

## BEAM LINE PHOTON SHUTTER – MODEL # 14001PGA

Johnsen Ultravac has successfully developed a dual-shutter style photon shutter for various beamlines operating in a state of the art synchrotron facilities, some of the advantages of our photon shutter are listed below:

1. The beamline photon shutter assembly (see right & below) consists of an Ultra-High Vacuum (UHV) vessel with two aperture blocks and two water-cooled shutters that are controlled by two independent actuators.



2. The overall shutter block provides sufficient thermal protection: The photon shutter blocks are designed and fabricated for a minimum of 1.15KW of heat energy incident upon either shutter block applied over an area of 25mm x 25mm centered vertically and horizontally on the shutter block face with a maximum heat density of 2.7W/mm<sup>2</sup>.

3. Tungsten alloy  $\geq 95\%$  W, for radiation protection, detailed specifications are: Shutter Block: 80 W x 50 H x 19.05 T (mm); Aperture Plate: 125 W x 150 H x 19.05 T (mm) with a 40 H x 25 V (mm) “standard” aperture in the center. The thickness of tungsten shutter can be increased upon request.

4. Other aperture sizes up to 60 H x 30 V (mm) can also be accommodated by adding the horizontal and vertical aperture opening to the model number if other than 40 H x 25 V (mm). Ordering example: 14001PGA – 60 H x 30 V (mm).

5. These photon shutters all meet BSA specification LT-C-XFD-SPC-PSH-001.

6. Two identical actuators with 2.5” bore and 2” stroke are used to independently move each shutter block. The actuators are designed to be fail-safe; the shutters are fully closed upon loss of actuator supply power. When the shutter is commanded to close or when a loss of actuator power/ air pressure occurs, both shutter blocks will fully close with sufficient overlap – 10mm and keep the minimum gap (less than 1.0mm) between the aperture-plates at all times, so that no radiation leakage downstream of the shutter occurs.

7. The all-metal CF flange structure allows repeated bake-out of all in-vacuum components at 200C max.

8. Our compact design, with 2175 (H) x 377 (W) x 300mm overall length from upstream to downstream, provide maximum space for other beamline components which may be located on either end.

9. There are two 152mm OD conflat flanges as interface in upstream, as well as downstream, and they provide a larger capability to accept a wider beam pass through.

10. The special shock absorbing design on the actuator, chamber support and stand help to minimize shock and vibration transfer to the supporting beamline as well as the experimental floor resulting from opening or closing of the shutter blocks. The First Item Tests were performed and the vibration levels transmitted to the experimental floor were much lower than the VC-E curve criteria



11. Competitive both on pricing and delivery due to the proficient design, excellent QA system, outstanding workmanship and zero failure rate of our products
10. The redundant PPS interlock, provisions for safety and tamper-resistance will satisfy all synchrotron facility requirements globally. All materials, coating and finishes are capable of withstanding prolonged exposure to x-ray radiation.
12. For further detailed information, please contact Tony Tong at:  
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