iba-dosimetry.com

# INTEGRATED BEAM SCANNING & ANNUAL QA

## IBA Dosimetry

full range of integrated and independent solutions for Quality Assurance (QA), calibration procedures, and services that maximize efficiency and patient safety in Radiation Therapy and Medical Imaging

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# INTEGRATED BEAM SCANNING & ANNUAL QA

# Beam Data Quality ®
# Fundamental for Patient Safety

1 Highest quality beam scanning results in the perfect beam dataset.

2 Detailed automated check of each scan ensures the perfect beam data set. Only with SMARTSCAN!

3 Correct TPS commissioning - the key for accurate planning and dose calculation.

4 Correct plan delivery and treatment safety. Your peace of mindfor all your patients!

**High-quality beam data and correct commissioning of your Linac and TPS are the basis for correct RT planning, treatment delivery for patient safety. However, beam commissioning remains a major challenge in most clinics:**

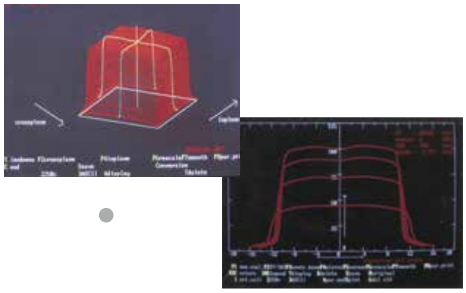
Common Pain Points with Beam Commissioning → Your Solution: Efficient and High-Quality Beam Commissioning

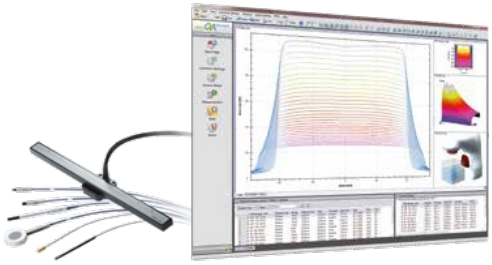
# IBA Dosimetry [2] 45 Years of ® Water Phantom Innovations

It all started with the world's 1st computerized water phantom by Manfred Wellhöfer

Introduction of the Blue Phantom family

1st scanning software integrated on a QA platform





myQA® Accept

GO

Wellhöfer WP600

Wellhöfer WP700

Wellhöfer Scanditronix RFA-300

Blue Phantom[1]

Blue Phantom[2]

Blue Phantom Compact

Blue Phantom Helix

myQA HALO for Varian Halcyon® / Ethos® *

1st and only Complete Solution for Automated & Guided Beam Commissioning

## SMARTSCAN™

**Automated & Guided Beam Commissioning**

# SMARTSCANö


SMARTSCANö transforms commissioning into a highly efficient, trouble-free user experience.

## Automated and Guided Beam Commissioning & Annual QA

**SMARTSCANö is the most precise and efficient solution to run your beam commissioning. SMARTSCANö is designed to give you the best possible beam data each time!**

## myQA® SMARTSCAN™ Software

Optimized workflow efficiency through smart grouping of scans and Linac settings.

Automatic scanning with instant check of each scan for flatness, beam symmetry, leakage and signal noise. Immediate warnings in case of suspicious scans.

### Guided Beam Scanning

- Avoid errors with screen-by-screen guidance throughout the scanning workflow, from preparation to execution
- Minimized user interaction through grouped tasks and optimization of the Linac settings
- Software prompts during the workflow whenever a detector change or other setup tasks are required

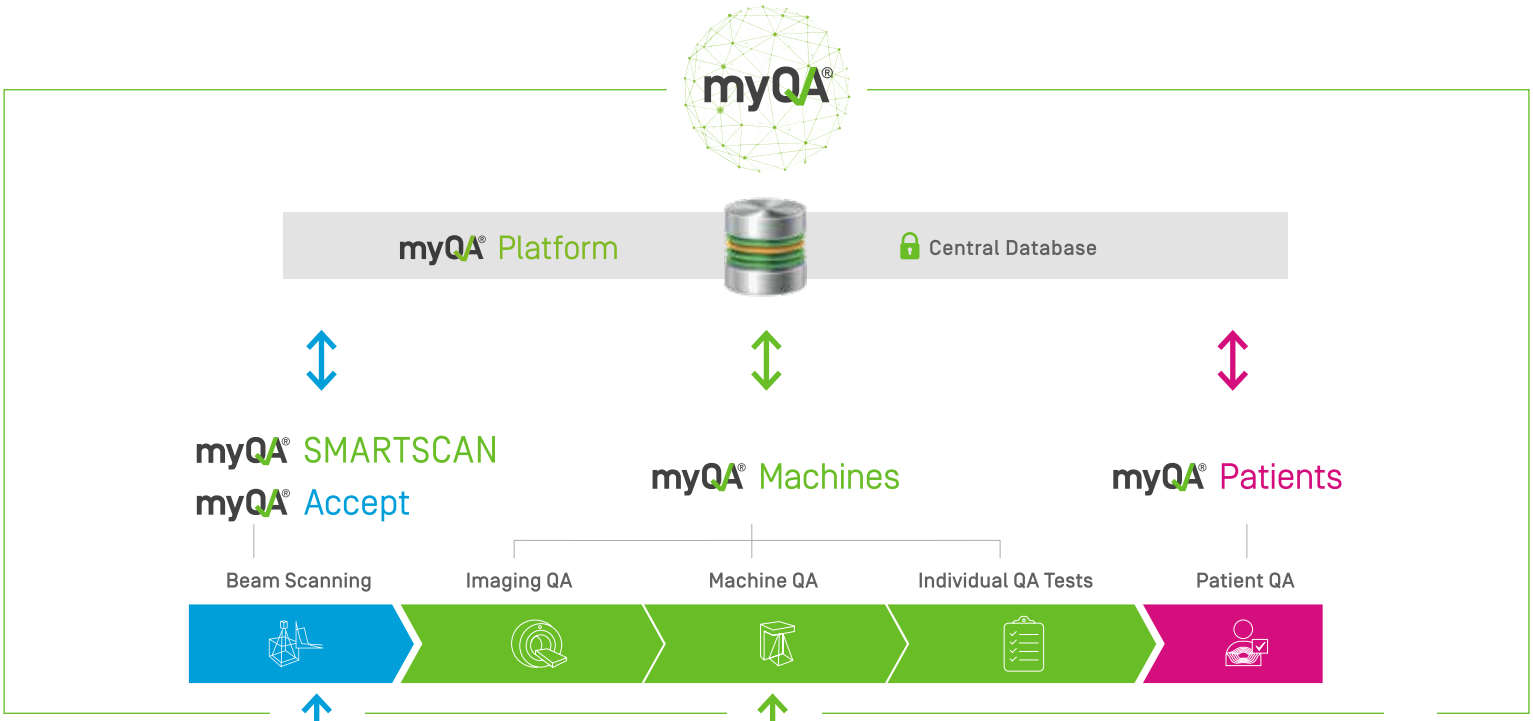
### Automated Beam Scanning

- Beam triggered automated scanning of the beam queues
- Instant automatic check of every measured scan. Immediate user alert in case of three consecutive poor scans
- Eliminates poor or wasted scans in your beam data
- Repeated automatic checks of background noise
- Automatic electrometer normalizations for every field

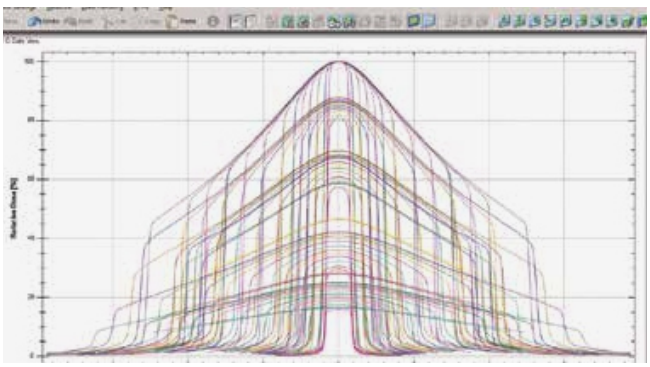
### New myQA SMARTSCAN™ release 2020 now supports

- FFF beams in baseline measurements
- Electrons
- Varian# Halcyonö / Ethosö incl. templates and queues
- CAX FFF for BluePhantom$^{COMPACT}$ and for myQA HALO

