

PRODUCT CATALOGUE 2017



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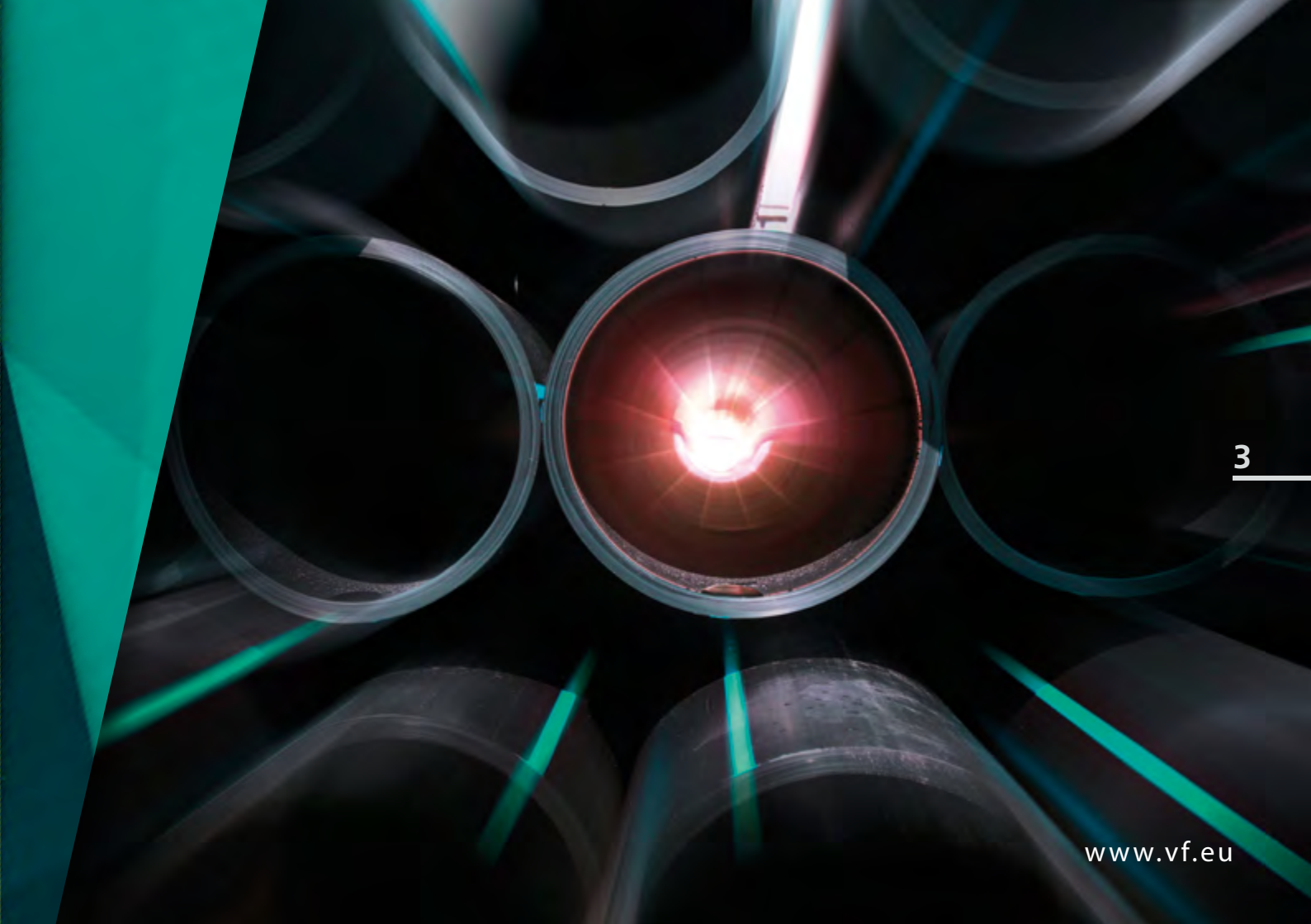


VF is a successful and reliable partner in the field of radiation protection and monitoring, which provides its clients with flexible, technologically advanced, high quality solutions tailored to the client's needs and expectations.

The five areas in which we offer products and solutions include:

- Nuclear Industry
- Radioactive Waste Management
- Environmental Monitoring
- Medical Industry
- Metrology and Calibration

Orders are fully realized from processing studies, design and other documentation, all the way up to delivering the product, the development and implementation of SW, the installation and complete testing of systems on-site, as well as training the client during hand-over. Further, we offer our clients a complete warranty and after-warranty service.





VF is a leading international company specializing in the field of radiation monitoring systems for the nuclear industry. Today, VF has more than 20 years of experience with the designing and manufacturing of instrumentation for the nuclear industry, including software applications. The individual radiation detectors and monitors are delivered either independently or as part of complete radiation monitoring systems.

