



Dose rate measurement from 1 μ R/h to 1500 R/h
(0.01 μ Sv/h to 15 Sv/h)
automatic or manual range switching
Dose measurement from 1 μ R to 1000 R (0.01 μ Sv to 1 Sv)
Dose rate warning from 1 mR/h to 10 R/h
(10 μ Sv/h to 100 mSv/h)
Dose warning from 1 mR to 10 R (10 μ Sv to 100 mSv)
Energy range 25 keV to 1.3 MeV
Detection probe removable from unit: easy operation
in all usual applications

SZINTOMAT 6134 A

**UNIVERSAL, PORTABLE
SURVEY METER
FOR PHOTON RADIATION
(GAMMA AND X-RAYS)**



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APPLICATIONS AND DESIGN

The SZINTOMAT 6134A is a portable, battery-operated measuring instrument for photon radiation (gamma and X-ray radiation) in the energy range of 25 keV to 1.3 MeV. The instrument has four parallel, simultaneous functions: dose rate measurement, dose measurement, dose rate warning, dose warning.

The exceptionally high dynamic response of the measuring ranges, the field-proven graduation of the warning thresholds which can be switched off and which have visual and audible alarms, together with the removable detection probe allow a universal application of the SZINTOMAT 6134 A in many areas of the field of protective radiation measurement.

The dose rate measurement range starts at 1 $\mu\text{R/h}$ (0.01 $\mu\text{Sv/h}$) so that, for example, even the very low limit of the "External monitoring area" established in the radiation safety regulation of October 13, 1976 is registered [30 mrem (0.3 mSv) per year, corresponding to 3.44 $\mu\text{R/h}$ (34.4 nSv/h)] (Federal Republic of Germany). Since the dose rate measurement range extends to 1500 R/h (15 Sv/h), measurements or work can be performed in areas in which high dose rates are expected, whether limited by time or location. The warning thresholds which can be switched on separately and the dose measurement operating in parallel provide additional protection.

The exceptionally high dynamic response of the dose rate and dose measurement permits examination of the effect of very efficient shielding devices. Since the energy range starts at 25 keV, stray radiation measurements on X-ray equipment and measurements on cathode ray tubes can be taken.

The radiation detector of the SZINTOMAT 6134A is a scintillation probe. A wide energy range and low directivity are obtained using a special scintillator combination (German Federal Patent No. 1789051). A high-performance photomultiplier allows the extensive measuring capability of the instrument.

The dose rate is indicated on a meter with a logarithmic scale. The three overlapping ranges cover values from 1 to 1500 ($\mu\text{R/h}$, mR/h or R/h) (0.01 to 15 $\mu\text{Sv/h}$, mSv/h, Sv/h); range switching is automatic or manual. Three stages are provided for the floating time constant of the indication.

During the dose rate measurement the dose is integrated and displayed digitally. Measuring capability is from 0.001 mR (0.01 μSv) to 999999 mR (μSv); the digits flash off and on to indicate an overflow of the display. The LED display can be switched off without the dose measurement being interrupted. A reset switch allows zeroing of the dose display.

The dose and dose rate warning thresholds which can be switched on separately can each be adjusted in 9 stages with a graduation of 1:3:10. The ranges cover 1 mR to 10 R (10 μSv to 100 mSv) or 1 mR/h to 10 R/h (10 $\mu\text{Sv/h}$ to 100 mSv/h). When a threshold is exceeded an audible alarm, which can be switched off, is triggered. The visual display of the dose rate alarm is a flashing of the corresponding range light in the meter window; during dose alarm the dose display flashes off and on. If both warning circuits are switched on simultaneously it is easy to establish which threshold has been exceeded.

The dose rate can be recorded via a chart recorder connection with additional terminals for range identification. Two more terminals are provided for remote alarm purposes.

Power is supplied by three standard D cells located in the handle of the instrument. An external battery or power supply unit can be connected via a socket.

