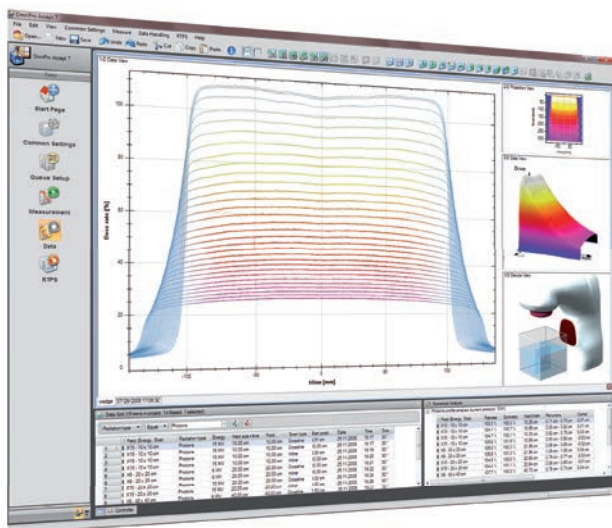




BEAM COMMISSIONING AND ANNUAL QA

Blue Phantom² | OmniPro-Accept 7



**FASTEST, MOST ACCURATE, MOST RELIABLE
RELATIVE DOSIMETRY**

RELATIVE DOSIMETRY FASTEST, MOST ACCURATE AND MOST RELIABLE

For **OVER 40 YEARS** IBA Dosimetry has been providing **high quality** dosimetry equipment and services, with more than **4,000 SATISFIED WATER PHANTOM USERS** worldwide. The new Blue Phantom² embodies decades of **expertise, research and experience** in the development and clinical use of water phantom systems.

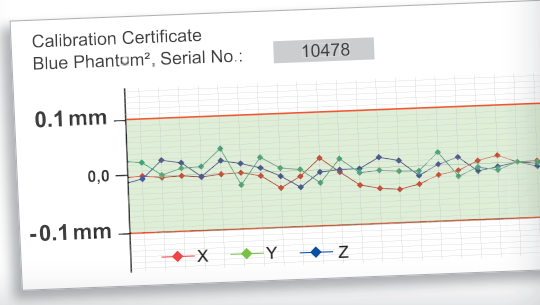
COMMISSIONING SERVICE ADVANTAGE!

- Book IBA commissioning service and get your **linac commissioned much faster**
- The Blue Phantom² is designed based on IBA's **commissioning service field experience**



CERTIFIED ACCURACY

- Uncompromised commissioning accuracy for your advanced IMRT, IGRT and rotational treatments
- The Blue Phantom² is calibrated and certified to guarantee high accuracy and reproducibility of min ± 0.1 mm!
- Have full trust in your beam profile data!



ADAPTIVE SCAN OPTIMIZATION

- Speed as well as Accuracy!
- ASO significantly speeds up continuous and step-by-step scanning
- ASO overcomes the restrictions of all other systems that compromise speed vs. high resolution scanning
- Automatic scanning speed adaptation enables optimal accuracy for the different profile segments as well as fastest scanning where fewer data points are needed

Find out more on page 5.



IBA AquaBlue: water treatment for protecting mechanical parts and saving water from decay

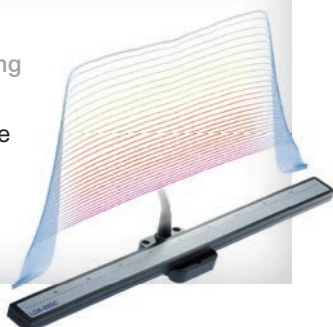
THE GOLD STANDARD REDEFINED THE NEW BLUE PHANTOM²

5 TIMES FASTER DATA SCANNING

Dramatically cut your commissioning times with the Linear Diode Array:

- Complete profile scanning at once
- High resolution down to 0.5 mm

Find out more on page 7.

