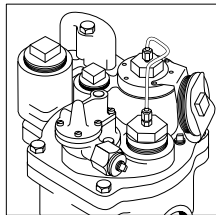
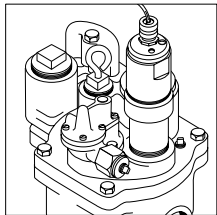


Manual **577013-727** Revision **B**

# PLLD/WPLLD

## Alarm Quick Help



**VR** VEEDER-ROOT

## NOTICE

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## TABLE OF CONTENTS

Introduction .....	Page 1
Gross Line Fail Alarm .....	Page 2
Periodic or Annual Test Fail Alarm .....	Page 3
High Pressure Warning/Alarm (Pre 19) .....	Page 4
Line Equipment Fault Alarm(Ver. 19 and Higher) .....	Page 5
Comm Alarm (WPLLD only) .....	Page 6
Continuous Pump On Warning/Alarm (Pre 19) / Continuous Handle Alarm (Ver. 19 and Higher) .....	Page 8
Fuel Out Alarm .....	Page 9
Low Pressure Alarm .....	Page 10
Open Alarm (PLLD Only) .....	Page 11
Short Alarm (PLLD Only)(Pre 19 Only).....	Page 12
Periodic or Annual Test Warning (Pre 19) / Periodic or Annual Test Needed Warning (Ver. 19 & Higher)	Page 13
Setup Data Warning .....	Page 14
APPENDIX A - TABLES .....	Page 15
APPENDIX B - THEORY OF OPERATION.....	Page 16

## INTRODUCTION

### **WARNING**



This system operates near highly combustible fuel storage tanks.

Fire or explosion resulting in serious injury or death could result if you do not follow these warnings:



1. Before you perform any servicing, switch Off power to the system, including console and STP.



2. To protect yourself and others from being struck by vehicles, block off your work area during installation or service.

#### Related Documents

Refer to the following manuals for more detailed information:  
577013-344 PLLD Troubleshooting Guide, or  
577013-484 WPLLD Troubleshooting Guide

#### Prior to Troubleshooting

If the line leak system is installed into a FE Petro STP, be sure it contains a check valve which is designed to support Veeder-Root line leak applications. The line leak system will not work if the correct valve is not in place.

If the line leak system is installed into a Red Jacket STP, the functional element must be disabled and the relief venturi into the siphon pipe must be free from blockage.

#### IMPORTANT

When measuring the pressure in the line for comparison with pressure transducer readings, always install the pressure gauge **DOWNSTREAM** of the Check Valve (such as at the emergency shut-off valve). **DO NOT** measure pressure at the STP.

## GROSS LINE FAIL ALARM

This alarm occurs when a drop in pump-off line pressure, or low pump-off line pressure is detected.

### Probable Causes:

1. The line is leaking [inspect all visible areas of pipeline, dispenser piping, and STP for leakage].
2. The tank is empty.
3. Power to the STP is switched Off - PLLD ONLY.
4. **Partially** clogged functional element (R. Jacket STP)(**Pre 19**).
5. STP contactor relay not closing or relay sticking - PLLD ONLY.
6. Faulty check valve (FE Petro or SwiftCheck Valve); check relief pressure; refer to Appendix A, Table II on Page 15.
7. Line length or type programmed incorrectly in the console.
8. Packer-Discharge Seal leaking (Red Jacket STP) - replace with the correct seal for your application.
9. Dispenser is leaking. External leaks (connections, filters, etc.),

or internal leaks (solenoid valves in dispensers leaking into nozzle hose, blender valve leaking, etc.)

10. Air in the line (**Pre 19**).
11. Low or no STP pressure (bad STP, starting capacitor).
12. Incorrect wiring of pump control/transducer - PLLD ONLY.
13. No STP request signal from dispenser. Verify all dispenser switches are recognized by the console when actuated.

