Model 5380 PFPD Troubleshooting Guide

The following lists the most common possible problems when using the PFPD, along with their most probable causes and corresponding corrective actions. Each problem potentially causes more than one symptom. The probable causes of each symptom are listed in order of increasing severity. This manual discusses each corrective action in previous chapters, under either an installation, operation, or maintenance procedure.

Before using this guide, become thoroughly familiar with the operation and maintenance information contained in previous chapters.

If none of the following corrective actions correct the problem(s) being experienced, contact OI Analytical's Technical Support Department at (800) 336-1911 or (979) 690-1711 with the following three printouts available:

1. **WinPulse screen showing a peak emission signal:** To capture a peak response during a chromatographic run, activate one of the two hold buttons on the right of the Main screen at the moment that the emission signal reaches its maximum value. To save the screen:

   - Press [Alt]+[Print Screen] on the PC's keyboard
   - Open the **Paint** program (**Start > Accessories > Paint** from the status bar at the bottom of the screen).
   - Go to the **Edit** menu and select **Paste**.
   - Save the captured screen to a file, and print out a copy of the captured screen.

2. **WinPulse parameter values:** To obtain this, go to the **File** menu in WinPulse and select **Print**; or click on the  button at the top of the main screen

3. **Chromatogram:** If a PC-based program such as Agilent ChemStation is being used to generate the chromatogram, obtain a printout using the same screen capture sequence described for capturing a WinPulse screen.

Symptom	Probable Cause	Corrective Action
No signal	PC's serial cable not connected to the Detector Controller	Check the serial cable connection to the PC and Detector Controller.
	Incorrect serial I/O port assigned	Reassign the serial port.
Flame ignition problems	Gas flows too low or not set correctly	Verify the carrier, H_2, and air pressure regulators are set correctly and that gas is supplied to the pneumatics module.
	EPC controllers off	Turn the EPC controllers on.
	Carrier gas flow rate too high	Decrease the carrier gas flow rate (if possible), increase Air 1 to increase the flame temperature in the combustor, or use a 3-mm combustor.
	Detector leaking gas from washers or other seals	Check for gas leaks around the aluminum sealing washers. Check column connections and verify the column's seal is secure and is not broken.
	Ignitor broken or shorted	Replace the ignitor. See Chapter 6, "Testing and Replacing the Ignitor Assembly" on page 79.
	Ignitor current set incorrectly	Verify the ignitor current is set at 2.8 A and optimize Air 1 flow. Increase the ignitor setting to 3.3 A until a regular pulse is obtained. Reset it to 2.8 A.
	Cold detector body	Heat the PFPD to 220°–300°C.

Symptom	Probable Cause	Corrective Action
Tick-tock flame propagation mode cannot be achieved	Fine adjust needle valve incorrectly set when closed	Check the fine adjust needle valve setting by removing the locking screws and knob. Gently turn the needle valve counterclockwise until seated, and then turn it clockwise one-half a turn. Replace the knob and retighten the lock screw.
Flame propagation problems	Inconsistent flame propagation into the combustor (tick-tock)	Set the GC oven to the highest temperature that the analysis requires. Then adjust the needle valve counterclockwise to bring it out of tick-tock.
	Incomplete flame propagation through the combustor	Examine the section of the column that extends above the combustor support. If the column's polyimide coating has not been cleanly burnt off, add more Air 1 (or reduce the H_2 flow).
PFPD quits pulsing when solvent is injected and does not restart after solvent elutes	Ignitor current set too low	Increase the ignitor current to a higher value (maximum is 3.3 A) and reset it to 3.1 A after a regular pulse is achieved.
	H_2 set too high	Decrease the H_2:air ratio.