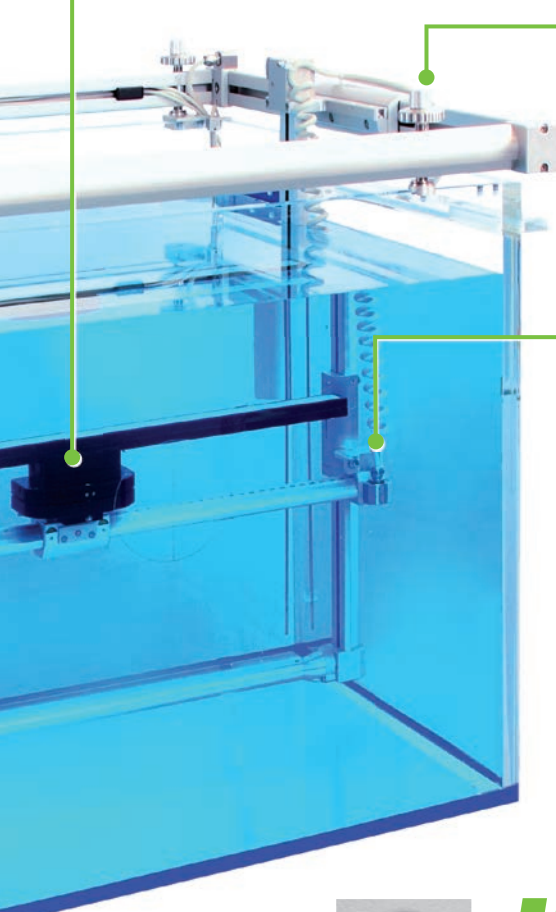


FAST & ACCURATE SETUP WITH CONFIDENCE

The micro-leveling technology allows for accurate alignment of the system to the water surface in just 2 minutes!



- Faster and more accurate than automated setup
- Avoids redundancy of validation needs of automated procedures
- No tank movement, no wave building

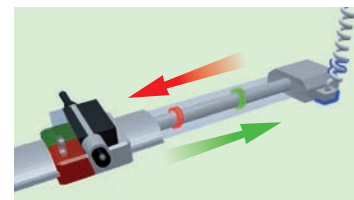


HIGH POSITIONING ACCURACY

- Absolute measurements
- Contact-less sensors in water phantoms
- High detector positioning accuracy without mechanical wear!

The Blue Phantom² is equipped with a high-precision sensor technology.

The superior solution is a non-contact absolute position sensor (vs. typical indirect stepper motor measurements).



Continuous absolute measurements of chamber position on all 3 axis



“ Looking at this new series of the Blue Phantom, I am happy to see a continuous and significant progress in accuracy, flexibility, long term mechanical stability and reliability since Wellhofer Dosimetry started developing and producing water phantoms 35 years ago. Take advantage of experience, knowhow and consequent innovation by having a Blue Phantom². ”

MANFRED WELFHÖFER
PREDECESSOR OF IBA DOSIMETRY, INVENTOR OF WATER PHANTOMS



Find out more @
iba-dosimetry.com/bluephantom

THE DIFFERENCE BETWEEN GOOD AND EXCELLENT SOFTWARE? OMNIPRO-ACCEPT

Fully **WORKFLOW ORIENTED**, menu guided OmniPro-Accept software: designed to **increase your efficiency** and to reduce the commissioning and QA time of your Linac.



