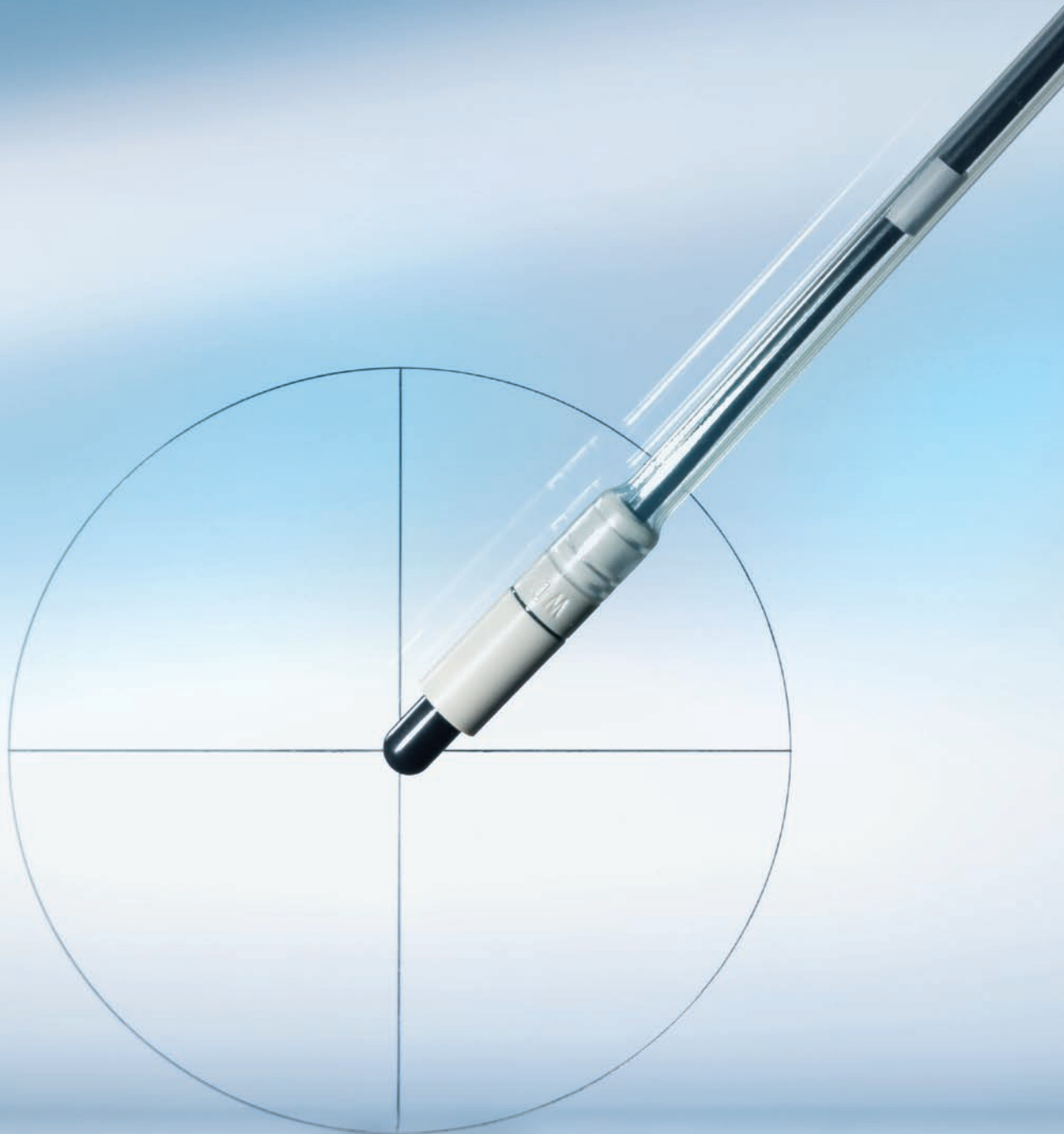




# Detectors for Relative and Absolute Dosimetry

Ionization Chambers and Diode Detectors



# Detectors for Relative and Absolute Dosimetry

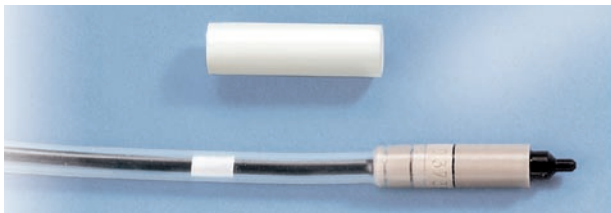
IBA Dosimetry offers a full range of ionization chambers and  $\rho$ Si semiconductor detectors for various 2D and 3D water phantom systems. All detectors are from our in-house production and have been extensively tested to meet the highest criteria in radiotherapy dosimetry.

## Air Ionization Chambers

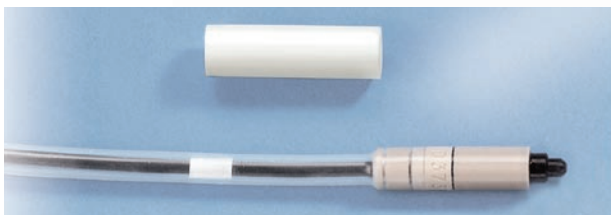
### Compact Chambers

#### Applications:

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



CC01



CC04

#### CC01 and CC04

CC01 and CC04 are the conventional ionization chambers for measurements of small fields and of ranges with high dose gradients, e.g. stereotactic fields.

### CC08

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

### CC13

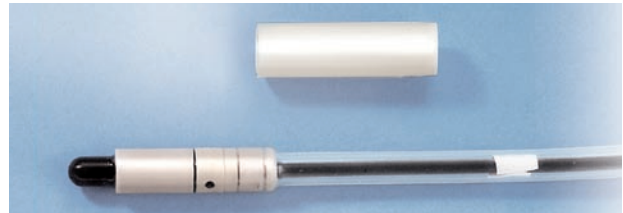
