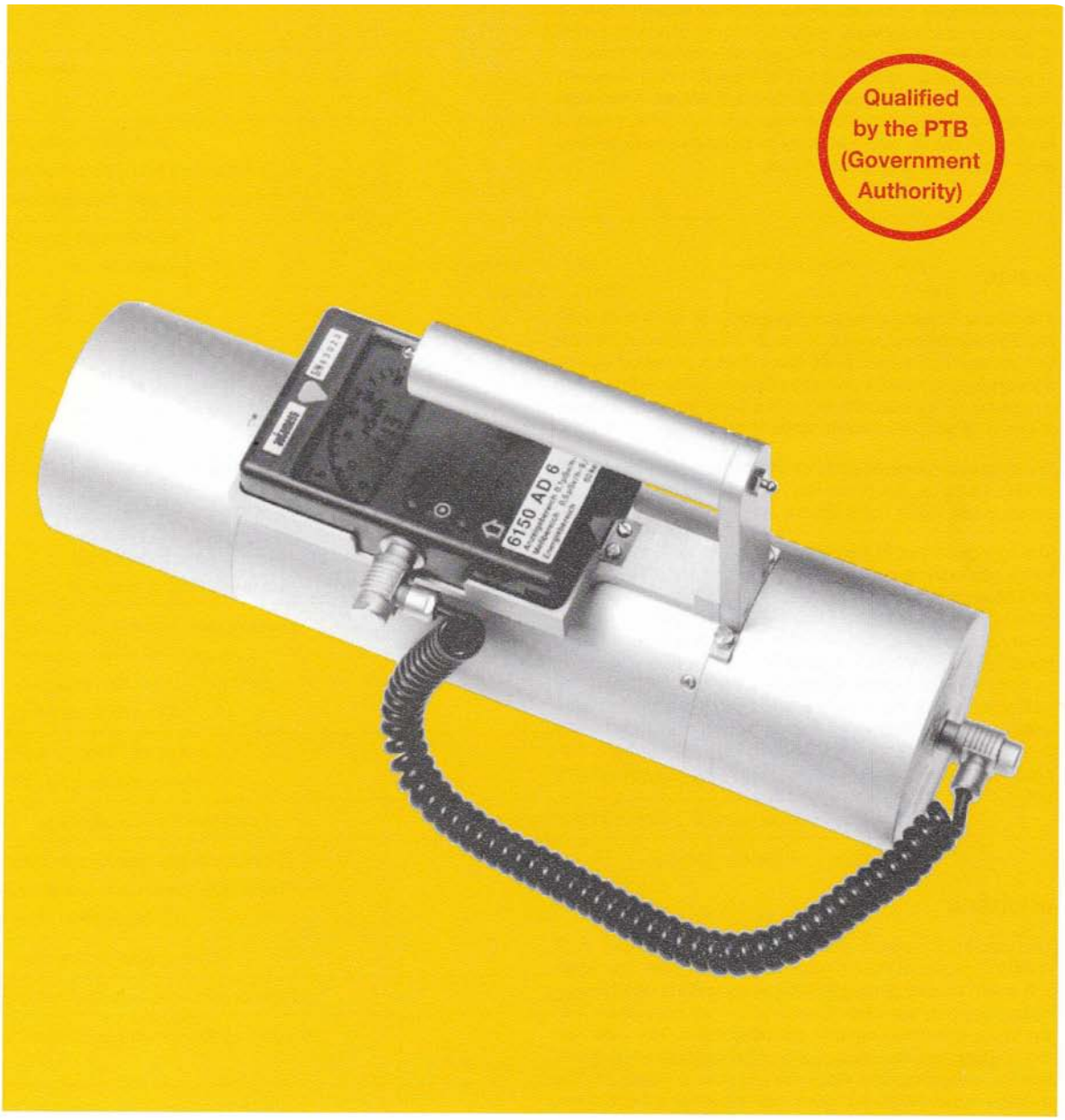
Automation und Messtechnik GmbH

automess



- Measuring unit consisting of the scintillator probe 6150 6150AD-b (/H) and a dose rate meter 6150AD5 (/H) or 6150AD6 (/H)
- High sensitivity due to large scintillator:
  Dose rate measurements starting from as low as 5 nSv/h
- Large energy range 23 (20) 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
- Instrumental background typically 1nSv/h
- Qualified by the PTB (German Federal Bureau of Standards)

SCINTILLATOR MEASURING UNIT 6150ADB

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

GENERAL

The scintillator measuring unit 6150ADB is a portable, battery-operated radiation measuring unit for photon radiation (gamma and X-radiation). It consists of the scintillator probe 6150AD-b (/H) and a dose rate meter 6150AD5 (/H) or 6150AD6 (/H). A three inch organic scintillator is used as a radiation detector. The energy range is 23 (20) 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.