4

These include a large spectrum of products in the following areas:

- Area Monitoring
- Airborne and Process Monitoring
- Effluent Monitoring
- Samplers
- Measurement, Control and Information Systems
- Contamination Monitoring
- Personnel Dosimetry

Nuclear Industry

5

MDG SERIES DOSE RATE METERS

6

MDG-0X meters are suitable for measuring dose rates of gamma radiation from very low levels, corresponding to a natural background, up to several Gy/h (models for measuring Sv/h are also available).

They can be used as environmental, area gamma or gate monitors with a local or remote indication in the host systems. For technological measurements in areas containing more sources, where only one source should be monitored, directional (collimated) dose meters are available.

Measurement capability:

- 2E-8 to 1E1 Gy/h (2E-6 to 1E3 rad/h)





AREA MONITORING

AGM-02 AREA GAMMA MONITOR

8

The AGM-02 monitor, with an integrated GM tube and backlit display in a compact casing, measures the dose rate at the place of installation and provides a local indication of the measurement results. It can also be connected to the host system for a remote indication.

Measurement capability:

- 1E-7 to 1E-1 Sv/h (1E-5 to 1E1 rem/h)





MDN-01 NEUTRON EQUIVALENT DOSE RATE METER

10

The MDN-01 meter is designed for the measurement of the ambient dose equivalent rate $H^*(10)$ in neutron fields in different environments, such as spent fuel storage facilities, PET centres with cyclotrons, workplaces with particle accelerators, etc. The detection part of the monitor consists of a proportional detector tube and a moderator sphere.

Measurement capability:

- 1E-7 to 1E1 Sv/h (1E-5 to 1E3 rem/h)





CPM-300 CONTINUOUS PARTICULATE MONITOR

12

The CPM-300 monitor is designed to measure alpha and beta particulate concentration in the air continuously using a moving filter tape and a solid-state detector. The air can be sampled directly from working environments, ventilation systems or surrounding environments.

Measurement range:

- Alpha concentration: 1.5 to 1E6 Bq/m³ (4E-11 to 2.7E-5 μCi/cc)
- Beta concentration: 3.7 to 1E6 Bq/m³ (1E-10 to 2.7E-5 μCi/cc)





NGD-03, NGD-04 NOBLE GAS DETECTORS

14

The NGD-03 and NGD-04 detectors are intended for the continuous measurement of noble gas beta activity in the air mass of ventilation stack discharges, in pipelines and technological systems, as well as in the environment.

The NGD-03 contains two identical scintillation detectors for low-range measurement; the NGD-04 contains two CdTe detectors for high-range measurement. One of the two detectors is used for real-time gamma compensation.

Measurement ranges:

- NGD-03: $1E4$ to $2E9$ Bq/m³ ($2.7E-7$ to $5E-2$ μ Ci/cc)
- NGD-04: $2E8$ to $5E13$ Bq/m³ ($5E-3$ to $1.35E3$ μ Ci/cc)



LAM-501 LIQUID ACTIVITY MONITOR

The LAM-501 monitor is intended for “on-line” non-invasive measurement of the gamma activity of liquids flowing through pipelines. The monitor is attached to a pipeline and measures the activity through its wall.

The standard model is equipped with a NaI(Tl) scintillation probe with suitable sensitivity.

Detection limits:

- on request, depends on the detector used

GEMS-700 GASEOUS EFFLUENT MONITORING, AND SAMPLING SYSTEM

16

The GEMS-700 system is used for routine and post-accident sampling and monitoring of the effluents from the ventilation stacks of nuclear facilities. It collects samples of particulates and iodine and measures the real-time activity of noble gases. The system meets US NRC RG 1.97 requirements.

Noble gas measurement capability:

➤ 3.7E3 to 1E15 Bq/m³ (1E-7 to 2.7E4 μCi/cc)

EFFLUENT MONITORING

NGM-2000 NOBLE GAS MONITOR

The NGM-2000 is a state-of-the-art monitor designed for quasi-continuous and nuclide-specific activity monitoring and the reporting of noble gases that are discharged from the ventilation stacks of nuclear facilities. Thanks to the unique design of its measuring chamber, the NGM-2000 offers very low detection limits. The HPGe detector is used to obtain high-resolution gamma spectra.

Measurement range for a 24-hour summary measurement:

- 5E2 to 1E9 Bq/m³ of ¹³³Xe (1.35E-8 to 2.7E-2 μCi/cc)



GES-400 GASEOUS EFFLUENT SAMPLER

18

The GES-400 sampler is intended for post-accident ventilation stack air sampling for the further evaluation of radioactive particulates and iodine discharges. Two shielded chambers ensure continuous sampling. It is equipped with dose rate detectors for the activity evaluation of filters with signalization for values exceeding the pre-set alarm levels of dose rate.



EFFLUENT MONITORING

LEM SERIES LIQUID EFFLUENT MONITORS

The LEM series monitors allow the taking of samples and off-line measurement of the volume gamma activity of liquids with very low minimum detectable activities. It is suitable for spectrometric measurement and the reporting of liquid effluents from nuclear facilities. It is available with a NaI(Tl), LaBr or HPGe detector.

