**Applying a Nitrogen Purge**

The Cary 4000/5000/6000i instruments are fitted with connection points for purging the optical system with nitrogen to enhance the performance of each instrument at extremes of its range. More details are provided in the Cary Hardware operation manual (part number 8510197200), supplied with the instrument.

Nitrogen supplies are not available from Varian but may be obtained from commercial suppliers. Liquid nitrogen (in conjunction with a heat exchanger) is recommended because it is generally less costly than compressed nitrogen and is of better quality. Where compressed nitrogen must be used, the gas must be dry, oil–free and uncontaminated. Do not use compressed nitrogen from a supplier who uses oil or water in the compression process (these methods leave fine particles of oil or water suspended in the nitrogen that may be deposited on the instrument optics). Only use nitrogen from a supplier who fills containers from immersion pumps lubricated with liquid nitrogen.

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|  | **Note** The instrument warranty will be void if damage is caused by the use of contaminated nitrogen. |

Operating pressure at the pressure regulator (# 7 in figure 53) for the nitrogen purging system is 83 to 172 kPa (12 to 25 psi). Use a suitable regulator and gauge assembly to ensure that the nitrogen supply is maintained at the correct pressure.

Nitrogen supply tubing should be clean, flexible plastic tubing 6 mm (1/4“) inside diameter (Tygon PVC or equivalent). Do not use rubber tubing as this is usually treated internally with talc which will be carried into and contaminate the instrument optics.

The nitrogen system should include a manifold assembly with inlet from the supply and two outlets for connection to the instrument. Manifold outlets should each be fitted with a stop valve and flowmeter for control of gas flow to the instrument. Flow meters should be adjustable for flow rates of 0 to 30 litres per minute (0 to 64 cubic feet per hour). Refer to the figure below for more details.

**Figure 53.** The position of flowmeters when purging with nitrogen:

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| 1. Instrument \* | 2. External DRA |
| 3. Tubing | 4. Flow meters |
| 5. Shut-off valves | 6. Manifold |
| 7. Pressure regulator | 8. Nitrogen control valve |

*\*Refers to the purge inlet labelled "Instrument".*

The DRA accessories each have an inert gas purge capability for reducing water vapour absorption inside the integrating sphere. The gas nozzle is located underneath on the left-hand side of the over­hanging accessory. A nitrogen purge can be applied as follows:

1. Install the accessory into the instrument sample compartment.

2. Attach a suitable gas regulator to the gas outlet of a nitrogen dewar or N2 cylinder.

3. Connect a suitable hose between the regulator outlet and the nitrogen connector on the accessory.

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| **Figure 54.** Attach the connector on the hose to the connector on the under side of the integrating sphere. | **Figure 55.** The connectors snap together. |

4. Crack open the shut off valve until the flow meter indicates the flow of nitrogen. Wait approximately five minutes before proceeding with reflectance or transmission measurements.