Interstitial Leak Monitor for Double Wall Tanks (DWE Design)

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

ADVERTENCIA: Cáncer y daño reproductivo - www.P65Warnings.ca.gov

AVERTISSEMENT: Cancer et effets néfastes sur la reproduction - www.P65Warnings.ca.gov

Double Wall Tank Interstitial Leak Monitor

Applications

- Oil Reservoirs
- Holding Tanks
- Interstitial Leak monitor

Related Materials

- Wiring Diagram

Panel and Probe

Controller

Description

The Green Turtle Double Wall Tank Interstitial Leak Monitor is designed to detect liquid leaking between the walls of a double wall tank system. This will facilitate early detection of tank failures and leakages, so that systems can be repaired and liabilities reduced. While Green Turtle tanks have a 30 year warranty against leaks when properly installed, some customers specify double wall systems and leak detection for additional protection.

The level monitor contains no moving parts, eliminating maintenance due to mechanical malfunction. Wetted parts are PP or PFA with cable rated NEMA 6 or IP68. Other materials are available for the wetted parts to suit the chemical composition of the wastewater.

An ultrasonic level switch is inserted into an access port on the top of the tank and lowered to the bottom. The probe switch is wired back to a remote relay controller which is equipped with a built-in intrinsic safety barrier and LED indicators for sensor, relay and power status as well as an invert switch. A signal can be relayed to a Building Automation System by connecting the BAS in series between the controller and panel.

From the controller, the signal is received by the remote monitor panel. The panel electronics are enclosed with a NEMA 4X polycarbonate enclosure which features an adjustable sound level horn, and LED lights indicating power, fault condition and past fault condition. Test and acknowledge buttons control the monitor indicators.

Operation

If the inner wall is broken through, fluid will enter the interstitial space trickle downwards by gravity to pool at the bottom. If the secondary wall is breached and any fluid such as ground water enters, it will also pool within the interstitial space. When liquid makes the connection between the forks of the probe, it triggers

the warning sound and the orange and red LED lights at the monitor.

The maintenance operator can acknowledge the signal to silence the horn and clear the orange LED light. The red LED light will remain lit until the liquid around the probe is removed or a fault condition has been corrected. Once the probe is not immersed anymore, the red LED light will clear and the horn will silence if it has not been acknowledged.

Specifications

Remote Panel

Supply Voltage:	120 VAC + 10%, -15%, 4.8 VA maximum
Indicators:	Red, green and yellow solid state LED's
Audible Alarm:	Field adjustable from 77 to 97 dB at 2ft.
Enclosure:	Weather tight (NEMA 4X) polycarbonate (6.25h x 3.25w x 3.5d)
Sensor Voltage:	D.C. version: 12 VDC, A.C. version: 12 VAC
Terminals:	Size 6 pan head screws with captivated wire clamping plate
Temperature:	-22° to 150°F ambient
Sensitivity, AC:	0-26K ohm maximum specific resistance
Listing:	U.L. listed, Industrial Control Equipment (508)
Conduit Connection:	¾" NPT, PVC Material

Features:

The panel is designed to interface with a variety of switching inputs for critical alerting situations ranging from critical equipment shutdown to breach of security. This solid state panel offers many features not commonly found in controls of this type including:

- Interface with virtually any non-powered contact including conductive probes, mercury tilt or reed switch floats
- Adjustable sound levels
- Caution light to warn when a fault condition has occurred and cleared itself
- Long life, highly visible red, green and yellow LED fault and normal operation indicators
- Low voltage sensing circuit for ease of wiring
- Small footprint design
- Easy to reach screw type wiring terminals for secure connection and easy installation
- Options for either normal open or normally closed contacts

Caution: The panel and remote switch must be located in a non-hazardous area.

