

DOWN-HOLE TRITIUM IN WATER DETECTOR

Model # SSS-33DHC
Model # SSS-33DHC-4

FEATURES:

- SENSITIVE BELOW EPA CLEAN DRINKING WATER LEVELS
- FITS IN CPT BORE HOLE (CONE PENETRATION)
- CONTINUOUS MONITORING
- REALTIME
- NOT INFLUENCED BY OTHER NUCLIDES
- NO LIQUID SCINTILLANT REQUIRED

APPLICATION:

- EARLY DETECTION OF UNDERGROUND PLUME OR TRITIUM LEAKAGE
- REASSURE THE PUBLIC BY CONTINUOUS MONITORING OF DRINKING WATER SOURCES



DETECTORS & DETECTION FLOW-THRU CELL: There are many thousands of bore holes in the United States which could or should be monitored for tritium. The water in these bore holes cover a wide range of tritium concentrations. From highly contaminated to very clean.

Current bore hole sampling and lab test methodology, take a sample and send it to the lab, is very sensitive; but extremely expensive and slow. Technical Associates **SSS-33DHC** Detectors automate, (and bring down the cost) of monitoring these bore holes.

DESCRIPTION: This System consists of a small diameter, water tight detector assembly with pump plus processor. The sample is passed through a deionizer and filter and thence to the scintillation crystals in the flow cell which is viewed by a matched pair of photomultiplier tubes.

The process portion of this system conditions and analyzes the output from the photomultiplier tubes by pulse height and coincidence, thereby permitting the system to eliminate counting most background and noise counts. Sensitivity is enhanced by use of stochastic resonance plus high gain, low noise PM tubes, and preamps.

SUB-SYSTEMS: Down-hole tritium measurement system involves the following subsystems.

Sonde-casing, sample water filtration & deionization pump, detectors & detection flow thru cell, plumbing, preamplifiers, amplifiers & electronic pulse analysis, detector bias supply, cables, data presentation, storage & transmission, and system power.

The electronics displays count-rate, total count and elapsed count time at the well head. The data is transmitted in RS-232 format. Data is printed out on a digital printer with date and time stamp.

TA TECHNICAL ASSOCIATES

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SPECIFICATIONS (Continued):	1 nanoCurie/ml in 100 seconds. LLD is better than the FDA drinking water standard which is 20,000 pCi/L (0.02nCi/ml)
Sensitivity:	averaged over 24 hours. 0-1000 nanoCuries/ml. Typical - Twice per day. 13"
Range:	Hx21"Wx20" D. (Larger for weather house version.)
Pumping Frequency: Above	Detector Housing: 30 lbs.
Ground Dimensions: Weight	Shipping: 100 lbs.
(Standard Unit):	The flow path (plumbing) all wetted parts are stainless steel or chemically inert materials. Replaceable Particulate Filter Cartridge. Replaceable Deionizer Cartridge.
Detector Sonde Contains:	Stainless Steel Sonde allows easy cleaning & maintenance. Pump which operates even at deep underground/underwater 1800 psi. Ambient Scintillation Cell. Dual PM Tubes. Dual Pre-amps. Cabling. Other Electronics.
Filtration:	Filters easily cleaned/recharged/replaced in the field. The Technical Associates tritium detection sonde contains a 400cc screw-in replaceable cartridge consisting of two stages. The lower stage has glass wool and, Optional , micro-pore alumina ceramic filter for removal of particulates and gelatinous contaminants. The upper filter contains deionizer beads to remove dissolved salts and metals from the sample water. The user has the option to refill the plastic filter cartridge or to replace the plastic filter cartridge with pre-filled replacements. Both of which are low cost. The current clear-plastic filter housing allows the user to visually inspect the filter contents without opening the filter. This gives very useful information on whether filter change interval can be increased in the future for that location due to its' local ground water quality. Higher Temperature for sample or above ground electronics. Other output interface. Other ranges. Addition of Strontium Detector. 6 Digit LED Display.
Options:	Conductivity Detectors to learn more about the ground water and to tell when ion exchange beads need replacing. Dry Hole Detector. Depth/Cable Length. Well head display electronics mounted in weather-tight housing. Data stored electronically at site. Data transmitted periodically (perhaps twice a day) to a distant data collection lab.

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Optional Back-Flushing: To periodically reverse the direction of the pump flow, so as to flush the filters and thereby further extend the time between filter replacement.

ENVIRONMENTAL:	SSS-33DHC	SSS-33DHXT	SSS-33DHC4
Detector:			
Sample Temperature:	35 to 122° F	35 to 135° F	35 to 122° F
Ambient Temperature:	35 to 122° F	35 to 135° F	35 to 122° F
Ambient Pressure:	0-100 psi	0-1800 psi	0-100 psi
Humidity:	Submerged Operation	Submerged Operation	Submerged Operation
Diameter:	1.75"	1.75"	3.5"
Recommended for Hole Diameter:	CPT	CPT	4"
Max. Deployment Depth:	160 ft.	5,000 ft.	160 ft.
Material Construction:	Stainless Steel	Stainless Steel	Stainless Steel
Above Ground Interface and Readout:			
Temperature:	35 to 100° F	35 to 100° F	35 to 100° F
Humidity (Non-condensing):	0-96%	0-96%	0-96%
Weatherproof (Optional):	Yes	Yes	Yes

*CPT: Cone Penetrometer Technology is often used to create 2" diameter vertical holes in the ground for the purpose of monitoring soil, vapor, and ground water.

**Below 0°C temperature can be accommodated by use of optional heat tracing.