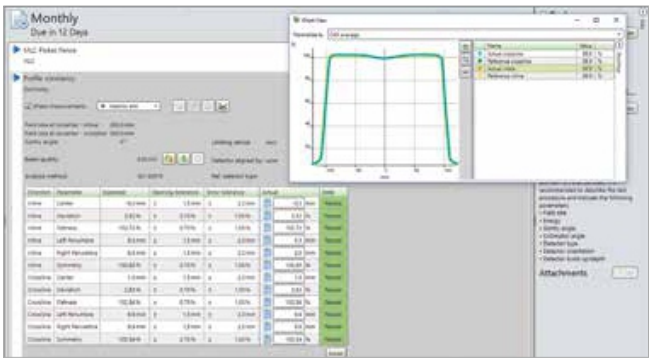
# Integrated Software



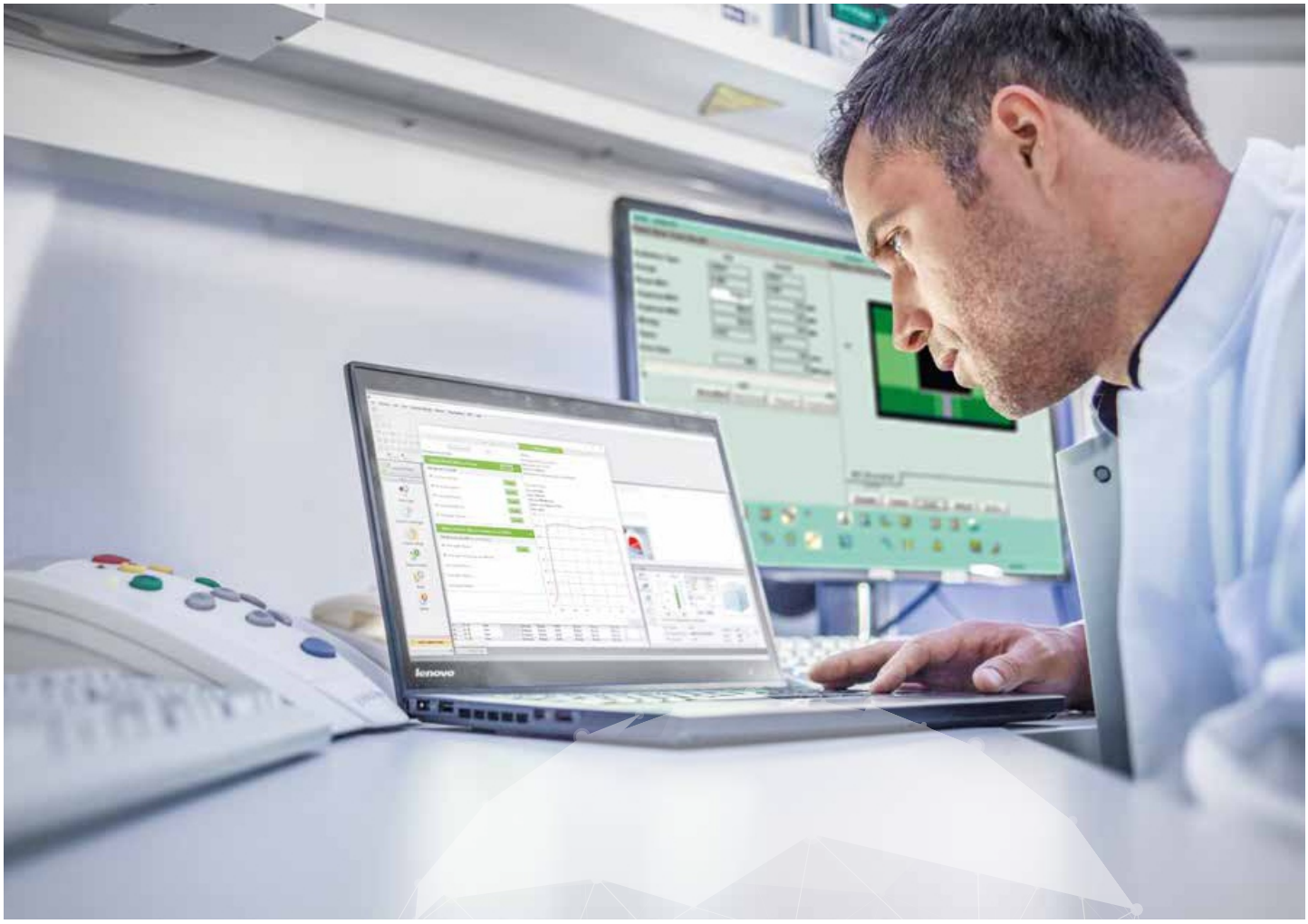




Scanning profiles from your commissioning.




Measured profiles, e.g. from your monthly QA.



# Integrated software for your comprehensive and efficient beam scanning, commissioning and annual QA.

**myQA Accept is the most trusted scanning and beam data analysis software for the commissioning of your TPS and Linac, as well as for annual QA.**

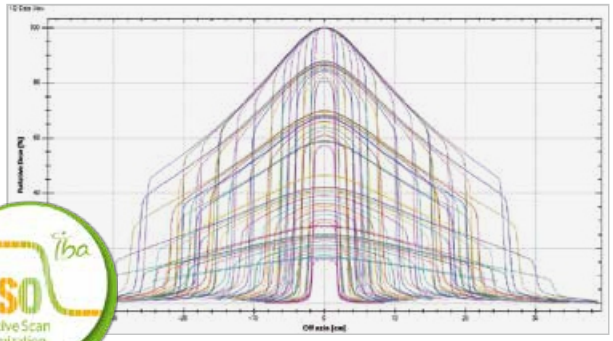
- Easy workflow interface for all IBA Dosimetry water phantoms
- Comprehensive scanning and commissioning software
- Beam Scanning automation with myQA SMARTSCANö
- Build your commissioning reference database to compare with new installations and to pair Linacs

## 1 Automated Queue Generation

- Fast & automatic data acquisition with predefined queues for all major TPS vendors
- Save time with smart sorting algorithm for optimized scan sequences
- Maximize scanning efficiency with advanced queue sorting, prioritizing and multiple queue editing
- Intuitive setup of user-specific queues
- Automated data export for TPS beam modeling

## 2 Data Acquisition

- Adjustable scanning parameters for optimized measurements
- 1D, 2D and 3D graphical and geometrical visualization of detector position during scanning
- Automatic scanning speed adaptation: Fastest scanning with optimal resolution through scanning speed adaptation

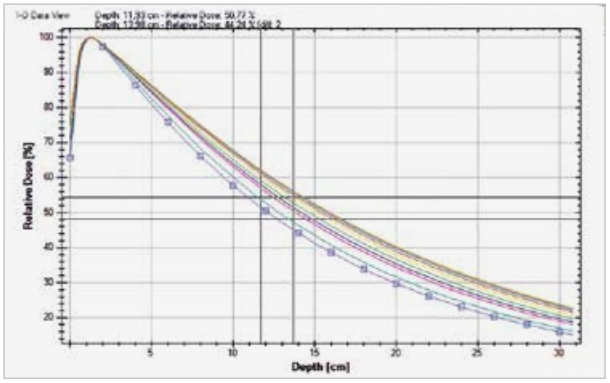


**Adaptive Scan Optimization (ASO)**

- Adapted scanning speed for the different profile segments
- Optimized for accuracy in the penumbra area
- Fast continuous scanning where fewer data points are sufficient

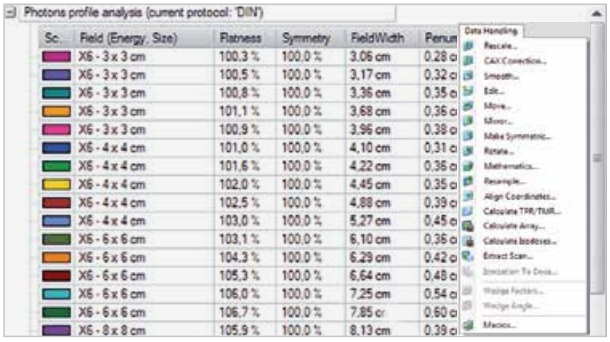
## 3 Data Analysis

- Accurate data analysis via standard and customizable protocols
- 1D gamma analysis tolerances
- Overlaying profiles for quantitative comparison
- Library of mathematical smoothing and interpolation functions
- Fast creation and export of data tables (PDD, TMR, OAR, etc.)




## 4 Data Handling

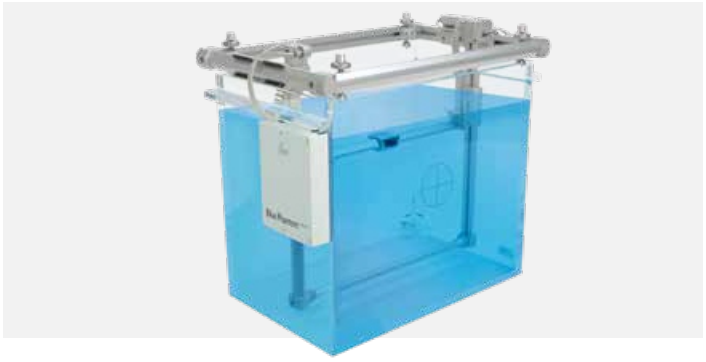
- Easy data handling with advanced filtering and sorting
- Fast creation and data export to all major TPS
- Copy & paste to other applications, e.g. MS Excel
- Exchange data with other IBA Dosimetry applications
- Convenient reporting



# The Blue Phantom Family
# Designed for Accuracy & Efficiency

## Blue Phantom² The 3D Water Phantom

- The most trusted 3D water phantom solution for comprehensive beam scanning and RTPS/Linac commissioning and annual QA
- The high-end water phantom has a modular design and can be configured and upgraded to fit any need and budget
- Upgradable with SMARTSCANö software for scanning automation and guidance
- Compatible with all standard Linacs, Halcyonö, and CyberKnife ®#



## Blue Phantom COMPACT ² The 2D Water Phantom

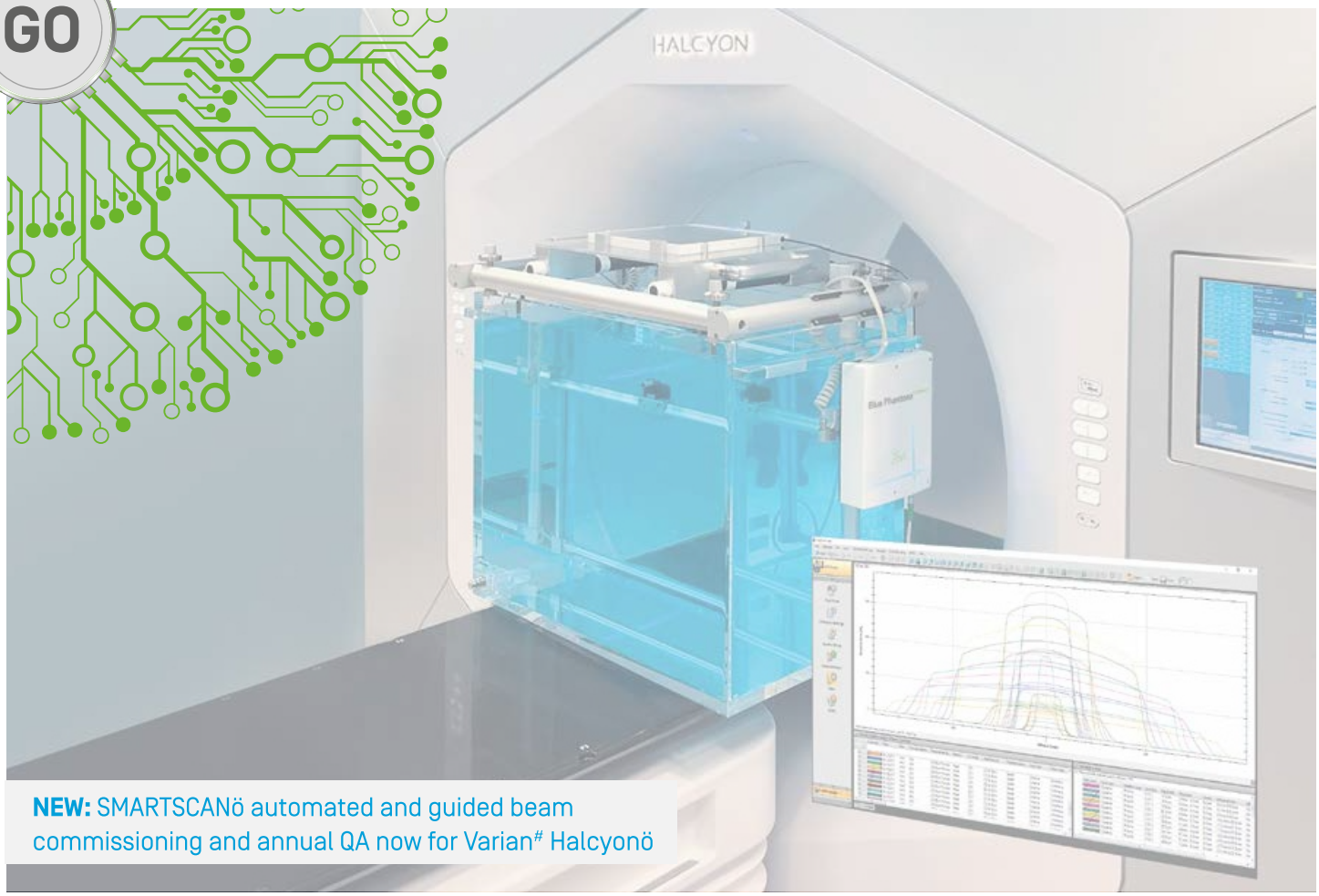
- 2D high-end water phantom, half the size of Blue Phantom² and minimized weight
- Promotes easy transportation with more efficient use, e. g. for annual checks
- Ideal for satellite hospitals and commissioning service providers
- Optimized for Varian® Halcyonö / Ethosö commissioning validation and annual QA (details next page)#

