

Portable Activity Meters

PAM-100 series



The PAM-100 series meters are portable hand-held instruments intended for the measurement of surface contamination by alpha, beta and gamma emitting radionuclides.

A compact and ergonomically designed user friendly meter.

Purpose

The PAM-100 series meters are portable hand-held instruments intended for the measurement of surface contamination by alpha, beta and gamma emitting radionuclides - depending on the model.

It can be used in many applications wherever contamination is expected and needs to be monitored: in nuclear power plants, re-processing plants, the decommissioning and dismantling of nuclear facilities and the management of radioactive waste, in medical industry, in research and environmental applications. The surfaces of various objects can be measured, such as; walls, floors, tables, pallets, drums, hands, feet and clothing. With a wall mounted holder the PAM-100 can be used to monitor hands as an exit monitor.

Description

The PAM-100 meters are compact lightweight instruments with the detector located in the lower part, covered with a protective grill. The digital display and control elements are located in the upper part. Plastic scintillator (with ZnS(Ag) for alpha models), reflector, photomultiplier and signal processing electronics are located within the plastic casing. Battery powered by standard C size batteries located inside the handle.

Designed as a simple, user friendly device to facilitate ease of use. A high degree of shock resistance was incorporated into design.

The graphic display, with high resolution, displays the count rate and/or activity as a figure and in bar-graph form. A battery status indicator is also displayed. Back illumination of the display can be activated if required and will remain active for 10 seconds after pressing the respective push button. It is also automatically activated 20 seconds after turning on the device. The display is easily legible under standard light conditions without back illumination.

Main Advantages

- gasless detector, fast replacement of foil
- compact, lightweight, simple usage
- long battery lifetime
- high sensitivity, uniform response
- two settable alarms
- easy decontamination

Specification

Detector type	plastic scintillator; ZnS(Ag)*
Active area	square (10 x 10 cm) 100 cm ² (3.9 x 3.9 in) 15.2 in ²
Upper range	up to 1E5 cps
Energy range for beta	¹⁴ C ~ 3.0 MeV
Effective energy range	0.2 ~ 2.5 MeV
Battery	2 pcs. standard C size
Battery life	app. 150 hours (without back illumination)
Temperature ranges	-10 ~ +40 °C 14 ~ 104 °F
Humidity ranges	max. 90% non-cond.
Weight	app. 1 kg (2.2 lb)
Dimensions (W x H x D)	120 x 109 x 223 mm (4.7 x 4.3 x 8.8 in)
Graphic display	128 x 64 dots (60.8 x 33) mm area
Units	cps, cps/cm ² optionally Bq and Bq/cm ²

*availability depends on the model

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Typical parameters of detectors

Device	PAM-100A	PAM-100B	PAM-100C		PAM-100D	PAM-100E	
Type	K0950	K0951	K0952		K0953	K0954	
Channel	A	A+B	A	B	A+B+G	A	B+G
Background[cps]	0.02	5	0.02	5	25	0.02	25
Efficiency	[%]	[%]	[%]	[%]	[%]	[%]	[%]
²⁴¹ Am	41	41	51	< 2	49	44	< 4
²³⁹ Pu	38	41	48	x	43	41	X
U-nat	26	92	36	46	89	28	52
¹⁴ C	x	20	X	5	15	x	4
³⁶ Cl	x	N/A	x	46	55	x	46
⁶⁰ Co	x	40	X	22	45	x	28
²⁰⁴ Tl	x	48	X	32	49	x	38
¹³⁷ Cs	x	48	X	34	48	x	35
⁹⁰ Sr/ ⁹⁰ Y	x	54	X	43	52	x	44
Response	[cps/Bq]	[cps/Bq]	[cps/Bq]	[cps/Bq]	[cps/Bq]	[cps/Bq]	[cps/Bq]
²⁴¹ Am	0.19	0.23	0.24	< 0.010	0.23	0.21	< 0.020
²³⁹ Pu	0.19	0.20	0.24	x	0.21	0.21	x
Unat	0.091	0.38	0.13	0.17	0.31	0.10	0.19
²⁴¹ Am gamma	x	0.001	x	0.001	0.019	x	0.005
¹⁴ C	x	0.080	x	0.020	0.059	x	0.016
³⁶ Cl	x	N/A	x	0.30	0.36	x	0.30
⁶⁰ Co	x	0.23	x	0.13	0.26	x	0.18
⁶⁰ Co gamma	x	0.018	x	0.015	N/A	x	N/A
²⁰⁴ Tl	x	0.31	x	0.24	0.30	x	0.24
¹³⁷ Cs	x	0.34	x	0.24	0.34	x	0.26
¹³⁷ Cs gamma	x	0.008	x	0.007	N/A	x	N/A
⁹⁰ Sr/ ⁹⁰ Y	x	0.37	x	0.29	0.35	x	0.30
Sensitivity Cs-137	[cps/(uGy/h)]	[cps/(uGy/h)]	[cps/(uGy/h)]	[cps/(uGy/h)]	[cps/(uGy/h)]	[cps/(uGy/h)]	[cps/(uGy/h)]
	7.2E-5	5.3E1	6.8E-3	3.8E1	5.0E2	7.1E-2	4.7E2

Description

The detectors used are large-area plastic scintillators with different thickness (and some models with a ZnS(Ag) layer) coupled to a photomultiplier; the window is covered with light-tight foil and protected by the metal grill.

The optimized reflector geometry and surface ensures very good homogeneity and efficiency.

