxel definition tools allow the user to see where and how the patient anatomy is controlled by plan constraints



- Constrained optimization optimizes dose to targets while respecting hard constraints on organs-at-risk
- Constrained Optimization ensures that all organ at risk goals are achieved while optimizing the target objectives at the same time.
- New visual Sensitivity Analysis guides the user to quickly and easily solve the conflicts between target goals and dose-limiting constraints
- Smart Sequencing® - Constrained optimization of deliverable segments lead to efficient step-and-shoot fields with fewer segments and a minimum of overall monitor units
  - Fluence (monitor units) and shape of segments are optimized subject to the initial prescription
  - No final dose calculation is necessary
- Segment Shape Optimization (SSO) improves plan quality and delivery efficiency through its proprietary approach to smoothing and clustering segments, then optimizing beam weights and shapes.
- The Monaco treatment planning system offers full support FFF by simply creating a machine model based on measurements from a FFF linac.



- Robust algorithms
  - XVMC – The Monte Carlo simulation algorithm provides highly accurate dose calculation and is employed within the optimization loop
  - Collapsed cone beam for Monaco with GPU accelerated calculations for 3D
  - An enhanced pencil beam algorithm facilitates fast results for evaluating optimization parameters

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VMAT

VMAT (Volume Modulated Arc Therapy) functionality within Monaco utilizes Segment Shape Optimization™ (SSO) which improves plan quality and decreases delivery time. Monaco can optimize single arcs with multiple rotations or multiple non-coplanar arcs simultaneously, fully supporting both convention and FFF delivery techniques, providing the flexibility and control needed for more complex treatment plans. Arc plans can be delivered with a single button push at the linear accelerator console. Gantry directions are automatically sorted, and all control points are seamlessly integrated into a single deliverable arc sequence. Monaco offers the accurate XVMC Monte Carlo dose engine for a continuous arc calculation as a single beam, instead of being limited to dose approximations that occur with a large number of discrete (control point) gantry angle positions. Monaco supports comparison of segmental IMRT with VMAT plans to choose the most appropriate for every patient.

mARC

Modulating Arc Therapy support for Siemens Linacs. Uses the same constraint based biological optimization as IMRT and VMAT and XVMC Algorithm

3D Conformal Planning

Using a graphical processor unit (GPU) for the collapsed-cone algorithm, Monaco increases the performance of 3D dose calculations even further. Monaco supports a range of modalities and techniques allowing clinicians to expand their treatment planning capabilities, including support of wedges, bolus and VMC++ Electron Monte Carlo

Stereotactic Planning

Full MLC-based planning including Apex™ micro-MLC support. Stereotactic cone support for static and arc fields using XVMC algorithm.

4D image Support

Monaco provides a comprehensive suite of capabilities that support the visualization and utilization of 4D image sets to create structures and review treatment options

Connectivity

Perform contouring, fusion, and plan review at any station or physician's workspace. Enhanced efficiency using template driven planning and report/batch printing generation.

Simulation

The integrated simulation application seamlessly performs contouring, beam placement, block/port definitions, and real-time DRRS. Multiple customizable views ensure efficient access to all required images and planning perspectives.

Contouring

The comprehensive array of drawing and editing tools from Elekta allow quick creation and expansion of structures. Includes edge detection/structure avoidance paintbrush tool and EZ-Sketch 3D auto-segmentation tool and PET SUV contouring.

Auto Fusion

Fully integrated fusion accommodates alignment of CT with CT/MR/PET/NM images for CT simulation or treatment planning utilization.

Plan Review

An intrinsic application offering a vast array of review tools and rapid off-line access for plan analysis and approval.

Rooms Eye View (REV)

Show the patient, gantry, couch, lighting, and decorations to simulate the treatment and verify patient positioning.

DICOM Integration

Integrated data transfer into MOSAIQ and other R&V systems including: Course ID, Plan Intent, Rx Site, Rx Dose, Dose Rate, Tolerance Table and Field ID.

Monaco 5.0 is not available for sale or distribution in all markets. Please contact your Elekta representative for details.
3D conformal radiation therapy, stereotactic cone, GPU-based Collapsed Cone calculation and dose service, are pending FDA 510(k) clearance

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info.america@elekta.com

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Tel +46 8 587 254 00
Fax +46 8 587 255 00
info.europe@elekta.com

Asia Pacific
Tel +852 2891 2208
Fax +852 2575 7133
info.asia@elekta.com

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MOSAIQ®
Practice Management
Version 2.5 Features

Overview

Practice Management - Overview	MQ 2.0	MQ 2.1	MQ 2.2	MQ 2.3	MQ 2.4/1	MQ 2.5
User Defined Schedules	✓	✓	✓	✓	✓	✓
Series Scheduling	✓	✓	✓	✓	✓	✓
Appointment Calendars	✓	✓	✓	✓	✓	✓
Scheduling Guidelines	✓	✓	✓	✓	✓	✓
Custom Report Launcher	✓	✓	✓	✓	✓	✓
User Defined Procedure Labels	✓	✓	✓	✓	✓	✓
Multiple Patient Accounts	✓	✓	✓	✓	✓	✓
Batch Edit Procedure Codes	✓	✓	✓	✓	✓	✓
Native PDF File Support	✓	✓	✓	✓	✓	✓
Integrated CodeCheck	✓	✓	✓	✓	✓	✓
Require IDA in demographics	✓	✓	✓	✓	✓	✓
Code Update Enhancements	✓	✓	✓	✓	✓	✓
Require "Responsible" field for QCI	✓	✓	✓	✓	✓	✓
Auto charge enhancements	✓	✓	✓	✓	✓	✓
Weekly Treatment Audit enhancements	✓	✓	✓	✓	✓	✓
Inactive item warning	✓	✓	✓	✓	✓	✓
Require "Account" field in code capture	✓	✓	✓	✓	✓	✓
Wave Edit Enhancements	✓	✓	✓	✓	✓	✓
Kiosk Check-in	✓	✓	✓	✓	✓	✓
ESI Lab Analyzer	✓	✓	✓	✓	✓	✓
ESI Schedule Import	✓	✓	✓	✓	✓	✓
ESI Schedule Export	✓	✓	✓	✓	✓	✓
Enhanced ESI Charge Export	✓	✓	✓	✓	✓	✓
"Mark as Ended" schedule status	✓	✓	✓	✓	✓	✓
Code Set Appointments	✓	✓	✓	✓	✓	✓
UDS Secondary Filter	✓	✓	✓	✓	✓	✓
UDS My Departments View	✓	✓	✓	✓	✓	✓
UDS Quick Appointment Section	✓	✓	✓	✓	✓	✓
UDS Pending Appointment Section	✓	✓	✓	✓	✓	✓

Continued on next page.

Why MOSAIQ®?

- Customizable scheduling views to quickly find appointments and optimize resource allocation
- Access patient demographic, clinical and billing information from the schedule to streamline processes
- Intelligent code capture, verification, audit, and export capabilities

For more information please visit

www.elekta.com/MOSAIQ

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Overview Continued

Practice Management Overview	MQ 2.0	MQ 2.1	MQ 2.2	MQ 2.3	MQ 2.4/1	MQ 2.5
UI Configuration Changes	✓	✓	✓	✓	✓	✓
Additional User Defined Schedule Columns and Options		✓	✓	✓	✓	✓
HDS "Linked" Schedule option		✓	✓	✓	✓	✓
Additional Co-Payment Security		✓	✓	✓	✓	✓
Code Capture History		✓	✓	✓	✓	✓
Enhanced UI Security and Push		✓	✓	✓	✓	✓
ESI Auto Import of Treatment Documents		✓	✓	✓	✓	✓
Charge-Appointment Linking			✓	✓	✓	✓
Staff QCL and Quick Schedule Chart UI			✓	✓	✓	✓
HITECH Meaningful Use (MU) Certified				✓	✓	✓
Login with Windows Authentication				✓	✓	✓
Patient Worklist Enhancements				✓	✓	✓
Add QCLs from the Patient Worklist				✓	✓	✓
Report for QCL Patient Reminders				✓	✓	✓
Patient Demographics Enhancements for MU				✓	✓	✓
Meaningful Use Compliance Reports				✓	✓	✓
Audit Log Enhancements				✓	✓	✓
Batch Edit for Diagnosis Code Library				✓	✓	✓
Diagnosis Code Type Indicator				✓	✓	✓
Demographics Workspace					✓	✓
Authorizations					✓	✓
Exported/Posted Charges Report					✓	✓
Facility Dialog Box					✓	✓
Name Search without Commas					✓	✓
User Defined Schedule Enhancements					✓	✓
Maximum Appointments of Activity Guideline					✓	✓
Biometric Support					✓	✓
Automatic Patient Verification					✓	✓
Quality Check List Enhancements						✓
Episodes of Care						✓
New Patient Registration Window						✓
Demographics Workspace Enhancements						✓
Diagnoses and Problems list pane						✓
Inline Editing						✓
Patient E-mail Column on the User Defined Schedule						✓
Queuing Across Departments						✓
New Eligibility Verification Work List						✓
Electronic Eligibility Verification						✓

This functionality will be available in the next scheduled release of MOSAIQ.

New in MOSAIQ 2.5	Advantage
Quality Check List Enhancements Provides full QCL functionality from the Home and Chart workspace with enhanced fields and filters to help staff find and prioritize tasks.	Improves task management and streamlines QCL maintenance and creation.
Episodes of Care Use "episodes" to record data for individual episodes of care. Use the new Episodes pane in the Demographics workspace to see, add, and change information about the episodes of the global patient.	Define episodes of care and collect episode user defined information.
New Patient Registration Window The enhanced New Patient Registration window has a new look and new fields.	Improved usability.

Demographics Workspace enhancements New Insurance pane and patient insurance eligibility as well as improvements to the existing workspace.	Improves user navigation and information access.
Diagnoses and Problems List Pane A new toolbar is added along with improved customization tool	Ability to change the layout of the pane for improved information access.
Inline Editing Use this feature to change the information in the editable field in a pane without going to a different pane or window.	Quickly change an editable field in a pane in a workspace without opening the item or easily go from one item to another and quickly change information in editable fields.
Patient E-mail column on the User Defined Schedule Use the new *Patient E-mail* column to show the home email address of the patient in the UDS (User Defined Schedule)	Key patient contact information available during scheduling.
New Eligibility Verification Work List The new Eligibility Work List identifies patients needing eligibility verification based on selected criteria such as upcoming appointments, days since last verification check, and codes captured.	Helps staff verify that patients are covered for service before arrival for an appointment and streamlines eligibility verification tasks.
Electronic Eligibility Verification Electronic Eligibility Verification enables a clinic to easily perform routine batch checks and to update patient insurance information before treatment. Up to date eligibility status information is accessible to staff throughout the clinic.	Reduces time spent verifying patients' eligibility for services. Accurate insurance eligibility status and coverage information improves reimbursement success.

New in MOSAIQ 2.4/1	Advantage
Demographics Workspace The Patient Demographic Data dialog box is changed to the Demographics Workspace with new enhancements including Configurable Workspace.	More efficient accessibility to the information you need, when you need it.
Authorizations Authorizations has had multiple enhancements: • Select the referring physician and referred to physician, and add the issue date. • Configure the default referring physician for code capture as the Authorization referring physician.	Authorization enhancements include new information and improve flexibility.
Exported/Posted Charges Report The Exported/Posted Charges report includes new filter and group options.	Filter charges by location, as well as multiple groupings now available.
Facility Dialog Box The Facility dialog box has a new field that lets you add a website address.	Greater functionality in the facility dialog box.
Name Search without Commas You can now type a space without a comma between the last and first name to select or find a patient or physician.	More intuitive and natural for specific regions.

User Defined Schedule (UDS) Enhancements

New features were added to the UDS to help you collect data for Meaningful Use measures. These enhancements let you quickly identify missing information about patients. You can collect the information when the patient checks in or during patient care:

- New Columns -
  Contact Preference, Diagnosis Stage, Ethnicity, Language, Pharmacy Facility, Race, Deleted By, Deleted Date.
- Enhanced Columns
  Co-Payments – This column now also shows if a co-payment was skipped
  You can configure the UDS so that the new options below appear on the UDS
- Options Menu
  View Chart, View Observation Orders, View Pharmacy Orders, View Demographics, Restore Appointment.
- Reports
  You can now configure the Dose Site Summary and Patient Demographics Compliance reports to appear on the Reports sub-menu on the UDS Options menu
- Quickly identify and collect missing Meaningful Use information during patient check-in.
- Open the patient's orders, chart and demographics directly from the highlighted appointment.
- View and restore deleted appointments from any User Defined Schedule.