### Troubleshooting Guidelines:

Retest line to determine if failure is repeatable or is intermittent. If the test passes, the problem is intermittent. Items 4, 5, 6, 9, 12, and 13 are the most common causes of intermittent failures. If the line fails, close all dispenser emergency shut-off ('crash') valves and retest. If the test passes, the leak is probably in the dispenser(s).

## PERIODIC OR ANNUAL TEST FAIL ALARM

Pump-on pressures indicate a Periodic (0.20 gph) or Annual (0.10 gph) line leak test failure has occurred.

### Probable Causes:

1. The line is leaking.
2. Check valve leaking
3. Packer -Discharge Seal (Red Jacket STP) - replace with the correct seal for your application.
4. Dispenser is leaking. External leaks (connections, filters, etc.), or internal leaks (solenoid valves in dispensers leaking into nozzle hose, blender valve leaking, etc.)
5. The console is not programmed for the correct line length / type.

### Troubleshooting Guidelines:

- a. **Switch STP On** and inspect all visible areas of pipeline, dispenser piping, and STP for leakage.

- b. Check for dispenser solenoid valve leakage by squeezing each nozzle **with STP On** and dispenser switched Off.
- c. If dispensers are blenders, check for blend valve leakage by looking for meter movement (no dispensing and **STP On**).
- d. After making any necessary repairs to correct problems identified in steps a - c, retest line to confirm failure: If it passes, but no repairs were made, the problem is intermittent. The most common intermittent causes are items 2 and 4. If it fails, close all dispenser emergency shut-off ('crash') valves, and retest. If it fails, the most common causes are items 1, 2, and 3. If it passes, the problem is in one of the dispensers. Open the shut-off valves, one at a time, or to save time, in groups, and continue testing until leakage recurs to identify suspect dispenser.

*Note: 0.20 gph tests take a minimum of 30 minutes and 0.1 gph tests take a minimum of 45 minutes.*

## HIGH PRESSURE WARNING/ALARM (Pre 19)

Excessive line pressure when STP is switched Off. Note: the pressure thresholds vary; see Table I, Appendix A, Page 15.

### Probable Causes:

1. Sticking/stuck relay (PLLD only).
2. Clogged functional element (Red Jacket STP).
3. Faulty pressure transducer.
4. Incorrectly adjusted check valve relief, or incorrect valve (FE Petro STP).
5. Faulty check valve.
6. Functional element relief valve has not been disabled (Red Jacket STP).
7. Vent closing screw on functional element not fully retracted.
8. STP is being switched On by another device not detected by

the console - e.g., Healy vapor recovery (PLLD only).

9. Bad PLLD Interface Module (PLLD only).
10. Cross-wired transducers (PLLD only).
11. Transducer incorrectly wired to wrong side of STP capacitor (WPLLD only).

### Troubleshooting Guidelines:

Switch On the STP for 10 seconds to pressurize the line. Shut the STP Off, wait 5 seconds and measure the line side pump-off pressure. It should be less than 27 psi. If it is, the problem is intermittent, otherwise the problem is continuous. Items 1,5, 8, and 10 are the most common causes intermittent failures. Items 1, 2, 3, 4, 6, 7, 9, 10, and 11 are the most common causes of continuous failures.

## LINE EQUIPMENT FAULT ALARM (Ver. 19 and Higher)

The pressure monitors have determined that there is a fault with the pressure measurement system.

### Probable Causes:

1. Faulty Pressure transducer.
2. Faulty PLLD Interface Module.
3. Mis-wired transducers.

### Troubleshooting Guidelines:

1. **Turn Off power to the STP - WARNING! The pump must remain Off for steps 2, 3, and 4 below..**
2. Vent the product line to drop the line pressure to zero.
3. Reconnect the product line.
4. Restore STP power.

5. In the PLLD/WPLLD diagnostic menu, run the pressure measurement offset test.

**WARNING!: WPLLD turns On the pump to make a pressure measurement. Make sure the line is reconnected before running the test.**

6. If the test result is greater than 5 psi, check the transducer wiring. If the wiring is correct replace the transducer.
7. Following all repairs re-run the pressure measurement offset test.
8. If the alarm is still active run a gross line test.