## Blue Phantom Helix ² For TomoTherapy ®

- 3D scanning solution for the TomoTherapy® / Radixact® System#
- Find more information on next page

# Dedicated Beam Scanning Solutions

GO




**NEW:** SMARTSCANö automated and guided beam commissioning and annual QA now for Varian# Halcyonö

## myQA HALO™ for Varian# Halcyonö / Ethosö

INDEPENDENT VALIDATION

myQA HALOö is the dedicated, proven package solution for independent commissioning & validation and beam data collection of the Varian Halcyonö as well as for monthly and annual scans. The package consists of cutting-edge beam scanning components that are released, clinically implemented, and trusted by over 4,000 satisfied users worldwide!

- Integrated Quality Assurance for your Halcyonö with the #1 Beam Scanning software: **myQA Accept**
- **myQA SMARTSCAN** now supports automated and guided beam validation for Varian# Halcyonö / Ethosö. Faster workflow through templates and optimized queues.
- **Blue Phantom Compact** tank designed for fast collection of all needed scans, low weight for minimal Halcyonö couch sag
- Unique **Stealth** reference chamber including special holder compensates for the absence of light field
- 1-minute validated leveling solution

**IBA Dosimetry QA solutions were used by the University of Pennsylvania medical physics team to validate the new Halcyonö linear accelerator for release and clinical use:**

> *We had a very good experience using our Blue Phantom solution to validate our Halcyon™ Linac. The setup was very straightforward, and the flexibility of the myQA Accept software was essential ... The bulk of our validation work was done in 3 days.*

**Chris Kennedy PhD, DABR**
Medical Physicist, University of Pennsylvania, USA


# Blue Phantom Helix for TomoTherapy® / Radixact® #

Blue Phantom Helix is dedicated for full 3D scanning of the TomoTherapy/Radixact System. Based on the proven Blue Phantom², this water phantom enables fast and accurate commissioning and QA work optimized for TomoTherapy.

- Optimized 3D water phantom for faster scanning
- Efficient measurements & analysis with myQA Accept
- Certified 0.1mm high positioning accuracy and outstanding reliability
- Long-term mechanical stability

# IBA Dosimetry Water Phantom Innovations

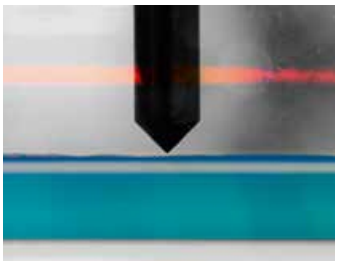

**Designed by experts for high-performance and long-lasting beam scanning reliability and accuracy.**

## 1-Minute Leveling, Visually Verified.

Intuitive and precise 4-point interactive micro leveling.

- Faster and more accurate than automated setup
- Visual check provides confidence in setup accuracy
- Avoids time needed for redundancy checks required by automated setup procedures
- Enables permanent visual check of the leveling and water surface level to detect water evaporation during longer commissioning times

1



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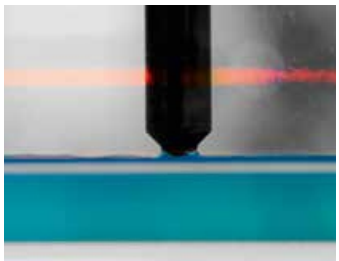


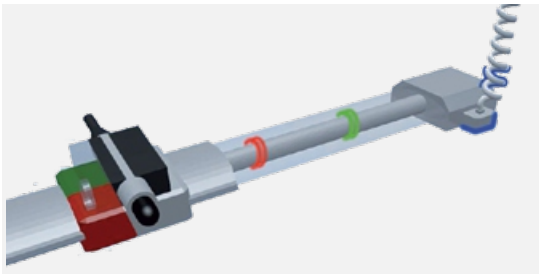
For leveling, simply adjust the four alignment pins towards the water surface 1 until the water surface adhesion touches the tips 2 .

## Certified 0.1 mm Accuracy

- Uncompromised accuracy for your RTPS and Linac commissioning
- Only IBA Dosimetry water phantoms are calibrated and certified to guarantee the highest accuracy and reproducibility of ± 0.1 mm
- Have full confidence in your beam data

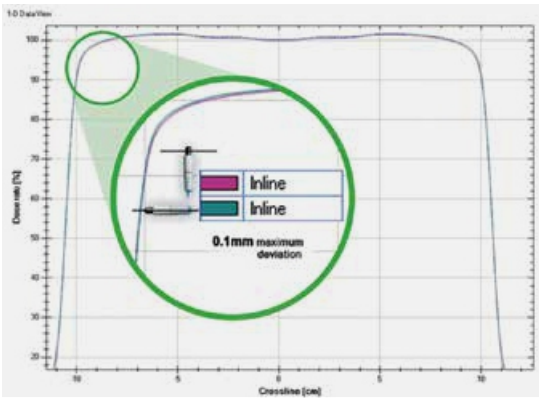
## Continuous, Long-Lasting Accuracy

- The unique magnetostrictive sensor technology provides continuous readouts of the water phantom±s absolute position in all three axes (even when not moving)
- Certified detector repositioning accuracy of ± 0.1 mm
- The contactless sensor technology minimizes mechanical wear and ensures long-lasting accuracy



## Consistent Accuracy in X and Y Axes

- Small ionization chambers like the IBA Dosimetry CC-04 ensure scanning accuracy independent of the scanning direction, regardless of detector movement and orientation (according to TG-106 report)

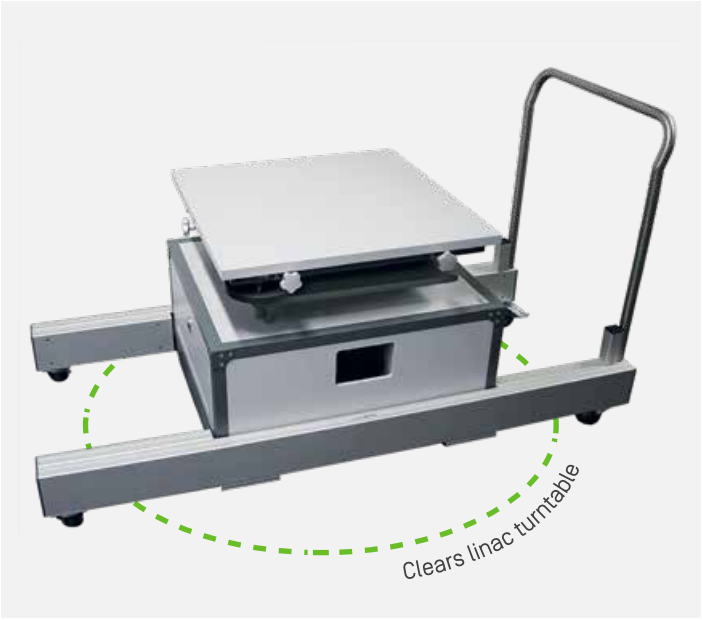



# High-End Clinical Training Courses at IBA Dosimetry

**Become an expert in commissioning and beam scanning and learn how to commission with the highest efficiency and data quality!**

- Best-practice courses conducted by real dosimetry experts
- Clinical hands-on with SMARTSCAN, myQA Accept and Blue Phantom²
- Special trainings for small fields, FFF, transmision reference chamber, data processing and more

# Accessories for Blue Phantoms




## Lift Table – Compact Design

- Lift Table with extended legs can be set up without putting weight on the Linac couch ring
- Water Phantom carriage with manual or electric (telescopic) lifting
- Convenient and fast positioning of the water phantom
- Includes leveling frame for vertical and horizontal micro adjustment (electrical version)

## Water Reservoir

- Separate tank trolley on wheels with a polyethylene water reservoir
- Small footprint allows convenient storage and easy maneuvering in narrow mazes
- High performance pump for uni-directional or bi-directional water transport to and from the water phantom
- Electronic pump control for TMR/TPR measurement (option)

