



Trusted
radiation
protection.

940-2 Off-Line Liquid Effluent Monitor

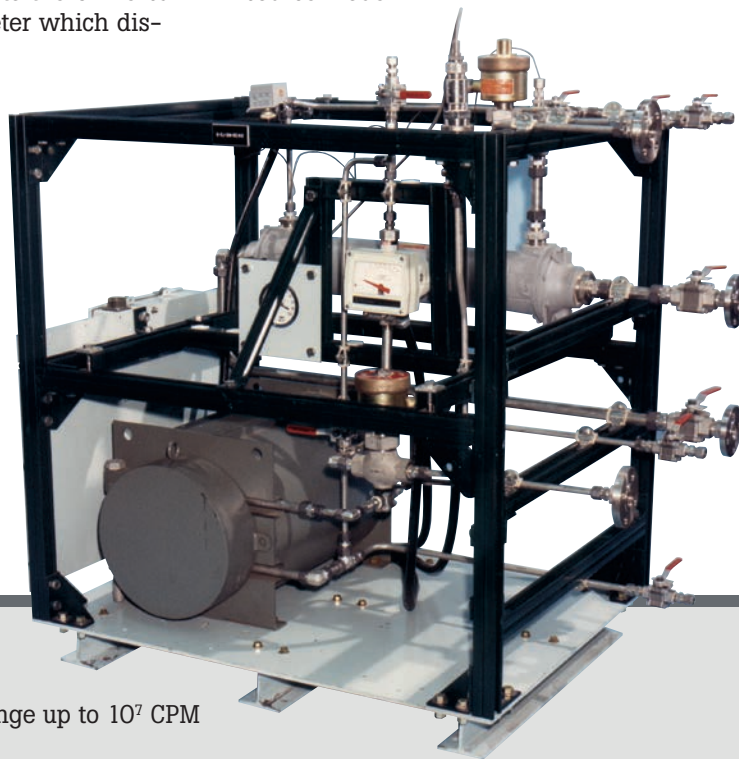
The 940-2 Off-Line Liquid Effluent Monitor assures radioactive materials within liquid effluents do not exceed maximum permissible concentrations (MPC), protecting personnel against the possibility of exposure to excessive radiation.

The Code of Federal Regulations requires any effluent that could possibly contain radioactivity be monitored, and the 940-2 Off-Line Liquid Effluent Monitor meets the guidelines set forth in the United States Nuclear Regulatory Commission (USNRC) radiation protection standards. Off-line liquid monitors usually include their own pumping systems to ensure a constant flow of effluent through the sample volume chamber with sufficient pressure to return the sample to the process. Off-line effluent monitoring is normally utilized where optimum geometry is desired to gain maximum sensitivity. Scintillation detectors are used because of their sensitivity and reliability.

The sample is drawn from the process piping through the customer's sample line to the inlet of the sampling skid. The sample flows through the heat exchanger (when supplied), then through the sample volume to the pumping system and back to the process pipe. The sample flow rate is indicated by a rotameter and manually controlled by a throttling valve.

The detector output signal is transmitted to the Universal Digital Ratemeter which dis-

plays gross liquid radiation counts. This ratemeter also provides output alarm contacts for Alert, High Radiation and Channel Fail. A low-flow alarm is included on the pumping system control module, with alarm contacts for customer use. The low-flow alarm also shuts down the system to protect the pump. Check source actuation is manual from the ratemeter, with alarms muted when in the check source mode.



Key features

- Universal Digital Ratemeter with dynamic range up to 10^7 CPM
- Scintillation type gamma detector
- Rugged open frame skid construction for ease of maintenance
- Centrifugal type pumping system
- Class 1E qualification available
- Off-line liquid monitor
- Compatible with the 943 Series Detectors and the 942A Series Digital Ratemeters or the 960 Series Electronics
- Optimum geometry for maximum sensitivity
- High temperature versions available

Technical specifications

Power requirements

120 V ac, 50/60 Hz, 1 phase

Sample flow rate

1 to 5 GPM

Sample temperature limit

50 °F to 122 °F (10 °C to 50 °C)
without heat exchanger

Dynamic count range

10 to 10⁷ CPM

Liquid sample volume

3000 cc

Skid overall dimensions

(w x d x h)

48 in x 35 in x 48 in
(121.9 cm x 88.9 cm x 121.9 cm)

Skid weight

2000 lb (907.18 kg)

Note: Refer to 841-334 data sheet for sampler specifications. Refer to the respective data sheets for the 942A Universal Digital Ratemeter and the 943 Series Gamma Detectors for detailed specifications.

The off-line liquid effluent monitor consists of the following components:

Open-frame sampling skid, with the following major elements mounted, plumbed and wired:

- Liquid sampler (with detector well), fixed volume, with 4 pi lead shielding, 841-334
- Scintillation type gamma detector, 943-36
- Flow indicator with manual flow adjusting valve
- Centrifugal pump
- Low-flow switch
- Manual inlet and outlet isolation valves
- Universal Digital Ratemeters, local or remote mounting, 942A-200
- Optional heat exchanger for sample cooling is available, if required
- Optional high temperature gamma scintillation detectors, 943-36H and 943-36HT

Ordering information

Model

940-2: Off-Line Liquid Effluent Monitor

Standard accessories

841-334: Three Liter Off-Line Sampler

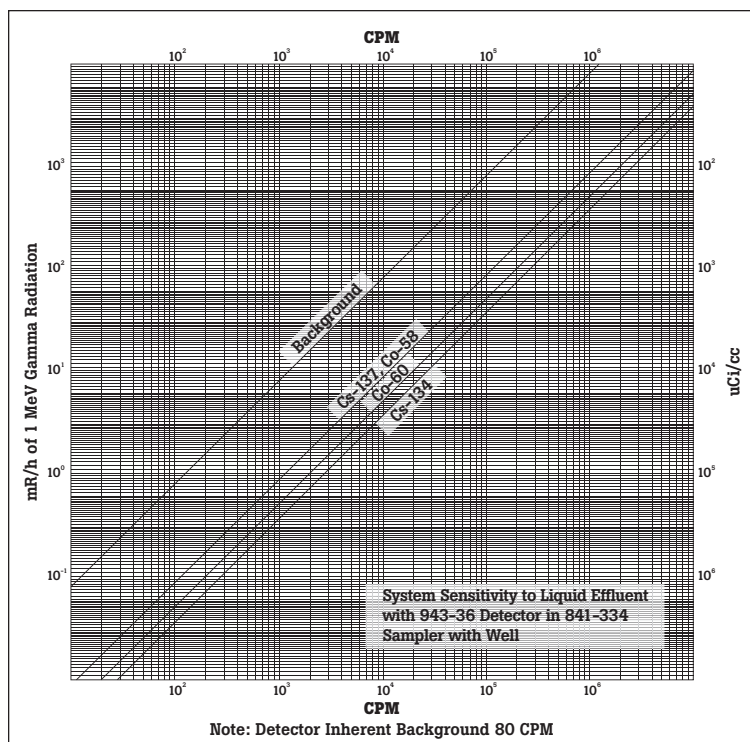
943-36: Scintillation type gamma detector

942A-200: Universal Digital Ratemeter (UDR)

Optional accessories

943-36H: High Temperature Gamma Scintillator (up to 160 °F)

943-36HT: Very High Temperature Gamma Scintillator (up to 300 °F)



6045 Cochran Road
Cleveland, OH 44139-3303 U.S.A.

For more information, please contact us at:

Phone: 440-542-3628

Email: Sales@Victoreen.com

Web access: www.victoreen.com

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