Maximum Appointment of Activity Guidleine

The new Maximum appointments with this activity rule lets you limit the number of appointments for a certain activity or code group.

Restrict or prevent selected activities from occurring at specific times. (i.e., no consultations from 4-6pm on Tuesdays and Thursdays).

Biometric Support

MOSAIQ now uses biometric information for patient identification and verification.
You can set up your workstation to automatically open a patient chart with the fingerprint reader.

You can use the fingerprint reader to enroll fingerprints of a patient in MOSAIQ. The enrolled fingerprints are used for patient identification when they walk-in for an appointment

Automatic Patient Verification

You can configure your workstations to automatically verify patient before radiation treatment.

Speeds up patient treatment workflow with patient information available on the screen before treatment.

Corporate Head Office:
Elekta AB (publ)
Box 7593, SE-103 93 Stockholm,
Sweden
Tel +46 8 587 254 00
Fax +46 8 587 255 00
info@elekta.com

Regional Sales, Marketing and Service:

North America
Tel +1 770 300 9725
Fax +1 770 448 6338
info.america@elekta.com

Europe, Middle East, Africa, Eastern Europe, Latin America
Tel +46 8 587 254 00
Fax +46 8 587 255 00
info.europe@elekta.com

Asia Pacific
Tel +852 2891 2208
Fax +852 2575 7133
info.asia@elekta.com

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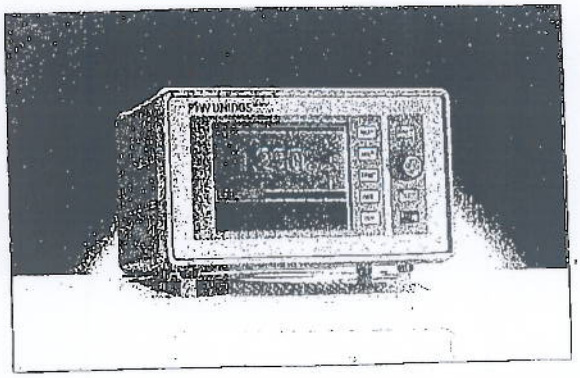
UNIDOS*webline* Universal Dosemeter



High performance secondary standard and reference class dosemeter / electrometer with integrated network features

Features

- High quality reference class dosemeter for radiation therapy, diagnostic radiology and health physics
- Integration in a LAN with the internet standard TCP/IP
- Remote access functionality
- E-mail capability, eg. to initiate self tests and to send a status report
- Configurable TFT display with wide viewing angles
- Easy and fast menu-driven handling with navigation knob and help system

The UNIDOS*webline* is a high-precision, secondary standard reference class dosemeter combined with modern network features. This unique dosemeter offers high quality, reliability and an excellent adaptation to the measuring tasks. It has the best performance on the market.
The Ethernet interface based on the TCP/IP protocol makes it possible to integrate the UNIDOS*webline* in a LAN for remote access and e-mail capability. Important settings can be password protected (different levels). The operation language is selectable. A comprehensive statistic and data logging function is implemented.
Chamber data are stored in a comprehensive chamber library. Air density is corrected by keying in air pressure and temperature or by means of radioactive check devices. The check device data are stored in a database. An internal clock calculates the isotope radioactivity decay. The device features both mains and battery operation.
UNIDOS*webline* surpasses the requirements for reference class dosemeters according to IEC60731, the IPEM secondary standard dosemeter guidelines, IEC 61674 for diagnostic radiology and IEC 60846 for health physics.

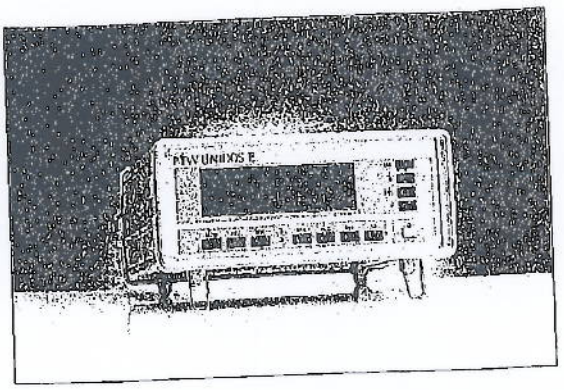
Ordering Information

T10023 UNIDOS*webline*, connecting system BNT
T10022 UNIDOS*webline*, connecting system TNC
T10021 UNIDOS*webline*, connecting system M

Option

L522021 UNIDOS Carrying case

UNIDOS® E Universal Dosemeter



Easy to use reference class or field class dosemeter / electrometer for routine dosimetry

Features

- An economical high quality dosemeter for universal use in radiation therapy and diagnostic radiology
- Complies with the following standards:
  - IEC 60731 as a field class dosemeter
  - IEC 60731 as a reference class dosemeter (option)
  - IPEM guidelines on dosimetry transfer instruments as a secondary standard dosemeter (option)
  - IEC 61674 as a diagnostic dosemeter
- High accuracy, excellent resolution (1 fA) and wide dynamic measuring ranges
- HV power supply (0 ... ±400) V in increments of ±50 V
- Measures integrated dose (or charge) and dose rate (or current) simultaneously
- RS232 interface for device control and data output

The lightweight and compact UNIDOS E is an easy to use dosemeter, mainly used for daily routine dosimetry in radiation therapy. Ion chambers and solid-state detectors can be connected. A chamber library makes it possible to store calibration data. Air density corrections are done by keying in air pressure and temperature. UNIDOS E displays the measured values of dose and dose rate in Gy, R, Gy/min, R/min or Gy·m. The electrical values charge and current are measured in C and A. The large, high-contrast LC display is easy to read. The device includes automatic leakage compensation and an RS232 interface. The high voltage between the ion chamber electrodes is checked automatically. UNIDOS E features both mains and battery operation.

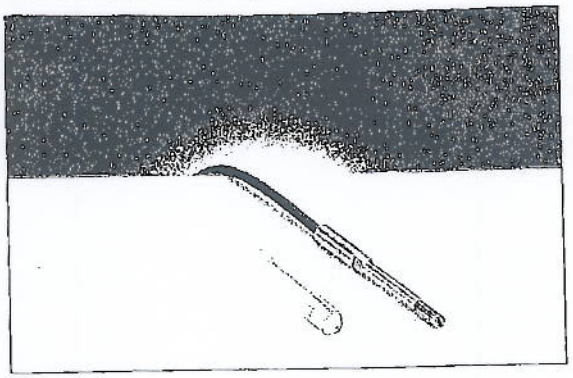
Ordering Information

T10010 UNIDOS E, connecting system BNT, 115/230 V
T10009 UNIDOS E, connecting system TNC, 115/230 V
T10008 UNIDOS E, connecting system M, 115/230 V

Options

E10101 UNIDOS E Reference class certificate
T11003.1.020 UNIDOS E Carrying case

- UNITEST Electric Test Device *page 22*
- Radiation Detectors *page 15ff.*



Farmer Chamber
Type 30013

Waterproof therapy chamber for absolute dosimetry in high-energy photon, electron and proton beams

Features

- Waterproof, fully guarded chamber
- Sensitive volume 0.6 cm³, vented to air
- Acrylic wall, graphited
- Aluminum central electrode
- Radioactive check device (option)

The 30013 Farmer chamber is the standard ionization chamber for absolute dose measurements in radiation therapy. Correction factors needed to determine absorbed dose to water or air kerma are published in the pertinent dosimetry protocols. Its waterproof design allows the chamber to be used in water or in solid state phantoms. The acrylic chamber wall ensures the ruggedness of the chamber.

Specification

Type of product	vented cylindrical ionization chamber acc. IEC 60731
Application	absolute therapy dosimetry in water, solid state phantoms and air
Measuring quantities	absorbed dose to water, air kerma, exposure
Reference radiation quality	^{60}Co
Nominal sensitive volume	0.6 cm³
Design	waterproof, vented, fully guarded
Reference point	on chamber axis, 13 mm from chamber tip
Direction of incidence	radial
Nominal response	20 nC/Gy
Long-term stability	≤ 0.5 % per year
Chamber voltage	400 V nominal ± 500 V maximal
Polarity effect at ^{60}Co	< 0.5 %
Photon energy response	≤ ± 2 % (70 kV ... 280 kV) ≤ ± 4 % (200 kV ... ^{60}Co)
Directional response in water	≤ ± 0.5 % for rotation around the chamber axis and for tilting of the axis up to ± 5°
Leakage current	≤ ± 4 fA
Cable leakage	≤ 1 pC/(Gy cm)

Materials and measures:

Wall of sensitive volume	0.335 mm PMMA, 1.19 g/cm³ 0.09 mm graphite, 1.85 g/cm³
Total wall area density	56.5 mg/cm²
Dimension of sensitive volume	radius 3.05 mm length 23.0 mm
Central electrode	Al 99.98, diameter 1.1 mm
Build-up cap	PMMA, thickness 4.55 mm

Ion collection efficiency at nominal voltage:

Ion collection time	140 µs
Max. dose rate for ≥ 99.5 % saturation ≥ 99.0 % saturation	 5 Gy/s 10 Gy/s
Max. dose per pulse for ≥ 99.5 % saturation ≥ 99.0 % saturation	 0.46 mGy 0.91 mGy

Useful ranges:

Chamber voltage	± (100 ... 400) V
Radiation quality	30 kV ... 50 MV photons (10 ... 45) MeV electrons (50 ... 270) MeV protons
Field size	(5 x 5) cm² ... (40 x 40) cm²
Temperature	(10 ... 40) °C (50 ... 104) °F
Humidity	(10 ... 80) %, max 20 g/m³
Air pressure	(700 ... 1060) hPa

Ordering Information

TN30013 Farmer type chamber 0.6 cm³, waterproof, connecting system BNT

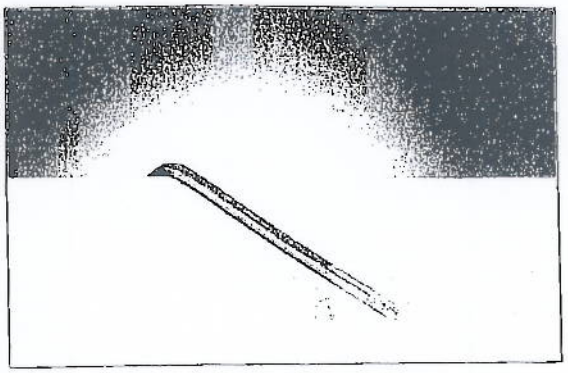
TW30013 Farmer type chamber 0.6 cm³, waterproof, connecting system TNC

TM30013 Farmer type chamber 0.6 cm³, waterproof, connecting system M

Options

T48012 Radioactive check device ^{90}Sr

T48002.3.003 Chamber holding device for check device



PinPoint 3D Chamber
Type 31016

Ultra small-sized therapy chamber with 3D characteristics for dosimetry in high-energy photon beams

Features

- Small-sized sensitive volume 0.016 cm³, vented to air
- Minimized directional response
- Aluminum central electrode
- Radioactive check device (option)

The 31016 PinPoint 3D chamber is ideal for dose measurements in small fields as encountered e.g. in IORT, IMRT and stereotactic beams. Relative dose distributions can be measured with high spatial resolution in any direction. The waterproof, fully guarded chamber can be used in air, solid state phantoms and in water.