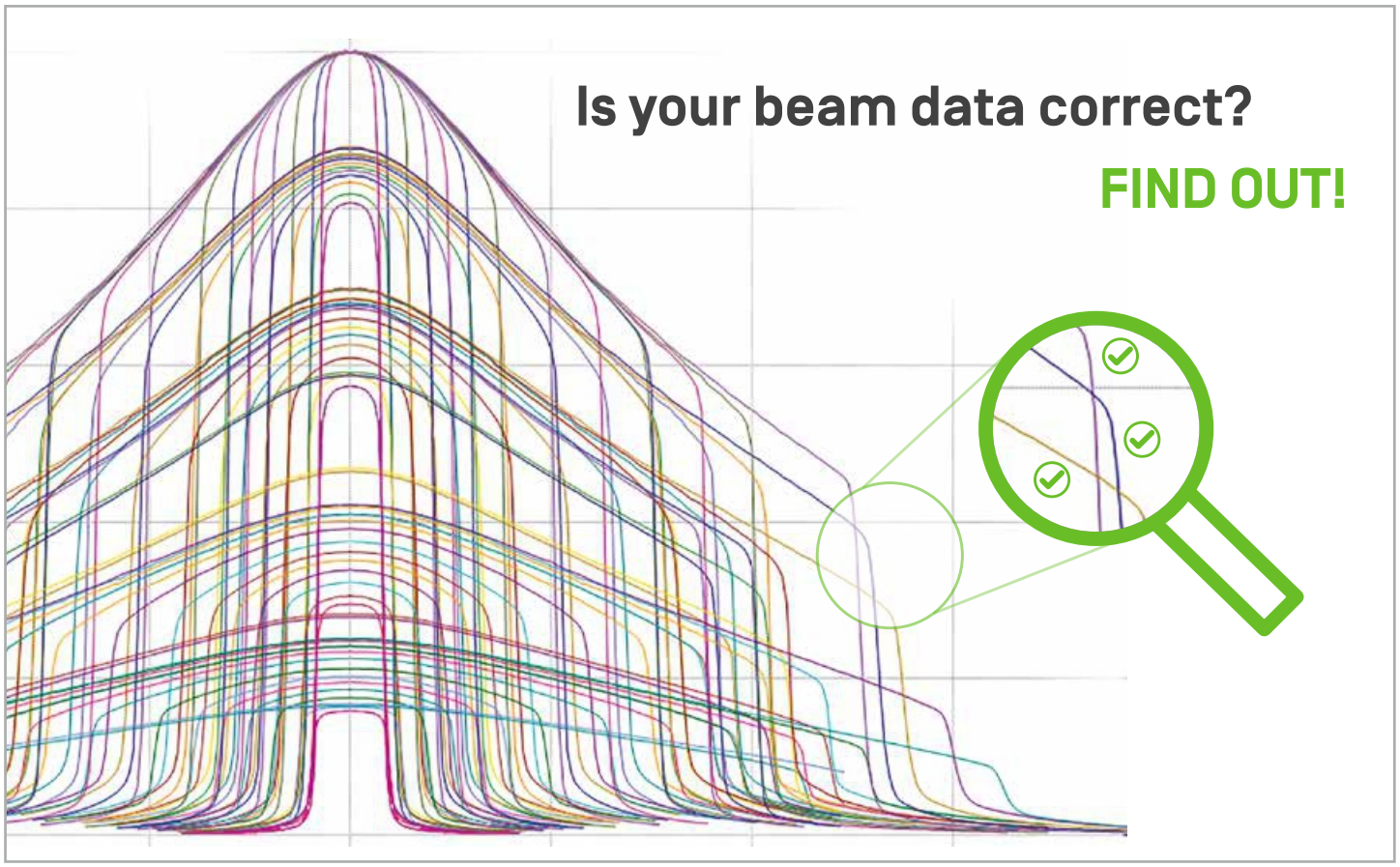
## TMR Set

- For continuous TMR depth dose curve measurement with real-time display of dose vs. water level
- Online measurement of tissue maximum ratio (TMR) with fixed source detector distance
- High-accuracy contactless sensor technology to accurately measure changing water level

## Temperature Sensor

- Water temperature measurement in combination with pressure measurement (built-in the CCU)
- ± 0.3 °C measurement accuracy

# Beam Data Verification Audit Service

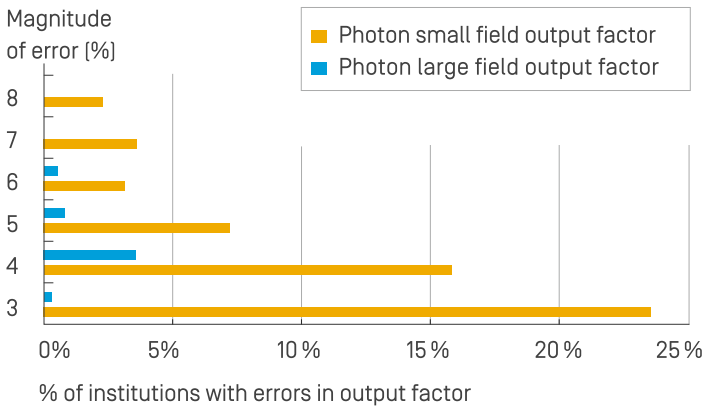



## The Challenge:
## Errors based on poor commissioning data

Errors in beam data collection are reported to frequently lead to flawed TPS beam models and thus to systematic dose computation errors. These systematic beam data errors are difficult to spot and to eliminate1).

- Commissioning is a challenging process requiring in-depth experience, especially for small field dosimetry.
- Commissioning is usually done under time pressure, and the job is repetitive and error-prone.
- International recommendations for independent audit of the data by a qualified medical physicist (e.g. AAPM TG-106, AAPM TG-53, ESTRO Booklet 10®).

## Dosimetric Issues in Radiation Therapy




**RT Deficiencies Identified During On-Site Dosimetry®**
S. Kry et.al.: IJROBP, Vol 99, 5, 2017 P1094-1100

# with Monte Carlo

## The Solution:
## Beam Data Verification Audit

To verify the quality and the accuracy of you commissioning beam data you can now benefit from a new and unique audit service based on highly accurate Monte Carlo simulation and analysis.

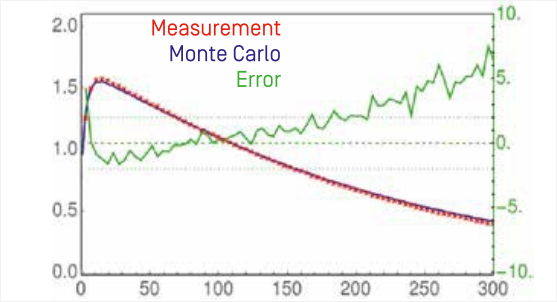
This service provides a trustful audit result that is independent, high quality and reliable.

**The result:**
You gain clarity and the peace of mind that the quality of your new or existing beam data is accurate, or know how to improve your data and scans if needed.

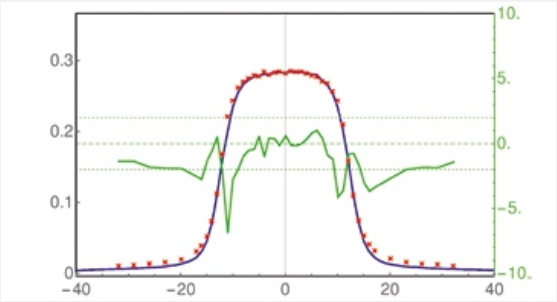
- Simply submit your commissioning data for the audit and gain full insight into the quality of your dataset.
- The report includes comprehensive details of the sources of inconsistencies or errors and provides guidance on how to resolve them.
- The audit is available for beam data of any water phantom and for all standard C-Arm Linacs, Halcyon◊, Ethos◊, CyberKnife®, TomoTherapy®/ Radixact®.#

## Typical beam data errors detected with Monte Carlo

### Wrong Voltage




### Penumbra Discrepancy




*I have validated our beam commissioning data using the Monte Carlo modeling within SciMoCa. The comprehensive validation report provided guidance to improve the PDD and MLC leaf calibrations in the TPS. We now have the confidence that our beam data is correct and that our treatment plan calculations are of high quality.*

**M. Kowatsch, Senior Medical Physicist, LKH Feldkirch, Austria**

Watch Webinar

*The quality of our measured beam data is critical to ensure accurate treatment planning and delivery, especially for stereotactic and other precision therapies. Medical physicists are challenged by varying responses from diodes and ion chambers because of the inherent differences between the different detectors. For the absolute confirmation of accuracy of beam data, I believe that Monte Carlo validation is the path forward for verifying small field beam data and has broader implications for verification of data for larger field sizes as well.*

**Raj K. Mitra, PhD, DABR.**
**Ochsner Health System [2] New Orleans, LA, USA**

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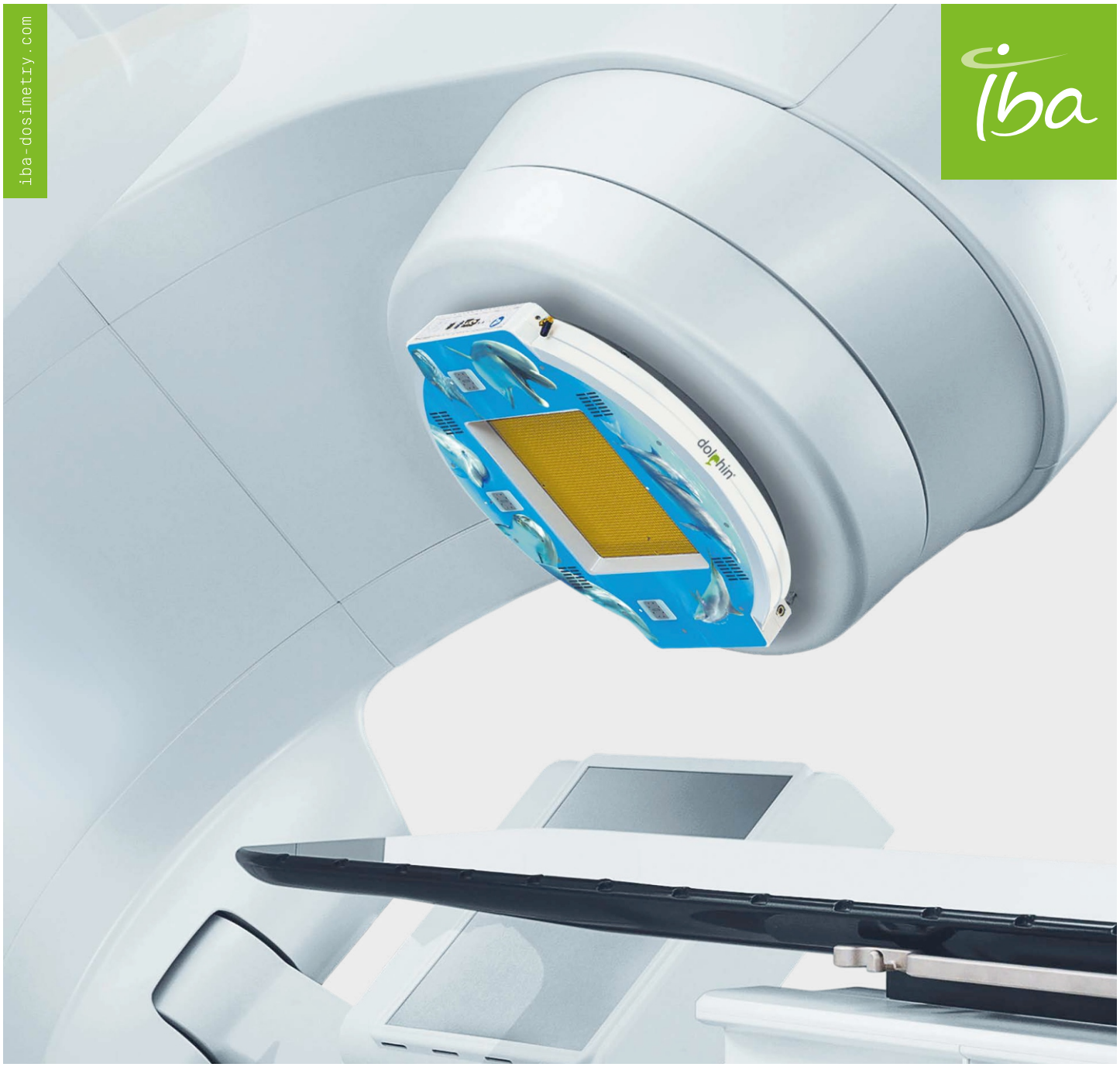