CC13 is the standard chamber for clinical use in water phantoms and for output factor measurements.

### CC25

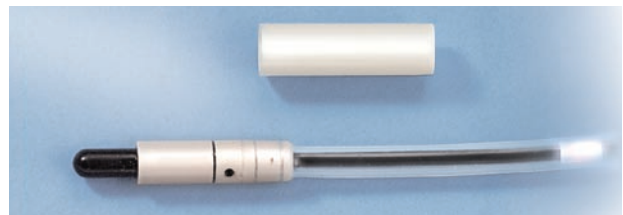
CC25 is mainly used for quality assurance in air and for low dose measurements in water phantoms.

### CC13-S

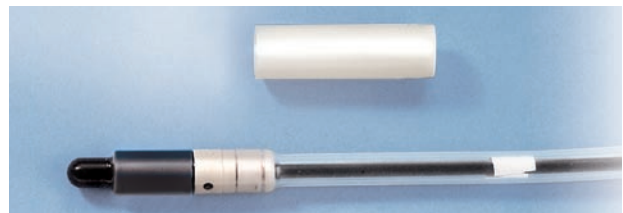
The CC13-S is replacement for RK chamber used in RFA phantoms. Parameters of the CC13-S are similar to CC13.



CC08 / CC13



CC25



CC13-S

### Features

	Waterproof	Vented through waterproof sleeve	Fully guarded	High uniform spatial resolution	Used for radial and axial beam incidence
CC01	■	■	■	■	
CC04	■	■	■	■	
CC08	■	■	■		■
CC13	■	■	■		■
CC25	■	■	■		
CC13-S	■	■	■		■

# Farmer Type Chambers

## Applications:

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



FC65-G

### FC65-G

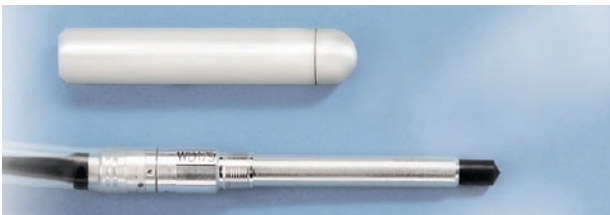
FC65-G is the standard reference detector for reference dosimetry and scientific applications.



