

DETECTION UNITS

Model 110A, 300A and 200A are Lucas type cells

These cells provide a convenient means for detecting and measuring radon and/or thoron gas and its progeny.

The Pylon Models 110A, 300A and 200A Lucas type scintillation cells are equipped with two gas-tight swagelok connectors. This allows them to be used for either flow-through (continuous monitoring) or vacuum collection of the gas sample (grab sampling). Water analysis by degassing (WG-1001 equipment) and soil gas analysis (Model 154 soil probe) depends on the use of a vacuum Lucas type cell. Cells such as Pylon Model 300A have a larger volume for high radon sensitivity making it suitable for continuous radon measurements as well as grab sampling. Cell fittings are light tight and gas tight allowing sample lines to be connected or disconnected while cell counting activities take place. Cells such as the Pylon Model 200A are fitted with a threaded coupling allowing them to be attached directly to a Pylon PMT assembly without an intervening adapter. The Lucas cells are high-efficiency scintillation devices. These cells are manufactured with a high efficiency scintillator of silver activated zinc sulphide to exacting tolerances.

Applications:

When combined with a Pylon radiation monitor these active cells can be used for:

- Radon/Thoron Analysis
- Residential Monitoring
- Industrial Monitoring
- Radioactive Site Monitors
- Autonomous Continuous Monitoring



Model 300A



Model 110A

- Mining/Ore Processing
- Entry Point Testing (Radon Sniffing)
- Meteorological Study
- Geological Studies
- Building Materials Research
- Health Protection
- Environmental Monitoring
- Custom Applications

Features:

- High sensitivity
- Continuous or Grab sampling
- Simple operation
- Immune to beta and gamma radiation
- Insensitive to temperature and humidity changes

Theory of Operation:

As the radon decays it emits alpha particles which strike the scintillation material on the side of the cell. The scintillation material will give off a photon of light which is amplified and counted by the PMT in the monitor.

ACTIVE CELLS

DETECTION UNITS

Specifications:

| | <u>110A</u> | <u>300A</u> | <u>200A</u> | |
|----------------------------------------|------------------------------------|----------------------------|----------------------------|---------------------------------------|
| Radiation Detected: | Alpha | Alpha | Alpha | |
| Scintillator: | ZnS(Ag) | ZnS(Ag) | ZnS(Ag) | |
| Alpha Energy Ranges: | 4.5 to 9 | 4.5 to 9 | 4.5 to 9 | MeV |
| LAD ¹ : | 1.30 (48.1) | 0.74 (27.4) | 1.18 (43.6) | pCi/l (Bq/m ³) |
| Sensitivity: | 0.76 (0.021) | 1.36 (0.037) | 0.85 (0.023) | cpm/pCi/l (cpm/Bq/m ³) |
| Accuracy ² : | ± 4% | ± 4% | ± 4% | % |
| Active Volume: | 154 (5.2) | 272 (9.2) | 170 (5.7) | ml (oz (US Liq)) |
| Detector Background: | < 1.0 | < 1.0 | < 1.0 | cpm |
| Calibration ³ : | Upon Request | Upon Request | Upon Request | |
| Primary Construction Material: | Aluminum | Aluminum | Aluminum | |
| Connectors: | Quick connect fittings | | | |
| Mating Connectors: | Swagelok B-QC4-S-4HC or equivalent | | | |
| Maximum Flow Rate ⁴ : | 10 (0.35) | 10 (0.35) | 10 (0.35) | lpm (ft ³ /min) |
| Operating Temperature Range: | 0 to +50 (+32 to +122) | 0 to +50 (+32 to +122) | 0 to +50 (+32 to +122) | °C (°F) |
| Storage Temperature Range: | -20 to +75 (-4 to +167) | -20 to +75 (-4 to +167) | -20 to +75 (-4 to +167) | °C (°F) |
| Relative Humidity Range ⁵ : | 0 to 90 | 0 to 90 | 0 to 90 | % |
| Diameter: | 5.5 (2.2) | 5.5 (2.2) | 6 (2.4) | cm (in) |
| Height: | 12.75 (5) | 18 (7.1) | 17 (6.7) | cm (in) |
| Weight: | 270 (0.6) | 318 (0.7) | 440 (0.97) | g (lb) |

¹ Lowest Activity Detectable.

² At a 1 σ Confidence Level.

³ Active Cells are production tested on a sampling basis. Custom Calibrations Available. Custom calibrations include multi-point calibrations and calibrations at non standard activity levels.

⁴ In continuous mode 1 lpm maximum is recommended. For grab sampling, up to 10 lpm may be used.

⁵ Non-Condensing.

- Values are nominal.
- Specifications are based on new units which have been appropriately calibrated.
- Custom low efficiency cells that are used to measure higher radon concentrations are available. Call for details.

Ordering Information:

| <i>Model</i> | <i>Part Number</i> | <i>Description</i> |
|--------------|--------------------|--------------------------------------|
| 110A | A202019 | Lucas Type Cell for use with an AB-5 |
| 300A | A204721 | Lucas Type Cell for use with an AB-5 |
| 200A | 6243330 | Lucas Type Cell for use with a CRM-1 |

Specifications subject to change without notice.

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Datasheet: 126 Rev 2

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