

ACAD 2000 dose calibrator



Principle

The ACAD 2000 calibrator provides a simple and accurate way of measuring the activity both in curies (Ci) and becquerels (Bq) of radioisotopes emitting gamma ray. Its main use is the calibration of the radiopharmaceutical doses injected to patients in nuclear medicine imaging.

ACAD 2000 system is composed by a well chamber detector optionally equipped with the up and down sample holder device "posilift" and a remote control electronic unit equipped with a touch screen panel that allows the operator to navigate in the different functions of the software.

Each calibrator is delivered with a calibration certificate which guarantees that the instrument had been calibrated, before delivery, according to current standard (CEI/IEC 1303).

Both electronic remote unit and ionization chamber are matched and identified with the same serial number (affected during the calibration procedure).

Description

The dose calibrator includes:

- a gamma rays detector with a well ionization chamber protected against the background radiation (natural or parasite) by a lead shielding;
- a remote control electronic unit with a touch screen panel than allows to navigate into the software through the activation of dedicate zone. This electronic unit is equipped with 3 RS232 type connectors for multiple detector application, a parallel connector for label printing device and a lan ethernet interface RJ 45 type;
- a sample holder for the introduction of the radioactive sources to be measured into the well chamber. The sample holder had been specially designed to present the minimum absorbent screen effect for the radiation to be measured under the 3 principal radioactive sources conditioning: vial, syringe, capsule.

It includes a removable radio transparent plastic well lining which is placed into the well of the detector in order to protects the inside of the well chamber from any accidental contamination, notably caused by leakage of the measured radioactive liquid sources (this well lining is easily removable and decontaminable).

The well chamber can receive as an option the up and down sample holder system Posilift.

- a 3 meters long cable with connectors between the well chamber detector and the remote electronic control box.
- a 1.54 meter long cable for the power supply of the electronic control box (220-240 V / 50-60 Hz).

Technical description

Detector

The detector in an aluminum ionization well chamber surrounding by a lead shield that protects the detector from the background radiations and the operator from the measured sources rays.

Height (outside): 420 mm.

Diameter (outside): 220 mm.

Diameter of the well lining: 42 mm.

Thickness of lead protection: 3 to 6 mm.

Weight: 22 kg.

Filling gaz: argon (99 %) at 2.5 bars.

Polarization high voltage: 360 V.

Energy range: from 30 KeV to 2 MeV.

Operating temperature: 18°C to 25°C.

Isosensitivity zone at 1%: total height 60 mm / total width at the center 25 mm.

Isosensitivity zone at 2%: total height 90 mm / total width at the center 30 mm.

Isosensitivity zone at 5%: total height 135 mm / total width at the center 40 mm.

Iometer

250 possibilities of preset isotopes per conditioning (vial, syringe, capsule).

The following limit values are given for the Tc99m.

Measurement range:

- detection threshold 185 kBq;

- maximum activity 75 GBq.

Measurement accuracy: 5 % (including the accuracy of the standard source).

Repeatability (relative standard deviation on the mean value): 0.2%.

Reproducibility (relative standard deviation on the mean value): 0.5%.

Response time: min. 2 s / max. 5 s.

Electrical data: class 1 (according to 60601-1 standard).

Tension: 220 V / 240 V.

Frequency: 50 to 60 Hz.

Power: 15 W.

Selectable functions on the different menus of the touch screen panel

- Measurement (Ci or Bq).
- Isotope selection (on a 250 nuclide list).
- Conditioning choice (vial, syringe, capsule).
- Operator selection.
- Decaying calculation (backward-forward).
- Zero electronic.
- Calibration.
- Drift.
- Mo99 test.
- Repeatability test.
- Linearity test.
- Multi detector mode (3 detectors simultaneous).
- Label printing (with selectable numbers).