TECHNICAL DATA

6150AD-b (/H)

	6150AD-b	6150AD-b/H
Detector	organic scintillator diameter 3", height 3", density 1.032 g/cm³	
Measuring quantity: photon dose (rate) equivalent H_x or ambient dose rate equivalent H*(10)	H_x	H*(10)
Energy dependence: nominal energy range	without protective cap: 23 keV to 7 MeV	without protective cap: 20 keV to 7 MeV with protective cap: 38 keV to 7 MeV
deviation referred to Cs-137	max. ±30%	
Directional dependence: nominal angular range	±80° around preferential direction	±60° around preferential direction
deviation referred to preferential direction at the same energy	max. ±20%	
Energy and directional dependence, deviation for all energies and directions referred to Cs-137 at preferential direction		without protective cap: ±37% with protective cap: ±17% (max. ±40%)
Analog dose rate range Digital dose rate range	10 nSv/h to 100 µSv/h 1 nSv/h to 99.9 µSv/h	
Dose range, alarm thresholds	see 6150AD Operating Manual, issue June 2001 or later	
Dose rate measuring range in the „dose rate mean value indication" state of the 6150AD	starting at 5 nSv/h	
Instrumental background	typically 1 nSv/h	
Linearity of dose rate measurement	deviation max. ±10%, calibration with Cs-137	
Overload: overrange will be indicated up to:	5 mSv/h (however, see 6150AD-b Operating Manual section 3.5: "After-effect")	
Preferential direction and location of detector	see 6150AD-b Operating Manual section 2.2	
Temperature range	−30°C to +50°C deviation max. ±10% referred to indication at + 20°C	
Humidity	nominal range 0 to 95% within specified temperature range	
Atmospheric pressure	nominal range 60 to 130 kPa (600 to 1300 mbar)	
Geotropism (change of response as a result of gravitational effects)	none	

	6150AD-b	6150AD-b/H
Power supply	4.75 Volt out of Dose Rate Meter 6150AD	
Battery life including the 6150AD (with a 6LR61 battery)	approx 120 hours with the 6150AD's illumination off	
Housing	natural colour aluminium, waterproof, protection class IP 67 according to DIN 40050	
Dimensions	353 x 195 x 96 mm^3	
Weight	approx. 2.5 kg including Dose Rate Meter 6150AD; the probe will float on water	
Carrying strap	plastic, decontaminable, length adjustable from 110 cm to 150 cm	

ACESSORIES

Source Holder 761.11

Application	holder to mount check source 6706 onto the Scintillator Probe
Dimensions	diameter 96 mm, height 95 mm
Weight	approx. 95 g (approx. 160 g including source 6706)
Material	natural colour aluminium

Loudspeaker Attachment 826.1.6

Application	audible representation of the dose rate measured by the 6150AD-b through built-in loudspeaker
Dimensions	62 x 30 x 24 mm^3
Weight	approx. 75 g
Material	natural colour aluminium

Loudspeaker Attachment 826.1.5

Application	audible representation of the dose rate measured by the 6150AD-b through earphone 6112B-134C
Dimensions	62 x 30 x 24 mm^3
Weight	approx. 70 g
Material	natural colour aluminium

Technical data of the earphone 6112B-134C required with the 826.1.5:

Cable length	approx. 1.5 m
Weight	approx. 30 g

Aluminium Case 6605.5

Application	storage and transportation of: Scintillator Probe 6150AD-b, Dose Rate Meter 6150AD, Loudspeaker Attachments 826.1.6 and 826.1.5, carrying strap
Dimensions	approx. 460 x 390 x 200 mm^3
Dead weight	approx. 3.7 kg

- SUBJECT TO CHANGE WITHOUT NOTICE -

southern scientific

Scientific House, The Henfield Business Park,
Shoreham Road, Henfield, West Sussex, BN5 9SL
Tel: +44 (0)1273 497600
Email: info@southernscientific.co.uk