

TRM Sensors LLC

TRM-CC, TRM-CB, TRM-CBX, TRM Relay Unit Type-C, TRM Flasher-BE

Equipment Check Guidelines for Inspectors

These instructions are intended for use by local agency inspectors and should be considered to be guide lines. All Installations are different and local conditions may necessitate minor deviations from the details outlined below.

Background: TRM Sensor systems consist of two parts:

A probe of type:	TRM-CC, TRM-CB or TRM-CBX
A monitoring instrument:	TRM Relay Unit Type-C used with TRM-CC or TRM-CB probes TRM FLASHER-BE used with TRM-CBX probe

Systems are normally installed on a one-to-one basis: one probe and one monitoring device of the appropriate type.

The alarm indication for the TRM FLASHER-BE is a flashing LED strobe that flashes red at a rate of one flash per second with a leak has been detected. There is no relay output or audible indication.

The alarm indication for the TRM Relay Unit Type-C is a single FORM-C relay that has a Normally Open a Common and a Normally Closed contact. There are no built in LED or audible signals. Therefore every installation of the TRM Relay Unit Type-C MUST be connected to a local audible alarm, visual indicator or connected to the input terminals of a site monitoring system (e.g. a PLC, RTU or similar system capable of monitor the status of a dry contact input signal)

Mounting Locations:

1. TRM Sensor Probes are sensitive level detection devices similar in concept to a solid state float switch that is sensitive to certain liquids but insensitive to other. Therefore the probe must be installed at the low point of the area that it is intended to monitor.
2. For sump installations, (usually TRM-CC probes) the base of the probe should rest on the floor of the sump
3. For berm installations, (usually TRM-CC probes) the probe should be installed at the lowest corner of the enclosed area and may be used to monitor the inflow to a storm water drain or other discharge location
4. For under-tank monitoring (usually TRM-CB or TRM-CBX probes) the probe should be installed:
  - a. In the PVC T-fitting which monitors drainage from the underside of the tank via slotted PVC drain system. This system is used for smaller diameter tanks that can be monitored with a slopped PVC drain line that exits the tank bottom area at a collection sump.
  - b. At the low point of inward sloping under-tank slotted PVC pipe collection systems. This system is used for larger diameter tanks that are too large to drill from one side to the other. Several 'spokes' may be drilled from the tank perimeter toward the center of

the tank with the TRM Sensor probe pushed into the slotted PVC lined boring such that any under tank leakage collects where the probe(s) are located.

5. Probe count is sufficient to monitor low points and installed tanks

PROBE COUNT IS ADDEQUATE AND ALL PROBES ARE CORRECTLY LOCATED

Flow Path Clear and Free of Debris:

1. The TRM Sensor system requires that leaking fluids reach the point where the sensor has been installed.
2. Check all sensor installation locations to assure that leaking fluids will not be diverted by debris or permanent structures

FLOW PATHS ARE CLEAR AND FREE FROM DEBRIS OR OTHER INSTRUCTIONS

Probe Securely Mounted:

1. Probes mounted in vertical orientation are normally fixed to unistrut or similar mounting frame using U-bolt clamped around the ¾" x 4" stainless steel pipe nipple. U-bolts should not be used over the plastic or stainless steel protective sleeves.
2. Probes used to monitor collection sumps beneath small diameter tanks should be placed in a vertical orientation within the open end of the T fittings. No clamping is necessary and vertical alignment can be approximate as determined by the loose fit in the T fitting.
3. For inward sloping slotted PVC collection drains, all probes should be pushed to the bottom end of the sloping drain tubes. No clamping is necessary.

PROBES SECURELY MOUNTED OR POSITIONED

Electrical Connections:

1. TRM-CC is equipped with a leader cable and two tinned leads. TRM- CB is equipped with a leader cable and three tinned leads. TRM-CBX is equipped with a leader cable and a factory installed connector
2. TRM-CBX leader cables are fixed length and designed to mate directly with the metal connector attached leader cable of the TRM-FLASHER-BE
3. For TRM-CC or TRM-CB probes monitored by the TRM Relay Unit Type-C, factory supplied or locally sourced 4 x 22 AWG jumper cable can be used to extend the leader cables for TRM-CC and TRM-CB up to 500 additional feet. (Note only two or three conductors will be used depending on probe type.). Splices should be protected by a junction box and should be

made via terminal blocks, Scotch-Loks, sealed crimps or other locally accepted and approved low voltage splicing technique. Splices should be protected by a junction box.

4. For probes installed in hazardous areas, MTL-7767+ zener barriers are required. The barriers are installed between the probe and the TRM-Relay Unit Type-C. Installation and grounding of the zener safety barriers must comply with the installation instructions provide my MTL Instruments. UL approved installation drawings are available at [http://www.mtl-inst.com/\\_cert/uploads/8/579/109/SCI-991.pdf](http://www.mtl-inst.com/_cert/uploads/8/579/109/SCI-991.pdf) Note: TRM-CC and TRM-CB probes are considered to be Simple Apparatus of the RTD class with power dissipation less than 0.2 w. Installation is of Type A on the SCI-991 drawing and Notes 3 and 4 apply. Similar certificates and drawings for FM, CSA, BASEEFA and other approval agencies are available from the same website.
5. All terminal block screws must be tight

ELECTRICAL CONNECTIONS PROPERLY MADE AND SCREW TERMINALS TIGHTENED



#### Functional Check:

1. Local inspectors may wish to have one or more randomly selected probes tested to demonstrate overall operation of the system.
2. Naphtha (Coleman Camp Stove Fuel, Zippo Lighter Fluid or Painters' Naphtha) is the recommended test fluid to demonstrate the hydrocarbon detection functionality. Place about 1" of naphtha in an appropriate small container and lower the bottom end of the probe into the naphtha. The system should respond with a leak alarm within 30 seconds.
3. Remove the sensor probe from the naphtha, place it on a paper towel and allow it to dry in the air for 30 to 60 minutes to reset.
4. Brine detection (TRM-CB and TRM-CBZ probes only can be demonstrated using locally mixed salt water. Dissolve 3T of table salt in 1 qt. of water to make a brine test fluid. Put about 1" of salt water into an appropriate small container and lower the tip of the probe into the water. Alarm response should occur within 30 seconds.
5. Remove the probe and place on a paper towel to allow the water to drip dry and evaporate. Reset should occur within 15 minutes and may be much faster.
6. For the TRM-FLASHER-BE, verify that the red LED strobe blinks at a rate of once per second when the sensor is in contact with naphtha or brine (TRM-CB and TRM-CBX only).
7. For TRM Relay Unit Type-C verify that any locally connected audible or visual indicators function when the probe is in contact with naphtha or brine.
8. IF the TRM Relay Unit Type-C is connected to remote monitoring equipment (PLC, TRU, etc.) verify that the alarm signal is recognized and appropriately processed when the probe is in contact with naphtha or brine.

FUNCTIONAL TEST COMPLETED