Start Page



Queue Setup



Data Acquisition



Data Handling & Analysis



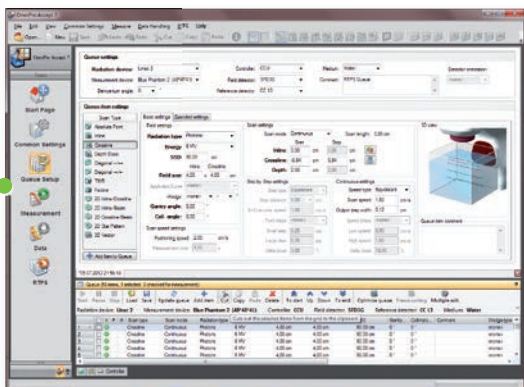
RTPS Transfer

ADVANCED COMMISSIONING INTERFACE

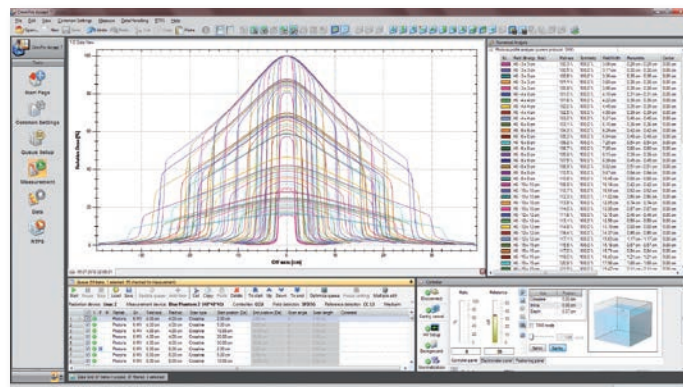
- Menu guided workflow optimization

TRUE WORKFLOW EFFICIENCY

QUEUE SETUP



DATA ACQUISITION

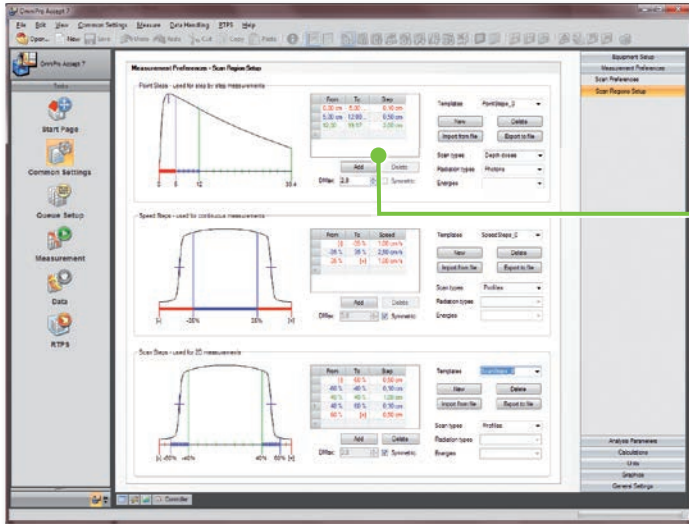


AUTOMATIC QUEUE GENERATION

- Fast & automatic data acquisition with predefined queues for all major TPS
- Save time with smart sorting algorithm for optimized scan sequences
- Sorting, prioritizing and multiple edits of scan queues to maximize efficiency
- Intuitive setup of user specific queues

- Adjustable scanning parameters for optimized measurements
- 1D, 2D and 3D graphical and geometrical visualization of detector position during scanning

WORKFLOW OPTIMIZED OMNIPRO-ACCEPT 7.4 **new!**



SCAN OPTIMIZATION

Select different scan speeds or data point densities in different regions of the scan, to optimize the overall measurement time and resolution.

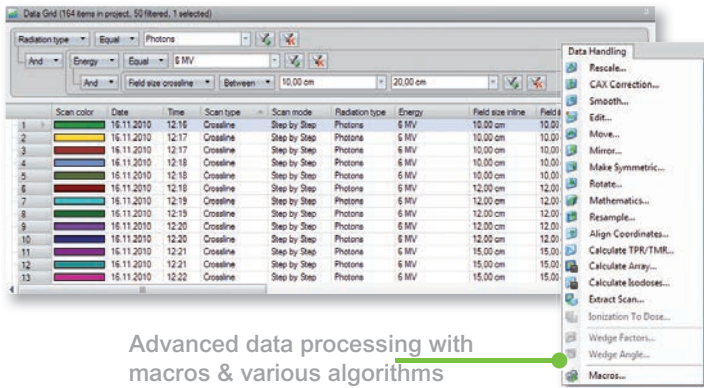
ASO Adaptive Scan Optimization:
This scanning mode ensures the short measuring time combined with a high spatial resolution. Time saving without compromising accuracy!

