

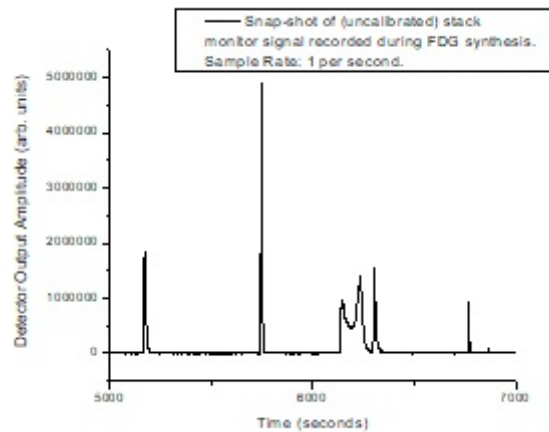
HIGH-SENSITIVITY RADIATION DETECTOR

The model 105-S is a high-sensitivity radiation detector system used for HPLC, flow monitoring in radiochemical synthesis, monitoring of stack effluents, and similar applications.

In HPLC and flow-monitoring applications, the system employs a compact detector probe (2 cm x 2 cm x 3 cm) in conjunction with a bench-top amplifier / console unit (7.75"W x 7.5"D x 2.5"H). The sensitive element of the detector probe is a 1 cm³ CsI(Tl) scintillating crystal, optically coupled to a 1 cm² silicon PIN diode which, in turn, is connected to a charge-integrating¹ preamplifier.

For applications requiring greater sensitivity, the same console unit is used with larger, more sensitive probes incorporating a 25 mm dia x 25 mm long, or a 30 mm dia x 50 mm long CsI(Tl) scintillating crystal, optically coupled to a 10 mm x 10mm silicon PIN diode. The probes are epoxy-cast for protection against moisture incursion, and sealed in cylindrical Aluminum enclosures for convenient shielding.

Stable, reliable operation at low photon fluxes is enhanced by operating the detector in AC-coupled pulse-mode. In this mode of operation, individual gamma ray photon interactions in the scintillating crystal are converted to flashes of light which are then converted in the diode / preamplifier to discrete pulses of current. The pulses of current are amplified, thresholded, and integrated to produce a "DC" signal which is proportional to the count rate of photons which exceed threshold.



¹Covered by one or more of the following US Patents: 5,990,745; 6,054,705; 9,081,102 B2