

Advanced Survey Meter (ASM)

Victoreen® ASM-990 Series



The ASM-990 is shown with optional GM Pancake Probe (Model 489-110D)

- Advanced survey meter for multiple hospital and environmental applications
- Cell phone-like multi-function key for easy menu navigation
- Backlit analog/digital display
- Integrated handle
- Error-free visual indication
- Auto-ranging
- Multiple probe use
- Full-range audio output capability
- Survey Mode data logging feature
- Timed Peak Hold feature
- Built-in scaler functions
- Barcode scanner (optional)
- Auto Power-Down feature extends battery life

Introduction

The ASM-990 series are easy-to-use instruments that detect alpha, beta, gamma, or x-ray radiation within an operating range of 1 μ R/hr to 1 R/hr or 1 to 5,000,000 CPM, depending on the probe selection. Visual indication of measured values, as well as selectable parameters, are displayed on the analog/digital display.

The units are compatible with Geiger-Mueller (GM) detectors and scintillation probes operating from 500 to 1300 volts.

Applications

The ASM-990 series are designed to meet the high technology requirements of health physics, medical physics, and nondestructive testing applications. Radiation safety officers (RSO), nuclear medicine laboratories, diagnostic x-ray and hospital emergency room technicians, and environmental health physicists will appreciate this intelligent survey meter with its cell phone-like multi-function key for easy menu navigation.

The units, with purchased probe, are shipped calibrated and ready-to-use.

With the proper probe combination, this meter can be used as a general survey meter, an area monitor, a wipe test counter, and a contamination monitor.

The unit is supplied with a MHV connector to ensure compatibility with all Victoreen probes. A Model 992 is available that includes a fully calibrated internal energy compensated 1 R/hr GM detector.

The Model 993 features a fully calibrated internal pancake detector as well as an internal energy compensated 1 R/hr GM detector.

Features

- Survey Mode feature allows user to store up to 5 separate survey sequences
- Infrared Data (IrDA) port

LCD readout

- 160 x 160 graphical LCD display shows digitized average of the bar graph value
- Analog scale has fifty-one elements arranged in a linear bargraph. Each element represents 2% of full scale. Scale markings are 0, 2, 4, 6, 8 and 10. Scale length is 2.2 inches (5.6 cm)
- Scale multiplier is 0.0001 to 1 million, depending on the probe selected and the units activated
- LCD also displays selected measurement units, status icons, and real time clock

Pushbutton controls

- **Light** activates a background light for a preset or indefinite amount of time
- **Start/Stop/Rst/Save** saves current data; starts and stops recording of data; resets internal counter in scaler mode
- **Sel** activates the menu systems; allows user to choose particular settings, etc.
- **Up/Dn arrows** enables user to navigate between various menus/selections
- **Esc** returns to the normal operating mode
- **Audio** allows the user to turn on/off the audio indicator

Specifications for ASM-990 and ASM-992

Operating modes

- Rate
- Integrate
- Scaler (dual option): “Based On Measurement” or “Based On Time”
- Timed Peak Hold
- Data Logging

Operating rate ranges (dependent on selected probe)

μ R/hr	mR/hr	R/hr
μ rem/hr	mrem/hr	rem/hr
μ Sv/hr	mSv/hr	Sv/hr
CPM	CPS	
DPM ^{99m} Tc	DPS ¹³¹ I	
Bq ¹²⁵ I	kBq ¹²³ I	MBq ²⁰¹ Tl
μ Ci ⁶⁷ Ga	mCi ¹⁸ F	Ci ⁵⁷ Co

μ R	mR	R
μ rem	mrem	rem
μ Sv	mSv	Sv
C (counts)	kC	MC
D (distintegrations)	kD ^{99m} Tc	MC ¹³¹ I

Complementary units in the integrate mode with the integrated time value in seconds

Accuracy Within 10% of reading between 10% to 100% of full scale indication on any range, exclusive of typical energy dependence. Accuracy is probe dependent

Detector Accepts GM detectors and scintillation probes operating at high voltages between 500 and 1300 volts

Environmental

Temperature range 14° to 122°F (- 10° to + 50°C)

Relative humidity 0 to 95%, non-condensing

Warm up time 5 second diagnostic check

Check source Natural uranium, mounted on the case

Power requirements Two “D” cells, 150 hours operation, automatically indicates when battery is low

Housing material Proprietary polycarbonate, splash-proof case

Display Liquid crystal display, 2.2 x 2.2 in (5.6 x 5.6 cm)

Data logging modes

The ASM-990 series’ Log Data feature can easily be accessed via the Setup Sub-menu

The unit can log/save a maximum of 500 data points in any of three separate modes (Manual and Survey modes can utilize the optional barcode scanner)