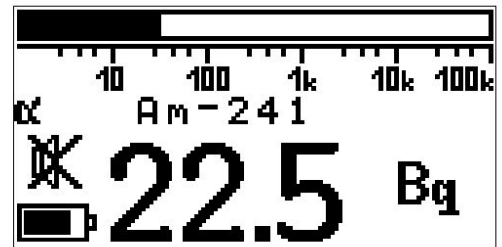
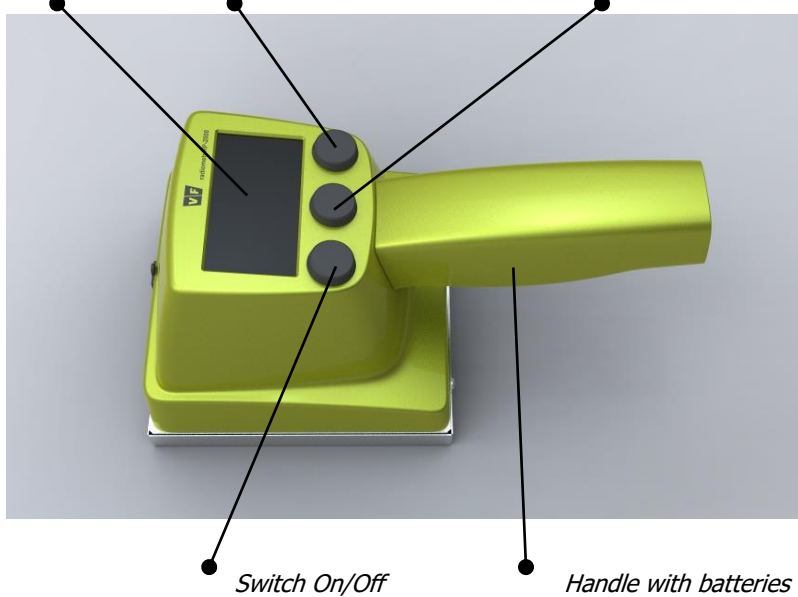
Incoming pulses are acoustically indicated using the internal buzzer. The acoustic indication can be switched on/off by pressing the respective push button.

Communication with an external PC is available using a serial line through USB connector. The port is intended for service purposes.

The instrument's surfaces can easily be decontaminated.

PAM-100 meter / main parts and functions

Display Function (units) Acoustic indication On/Off; Illumination on



Typical PAM screen – one channel model

Optional accessories

- Service software (PC/Windows based)
- Calibration/check kit
- Carrying case
- Wall mounted holder which allows the PAM to be used as an exit monitor
- Lanyard connectors fitted onto the PAM and lanyard (shoulder strap)
- Frame with thin three-layer lightproof foil and gasket
- Screwing safe-plate for secure foil replacement



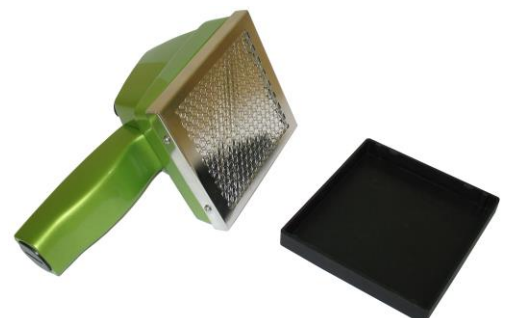
Lanyard with connectors



Carrying case



Screwing safe-plate



Protective plastic cover (included)

Certification and Standards

Type approved meter, certificate no. **TCM 441/10 – 4800** issued by Czech Metrological Institute

ČSN EN 60325:2005

Radiation protection instrumentation - alpha, beta and alpha/beta (beta energy >60 keV) contamination meters and monitors

ČSN EN 61326-1:2006

Electrical equipment for measurement, control and laboratory use - EMC requirements

Models and Accessories

Type	Description		
K0950	PAM-100A alpha surface activity meter – single channel basic configuration		
K0951	PAM-100B alpha and beta surface activity meter – single channel basic configuration		
K0952	PAM-100C alpha and beta surface activity meter – two channel basic configuration		
K0953	PAM-100D alpha and beta + gamma surface activity meter – single channel basic configuration		
K0954	PAM-100E alpha and beta + gamma surface activity meter – two channel basic configuration		
Model	Optional Accessories		
K0820-53	Vanguard protective case	K0820-02-C02V27	Screwing safe-plate
K0820-52	Lanyard with eyelets	-	Calibration toolkit
Model	Service spare parts		
K0820-02-C-02-P02	Frame with thin three-layer lightproof foil and gasket (K0820-02-C-02-V03)		
Type	Related Products		
K1230	PAM-170A alpha surface activity meter – single channel basic configuration		
K1231	PAM-170B alpha and beta surface activity meter – single channel basic configuration		
K1232	PAM-170C alpha and beta surface activity meter – two channel basic configuration		
K1233	PAM-170D alpha and beta + gamma surface activity meter – single channel basic configuration		
K1234	PAM-170E alpha and beta + gamma surface activity meter – two channel basic configuration		



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Contact address

Czech Republic

VF, a.s., Svitavská 588
CZ 679 21 Černá Hora
tel. +420 516 428 611
fax +420 516 428 610
info@vf.eu

Slovak Republic

VF, s.r.o., M. R. Štefánika 9
SK 010 02 Žilina
tel. +421 415 072 411
fax +421 415 072 410
info@vf.eu