

## **A) PRODUCT DESCRIPTION:**

The **TMS Series Tank Gauge and Leak Monitor** is designed for use with 1 to 12 above or under ground storage tanks containing liquid products. It monitors from 1 to 24 leak sensors and has up to 32 dry contact relays.

The console is microprocessor based and continuously monitors the level of product in the tank and is EPA approved for In-Tank Leak Detection. It is capable of reporting information on the front display, printer, RS-232, or through the Modem. (See Report Logs below)

## **B) MAINTENANCE SCHEDULE:**

The time between maintenance is dependent upon the environment in which the sensors and probes are operating.

- The console should be tested every month.
- The leak sensors should be visually inspected for fouling or clogging at least every twelve (12) months.
- The inventory probe readings should be compared against stick measurements every six (6) months.

## **C) VERIFYING CONFIGURATION:**

The most important step **before** inspecting and testing the system is verifying that the system configuration has not been damaged or corrupted from the settings that were programmed at start-up.

**To Test:** Power the TMS unit down, count to 5 then power back up. The TMS will display (and print if available) any EEPROM error messages or configuration checksum warnings

There should be NO error / warning messages displayed on power up.

If any Errors or warnings are displayed contact a Pneumercator Certified Technician.

## **D) MANUAL TESTING:**

**NOTE: The following testing should, (but is not required) be performed by a “licensed” tank contractor and a “certified” Pneumercator Service Provider. Power should ALWAYS be turned OFF before disconnecting any probe, sensor or board.**

### **CONSOLE:**

- By performing Item “C” above, the TMS will test all of it’s internal electronic processor systems and display / print any errors. If no errors occurred, all systems are working normal.
- By pressing the “TEST” button the complete testing of the lights, LED, & horn is accomplished.
- Check exterior for any physical damage.
- Check wiring connections in console, make sure they are tight.
- Press the “PRINT” button (if available) and check that printer prints & feeds paper properly.

### **INVENTORY PROBE:**

The Pneumercator Magnetostrictive probe series (MP) has continuous self checking and will display any errors associated with it’s electronic operation automatically on the system display. The following is the only manual testing needed:

- Compare gauge reading against a carefully taken stick reading.
- Remove probe in accordance of the appropriate installation guide for the model you are testing. You **MUST POWER DOWN** before removing probe.
- Check floats for physical damage.
- Clean probe shaft with a clean rag.
- Reinstall probe and recheck against stick reading.

## **SOLID STATE TYPE LEAK SENSOR:**

All of Pneumercator’s optical solid-state leak sensors (ES-825-XXXXF) have Pneumercator Fault Detection built in, which constantly monitors the sensors field wiring for shorts & open circuits and tests for proper sensor operation.

- Remove and Replace per O&M Manual.
- Inspect for residue buildup. If sensor is fouled or clogged, unplug with compressed air, clean with soap and water solution.
- Test sensor – Solid-state sensors work on the principle of optically sensing a beam of light. With this in mind there are special requirements with testing Solid State sensors. Please refer to the proper O & M manual for testing sensors.

## **FLOAT TYPE LEAK SENSOR:**

Pneumercator makes multiple types of float switches. Most of them can be ordered either Normally Open or Normally Closed. You can determine what was ordered by looking at the wiring coming directly out of the sensor, if it has striped colored wires, it was ordered as Normally open, if solid color it is Normally Closed. In the case of the LS-600-LDBN, which can be changed in the field by reversing the float, the wire color is always Red & Black.

- Models: LS 600LDBN, LS610 & RSU 800 (Float Switch)
- Remove and Replace per O&M Manual.
- Inspect for residue buildup. If sensor is fouled or clogged, unplug with compressed air, clean with soap and water solution.

Movement of float - Turn sensor up side down, or manually lift float. Appropriate LED will illuminate and horn will sound. Press any Function Button to silence the horn or move the float below the set point.

## E) PRINTER OPTION:

If an Optional printer was ordered, pressing the "PRINT" button will print a complete inventory report for all tanks connected to the system.

The most important Reports for inspection purposes are: Inventory, Leak Test and Alarms. To VIEW or obtain PRINT-OUTS of these REPORTS follow these steps:

### ENTER the REPORT LOG Menu:

- STEP-EL.1 Press and hold **TEST** button until all LED's illuminate. While holding **TEST** button, press and hold **MODE** until the word "LOG" appears solidly on the display. Release both buttons.
- STEP-EL.2 Momentarily press **TEST** button, "LOG" will begin flashing.
- STEP-EL.3 Momentarily press **MODE** button. The word "Inventory" will be displayed solidly. The beginning of the REPORT LOG Menu has been entered.

### MOVE to individual REPORT LOGS:

- STEP-ML.1 Momentarily press **TEST** button, "Inventory" will begin flashing. REPORT LOGS can only be entered for viewing or printing if its name is flashing.
- STEP-ML.2 Momentarily pressing the **TEST** button will step to the next REPORT LOG. The Inventory report is the first of nine logs. When the desired LOG has been reached proceed to either the PRINT or VIEW sections.

### PRINT details contained in individual REPORT LOGS:

- STEP-PL.1 While the name of the REPORT LOG is flashing, press and hold the **MODE** button for one (1) beep. The word "Return" will appear in the display solidly.

- STEP-PL.2 Momentarily press the **TEST** button and the REPORT LOG name will appear in the display solidly.
- STEP-PL.3 Press the **PRINT** button. The entire contents of the REPORT LOG will print for all activated tanks.
- STEP-PL.4 To advance to another REPORT LOG, press the **TEST** button twice. The next Log name will appear, flashing. Follow Steps PL.1-3 to obtain a print-out of this Log.

### VIEW details contained in individual REPORT LOGS:

- STEP-VL.1 While the name of the REPORT LOG is flashing, momentarily press the **MODE** button, this enters into the individual REPORT LOG.
- STEP-VL.2 Press the **TANK SELECT** button to move through the various activated tanks within the selected LOG.
- STEP-VL.3 Press and hold the **MODE** button for 1 beep to view successive data files within the REPORT LOG. When the word Return appears, the end of the Log has been reached.
- STEP-VL.4 To MOVE to another REPORT LOG, hold the **MODE** button for two (2) beeps. The word "Return" will appear in the display solidly.
- STEP-VL.5 Press the **TEST** button two (2) times, this will re-enter the REPORT LOG Main Menu. Reference the MOVE Section (above) to access other REPORT LOGS.

EXIT to NORMAL OPERATING Mode, do nothing. The system will "time-out" after two minutes and return to normal mode.



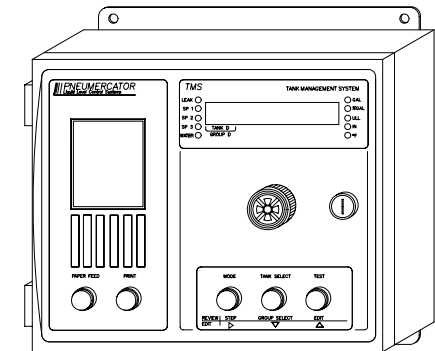
## PERIODIC MAINTENANCE CHECKLIST

MODEL: TMS 2000 / 3000

LIQUID LEVEL GAUGE

AND

LEAK DETECTION MONITOR



Front View

(Printer Option Shown)

This checklist is for systems that have been started-up and tested as per Pneumercator start-up policies. This is for periodic maintenance only.

**Inspectors Note:** Reference sections B, C, D, & E for inspection details.

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