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CALIBRATION  
LABORATORIES



RESEARCH  
CENTRES

BC-13

# BETA CALIBRATOR



## KEY FEATURES

- Safe remote-controlled calibration
- Beta ionizing radiation standard including the relevant energy filters according to ISO-6980
- Standardized phantoms
- Automatic measurement and correction of the effect of ambient temperature, pressure and relative humidity

## DESCRIPTION

The BC-13 calibrator is primarily intended for convenient and safe calibration of beta radiation detectors and personal dosimeters measuring personal  $H_p(0.07)$ ,  $H_p(3)$  and directional  $H_p'(0.07)$ ,  $H_p'(3)$  dose equivalents in accordance with the ISO 6980 standard.

The calibrated instrument can be irradiated by three different sources of beta radiation with different energies. Two different phantoms can be used for calibration – rod or plate according to the ISO 6980 standard.

Each of the radiation sources has a specific filter for homogenization of the radiation field during irradiation according to ISO 6980. The filter can be removed for the Sr-90 source.

The main components of the calibrator are:

- supporting frame with adjustable legs
- shielded body of the calibrator with 3 sealed radionuclide sources (in accordance with the ISO 9978 standard) and homogenization filters
- linear guide with a worktable for adjustment of the distance in the x axis and adjustment of the angle of rotation of the worktable
- RSBC-13 control box
- PC with control software

BC-13 allows you to choose the source to be used for calibration together with the filter for homogenization of

the radiation field. It also allows you to hide all the sources in the shielding cover. Dangerous exposure of the operator when approaching the calibrator in operation is prevented by an optical barrier, optionally also by a door switch and PIR sensors, which automatically turn the sources to the basic shielded position and put the device in a safe state if a person approaches.

The linear guide with the worktable automatically adjusts the distance of the calibrated meters from the radiation source. The worktable has angular adjustment in the range 0 to 360° for measuring directional characteristics. A rod or plate phantom can be placed on the worktable. A mechanical micro-shift in the X-axis is used to compensate for different phantoms.

Control box includes power supply modules, main power switch, communication interfaces, optical indication of the device status, as well as a temperature, pressure and humidity sensors.

The calibrator contains a lead shield with a cover in which three radiation sources are placed in a carousel. Each source is housed in a separate stainless steel case with a shutter. Using a stepper motor, the carousel rotates so that one of the three sources is exposed to the working position or to a safe position where all three sources are shielded. The status of the device is indicated by an optical indicator on the control box and the control PC monitor.

In the event of a power failure, the source shutter closes automatically. If necessary, after opening the side cover, the carousel with the sources can be turned to the safe position manually.

A connected PC with control software is used to display the status and control the calibrator. It primarily allows you to set the distance of the work table from the source, select and expose the appropriate source and filter to the irradiation position, measure the table rotation angle and end the irradiation after the set time or dose, or in non-standard situations.

## SPECIFICATIONS

Number of sources	3
Reference source activity	
$^{147}\text{Pm}$	3,7 GBq
$^{85}\text{Kr}$	3,7 GBq
$^{90}\text{Sr}/^{90}\text{Y}$	460 MBq
Deployment of the sources	step 90°
Source-detector distance	110 to 700 mm
Distance setting resolution	0,1 mm
Time to set the source into working position	max. 10 s
Angle of the worktable	from 0° to 360° (with step 5°)
Dimensions (w × l × h)	(700 × 1 270 × 1 010) mm
Weight	120 kg
Power supply	230 V 50Hz / 6 A – TN-S
Operational temperature	from 10 to 35°C
Relative humidity	max. 80%, non-condensing
Operational pressure	from 84 to 106 kPa
Interface to host PC	Ethernet
Range of the dose equivalent	0,1 mSv ÷ 10 Sv
Minimum dose equivalent rates	$^{147}\text{Pm}$ – 4,6 mSv/h $^{85}\text{Kr}$ – 155 mSv/h $^{90}\text{Sr}/^{90}\text{Y}$ – 374 mSv/h
Maximal dose equivalent rate on the cover surface with shielded sources.	3 μSv/h
Range of the irradiation time	(from 10 to 1E8) s

## OPTIONAL ACCESSORIES

Entry door sensor and lock and PIR motion sensors

CCTV

Radiation monitoring system

Holders for various types of calibrated detectors

## RELATED PRODUCTS

BC-03 Personal Dosimeter Calibrator

PGI-01 Panoramic Gamma Irradiator



Rotating worktable with a micro-shift