# DOLPHIN

## Advanced Detector for 3D Patient QA

# Unique Design

## Unique multi-purpose Transmission Detector for Pre-Treatment Patient QA and Machine QA

**High-resolution, high-accuracy detector array**

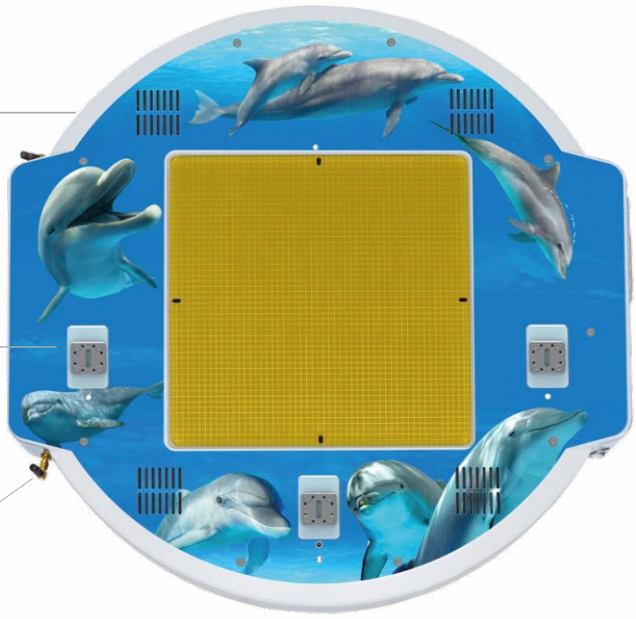
- Detector is perpendicular to the beam
- No angular dependence

**Optimized for rotational treatments**

- Built-in gantry angle sensor
- Time resolved (4D) segment-by-segment response detection

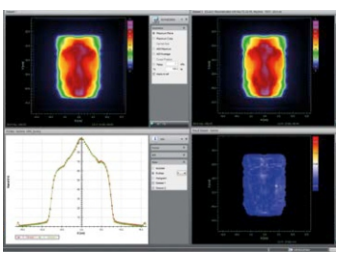
**Cable-free design**

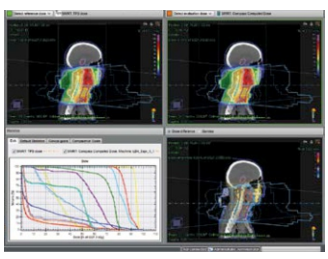
- Wireless data connection
- Battery-powered; seconds to change



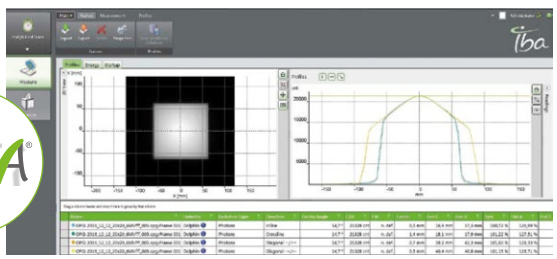
## Dolphin accuracy and efficiency in numbers

| | |
|---|---|
| **1513** | ionization chambers in Dolphin detector |
| **40x40 cm²** | full field size for QA of largest fields in one setup |
| **5 mm** | detector resolution for high accuracy |
| **1 min** | setup and readiness for QA measurements |





Dolphin real Linac output measurements used for 2D and/ or 3D plan QA, **and** for pre-treatment




Check your dose output and profiles, beam uniformity, constancy, flatness, and more

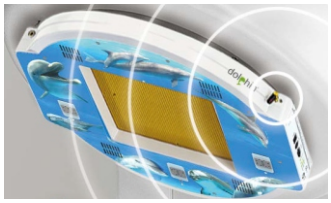
# Pre-Treatment QA

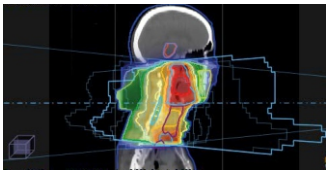
## Patient pre-treatment QA at the most advanced level

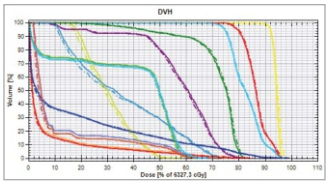
**QA efficiency, confidence, and safety before you treat your patients**

- Save time for your equipment setup, measurements, and verifications.
- Use Dolphin for pre-treatment QA and Machine QA

> *In our institution we have clinically implemented Dolphin on our three Linacs. Prior to each patient treatment, an advanced measurement-based quality assurance is performed with Dolphin. This is our basis to achieve the highest QA standards and safe treatments for all our IMRT patients today and in the future.*





