



SX-2R X-Ray Probe

Features

- X-ray and gamma measurement
- Low energy starting from 5 keV
- Belongs to CSP family
- Calibration via PC
- Ideal for Homeland Security applications
- Dynamic energy discriminator button

Description

The SX-2R probe for measurement of leakage and surface contamination is designed to be used with any CSP survey meter. Its 1.5" NaI(Tl) detector with 3 mm thickness and Beryllium window makes it an ideal tool for direct measurement of x-ray emitters. SX-2R is a probe of choice for Homeland Security application since it

is able to detect most contaminations (including alpha and beta) based on x-ray emission. It is also very useful for precise X-ray leakage monitoring on accelerators, X-ray generators and containers.

SX-2R is part of CANBERRA's SMART Probe (CSP™) family. It includes all key components of hardware circuitry (high voltage power supply, amplifier, discriminator, etc.). Also, the intelligence associated with controlling those components is located in the probe – that is control and storage of key parameters, settings, calibrations, probe ID, alarm settings (10 values for each unit to display with default setting), etc. Thus the probe is a fully integrated subsystem taking and transmitting the measurement to the instrument, which is used for display.

With high voltage and digitization of the data occurring in the probe rather than the instrument, measurement quality is no longer dependent on external device quality (cable, host instrument). Moreover, a CSP is using a serial protocol to communicate with host, which can be an instrument or a PC.

Calibration and QA measurements can be performed directly with the probe, without using an instrument, by connecting the probe to a computer with CANBERRA Smart Probe Software (CSPS™), allowing your instruments to remain deployed in the field.

Once calibrated, SX-2R is ready to be used as a plug and play probe to start a QA measurement in CPM, DPM, DPM/100cm² or c/s, Bq, Bq/cm². SX-2R connects to survey meter via a 1.5 meter or 20 meter CSP cable.

A push-button located on the probe housing triggers an energy threshold. When depressed and held, an LED is activated and the probe measures only X-rays below the preset threshold. It is a powerful feature to reduce influence coming from gamma of higher energy and to improve the x-ray MDA. Energy threshold is set with CSPS and a PC.



SX-2R X-Ray Probe

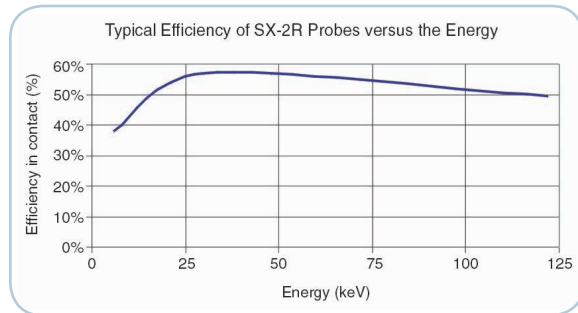
The SX-2R includes a plastic protective cap that is very easy to remove to take measurements and helps ensure that the beryllium window stays in good shape during transportation.



The SX-2R probe is able to store up to 1000 data points from a data-logging procedure handled via the host instrument. These data are: Index, date/time, measurement value, selected unit and counting time.



The SX-2R can be upgraded (probe's firmware) via CSPS, a USB cable and a PC.



Response of SX-2R Probes versus the Energy.

Specifications

NUCLEAR

- DISPLAY UNITS – Depending on survey meter (c/s, Bq, Bq/cm² or CPM, DPM, DPM/100 cm²).
- EMITTERS – X-Ray and low energy Gamma.
- DETECTOR – NaI(Tl) 1.5 in. (38 mm) dia x 3 mm.
 - Detection area – 8 cm².
 - Beryllium entrance window 37 mg/cm², thickness: 0.2 mm.
- MEASUREMENT RANGE – 0 to 10000 c/s, 0 to 600 kcpm. Activity equivalent range depends on calibration emitter. Conversion coefficient is factory set with ¹²⁹I.

- DEAD TIME – 50 μs.
- ENERGY RANGE – 5 keV to 200 keV.
- GAMMA SENSITIVITY FOR ¹³⁷Cs – 160 c/s per μGy/h (96 kcpm per mR/h).
- BACKGROUND – Ambient ≤100 nSv/h (10 μR/h): <12 c/s (<720 cpm).

ERGONOMIC

- DISPLAY – Provided by survey meter.
- ALARM SETPOINTS – 10 values for each unit to display. Saved in probe memory. They can be edited with CSPS and PC. Default alarm threshold is chosen in a list by use of survey meter keypad.

ELECTRICAL

- POWER – Supplied by survey meter (low voltage only).
- BATTERY LIFE – Does not reduce survey meter's battery life.
- CONSUMPTION – 15 mA maximum.

MECHANICAL

- HOUSING – Painted aluminum.
- DIMENSIONS – Length (with connector) x diameter: 225 x 59 mm (8.9 x 2.3 in.).
- WEIGHT – 590 g (21 oz) without cable.

ENVIRONMENT

- TEMPERATURE – -10 °C to +50 °C (+14 to +122 °F).
- RELATIVE HUMIDITY – 40% to 85% at 35 °C – IP40.
- CLEANING – Housing easy to decontaminate.

NORM

- CEM – Conform.
- CE – Meets CE requirements.

ORDERING REFERENCES

- SX-2R – EM78627.
- CSP Cable (1.5 m length) – EM77336.
- CSP Cable (20 m length) – EM80653.
- Carrying Case for Radiagem Emergency Response Kit – EM76287.
- CSP-PC USB Cable – EM78466.
- Calibration/Setup Software (CSPS) – CSPS-F: EM78468, CSPS-R: EM80642, CSPS-E: EM80643.



Detection efficiencies and MDAs with 100 cm² ISO 8769 source in contact with probe:

| Nuclide | Emitter | Typical efficiency over 2π (%) | Guaranteed efficiency over 2π (%) | Response to activity (c/s)/Bq | MDA (Bq) |
|------------------|---------|--------------------------------|-----------------------------------|-------------------------------|----------|
| ¹²⁹ I | X-Ray | 57 | 51 | 0.14 | 24 |

MDA: Background = 10 c/s measured during 100 s in a 0.1 μGy/h ambience.

Measuring time on source = 10 s.

Statistic: false alarm = 5% and non-detection = 5%.

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