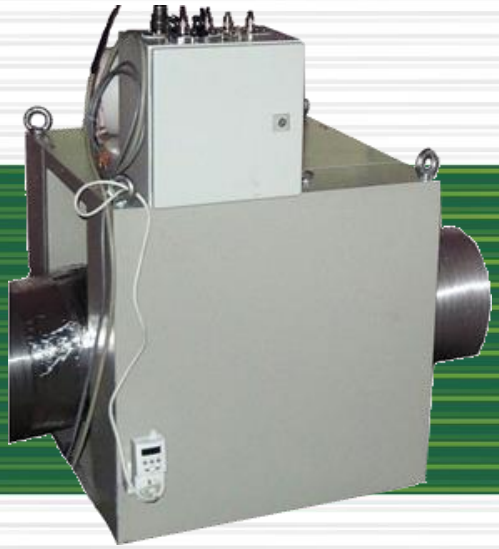
VF NUCLEAR

NUCLEAR MEDICINE

PET-02

PET AIR MONITOR



KEY FEATURES

- An air monitor optimized for the detection of typical radionuclides produced in cyclotrons for PET centres
- Detectors and coincidence electronics designed so as to minimize the influence of the natural background
- Minimization of false coincidences
- Local display and control and/or part of a host monitoring system

POPIS

The PET-02 monitor is intended for the monitoring of gaseous effluents in facilities that produce and process positron emitting radionuclides. Typical users include PET centres and cyclotron facilities.

The monitor is especially suitable for the detection of F-18 and radionuclides of biogenic elements of C-11, N-13, O-15, but it is also capable of detecting other positron emitting radionuclides (e.g. Sr/Rb-82 and Ge/Ga-68).

The PET-02 monitors may be used as part of host monitoring systems or may serve as autonomous monitors when connected to a local display unit.

The PET-02 monitor is composed of the following main parts:

- a measuring pipe of a circular cross-section with flanges to be used on the main pipe,
- a pair of plastic scintillation gamma detectors in a coincidence arrangement placed closely to the measuring pipe on opposite sides with each detector being optionally equipped with lead shielding,
- RPU-06 processing unit containing a pair of multichannel analysers (DIM-09) and coincidence counting electronics.

The PET-02 monitor should be situated in an environmentally controlled area. To ensure the required measurement accuracy, stable ambient temperatures of the detectors needs to be maintained (typically 25 °C). Where required, forced ventilation or air conditioning is used to maintain the ambient temperature.

The physical phenomenon of positron annihilation in a collision with an electron is used to detect positrons where a pair of photons with an energy of 511 keV is emitted which escape in opposite directions. The same phenomenon is used as the basis for PET diagnostic devices.

The processing electronics uses a coincidence detection technique, which enables the setting of parameters to count the signals from both detectors to minimize false coincidences.

The resulting count rate is directly proportional to the number of annihilations of positrons that have taken place in the measured volume.

The count rate can be converted to volume activity.

Results can be displayed either in the place of measurement (e.g. on the RPU-06 radiation processing unit) and/or on another remote display unit. The monitor can also be connected and send the results to a host monitoring system where the values obtained may be archived and further processed.

RPU-06 Radiation Processing Unit

PET-02

PET AIR MONITOR

OPTIONAL FEATURES

N/A	Lead shielding 50mm (2 in)

RELATED PRODUCTS

RMS	Radiation Monitoring System
RPU-06	Radiation Processing Unit

Installation of PET-02 in air ducts in a nuclear medicine facility

SPECIFICATION

Detector	2 plastic scintillators
Detector dimensions	350 x 360 x 50 mm (13.8 x 14.2 x 2 in)
Energy range	150 keV to 1,5 MeV
Referential nuclides	F-18, Ge-68
Length of the measuring pipe	600 mm (23½ in)
Diameter of the measuring pipe	300 mm (11¾ in)
Display and Control	local or host system
Weight	approx. 430 kg (950 lb)
Dimensions *	685 x 845 x 685 mm (27 x 33¼ x 27 in)
Ambient temperature	+5 ÷ 50 °C (+41 ÷ 122 °F)
Ambient relative humidity	max. 80%, non-condensing
Power supply	230 V AC

** Without input and output flanges*

VF NUCLEAR

VF, a.s. Czech Republic

T:+420 516 428 611

E: sales@vfnuclear.com

www.vfnuclear.com

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