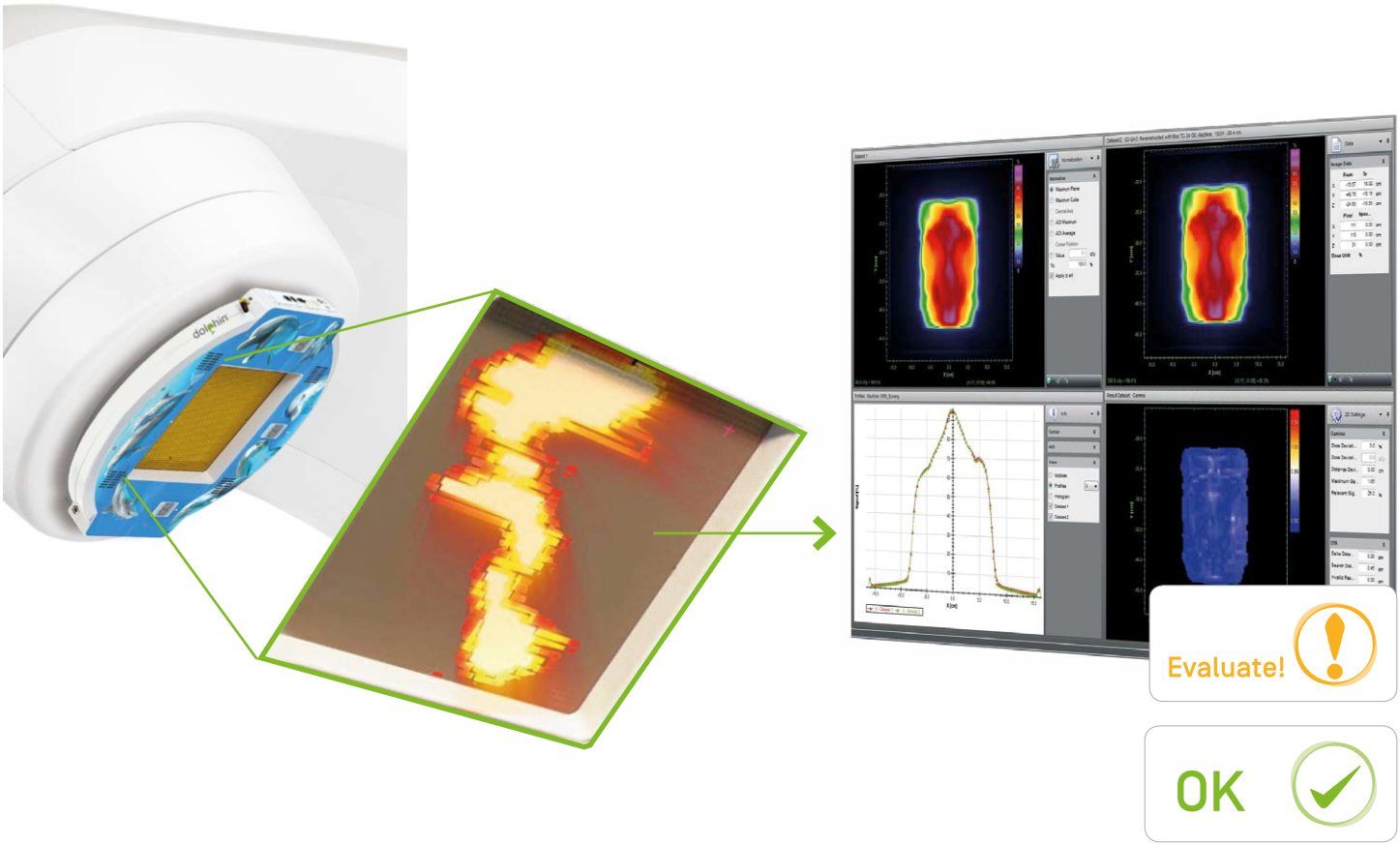



Watch Dolphin user M. Dierl

# Patient QA Workflow Simplicity

## Easy setup and QA measurements

## Automatic instant verification results



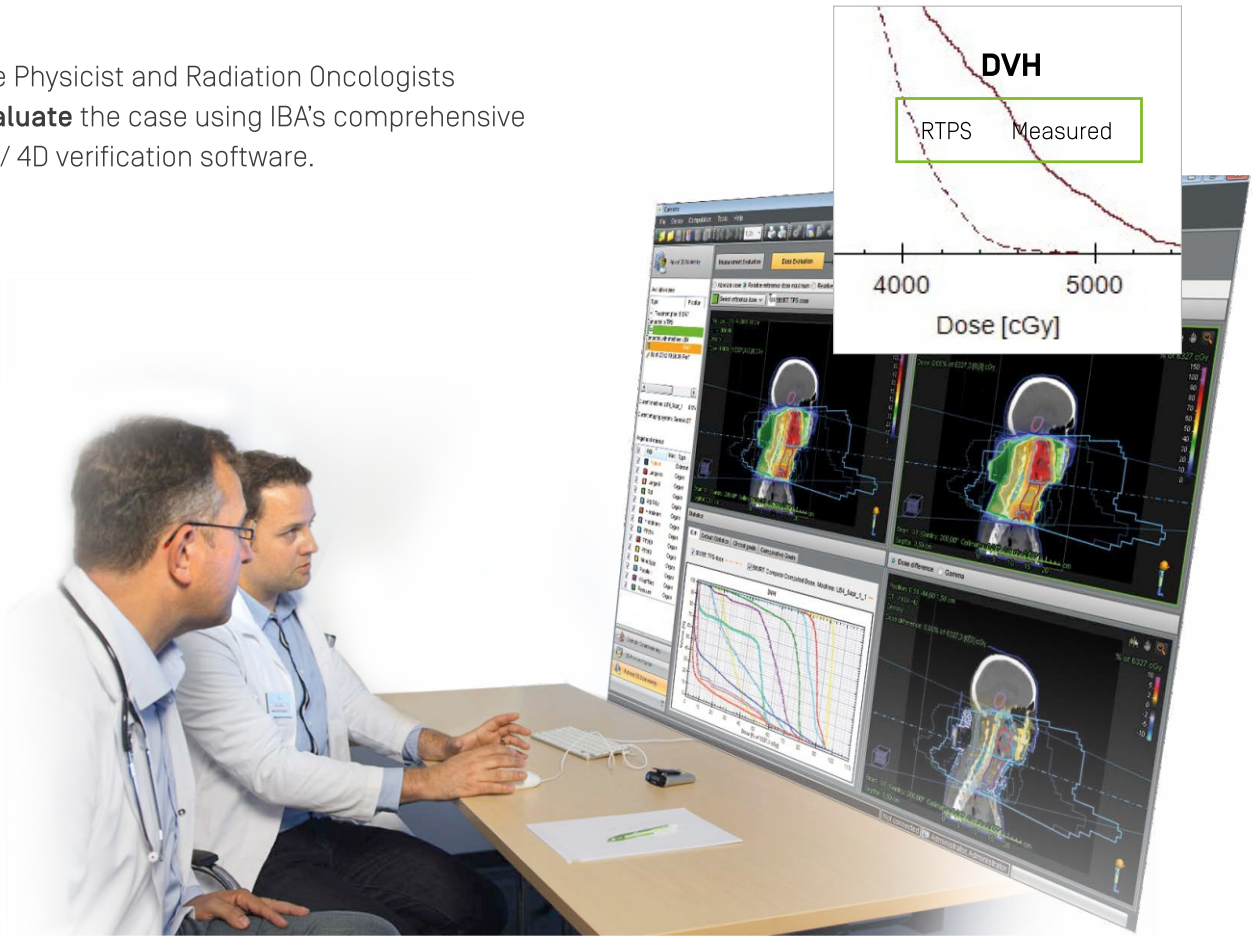

- Fast detector setup in just 1 minute
- Simply attach Dolphin to your gantry without cables or calibrations
- Transmit your measured data wirelessly for efficient verification at your QA console

- Instant verification of Dolphin measurements vs. TPS plan and display of the result
- "**OK**" for a test that is successfully passed
- "**Evaluate**" for discrepancies exceeding your individual threshold
- In case further analysis is required, a full 3D measurement-based evaluation can be performed

Watch 1 min Dolphin setup video

## Optional full 3D patient dose analysis with COMPASS

The Physicist and Radiation Oncologists **evaluate** the case using IBA's comprehensive 3D / 4D verification software.




- Proven DVH metrics and TPS evaluation tools support comprehensive evaluation and decision making

- Determine when re-planning is required, or when machine-specific tests are necessary
- Understand the clinical impact of the actual delivery in the patient anatomy

# Machine QA


myQA Cockpit gives you full overview of your machine QA status and trend analysis.
The browser-based application ensures access anytime, anywhere!

## Machine QA efficiency

**Dosimetry tests with Dolphin Transmission Detector and myQA**

- Save time: Check your dosimetry constancy with the same Dolphin setup and in one session with your patient QA
- Easy comparison of test results and trend analysis
- myQA Machines connects Dolphin into your global QA platform

myQA®

# DOLPHIN® & COMPASS

**FOCUS ON EVERY PATIENT**

## DOLPHIN Key Benefits

- **Ready to measure in 60 seconds**

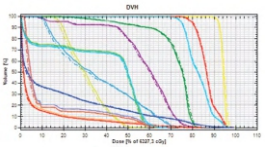
  Simply attach DOLPHIN to the gantry with one „click-in“ at the same aligned and reproducible position with respect to the beam. Along with the cable-free design, this allows operation to start immediately.

- **Full field measurement**

  The DOLPHIN detector design enables measurements at all beam shapes and field sizes: entire large fields up to 40 × 40 $cm^2$ at isocenter plane as well as small fields at high precision. As opposed to other solutions, with DOLPHIN the actual patient plan can be measured, which helps prevent additional phantom plans or cumbersome combinations of multiple measurements.

- **3D dose analysis in the patient0s CT**

  The actual measured dose delivery is reconstructed to the patient‘s anatomy by the COMPASS software, providing a 3D analysis of the actual dose impact. The TPS-class dose engine embedded in COMPASS enables a truly independent second calculation and comparison wth the TPS plan data.



myQA Patients


# Efficient Patient QA - Hardware

Detectors, Phantoms & Accessories

iba

# MatriXX - the **ONE** Detector for your Patient QA and Machine QA.

**Compatible with:**

- ✓ Conventional & IMRT
- ✓ VMAT/RapidArc©
- ✓ FFF Beams
- ✓ Tomo Therapy©


## MatriXX Evolution

- ✓ Proven and effective for conventional, IMRT and rotational cases
- ✓ Suitable for high-dose-rate cases (see specifications)

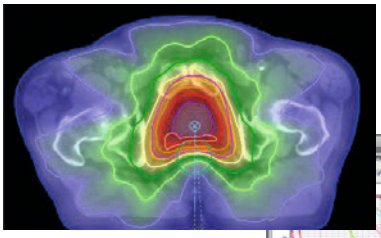
## MatriXX FFF

- ✓ Optimized to support current and future high-dose-rate delivery systems
- ✓ Dedicated for high-dose-rate Flattening-Filter-Free (FFF) as well as for conventional measurements

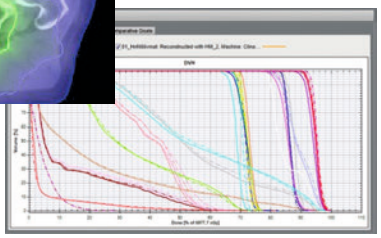
COMPASS

## 3D Patient Dose QA

- ✓ Verify the plan in the patient anatomy
- ✓ Understand the impact of the actual delivery
- ✓ Maximize efficiency with the best 3D solution



3D Dose

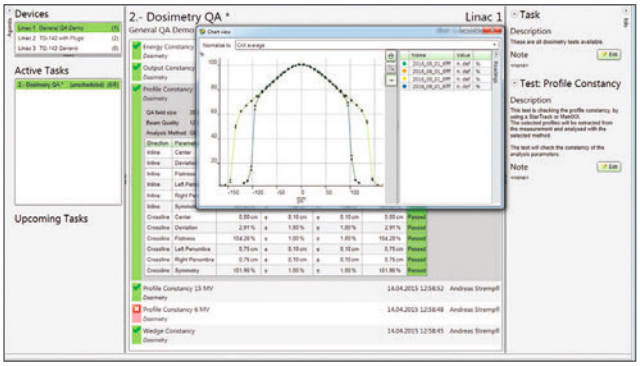


DVH Comparison

myQA Machines

## Intelligent Machine QA

- ✓ Protocol based machine QA (including TG-142 and other protocols)
- ✓ Full coverage of tests with a flexible scheduling tool to manage your tasks
- ✓ Comprehensive analysis, archiving and reporting tools

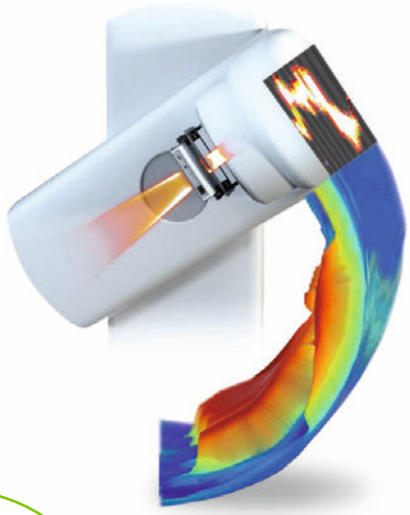



myQA Machines Profile Analysis

# MatriXX Accessories

## 3D anatomy-based Patient QA with the Gantry Holder

- ✓ Simple and rigid mounting of MatriXX/Startrack
- ✓ Perpendicular to the beam: Optimal for rotational treatments
- ✓ Ideal for 3D Patient QA

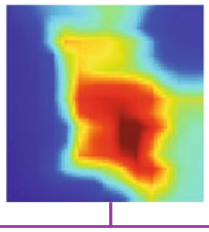


MatriXX mounted to the gantry head


Automated gantry angle correction with the Gantry Angle Sensor

## More Sensitivity to Fluence Variation

MatriXX ion chambers increase the sensitive area of the array, and the sensitivity to fluence variations by providing the most complete and accurate picture.*



