



**Warning:** To avoid explosion and fire, do not use gases that would allow the combustion of combustible solvents. Always use inert gases.

#### To connect the detector to the gas supply:

1. Connect one end of the plastic tubing to the nitrogen source.  
**Tip:** The nitrogen source can require an adapter to fit the plastic tubing.
2. Connect the free end to the nitrogen fitting on the rear panel of the detector.

## 2.8 Starting up and shutting down the 2998 PDA detector



#### **Warning:**

- Always observe Good Laboratory Practices when you use this equipment and when you work with solvents and test solutions. Know the chemical and physical properties of the solvents and test solutions you use. See the Material Safety Data Sheet for each solvent and test solution in use.
- Using incompatible solvents can cause severe damage to the instrument and injury to the operator.

The detector startup procedure requires less than one minute. Following the procedure, allow the detector to warm up for at least one hour before performing an analysis. Follow the procedures in this section, to ensure reliable detector performance.

### 2.8.1 Starting the detector

#### To start the detector:

1. In the instrument method, set the solvent delivery system or pump to deliver 10 mL of HPLC-grade methanol or mobile phase.

**Tip:** For details, refer to the Empower or MassLynx online Help.

#### **Guidelines:**

- Use only thoroughly degassed HPLC-grade solvents. Gas in the mobile phase can form bubbles in the flow cell, and cause the detector to fail the reference-energy diagnostic test.
  - Ensure that the solvent is correctly composed and that it is of high quality and miscible with any other solvents used in the system. Use filters in all solvent reservoirs, and ensure that the volumes of solvents are sufficient for priming.
2. Power-on the detector.
  3. Observe the lamp and power-indicator LEDs, on the front door of the detector which LEDs change as follows:
    - During initialization, the power LED flashes green.
    - After the detector has successfully powered-on, the power and lamp LEDs show steady green.
  4. Wait 1 hour for the detector to stabilize before acquiring data.

**Note:** If the detector fails to stabilize, see [Chapter 4](#).

## 2.8.2 Monitoring LEDs

Light-emitting diodes on the detector indicate its state of functioning.

### 2.8.2.1 Power LED

The power LED, on the 2998 PDA detector's front door, indicates when the instrument is powered-on or powered-off. It is steady green when the instrument is working properly.

### 2.8.2.2 Lamp LED

The lamp LED, to the left of the power LED, indicates the lamp status.



**Warning:** To avoid electric shock, do not touch the lamp connector if the lamp LED is flashing red. Power-off and unplug the detector before touching the lamp connector.

The following table identifies each LED mode with its corresponding detector lamp state.

**Table 2–8: 2998 PDA detector LED indications**

LED mode and color	Description
Unlit	Indicates the detector lamp is extinguished.
Constant green	Indicates the detector lamp is ignited.
Flashing green	Indicates the detector is initializing or verifying calibration.
Flashing red	Indicates that an error stopped the detector. Refer to the console for information regarding the error.
Constant red	Indicates a detector failure that prevents further operation. Power-off the detector, and then power-on. If the LED is still steady red, report the problem to Waters Technical Service.

## 2.8.3 Shutting down the detector

**To shut down the detector:**

1. Set the solvent delivery system or pump to deliver 10 mL of HPLC-grade water, if the mobile phase contains buffers, or 10 mL of degassed methanol, if the mobile phase does not contain buffers.
2. Power-off the detector.

## 2.9 Using a cuvette

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The 2998 PDA detector cuvette option allows for ease of use in:

- Sample handling