Detection limits:

➤ from 0.5 Bq/l of ^{137}Cs (1.35E-14 $\mu\text{Ci/cc}$)



SAMPLERS

VOPV-10 DIGITAL HIGH-VOLUME AIR SAMPLERS

20

The more compact VOPV-10 sampler is intended for air sampling in different applications and can be powered from automobile batteries. Both can be used, for example, for sampling and evaluating radioactive pollutants, dust, etc. in the air. The specific use depends on the type of filter used.

Available models of VOPV-10:

- aerosol and/or iodine sampling with airflow from 1 to 3 m³/h (0.59 to 1.77 cfm)
- aerosol and/or iodine sampling with airflow from 4 to 12 m³/h (2.35 to 7.06 cfm)
- aerosol sampling with airflow from 6 to 15 m³/h (3.53 to 8.83 cfm)
- aerosol sampling with airflow from 12 to 30 m³/h (7.06 to 17.67 cfm)



SAMPLERS

VOPV-12 DIGITAL HIGH-VOLUME AIR SAMPLERS

The VOPV-12 sampler is intended for the sampling of high volumes of air and allows for follow-up air contamination evaluation.

Available models of VOPV-12:

- aerosol sampler with airflow from 20 to 160 m³/h
(11.8 to 94.2 cfm)
- iodine sampler with airflow from 1.5 to 4.5 m³/h
(0.88 to 2.65 cfm)



SAMPLERS

NGS-2000 NOBLE GAS SAMPLER

22

The NGS-2000 sampler is intended for the collection of pressurized air samples from nuclear facilities' ventilation stacks into a portable Marinelli beaker. Subsequently, noble gas nuclide specific activity in collected samples is evaluated in the laboratory by using a spectrometric HPGe detector.

Marinelli beaker:

- volume 10 l, pressure 1,200 kPa



SAMPLERS

OTK-01 TRITIUM SAMPLERS

OTK-01 is used for airborne ^3H sampling in the basic form of HTO. A simple but effective condensation sampling method is used, avoiding the use of sorbent.



V3H14C SERIES SAMPLERS FOR ^3H AND ^{14}C

24

The V3H14C series samplers are designed for the sampling of airborne ^3H and ^{14}C . They can contain one or two sampling channels. The first channel is provided with a catalytic combustion system and is used for ^3H and ^{14}C sampling in the form of H_2O , H_2 , CO_2 , CO and C_xH_x . The second channel is used for ^3H and ^{14}C capture only in the form of H_2O and CO_2 .

Available models:

- **V3H14C:** two-channel differential sampler, one channel with catalyst.
- **V3H14C:** one-channel sampler, without catalyst.
- **V3H:** two-channel differential sampler, one channel with catalyst.
- **V3Ha:** one-channel sampler, without catalyst, smaller compact case.





SAMPLERS

LES LIQUID EFFLUENT SAMPLERS

26

The LES samplers are designed for representative sampling from nuclear facilities' liquid effluents into plastic bins for further laboratory analysis and released activity calculation. The sampling process is automated.



LZJ SERIES RADIATION PROCESSING AND DISPLAY UNITS

The LZJ series units are state-of-the-art devices intended for use in radiation monitoring systems. These devices provide acquisition, processing, displaying, local archiving and transmission to the host system of the signals coming from detectors. A wide variety of "intelligent" or "dumb" probes can be connected locally or remotely using different interconnections – RS-485, RS-232, cps, Ethernet, USB, current loop, digital and relay I/O, etc.

An ASU-50 alarm slave unit can be connected for very powerful optical and acoustic alarm signalling.



RMS RADIATION MONITORING SYSTEM

28

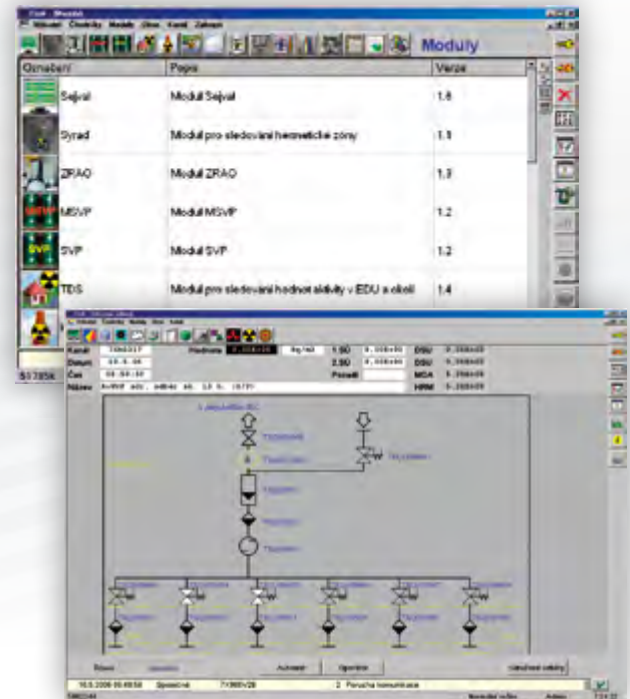
The VF RMS radiation monitoring system is a state-of-the-art modular and standardized system for radiological monitoring. A variety of radiation monitors, display and alarm units can be connected to the RMS system.