FC65-P

### FC65-P

FC65-P can be used for all routine applications.



FC23-C

### FC23-C

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

## Features

	Waterproof	Vented through waterproof sleeve	Fully guarded	Wall material	Robust plastic construction for daily beam check	Higher spatial resolution
FC65-G	■	■	■	Graphite		
FC65-P	■	■	■	POM	■	
FC23-C	■	■	■	C552	■	■

# Plane Parallel Chambers

## Applications:

All plane parallel chambers are designed for measurements with high reproducibility in air, in solid or in 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 and allows measurements at shallow depth and high accuracy even at low electron energies is guaranteed.



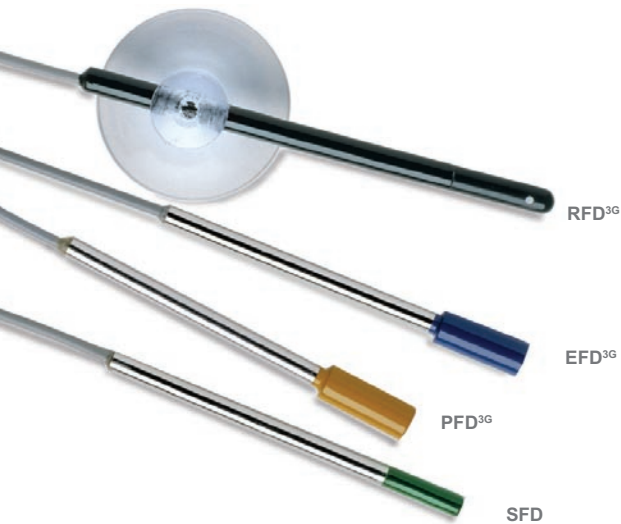
NACP

Features	Waterproof	Vented through waterproof sleeve	Fully guarded	Higher spatial resolution (depth dose)	Superior physics characteristics: – stabilization time after polarity change approx. 30 s – polarity effect < 1% for all usable energies, field sizes and depths at linear accelerators	Low polarity effect
PPC05	■	■	■	■		
PPC40	■	■	■		■	
NACP	■	■	■			■

# Diode Detectors

## Applications:

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



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 *p*Si semiconductors. The high doped *p*-type silicon detector chips, specifically designed for radiation therapy applications, have since their introduction in 1992 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.

## Features

	Waterproof	Proven dose rate and energy independence	High uniform spatial resolution in the beam plane and precise definition of the measurement depth (accurately shaped penumbras in the whole beam plane using the same detector orientation)	Direct electron depth dose, no need for ionization to dose conversion	Independent of bias, pressure and moisture, very robust – always reliable, no “warm-up” time	High durability: 3 year warranty – low lifetime costs
PFD <sup>3G</sup> Photon	■	■	■		■	■
EFD <sup>3G</sup> Electron	■	■	■	■	■	■
RFD <sup>3G</sup> Reference	■	■	■		■	■
SFD Stereotactic	■	■	■	■	■	■

# Technical specifications

## Compact Chambers

	Cavity volume (cm <sup>3</sup> )	Cavity length (mm)	Cavity radius (mm)	Wall material	Wall thickness (g/cm <sup>2</sup> )	Central electrode material	Water-proof
<b>CC01</b>	0.01	3.6	1.0	C552	0.088	Steel	Y
<b>CC04</b>	0.04	3.6	2.0	C552	0.070	C552	Y
<b>CC08</b>	0.08	4.0	3.0	C552	0.070	C552	Y
<b>CC13</b>	0.13	5.8	3.0	C552	0.070	C552	Y
<b>CC25</b>	0.25	10.0	3.0	C552	0.070	C552	Y
<b>CC13-S</b>	0.13	5.8	3.0	PEEK/C552	0.154	C552	Y