Manual Individual rate data points can be saved by pressing the Start/Stop/Rst/Save button

Timed A data point will automatically be saved at user selectable time intervals in the range of 1 to 255 seconds

Survey Programmed sequences can be accessed via the menu system. Pressing the Start/Stop/Rst/Save button saves the current reading and displays the next survey location

Programming of survey sequences, as well as retrieval of logged data, is accomplished via the built-in IrDA port

Label names up to 20 characters can be programmed into the unit to identify the individual survey locations

Weight (without probe)

ASM 990, 992 2.1 lb (0.95 kg)

ASM 993 2.4 lb (1.09 kg)

Dimensions 4.125 (w) x 10.91 (d) x 2.5 in (h) (10.47 x 27.71 x 6.35 cm)

Probe connector The unit is available with a MHV connector

The unit can be used with multiple probes (5 total) by selecting the appropriate probe from the main menu. All calibration data for each probe is stored in the unit’s EEPROM



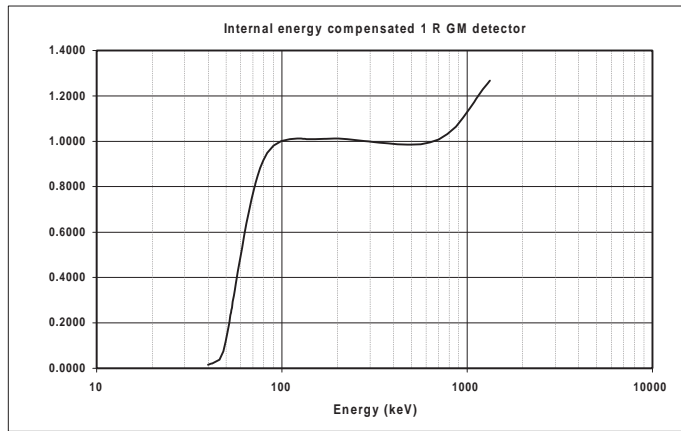
Specifications for ASM-992 and ASM-993 internal energy compensated 1 R/hr GM detector

Range 0.1 mR/hr to 1 R/hr

Radiation detected Gamma above 60 keV

Accuracy ± 10% of reading between 10% and 100% of full scale on any range, exclusive of energy dependence

Typical energy dependence



Specifications for ASM-993 internal pancake detector

Radiation detected Alpha above 3.5 MeV, beta above 35 keV and gamma above 6 keV

Range Background to 80 mR/hr

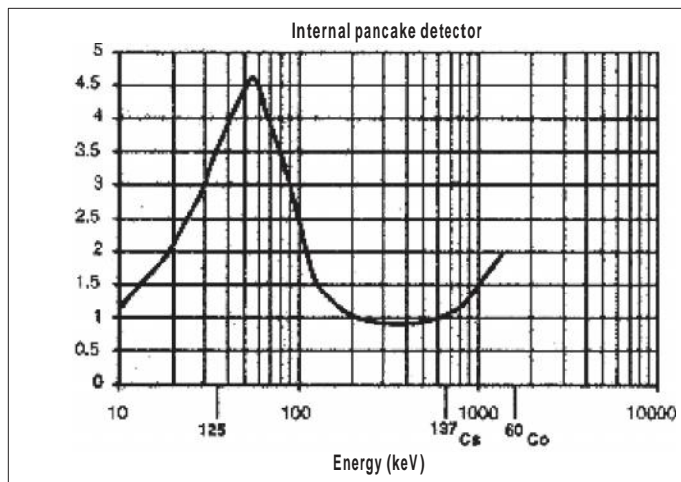
Window 15 cm² (1.75 in Ø) mica, 1.4 to 2.0 mg/cm²

Typical background 30 CPM

Protective screen Stainless steel, hexagonal pattern providing 86% open area

Accuracy ± 10% of reading between 10% and 100% of full scale on any range, exclusive of energy dependence (protective cover open)

Typical energy dependence



Efficiency The internal pancake detector efficiency is shown below. In a recent performance check, the numbers shown represent typical results obtained:

Isotope	%Efficiency
¹⁴ C	5
⁹⁹ Tc	12
¹³⁷ Cs	24
⁹⁰ Sr	59
³⁶ Cl	26
²⁴¹ Am	8
¹²⁹ I	2
²³⁰ Th	15
²³⁹ Pu	12

*Note: The efficiency formula used to calculate the %Efficiency is:
Eff. % = (CPM x 100) / DPM*

Optional accessories

Mass Casualty Triage Tags, 500 per case (Model 990-ERT-101)

Barcoded Emergency Response Tags, 1000 per case (Model 990-ERT-102)

Serial Port IrDA Adapter (Model 990-IR-SER)

Carrying Case (Model 990CC)

Wall Mounting Bracket (Model 990WM)

Probe Holder for Model 489-110D (Model 990PH)

Universal Probe Holder (Model 990UPH)

Soft-Sided Holster (Model 990SH)

Shoulder Strap Assembly (Model 990SA)

Note: The shoulder strap assembly is only available for the ASM-993 and must be ordered with the instrument and factory installed.