- Step-by-step and continuous scanning

MORE AUTOMATED FEATURES

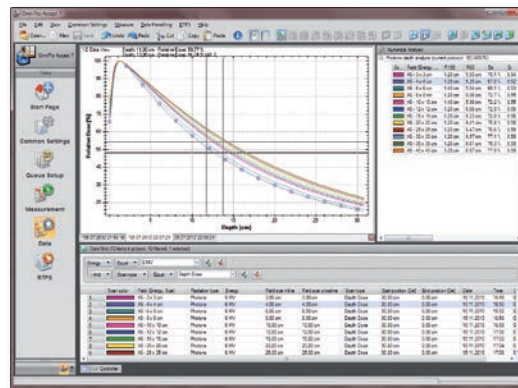
- Output factor determination
- Central axis correction via automated measurement routine

DATA HANDLING & ANALYSIS



Advanced data processing with macros & various algorithms

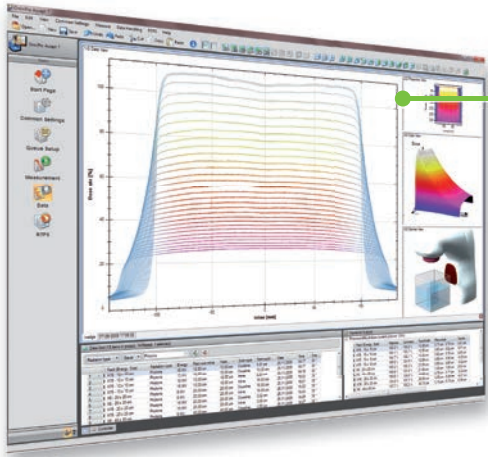
- Easy filtering and sorting
- Fast creation and export of data tables (PDD, TMR, OAR, etc.)
- Copy & paste to other applications, eg. MS Excel
- Exchange data with other IBA Dosimetry applications e.g. OmniPro-1'mRT, OmniPro-Advance



RTPS TRANSFER

- Accurate data analysis via standard and customizable protocols
- Analysis of TrueBeam™ / FFF scans
- Overlaying profiles for quantitative comparison
- 2D array and isodose calculation and display
- Library of mathematical smoothing and interpolation functions

MOST EFFICIENT & MOST ACCURATE LINAC COMMISSIONING & QA



ADVANCED COMMISSIONING INTERFACE

OmniPro-Accept Software is tailored to make your commissioning and annual QA faster and better

- Menu guided workflows enable easy operations
- Features like the ASO scanning dramatically shorten the procedures
- Advanced data handling and connectivity
- Pre-Programmed TPS data requirements

INTERACTIVE MICRO-LEVELING SYSTEM

- For most efficient and user validated setup of the phantoms

SINGLE HAND CONTROL INCREASES EFFICIENCY

- For easy and intuitive control of the Blue Phantom² and water reservoir

CCU (COMMON CONTROL UNIT)

Its compact design integrates a controller and two independent electrometers:

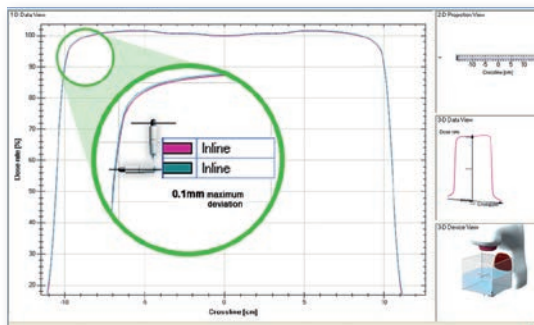
- Simultaneous support of diodes and ionization chambers
- Built-in pressure & temperature sensor interfaces prepared for automatic K_{t,p} correction



MOST ACCURATE & MOST RELIABLE

Blue Phantom²: the right solution for your crucial Linac commissioning

- From the inventor of water phantoms
- Over 40 years of experience



In-plane and cross-plane scanning consistency of Blue Phantom² with CC13 chamber

CONSISTENTLY ACCURATE MEASUREMENTS IN X AND Y

Small ionization chambers like IBA's CC-13 ensure scanning direction independent accuracy, regardless of detector movement and orientation (according to TG-106 report).