Specification

Type of product	vented cylindrical ionization chamber
Application	dosimetry in high-energy photon beams
Measuring quantities	absorbed dose to water, air kerma, exposure
Reference radiation quality	^{60}Co
Nominal sensitive volume	0.016 cm³
Design	waterproof, vented, fully guarded
Reference point	on chamber axis, 2.4 mm from chamber tip
Direction of incidence	radial
Pre-irradiation dose	2 Gy
Nominal response	400 pC/Gy
Long-term stability	≤ 1 % per year
Chamber voltage	400 V nominal ± 500 V maximal
Polarity effect	≤ ± 2 %
Directional response in water	≤ ± 0.5 % for rotation around the chamber axis, ≤ ± 1 % for tilting of the axis up to ± 110°
Leakage current	≤ ± 4 fA
Cable leakage	≤ 1 pC/(Gy·cm)

Materials and measures:

Wall of sensitive volume	0.57 mm PMMA, 1.19 g/cm³ 0.09 mm graphite, 1.85 g/cm³
Total wall area density	85 mg/cm²
Dimensions of sensitive volume	radius 1.45 mm length 2.9 mm
Central electrode	Al 99.98, diameter 0.3 mm
Build-up cap	PMMA, thickness 3 mm

Ion collection efficiency at nominal voltage:

Ion collection time	60 µs
Max. dose rate for ≥ 99.5 % saturation ≥ 99.0 % saturation	 19 Gy/s 38 Gy/s
Max. dose per pulse for ≥ 99.5 % saturation ≥ 99.0 % saturation	 1.0 mGy 1.9 mGy

Useful ranges:

Chamber voltage	± (100 ... 400) V
Radiation quality	^{60}Co ... 50 MV photons
Field size	(2 x 2) cm² ... (30 x 30) cm²
Temperature	(10 ... 40) °C (50 ... 104) °F
Humidity	(10 ... 80) %, max 20 g/m³
Air pressure	(700 ... 1060) hPa

Ordering Information

TN31016 PinPoint 3D chamber 0.016 cm³, connecting system BNT

TW31016 PinPoint 3D chamber 0.016 cm³, connecting system TNC

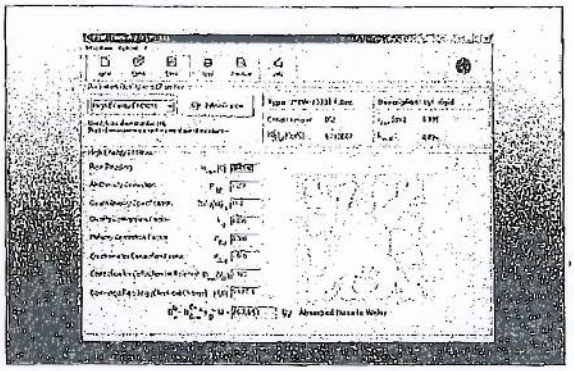
TM31016 PinPoint 3D chamber 0.016 cm³, connecting system M

Options

T48012 Radioactive check device ^{90}Sr

T48002.1.008 Chamber holding device for check device

UniSoft Dosimetry Software



Software for radiation therapy dosimetry according to international dosimetry protocols

Features

- Determines chamber correction factors and calculates absorbed dose to water
- Put out data in worksheet format
- Two versions are available to support all established international therapy dosimetry protocols

The UniSoft software is designed to determine the absorbed dose to water of high-energy photon and electron radiation out of dosemeter readings from ionization chambers based on ^{60}Co calibrations.

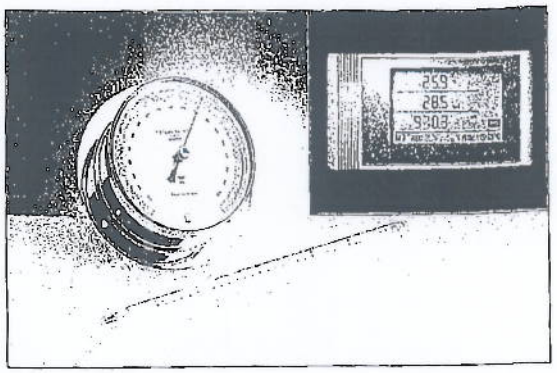
UniSoft software, Edition 2000 supports the AAPM TG-51 and IAEA TRS-398 therapy dosimetry protocols by calculating the relevant correction factors for air density, polarity effect, saturation effect, radiation quality and displacement. A software module to control the dose meter and to position the detector is included.
UniSoft features ionization chamber libraries to store chamber data necessary for the determination of correction factors. Dosimetry worksheets can be defined for different dosimetry protocols, beam qualities, types of ionization chambers and two kinds of air density correction.

Ordering Information

S100009 UniSoft Software, Edition 2000

- UNIDOS*webline* Universal Dosemeter *page 13*
- UNIDOS E Universal Dosemeter *page 13*
- MULTIDOS Multi Channel Dosemeter *page 30*
- TANDEM Dual Channel Electrometer *page 14*
- Radiation Detectors *page 15ff.*
- Radioactive Check Devices *page 22*
- MEPHYSTO *mc²* Software *page 44*

Barometer Thermometer



Precise air pressure and temperature measuring instruments for air density correction of ion chamber readings

Features

- The barometers provide precise measurement of absolute air pressure in hPa
- Official calibrations traceable to primary standards are optionally available for barometers and thermometer

The precision barometers and the thermometer are used to determine air density correction factors for absolute dosimetry.

The precision barometers are calibrated against sea level.

The temperature-compensated barometers have a circular analogue scale with 115 mm diameter. The scale resolution is 0.5 hPa. The metal housing is supplied with a flange for wall mounting.

The analogue precision thermometer is a mercury thermometer with a glass capillary. The measuring range is from 0 °C to 50 °C, and the scale resolution is 0.2 °C.

The digital combined barometer and thermometer device is equipped with interfaces for data transfer to a PC.

Ordering Information

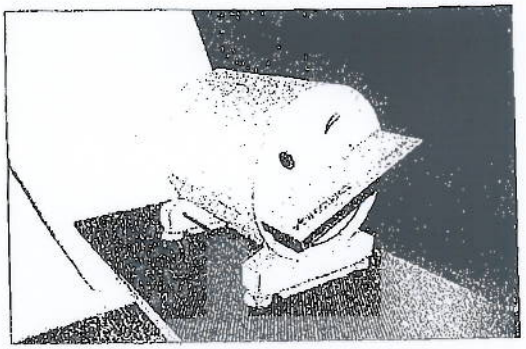
L991133 Precision barometer (900 ... 1050) hPa

L991237 Precision barometer (900 ... 1050) hPa with German calibration

L991385 Precision barometer (300 ... 1300) hPa and thermometer (-20 ... 50) °C, digital with USB and LAN interface, software included

L654004 Precision thermometer (0 ... 50) °C

L654003 Precision thermometer (0 ... 50) °C, officially calibrated



OCTAVIUS 4D

4D in Motion
The New Dimension
in IMRT Dosimetry

Coming early 2012

Features

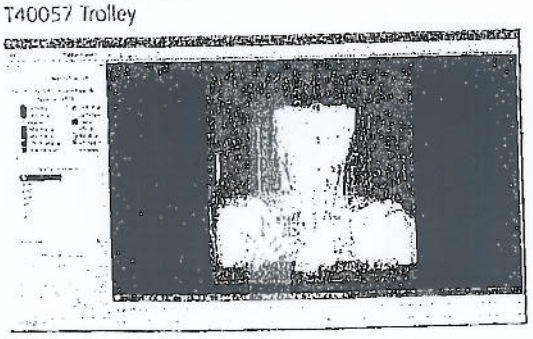
- **Measurements inside the entire volume**
  OCTAVIUS® 4D rotates with the gantry, measuring the dose in multiple planes, thus covering the entire volume.
- **Dose analysis within the patient's anatomy**
  The measured dose distribution can be superimposed on patient structures (2D/3D view), using VeriSoft® IMRT plan verification software.
- **Truly independent measurements**
  TPS data are not required for measurements.
- **A multitude of measurement points inside the volume of interest**
  OCTAVIUS® 4D acquires the dose in multiple planes intersecting the isocenter, providing you with clinically relevant dose information from where it is important – inside the target volume.
- **Accuracy without calibration**
  OCTAVIUS® 4D does not require any angular corrections or complicated calibration procedures for truly angle-independent measurements. It follows the movement of the gantry, always remaining perpendicular to the beam.
- **3D data analysis with slice selection**
  Transversal, coronal or sagittal slices can be extracted from the measured 3D dose cube for precise plan comparisons.

Specification

Type of product	**Rotation Unit:** Motor-driven, water-equivalent cylindrical phantom with inclinometer **Detector:** Two-dimensional array with 729 vented cubic ionization chambers
Application	Patient plan verification for IMRT, IMAT, VMAT and RapidArc®
Measuring quantity	Absorbed dose Absorbed dose rate
Range of use	(0.5 ... 45) Gy/min
Resolution	0.1 mGy, 0.1mGy/min
Dead time	zero
Display cycle	200 ms
Max. field size	27 cm x 27 cm
Angle range	± 360°
Rotation reproducibility	± 1°
Phantom material	Polystyrene, density 1.06 g/cm³
Outer dimensions	**Detector:** 300 mm x 420 mm x 22 mm **Phantom:** Diameter 320 mm, length 443 mm
Weight	**Rotation Unit:** 29 kg **Detector:** 5.4 kg

Ordering Information

L981387 OCTAVIUS® 4D
incl. OCTAVIUS® Detector *seven29*
and VeriSoft® Software
T40057 Trolley



Comparison of 4D Dosimetry Systems

OCTAVIUS® 4D

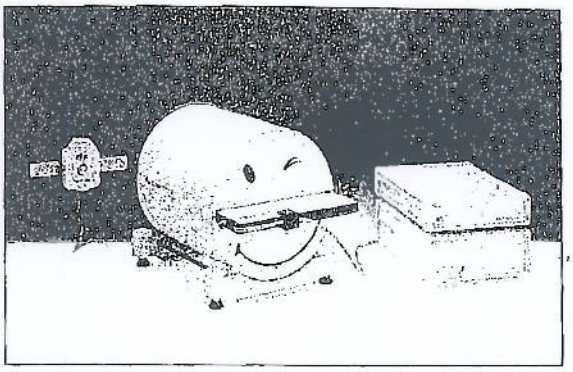
OCTAVIUS® 4D measures where it counts: inside the volume of interest

D913.139.00/00 Effective 2011-07
Previous specifications are void.

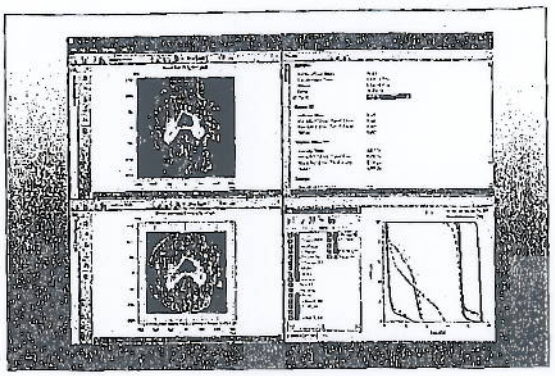
PTW-Freiburg · Lörracher Straße 7 · 79115 Freiburg, Germany
Phone: +49 761 49055-0 · Fax: +49 761 49055-70
info@ptw.de · www.ptw.de

PTW

OCTAVIUS® 4D



4D Patient Plan Verification



Supported PTW Detector Arrays:

- OCTAVIUS Detector 729
- OCTAVIUS 1000 *SRS*
- 2D-ARRAY *seven29*

Features

- True independent 4D dose verification
- Dose measurements inside the entire phantom volume
- Unique rotating phantom offering perfect isotropic measurement geometry
- Failed point analysis in patient contours
- Superior ionization chamber technology
- Phantom suitable for different detector arrays
- Suitable for FFF LINACs
- DVH analysis option

OCTAVIUS 4D is a new 4D dosimetry system designed to verify IMRT treatment plans based on true independent measurements. It rotates with the gantry, measuring the dose inside the entire phantom volume, always perpendicular to the incident beam. As a consequence, OCTAVIUS 4D requires no angular corrections or detector calibrations to compensate for the directional response of its detectors which makes it perfectly suited for rotational delivery techniques and easy-to-use in clinical routine.

With its powerful acquisition and 3D dose analysis capabilities the software VeriSoft allows to compare the dose in transverse, coronal and sagittal planes and to analyze the measurement results superimposed on the patient's CT scan. VeriSoft allows to perform a volume analysis comparing the measured dose against the calculated dose for the entire phantom volume.

The optional software module DVH 4D calculates dose-volume histograms (DVHs) for each structure in less than a few minutes and compares them with the DVHs calculated by the treatment planning system (TPS). As a truly independent plan evaluation tool, DVH 4D requires no dose data from the TPS, but performs its calculations based entirely on patient CT data and OCTAVIUS 4D measurements, using a unique algorithm.

