

Model 42-31H

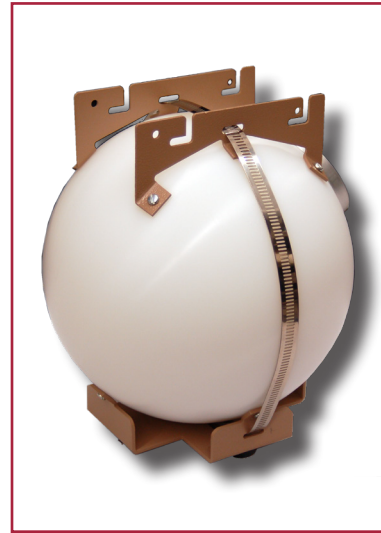
9-Inch Moderated Neutron Detector



Ludlum Measurements, Inc.

Features

- Portable Neutron Detector
- Rugged Bracket for Mounting Measurement Instrument
- Cadmium-Loaded Polyethylene Sphere Responds Similarly to a Larger 10-Inch REM-Responding Sphere



left: shown with Model 12 General Purpose Ratemeter

Introduction

The Ludlum Model 42-31H Neutron Detector is designed to detect thermal and fast neutrons (0.025 eV to approximately 12 MeV). Neutrons are detected indirectly through nuclear reactions which result in energetically charged particles such as alpha which are often found associated with intense fields of gamma rays. Therefore it is important to choose a method of neutron detection with the ability to discriminate against those gamma rays in the detection and measurement processes.

The Model 42-31H is intended for use with portable counting instruments, and is fitted with a top bracket for convenient mounting. The instrument consists of a cadmium-loaded polyethylene sphere surrounding the ^3He detector. A study demonstrates that the 9-inch cadmium-loaded sphere has a response similar to that of a 10-inch diameter rem-responding sphere.

Specifications

Part Number: 47-3583

INDICATED USE: neutron detection; area monitoring

DETECTOR: 2 Atm ^3He tube LND 25185 or equivalent

MODERATOR: 22.9 cm (9 in.) diameter cadmium-loaded polyethylene sphere

COMPATIBLE INSTRUMENTS: typically used with portable counting instruments capable of achieving -2 mV input sensitivity)

SENSITIVITY: 10,000 cpm per mSv/h (100 cpm per mrem/hr) ($^{241}\text{AmBe}$ fast neutrons)

GAMMA REJECTION: 10 cpm or less through 100 mSv/hr (10 R/hr) (^{137}Cs)

DETECTION RANGE: thermal to approximately 12 MeV

ENERGY RESPONSE: thermal to 12 MeV follows the radiation protection guide curve for neutron dose

INPUT SENSITIVITY: -2 mV

OPERATING VOLTAGE: typically 1200 volts

CONNECTOR: Series "C" (others available)

CONSTRUCTION: brackets: drawn-and-cast aluminum with a beige powder-coat; ball: polyethylene

TEMPERATURE RANGE: -20 to 50 °C (-4 to 122 °F)

SIZE: 26 x 22.9 x 22.9 cm (10.3 x 9 x 9 in.) (H x W x D), including brackets

WEIGHT: 6.6 kg (14.5 lb)

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Note: specifications subject to change without notification. We are not responsible for errors or omissions.