TRITIUM PERMEATION LEAK DETECTOR

Model ~ TRI-PER

FEATURES:

- HIGH SENSITIVITY TRITIUM ION CHAMBER
- SEALS TO ANY SIZE TANK
- USER SETTABLE UNITS - uCi/l or Bq/m^3 etc.
- WIDE RANGE - DIGITAL ACCURACY
- PROGRAMMABLE DIGITAL READOUT
- SENSITIVE FOR OCCUPATIONAL EXPOSURE
- BATTERY OPERATION OR AC OPERATION
- BUILT-IN RS-232 / USB COMPUTER INTERFACE
- EASY TO RE-POSITION FOR MEASUREMENT OF DIFFERENT AREAS OF THE TANK
- PORTABLE FROM ONE TANK WALL LOCATION TO ANOTHER AND FROM TANK TO TANK
- **OPTIONAL** - BUILT-IN HIGH LEVEL ALARM

TRI-PER ELECTRONICS

DESCRIPTION:

Technical Associates **TRI-PER** is a Tritium Permeation Leak Detector; an ion chamber designed to seal to any type of cylindrical tank wall regardless of tank diameters via pliant air tight rubber seals.

What is a Triton?

The nucleus of a Tritium atom, consisting of a proton and two neutrons.

SITUATION:

A high pressure tank of Tritium gas (T_2) continuously loses the Tritons as they migrate through the metal tank wall and emerge on the tanks outer surface as if the tank is sweating Tritium. The tank wall is vulnerable to this migration as though it was a thin membrane.

Escaping Tritium nuclei are of interest and concern for a variety of reasons:

- They constitute a health / safety environmental problem when released.
- They might someday be useful as a measure of the activity and quantity, volume or pressure of the remaining Tritium gas in the tank.
- They are an indicator of the tank's structural integrity.

TYPICAL MEASURMENT TECHNIQUES:

- Take wipes from the tank's outer surface and count them in the SF-TF-6 Proportional Counter or the SSS-22P Liquid Scintillation counter
- Spray the outer surface of the tank with LSC fluid lightly and photograph the fluorescence in low light.
- Use an FF-27 Tritium Surface Monitor. However, while very effective for measurement on smooth flat surfaces this method is not particularly useful for measuring curved, bumpy surfaces of cylindrical storage tanks.

TA CBRN Real - Time Air & Water Specialists

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TRI-PER MEASURMENT TECHNIQUE:

1. **Select portion of tank wall to be measured.**
2. **Wipe surface area with filter paper and measure Tritium of filter paper with the SF-TF-6 Proportional Counter or the SSS-22P Scintillation Counter for baseline data.**
3. **Clean area to remove preexisting Tritons (Tritium) and any volatile chemicals, dirt, and dust.**
4. **Secure Tri-Per mounting bracket with included strapping to the cleaned area.**
5. **Insert Ion Chamber**
6. **Plug cable into electronic read-out.**
7. **Check electronic settings.**
8. **Push start count button and note time and date.**
    - **A longer count time is necessary for measuring small amounts of Tritium**
    - **A shorter count time is necessary for measuring large amounts of Tritium**
9. **Record counts and elapsed time.**
10. **Calculate leak rate with simple formula included in the Tri-Per manual.**

SPECIFICATIONS:

Ranges:	Compact, easy to read digital LCD readout. 1 x 10^{-3} to 10 uCi/l (37 KBq/m^3 to 3.7 x 10^8Bq/m^3)
Circuit:	Electrometer circuit amplifies chamber current from 0.7 liter Tritium internal chamber.
Controls:	Power, Battery Check, Set (calibration aid), Zero Adjust, Meter Programming (Two buttons).
Calibration:	Can calibrate internally with Tritium gas, or on a calibration course, or (at a single point) with optional Beta or Gamma source.
Computer Port:	RS-232 / USB serial port is built in (fully addressable).
Portability:	Tri-Per is provided with carrying handle.
Electronics Case:	Deep drawn aluminum case, with handle with a gasketed lid, and an easily cleanable anodized finish.
Battery:	9V rechargeable and sealed.
Battery Life:	20 hours continuous use between charges.
Battery Charger:	Built-in.