High or Low Relay Controller

Supply Voltage:	120 VAC (240 VAC), 50-60 Hz
Consumption:	5 Watts
Sensor inputs:	(1) Sensors
Sensor supply:	13.5 VDC @27 mA
Configuration:	High and Low alarm
Relay types:	(1) SPDT
Relay rating:	250 VAC,10A, ½ hp.
Relay mode:	Selectable NO or NC
Relay latch:	ON or OFF
Time delay:	0-60 seconds
LED indication:	Sensor, relay,and power status

Fail safety:	Power fail-safe
Temperature range: to 70°	F: -40° to 158° C: -40°
Enclosure rating:	35 mm DIN (EN 50 022)
Enclosure material:	Polypropylene, U.L. 94VO
CSA approval:	Class I, Groups A, B, C, and D; Class II, Groups E, F, and G; Class III
CSA entity parameter:	Voc = 17.47 VDC Isc = 0.4597 A Ca = 0.494 µF La = 0.119 mH

Features

- Remote relay controller with one sensor input and one relay output
- Built-in intrinsic safety barrier for use with hazardous applications
- Fail-safe design for direct actuation of pumps, valves and alarms
- PP enclosure mounts on 35mm DIN rail or panel installation
- LED indicators for sensor, relay and power status
- Adjustable 0-60 second time delay dampens out relay chatter
- Invert switch provides simple NO or NC relay operation

High or Low Level Switch

Accuracy:	+/- 1 mm in water
Repeatability:	+/- .5 mm in water
Supply voltage:	12-36 VDC
Consumption:	Relay rating: 25 mA FET: 5mA (dry), 19 mA (wet)
Relay rating:	60 VDC/VAC @ 1A
Switch output:	Selectable NO or NC
Temperature range:	F: -40° to 194° C: -40° to 90°
Pressure range:	150 psi (10 bar) @ 25°C., derated @1.667 psi (.113 bar) per °C. Above 25° C.
Sensor material:	PP
Sensor rating:	NEMA 6 (IP68)
Mounting threads:	¾" NPT

Mounting gasket:	Viton (3/4")
Cable type:	50 ft. (15 m), 4conductor # 22 AWG (shielded) PP jacket
CSA approval:	Class I, Groups A, B, C, and D; Class II, Groups E, F, and G; Class III
CSA entity parameters:	Vmax = 32 V Imax = 30 mA Ci = 0 µF Li = 0 µH
CSA certificate:	LR 79326
CE compliance:	EN 50082-2 immunity EN 55011 emission EN 61010-1 safety
Classification	Intrinsically Safe

LEVEL MONITOR

INSTALLATION:

Note: High level monitors are sensitive instruments and all care is taken to ensure the parts are shipped without damage. Please examine the instrument for possible shipping damage. **IMPORTANT:** If for any reason it is determined that parts need to be returned to the factory, please notify a Green Turtle Representative prior to shipment for a return authorization number. Install the electronics in accordance with local electrical code and industry standards.

1. Consult the instructions included in the boxes of each component for detailed product information and installation details. Save these together with this manual for the owner's equipment manuals. The following is a brief summary of installation procedures.
2. Determine length of cable required between level probe and controller. 50 ft. of cable is provided, this may be extended up to 1000 ft. (300 m) using insulated, 14 – 16 gauge shielded MTW or THHN cable. Allow enough slack to provide for maintenance of the probe.
3. On elliptical tanks, install the probe in the 2" vertical port in the tank accessway. On round tanks, the port is usually on the top outside edge of a double wall unit. To insert the probe, lower it slowly through the 2" access conduit into the interstitial space until the protector end touches tank bottom. Install conduit from the top of the tank to the controller in such a manner that the probe can be fished out later if required for trouble shooting. Connect the probe wire to the controller input as shown in the wiring diagram. Only the red, black and ground wires are used in this application.
4. The controller must be located in a non-hazardous dry location, preferably adjacent to the remote panel.
5. **Set the invert switch to the POSITIVE position**.
6. Mount the control panel on a wall in a non-hazardous area.
7. Connect the controller to the alarm panel and power as shown on the wiring diagram.

