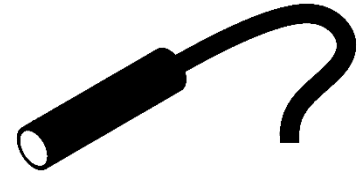


TRM Sensors LLC Data Sheet

TRM-UST

Combination Fuel/Water Sensor



Product Description

TRM-UST is a sensor designed to detect the presence of hydrocarbon liquids (e.g. gasoline, diesel or jet fuel) and ground water in the interstitial space of an underground storage tank. A typical application would be to monitor the normally dry space between the inner fuel tank and outer containment tank in a dual wall fiberglass tank designed for underground installation.

Small diameter and short length allow the probe to be installed through an access riser pipe and threaded around the circumference of the interstitial space.

TRM-UST is a passive resistive device. There are no active electronic components other than resistive pathways. There are no moving parts. Excitation voltage and current requirements are very low and well within the limits of intrinsically safe operation in the most hazardous explosive atmospheres. The preferred monitoring device is TRM Relay Unit Type-CV.

Key Features

- Fast detection of gasoline, diesel and jet fuel leaking into the space between walls of a double wall tank.
- Quickly detects any ground water ingress from a cracked or damaged outer tank shell
- Fully monitored circuit that indicates two states: Normal or Alarm
 - Alarm defined as fuel detection, water detection or cable break
- Simple Form-C relay interface via TRM Relay Unit Type-CV
- No moving parts or active electronics
- “Simple Apparatus” recognition allows usage of three-wire zener safety barrier where hazardous area regulations apply

Product Specifications

- Excitation Source: TRM Relay Unit Type-CV
 - Less than 5 volts at less than 1 mA applied to sensor
- Three wire circuit that can be protected with a three wire zener safety barrier such as MTL-7789+
- Dimensions:
 - ½” OD x 2 ¼” long (12.7 mm x 57 mm)
 - 33 ft (10 m) leader cable
- Leader cable: 4 x 22 AWG with shield (only three conductors are used)
- Maximum distance between probe and Relay unit:
 - 1000 feet / 300 m
- Operating Temperature:
 - Water detection 0C to 100C
 - Fuel Detection -40C to 100C
- Typical response times at 10C:
 - Gasoline, diesel, diesel: less than 3 sec
 - Ground water: less than 3 sec.
- Reset after water detection: Immediate when remove from water
- Reset after fuel detection: Time varies depending on ambient temperature and fuel volatility, may require naphtha rinse
- Multiple-reuse capability in most circumstances
- Qualifies as “Simple Apparatus” under ANSI/UL 60079-11 and ANSI/ISA 60079-25 and can be installed with MTL 7789+ Zener Safety barrier to achieve CID1 or Zone 0 Intrinsic Safety

Installation:

1. TRM-UST is designed to operate in a clean and dry interstitial space between the inner and outer walls of a double wall fiberglass storage tank.
2. The sensor is functional in any orientation. In most installations the sensor will be most effective when it is positioned horizontally at the lowest point of the tank's interstitial space.
3. Thread the sensor into the interstitial space via an interstitial access port typically found along the top surface of the tank. In many cases the access port will be fitted with a 2" or 4" riser pipe. The small diameter and short rigid length of the probe is designed to facilitate installation. However the transition from vertical to horizontal at the base of the riser pipe is a known pinch point and in some cases may not provide sufficient clearance to install the probe.
4. The probe is most effective at the "bottom dead center" of the interstitial void. However, getting the probe positioned correctly is a 'blind' installation. Obtain the tank diameter and calculate the semi-circumference. $(\pi \times \text{dia.}) / 2$ Feed this amount of cable down the riser once the probe has transitioned from vertical to horizontal at the base of the riser.

NOTE ON TANK CONDITIONS: Make sure that the interstitial space is actually clean and dry. Rain water may have leaked into the interstitial space if the tank has been stored outdoors. In some cases the interstitial space may contain residual un-cured styrene monomer left over from the manufacturing process. In either case, ventilate the interstitial space with forced air to clear the space between the walls.

Care and Reset:

If the TRM-UST probe and TRM Relay Unit Type-CV have detected and alarm condition there are three possibilities: fuel present in the interstitial space, water in the interstitial space or a broken wire or loose connection.

Do not ignore an alarm indication. Remove the probe and determine if the alarm was caused by fuel or water in the containment space. If the probe is 'wet', tank repairs are indicated. The probe has done its job and there is no point in resetting and re-installation until the tank is repaired. If the probe is dry, check for broken wires or a damaged probe.

Follow these general guidelines for cleaning and reset

1. If the sensor has detected water, reset will be immediate after the sensor is removed from the tank and any residual water has been drained from the sensor body.
2. Visually check for corrosion and if the probe is undamaged it is ready for re-use.
3. If the probe has tripped on fuel, lay the probe on its side and allow the residual fuel to evaporate for several hours. Leaving the probe in sunlight will speed the process. Gasoline detections will often reset spontaneously. Diesel and Jet Fuel may not evaporate spontaneously.
4. If the probe does not reset on its own within 24 hours, dip the probe in naphtha (Ronsonol lighter fluid, Painters Naphtha or Coleman Camp fuel). Allow the probe to soak for no more than 3 minutes. Drain the naphtha and lay the probe on its side. Again allow several hours for evaporation. Repeat the naphtha and evaporation sequence up to 3 times

Replace the sensor if it fails to reset after three naphtha /evaporation cycles.