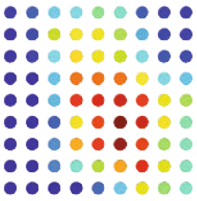
Actual dose at the measurement plane

Graphics shows a zoomed 6cm x 6cm beam across section

**Diode Dector**

98% of beam information missed. Point measurements limit predictability*

**MatriXX Ion Chamber**



Accurate and high-sensitivity measurements

*Gago-Arias et. al "Evaluation of chamber response function influence on IMRT verification using 2D commercial detector arrays". Phys. Med. Biol. 57 (2012) 2005

| Technical Specifications | MatriXX Evolution | MatriXX FFF |
|---|---|---|
| Number of chambers and type | 1020 air-vented ionization chambers | |
| Read-out time | 20ms without dead time (parallel read-out of all chambers) | |
| Active area | 24.4 x 24.4 cm² | |
| Sensor layout | MatriXX in a plane arranged in a 32 x 32 grid | |
| Pixel spacing (center-to-center) | 7.6 mm | |
| Chamber size / volume | 4.5 (Ø) x 5 (h) mm² / 0.080 cm³ | 4.5 (Ø) x 2 (h) mm² / 0.032 cm³ |
| Nominal sensitivity | 2.0nC/Gy | 1.4nC/Gy |
| FFF compatible | Suitable for FFF beams | Optimized for FFF beams |
| Charge collection efficiency (at 24Gy/min; 10MV FFF at 100cm SDD) | > 97 % at 1.0 mGy/pulse | > 99 % at 1.0 mGy/pulse |
| Deviation from linearity | ≤ 1 % if the dose is ≥ 0.02 Gy | ≤ 1 % if the dose is ≥ 0.15 Gy |
| Temperature & pressure sensor | Automated k(t,p) correction of the chamber signal | |
| Weight | 10 kg. Easy to carry | |
| Data communication method | Ethernet connection (via standard network cable) | |
| Gantry Angle Sensor accuracy | +/- 0.6° | |

iba-dosimetry.com


# myQA® Daily

## easy, efficient, and accurate morning QA

PROTECT +
ENHANCE +
SAVE LIVES

# myQA® Daily
# easy, efficient, accurate by design

**myQA Daily is the only solution for fast, easy, and high-quality morning Linac QA.**
**The largest number of ionization chambers provides more beam data for more accurate beam quality verification.**


**125 ionization chambers**
provide the largest amount of measured beam data of any available daily QA device. This means a more accurate morning QA and trend analysis of dose output, flatness, symmetry, center, field size, and energy.

**High-resolution centerline measurements**
The 31 ionization chambers for each centerline offer greater beam measurement accuracy, especially in the penumbra regions. This allows a finer analysis of daily beam characteristics as well as earlier detection of suspicious trends.

**Energy constancy checks**
Dedicated ionization chambers with integrated absorber material automatically verify the photon and electron energy constancy " all with the same beam and detector setup. There²s no need to manually add buildup material, to change the setup, or to flip the detector.

**Field size flexibility**
The detector layout provides the flexibility to perform daily QA tests with standard 20×20 cm² or smaller 10×10 cm² beams.

**Light field check**
Field size markers permit easy verification of the light field²s conformity with the radiation field.

## Wireless connectivity

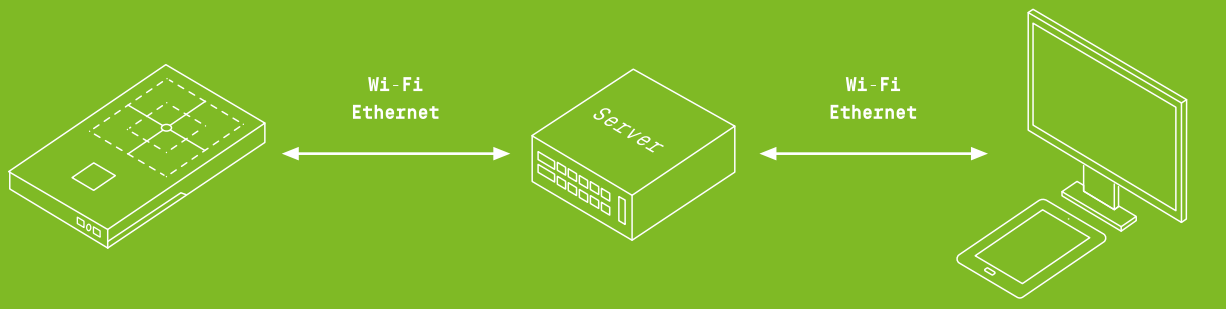
The real-time Wi-Fi data exchange and rechargeable battery allow wireless daily QA setup and measure-ments. The cable-free design enables a convenient workflow and makes it easy to use at multiple Linacs.

**Instant results at your fingertips**
The server-based myQA Daily software application is the backbone of seamless morning QA checks. The software easily guides the user through just a few steps.

**Easy daily QA test interface:**
Simply start the application to have your daily test run automatically ready. For test execution, the menu guides you easily through just a few steps.

PROTECT + ENHANCE + SAVE LIVES

The server-based software enables easy and fast integration into an existing IT infrastructure. Furthermore, you can execute tests and review your results on any device.




*myQA Daily detector*

*myQA Daily software application*

*Communication through web browser on your desktop or mobile devices*

| | |
|---|---|
| **Sensor design** | |
| ***Type of detectors*** | 125 ionization chambers, carbon electrodes |
| ***Energy verification*** | Built-in attenuation material |
| ***Inherent buildup*** | 6.0 mm ABS |
| **Performance** | |
| ***Photons*** | Co-60 to 24 MV |
| ***Electrons*** | 4 MeV to 24 MeV |
| ***Dose*** | Unlimited |
| ***Dose rate*** | ≥ 1 Gy/min, ≤ 24 Gy/min |
| ***Dose/pulse*** | Max. 0.3 cGy/pulse |
| **Connectivity** | |
| ***myQA Daily detector*** | Ethernet or Wi-Fi connection to the server; additional LAN port |
| ***myQA Daily software*** | Ethernet or Wi-Fi connectivity to the server via the hospital network |
| **Electrical** | |
| ***Power*** | Battery and ext. battery charger 9V DC power supply [included] |
| **Software** | |
| ***myQA Daily software/database*** | Installed centrally on a server or on a PC, web browser application via network workstation, or tablet PC |

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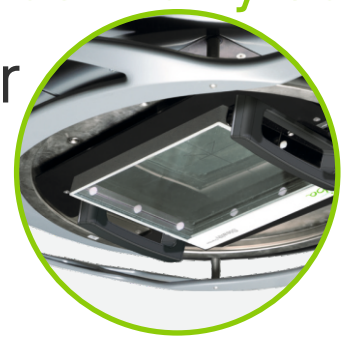
# DETECTORS

## For Relative and Absolute Dosimetry

### Ionization Chambers and Diode Detectors

# Unique Small Field Dosimetry Solutions

## Reference Chamber

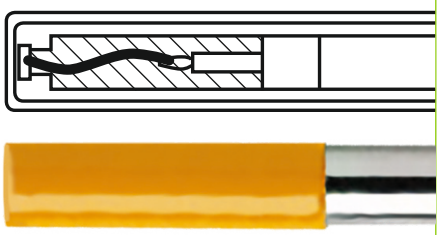


## Stealth CHAMBER

- New «perturbation free» reference signal chamber
- Avoid returning to the LINAC room frequently and repositioning (compared to standard reference chambers)
- Excellent reproducible reference signal quality, even for SRS/SBRT fields

## Detectors

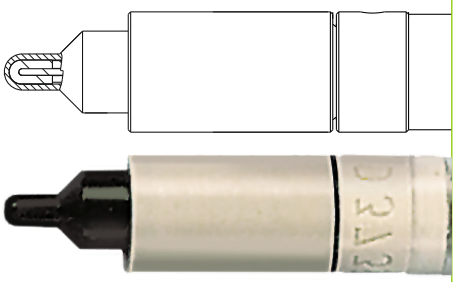
### RAZOR DIODE DETECTOR



High-performance diode detector

- Chip size: 0.95 x 0.95 mm; t = 0.4 mm
- Sensitive area: Ø 0.6 mm
- For Photon and Electron beams in RT

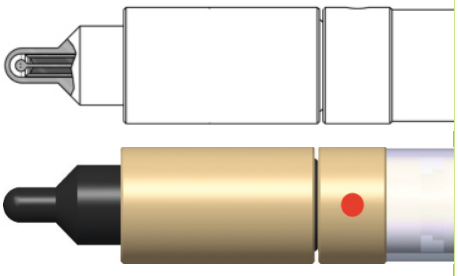
### RAZOR CHAMBER



Compact air ionization chamber

- Cavity volume: 0.01 ccm
- Central electrode material: graphite
- For Photon and Electron beams in RT

### RAZOR NANO CHAMBER



Smallest available ionization chamber

- Cavity volume: 0.003 ccm
- Central electrode material: graphite
- For Photon and Electron beams in RT

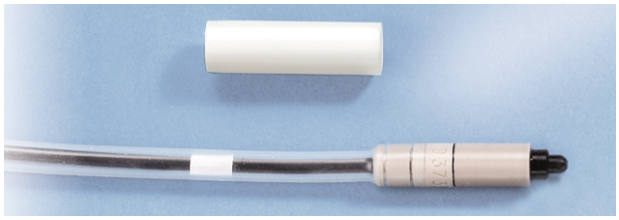
# Detectors for Relative and Absolute Dosimetry

IBA Dosimetry offers a full range of ionization chambers and pSi semiconductor detectors for various 2D and 3D water phantom systems and solid phantoms. All detectors are from our in-house production and have been extensively tested to meet the highest criteria in radiotherapy dosimetry.

## Air Ionization Chambers

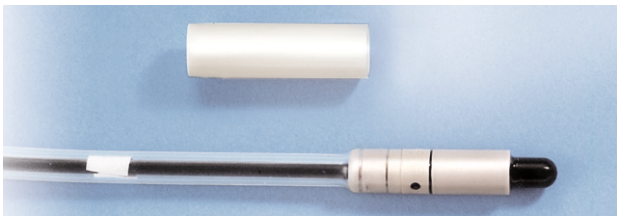
### Compact Chambers

Applications:
All compact chambers are designed for measurements with high reproducibility in air, solid, or water phantoms. They are suitable for relative dosimetry of photon, electron and proton fields in radiotherapy.



CC04

CC04
The CC04 is the conventional ionization chambers for measurements of small fields and of ranges with high dose gradients, e.g. stereotactic fields.



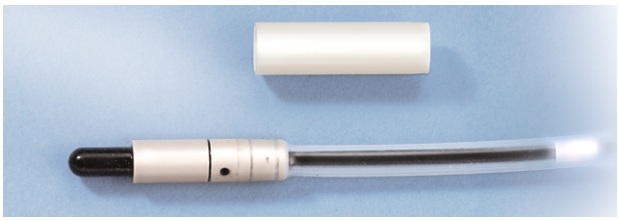
CC08 / CC13

CC08
CC08 is used for customized applications during manufacturing and installation of linear accelerators (e.g. ™Buddelship±).