Ordering Information

L981387 OCTAVIUS 4D system

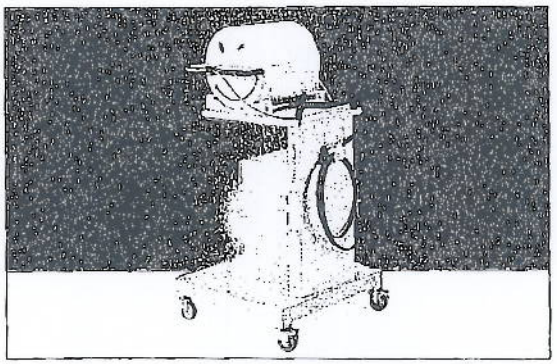
L981398 OCTAVIUS 4D system incl. trolley

L981324 OCTAVIUS 4D Upgrade Package
for use with existing PTW detector arrays

Options

S070026 DVH 4D module
T40057 OCTAVIUS 4D Trolley
T40056.1.002 Phantom Insert Plate Semiflex 0.125 cm²
T40056.1.003 Phantom Insert Plate Farmer
S070020 DIAMOND Secondary Check Software
L981390 DAVID Dose Delivery QA System

- OCTAVIUS Detector 729 *page 54*
- OCTAVIUS 1000 *SRS* *page 57*



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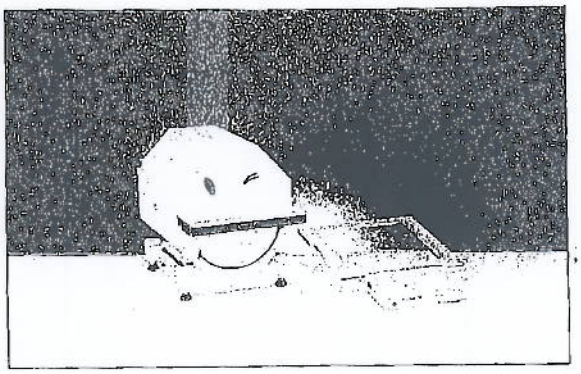
OCTAVIUS® III



IMAT patient plan verification and in-vivo dosimetry

Features

- Patient plan verification and in vivo verification of dose delivery and MLC accuracy during actual patient treatment provided in one solution, using a novel, clinically validated QA technique
- Customizable, color-coded alarm levels to quickly detect serious (e.g. lost MLC positions) as well as minor leaf malfunctions and plan deviations during each session
- Ingeniously simple installation and everyday operation
- Available for all standard MLCs

Designed to close the gap in IMRT QA, OCTAVIUS III cleverly combines pre-treatment verification using OCTAVIUS II with the DAVID Detector, a truly innovative real-time in vivo dosimetry system for IMRT. By integrating DAVID, OCTAVIUS III gives you a powerful, yet highly practical QA solution at hand to verify whether the planned dose is actually being delivered over the entire treatment period. It is the ultimate safety layer for complex IMRT treatments.
DAVID features a transparent multiwire ionization chamber (MIC) which is installed below the MLCs. Measurement wires are stretched parallel to the running direction of the MLCs. Each measurement wire monitors the opening of a leaf pair. The evaluation software compares the dose measured during radiotherapy to a reference dose, which was taken during a reference measurement. DAVID can be used independent of the IMRT method (Step and Shoot, Sliding Window or Dynamic Arc).

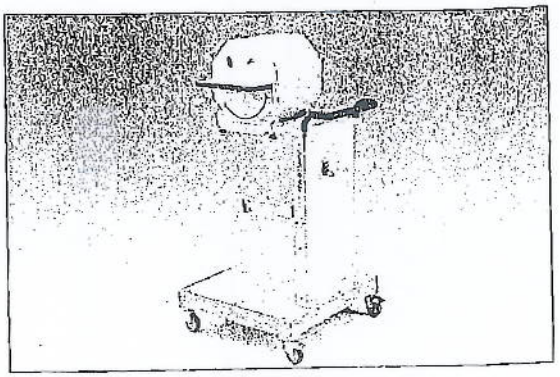
The DAVID system was developed in collaboration with PIUS Hospital and CARL VON OSSIETZKY University, Oldenburg as well as Goettingen University, Germany.

Ordering Information

L981229 OCTAVIUS III

▸ OCTAVIUS Accessories page 55

OCTAVIUS® Accessories



Optional accessories for OCTAVIUS systems (not for OCTAVIUS 4D)

OCTAVIUS mobile QA Trolley (T40053)

Robust, functionally designed trolley to conveniently store and move OCTAVIUS phantom and detector.

Inclinometer (L981316)

Device to measure the gantry angle. Allows dose measurements as a function of time and gantry angle to verify partial plans. Typically use for IMAT measurements.

Film Measurement (T40054.1.015)

Polystyrene holding device for OCTAVIUS phantom to insert a GafChromic® EBT / EBT 2 film (max. size 20.32 cm x 25.4 cm, 8" x 10") for film measurements.

Chamber Measurement (T40042.1.010)

Insert plates for OCTAVIUS phantom with cavities to allow point measurements with up to nine 0.125 cm^3 semiflex ionization chambers. Unneeded cavities can be closed with blind plugs.

Inhomogeneity Phantom (L981296)

Acrylic phantom to test RTPS system with consideration of inhomogeneities

▸ *page 58*

BQ-CHECK (T42030)

Energy verification phantom

▸ *page 63*

Positioning Device (T40049)

Positioning phantom for OCTAVIUS Detector and for STARCHECK

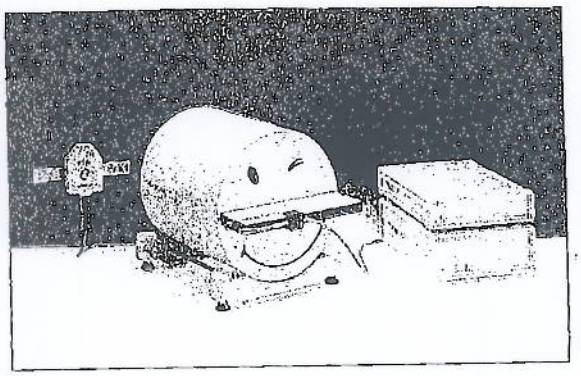
▸ *page 65*

Universal Gantry Mount (T41021)

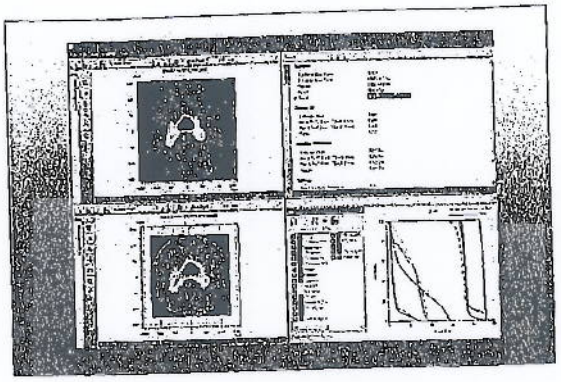
Vendor-specific gantry holding device designed to keep PTW ionization chamber arrays secure at isocenter at any gantry position

▸ *page 60*

OCTAVIUS® 4D



4D Patient Plan Verification



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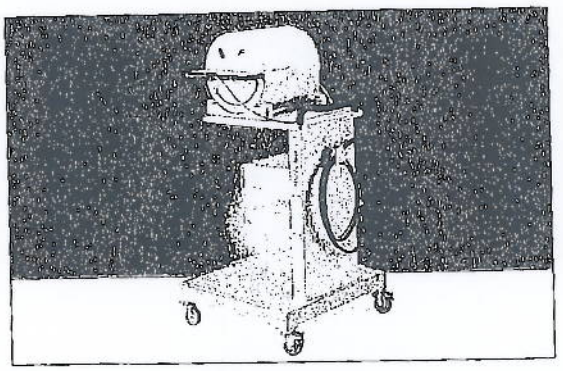
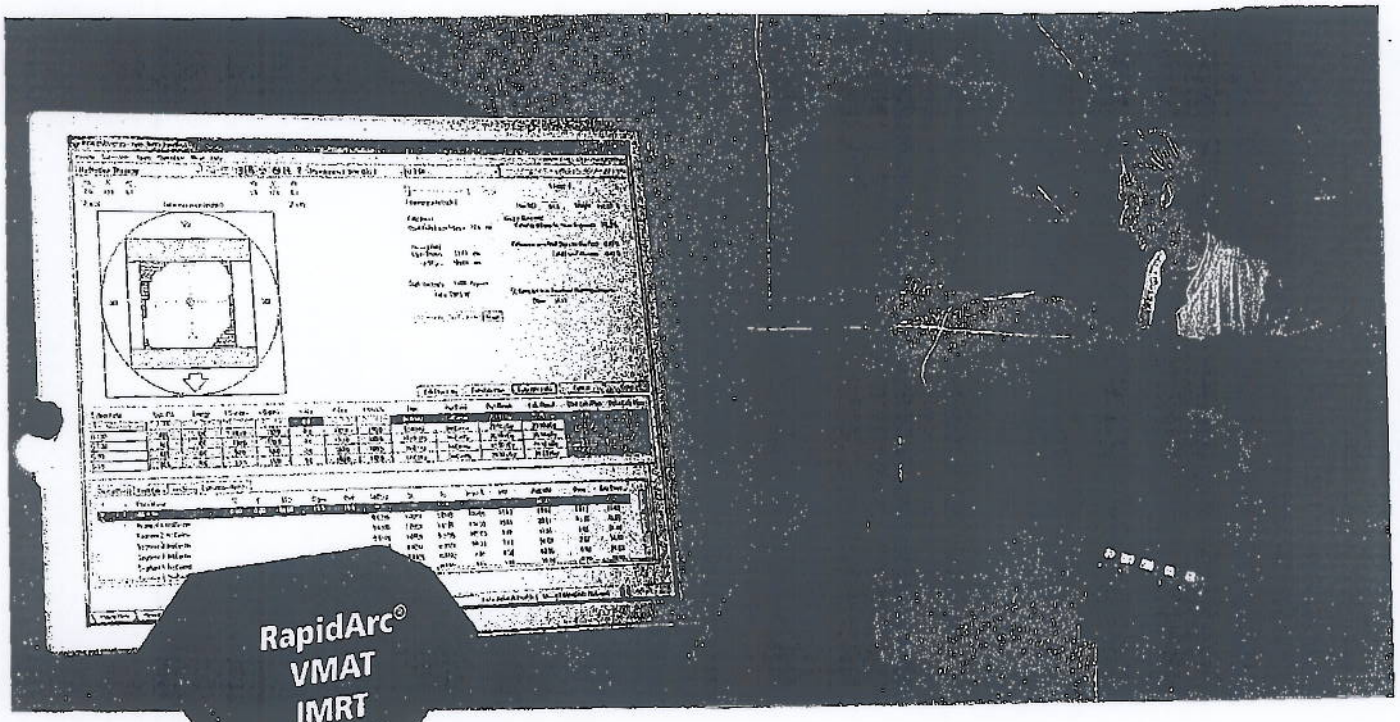
L981390 DAVID Dose Delivery QA System

- OCTAVIUS Detector 729 *page 54*
- OCTAVIUS 1000 *SRS page 57*



Points selected. Plan verified.



DIAMOND™

Secondary Check Software for
Independent Dose or MU Verification

PTW

DIAMOND™

Points selected. Plan verified. Time saved.

DIAMOND™ is a clinically proven secondary check software that allows independent point dose or MU verification of both conformal and IMRT treatment plans.

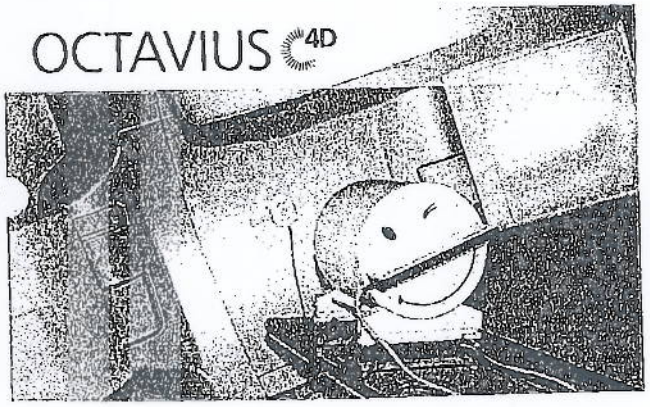
It computes the dose at one or multiple dose points and compares the results with calculations by the treatment planning system (TPS), making routine IMRT plan verification much faster and simpler. As an independent verification tool, it can replace IMRT dose verification measurements with PTW OCTAVIUS® systems in clinical routine cases. IMRT fluence and dose maps can be calculated and exported to the TPS VeriSoft® IMRT plan verification software for comparison and detailed analysis.