The SZINTOMAT 6134 A consists of the detection probe and the instrument; both components are fitted with handles. The probe can be inserted into the lower part of the instrument

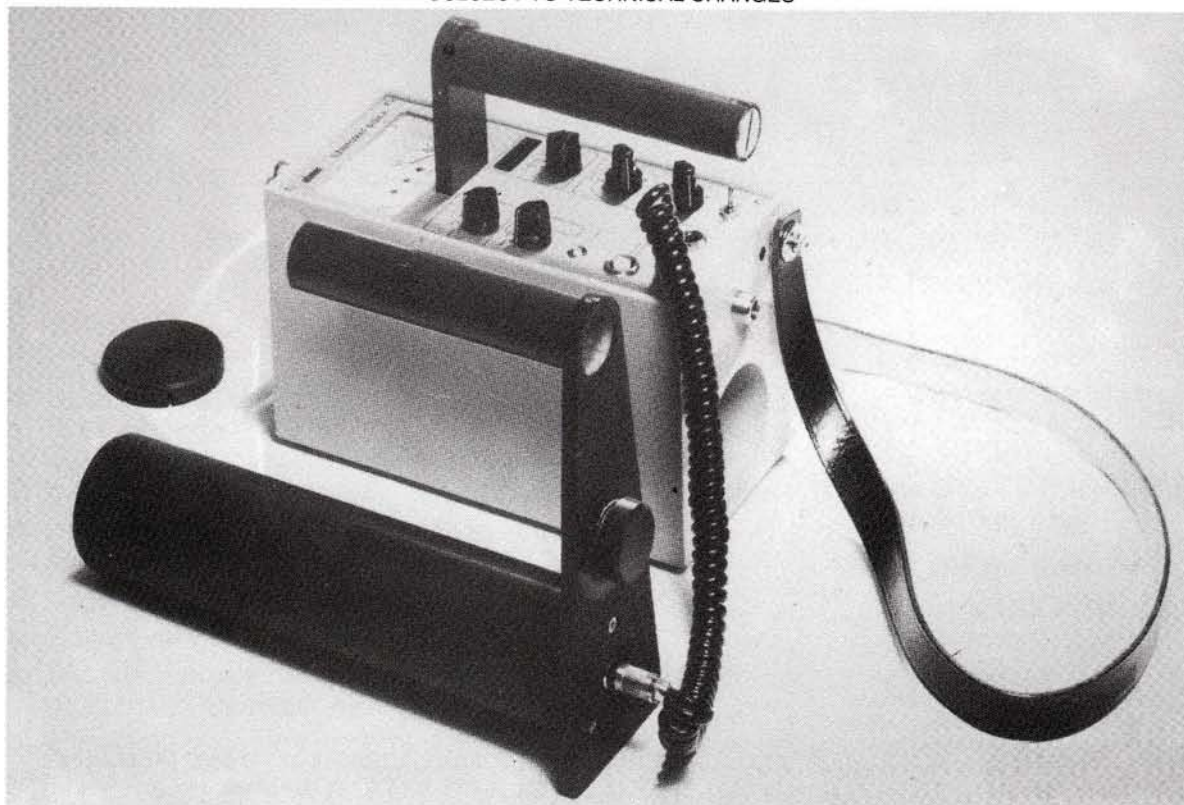
housing and fastened by means of a screw fastener. The handle of the instrument slides into the handle of the probe, resulting in a unit which is easy to manipulate with one hand. The probe is connected to the instrument by means of a plug and cable and an extension cable can be utilized. The instrument can therefore easily be adapted to the most varied conditions of use.

TECHNICAL DATA

Radiation detector	Scintillator combination of plastic scintillator and ZnS layer Ø 44 mm, 15 mm thick
Photomultiplier	EMI 9727 B
Measured value	Standard ion dose rate
Dose rate measuring ranges	1) 1 to 1500 $\mu\text{R/h}$ (0.01 to 15 $\mu\text{Sv/h}$) 2) 1 to 1500 mR/h (0.01 to 15 mSv/h) 3) 1 to 1500 R/h (0.01 to 15 Sv/h)
Dose rate indication	Pointer meter movement with log. scale, 3 decades with overlap from 1000 to 1500 (10 to 15)
Range selection	Automatic or manual, using rotary selector switch
Range display	3 LED displays in meter window
Time constant	Floating, selectable in 3 stages (small, medium, great)
Dose measurement	In steps of 1 μR (0.01 μSv), parallel to dose rate measurement
Dose display	7-segment LED display in two formats with automatic changeover, display can be switched off
Dose display formats	1) 0.001 mR to 99.999 mR (0.01 μSv to 999.99 μSv) 2) 100 mR to 999999 mR (1000 μSv to 999999 μSv)
Dose reset	By means of rotary, self-returning switch
Dose rate warning	9 thresholds adjustable by means of rotary switch, from 1 mR/h (10 $\mu\text{Sv/h}$) to 10 R/h (100 mSv/h), graduation 1:3:10, can be switched off
Dose warning	9 thresholds adjustable by means of rotary switch, from 1 mR to 10 R (10 μSv to 100 mSv), graduation 1:3:10, can be switched off
Audible alarm	Intermittent alarm tone, 4 kHz, approx. 70 dB at 100 cm, cancelling by means of self-returning toggle switch
Visual alarm	a) Dose rate warning: flashing of the corresponding dose-rate range display in meter window b) Dose warning: flashing of the dose display Cancelling: automatic when measurement drops below warning threshold
Remote alarm	Floating relay terminal, 100 V, 0.25 A 10 Watt max.
Chart recorder connection	Log. DC-output 0 mV to 89 mV over 3 decades with overlap scale 1 (0.01) corresponds to 4.45 mV scale 1500 (15) corresponds to 89 mV