Symptom	Probable Cause	Corrective Action
Noisy detector	PMT seal not properly made	Secure the PMT housing to the PMT mounting on the detector body with the supplied thumbscrew.
	Cracked or deformed PMT housing	Replace the PMT housing.
	Filter(s) incorrectly installed	Verify the proper PMT and filter(s) are being used for the desired analysis and that the filter is not loose. If loose, add an extra O-ring.
	HV too high	Lower the HV setting.
	Ignitor cap not properly sealed	Secure the ignitor cap.
	Trigger level improperly set	Adjust the trigger level.
	Contaminated combustor	Bake the PFPD overnight at 350°C and observe if the noise is reduced. If the noise is not reduced, replace the combustor.
PMT voltage stays at 0 V	Severe light leak	The PMT may be exposed to ambient light or the PMT is damaged. Replace the PMT.
Negative baseline	Output signal zero set at an inappropriate level.	Reset the autozero via the Board/Channel Parameters screen in WinPulse.
	High gain in the PMT	Reduce the PMT voltage.
High baseline	High contamination	Examine the emission profile for response due to contamination. Replace the combustor if necessary.
	Improperly set output signal zero	Verify the output signal zero is enabled.
	Improper gas flows	Check that H_2:air ratio is optimized and that the range value is correctly set.
	Improperly set gate values	Check gate values and filter-PMT combination.

Symptom	Probable Cause	Corrective Action
Truncated peak tops	Detector response exceeding the PFPD's or data system's signal handling capacity	Reduce the electrometer gain by reducing the PMT voltage (if necessary), and increase the attenuation value (normally set to one).
	Range setting for the signal set too low	Increase the range setting.
	Output signal zero offset set too low	Reset the zero value.
	Analyte concentration too high for the column	Use a split injection to reduce analyte concentration.
Truncated peak bottom	Output signal zero set too high	Reset the output signal zero via WinPulse.
	Insufficient PMT voltage (gain)	Optimize PMT voltage for noise measurements (see Chapter 14, "Noise Sources and Output Signal Optimization" on page 119 for details).

Symptom	Probable Cause	Corrective Action
Low sensitivity	Excess flow through the combustor	Adjust the needle valve to tick-tock operation. Back off ¼ to ½ turn.
	Low PMT voltage	Increase the PMT voltage setting (50 V higher) and monitor the noise. If noise remains the same, continue increasing the PMT voltage until the noise level increases (doubles the initial noise measurement). Rerun the analysis. If the signal response increases proportional to the noise, reset the PMT voltage to the original optimized noise level.
	Incorrectly set gates	Check gate start and stop times to ensure they are set correctly for maximum selectivity, and check threshold (trigger) level for proper sensing of the propagating flame event.
	Contaminated combustor	Bake the PFPD overnight at 350°C and observe if the noise reduces. If the noise is not reduced, replace the combustor.
	Wrong filter	Verify the correct filter is being used with the PMT.
	Improper gas flows	Verify the H_2 and Air 1 flow are optimized.
Low sensitivity–continued	Improper gate values	Verify the correct mode and gate values are being used. Optimize gate and threshold (trigger) level settings in the Board/Channel Parameters screen in WinPulse.
	Low range	Increase the gain by using a lower range.

Symptom	Probable Cause	Corrective Action
Severe peak tailing	Unswept dead volumes, sample adsorption on activated surfaces, sample decomposition, or a leaking injector septum	Check PFPD temperature to ensure the sample is not condensing prior to elution into the combustor and that the PFPD temperature does not exceed the recommended maximum temperature for the column.
	Crushed column at the combustor support	Check the column end protruding beyond the combustor support to verify full flame propagation into the combustor. Increase the detector temperature to prevent condensation in the detector body. Verify proper operation of the injector and column installation.
	Normal elemental reaction	Peak tailing is normal in As, Sn, and Sb detection. The tail is reduced for these elements at high PFPD temperatures. At low PFPD temperatures, the tail may become much longer but with a low amplitude.
	Ruined column	Replace the column. If dirty samples are used, add a guard column.
Nonuniform response	PFPD too cold	Increase the PFPD temperature to 300°C for phosphorus or sulfur–phosphorus pesticides.
Reduced sulfur response under coelution with hydrocarbons	Quenching	Replace the column with one with better separation, inject less sample. Use a 3-mm combustor, and increase Air 1.