DIAMOND™ utilizes a modified Clarkson integration and advanced optimization algorithms to ensure the most accurate calculations for dynamic IMRT delivery techniques.

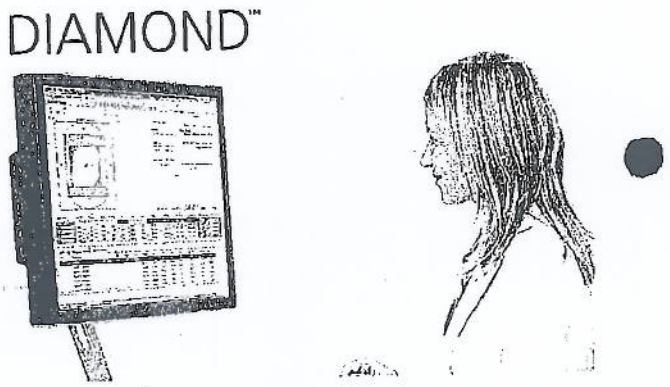
Overview

- Independent verification of point dose or MU calculations
- Dose comparisons at one or multiple dose points
- Advanced capabilities, e.g. wedge support, corrections of "flash" in breast treatments, fluence/dose mapping
- Fast, efficient plan verification without LINAC
- For multiple treatment techniques, including 2D/3D, IMRT step & shoot, sliding window, VMAT, RapidArc®

DIAMOND™ - a valuable addition to PTW OCTAVIUS® systems



Dose verification by independent measurements with PTW OCTAVIUS® systems



Dose verification by independent calculation with DIAMOND™ Secondary Check software

DIAMOND™ Clinically validated results

	Totals	Fields within tolerance 3%	Fields within tolerance 5%	Plans within tolerance 3%	Plans within tolerance 5%
Thoracic	52	98%	100%	80%	100%
H&N	84	98%	100%	80%	100%
CNS	53	98%	100%	100%	100%
GU	81	100%	100%	100%	100%
Totals	270				
Averages		98.5%	100.0%	90.0%	100.0%

Source: Pre-publication data provided by MD Anderson Cancer Center, Houston, Texas · Definitions: Thoracic: Lung; H & N: Head & Neck; CNS: Central Nervous System; GU: Gastro/Urologic

Basic Calculation Capabilities

DIAMOND™ provides a quick and efficient tool for performing the basic independent MU calculations.

Features

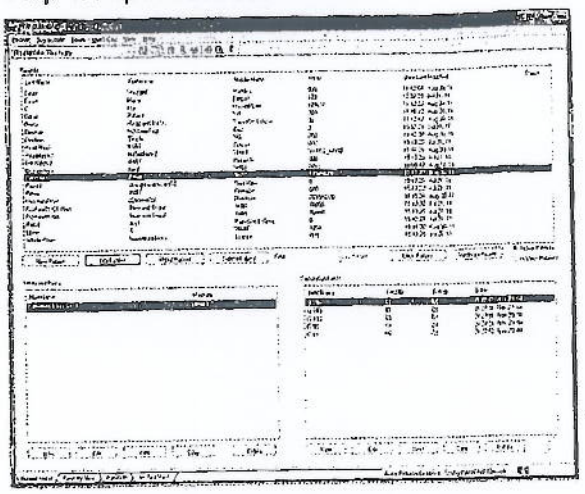
- Unlimited treatment units in multiple institutions/departments
- Unlimited fields for each plan
- Unlimited point dose calculation for each field
- Photon and electron beam calculations
- QuickCalc calculation mode for fast check calculations
- Calculations for SSD or isocentric treatment plans

Basic Capabilities

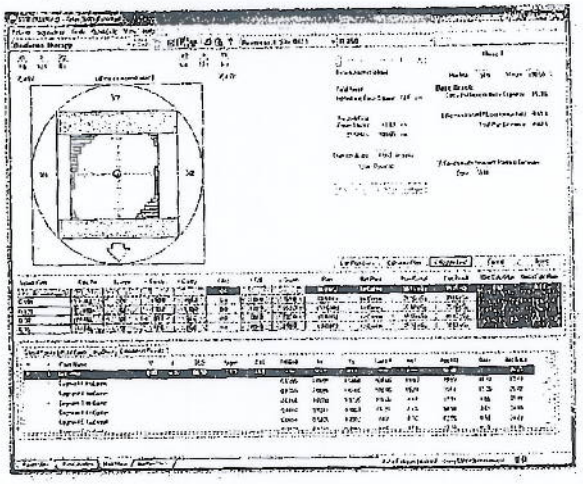
- Photon and electron calculations
- Graphical entry of MLC outline
- Off-axis point dose calculation for open and wedged fields
- Effective wedge calculations
- Field weighting, wedge and tray factors
- Inhomogeneity and compensator/modifier correction
- MU/degree calculation with arc angle entry
- D_{max} (given dose) calculation for each field
- S_c & S_p calculation formalism for collimator and phantom scatter

Simple Workflow: Plan verification in three steps

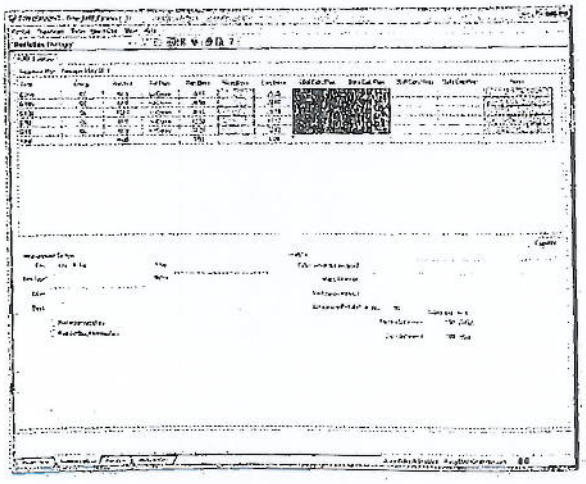
Step 1: Import DICOM RT Plan.



Step 2: Calculate single or multiple points.



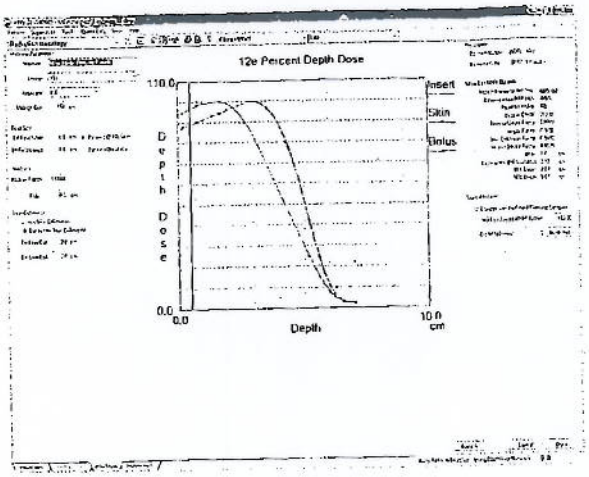
Step 3: Document plan results.



Advanced Calculation Capabilities

Electron Calculations – two methods supported

- Simple table look-up of output factors
- Extended MD Anderson method with depth dose and skin collimation

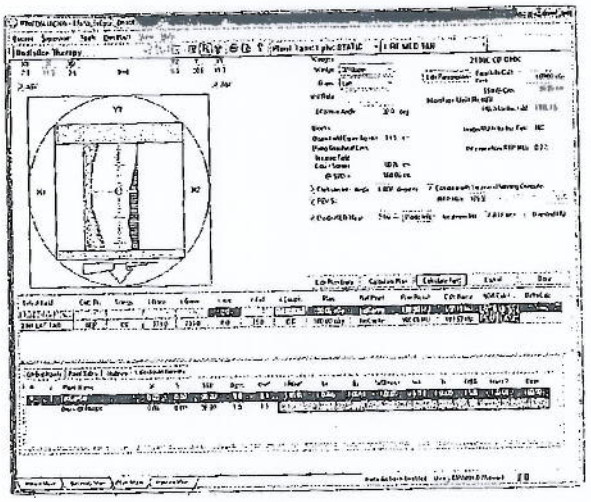


Dynamic Wedge Support

- Varian Enhanced Dynamic Wedge
- Siemens Virtual Wedge
- Elekta Motorized Wedge

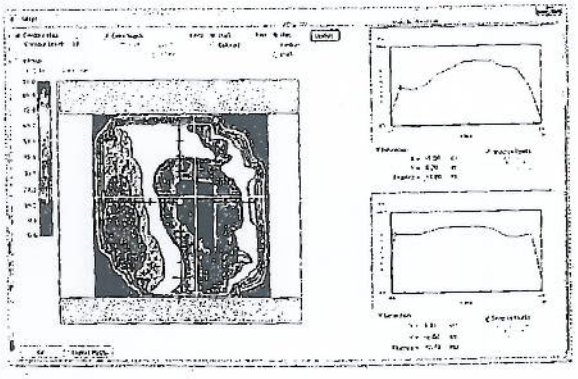
Plan Import

- DICOM RT
- Import Data Viewer



Multiple Outlines for Blocks, MLC or Air

- MLC, blocks and air pattern
- Unique transmission or scatter values
- Correction for "flash" in breast treatments
- Correction for lung tissue in the proximity of the point



Fluence & Dose Mapping

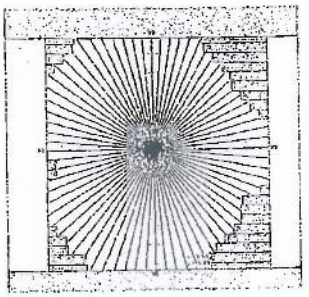
DIAMOND™ can calculate IMRT fluence and dose maps and export them to VeriSoft® IMRT plan verification software for a detailed comparison with TPS dose or fluence maps.

Precision IMRT, RapidArc® and VMAT Dose Assessment

DIAMOND™ performs its calculations based on machine data, a modified Clarkson integration and optimized dose calculation algorithms.

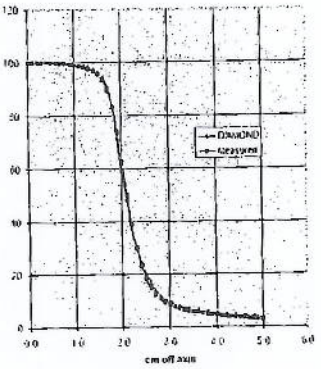
Modified Clarkson Integration

The effective square field size which is equivalent to an irregularly shaped field is accurately determined by a modified Clarkson algorithm.



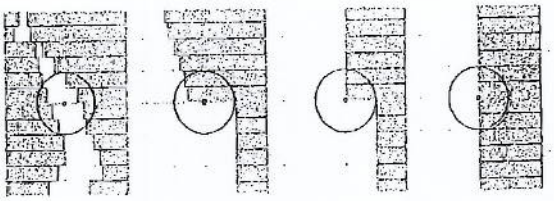
AcuTrack Unique

The AcuTrack algorithm is a unique MLC profile model that allows precise tracking of the measured MLC profile (MLC shape) which is particularly important for small field segments.



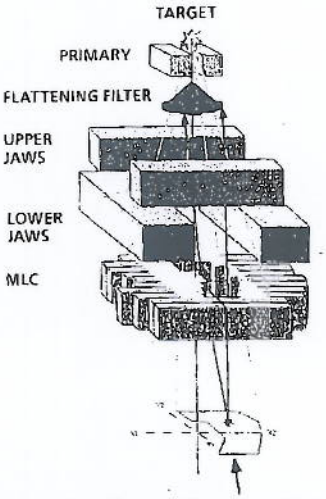
I-Mod-Sync

The I-Mod-Sync (intensity modulation synchronization) algorithm ensures the accurate detection of all beam modulation conditions, orientations, combinations and proximities.



PEV SC Integration

The Points-Eye-View Integration is a proprietary head scatter algorithm that projects back into the collimator/MLC system to the flattening filter plane.



