VF NUCLEAR

NUCLEAR POWER PLANTS | RESEARCH CENTRES | INDUSTRY & MANUFACTURING

NGM-2000

NOBLE GAS MONITOR

MAIN ADVANTAGES

- Measurement of very low levels of the volume activities of radioactive noble gases
- Correction of measured activities to specified reference pressure and temperature conditions
- Can connect an external stack flow signal
- Determination of total released activities and committed effective dose of noble gas radionuclides released during the specified period
- Provides proof of compliance with the limits set out in the 96/29 / EURATOM European Union Directive laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation.

PURPOSE

The NGM-2000 is designed for monitoring the releases of radioactive noble gases from nuclear power plants, nuclear fuel processing plants and scientific institutions with research reactors. The sample is brought either directly from the ventilation stacks or from stack inlet ducts.

Two basic models of the NGM-2000 monitor are available:

- "Regulatory" monitor aimed for regulatory measurements with very low MDAs, which pressurizes the sample into a Marinelli vessel.
- "Continuous" monitor for measurements with the sample flowing continuously through the measurement chamber at normal pressure.

Basic monitor set includes:

- Input sampling line with particulate and iodine filters
- Air dryer (regulatory monitor only)
- HPGe semiconductor detector with electrical cooling
- Marinelli vessel for air sample measurement
- Compressor (regulatory monitor) or pump (continuous monitor)
- Local display and control unit
- External input for the stack flow signal
- Uninterruptible power supply for safe monitor switch-off

The sampled air is at the monitor inlet filtered to remove particulates (aerosols) and iodine. The processed sample is taken into the Marinelli vessel (either pressurized by a compressor or under normal pressure by a pump). The sample is then measured by the HPGe detector.

Output values of the monitor are:

- Current volume activities of noble gas radionuclides from the last measurement cycle
- Hourly and daily volumetric activities of noble gas radionuclides obtained by summarizing the spectra from individual measuring cycles
- Indication of exceeding of preset alarm levels of volume activity
- Daily, monthly, quarterly and yearly totals of released activities of noble gas radionuclides
- Daily, monthly, quarterly and annual committed effective doses E(50)inh

The use of a compressor and a pressure vessel in the regulatory version of the monitor increases the measured volume of the air sample to achieve very low detection limits. If the set volume activity is exceeded, the monitor will automatically switch to atmospheric pressure mode, thus increasing the upper limit of the measuring range by approximately one decade.

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The standard factory calibration of the detector is performed using an MCNP simulation and solid sources. Optionally, the detector can be calibrated using radioactive gases.

SPECIFICATION

Detector type	electrically cooled HPGe
Measuring vessel volume	approx. 12 l
Pressure in vessel	
• Regulatory monitor	max. 900 kPa
• Continuous monitor	app. 100 kPa
Regulatory monitor	
Measuring range	
(1 hour measurements)	
• ^{133}Xe	500 to 1E8 Bq/m^3
• ^{85M}Kr	200 to 1E8 Bq/m^3
• ^{85}Kr	5E4 to 1E9 Bq/m^3
MDA (1 day summary spectra)	
^{133}Xe	45 Bq/m^3
^{85M}Kr	20 Bq/m^3
^{85}Kr	7500 Bq/m^3
Continuous monitor	
• Measuring range ^{133}Xe	7E3 to 4E8 Bq/m^3
• MDA ^{133}Xe	270 Bq/m^3
Standard length of the measuring cycle	12 min
Shielding	
• Pb	50mm
• Cu	1 mm
• Sn	1 mm
Power supply	230 VAC / 50 Hz
Dimensions (W × H × D)	
Regulatory monitor	1000 × 1800 × 600 mm
Continuous monitor	1325 × 1855 × 600 mm
Weight	approx. 800 kg

OPTIONAL ACCESSORIES

Calibration with radioactive gas (Kr-85, Xe-133, Ar-41)

OPTIONAL CONFIGURATIONS

HPGe detector with 40% efficiency, or higher.

Alternative mains power supply 110-230 VAC / 50-60 Hz

RELATED PRODUCTS

V3H14C	V3H14C series Tritium and Carbon-14 Samplers
VOPV-12	Aerosols and Iodine Samplers
VOPV-10	High Volume Air Sampler
VOPV-7	Very High Volume Air Sampler

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