TESTING:

With power supplied to the system, the following are nominal conditions:

LED	DRY	WET or TEST Condition
Panel Alarm	Off	RED
Panel Power	GREEN	GREEN
Panel Caution	Off	ORANGE until acknowledged
Controller Power	GREEN	GREEN
Controller Input 1	GREEN	ORANGE (green if test only)
Controller Relay	RED	Off (red if test only)

Push the test button on the monitor panel. The Caution LED will light ORANGE and stay on until the Acknowledge button is pushed. Adjust the horn volume by rotating the black shutter.

To test the probe operation, immerse the forks of the probe in water.

MAINTENANCE:

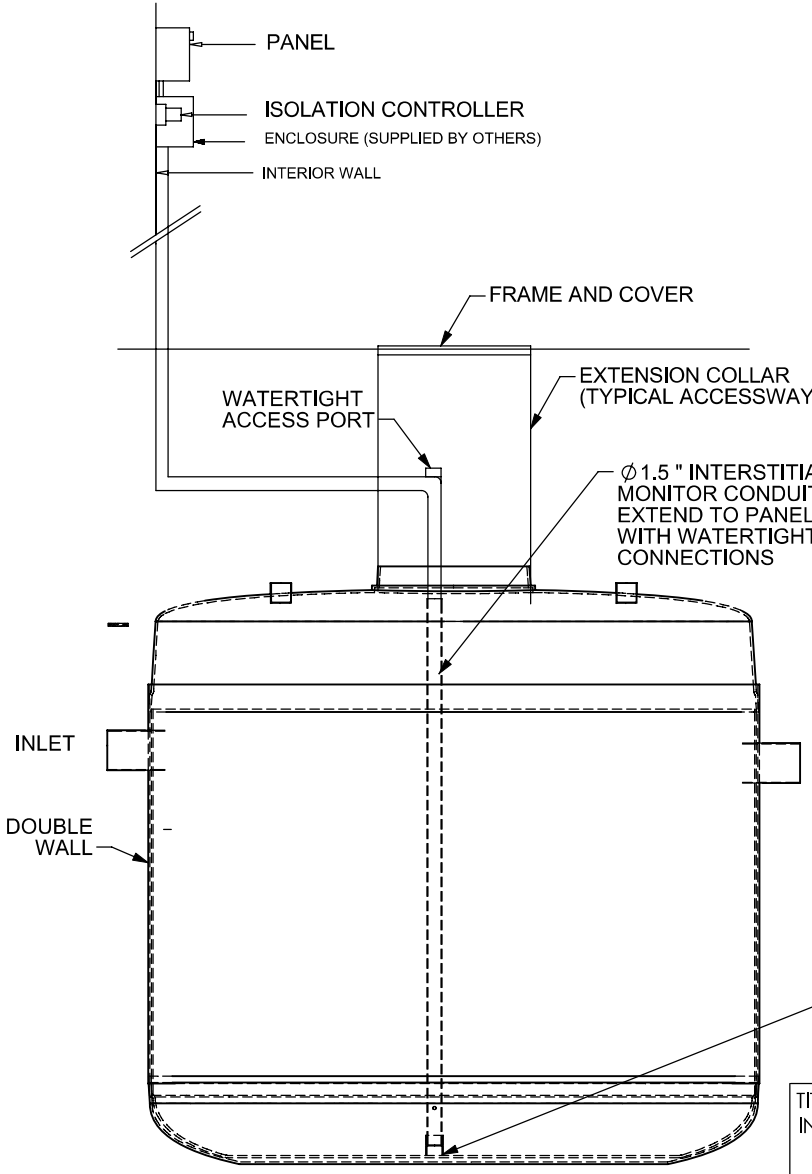
Ensure that the monitor panel and controller indicators are at nominal conditions as shown in the above table.

When the monitor sounds, press the acknowledge button to silence it, if desired. The ALARM light should remain RED as a reminder. Call your liquid waste company for pump out of the internal tank. Check for leaks after tank is cleaned out. Hazardous vapors may be present even in empty tanks. Follow all safety regulations for confined space entry.