Points-Eye-View of flattening filter

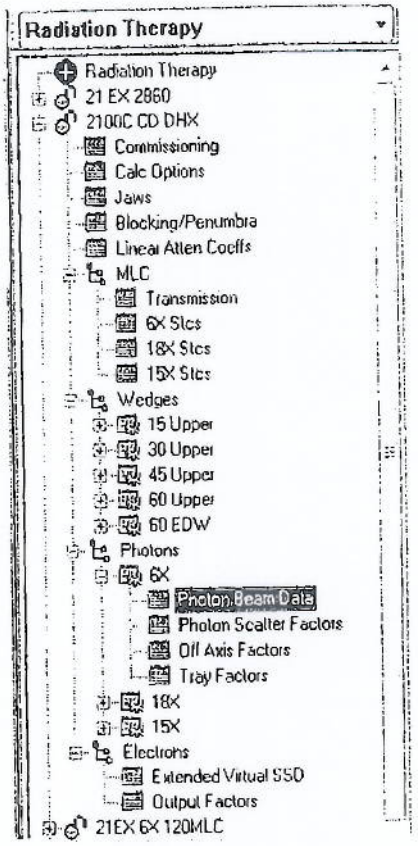
Treatment Machine Data

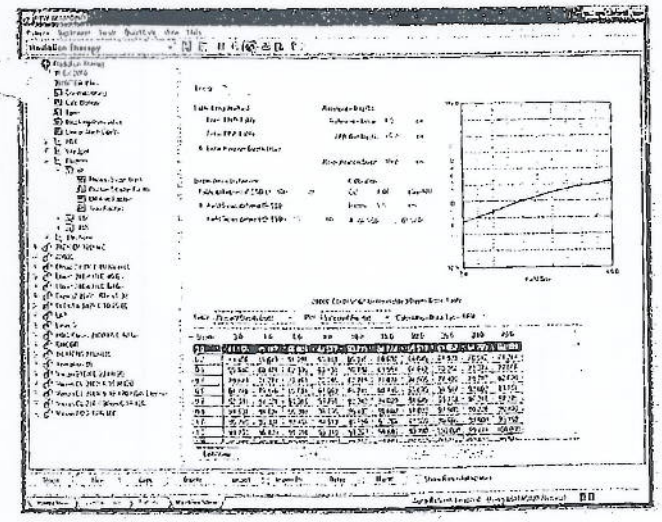
Machine Data Entry

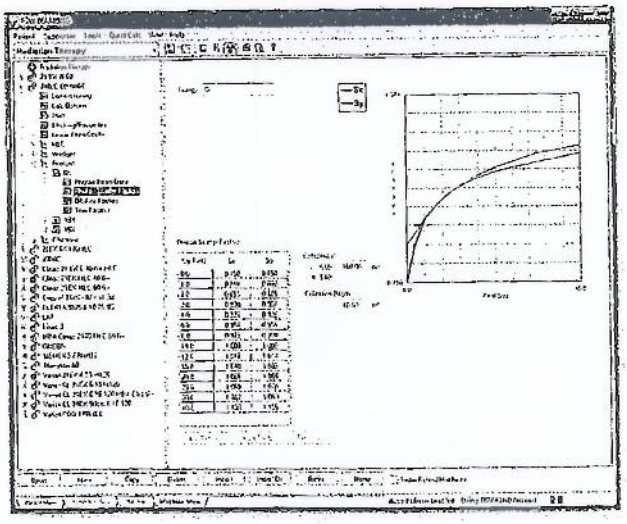
- "Tree view" for quick access to all machine data
- Data entry by PTW or directly by the user
- Copy/paste and import
- PDD to TMR or TPR conversion
- Support of Cobalt-60 machines

Machine Data Management

- Comprehensive data management functions: import, copy, check-in, check-out, commission, retire
- Check-in/check-out to manage files with multiple data supervisors on a network
- Locking of all commissioned machine files
- Archiving of retired files in the machines folder for future reference







System Features

Network Capabilities

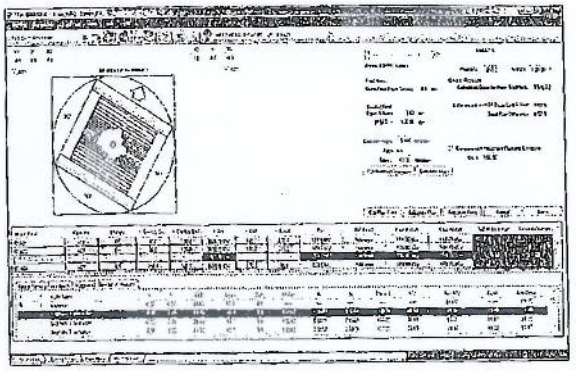
- Synchronized patient files
- Shared machine and patient data stored on server
- User login management
- Machine data file security with password and check-in/check-out

Minimum PC Requirements

Operating system:	Windows XP, Windows Vista, Windows 7
Memory (RAM):	2 GB
Hard disk:	200 MB of free space (excluding patient and machine files)

NOTICE: This program is not intended to be used as the primary means of treatment planning. It is intended to be a quality check device for the independent verification of plans supervised by qualified medical physicists.

DIAMOND®
MU Calculation



MU calculation software

Features

- Efficient plan verification without LINAC
- Compares dose at one or multiple measurement points (field-by-field, composite)
- Provides basic and advanced calculation capabilities (e.g. electron and photon, blocks, MLCs, dynamic wedges)
- Offers enhanced fluence mapping with color wash and contour lines
- Supports multiple treatment techniques (conformal, static and dynamic IMRT, e.g. step and shoot, sliding window, RapidArc®, VMAT)

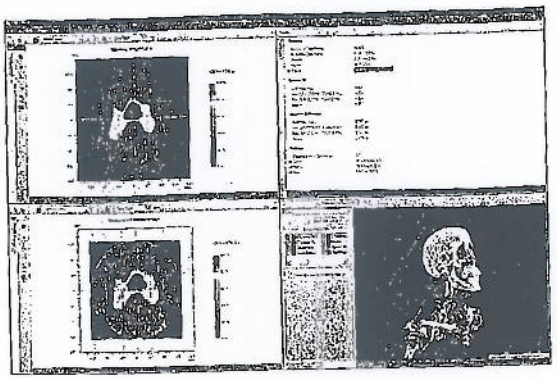
DIAMOND is a clinically proven[1] secondary check software that allows independent point dose or MU verification of both conformal and IMRT treatment plans.
It computes the dose at one or multiple dose points and compares the results with calculations by the treatment planning system (TPS), making routine IMRT plan verification much faster and simpler. As an independent verification tool, it can replace IMRT dose verification measurements with PTW OCTAVIUS systems in clinical routine cases. IMRT fluence and dose maps can be calculated and exported to the TPS or VeriSoft IMRT plan verification software for comparison and detailed analysis.
DIAMOND utilizes a modified Clarkson integration and advanced optimization algorithms to ensure the most accurate calculations for dynamic IMRT delivery techniques.

Ordering Information

S070020 DIAMOND software
S070020.1 Option VMAT for DIAMOND software
S070020.2 Option M.D. Anderson electron calculation for DIAMOND software

[1] Evaluation and Commissioning of K&S Associates Inc. Diamond Monitor Unit Calculation Software; R Kukdchadker et al., The University of Texas MD Anderson Cancer Center, Houston, TX 77030, Poster Presentation, AAPM Annual Meeting 2006

VeriSoft®
Verification Software



IMRT patient plan verification software

Features

- DVH analysis in patient anatomy based on measured data independent from TPS
- 3D volume analysis
- 2D/3D Gamma index analysis
- Profile and dose distribution overlays
- Dose-difference distributions
- Results summary with "traffic light" indicator
- Gamma histograms
- Patient CT overlay

VeriSoft helps the medical physics expert to verify the IMRT treatment plan by comparing data measured in an IMRT verification phantom with data computed for the same phantom by a radiotherapy treatment planning system. Matrices of measured and calculated points of an IMRT beam are read and displayed by VeriSoft. Isodoses, profiles and numerical values can be compared. VeriSoft features several display modes.
The unique 3D volume analysis compares the dose measured inside the entire phantom volume and automatically calculates all slices of the dose volume. Failed points, measured isodoses, contours of the CTV, PTV and organs at risk can be overlaid onto the patient's CT image to support you in your evaluation of the accuracy of dose delivery.
The optional software module DVH 4D calculates dose-volume histograms (DVHs) for each structure in less than a few minutes and compares them with the DVHs calculated by the treatment planning system (TPS). As a truly independent plan evaluation tool, DVH 4D requires no dose data from the TPS, but performs its calculations based entirely on patient CT data and OCTAVIUS 4D measurements, using a unique algorithm.

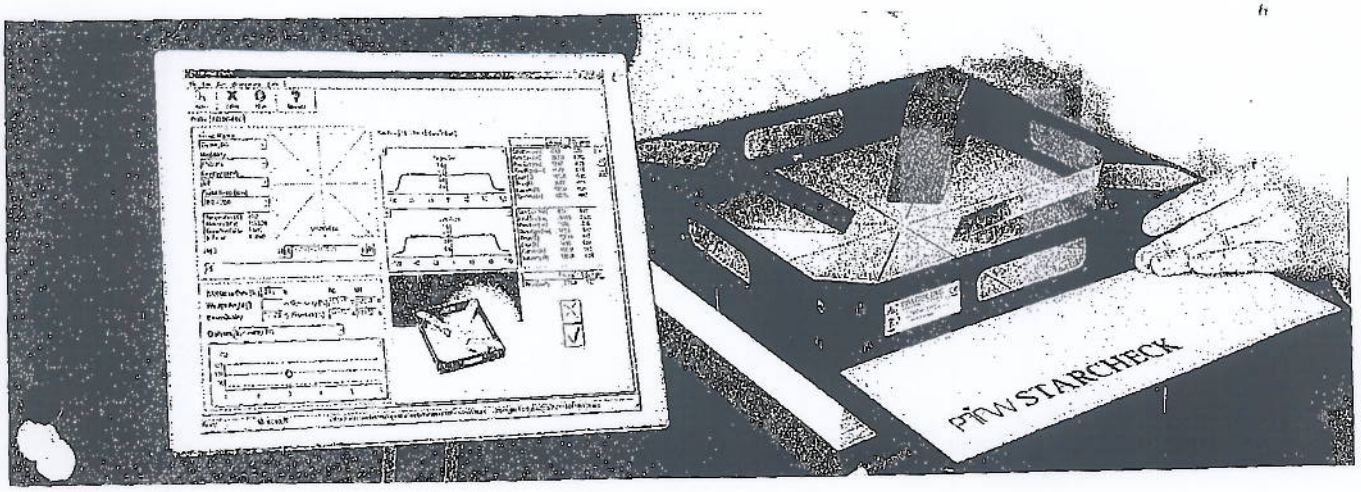
Ordering Information

S070009 VeriSoft Software
S070026 Option DVH 4D for VeriSoft

▸ IMRT Verification Phantoms *page 58ff.*

LINAC QA Solutions

Dosimetry, Mechanical, MLC, Wedge QA



STARCHECK®

High-Resolution Ionization Chamber Arrays for Advanced LINAC QA

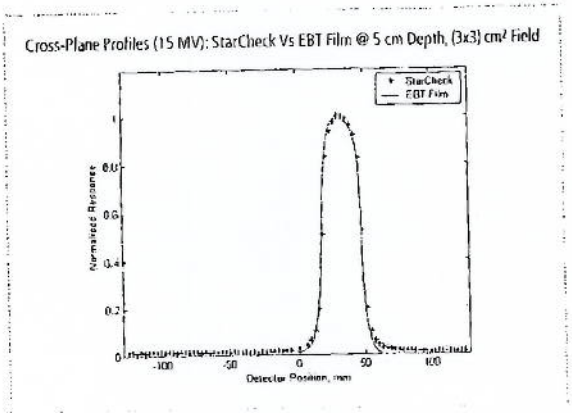
Key Features

- Comprehensive LINAC QA with one single device
- Fast, efficient acquisition of in-plane, cross-plane and diagonal beam profiles, including all profile parameters and absolute dose, in one single shot
- Highest spatial resolution (3 mm) of available arrays
- Robust Gold Standard ionization chambers
- Real-time measurement and display of beam profiles during gantry rotation with OCTAVIUS 4D phantom*
- 40 cm x 40 cm field measurements at clinically relevant 100 cm SSD with STARCHECK *maxi*
- High chamber voltage for precise measurements at reduced focus distance or of FFF beams
- Profile and trend analysis with MultiCheck LINAC QA software

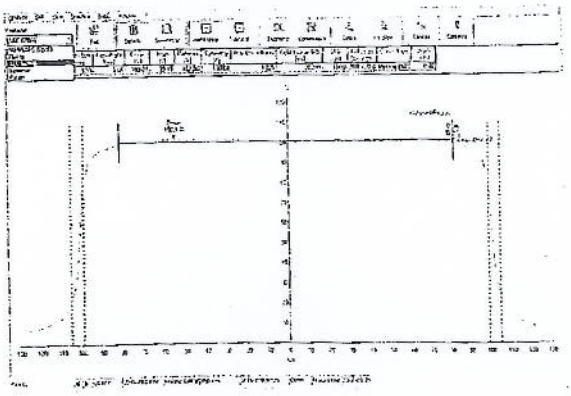
Options

- BQ-CHECK®
- FIELDCHECK
- SC Universal Gantry Mount
- PMMA or RW3 Build-up Plates

** coming end 2013*

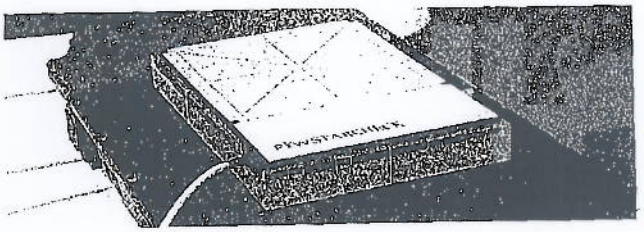


Exceptional resolution for accurate measurements in all field regions, including the penumbra: EBT film and STARCHECK measurements show excellent agreement.