> 5 TIMES FASTER BEAM PROFILE MEASUREMENTS

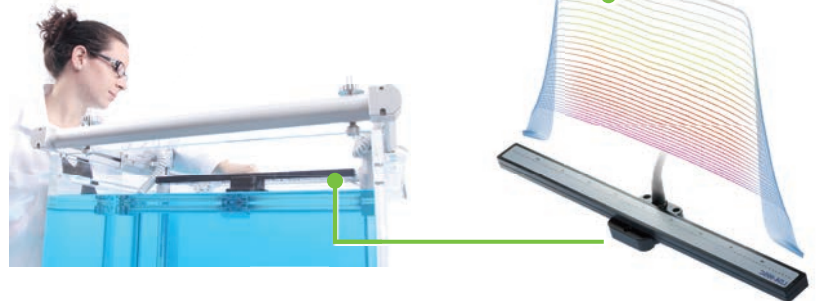
LDA-99: REDUCE YOUR COMMISSIONING TIME WITHOUT COMPROMISING ACCURACY

INSTANT MEASUREMENT OF ENTIRE PROFILES

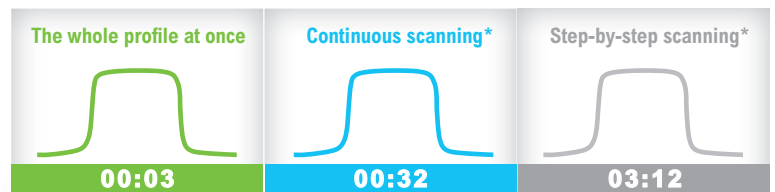
- Start your treatments days earlier
- Consistent high accuracy measurements, according to TG-106 standards

LEADING TECHNOLOGY

- High linear diode array resolution with 99 p-type semiconductor detectors
- Software controlled automatic LDA-99 shift and measurements: data sampling resolution down to 0.5 mm
- Reliable commissioning and QA of dynamic wedges and MLC fields
- Suitable for photons and electrons
- Linac adjustment with instant beam analysis
- In-water and in-air measurements



COMPARISON OF BEAM PROFILE ACQUISITION MODULES

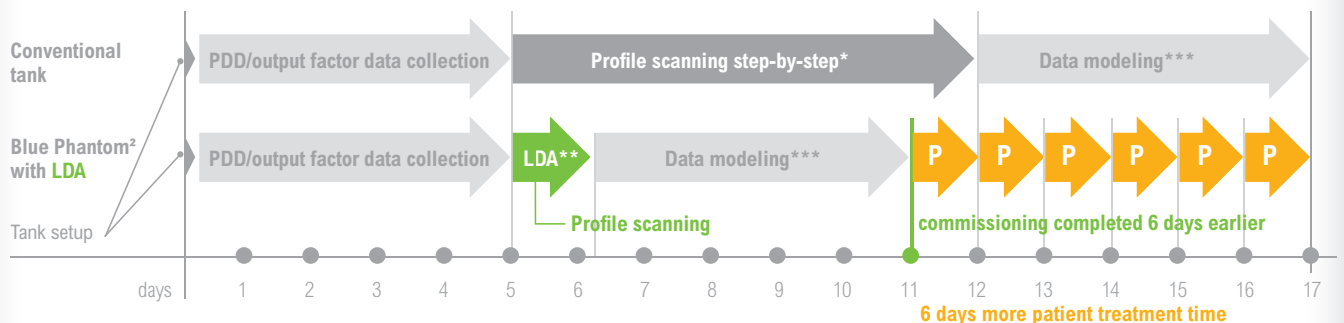


LDA-99
3 secs for 2.5 mm pitch (198 data points)

* Field size: 10 x 10 cm
Depth: 1.5 cm
Scanning speed: 5 mm/s

* Field size: 10 x 10 cm
Depth: 1.5 cm
Measurement time: 1 s
Step size: 1 mm
In-scan speed: 10 mm/s

COMMISSIONING TIME SAVING WITH IBA TECHNOLOGY



Comparison shows a typical Linac / RTPS commissioning:

* Typical step-by-step scanning with average data resolution takes minimum 7 days

** Profile and wedge scanning with LDA saves up to 6 days in Linac commissioning

*** Data Modelling typically takes 5 days but can vary depending on RTPS

Times shown are average, based on commissioning of 3 photon energies with average 765 profiles + 1015 PDD / Output Factors; Times incl. changes in machine setup, wedges, breaks and starts

