

Brookhaven Instruments Corporation

## **Instructions for Using the BI-PA Polarization Analyzer**

### **Specifications**

The BI-PA uses a Glan-Thompson prism mounted in a two-position, click-stop stage. The extinction coefficient is nominally  $5 \times 10^{-6}$ . This ratio of the intensity of light with linear polarization perpendicular to the prism setting divided by the intensity of light with linear polarization parallel to the prism setting.

The input aperture on the front of the BI-PA is nominally 3mm.

The maximum allowed power is 0.5 watt. Exceeding this power may cause damage to the prism. Except for zero angle, it is unlikely that this specification will be exceeded. Align, therefore, your system without the BI-PA. Mount it afterwards, thereby avoiding the possibility of damage.

### **Mounting**

The BI-PA is mounted with the same four screws that hold the front plate of the detector optic on the BI-200SM goniometer. Remove the four screws. Remove the front plate. Substitute the BI-PA for the front plate. Lightly tighten the four screws through the slots on the circumference of the BI-PA.

### **Alignment & Operation**

Warm up the laser. This procedure assumes that, as is the normal case, the laser is linearly polarized perpendicular to the horizontal scattering plane. Turn on the high voltage and correlator/photon counter. Place the goniometer at  $90^\circ$  scattering angle. Measure the count rate with a strong scatterer in position. Rotate the knurled front plate of the BI-PA until the red mark on it is perpendicular to the mark on the barrel. In this position you are measuring light with polarization perpendicular to the input polarization. A minimum, therefore, is expected in the count rate. Slowly rotate the barrel of the BI-PA back and forth until a minimum is found. Secure tightly the 4 screws mounting the BI-PA. The BI-PA is now aligned.

During operation there are only two positions: parallel and perpendicular to the incident polarization. When the marks on the BI-PA are aligned, the BI-PA is passing light with parallel polarization.