Thermo Scientific FHT 57 E-L

Measures and monitors noble gas activity concentration

The Thermo Scientific™ FHT 57 E-L Noble Gas Monitor can be used in the field for air contamination monitoring as well as for immission and emission measurements. With these applications the noble gas activity concentration can be measured and monitored.

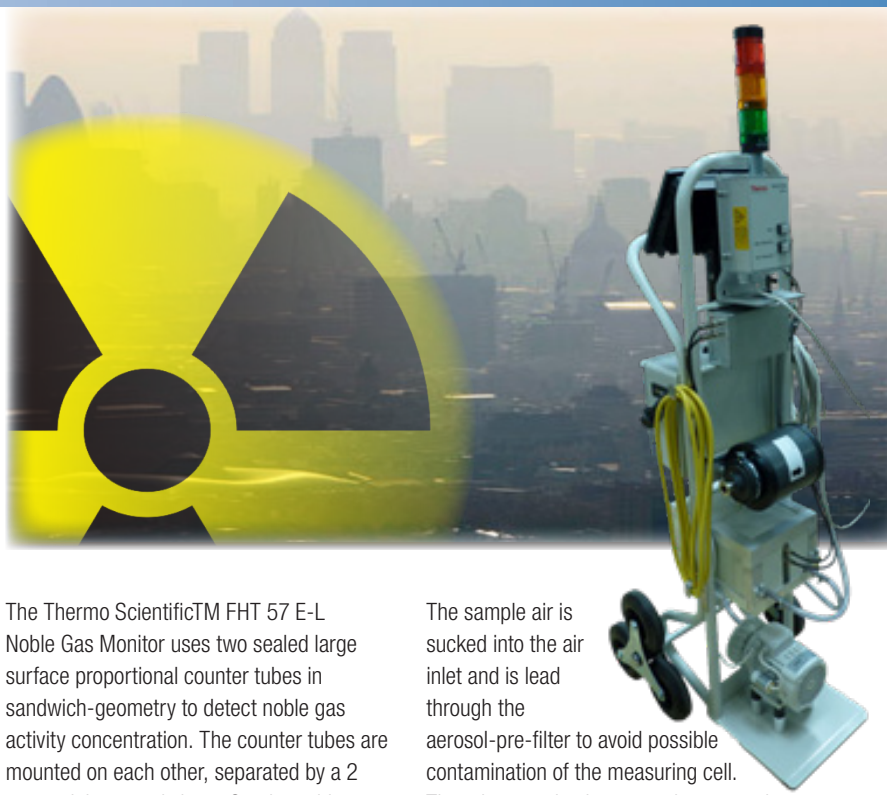
Key Features and Benefits:

- For the use in the ambient air monitoring networks or stack emissions monitoring systems
- Excellent selectivity against other iodine isotopes or interfering noble gases
- Direct read-out of measured values in physical units of Bq/m^3
- Aerosol filter heated air inlet for optimized iodine retention
- Maintenance-free and low-noise gas ring vacuum pump
- Menu-driven calibration procedure with complete track record of efficient data

Applications

- Nuclear facilities
- Stack emissions systems and air monitoring networks

Display FHT 57 E-L



The Thermo ScientificTM FHT 57 E-L Noble Gas Monitor uses two sealed large surface proportional counter tubes in sandwich-geometry to detect noble gas activity concentration. The counter tubes are mounted on each other, separated by a 2 mm stainless steel sheet. So, the noble gas activity of the measurement sample does not influence the counting rate of the shield counter tube. The noble gas measurement is performed as a straightforward coincidental combination of measuring and shield counter tube. The device is operated via a touch sensitive screen on the Panel PC.

The counter pulses are captured and amplified by a charge-sensitive pre-amplifier FHT 681 P2. The activity concentration of the noble gas is calculated from these counting rates using the selectable calibration factors for ^{85}Kr, ^{133}Xe or ^{41}Ar.

The whole detector assembly is flange-mounted to the measuring cell by removable clamps. The measurement volume and the counter tubes are protected by a 25 mm lead shielding to reduce the background counting rate (gamma radiation from the environment).

The sample air is sucked into the air inlet and is lead through the aerosol-pre-filter to avoid possible contamination of the measuring cell. Then the sample air passes the measuring cell in axial direction. The detection volume has a height of only 50 mm to reduce self-absorption.

A differential pressure gauge is used for monitoring the air flow. The differential pressure gauge detects and signalizes whether the air flow is too high (leak, filter missing, wrong pump) or too low (filter clogged, defective pump, air inlet blocked).

The mechanical design of the device allows an easy transport, especially over stairs and obstacles. As the required floor space is very small, the Noble Gas Monitor FHT 57 E-L can be used e.g. for inspection work almost everywhere in the nuclear power plant.

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Specifications

Technical data FHT 57 E-L Noble Gas Monitor

Measuring unit	
Dimensions	Width 480 mm Depth 650 mm Height 1300 mm
Weight	Approx. 103 kg
Power supply	230 V, AC Single phase, 50 HZ
Power consumption	200 VA
Ambient and operation temperature	+ 15 °C ... + 45 °C
Permitted temp. gradient	Max: 15 K/h
Sampled air intake temperature	Min. +5 °C … Max. +45 °C
Barometric pressure	900 hPa … 1050 hPa
Rel. Ambient humidity	20 % … 80 %, non-condensation
Pump	Air flow rate: Max. 3 m^3/h 230V AC, 50 Hz, power consumption 200 VA
Protection class	IP 54

Radiological data FHT 57 E-L Noble Gas Monitor	
Detector	Proportional counting tube with counter channel with intelligent pre-amplifier FHT 681 P2 Length 210 mm, width 134 mm, height 23 mm
Display type	Windows-based touch screen panel PC
Diameter Detector Window	170 x 100 mm
Measuring range	10^4 … 10^9 Bq/m^3 for ^{133}Xe
Background β	1.5 cps
Diameter Detector Window	170 x 100 mm
Minimum detectable activity concentration	ISO 11929, approx. 5.2 × 10^3 Bq/m^3 related to ^{131}Xe, measuring time t^1 = 30 min. t^2 = 60 min, constant gamma-dose rate 100 nSv/h SO 11929, approx. 2.6 × 10^3 Bq/m^3 related to ^{85}Kr, measuring time t^1 = 30 min. t^2 = 60 min, constant gamma-dose rate 100 nSv/h
Error probability	$k_{1-\alpha} = k_{1-\beta} = 1.645$ (5% for error of 1st & 2nd kind)
Cross-sensitivity	3 cps/µSv/h (25 mm lead)
Efficiency	0.055 cps/Bq related to Xe-133 0.11 cps/Bq related to Kr-85
Shielding type	Omni directional lead shielding (25 mm)

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