

Chapter 1

Installation

The Waters[®] 2996 Photodiode Array (PDA) Detector operates in any standard laboratory environment. The detector requires electrical power, sample and waste fluidic lines, and either the Millennium[®]³² or MassLynx[™] workstations. Optional connections on the detector rear panel allow communication with chart recorders, data integrators, and other instruments that are not compatible with Millennium³² or MassLynx software control.

1.1 Installation Site Requirements

Install the 2996 PDA Detector at a site that meets the specifications in Table 1-1 and Figure 1-1.

Table 1-1 Site Requirements

| Factor | Specification |
|---------------------|---|
| Ambient temperature | 4 to 40 °C (39 to 104 °F), not to vary more than 1 °C per hour (to prevent drift) |
| Relative humidity | 20 to 80%, noncondensing |
| Bench space | Width: 11.5 in. (29 cm) Depth: 24 in. (61 cm) Height: 8.5 in. (22 cm) |
| Bench support | Capable of supporting 31.5 pounds (14.3 kg) |
| Clearance | At least 4 in. (10 cm) on the back side for ventilation |
| Power | Grounded ac, 100 to 240 Vac |

Electrical Specifications

Before you connect an external device to an event input or output terminal, refer to the electrical specifications in Table 1-2 and Table 1-3.

Table 1-2 Event In Terminal Specifications on TTL or Switch Closure

| Parameter | Specification |
|---------------------|---|
| Low trigger | <1.8 V |
| High trigger | >3.0 V |
| Protected to | ±30 V |
| Minimum pulse width | 30 msec (this may limit compatibility with valves that require a quick pulse) |
| Maximum current | 5 mA |

Table 1-3 Event Out Terminal Specifications on Contact Closure

| Parameter | Specification |
|-----------------|---------------|
| Maximum power | 10 W |
| Maximum current | 0.5 A at 20 V |
| Maximum voltage | 24 V RMS |



Attention: To avoid damage to the 2996 Detector electronics, be sure you make the proper electrical connections as outlined in this section.

1.5 Fluidic Connections



Caution: To avoid chemical hazards, always observe safe laboratory practices when handling solvents. Refer to the Material Safety Data Sheets for the solvents in use.

Required Materials

- 5/16-inch open-end wrench
- 0.009-inch (0.23 mm) ID stainless steel tubing (included in the 2996 Detector Startup Kit)

Appendix A

Detector Specifications

Table A-1 lists the 2996 PDA Detector specifications.

Table A-1 2996 Detector Specifications

| Item | Specification |
|-------------------------|---|
| Dimensions | Width: 11.5 in. (29 cm) Depth: 24 in. (61 cm) Height: 8.5 in. (22 cm) |
| Weight | 31.5 lbs (14.3 kg) |
| Wavelength range | 190 to 800 nm |
| Wavelength accuracy | ±1 nm |
| Linearity range* | 5% at 2.0 AU, propylparaben, at 256 nm |
| Spectral resolution | 1.2 nm |
| Baseline noise | ±1.5 × 10 ⁻⁵ AU peak-to-peak, dry, at 254 nm |
| Drift | 1 × 10 ⁻³ AU/hour at 254 nm (after warmup) ΔT ≤ 1°C per hour |
| Flow cells | Pathlength (mm): Tubing (ID): |
| Standard | 10 0.009 in. |
| Semi-preparative | 3 0.040 in. |
| Variable path flow cell | 0.15 to 3 0.004 in. |
| Microbore | 3 0.005 in. |
| Inert | 10 0.010 in. |
| Autopurification | 0.5 0.009 in. (A Inlet) 0.020 in. (P Inlet) 0.040 in. (Common Outlet) |

*Per ASTM 685-79