WEIGHT & DIMENSIONS:

Dimensions:	**Instrument Case (Including handle):**	9.25"W x 13.5"L x 10" Tall.
	Front Panel:	9" Long x13" Wide.
Weight:	12 lbs.	
Shipping Weight:	18 lbs	

OPTIONS: Higher Range Different Readout Units

Alarms: High Level Alarm: Red Lamp and Audio Alarm.

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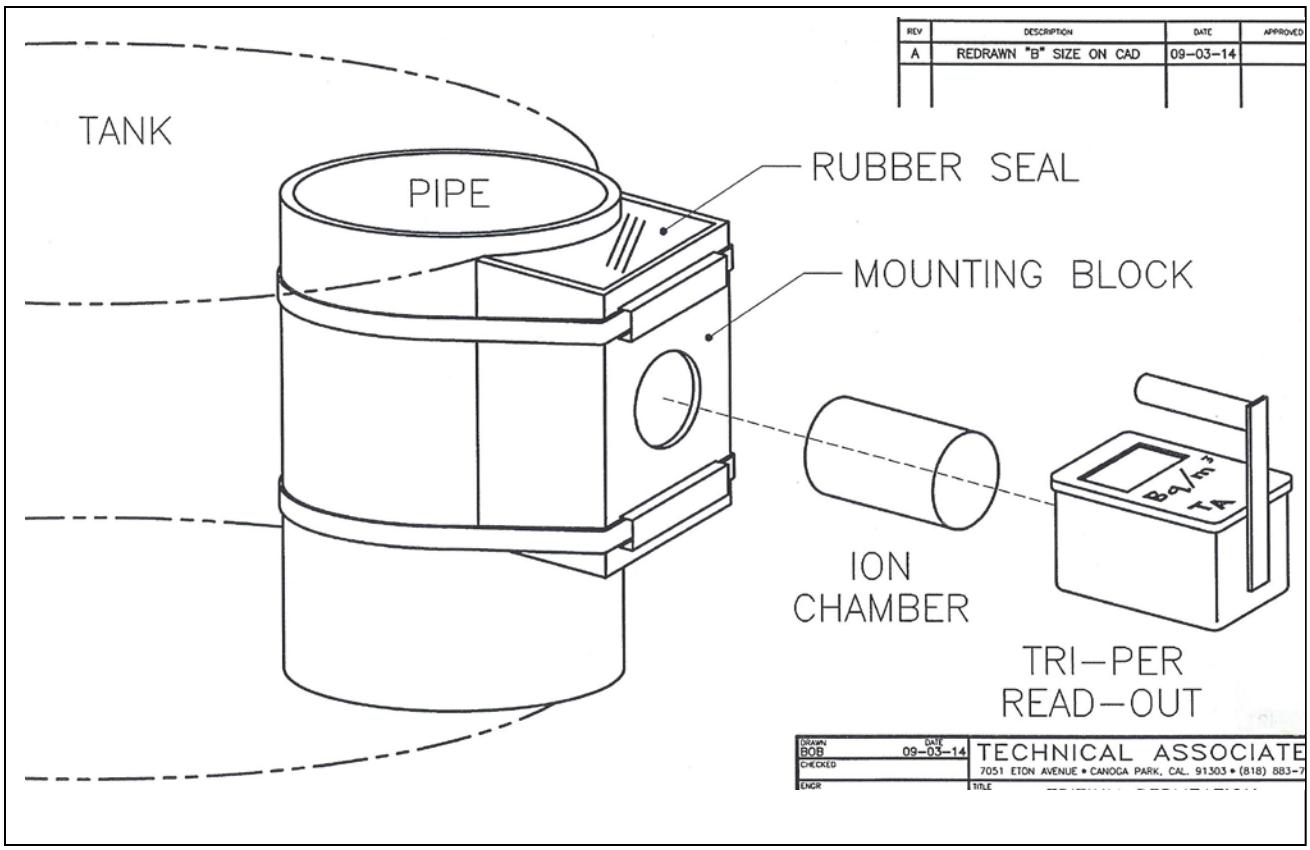

TRI-PER Attachment & Detection Process

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