Expert analysis tools: Detailed beam profile analysis based on common dosimetry protocols

Systems



STARCHECK®

527 vented ionization chambers: 108 along each diagonal, 82 on each axis, one at the center, 106 for MLC checks, 40 for field size; field sizes (4 x 4 ... 26 x 26) cm²; dynamic range 0.05 - 80 Gy/min; dimensions 300 mm x 420 mm x 22 mm; weight 5.5 kg

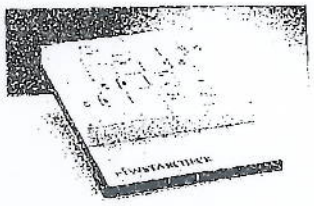
STARCHECK *maxi*®

707 vented ionization chambers: 190 along each diagonal, 140 on G-T axis, 138 on L-R axis, one at the center, 48 for field size; field sizes (4 x 4 ... 40 x 40) cm²; dynamic range 0.05 - 80 (Gy/min); dimensions 465 mm x 740 mm x 30 mm; weight 13 kg

Optional Tools

BQ-CHECK®

Dosimetric QA phantom of 30 cm x 30 cm x 4.5 cm in size, with three wedges at the diagonal corners, used for simultaneous measurement of photon (two opposing aluminium wedges) and electron (one copper wedge) beam energy in combination with a STARCHECK system. Optional accessory plate for STARCHECK *maxi*.



FIELDCHECK

Geometric phantom with four movable sliders for filmless light/radiation field QA. Used to verify the light and radiation field coincidence of a 10 cm x 10 cm and 20 cm x 20 cm field with an accuracy of 0.3 mm using a STARCHECK system. Optional accessory plate for STARCHECK *maxi*.

Designed by T. Perik, The Netherlands Cancer Institute NKI-AVL, Amsterdam.

QA Procedures

Dosimetry QA

1. X-ray output constancy, all energies
2. Electron output constancy
3. Photon beam profile constancy
4. Electron beam profile constancy
5. Electron beam energy constancy*
6. X-ray output constancy vs gantry angle
7. Electron output constancy vs gantry angle
8. Electron and x-ray off-axis factor constancy vs gantry angle
9. Dose rate and symmetry over time (LINAC performance/startup behavior)

Mechanical QA

10. Light/radiation field coincidence*

MLC QA

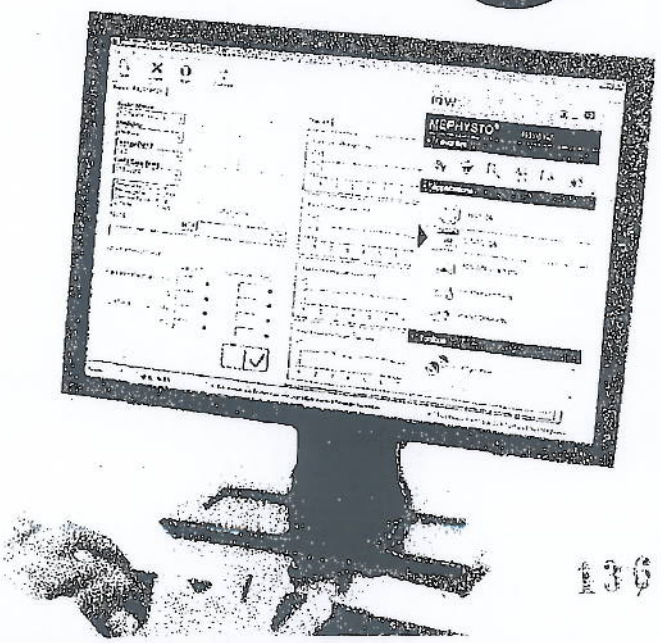
11. Coincidence of light field and radiation field (all energies)*

Wedge QA

12. Check of wedge angle for 60°, full field and spot check for intermediate angle, field size

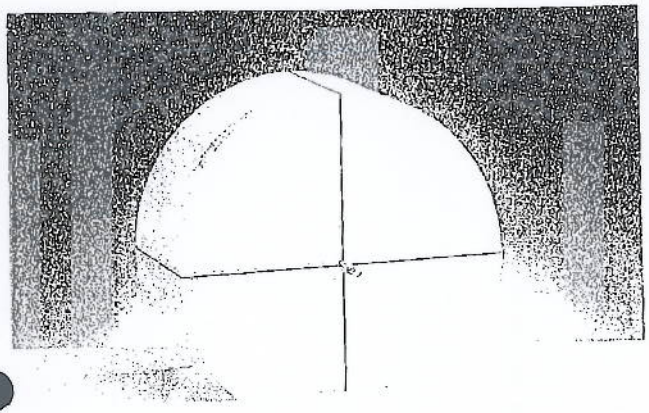
* *optional*

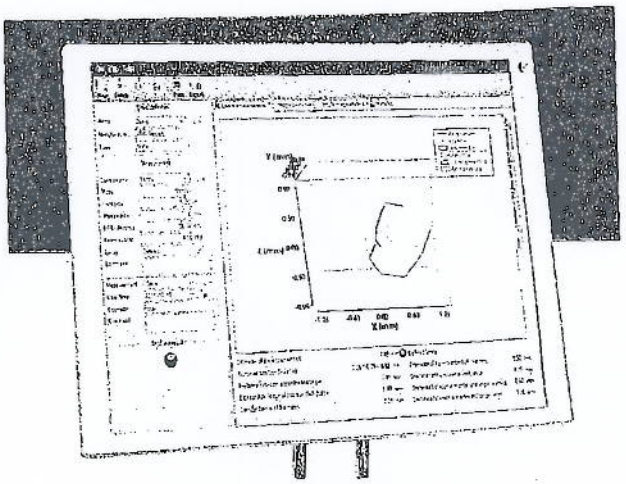
Multiple applications – one interface: MEPHYSTO® Navigator



LINAC QA Solutions

Mechanical, MLC QA





ISOCHECK

Film-Based Isocenter Verification

Solid QA phantom of 20 cm diameter to determine the location of the radiation isocenter of a LINAC using **star shot films**.

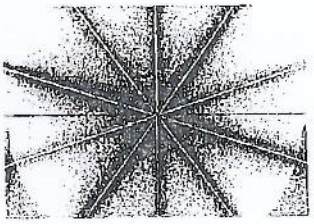
To obtain a star shot image, a film is inserted between the two 50 mm thick plates and exposed at different gantry angles. Size and position of the mechanical isocenter are marked beforehand on the film with the needle marker at the center. IsoCheck software for automated analysis of star shot films optionally available.

Options

- IsoCheck Software

QA Procedures

2 4 9



- **Automated star shot film analysis**

IsoCheck *epid*

EPID-Based Isocenter Verification

EPID-based QA software with 3D visualization and statistics tools for a fast, accurate verification of the mechanical and radiation isocenter coincidence of a LINAC using a **Winston-Lutz test**.

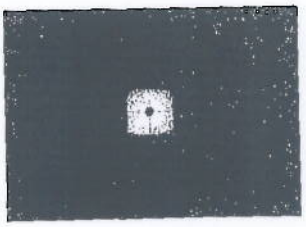
To obtain images for analysis, the optional radiopaque ISOBALL is placed at the mechanical isocenter of the LINAC and irradiated. The EPID images acquired are analyzed based on predefined tolerance levels. Single and multiple image analysis selectable.

Options

- ISOBALL Isocenter Marker

QA Procedures

1 2 3 4 9



- **Single and multiple EPID image analysis**

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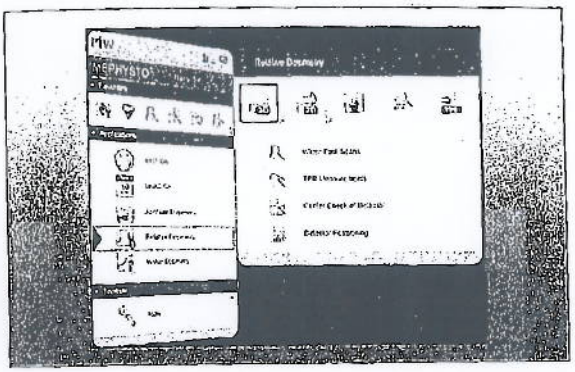
MEPHYSTO® *mc²* Software
TBA Software with MEPHYSTO® Navigator



Software for therapy beam data acquisition and data analysis in radiation therapy

Features

- MEPHYSTO Navigator for all dosimetry tasks in radiotherapy
- Fast beam data acquisition with integrated graphical TaskList
- Fast and accurate commissioning with batch conversion for all established RTPS
- Supports online data analysis with linear array

The MEPHYSTO *mc²* TBA software with the MEPHYSTO Navigator is the most advanced, comprehensive and self explaining user interface for TBA control and data evaluation. Solutions of all important dosimetry tasks in radiotherapy are implemented in modules with optimized workflows. The Control Center is customizable and allows the adaptation to the available equipment. Additional software or documents can be integrated.
By means of intuitive graphics with two tabs for accelerator and measurement parameters, the user can quickly and easily start a measurement. Predefined measurement programs for PDDs, profiles, matrices for isodoses, and points are available. Axis definition for each defined radiation device with name and direction is possible.
Beam data collection for LINAC commissioning and RTPS beam data collection can be done very fast and structured due to an implemented TaskList with multiple energies, applicators, wedges, blocks, field sizes, SSDs, depths and even multiple queues.
An optimized batch conversion module for each established RTPS is available.
All established international protocols including the LINAC vendor specifications are available. User specific protocols can be generated. Curve comparison with percentage difference or 1D gamma analysis is possible.
Besides many other operations, ion depth curves can be converted into water absorbed energy dose curves according to all established international protocols. Matrix operations allow adding treatment fields. A table generator for OCR table creation and PDD conversion into TPR curves is available. Predefined RTPS TaskLists for beam data collection are available.
Data can be imported and exported with copy and paste function. A plot generator allows scaled and customizable printouts, html print preview is also available. Data can be stored anywhere in the network, with filenames in windows convention. New programming technique allows drag and drop functionality and customizable screens and colors.
Isodoses and rotational 3D Display in color wash or lines. Dual cross hairs, zoom and various normalization functions are available. A deconvolution algorithm allows the correction of volume effect of ionization chambers.

Additional functions:

- Linear Array
  A module to adjust the beam with online analysis is included. Static fields as well as dynamic (IMRT) fields and wedges can be measured and analyzed.
- TPR
  Allows easy and precise TPR measurements with an optimized module with stepping mode and fast continuous mode.
- MLCSoft
  Includes MLCSoft software for calibration and QA to verify the radiological MLC positions for 48 leaves in one run.
- Absolute Dosimetry
  TanSoft for absolute dose measurement with TANDEM electrometer in accordance with IEC 60731 and UniSoft Edition 2000 is included.
- Film Analysis
  Full functionality of FilmSoft for film dosimetry with a GAFCHROMIC optimization for RGB scanners is included.
- Planning Module (plamo)
  Format and transfer RTPS data according to their specification.