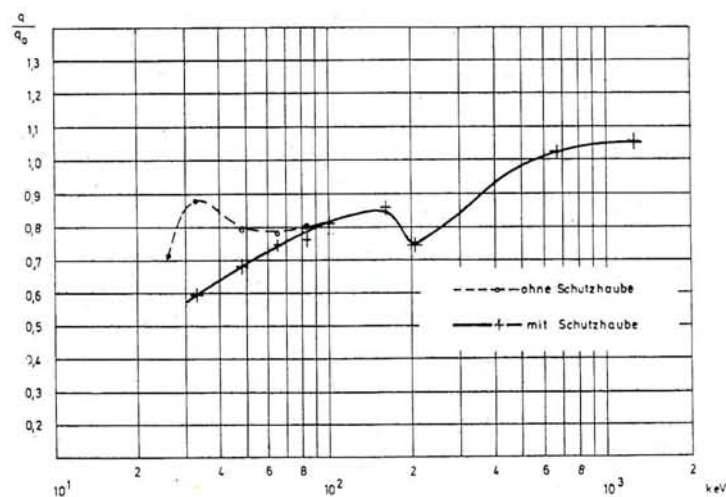
Range marking for chart recorder connection	1 output for 3 ranges, 0.99 V for range 1 R/h (0.01 Sv/h) to 1500 R/h (15 Sv/h) 0.96 V for range 1 mR/h (0.01 mSv/h) to 1500 mR/h (15 mSv/h) 0.93 V for range 1 μ R/h (0.01 μ Sv/h) to 1500 μ R/h (15 μ Sv/h)	Battery life (intermittent)	1) Leakproof cells (Zn-C) e.g. Varta 3020, appr. 14 h 2) Alkali-manganese cells e.g. Varta 4020, appr. 28 h 3) Ni-Cd accumulator e.g. Varta RSH 4, appr. 10 h (for one discharge)
Serial output	9600 Baud, 7 bit, 1 stopbit, no parity	Operating with external power source	Via "Ex. Batt." socket, 3.5 to 4.5 V, min 0.4 A
Measuring precision	$\pm 20\%$, calibration using C 137	Housing	1) Probe: black anodized aluminium, detector cap: plastic, 3 mm thick 2) Measuring instrument: aluminium, plastic coated
Energy dependence	Rated range from 0.025 MeV to 1.3 MeV (detector cap removed)	Dimensions (max. with probe inserted)	Height 245, length 370 (with cable), width 120 (mm)
Detector cap	Plastic, weight per unit area approx. 280 mg per cm ²	Weight	1) Probe with cable 1.9 kg 2) Measuring instrument with batteries 2.8 kg
Directivity	Less than $\pm 10\%$ in rated range of $\pm 45^\circ$ to the preferred direction	Carrying strap	Adjustable, made of decontaminatable plastic
Preferred direction	Parallel to the longitudinal axis of the probe in direction facing the front of the probe	PTB qualification symbol	23.01 82.15
Temperature range	-20°C to $+40^\circ\text{C}$	Accessories (on request)	
Temperature dependence of the measured value	$\leq 10\%$	Radiation source	Cs 137, 9 μCi (333 kBq), with shielding container
Air humidity	Rated range 0 to 90 % relative humidity	Charging unit 875.1, with cable	For charging via "Ext. Batt." socket when using Ni-Cd accumulators
External atmospheric pressure	Rated range 600 to 1300 mbar	Extension cable G 187.4	10 m long, to connect the probe
Operating position	Rated range: any, normal position: meter scale horizontal, viewed from above	Recorder LM 2322	2-channel recorder with automatic range switching
Power supply	3 standard D cells according to DIN 40 865 or ICE R 20 (34 mm dia., 60 mm high)		

– SUBJECT TO TECHNICAL CHANGES –





SZINTOMAT 6134 A with check source 6707



Energy dependency SZINTOMAT 6134 A
 --- o --- without probe cap
 — + — with probe cap



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