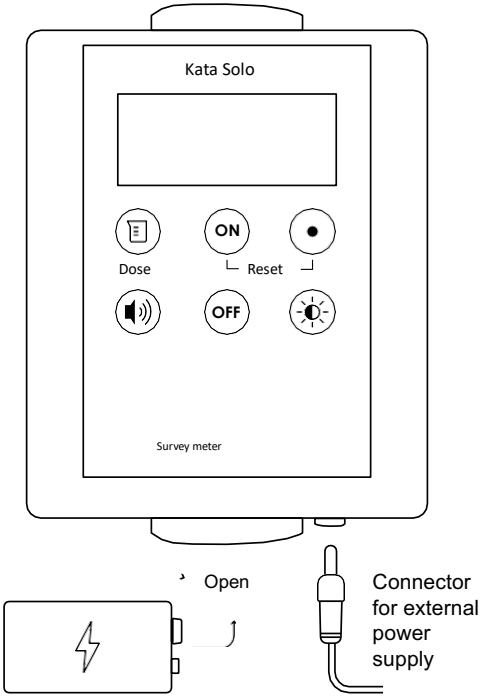
KATA®
Solo

Radiation Survey Meter

Manual



Accessories

- Mains adapter 9 V reg./2.5 W, 3.5 DIN connector
- Wall-mounting bracket and fixing screws

KATA® Solo
Radiation Survey Meter

Push button functions

Power on: The meter is switched on by pressing the ON button. Each time it is switched on the meter performs a self-diagnostic routine, after which it automatically starts measuring both the radiation dose rate and the cumulative dose.

Reliable measurement is obtained at normal ambient radiation levels (appr. 0.04–0.20 microSv/h) in about 3 minutes. At higher levels of radiation (from appr. 100 microSv/h) reliable measurement is obtained already in about 5 seconds.

Dose rate: The measurement result is expressed in microSieverts per hour (microSv/h). The measurement range for automatic operation is 0.07...100,000 microSv/h. When the measured level exceeds 9,999 microSv/h the result is displayed in integer units of a thousand, rounded to the nearest thousand, followed by the exponential symbol 'E3' (= x 10 to the power 3). For example, a measured level of 55 425 microSv/h would be displayed as 55E3.

Radiation dose: The dose registry reading is expressed in millisieverts (mSv). The measurement range of the dose register is 0.001...1,000 mSv. The dose register always contains the cumulative radiation dose whenever the meter is in operation. The cumulative radiation dose can be displayed by pressing the DOSE button.

Clearing the dose register: The dose register can be cleared by the user at any time. First, switch the meter off. The dose register can now be cleared by holding the O push button and ON button down simultaneously.

Alarm tone: The alarm tone, which gives an indication of the radiation level, can be enabled or disabled by means of this push button.

Backlight: The display backlight can be switched on for 5 seconds by momentarily pressing this push button.

Power off: The meter can be turned off by pressing the OFF button. When the meter is switched off all settings and the contents of the dose register are stored in non-volatile memory. This information is retained in the non-volatile memory for several years, even if the battery is removed from the meter.

Measurement mode selection

In addition to the automatic mode, the KATA® Solo radiation meter features two other user-selectable measurement modes. To step through the modes (fast measurement – precision measurement – automatic measurement), hold the O push button down for at least three seconds.

Automatic measurement

The **AUTO message** appears when the meter is in the automatic measurement mode. The meter always returns to the automatic mode if it is switched off momentarily and then on again, regardless of the previous mode.

Fast measurement

The **FAST message** appears when the meter is in the fast measurement mode. The fast measurement period is fixed at 1.25 secs, allowing fast pinpointing of radiation sources, for example. This mode is not suitable for measuring low-level ambient radiation.

Precision measurement

The **letter 'h'** on the screen indicates the integrating precision measurement mode. The radiation dose rate is displayed in microSv/h. The expiration of each one-hour period is indicated

by a change in case of the letter ‘h’ (h/H). The integration will continue for up to three hours. This is the KATA® Solo’s most precise measurement mode and is particularly suitable for measuring low levels of radiation. The range of measurement is 0.01...9.99 microSv/h.

If the dose rate momentarily exceeds this range, the meter will immediately switch to the automatic mode. Precision measurement is limited to low dose rates so that this method also meets the requirement for a rapid response as the dose rate increases.

Programming the alarm limits

Meter alarm levels for the dose rate and cumulative dose are user-programmable. If the dose rate or cumulative dose of the measured radiation reaches the alarm level programmed for it the meter will emit an alarm tone.

When the dose rate alarm level is exceeded. the meter emits a periodic double beep. When the cumulative dose alarm level is exceeded, the meter emits a periodic single beep. The period of the double beep alarm tone is slightly shorter than that of the single beep tone.

The programming mode is entered by pressing the TONE and LIGHT push buttons simultaneously. The O push button is then pressed to select the alarm level to be programmed: a ‘0’ in the display means dose rate alarm level, and a ‘1’ means cumulative dose alarm level. The programmed alarm level can then be

incremented by pressing the DOSE button or decremented by pressing the TONE button. The rate at which the programmed level changes when one of these buttons is pressed is slow at first, but increases if the button is held down continuously. When both alarm levels have been set the O and LIGHT buttons are pressed simultaneously to exit the programming state.

