

# Unified phantom UP-02T

## UP-02T

Standard sample

Unified phantom UP-02T has gained the greatest popularity in the Russian Federation and in the world. Phantom UP-02T consist of polyethylene blocks with holes, in which rod sources with radioactive material are placed. From blocks phantoms of a wide range of physiqes can be assembled – from a child of 2 years old weighing 12 kg to an adult man weighing 110 kq.

### Features

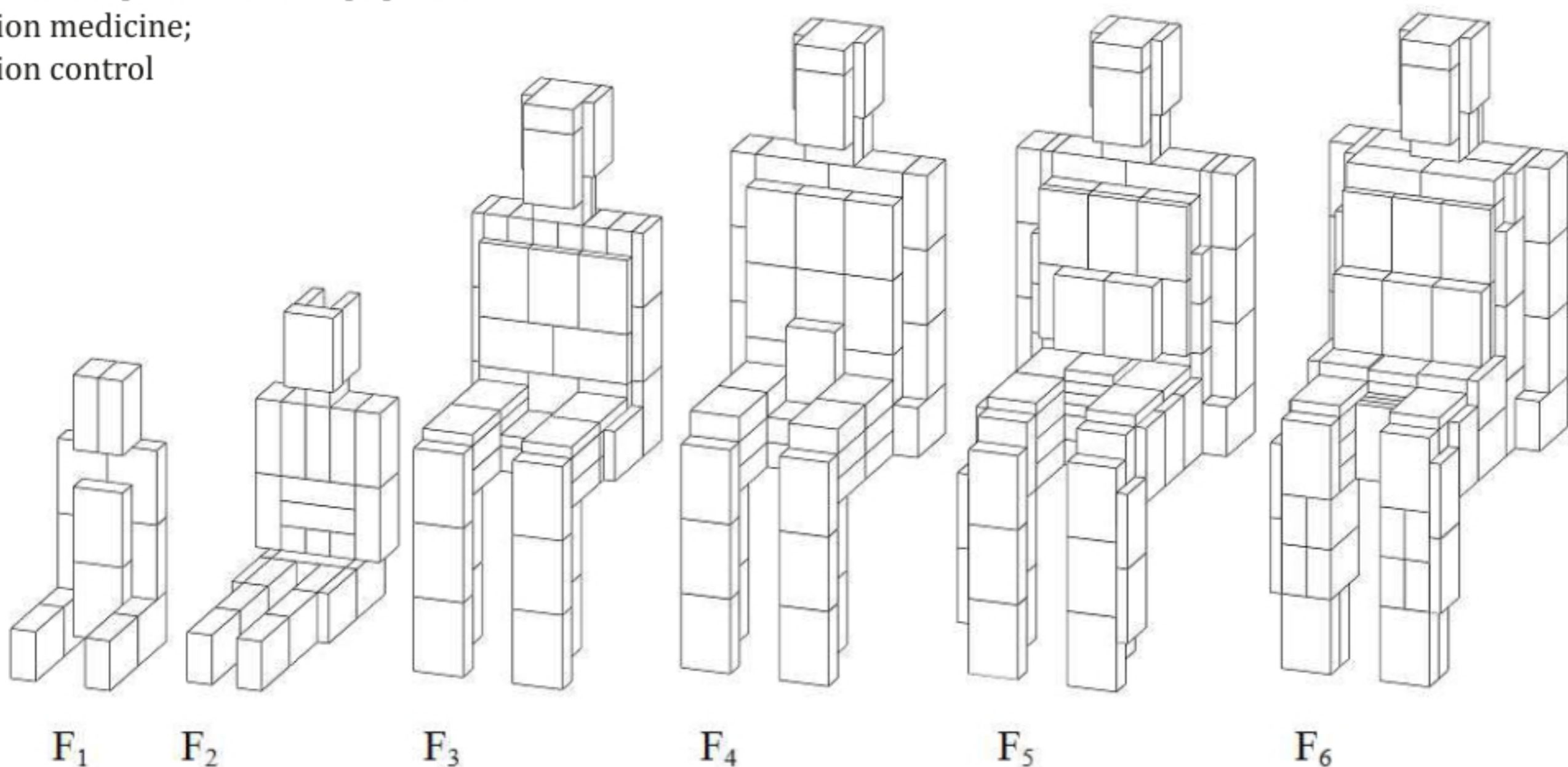
- The location of sources in phantom blocks corresponds to uniform distribution of radionuclides in the human body. Phantom UP-02T satisfactorily reproduces spatial-energy spectrum of gamma-radiation of incorporated radionuclides to transfer the activity value of radionuclides to a whole body counter (WBC) by means of its calibration in energies range from 350 to 3000 keV.
- The construction of the phantom UP-02T provides the possibility of phantom assemblies: of different physiqes from the range child-teenager-adult; in measurements geometries – “sitting”, “standing-lying”.
- Geometrical dimensions of different phantom assemblies correspond to anthropomorphic characteristics and human body posture.
- Impermeability and wide range of rod radionuclide sources.

Phantom UP-02T was used to calibrate the whole body counters applied in mass screening of the population affected by the Chernobyl accident in Russia, Ukraine and Belarus. In 1996 it was used for international comparisons of WBC in 19 countries of the European Union.