## Farmer Type Chambers

	Cavity volume (cm <sup>3</sup> )	Cavity length (mm)	Cavity radius (mm)	Wall material	Wall thickness (g/cm <sup>2</sup> )	Central electrode material	Water-proof
<b>FC65-G</b>	0.65	23.1	3.1	Graphite	0.073	Aluminium	Y
<b>FC65-P</b>	0.65	23.1	3.1	POM <sup>1</sup>	0.057	Aluminium	Y
<b>FC23-C</b>	0.23	8.8	3.1	C552	0.070	C552	Y

Various build-up caps for compact chambers and farmer type chambers in PMMA or other materials on request.  
Farmer type chambers: For Cobalt energies the protection cap can be used as build-up caps.

## Plane Parallel Chambers

	Materials	Window thickness (mg/cm <sup>2</sup> )/(mm)	Active volume (cm <sup>3</sup> )	Electrode spacing (mm)	Collecting electrode diameter (mm)	Guard ring width (mm)	Water-proof
<b>PPC05</b>	Window and body C552; graphited (PEEK) electrode	176 / 1	0.05	0.5	10	3.5	Y
<b>PPC40</b>	PMMA	118 / 1	0.40	2.0	16	4.0	Y
<b>NACP</b>	Mylar foile and graphite window; body PMMA; electrode graphited	104 / 0.6	0.16	2.0	10	3.0	Y

<sup>1</sup> Poly Oxy Methylene (CH<sub>2</sub>O). A trade name is Delrin.

## Diode Detectors

	Effective measurement point	Chip size (side/thickness)	Geometric form of active area	Diameter of active area	Thickness of active volume
<b>PFD<sup>3G</sup> Photon</b>	< 0.9 mm	2.5 / 0.5 mm	circled	2 mm	0.06 mm
<b>EFD<sup>3G</sup> Electron</b>	< 0.9 mm	2.5 / 0.5 mm	circled	2 mm	0.06 mm
<b>RFD<sup>3G</sup> Reference</b>	n. a.	2.5 / 0.5 mm	circled	2 mm	0.06 mm
<b>SFD Stereotactic</b>	< 0.9 mm	0.95 / 0.5 mm	circled	0.6 mm	0.06 mm

Technical data is subject to change without prior notice.

# IBA activities in a nutshell

IBA delivers solutions of unprecedented precision in the fields of cancer diagnosis and therapy. The company also offers sterilization and ionization solutions to improve the hygiene and safety of everyday life.

## Diagnostics

IBA has unique expertise in the design of cyclotrons and in the production and distribution of radiopharmaceutical tracers which are used every day in hospitals to quickly and accurately detect cancer, neurological and cardiac diseases. IBA also offers dosimetry products used in many hospitals for quality assurance in X-Ray diagnosis and for patient-dose monitoring

## Therapy

IBA has developed Radiotherapy solutions and dosimetry equipment to treat cancer with the greatest accuracy. IBA is the undisputed leader in Particle Therapy, acknowledged to be the most precise and effective clinical radiotherapy method in the selective destruction of cancer cells.

## Sterilization & Ionization

IBA designs electron accelerators and high power X-Ray solutions used in many industries to sterilize medical devices, to cold pasteurize food products and to improve polymer properties. Over 250 IBA Industrial accelerators are used in the world today, some for more than 40 years.

IBA a Belgian company, is listed on the paneuropean stock exchange EURONEXT and its Annual Reports can be downloaded on the Website: [www.iba-group.com](http://www.iba-group.com).

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