



FSUE "D.V. Efremov Scientific Research Institute of Electrophysical Apparatus"

Scientific and Production Complex of Linear Accelerators and Cyclotrons

NPK "LUTS" NIEFA

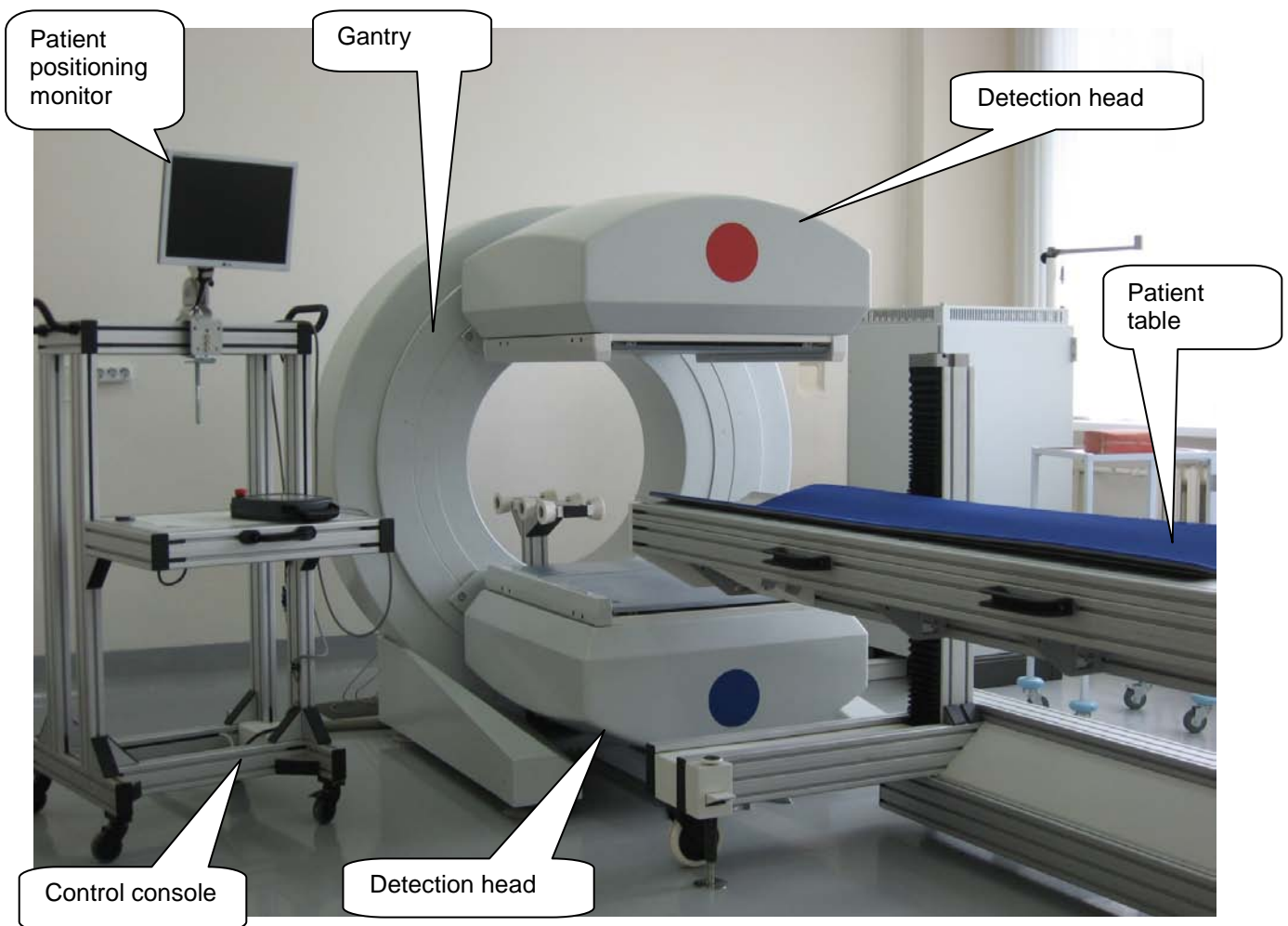
"EFATOM" – Double-detector Single-photon Emissive Computerized Tomograph

The EFATOM tomograph is intended for medical diagnostics of the internal organs and systems in the human body by visualizing the distribution of medical preparations labeled by gamma-radiating radionuclides (radiop-harmaceutical preparations).

The result of tomograph operation consists in one-channel digital images that represent the projections of a three-dimensional radiopharmaceutical preparation distribution onto the plane of a detector.

The EFATOM was subjected to technical and clinical tests at clinical hospital 83 (Moscow). The registration certificate is FCR 2009/05499.

The EFATOM consists of the following parts: a support-rotation unit (gantry), detection units, a set of collimators with collimator storage and change device, a patient table, a control console, a patient positioning monitor, and a cardiosynchronizer.



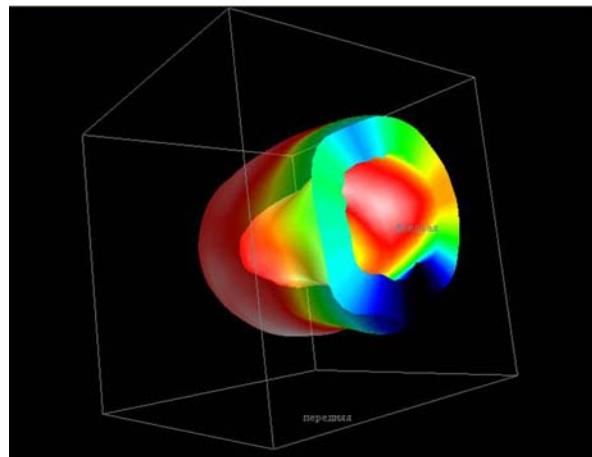
Appearance of the EFATOM gamma tomograph

Main characteristics of gantry:

Parameter	Value
Inside diameter of the rotation trajectory, mm	0–170
Angular motion range, deg	0–357
Angular positioning accuracy, deg	0.5
Maximum angular rate, rpm	0.5
Radial positioning accuracy, mm	0.5



Work place of nuclear physician



Three-dimensional reconstruction of left ventricle of heart

Comparative characteristics of base gamma tomograph models:

Parameter		Value of the parameter		
		Gamma tomograph EFATOM	Gamma tomograph E.CAM (Siemens)	Gamma tomograph Nucline Spirit DH-V (Mediso)
Useful field of view (UFOV), mm		546 × 405	533 × 387	530 × 390
Instrumental spatial resolution of the detector at a level of 0.5 (FWHM), mm	In the central field of view (CFOV)	3.4	3.8	3.6
	In the useful field of view (UFOV)	3.4	3.9	3.7
System spatial resolution of the detector with a low-energy high-resolution collimator at a level of 0.5 (FWHM), mm		6.5	7.4	7.3
Instrumental integrated image nonuniformity, at most, %	CFOV	1.8	2.9	2.4
	UFOV	2.4	3.7	2.9
Instrumental differential image nonuniformity, at most, %	CFOV	1.4	2.5	1.9
	UFOV	1.9	2.7	2.4
Instrumental absolute image nonuniformity, at most, mm	CFOV	0.31	0.4	0.38
	UFOV	0.31	0.7	0.4
Instrumental differential image nonuniformity, at most, mm	CFOV	0.15	0.2	0.2
	UFOV	0.15	0.2	0.4
Counting rate in a 20% window, cps		200	–	160

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