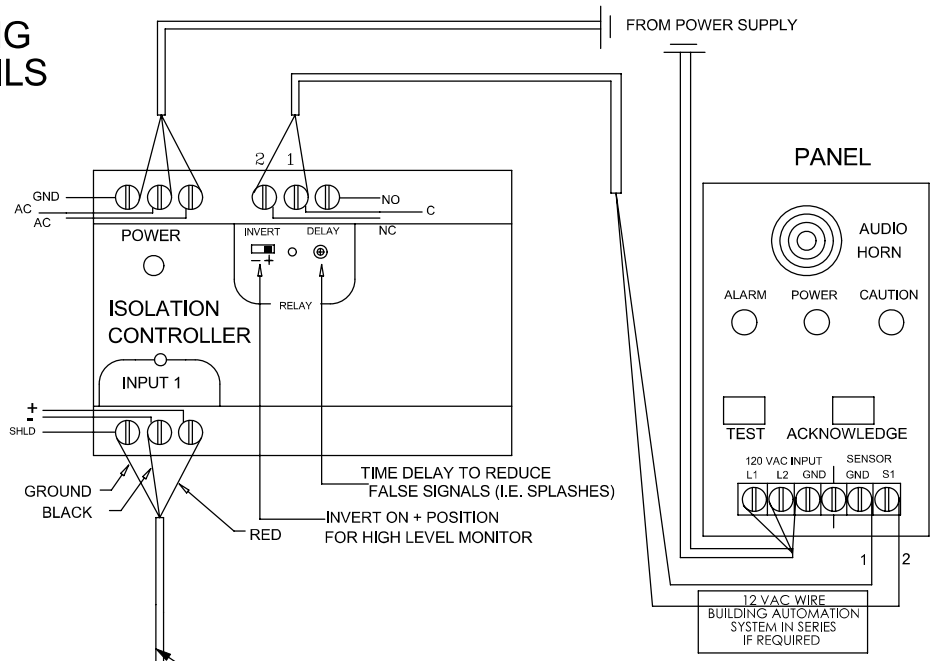
If the monitor sounds and the probe is still in the dry, check the system for electrical faults. Power outages may also cause alarms.

To check the sensor probe condition, remove the sensor and visually inspect. If debris is found on the probe forks, clean them carefully with a soft brush and detergent, being careful not to scratch the surfaces or break the forks.

INTERSTITIAL LEAK MONITOR FOR DOUBLE WALL TANKS

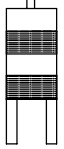


WIRING DETAILS



MAY BE EXTENDED UP TO 1000 FT. (300 m);
USE INSULATED, 14 - 16 GAUGE SHIELDED
MTW OR THHN CABLE

SENSOR DETAIL



ULTRASONIC LEVEL
PROBE WITH 3/4" (19mm) NPT
THREADS AND 50 FT. (12.7m) CABLE
(TYPICAL)

LOWERED TO
BOTTOM OF CONDUIT

TITLE:
INTERSTITIAL LEAK MONITOR

PROJECT: WO:

REV	DATE	DRAWN
1	SEPT 26, 2006	L. SIMKINS
2	JAN. 25, 2007	L. SIMKINS
3	DEC 11, 2007	L. SIMKINS
4	MAR 13, 2008	L. SIMKINS
5	JUNE 16, 2009	L. SIMKINS
6	FEB. 5, 2010	L. SIMKINS
7	SEPT 1, 2010	L. SIMKINS
8	JAN. 14, 2011	L. SIMKINS
9		
10		

DRAWN BY: L. SIMKINS

DRAWN DATE: AUG. 11, 2006

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www.greenturtletech.com

SIZE	DWG. NO.	REV.
A	LEVEL-DWE	8

SCALE:NTS | DO NOT SCALE DRAWING | SHEET 1 OF 1