CC13
CC13 is the standard chamber for clinical use in water phantoms and for output factor measurements.

### CC25

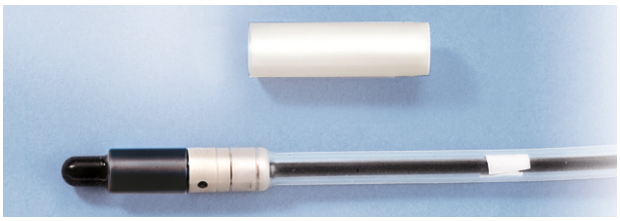
CC25 is mainly used for quality assurance in air and for low dose measurements in water phantoms.



CC25

### CC13-S

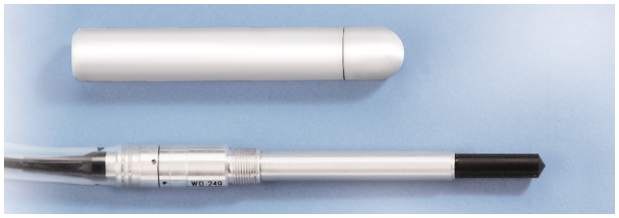
The CC13-S is the replacement for the RK chamber used as the standard ionization chamber for RFA phantoms. Parameters of the CC13-S are similar to the CC13.



CC13-S

## Farmer Type Chambers

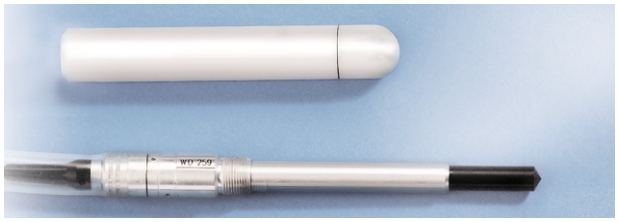
Applications:
All farmer type chambers are designed for measurements with high reproducibility in air, solid, or water phantoms. They are suitable for absolute dosimetry of photon, electron and proton beams in radiotherapy.



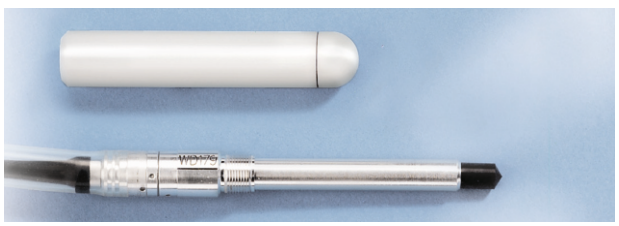
FC65-G

### FC65-G and FC65-P

FC65-G and FC65-P are the standard reference chambers for clinical reference dosimetry of high-energy photon and electron beams and scientific applications.



FC65-P



FC23-C

### FC23-C

FC23-C yields higher precision in measuring of isodose contours.

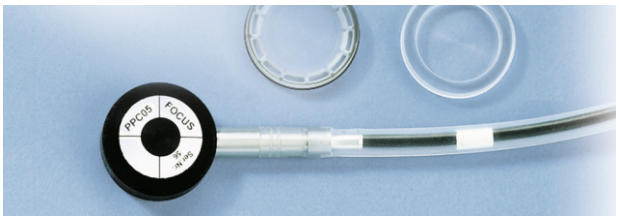
Because of their robust plastic construction, FC65-P and FC 23-C can be used for daily routine beam check.

# Plane Parallel Chambers

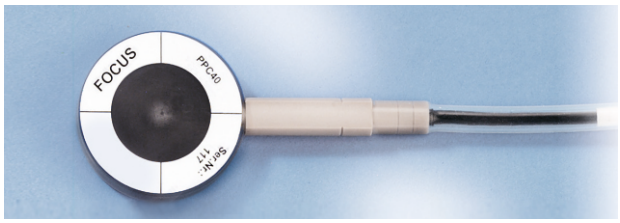
Applications:
All plane parallel chambers are designed for measurements with high reproducibility in air, solid, or water phantoms.

## PPC05 and PPC40

PPC05 and PPC40 are suitable for absolute dosimetry of electron, photon and proton beams in radiotherapy.




PPC05




PPC40

## NACP

The NACP is designed according to recommendations of the Nordic Association of Clinical Physicists (NACP), Acta Radiologica Oncology 19,55. The chamber is used for absolute dosimetry of electron beams 2-50 MeV. A thinner front wall minimizes contamination of the beam, allows measurements at shallow depths, and guarantees high accuracy even at low electron energies.

NACP

# Diode Detectors

Applications:
The IBA Dosimetry diode detectors are designed for depth dose and profile measurements in water and air and for output factor measurements in small photon beams.


RAZOR DIODE
especially recommanded for SRS/SBRT fields

The diode detectors from IBA Dosimetry are an excellent choice in relative field analysis as well as output factor measurements. They are based on the 3rd generation of pSi semiconductors.
Since their introduction in 1992, the high doped p-type silicon detector chips, specifically designed for radiation therapy applications, have been the natural choice for measurements where high spatial resolution is required. The accuracy and lifetime of the diode detectors is unsurpassed in the field of radiation therapy today.

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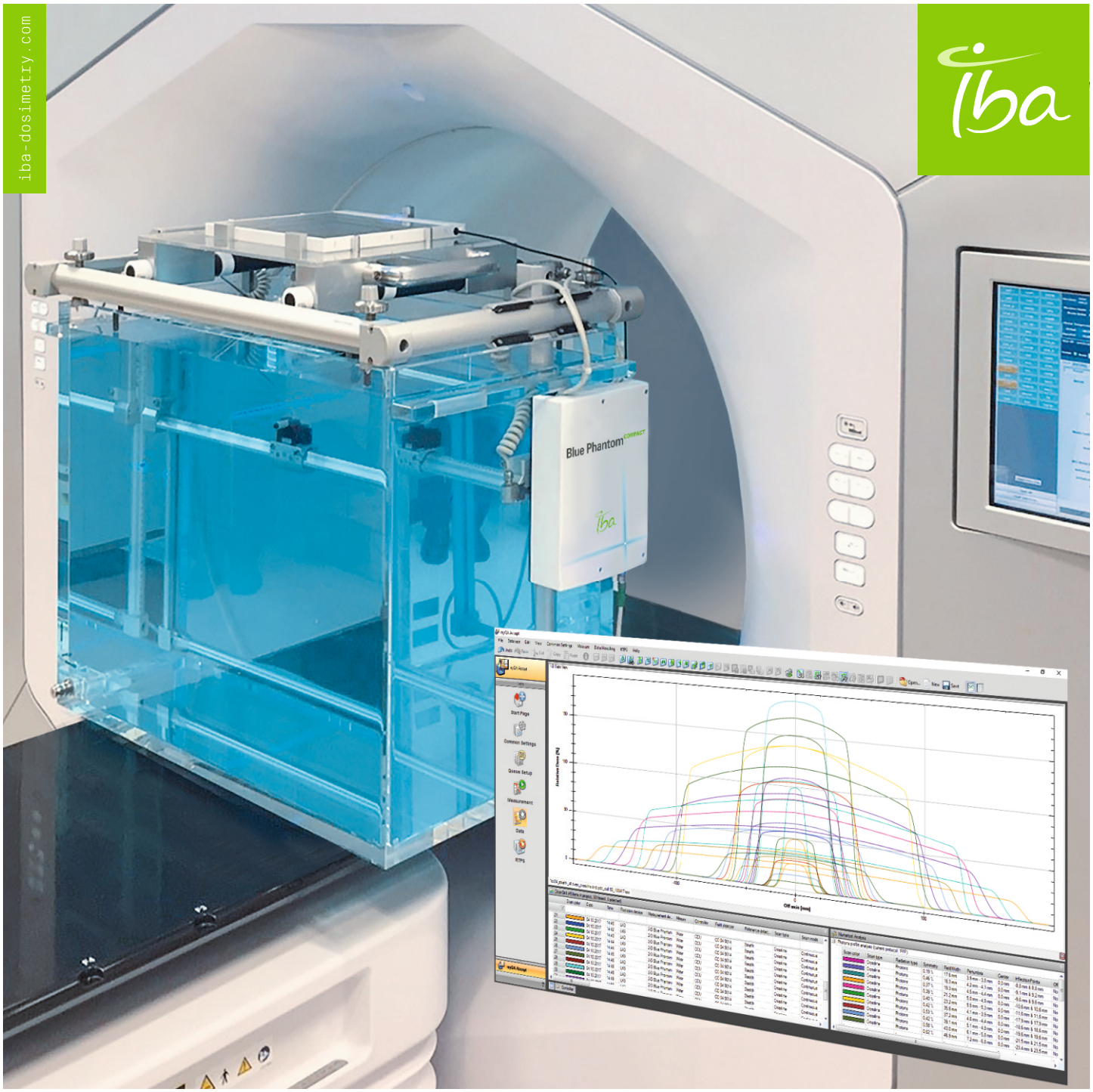



# myQA HALO™

## Integrated Quality Assurance for Varian Halcyon™,1

DOSIMETRY

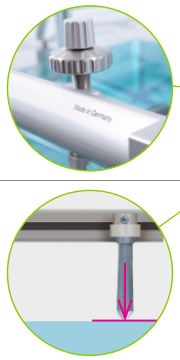
PROTECT +
ENHANCE +
SAVE LIVES

# myQA HALO™

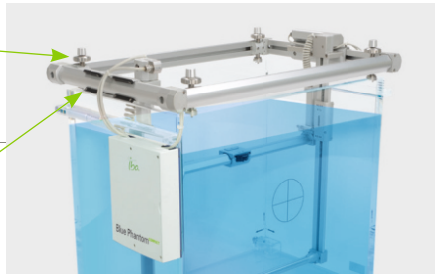
## Blue Phantom COMPACT

**The right fit for Halcyon™ commissioning and required scans**

- Optimized 2D tank design for fast collection of all needed scans
- Fastest tank setup with micro-leveling frame and alignment pins*
- Minimized couch sag through compact and lightweight tank
- Certified to guarantee highest accuracy & reproducibility of min ± 0.1 mm!
- Ideal for your commissioning, as well as other monthly and annual scans







## Stealth CHAMBER™

**Small Field scanning accuracy with ease**

- The Stealth reference chamber is specially designed for accuracy and excellent reproducibility of field sizes down to 0.5 cm x 0.5 cm
- Special holder attaches the Stealth Chamber to the Blue Phantom Compact*

1