

Hydrostatic Monitoring

F 920 Rev B

Guide Specification For Hydrostatic Monitoring of FRP Underground Storage Tanks

1.0 General

The tank manufacturer will supply a continuously monitored hydrostatic head pressure leak detection system. The system will be designed by the manufacturer to detect a leak in either the primary tank or the secondary tank in either a wet or dry excavation. The system will include: a brine solution (to prevent freezing) delivered to the job site in the interstice of the double wall tank; a reservoir mounted on top of the tank to provide a liquid medium for monitoring; and an electronic monitoring system to sound an audible and visual alarm when the liquid level of the reservoir rises or falls to predetermined alarm points. The system will also include an electronic sensing probe to monitor the attached manway riser for the submersible pump, if so specified.

2.0 Standards

The double wall tank with a brine filled interstice will be listed by Underwriters Laboratories (U.L.). The electronic monitoring system used to monitor the liquid reservoir and the attached manway riser will also be listed by (U.L.) for intrinsic safety in a hazardous location.

3.0 Requirements for Liquid Filled Double Wall Tank

The interstice of the double wall tank will be filled with a brine solution. The tank will be delivered to the site with the brine solution in the interstice for all tanks up through 80,000 Litres. Brine filling of interstice on 90,000 and 110,000 Litre tanks shall be done at job site by contractor. The reservoir will be constructed of fiberglass and mounted directly to the top of the tank. The reservoir will be fitted with one 100mm BSP fitting suitable for installation of the electronic reservoir probe. The reservoir will have a capacity of 53 Litres for tank sizes 2,000 Litre through to 70,000 Litres and 151 Litres for tank sizes 80,000 through to 110,000 Litres.

4.0 Requirements for the Electronic Monitoring System

4.1 The Controller:

The panel will receive the signal from the reservoir and/or attached manway riser and provide for the following indications:

1. System normal
2. System fault (the "fault" indication must not be the same as the "alarm" indication)
3. System leak alarm

Also a system test switch indicating the system is functional will be provided. All alarms will be both audible and visible. Unit will be able to be reset. The control panel will provide an indication of which tank is in the alarm condition, if more than one tank is being monitored. The system will provide intrinsic safety at the probe locations.

4.2 Reservoir Probe: The probe will be constructed of a material which is suitable for prolonged, complete immersion in the monitoring liquid.

The monitoring liquid may be:

Salt Brine (up to 30% CaCl in water). The probe will detect and report a change in liquid level either above (high alarm point) or below (low alarm point) the neutral level established during the initial filling and subsequent maintenance of the system. The probe will not operate by inducing an electrical current into the liquid medium which is being monitored.

The sensing range represents a build-in allowance for pressure and thermal variation. Until the liquid level exceeds the allowable variation, the probe will not send a signal to the monitor unit.

The probe will be capable of being mounted in the reservoir in a manner which allows adjustment of location. The probe must be able to be mounted so that normal fluctuations of the liquid level do not interfere with the normal operation of the probe.

The probe will be capable of operating at a distance of 150 m from the control panel.

4.3 Attached Manway Riser Probe

(if applicable and shown on the drawing)

The probe will be constructed of a material which is suitable for prolonged, complete immersion in any of the fluids listed in U.L. Standard for Safety 1316, Table 14.1, all columns.

The probe will detect the presence of liquid in the riser when the liquid level has risen to a maximum of one inch above the bottom of the probe as located in its permanent mounting position. The permanent mounting position is determined by the installer at the time of installation.

The probe will be capable of being mounted in the riser in a manner which allows adjustment of location. The probe will be able to be mounted so that an increase in the liquid level does not interfere with the normal operation of the probe.

The probe mounting assembly supplied and installed by contractors will provide protection for the probe from the operational activities which may take place within the riser.

The probe will be capable of operating at a distance of 150 m from the control panel.

4.4 Operating Parameters:

Temperature:	Voltage:
-17°C to 65.6°C	110 or 220 VAC, 50/60 Hz

5.0 Performance

The continuous hydrostatic monitoring system, including the electronic & the probes, will be capable of detecting and alarming when the liquid level in the tank reservoir rises or drops 75mm to activate the sensing probe.

6.0 Materials

The materials used in the monitoring system will be corrosion resistant to the liquid used to fill the interstice. The liquid used to fill the interstice will not be corrosive to the materials of construction of the fiberglass tank.

7.0 Installation

The monitoring system will be installed in accordance with the manufacturer's installation instructions and all applicable federal, state and local laws and regulations.

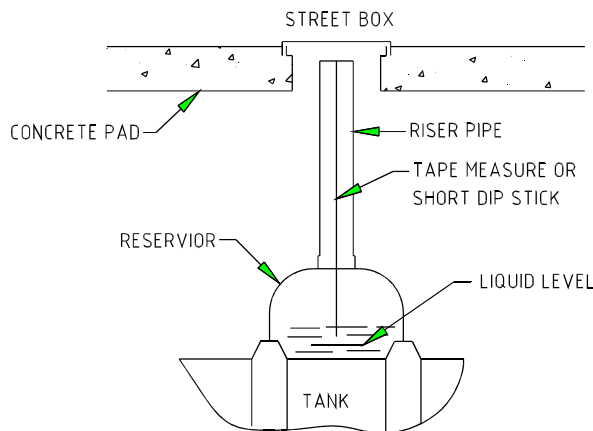
WET INTERSTITIAL SPACE

MANUALLY CHECKING TANK INTEGRITY WITH A HYDROSTATIC RESERVOIR

During piping, a 100 mm PVC riser pipe with 5mm vent hole is fastened to the fitting atop the reservoir. This will be cut to a level below a street box and secured with a threaded cap. The reservoir liquid level and the tank's integrity can then be visually checked with a dipstick. (A liquid level of 150 mm from the tank top should be maintained.*)

In the unlikely event of a tank leak, the liquid will drain from the reservoir. If the leak is in the interior wall, the monitoring fluid will drain into the primary tank and can be detected with a water-finding paste at the tank's bottom. Should a leak occur in the outer wall, the monitoring fluid will also drain from the reservoir and interstice into the gravel environment. No water will be detected in the primary tank.

** The liquid level in the reservoir will fluctuate with the temperature differential of incoming product. The reservoir is designed to provide adequate capacity for normal thermal expansion and contraction.*



DRY INTERSTITIAL SPACE

AN ALTERNATIVE TO HYDROSTATIC MONITOR

If FTS tanks are purchased without the Hydrostatic Monitor, the integrity of the primary and secondary tank walls may be physically monitored through a 100 mm fitting installed on each end of tanks 10,000 Litres capacity and above.

A single fitting is installed on 2,000 to 10,000 Litre capacity tanks.

By providing access to the tank bottom through the circumferential end ribs - open to the interstitial space - a liquid sensor, or a vacuum or air pressure monitoring system may be used.

