



- Measuring unit consisting of the scintillator probe 6150 AD-b and a dose rate meter 6150 AD 5 or 6150 AD 6
- High sensitivity due to large scintillator:
Dose rate measurements starting from as low as 5 nSv/h
- Large energy range 23 keV to 7 MeV
- Four parallel operating modes with any desired display:
Dose-rate • average value of dose rate (average-value or standard-deviation display, can be switched over) • maximum dose-rate value • cumulative dose
- Adjustable dose- and dose-rate warning thresholds
- Automatic range switching, easy operation
- Inherent background radiation < 1nSv/h
- Qualified by the PTB
(German Federal Bureau of Standards)

SCINTILLATOR MEASURING

UNIT 6150 ADB

with organic scintillator for measuring photon radiation (gamma and X-rays)

GENERAL

The scintillator measuring unit 6150 ADB is a portable, battery-operated radiation measuring unit for photon radiation (gamma and X-rays). It consists of the scintillator probe 6150 AD-b and a dose rate meter 6150 AD 5 or 6150 AD 6. A three inch organic scintillator is used as a radiation detector. The energy range is 23 keV to 7 MeV. A high sensitivity (from 5 nSv/h) allows especially fast and accurate measurements in the area of natural ambient radiation. Other areas of application are for example leakage radiation measurements and measurements on picture tubes.

DESIGN

The tubular housing of the scintillator probe is made of aluminium. The scintillator (diameter 3", height 3") is located at the front end under a thin-walled plastic cover. This is protected against damage by a removable protective aluminium cap. A frame with a retaining spring is used to mount the dose rate meter. A handle and a carrying strap make handling easier.

The dose rate meter mounted on the probe is connected to the probe by a cable. The probe can also be used separately from the dose rate meter, cable lengths of up to 100 m are possible.

The light generated in the scintillator by radiation is converted into a proportional current by a photomultiplier (PM) and fed through a current-frequency converter to the connected measuring unit. The probe electronics equipped with a microprocessor provide an extremely stable PM high voltage, effective compensation of the dark current and temperature dependence of the PM and precise calibration of the probes. The precise calibration allows the replacement of probes and measuring units as often as desired, as the assignment of a certain probe to a certain measuring unit is not required. The probe is supplied with power from the battery of the connected measuring unit.

OPERATION

The scintillator measuring unit 6150 ADB can be used in all operating modes of the connected dose rate meter. The "average value" operating mode is of particular interest as it allows a much more accurate determination of low radiation values than the "dose rate measurement" operating mode. The dose rate meter calculates an average value from the number of pulses and the measuring time since the unit was switched on. The average value display indicates the respective current value. The average value can be cleared and restarted during operation. The average value is also cleared and restarted when the probe is changed or the unit is switched off.

The statistical error of the average value decreases as the number of pulses increases, i.e. as the measuring time. The relative standard deviation serves as a measure of the statistical error. In the "average value" operating mode, the signal button of the dose rate meter can be used to switch over between the average value display and the display of the related relative standard deviation (display S in %). If the standard deviation is greater than 5%, the display flashes (that of the average value as well), if it is smaller than 0.1%, "0.1% max" is displayed. As a result, it is easily possible to obtain a statement on the statistic measuring error and, if necessary, to change the measuring conditions.

COMPARISON OF THE DOSE RATE METERS 6150 AD 5/6 WITH 6150 AD 3/4

Compared to the versions 6150 AD 3 and AD 4, the dose rate meters 6150 AD 5 and AD 6 are equipped with the following additional functions:

1. Probe coding and probe ranges

The units 6150 AD 5 and AD 6 are equipped with an additional probe coding "ext b", which appears in the display field when probe 6150 AD-b is connected. During probe operation the probe-specific display ranges (see "Technical Data") are used. The probe 6150 AD-b can only be operated with 6150AD5/6

2. "Average value" operating mode

In the "average value" operating mode the display can be switched to either "average-value display" or display of relative standard deviation" on the units 6150 AD 5 and AD 6 with the signal button.

All other characteristics of the units 6150 AD 5/6 correspond to the specifications in "DOSE RATE METER 6150 AD 3/6150 AD 4 - DESCRIPTION AND OPERATING INSTRUCTIONS". The specifications for 6150 AD 3 also apply to 6150 AD 5, and those for 6150 AD 4 are also valid for 6150 AD 6. Post-production conversion of the units 6150 AD 3/4 to the state of 6150 AD 5/6 is possible.

TECHNICAL DATA

Scintillator Probe 6150 AD-b

Radiation detector	organic scintillator ZnS-coated diameter: 3" height: 3" density: 1.032 g/cm ³
Measured quantities	photon-equivalent dose rate photon-equivalent dose
Energy response	23 keV to 7 MeV
Dose rate display ranges	analog: 10 nSv/h to 1000 nSv/h 0.1 µSv/h to 10 µSv/h 1 µSv/h to 100 µSv/h digital: 1 nSv/h to 99.99 µSv/h
Dose rate measuring range*)	50 nSv/h to 99.99 µSv/h standard deviation <15% at 50 nSv/h
Dose rate measuring range in "average value" operating mode*)	from 5 nSv/h *) (for German customers only) For Dose rates less than 100 nSv/h there is no gauging duty
Average value of dose rate	resolution 1 nSv/h
Display range max. value of dose rate	0.01 µSv/h to 99.9 µSv/h
Dose display range	0.01 µSv to 999.9 µSv
Dose measuring range	0.01 µSv to 999.9 µSv
Dose rate alarm threshold	adjustable to 7.5 µSv/h, 25 µSv/h, OFF, or a freely programmable value
Dose alarm threshold	one freely programmable value
Inherent background radiation	typically < 1 nSv/h
Operating temperature range	-30°C to 50°C
Absolute amount of change in display in operating temperature range	<10%
Humidity	Nominal range 0 to 95% rel. humidity within the permissible temperature range
Pressure of outside air	Nominal range 600hPa to 1300hPa
Position dependence	Nominal range any
Battery life	approx. 120h with alkaline battery
Protection class	IP 67 acc. to DIN 40050 (water- tight)
Dimensions	353 x 195 x 96 (mm)
Weight	approx. 2.5 kg (probe with measuring unit) The probe floats.
Carrying strap	Plastic, decontaminable, length adjustable from 110 cm to 150cm
PTB approval for gauging	23.01 94.11

ACCESSORIES

Check source 6706

Radiation source	¹³⁷ Cs
Activity	333kBq±10%(9 J Ci±10%) Nickel-
Housing	plated brass
Dimensions	Diameter 32 mm, height 35 mm
Weight	210g
Design	acc. to DIN 44 427
PTB approval for calibration	23.11 78.28
Design approval	Government Trade Supervisory Office Stuttgart

Storage container 6706-1

Housing (pot and lid)	lead
Surface	enamel
Dimensions	Diameter 60 mm, height 59 mm
Weight	1.38kg
Design	acc. to DIN 44 427

Holder 761.11

Weight	158 g
Dimensions	Diameter 96 mm, height 94 mm

SUBJECT TO TECHNICAL CHANGES

