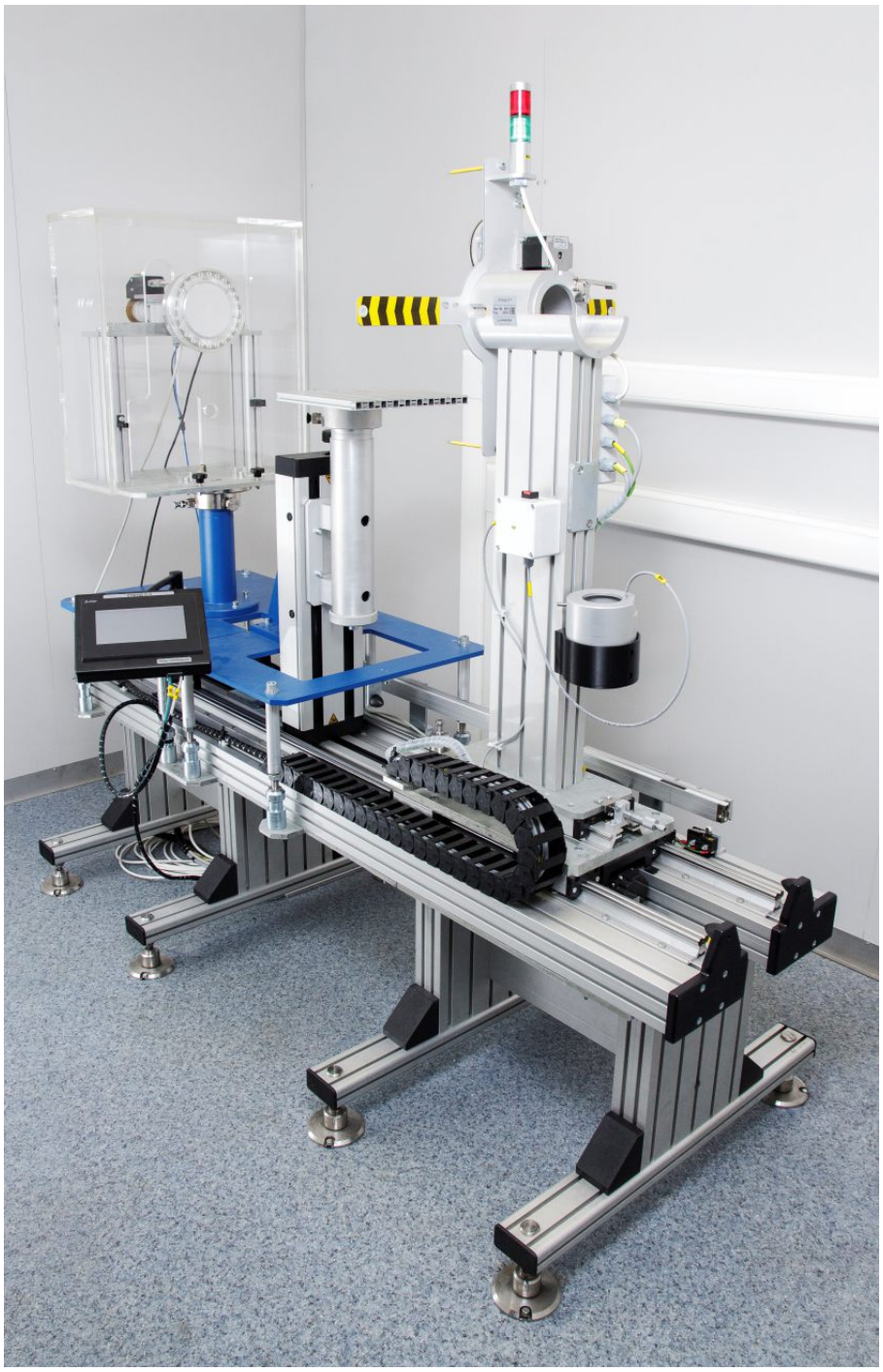
AT200 Beta Calibration Facility



Purpose

Working standard for units of absorbed dose, directional and personal dose equivalents and dose equivalent rates of beta radiation in tissue-equivalent material.

Application

1. Transfer units of dosimetric quantities to working standards, dosimeters for absorbed dose measurement in tissues and to personal dosimeters of beta radiation for calibration and verification
2. Reproduction of units of absorbed dose, absorbed dose rate in tissues by means of automated extrapolation ionization chamber, which is a part of the facility
3. Applied metrology

Features

- Sealed radionuclide sources of beta radiation $^{90}Sr+^{90}Y$ (BIS-50, 22 GBq), ^{85}Kr (KAC.D3, 15 GBq) and ^{147}Pm (BIP-50, 10 GBq) are used
- Reference field is generated by means of sources with movable irradiator unit with smoothing filters
- Dose equivalents of absorbed doses of beta radiation in tissue $D_t(0.07)$ is determined by conversion coefficients according to ISO 6980-3
- Source holders with a shutter and safety shields
- Actuator and linear encoder for irradiator positioning.
- Turning measuring table for positioning of calibrated dosimeters and standard phantoms according to ISO 6980-3
- Calibrated rods and a laser device for aligning and digitization
- Video surveillance system for measurements
- Can be used as part of an automated extrapolation chamber for reproduction of absorbed dose (absorbed dose rate) in tissue
- Measuring ionization currents over 1 fA by automated extrapolation chamber and precision electrometer
- Control system for irradiator positioning, shutter, exposure settings, environmental parameters measurement
- Control and measurement software
- Alarm and interlock system, radiation control system for photon radiation levels in measuring room and operator's room
- Storage case for sources with holders

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Specifications

Absorbed dose rate range of beta radiation $D_t(0.07)$ (rated limits)		10 – 5.5·10³ μGy/s
Source positioning error		0.1 mm
Travel range of irradiator unit in measurement geometry:	"Dosimeters"	100 – 500 mm
	"Extrapolation chamber"	
Intrinsic error of reproduction of beta radiation absorbed dose rate		5%
Diameter of irradiator exit window		55 mm
Height of radiation beam axis		1300 mm

Control area (Operator's room)

Delivery set

Components of calibration bench:

- Moving irradiator unit
- Base
- Remote control
- Control unit
- Measuring table
- Accessory kit

Options:

Automated extrapolation chamber, including:

- Processing unit
- Control unit
- Electrometer
- Accessory kit

Design and specifications are subject to change without notice

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