## COMM ALARM (WPLLD Only)

The WPLLD pressure transducer transmits pressure readings on the 220 Vac STP power lines. The readings are transmitted in short bursts (1/2 second) every eight seconds. After four minutes, the transducer stops transmitting. A WPLLD Comm Alarm is posted when the transmission is not received or when noise interferes with the reception.

### PROBABLE CAUSES:

#### No transmission

1. No Power to the STP (circuit breaker Off).
2. STP contactor permanently stuck On.
3. Controller Module has blown fuse.
4. Controller Module faulty.
5. AC Interface Module faulty.
6. Bad connection from the 220 Vac line to the AC Interface Module.

7. Comm Module faulty.
8. Bad connection between the AC Interface Module and Comm Module.
9. WPLLD transducer faulty.
10. Field wiring to STP faulty.
11. STPs using different legs of 3-phase power.

#### Noise Interference

1. External device generating noise on the AC line (common sources are neon signs, variable speed motors, and STP contactors).
2. Signal strength adjustment incorrect (Refer to Manual 576013-923).
3. A sticking STP contactor on one of the lines.

### TROUBLESHOOTING GUIDELINES

#### Determining if the problem is noise related:

With all the STPs Off, examine the lights on the AC Interface Module. If more than one light is lit, the problem is an external device generating noise. Isolate the circuit that is generating the noise by turning the station's electrical breakers off one at a time until no lights are lit on the module. Determine which device on the circuit is generating the noise and remove or correct.

*NOTE: Noise interference caused by 120 Vac devices drawing less than 5 amperes can be reduced/eliminated by using a plug-in noise filter, part number AF100, manufactured by Advanced Controls Technologies (telephone 800-886-2281).*

#### Determining if the problem is transmission related:

Manually start a test on the line that has the Comm alarm. The STP will be switched on for 10 seconds to pressurize the line. Watch the lights on the AC Interface Module for a short burst of data 8 seconds after the pump switches On:

- If no lights are lit, the transmission is not being received, indicating a possible failed WPLLD transducer.
- If only one or two lights are lit, the problem is incorrect gain adjustment.
- If three or more lights are lit, repeat the manual test but this time watch the light on the WPLLD Comm Module. The light should flash 8 seconds after the STP switches On. If it does not, the Comm Module or the connection between the Comm Module and AC Interface Module is bad.

## Continuous Pump On Warning/Alarm (Pre 19) / Continuous Handle Alarm (Ver. 19 & Higher)

A continuous pump-in signal will activate:

### **(Pre 19)**

- A Continuous Pump On warning after 8 hours and a Continuous Pump On alarm after 16 hours, or

### **(Version 19 and higher)**

- A Continuous Handle alarm.

### **Probable causes:**

1. Dispenser switch is continuously On - verify that all dispenser switches are Off.
2. Excessive dispenser leakage voltage - measure pump-in voltage with all dispensers switched Off; a reading >30 Vac indicates excessive leakage. Install an isolation relay between the dispenser and the PLLD Controller Module (reference Manual 577013-344).
3. Dispenser internal board is faulty, or possibly a bad dispenser switch - switched Off, but it is still On.

## FUEL OUT ALARM

This alarm occurs when the fuel level is below 10 inches and a gross line test has failed. The alarm will clear when the fuel level exceeds 10 inches.

*NOTE: The fuel level does not include the programmable tilt value and may therefore be different from the height reading displayed.*

## LOW PRESSURE ALARM

This alarm indicates a Low Pressure condition was detected while dispensing. The low pressure threshold is programmable from 0 - 25 psi (a low pressure threshold of 0 disables the low pressure monitor).

### **Probable causes:**

1. Large line leak (inspect visible areas of piping, dispensers, and STP)
2. Tank is empty.
3. Low or no STP pressure (bad STP, starting capacitor).
4. Failed STP contactor relay.
5. Power to the STP is switched Off.

## **OPEN ALARM - PLLD ONLY**

When the pressure transducer is not connected to the PLLD Interface Module the pressure reading is negative. Note: Diagnostic screen will display 0 when pressures are negative.