The system has been designed for use at nuclear research facilities, radioactive waste repositories, hospitals, etc.

CISRK RADIATION MONITORING AND INFORMATION SYSTEM

CISRK is an advanced and robust radiation monitoring and information system designed primarily for nuclear power plants, which provides detailed information about the radiation situation at the site and in its vicinity. Up to several thousand radiation detectors can be connected to the system. Amongst its key functions are the acquisition of data from radiation detectors from all parts of the plant, their interpretation, presentation and archiving, and the remote control of technology.

It is a modular application that enables customization for the specific requirements of each plant.



EXITSCAN-2 SERIES PERSONNEL EXIT MONITOR

30

The ExitScan-2 is a new type of a two-step whole-body exit monitor designed for checking the contamination of personnel leaving the controlled areas of nuclear facilities. The monitor checks for contamination by alpha, beta, and gamma radiation emitting radionuclides (depending on the detectors used). For different workplaces, an appropriate smart scintillation detector can be utilised, with or without alpha discrimination.

Efficiency:

- Alpha: up to 51% (^{241}Am)
- Beta: up to 47% (^{204}Tl)





HF SERIES HAND-FOOT CONTAMINATION MONITORS

32

The HF series monitors are intended for the measurement of surface contamination on hands and feet (and clothing when equipped with an optional frisking probe). The monitor checks for contamination by alpha, beta and gamma emitting radionuclides (depending on the detectors used). For different workplaces, an appropriate smart scintillation detector can be utilised, with or without alpha discrimination.

Efficiency:

- Alpha: up to 51% (^{241}Am)
- Beta: up to 47% (^{204}Tl)





HM-4 SERIES HAND CONTAMINATION MONITORS

34

The HM-4 series monitors are intended for the measurement of surface contamination on hands (and on clothing when equipped with an optional frisking probe). The monitor checks for contamination by alpha, beta and gamma emitting radionuclides (depending on the detectors used). For different workplaces, an appropriate smart scintillation detector can be utilised, with or without alpha discrimination.

Efficiency:

- Alpha: up to 51% (^{241}Am)
- Beta: up to 47% (^{204}Tl)



FCM-02 CONTAMINATION MONITOR

The FCM-02 monitor enables the measurement of the surface contamination of radiation workers, their clothing and working instruments by alpha, beta and gamma emitting radionuclides (depending on the detectors used).

Typically, SFP-100 series smart scintillation frisking probes are connected with an active area of 100 cm². Dual phosphor probes with two channel electronics for alpha discrimination are available.

Efficiency:

- Alpha: up to 51% (²⁴¹Am)
- Beta: up to 47% (²⁰⁴Tl)



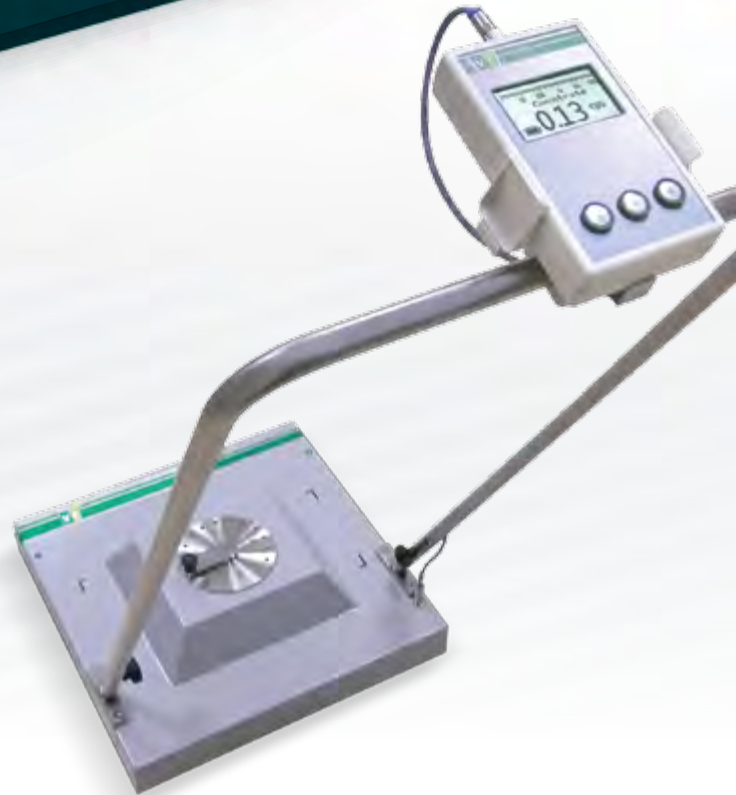
FLOORSCAN SERIES FLOOR CONTAMINATION MONITORS

36

The FloorScan series monitors are intended for the measurement of surface contamination by alpha, beta and gamma emitting radionuclides on floors (depending on the detectors used). Smart gasless scintillation detectors are used. Dual phosphor detectors with two channel electronics for alpha discrimination are available.