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Alarm tones

The meter provides six different alarm tones. These alarm tones and their meanings are described below in order of importance.

Only one alarm tone can be emitted at a time.

Alarm tone

	Duration
1. Battery voltage too low. ----------	5 sec. in total
2. Measurement range exceeded. _ _ _ _ _ _	... continuous
3. Dose rate alarm limit - - - - - -	... continuous
4. Cumulative dose alarm level.....	continuous
5. Button pressed	- single beep
6. Radiation pulse detected	- single beep

The symbols used in the timing chart above have the following meanings:

- tone

pause

... sequence repeats

Special display messages

: Low battery voltage warning. Appears in the display when the battery voltage drops below a certain level. Replace the battery as soon as possible, with up to 8 hours remaining. If the battery voltage continues to drop, the meter will emit an alarm tone for five seconds, then switch itself off.

OFL This message will appear in the display when the dose rate exceeds the meter's measurement range. An alarm tone is also emitted.

xxE3 When the dose rate exceeds 9,999 microSv/h it will be displayed in exponential mode in integer units of one thousand. For example, a dose rate of 55,000 microSv/h will be displayed in the form 55E3.

Auto See 'Measurement mode selection.'

FAST See 'Fast measurement.'

h/H See 'Precision measurement.'

Error message display The meter executes a self-diagnostic routine to detect possible fault situations. If a fault is detected, the meter displays an error message consisting of the letters 'Er' followed by a number. All error messages except Er1, which remains in effect until the fault has been corrected, can be cancelled by pressing any function button.

Er 1 Indicates that the meter cannot function and must be sent for repair immediately.

Er 10 Indicates a loss of calibration coefficients. When this occurs the internal average default values will be used. This fault does not render the meter unusable, but it may affect the accuracy of the measurement. This message will always appear in the display when the meter is switched on until the fault is repaired. The meter should be sent for repair as soon as possible.

Er 11 Indicates a loss of dose register contents. Check the dose register and reset it if necessary. The meter need not be returned for maintenance provided the fault does not recur.

Er 12 Indicates that the user-programmed alarm levels have changed and must be reprogrammed. The meter need not be returned for maintenance provided the fault does not recur.

Using the meter

The KATA® Solo is a versatile and reliable survey meter intended for measuring gamma and X-ray radiation levels. Because of its wide range, it can be used to perform many different types of radiation measurements.

The survey meter is ready to use as soon as it is switched on. Fast measurement (FAST) and precision measurement (h) functions, which enable the meter to perform special measurements, are also available.

There are separate user-programmable alarm levels for dose rate and cumulative dose. If these levels are exceeded, an audible alarm is given.

Dose measurement

The KATA® Solo measures the instantaneous dose rate and cumulative dose simultaneously. Whenever the meter is in operation, the dose register contains the current cumulative dose. The cumulative dose can be displayed by pressing the DOSE push button. For example, in a location where the dose rate is 8 microSv/h, the cumulative dose over a period of 24 hours will be 0.192 mSv.

The contents of the dose register are saved in non-volatile memory when the meter is switched off; so, the cumulative

dose for the total time of operation of the meter is always available. The contents of the dose register can be cleared by the user whenever required (see ‘Push button functions’).

Continuous measurement of ambient radiation

The KATA® Solo has a standard connector for a mains adapter provided as an accessory, which allows the meter to be used for round-the-clock radiation monitoring.

A wall mounting bracket can be used to install the survey meter where the precise level of ambient radiation is always easily visible.

The alarm level is user-programmable. If the level of the measured radiation exceeds the alarm level, a warning tone is emitted (see ‘Programming the alarm limits’).

Calibration

Each KATA survey meter is individually calibrated at the factory. A calibration certificate is delivered with every device, and it looks like the following template.

We recommend that the KATA Solo is inspected at least every five years

Technical specifications

Type	KATA® Solo radiation dose rate and dose meter
Types of radiation	Gamma and X-ray radiation
Energy range	45 keV..... MeV
SI standard detector	Ambient dose equivalent-energy compensated GM tube
Measurement range	Dose rate 0.01..... 100,000 microSv/h Dose 0.001..... mSv
Response time	Fast measurement: 2.5 sec. Automatic measurement: At ambient radiation levels 3 min, at increased radiation levels (100 microSv/h) 5 sec.
Accuracy	±5% of the reading when irradiated by Cs-137 at the calibration point at 20 °C
Linearity	±10% at 20 °C
Radiation level display	

	Results are displayed on a backlit LCD in easy-to-read microSieverts (dose rate) and milliSieverts (dose). (1,000 microSv = 1 mSv.)
External interfaces	Mains adapter
Thermal range	Operating temperature -30 °C...+55 °C. Storage temperature -40 °C ... +70°C
Power supply	Single 9V alkaline battery Battery life of more than 300 h. in ambient radiation Mains adapter 9 V reg./2.5 W
Case	Shock-proof, splash-proof plastic case, IP 54
Dimensions:	90 x 145 x 40 mm
Weight	250 g without battery, 300 g with battery

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