



ELEKTRA
Precision electrometer

ELEKTRA

The beauty of simplicity

EASY

Easy to install.
Easy to use.
Easy to read.

INTUITIVE

Intuitive to use with just one high resolution digital display for the readout and no obscure sensitivity settings.

SAFE

Exact readings every time due to the absence of controls that influence the sensitivity.
Separate display for check of the bias voltage during the measurements.

VERSATILE

Readout in nanocoulombs allows the use of almost any type of ion chamber for routine work and for specialized purposes.



WHY?

Modern radiotherapy treatment machines are very complex systems and any error in them that goes undetected for several days can cause irreparable injury to many patients.

Daily quality assurance of the treatment machines is essential for safe and efficient radiotherapy. It shows quickly if anything in the treatment machine goes wrong so that the clinical staff can stop the treatments until the machine is repaired and safe to use again.

HOW?

The most essential QA for radiotherapy treatment machines is a daily morning check with an ionization chamber in a phantom block and an electrometer for readout of the given dose.

The phantom with the chamber is just placed on the treatment table, set up with a given distance and field size and irradiated with a predetermined number of monitor units.

This procedure is very quick and easy and it verifies the proper operation of the distance indicator, field size setting and the internal dose monitor system of the machine.

With such a QA system installed on each treatment machine the radiographers can perform this morning dosimetry check on their own, without the intervention of a physicist.

The Elektra precision electrometer is designed primarily for daily dose monitor checks of radiotherapy treatment machines, performed by physicists or radiographers. It is designed for ease of use and intuitive handling and is based on more than 35 years of experience with dosimetry systems for radiotherapy.

Elektra has only two controls accessible on the front panel: the On/Off switch and the reset button. All other controls require a screwdriver to access, either the offset control that is reached through a hole in the front panel or the setting of the magnitude and polarity of the bias voltage that is done inside the electrometer unit. Elektra is calibrated in nanocoulombs so all readings are in absolute charge. It has no switches for different chambers or additional correction factors that can be accidentally set in the wrong position in a way that is impossible to check afterwards.

This makes the Elektra system extremely simple and safe to use. The responsible physicist determines the nominal level and acceptable limits of variation in the charge reading and can then delegate the measurement and recording of the morning checks to the radiographers. Any reading outside the defined limits should result in an immediate investigation and repair of the treatment machine before any patients are treated with it.

Elektra is very compact and it is very easy to find a suitable place for it, even in a small control room. The ideal position for it is on a shelf at eye level and within easy reach.



WHAT DO YOU NEED?

For a compact and comprehensive daily dose monitor QA system you need an Elektra electrometer unit in the control room, an ion chamber cable from the control room into the treatment room and an ionization chamber mounted in a solid phantom block in the treatment room. For the morning checks the phantom block is placed at isocenter distance, a standard treatment field size is set and the phantom is irradiated with a predefined dose, typically 100 or 200 monitor units. The measured charge is compared against the predefined limits and recorded in the QA-logbook. If the reading is within the limits, the patient treatments can start, and if not, an immediate intervention by the technical staff is required.

The QA-logbook is both a valuable quality record for the department quality system and also a very useful tool to monitor the long-term performance of the treatment machines.

Technical specifications

Dimensions:	30×16×5 cm
Weight:	1.4 kg
Display resolution:	4½ digits
Display ranges:	Two ranges automatically switched, 19.999–199.99 nC.
Bias voltage:	Internally adjustable within 200–400 V with reversible polarity.
Bias voltage display:	3½ digits
Bias voltage resolution:	1 V
Connectors:	BNC-connector for the signal, protected banana jack for the bias voltage and coaxial battery jack for the battery charger. Triaxial BNC or TNC connectors are available as options.
Power supply:	Double insulated transformer unit. Primary voltage: 115 or 230 VAC 50-60Hz Size: 7.5×12×7 cm Weight: 0.7 kg
Backup batteries:	Ni-MH rechargeable batteries, 2×7.2 V, nominal capacity 170 mAh.
Current consumption:	< 15 mA

Options

Phantom block:	Solid phantom with handles and hole for ion chamber. Size: 25×25×5 cm. Weight: 3.2 kg.
Triax connectors:	TNC triax or BNC triax connectors
Ion chamber cable:	Standard length: 20 m, other lengths on request.
Ion chambers:	Chambers suitable for daily QA: Exradin Model A 18, 0.125 cm ³ PTW Type 31010, 0.125 cm ³ Semiflex Chamber A wide variety of ion chambers are available for different other purposes.



Specifications are subject to change without notice.

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