OG-8 Gamma Irradiator

Purpose

The OG-8 gamma irradiator, fitted with appropriate radionuclide sources, serves as a reference source of homogenous, collimated beam of gamma radiation, ranging from tenths of μGy/h up to units Gy/h.

Usually, it is a part of gamma dose and dose rate meters calibration laboratories.

Description

The main parts of OG-8 gamma irradiator are:

- lead-shielded rotary carousel for max. 7 sources
- radiation beam collimator
- mechanical indicator of the source position
- control unit
- safety system indicating the process of irradiation and a safe status of the irradiator

The sources are placed at the bottom of the rotary carousel. The carousel is equipped with 7 slots for placing sealed radionuclide sources and one empty slot (parking position) enabling safe status of the irradiator when all the sources are safely shielded. Each of the sealed radionuclide sources is fixed inside a special holder designed for being used with the OG-8 irradiator.

For irradiation the chosen source arrives in the working position under the collimator and then it is ejected to expose the space in front of the irradiator. The exposed source indicator at the top displays the irradiation status.

The irradiator is equipped with the safety system enabling automatic exposure termination in case of non-standard or emergency situations. In case of the power failure the exposed source automatically returns to the shielded position via gravity.

Main Advantages

- 7 different gamma radiation sources
- Provides homogeneous, collimated beam with dose rate of up to units of Gy/h
- Very low dose rate on the irradiator’s surface
- Independent mechanical indicator for carousel position verification
- Fully automated irradiation process
- Integrated safety system

Standards and Certification

Type approval ref. no. 5548/2005 issued by the State Office for Nuclear Safety, Czech Republic.

The irradiators collimator fulfils the requirements of ISO 4037-1: X and gamma reference radiation for calibrating dose meters and dose rate meters and for determining their response as a function of photon energy - Part 1: Radiation characteristics and production methods.
Description

The irradiator is set to provide the beam axis at the height 1,5 m.
At the bottom of the irradiator there are adjustable feet which allow setting the required height of the beam.

Typically the calibration bench CB-50 is installed in front of the irradiator, moving on rails. The track length is adjustable in segments of 1 and/or 2 m.

The irradiator can be equipped by different types of collimators:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Collimator parameters</th>
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</thead>
</table>
| C-100 | acc. ISO 4037; collimates **wide beam** of radiation | • Inlet diameter 60 mm  
|       |                                    | • Outlet diameter 150 mm  
|       |                                    | • Length 290 mm         |
| C-110 | acc. ISO 4037; collimates **narrow beam** of radiation | • Inlet diameter 60 mm  
|       |                                    | • Outlet diameter 100 mm  
|       |                                    | • Length 290 mm         |
| C-130 | acc. GOST 8.087-2000                | • Inlet diameter 116 mm  
|       |                                    | • Outlet diameter 116 mm  
|       |                                    | • Length 290 mm         |

The irradiator and Calibration laboratory equipment of the company VF are controlled remotely via the connected PC by the means of the SW DARS.

The calibration laboratory can be controlled and operated manually or in the fully automatic mode in accordance with the pre-set calibration procedures.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Number of sources</td>
<td>max 7</td>
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</table>
| Maximum activity of individual radiation source | 200 TBq $^{137}\text{Cs}$  
|                                       | 370 GBq $^{60}\text{Co}$ |
| Dose rate on the irradiator's surface | $\leq 0,1 \mu\text{S}/\text{h}$ (for $^{137}\text{Cs}$)  
|                                       | $\leq 10 \mu\text{S}/\text{h}$ (for $^{60}\text{Co}$) |
| Maximum source dimensions            | 37 x 65 mm (Ø x l) |
| Beam axis height                     | 1,5 m |
| Radiator position setting time       | Max. 15/2 s |
| Repeatability of source placement    | ± 0,5 mm |
| Power supply                         | 110 / 230 VAC |
| Communication with host system       | Ethernet, RS-485 |
| Weight with standard double shielding| approx. 3,5 t |
| Dimensions                           | Ø 670 mm (720 with collimator), x height 2190 mm |

Models and Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>K0123-02</td>
<td>OG-8 Irradiator</td>
</tr>
<tr>
<td>S5003-01</td>
<td>Software DARS Basic Control</td>
</tr>
</tbody>
</table>

Optional Accessories

- Ionizing radiation sources & holders
- Laser in the beam axis
- Emergency shielding shutter

Related Products

<table>
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<tr>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>GI-06</td>
<td>Gamma Irradiator</td>
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<tr>
<td>IG-13</td>
<td>Gamma Irradiator</td>
</tr>
<tr>
<td>PGI-01</td>
<td>Panoramic Gamma Irradiator</td>
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<tr>
<td>CB-50</td>
<td>Calibration Bench</td>
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