Available models:

- FloorScan-525 with 525 cm² (81.4 in²) detection area
- FloorScan-1050 with 1050 cm² (163 in²) detection area





LCM-300 SERIES LAUNDRY CONTAMINATION MONITORS

38

The LCM-300 series monitors are mobile devices that primarily serve for the checking of the contamination of washed and dried laundry originating from areas where it could have been in contact with alpha, beta and/or gamma radionuclides (depending on the detectors used). They can also be used for checking the contamination of other items of a suitable size.

Detection limits:

- **Beta:** 0.2 Bq/cm^2 ($5.4\text{E-}3 \text{ nCi/cm}^2$)
- **Gamma:** 1.2 Bq/cm^2 ($3.25\text{E-}2 \text{ nCi/cm}^2$)





RADCOUNT-2 RATEMETER AND DISPLAY UNIT

40

The Radcount-2 is a hand-held ratemeter for the measurement of medium rates of pulse counts from ionizing radiation detectors. The instrument has many flexible and adaptable features:

The device can be used with several different types of detector. The instrument can operate in single or dual channel detection mode. Integration mode is also available. There are versions for both “dumb” probes (Radcount-2 Ratemeter) and “smart” probes (Radcount-2S Display Unit). It contains a large clear backlit display that shows the measurements’ results and other necessary information. Results can be presented in any desired measurement unit.





PAM-100 & PAM-170 SERIES PORTABLE ACTIVITY METERS

42

The PAM-100 and PAM-170 series meters are portable hand-held user-friendly and ergonomically designed instruments intended for measuring surface contamination by alpha, beta and gamma emitting radionuclides (depending on the detectors used). Smart gasless scintillation detectors with an active area of 100 cm² or 170 cm² are used. Dual phosphor detectors with two channel electronics for alpha discrimination are available.

Efficiency:

- **Alpha:** up to 51% (²⁴¹Am), up to 48% (²³⁹Pu), up to 92% (natU)
- **Beta:** up to 20% (¹⁴C), up to 45% (⁶⁰Co), up to 49% (²⁰⁴Tl), up to 54% (⁹⁰Sr/⁹⁰Y), up to 48% (¹³⁷Cs)





SIM SERIES SMALL ITEMS CONTAMINATION MONITORS

44

The SIM series monitors are devices for monitoring small objects that may be contaminated by gamma radionuclides. The measured objects are inserted into a shielded measuring chamber. Standard chamber volumes available are 17 l, 27 l and 101 l. Two to six smart scintillation detectors are used as standard.

Detection limit:

- 100 Bq of ^{137}Cs (2.7 nCi)





SAMPLE ANALYSIS SYSTEM (MK-30P)

46

The Sample Analysis System (consisting of MK-30P shielded chamber and connected PC/notebook) is intended for measuring swipe (smear) and evaporation samples and air filters. Various detectors can be used for specific applications: alpha, beta, gamma, alpha/beta, etc.

Measuring dish diameter:

- max 50 mm (2 in)



SEOD ELECTRONIC PERSONAL DOSIMETRY SYSTEM

The SEOD system is designed for everyday operative assessment of the personal doses received by workers in controlled areas, especially in nuclear power plants. The SEOD system uses directly readable electronic personal dosimeters by various manufacturers. It allows doses to be restricted in accordance with legislation limits.

A simplified version, the SEOD-MP, for hospitals, research institutes and other similar workplaces is also available.



TED SERIES ELECTRONIC DOSIMETERS TERMINAL

48

The TED terminal serves as an end device of the SEOD Electronic Personal Dosimetry System. The terminal works with a database of personnel (and their personal doses) and enables them entering controlled areas, according to specified parameters. The terminal transfers all personal doses acquired and other data, for further processing, into the host system.

A simplified and more compact version, the TED-MP, for hospitals, research institutes and other similar workplaces is also available.





TED K004

EPD-5

DPD DISPENSER OF PERSONAL DOSIMETERS

50

The dispenser of personal dosimeters is a device that enables automatic, fast and controlled issuing of film, thermoluminescent, optically-stimulated luminescent, radiophotoluminescent or other similar personal dosimeters for workers that enter controlled areas.

Dosimeter type:

- EPD, TLD, RPL, OSL, film badge







VF offers a range of products for radioactive waste management and safe and economical disposal of ionizing radiation sources. Due to the decommissioning and dismantling of older nuclear facilities, there is an increased interest world-wide in solutions that include the free release of waste into the environment. Our products are often customized to varying national regulations in order to maximize their performance and minimize the cost of waste disposal.