### **Probable Causes:**

1. Open condition in the field wiring.
2. Incorrect field wiring.
3. Reversed wiring on transducer.
4. Bad transducer.
5. Bad PLLD Interface Module.

## **SHORT ALARM - PLLD ONLY (Pre 19 Only)**

This alarm occurs when the pump-On and pump-Off pressures are reading the same value and are within the range of 5 to 15 psi.

### **Probable causes:**

1. STP did not switch On.
2. Low STP pump pressure.
3. Bad transducer.
4. Bad PLLD Interface Module.

## Periodic or Annual Test Warning (Pre 19) / Periodic or Annual Test Needed Warning (19 & Higher)

The system failed to complete or pass a Periodic (0.20 gph) or Annual (0.10 gph) test in the programmed number of days.

### Probable Causes:

1. There are Periodic or Annual test failures [Check test history to determine if tests are failing; if they are, follow procedures in Periodic or Annual Test Fail alarms (Page 3)].
2. Pump-on pressure readings <22 psi.
3. **(Ver 17 & 18 only)**  
Active High Pressure Warning or Alarm: follow procedures on Page 4 to correct the High Pressure condition.  
**(Ver 19 and higher)**  
The line is not venting when the pump is shut Off. There should be at least a 2 psi difference between P<sub>on</sub> and P<sub>off</sub>. Print out the 0.2 or 0.1 diagnostic. The No Vent test aborts

message X out of 10 tests, indicates how many tests have been aborted due to a non-venting problem. Check for stuck relay, Functional Element not disabled (Red Jacket), incorrect Check Valve (FE Petro), or incorrectly adjusted Check Valve (FE Petro).

4. Active Continuous Pump Warning/Alarm or Continuous Handle Alarm.
5. If the site is extremely busy, especially if blenders are present, there may not be sufficient idle time to complete a Periodic or Annual test unless the station is shut down.



## SETUP DATA WARNING

This alarm occurs when an error has been made in programming. In Version 17 and later, this will also occur if the line length has not been programmed. The line length default is 501 feet and will cause a SETUP DATA WARNING if the Service Contractor does not enter the line length.

***NOTE: The default line type is set to FLEX A (white Enviroflex PP1501). If the actual line type is not FLEX A, and the Service Contractor does not select the correct line type, the result may be a GROSS LINE FAIL.***

## APPENDIX A - TABLES

**TABLE I - High Pressure Thresholds & Warning/Alarm**

<u>Software Version</u>	<u>High Pressure Limit</u>
15	40 psi warning 50 psi alarm & shutdown
16 A & B	40 psi warning 50 psi alarm & shutdown
16 C	29 psi warning 30 psi alarm & shutdown
17 & 18	30 psi warning 40 psi alarm & shutdown
19	Not Applicable

**TABLE II - Typical Line Pressure**

<u>STP Status</u>	<u>Pressure Range</u>	<u>Gauge vs. Console</u>
Off	17 - 25 psi	±5 psi
On	>25 psi	±5 psi

## APPENDIX B - THEORY OF OPERATION

### PLLD 3.0 gph Test Protocol

1. The 3.0 gph line leak test is performed immediately after the last dispense cycle has been completed.
2. The STP remains running for approximately 10 seconds to pressurize the line.
3. The STP is then switched Off.
4. Wait a certain number of seconds to allow the line to vent down to the check valve's relief pressure. The time varies with line length and line type.
5. Take the first pump-off pressure reading ( $P_1$ ). If  $P_1$  is less than 12 psi, a GROSS TEST FAIL alarm is posted and the test is complete.
6. Wait a pre-determined amount of time (varies with line length and type - *from 5 seconds to several minutes*) to allow the line to lose pressure if a leak exists.
7. Take the second pump-off pressure reading  $P_2$ .
8. Compare the drop from  $P_1$  to  $P_2$ , if it exceeds the 3 gph threshold, the test is repeated. If it fails again, a GROSS TEST FAIL alarm is posted and the test is complete.