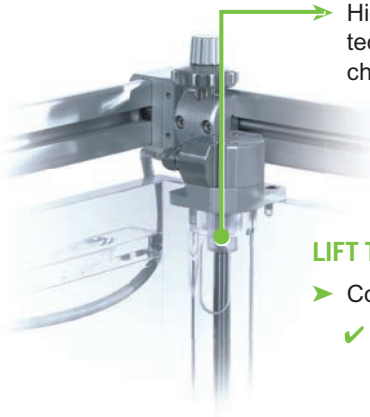
“ I have been using IBA’s Blue Phantom and the innovative linear diode array during the commissioning of my Trilogy and Novalis TX Linacs. The capability to acquire profiles instantly, allowed me to collect all beam data in a fraction of the time. The speed of the LDA-99 versus a single detector is unmatched in the industry. ”

● R. RODEBAUGH, PH.D. CHESAPEAKE GENERAL HOSPITAL, CHESAPEAKE, VA

ACCESSORIES TO COMPLETE YOUR SYSTEM

TMR-SET

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



LIFT TABLE

- Compact design:
 - ✓ Provides full tank access without lift table bumping causing setup failures (compare to other tables with extended legs)
 - ✓ Easy to store and convenient to drive even through narrow mazes
- Convenient and fast positioning of the water phantom incl. leveling frame for vertical & horizontal fine adjustment (electrical version)
- Water phantom carriage with manual or electric (telescopic) lifting
- 2 fixed and 2 steerable rollers with brakes, incl. storage compartments



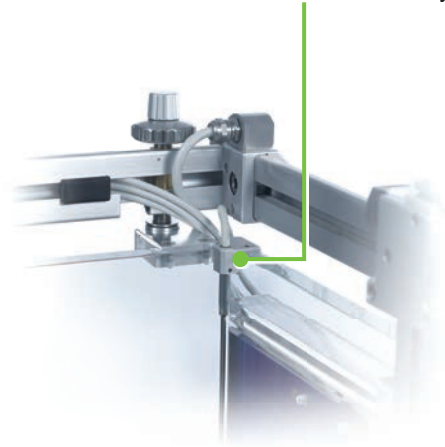
WATER RESERVOIR

- Separate tank trolley on wheels with a polyethylene water reservoir
- Pump for uni-directional or bi-directional water transport
- Electronic pump control for TMR/TPR measurement (option)



TEMPERATURE SENSOR

- The water temperature measurement is used in combination with the pressure measurement (built-in pressure sensor provided in the CCU)
- Automatic $K_{t,p}$ correction for output factor determination
- Easy setup in the water tank
- $\pm 0.3^{\circ}\text{C}$ measurement accuracy





BLUE PHANTOM^{HELIX}

The smaller tank for periodic quick QA tasks and for TomoTherapy® commissioning & QA.

- Based on Blue Phantom² technology
- Operated with OmniPro-Accept software and Common Control Unit
- 3D movement enables scanning without tank repositioning
- ± 0.1mm detector positioning accuracy. Certified!

Find out more at iba-dosimetry.com/bluephantom



DEDICATED QUALITY DETECTORS – ACCURACY FOR ALL APPLICATIONS

IBA Dosimetry offers a complete range of detectors, including ionization chambers and semiconductor detectors.

- The Universal Holders enable fast and flexible mounting of all chambers and detectors in vertical and horizontal orientation
- Calibrated in our Calibration Laboratory, accredited by DAkkS and member of the IAEA/WHO SSDL



CONNECTIVITY

The Blue Phantom is connected to the hospital network via Ethernet:

- Standard Ethernet cable instead of special cables
- Easy to connect, easy and inexpensive to replace!