We have experience in the design and supply of:

- Waste assay monitors for the characterization of radioactive waste.
- Free release monitors for the free release (clearance) of waste into the environment.
- Information and tracking systems and databases of radioactive waste.
- Design and construction of hot cells for work with high-level activities.
- Supply, replacement, handling and safe disposal of ionizing radiation sources.

A stack of several yellow cylindrical drums, likely used for radioactive waste, is shown. The drums are arranged in a slightly overlapping manner, with some in the foreground and others behind. The background is a textured, light-colored surface, possibly concrete or stone, with some dark spots and cracks. The overall lighting is bright, highlighting the metallic sheen of the drums.

Radioactive Waste Management

FRM-02 SERIES FREE RELEASE MONITOR

54

The FRM-02 monitors are intended for measuring and analysing the integral activity of gamma-emitting radionuclides in waste stored in standard crates or drums. Based on the measurements' results, it is possible to make a decision on whether the material is to be free released or not. As standard, 32 large area scintillation detectors in 4 π geometry are used, which are located in the door, back panel, top and bottom panels and the side panels of the shielded measurement chamber. The number of detectors allows for a fast measurement and an accurate determination of the activity's space distribution.



Detection limits for sources in the middle of the chamber:

➤ ^{60}Co less than 300 Bq (8.1 nCi), ^{137}Cs less than 700 Bq (19 nCi), ^{133}Ba less than 1 000 Bq (27 nCi)



VF

Flexible solutions

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FRM-02B

Truck Test Equipment Measurement Station (TRM-10)

EMERGENCY STOP

Red helmet

Teal vest

Yellow helmet

Linde

FRM-06 SERIES FREE RELEASE MONITOR

56

The FRM-06 facility is designed for activity measurement and analysis of radionuclides that can be present in large volume waste material, e.g., clay, building debris, crushed concrete, etc. stored in standard roll-off containers. Based on the measurement results, it is possible to make a decision on whether the material is to be free released into the environment or not.

Detection limits:

- 10 Bq/kg (0.27 nCi/kg)



FRM-24 SERIES FREE RELEASE MONITOR

58

The FRM-24 monitor is intended for activity measurements in waste material, i.e. in normal operating waste, disposed technological parts, etc. before its free release into the environment. It allows the monitoring of gamma radiation in the bar-shaped material that passes through a measuring tunnel. Otherwise, material can be placed in standard packages, i.e. transport boxes, bags, etc.

Detection limits:

- 600 Bq (16.2 nCi)



WASTE MONITORING

WAM SERIES WASTE ASSAY MONITORS

The WAM series monitors are the latest generation of segmented waste assay monitors. It is primarily intended for quantitative and qualitative characterization of gamma emitting radionuclides in waste stored in drums of different height, shape and weight. Typical applications are the assay of low or intermediate level waste to be stored in the repository or the checking of the waste potentially suitable for free release. Integrated sophisticated software enables total and nuclide specific activity evaluation and their distribution in drum volumes. Models with a transmission source, which enables the measuring and calculating of the material's density, are available.

Available measuring range:

➤ 3 kBq to 3 TBq (81 nCi to 81 Ci)



HOT CELLS

60

Hot Cells are designed and built for working with sealed radiation sources with high activities of up to 8 000 TBq. The environment is shielded from the workplace by concrete walls. The following technology is usually installed in the hot cell: mechanical manipulators, sliding door, platforms for the placement of containers, workbenches, portal crane, containers for operative storage, locked openings for taking out samples, inspection window, visual monitoring system, ventilation system, safety and control system, electric power supply system and safety and emergency interlocks.



VF

SEMI-HOT CELLS

62

Semi-hot Cells represent a complex workplace for treating solid or liquid radioactive emitters and provides personnel with maximum radiation protection. The basic construction components are a bearing steel frame and lead shielding. There are technological apertures located in the enclosure walls and on the front observation window, made of lead glass.







Solutions for monitoring of radioactive materials present in the environment plays an important role in the VF portfolio.

Of all the products and solutions that we offer, the most important are the following:

- Design and supply of perimeter and/or boundary monitoring systems around nuclear facilities with dose rate monitors and wired or wire-less data transmission to the central radiation monitoring system of the plant;
- Automatic stations with dose rate monitors, continuous particulate monitors, high volume air samplers or tritium samplers for the monitoring radioactivity in the air;
- Automatic stations for the monitoring radioactivity in water sources;
- Mobile stations with dose rate monitors, high volume air samplers and other instruments and tools for the monitoring radioactivity in the environment;
- Complete environmental monitoring networks with data transmission systems and information systems for supervision centres.

