

## PLD Intelligent Window

*The PVD Products "Intelligent Window" provides the customer with significantly improved deposition capability by accurately monitoring one of the most critical parameters in the process: the "On-Target Laser Fluence" or OTLF. OTLF is the energy that actually enters the deposition chamber and impinges on the ablation target. A second important feature of the Intelligent Window is its ability to keep the optical beam path clean for extended periods of time. A high quality AR coated window mates to the large flange using a Viton O-ring. Inside the large flange is a large diameter, UV grade fused silica disc. Between the disc and target is an aperture that limits to a small section the portion of the disc coated by ablated material. This disc insures that the AR-coated window is kept clean by intercepting the ablated plume. Once the exposed section of the disc has become coated, the disc can be easily rotated exposing a new, optically clean surface, even during deposition. These internal discs are easily replaceable and reusable. When depositing films for device applications, or simply conducting parametric studies it is imperative that the OTLF be held constant in order to obtain consistent, accurate, and reliable results. It is well known that PLD film properties depend strongly on the OTLF, and not simply the energy exiting the pulsed laser. The OTLF may vary due to several factors in all PLD systems. Films continually build up on the inner surface of the PLD chamber's laser entrance port. Also, excimer laser output and beam brightness can vary significantly depending on the life of the laser gas fill, output coupler, and electrodes. Furthermore, the components of the optical train degrade with time due to color centers and/or degradation of reflecting or AR-coated surfaces. Monitoring and adjusting the energy that actually enters the chamber before each run, or during the growth process, results in more constant OTLF and helps yield reproducible film properties and deposition rates.*



**Photo of PLD-3000 Intelligent Window with Fluence Option**

### **Intelligent Window Features:**

- *Monitors the laser energy which actually enters the deposition chamber*
- *Keeps the laser entrance window clean for extended periods (10 X or more)*
- *Bolts directly onto your existing chamber's laser entrance port*
- *Yields reproducible film properties and deposition rates*
- *Ideal for UHV, load-locked, or Reel-to-Reel tape systems*
- *High quality AR-coated window included for your specific laser wavelength*
- *Easily replaceable and reusable fused silica disc (spare included)*

The performance of load-locked systems and processes that run at low deposition pressures will benefit significantly with the addition of an Epion Intelligent Window. The time required between window replacements will be increased by well over an order of magnitude, significantly reducing system downtime.

**Intelligent Window Installation:**

The unit bolts to the deposition chamber using standard 2.75” (70 mm), 3.38” (86 mm), or 4.5” (114 mm) knife-edge style flanges. Custom flanges are also available to adapt to your specific PLD chamber requirement. You may need to obtain a new focus lens, as the unit will increase the distance from your target to the present window by the overall length L, defined in the figures and table below.

To obtain a quotation, please specify the following: Flange 1 (F<sub>1</sub>), Flange 2 (F<sub>2</sub>), AR window diameter, and desired operational wavelength. Also, specify if you would like the in-situ fluence monitor option (as shown in figure below).

Window Style	F <sub>1</sub>	F <sub>2</sub>	Internal Disc Dia.	Overall Length (L)*	AR Window Dia.
PLD-3000	172	70	100	175	50
PLD-3000	172	114	100	185	50
PLD-5000	254	114	150	256	50 or 75
PLD-5000	254	150	150	256	50 or 75

Note: All dimensions in mm.

\* Dimensions specified for units with the in-situ monitor option. Custom lengths are also available.