### Sphere of application

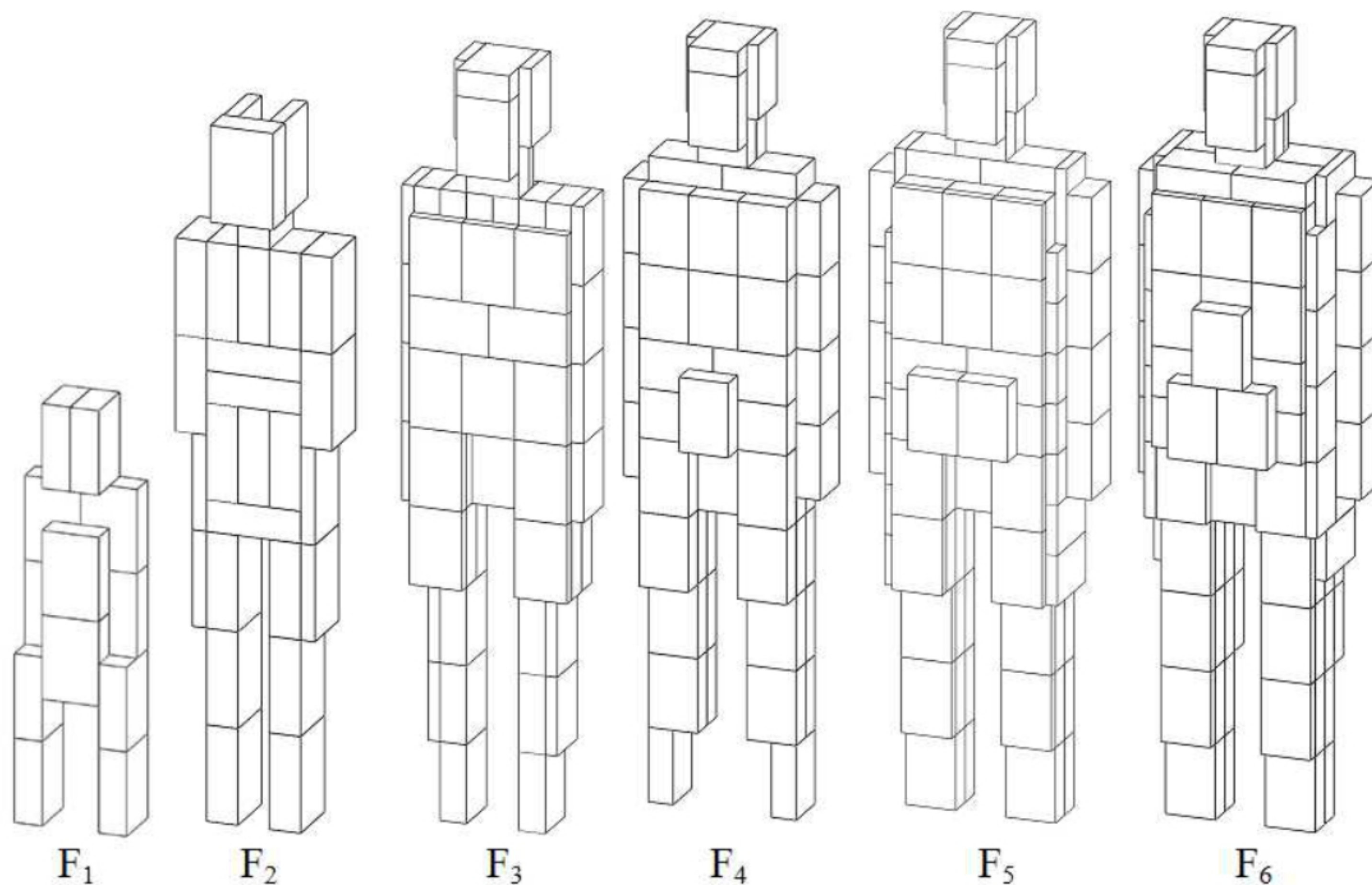
- Metrology of spectrometry of body counting;
- Calibration of spectrometric equipment;
- Radiation medicine;
- Radiation control



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## Main characteristics

Assembly possibilities: UP-02T - sitting position (standard assembly), UP-02T - lying, standing position



Density of polyethylene, used for manufacture of phantom blocks: from 0,93 to 0,96 g/cm<sup>3</sup>

Standard range of activity of the rod radionuclide sources set: from 10<sup>3</sup> to 5\*10<sup>5</sup> Bq

**Main radionuclides used for manufacture of rod radionuclide sources:**

<sup>57</sup>Co, <sup>60</sup>Co, <sup>133</sup>Ba, <sup>152</sup>Eu, <sup>137</sup>Cs, <sup>134</sup>Cs, <sup>40</sup>K and other radionuclides by agreement with the Customer.

Type of the phantom (index of standard sample in the set)	Age and anthropometric characteristics of the human body			
	Age, years	Weight, kg	Height, cm	Average thickness, cm
F1	2	12	82,5	8,8
F2	6	24	121,0	10,9
F3	14	50	160,0	11,8
F4	18	70	170,5	14,3
F5	18	90	170,5	15,7
F6	18	110	170,5	19,4

**Assembly of the phantom with radionuclide sources makes the standard sample of activity of incorporated radionuclides, uniformly distributed in the human body.**

**Assembly of polyethylene blocks without radionuclide sources make the background samples (background phantoms) of the corresponding type and size.**

**Delivery set:** polyethylene block "nominal" - 90 pcs., polyethylene block "half" - 40 pcs., connector - 280 pcs., fixing - 10 pcs., mounting blade - 1 pcs.

**Optional** (by agreement with the Customer): rod radionuclide source "nominal" - 180 pcs., rod radionuclide source "half" - 80 pcs., pen-box, tripod.