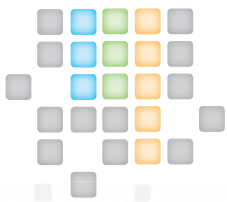


“ The main things I look for in a scanning system are positional accuracy, reproducibility, and stability. The folks at IBA Dosimetry definitely got it right with this one. The typical potentiometers and stepper-motors of other systems are replaced with contact-less absolute measurement sensors. This ingenious piece of engineering provides 0.1 mm accuracy, ± 0.1 mm reproducibility, and unsurpassed long-term stability. Over 20 years, I have used many systems from many vendors. This is by far the best! ”



SCOTT R. CONLEY, MS, DABR
CAROLINAEAST HEALTH SYSTEM, NEW BERN,
NORTH CAROLINA, USA

BUDGETS MAY DIFFER. CUSTOMIZE TO YOUR NEEDS, WITHOUT COMPROMISING ON QUALITY



MODULAR DESIGN

MAXIMUM FLEXIBILITY FOR A WIDE RANGE OF USE AND BUDGET!

The Blue Phantom² is the only water phantom customizable to your specific requirements:

- Select among various premium value adding features
- Gain maximum flexibility to configure to your individual needs and budget
- Choose from advanced options designed to save time and increase accuracy and flexibility

MAXIMIZE EFFICIENCY

INSTANT MEASUREMENT OF ENTIRE PROFILES

- 5x faster scanning
- 3 secs for 2.5 mm pitch (198 data points) with LDA

CONTINUOUS SCANNING MODE

- For fast and accurate measurements

SLANTED BOTTOM

- Fast and complete tank drainage without manual lifting

MAXIMIZE ACCURACY

ASO ADAPTIVE SCAN OPTIMIZATION

- Combine speed AND accuracy!
- Define and automatically execute most optimal scan resolution vs. scan speed for different beam profile segments

MICRO-LEVELING FRAME

- Accurate horizontal alignment of the scanning mechanism
- Without moving the tank, without wave building
- In just 2 minutes

CAX CORRECTION

- Central axis check
- Measurements with automated CAX correction

INCREASE FLEXIBILITY

SOFTWARE CONTROLLED COMMON CONTROL UNIT

- Selectable input: floated or grounded flexible use of various IBA detectors

OUTPUT FACTOR TABLE

- Determination of output factors
- Comparison in graphic charts and tables

WEDGE CHECK MODULE

- Wedge factor and angle determination

TMR-SET

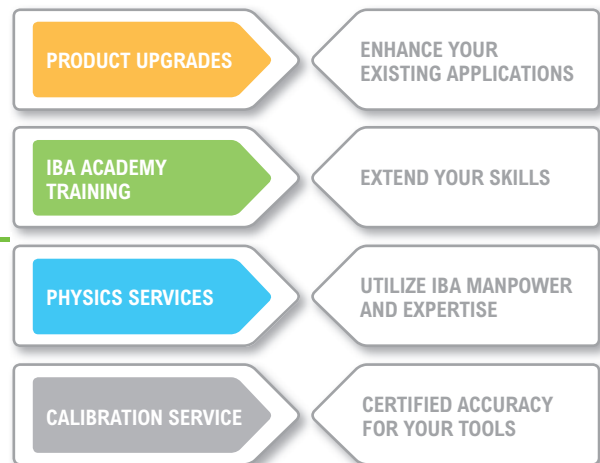
- Continuous measurement of TMR curves with real-time display

THIN WINDOW

- Enabling horizontal irradiations through only 3 mm PMMA

Your satisfaction as a customer and user of IBA equipment is in the center of all of our activities. Therefore we strive for **INNOVATIVE SOLUTIONS AND SERVICES** with one goal in mind: to **constantly improve your dosimetry** and to enable you to do your dosimetry the **FASTEST, MOST ACCURATE** and **MOST RELIABLE** way!

- Optimal Workflows and Highest Efficiency
- Treatment safety with best QA standards



UPGRADE YOUR EFFICIENCY IN COMMISSIONING & ANNUAL QA!



Advancements in Linac technology demand more and more data collection during commissioning.

Ensure you keep up with IBA innovations that will enable you to save valuable time and provide highest accuracy.

- Adaptive Scan Optimization and LDA-99 provide significantly faster data scanning with high accuracy
- High accuracy with contact-less sensor technology, certified to +/- 0.1mm!
- Software upgrades for your existing RFA-300 and Blue Phantom (generation 1): Boost your workflow efficiency and ease of use



Iba Academy

TRAINING COURSES

Enhance your knowledge, maximize your utilization, operate most efficient! Discover the curriculum of the International Competence Center ICC and our online webinars:

- Application Courses
- Product Training
- Clinical Sessions

Find the latest upgrade solutions and CAREprogram information online!