Note: The ASM-990 series, with the customer selected probe is calibrated to NIST standards. The ASM-990 series with GM probe standard calibration is in R, Sv, and rems. Scintillation detectors are calibrated in counts. Radionuclide specific efficiency calibrations are available upon request. For probe selection and calibration services, see next page.

Available model(s)

ASM-990 series	Advanced survey meter	Barcode reader	Internal energy compensated 1 R/hr GM detector	Internal pancake detector
990	X			
990BC	X	X		
992	X		X	
992BC	X	X	X	
993	X		X	X
993BC	X	X	X	X

For probe selection and calibration services, see next page.

CE Tested. Meets applicable standards.

For more information, receive our full product catalog, or order online, contact **Radiation Management Services** business of **Fluke Biomedical**: 440.248.9300 or www.flukebiomedical.com/rms.

Specifications are subject to change without notice.

© 2005 Fluke Biomedical. All rights reserved. Victoreen is a trademark of Fluke Corporation. Printed in USA. ASM-990-ds rev 7 14 oct 05

Victoreen® Geiger-Mueller and Scintillation Probe Selection Guide

Pancake GM Probe Model 489-110D

- Alpha above 3.5 MeV
- Beta above 35 keV
- Gamma and x-ray > 6 keV
- To 80 mR/hr (800 μ Sv/hr)



Energy Compensated GM Probe Model 90-12

- Beta above 200 keV
- Gamma and x-ray > 12 keV
- Up to 1 R/hr (10 mSv/hr)



Thin End Window GM Probe Model 489-35

- Alpha above 4 MeV
- Beta above 70 keV
- Gamma and x-ray > 6 keV
- Up to 80 mR/hr (800 μ Sv/hr)



Utility 1 R/hr GM Probe Model 491-40

- Beta above 200 keV
- Gamma and x-ray > 12 keV
- Up to 1 R/hr (10 mSv/hr)



Gamma Scintillation Probe Model 489-50

- Gamma and x-ray > 60 keV
- 1 x 1 in, 1.5 x 1.5 in and 2 x 2 in NaI (TI) detectors available



Alpha Scintillation Probe Model 489-60

- Alpha above 4 MeV
- 1.5 in \varnothing ZnS (Ag)



Alpha/Beta Scintillation Probe Model 425-200

- Alpha above 350 keV
- Beta above 14 keV
- Plastic scintillator



Scintillation Pancake Probe Model 489-200

- Beta above 100 keV
- Gamma and x-ray > 25 keV
- NaI (TI) rectangular



Low Energy Gamma Scintillation Probe Model 425-110

- Gamma and x-ray > 10 keV
- NaI (TI) 1 mm thick



100 cm² Beta/Gamma Scintillation Probe Model 190-100BGS

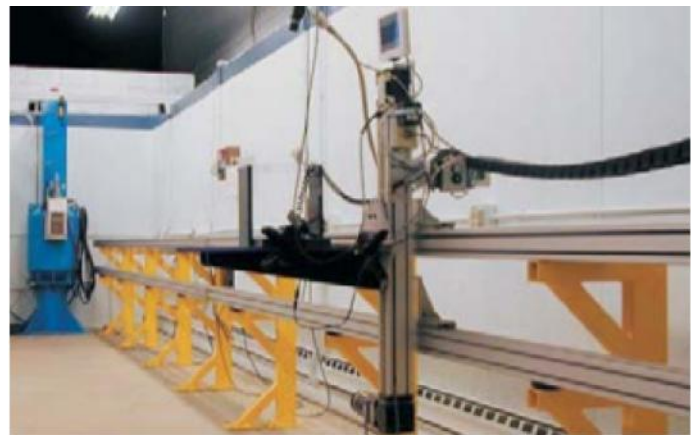
- Beta ⁹⁰Sr efficiency 65.0%
- 126 cm² active area
- Plastic scintillator



Global Calibration Laboratory



- Expert 24 x 7 same day emergency service
- Multi-unit contract pricing available
- Multi-vendor calibration available
- Radionuclide dependent calibrations



Calibration programs

ISO 17025:1999, ANSI Z540, Mammography MQSA, CNSC, NIST & PTB Traceable

Quality programs

ISO 9001:2000, ISO 13485:1996, FDA/QSR, NRC/Part 50, Appendix B/Part