Environmental Monitoring

65

MDG-01, MDG-07 DOSE RATE METERS

66

The MDG-01 and MDG-07 meters are smart radiation detectors suitable for measuring dose rates of gamma radiation from very low levels corresponding to the natural background. They are typically used as perimeter or environmental monitors with local or remote indication in host systems.

Measurement capability:

- 2E-8 to 1E-1 Sv/h (2E-6 to 1E1 rem/h)



OUTDOOR AIR SAMPLING STATIONS

The Digital High-volume Air Samplers are intended for air sampling on filter media with adjustable flow rate. It is used for the sampling and consequent evaluation of radioactive aerosols, particulates, and other compounds in the contaminated air.

The radioactive pollutants retained on the filter can be subsequently analysed in a laboratory and the nuclide specific volume activities can be calculated.

Flow rate:

- up to 900 m³/h (530 cfm)



Equipment for Environmental Stations

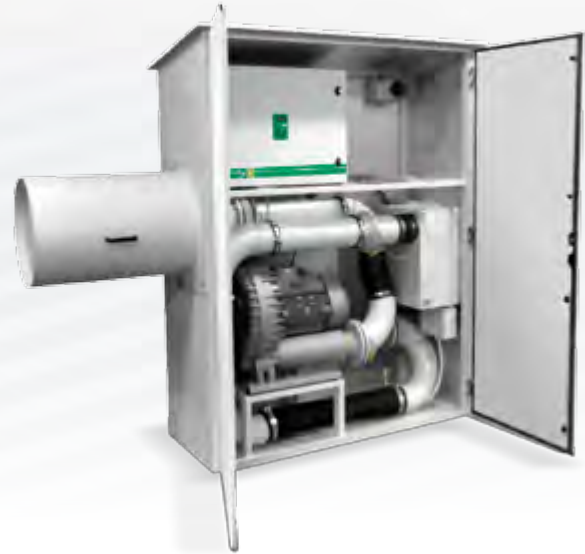
VOPV-7 VERY HIGH-VOLUME AIR SAMPLER

68

The VOPV-7 sampler is intended for the sampling of very high volumes of air on filter media. It is typically utilised for the sampling and follow-up analysis of radioactive aerosols, dust, etc. in the air in environmental outdoor applications.

Flow rate:

➤ up to 900 m³/h (530 cfm)







Radiation monitoring systems can only be reliable when accurate and properly calibrated measuring instruments are used. Our products in the field of metrology and calibration are long term verified in our own accredited laboratory and in similar workplaces built by VF for its customers worldwide.

70

In the field of metrology and calibration we specialize in:

- Design and supply of complete metrological secondary standard dosimetry laboratories for metrological institutes, nuclear power plants and other nuclear facilities, military and civil defence, producers of ionizing measurement radiation instrumentation, as well as other customers;
- Design and manufacturing of collimated gamma irradiators, panoramic gamma irradiators, beta irradiators, neutron irradiators, calibration benches, safety systems, special calibrators, phantoms, data management and control systems and other related accessories.
- Systems for the measurement and standardization of radionuclide activities suited for the establishment of national activity standards;
- Provision of calibration services in accredited laboratory in the Czech Republic.

Metrology and Calibration



Irradiators and Calibrators

OG-8 GAMMA IRRADIATOR

72

The OG-8 irradiator, when fitted with appropriate radionuclide sources, can serve as a gamma dose rate source in a very wide range up to units of Gy/h. It generates a homogeneous and collimated ionizing radiation beam for the calibration of various dose / dose rate meters.

Number of source holders: 8

Total maximum activity:

➤ 200 TBq of ^{137}Cs (5,400 Ci)





Irradiators and Calibrators

IG-13 GAMMA IRRADIATOR

74

The IG-13 irradiator, when fitted with appropriate radionuclide sources, can serve as a gamma dose rate source in a wide range up to approx. 1 Gy/h. It generates a homogeneous and collimated ionizing radiation beam for the calibration of various dose / dose rate meters.

Number of source holders: 3

Total maximum activity:

➤ 2.6 TBq of ^{137}Cs (70 Ci)



Irradiators and Calibrators

PGI-01 GAMMA IRRADIATOR

The PGI-01 irradiator, fitted with a suitable radionuclide source, is primarily intended for the calibration and testing of personal dosimeters with a non-collimated source, or as a general panoramic source of gamma radiation. Depending on the configuration, a suitable source can be installed, for example, ^{60}Co with activity up to 300 GBq (8 Ci), or ^{137}Cs with activity of 3 TBq (81 Ci).

Number of source holders: 1



NI-08 NEUTRON IRRADIATOR

76

The neutron irradiation sources (typically ^{252}Cf , $^{241}\text{Am/Be}$) are stored in a safe basic position in the shielded carousel of the NI-08 irradiator, typically under the floor. The sources, when shifted to a working position (ideally at the geometrical centre of the laboratory), provide a 360° radiation field for calibrating neutron detectors. Ancillary gamma sources can also be inserted into the irradiator and used for measuring the response of neutron detectors in the field of gamma radiation.