Ordering Information

S080045 MEPHYSTO *mc²* basic software
S080045.001 Option LA48
S080045.002 Option MLCSoft
S080045.003 Option TPR
S080045.004 Option Film Analysis
S080045.005 Option Absolute Dosimetry
S080045.006 Option Planning Module (plamo)
The type of RTPS has to be specified
L981154 TBA hardware and software upgrade, connecting system M
L981155 TBA hardware and software upgrade, connecting system BNT
L981156 TBA hardware and software upgrade, connecting system TNC

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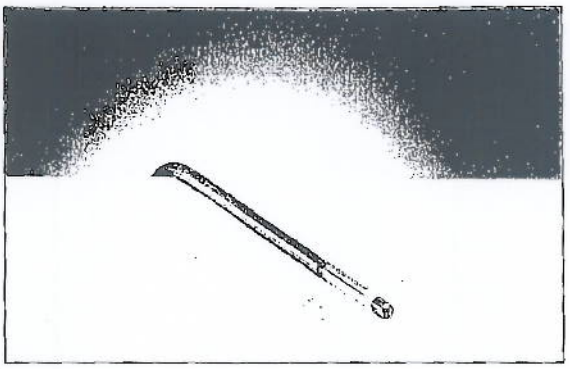


0.125 cm³ Semiflex Chamber

Type 31010

Standard therapy chamber for scanning systems and for absolute dosimetry

Features

- Waterproof, semiflexible design for easy mounting in scanning water phantoms
- Minimized directional response
- Sensitive volume 0.125 cm³, vented to air
- Radioactive check device (option)

The 31010 semiflexible chamber is the ideal compromise between small size for reasonable spatial resolution and large sensitive volume for precise dose measurements. This makes the 31010 chamber to one of the most commonly used chambers in scanning water phantom systems. The chamber volume of 0.125 cm³ gives enough signal to use the chamber also for high precision absolute dose measurements. The sensitive volume is approximately spherical resulting in a flat angular response and a uniform spatial resolution along all three axes of a water phantom.

Specification

Type of product	vented cylindrical ionization chamber
Application	absolute dosimetry in radiotherapy beams
Measuring quantities	absorbed dose to water, air kerma, exposure
Reference radiation quality	^{60}Co
Nominal sensitive volume	0.125 cm³
Design	waterproof, vented, fully guarded
Reference point	on chamber axis, 4.5 mm from chamber tip
Direction of incidence	radial
Nominal response	3.3 nC/Gy
Long-term stability	≤ 1 % per year
Chamber voltage	400 V nominal ± 500 V maximal
Polarity effect at ^{60}Co	< 1 %
Photon energy response	≤ ± 2 % (140 kV ... 280 kV) ≤ ± 4 % (140 kV ... ^{60}Co)
Directional response in water	≤ ± 0.5 % for rotation around the chamber axis and for tilting of the axis up to ± 10°
Leakage current	≤ ± 4 fA
Cable leakage	≤ 1 pC/(Gy·cm)

Materials and measures:

Wall of sensitive volume	0.55 mm PMMA, 1.19 g/cm³ 0.15 mm graphite, 0.82 g/cm³
Total wall area density	78 mg/cm²
Dimension of sensitive volume	radius 2.75 mm length 6.5 mm
Central electrode	Al 99.98, diameter 1.1 mm
Build-up cap	PMMA, thickness 3 mm

Ion collection efficiency at nominal voltage:

Ion collection time	100 µs
Max. dose rate for ≥ 99.5 % saturation ≥ 99.0 % saturation	 6 Gy/s 12 Gy/s
Max. dose per pulse for ≥ 99.5 % saturation ≥ 99.0 % saturation	 0.5 mGy 1.0 mGy

Useful ranges:

Chamber voltage	± (100 ... 400) V
Radiation quality	140 kV ... 50 MV photons (10 ... 45) MeV electrons (50 ... 270) MeV protons
Field size	(3 x 3) cm² ... (40 x 40) cm²
Temperature	(10 ... 40) °C (50 .. 104) °F
Humidity	(10 ... 80) %, max 20 g/m³
Air pressure	(700 - 1060) hPa

Ordering Information

TN31010 Semiflex chamber 0.125 cm³, connecting system BNT

TW31010 Semiflex chamber 0.125 cm³, connecting system TNC

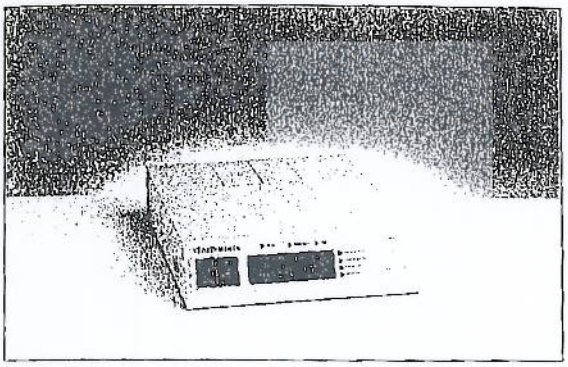
TM31010 Semiflex chamber 0.125 cm³, connecting system M

Options

T48012 Radioactive check device ^{90}Sr

T48002.1.004 Chamber holding device for check device

LINACHECK® Monitor Test Device



Dosimetric test device for automatic constancy tests of the LINAC dose monitor calibration

Features

- Checks the monitor calibration in a simple and reliable manner
- Measures dose, dose rate and irradiation time simultaneously
- Does not need air density correction due to the built-in sealed ionization chamber
- Stores up to 99 measurements
- Communicates with a computer using the optional LinaSoft software

LINACHECK is suitable to verify very quickly and easily the most important parameter of a linear accelerator, the monitor calibration. For measurements, the lightweight device is put on the table-top in a 10 cm x 10 cm field. As the radiation detector is a built-in sealed plane-parallel ionization chamber, no air density correction is required. The LINACHECK features auto-start, auto-stop and auto-zeroing. The bright and large display serves for easy reading from a distance.
As up to 99 measurements can be stored, all LINACs may be checked one after the other, using different photon and electron energies. When the measurements are finished, data can be evaluated. The easy-to-use LinaSoft software helps to download the logged data via the RS232 interface to an MS Excel sheet for storage and evaluation. The user can recalibrate the chamber.

LINACHECK is operated by rechargeable batteries.

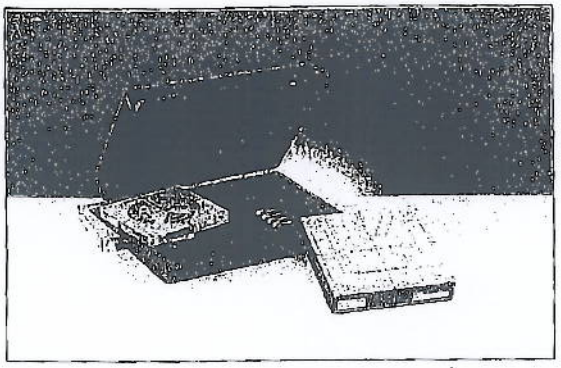
Ordering Information

T42010 LINACHECK Test device
L991042 Plug-in power supply, (100 ... 240) V

Option

S070001 LinaSoft Software

IGRT QC Set



Test objects for image quality control of MV and kV imagers at IGRT radiation treatment devices

Features

- Optimized phantoms for MV and kV beam imagers
- Measurement of all parameters with a single beam in one image

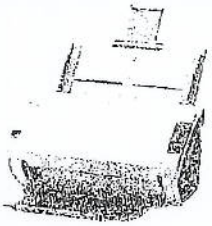
In Image Guided Radio Therapy (IGRT), most radiation treatment devices are using a kV beam to detect and correct the patient's position in the MV beam. For both beam types typically a flat panel imager is used for the image read out. To ensure a high imager quality the IGRT set contains optimized test phantoms for kV and MV imagers for consistency checks.
The EPID QC PHANTOM checks linearity, isotropy, noise, low and high contrast resolution. All test elements are focused to 100 cm focus distance, for use in 4-25 MV photon beams. A dedicated software epidSoft allows an automatic evaluation of image files acquired with the EPID QC PHANTOM. A statistic function allows following up the QC history over the whole lifetime of the imager.
The NORMI RAD/FLU test object is designed for constancy tests of X-ray installations for fluoroscopy in diagnostic radiology. The test object includes a structure plate with a copper step wedge for testing the dynamic range, a resolution test pattern, low contrast and detail test elements. The NORMI RAD/FLU structure plate allows to check all parameters in one shot. For patient simulation, a 1 mm copper plate and a 30 mm PMMA is included in the set.

Ordering Information

L981097 IGRT QC set
L981425 IGRT QC set with dose measurement

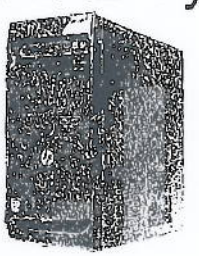
- epidSoft *page 67*
- EPID QC PHANTOM *page 67*
- NORMI RAD/FLU *page 98*

SCAN Skener A3



Zařízení pro skenováni filmů A3 600-1200dpi

EVAL Vyhodnocovací PC



Pracovní stanice - Intel Core i7 4790 Haswell, Intel H87 Express, RAM 16GB, NVIDIA GeForce GT 630 2GB, SSD paměť 500 GB, DVD, DVI, USB 3.0, klávesnice a myš, Windows 8.1 Pro 64-bit - předinstalované Windows 7 Professional 64-bit (J8T40ES) doplněná o karty komunikující s Vodním fantomem, RS232

Severozápad
EVROPSKÁ UNIE
Regionální operační program regionu soudržnosti Severozápad
Podporováno z Evropského fondu pro regionální rozvoj
„Vize přestane být snem"
www.nuts2severozapad.cz www.europa.eu

Příloha č. 3 kupní smlouvy č. 15-2001

Předávací protokol zdravotnického prostředku

Dodavatel TRANSKONTAKT-MEDICAL s.r.o. IČ 45797803 DIČ CZ45797803 Adresa Na Zatlance 5, 150 00 Praha 5 tel: 25156 4228 email: miroslav.krist@medicaltk.com	**Odběratel: Krajská zdravotní, a.s.** IČ: 254 88 627 Adresa: Sociální péče 3316/12A, 401 13, Ústí nad Labem
Smlouva/objednávka č.:15-2001 **Faktura č.:** **Dodací list č.:** **Datum vystavení předávacího protokolu:**	**Místo určení (OZ): Nemocnice Chomutov** **Adresa (vč. uvedení pavilonu/budovy)** **Kochova 1185, 430 12 Chomutov** - **Budova E, Komplexní onkologické centrum - Oddělení onkologie**

Dodavatel potvrzuje, že zboží, tak jak je uvedeno níže, bylo dodáno a nainstalováno v souladu s Kupní smlouvou/objednávkou č. 15-2001

Dodané zboží dle kupní smlouvy/objednávky	Označení zboží v kupní smlouvě/objednávce a na faktuře	Typ přístroje, výrobce

Dodané příslušenství:

Příslušenství - obecný název	Příslušenství - typ	Výrobní číslo	Výrobce	Počet

Klasifikační třída ZP (třída rizika):

Záruční servis zdravotnického prostředku dle zákona č. 123/2000 Sb. v platném znění je garantován po dobu 36 měsíců

Pozáruční servis zdravotnického prostředku dle zákona č. 123/2000 Sb. v platném znění je garantován po dobu 84 měsíců, firmou TRANSKONTAKT-MEDICAL s.r.o. jako vedoucím účastníkem sdružení „Lineární urychlovač Chomutov"

Zaškolení personálu se zacházením se zdravotnickými prostředky proběhlo dle zákona č. 123/2000 Sb. v platném znění dne: .....

Severozápad
EVROPSKÁ UNIE
Regionální operační program regionu soudržnosti Severozápad
Podporováno z Evropského fondu pro regionální rozvoj
„Vize přestane být snem"
www.nuts2severozapad.cz www.europa.eu

Předaná dokumentace:

Protokol o proškolení/instruktáži	ANO	NE
Návod k obsluze	ANO	NE
Návod k obsluze v el. podobě (CD/DVD)	ANO	NE
Prohlášení o shodě (CE certifikát)	ANO	NE
Servisní dokumentace	ANO	NE

Zboží předal:

datum:

podpis:

Zboží převzal:

datum:

podpis: