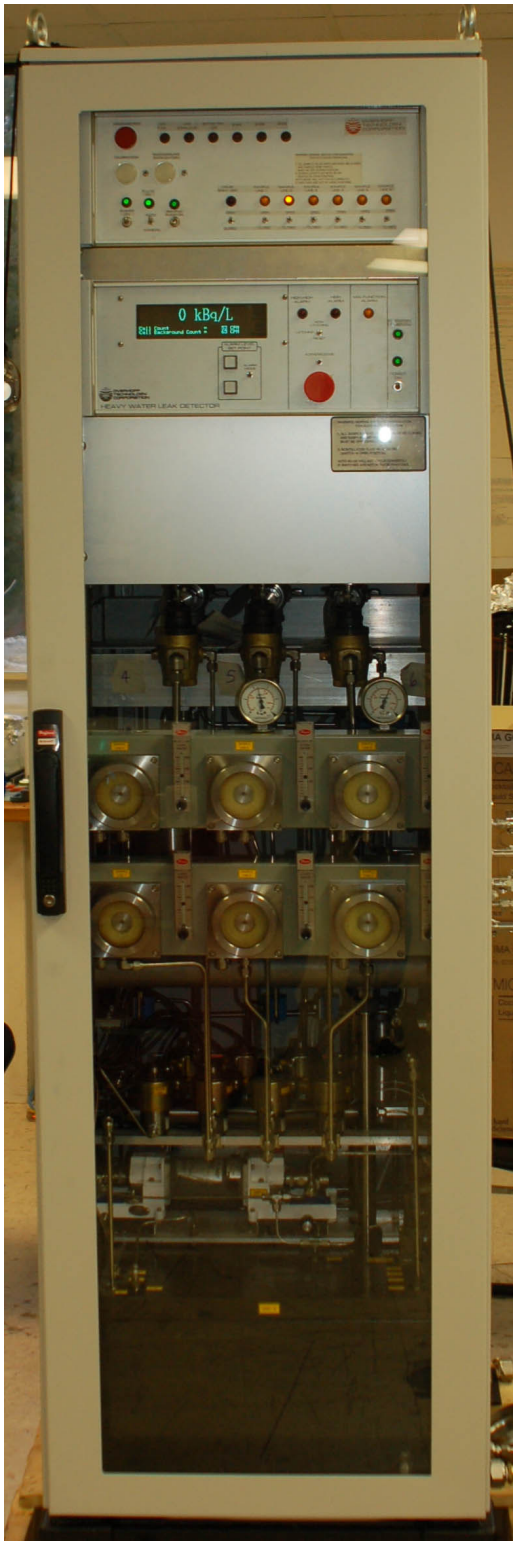
Heavy Water Deuterium Monitor

Model #D_2O-LO (for Low Levels)
D_2O-HI (for High Levels)
D_2O-HI-LO (combined system)

FEATURES:

- AVAILABLE ON WHEELS OR FIXED INSTALLATION
- MEASURES D_2O from 0.01-5%
- REAL TIME, IN-LINE, CONTINUOUS
- HIGH SENSITIVITY FOR DEUTERIUM
- NO REAGENT TANKS TO FILL
- NO WASTE STREAM – MOST MODELS
- EASY CALIBRATION
- CONTINIOUS FLOW THRU SYSTEM
- NO MOVING PARTS
- OPTIONAL TRITIUM MONITOR



DISCUSSION:

D_2O or heavy water is used as the moderator in pressurized heavy water nuclear reactors. H_2O or light water is used as a secondary coolant to transfer the heat energy from the primary coolant D_2O pipes to the steam turbine. The measurement of D_2O in water is important to determine whether there are any leaks between the H_2O water loop and the D_2O loop. D_2O is also used in obesity studies and other medical, biological and pharmaceutical research. D_2O-LO can measure D_2O concentrations in water from 0.01 – 5%.

APPLICATION:

- Monitor water for Deuterium content and optionally Tritium content.

TA TECHNICAL ASSOCIATES
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SOLUTION: For the first time in a **Continuous Real Time** monitor the Model D_2O-LO, D_2O-HI and D_2O-HI-LO allow continuous monitoring of water using ultra-sensitive, infra-red detector for D_2O and optional beta detector. The information from each detector is analyzed and displayed in units of "percent" or other engineering units. Measurements of concentration are logged 24 hr/day, 7 day/week.

DESCRIPTION: Model D_2O-LO/HI are heavy water monitor /controllers for measuring Isotopic Hydrogen content in water. The electronics are microprocessor with LED/LCD display. The electronics are plug in modules allowing change or addition of functions at a later date, and this also allows rapid repair by module replacement in the field. The modular system is covered by TA's unique exchange warranty system in addition to the full one year warranty. The measurement flow cell is easily changed via disconnect fittings. All connections are sealed against leaks. The standard water moving system is based on a high precision pump. It has a 2 liter per minute capacity. A wide range of pump capacities are available to meet users specific needs. System can also be operated using hose pressure in which case no pump is required.

The system electronics is mounted in a rugged cabinet for fixed installation or on wheels for portable use. It comes complete with all cabling tubing and connectors in place and is ready to operate. 115 Volt 60Hz is standard; 220 Volt 50/60 Hz is optional.

Tritium measurement in this system; (optional)
1. Beta Detector: Consists of a light-tight detector assembly which interfaces with the sample via quick disconnect coax cables and medical grade hoses. The sample is viewed by a matched pair of photo-multiplier tubes.
2. The beta pulse analysis portion of this system conditions and analyzes the output from the photo-multiplier tubes by pulse height, duration and coincidence. Thereby permitting the system to eliminate counting most background and noise counts. Sensitivity is enhanced by the use of stochastic resonance plus high gain, low noise PM tubes and pre-amps.

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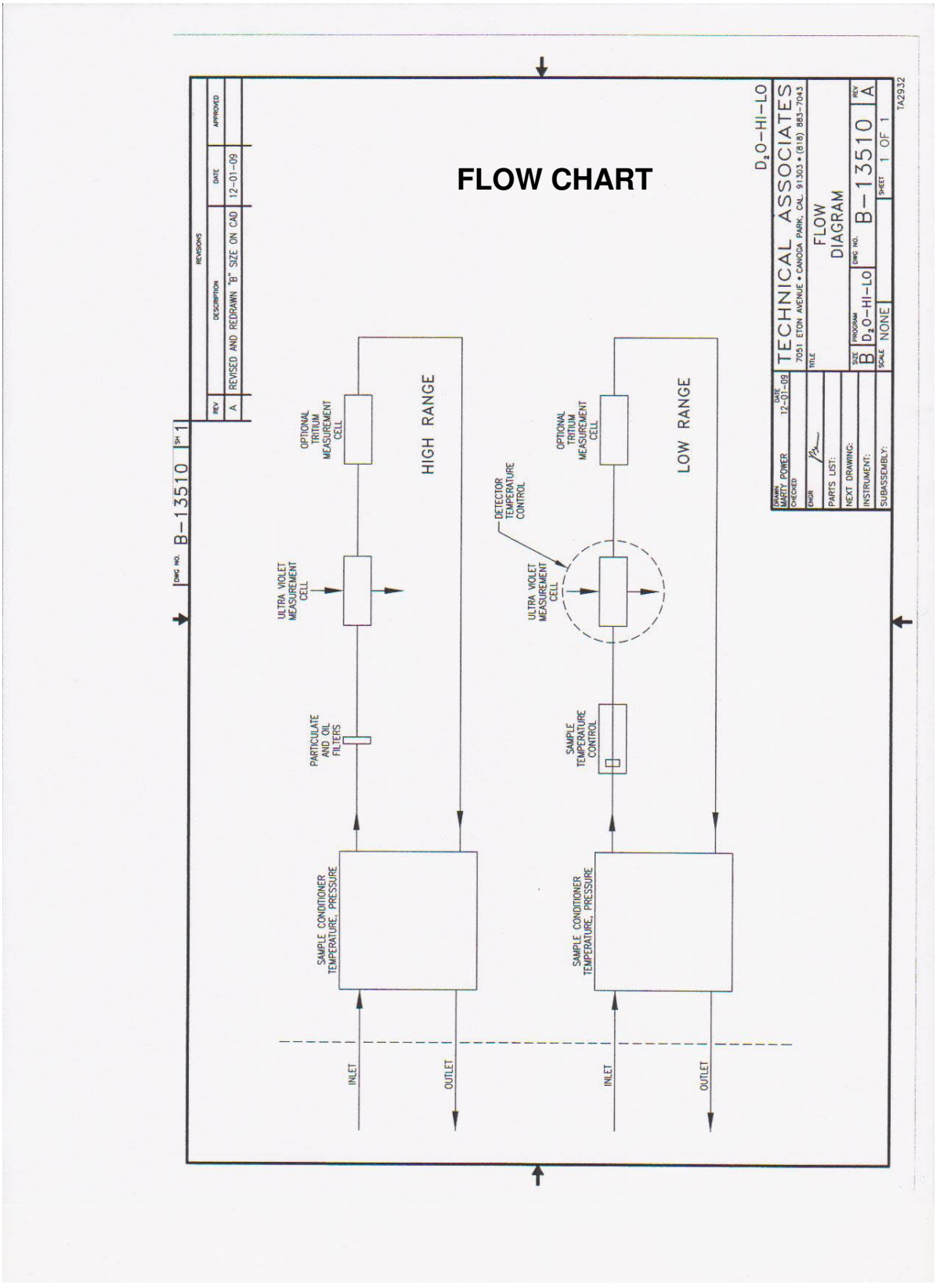

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Data:-Analysis-Display-Hard-Copy-DVD-ROM Archive
The concentration and total activity released and MDA levels are continuously calculated and recorded. Also, all data can be saved to the memory drive in spreadsheet format.

Flow Path

Water Inlet port
Pressure relief valve
Particulate Pre-Filter (with optional Gamma Detector)
Ultra Violet Sterilizer (Optional)
Mass Flow Meter (Optional)

Discharge water is clean and can go back into the water line.
No liquid scintillant or reagents are added
No toxic or radioactive waste of any kind.

SPECIFICATIONS:

- **Alarms:** Each alarm activates a relay. Relay alarms are available to the user.
- **Sample temperature standard:** up to 80˚ F liquid. (optional to higher temperatures)
- **Ambient temperature:** 65 - 105 ˚ F (18 ˚ 40 ˚C)(wider temperatures ranges optional)
- **Humidity:** 0 – 95% RH
- **Optional:**
  - **Cooler Model** Cool-33 for detector & sample is used in case of higher sample or ambient temperatures.
  - **Model Temp**-Stat-33 gives precise temperature control - optional

RACK CABINET MOUNT
31’ x 23’ x 84’ (800 x 600 x 2133 mm)
Front door 110 ˚ open – optional
Floor Mount Cabinet can be bolted to floor if needed.
Protection grade: IP55
Ground protection: copper strap and bolt + durable label.
Water-proof cable opening- optional
Fire retardant paint optional
SIZE AND WEIGHT: Are dependant on model selected and customer requirements.
Inlet – outlet plumbing fittings ¼” NPT standard. Other fittings or flanges to customer need are available.

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Flow-thru Deuterium Water Monitors

Model #	D_2O-LO	D_2O-LO-T	D_2O-HI	D_2O-HI-T
Read-out Units (Typical) D_2O T_2O	 Percent D_2O NA	 Percent D_2O pCi/l	 Percent H_2O NA	 Percent H_2O uCi/l – Ci/l
Measures	D_2O	D_2O,T_2O	D_2O	D_2O, T_2O
Deuterium Range	0.01 – 5%	0.01 – 5%	95-100% (.01 – 5 % H_2O)	95-100% (.01 – 5 % H_2O)
Method	Infra-red	Infra-red	Infra-red	Infra-red
Tritium	NA	HWLD 1925 Model 1925	NA	SSS-33m8
Method		Continuous Liquid Scintillation		Crushed Crystal Scintillation

Available options: Model D_2O HI-LO is combined two channel model

Other options:

High pressure pump to return the sample to a pressurized system
Optional WIN-W Data Logger Software
Overview networking software
Interface options
4-20mA
Serial port
Ethernet or USB port
Higher capacity pumps
Longer Inlet-tubing