Number of source holders: 8



BETA RADIATION CALIBRATION SYSTEM

The Beta Radiation Calibration System is intended for the comfortable and safe calibration of dosimeters by a set of beta radiation sources. It is primarily designed for electronic personal dosimeters; its advantage is its capability to calibrate the dosimeters in fully automatic mode with a relatively high throughput. Other beta dosimeters and detectors can optionally be calibrated after necessary customization.

Beta radiation sources:

➤ ^{147}Pm , ^{85}Kr , $^{90}\text{Sr/Y}$



CALIBRATION BENCHES

CB-50 CALIBRATION BENCH

78

The CB-50 bench is intended for the precise automatic 3-axis positioning of the meter within the horizontal ionizing radiation beam during calibration. A trolley, a key part of the bench, moves on rails parallel to the beam axis. It is used to position the tested instrument at the desired distance from the source (or desired dose rate).

Typical adjustable distance:

- 0.5 m to 10 m (1.6 to 33 ft)



CALIBRATION BENCHES

PTW CALIBRATION BENCH

The PTW calibration bench is very stable steel construction used for accurate positioning of radiation detectors

Typical adjustable distance:

➤ 0.3 m to 10 m (1.0 to 33 ft)



CONTROL AND SAFETY

DARS DATABASE AND CONTROL SYSTEM

80

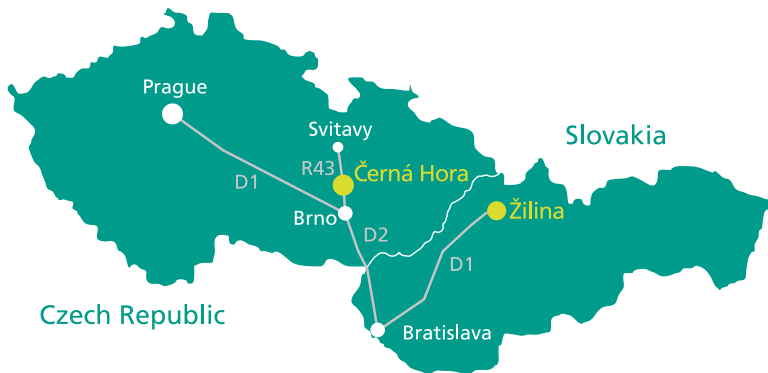
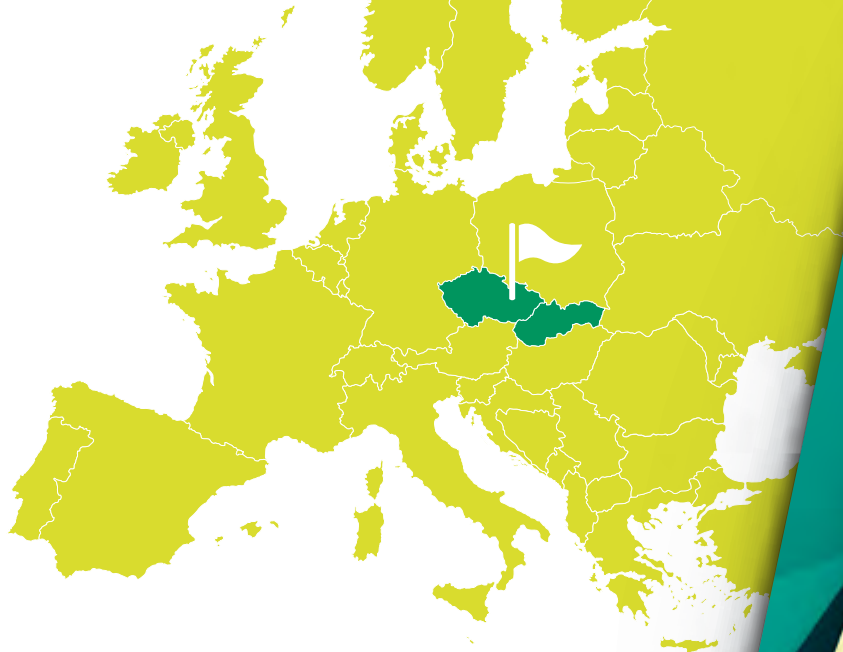
The DARS system provides a user interface for complete administrative and operational control of calibration laboratories for ionizing radiation meters. The DARS system is a modular application customisable to customer needs. It meets the requirements of the ISO/IEC 17025 standard for the accreditation of laboratories.



SAFETY SYSTEM

The purpose of the safety system is to prevent any unacceptable exposure of personnel. The technical components of the safety system are installed inside the irradiation room and in the operator's control room as well. All components are hardwired, i.e. the signals have higher priority than any signal from the control PC/PLC.





GPS:

N / 49°24'59.7"
E / 16°35'04.1"



SÍDLO SPOLEČNOSTI
TECHNOLOGICKÉ CENTRUM
ŠKOLICÍ STŘEDISKO





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