TECHNICAL SPECIFICATION

Blue Phantom²

Exterior water tank dimensions (LxWxH):	675 mm x 645 mm x 560 mm
Scanning volume (LxWxH):	480 mm x 480 mm x 410 mm
Position resolution:	0.1 mm
Position accuracy:	± 0.1 mm
Position reproducibility:	± 0.1 mm
Speed:	Positioning Speed: max. 50 mm/s; Scanning Speed: max. 25 mm/s
Approximate volume:	200 l
Wall thickness / material:	15 mm / acrylic
Weight (empty):	45 kg

Common Control Unit (CCU)

Maximum resolution:	0.5 fA at 0.4 nA full scale; 5 fA at 40 nA full scale; 0.5 pA at 4 uA full scale
Full scale range:	0.4 nA / 40 nA / 4uA
Leakage current:	< 200 fA, typically <20 fA
Time constant:	20 ms
Bias voltage range:	± 50 through ± 500 V
Trigger interface:	RS 485 (custom specific)
Common interface:	ETHERNET (100BaseT)
Main supply:	100 – 240 V AC ± 10 %; 50/60 Hz

LDA-99SC

Number of diodes:	99
Diode spacing:	5 mm (center-to-center)
Diode specifications	
Type of silicon:	Hi-pSi diode detectors
Chip size:	2.45 mm x 2.45 mm
Diameter of active area:	2.0 mm
Sensitivity:	35 gy/nC
Effective measurement point:	<1 mm
Positioning in phantom:	0, 45, 90 and 135 degrees

emXX

Number of channels:	99+1
Measurement mode:	dose, dose rate, real-time, simultaneous measurements of all channels
Characteristics (Dose/Dose rate)	
Input range:	0 nA to 500 nA
Accuracy:	± 1 % for currents > 10 pA
Resolution:	100 fC (for charge values up to 0.2 mC)
A/D converter:	128 simultaneous working A/D converters
Dimensions (LxWxH):	320 mm x 265 mm x 70 mm
Weight:	3.75 kg

Water Reservoirs

Pump direction:	bi-directional (HA05) / uni-directional (HA06)
Tank volume:	220 l
Flow control:	20 l/min
Dimensions (LxWxH):	970 mm x 660 mm x 830 mm
Weight (empty):	70 kg

Lift Tables

Operation:	manual (HA01)/ electric (HA03)
Vertical range:	660 - 1020 mm / 660 - 1160 mm
Vertical adjustable range (tilt):	± 15 mm / 20 mm
Horizontal adjustable range:	- 15 mm in X/Y direction
Rotation in XY plane:	n.a. / ± 5°
Table size:	635 mm x 635 mm / 680 mm x 680 mm
Dimensions (LxWxH):	790 mm x 630 mm x 660 mm / 840 mm x 680 mm x 660 mm
Weight (empty/full tank):	69 kg / 116 kg

TMR Set (requires Water Reservoir HA05)

Scan length:	30 cm
Position reproducibility:	± 0.3 mm
Filling / draining speed:	50 mm / min

Minimum Computer Requirements

Operating systems (US-English versions only):	Windows® XP Professional, Service Pack 3, 32 bit Windows® Vista™ Ultimate, Service Pack 2, 32 bit Windows® 7 Enterprise, Service Pack 2, 32 bit and 64 bit
Processor:	Dual Core (or equivalent), 2 GHz or better
RAM:	2 GB of RAM
Graphics card:	DirectX 9c compatible, 256 MB video RAM, no shared memory
Screen resolution:	minimum 1280x1024 with 32 bit color
Network:	Ethernet (RJ-45) connection to connect controllers (e.g. CCU, emXX)
Free space on harddisk:	minimum 300 MB free disk space before installation and 80 MB after installation: For archiving of data, much more disk space is needed

**MADE IN GERMANY.
SUPPORTED GLOBALLY.**

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enhance
and save
lives**

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