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Electron Generator Array Installation and Handling Instructions

In order to preserve the high performance characteristics of this your PHOTONIS Electron Generator Array, it is important to follow special handling and storage procedures, outlined below.

STORAGE
Because of their structure and the nature of the materials used in manufacture, care must be taken when handling or operating MCP-based EGAs. The following precautions are strongly recommended:

Containers in which EGA's are shipped are *not suitable* for storage periods exceeding the delivery time. Upon delivery to the customer's facility, microchannel plates must be transferred to a suitable long term storage medium.

- **The most effective long-term storage environment for an EGA is an oil free vacuum of at least 10^{-4} Torr.** When stored in vacuum, the parts can be removed from their aluminum storage bags.
- While vacuum storage is strongly recommended, a continuously purged dry box which utilizes a dry inert gas, such as argon or nitrogen can be used for storage for up to several weeks. In this case, it is **critical that the part remain in its sealed aluminum vacuum storage bag while in the purged dry box.**
- Desicator type cabinets which utilize silica gel or other solid dessicants to remove moisture have been proven ***unacceptable.***

UN-PACKAGING
The Electron Generator Array (EGA) is shipped in a vacuum evacuated, sealed barrier bag, in order to prevent contamination. Note: Un-packaging should be performed at the time of installation into the vacuum system. If long-term storage is required, refer to Storage instructions listed above

Begin to un-package by removing the barrier bag containing the EGA from the box. Remove any packaging debris, which may have adhered to the package. Place the barrier bag on a clean flat surface. Carefully slice open the barrier bag at the outermost edge. With clean room or vacuum compatible gloves, remove the assembly from the barrier bag.

The EGA is shipped in either a vacuum formed plastic package or sandwiched between two metal cover plates in order to prevent damage to the emission area. **CAUTION: Physical contact with the emission surface is to be avoided.** Before installing the EGA it is necessary to remove these plates. Place the EGA on the flat surface with the wider cover in contact with the tabletop. Remove the top cover plate by removing the two #0-80 nuts, washers and centering ceramics from the assembly.
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Carefully remove the top cover plate. Next remove the EGA by grabbing the device by the metal hardware at the edges. The EGA is now ready for installation.

INSTALLATION
The EGA is provided with a set of tapped #0-80 holes and a pair of through holes suitable for mounting. Since voltage is applied to both the metal plates of the EGA, mounting must be done with insulators.

The EGA has two electrical connections: Vi and Vo. Vo must always be more positive than Vi in order for the device to operate. In a typical application, negative voltage will be applied to Vi while Vo is at ground. In this configuration, the emission current will be generated at the Vo side of the array. The emitted electrons may be directed to the target by applying a potential between the array and the target. If the target is at ground potential, the polarity of the EGA can be reversed. To reverse the polarity, connect –HV to Vi and a small (-50V) negative to Vo.

OPERATION
When a satisfactory vacuum has been achieved, voltages may be applied. It is recommended that this be done slowly and carefully. Current measuring devices in series with power supplies aid in monitoring EGA behavior. Voltage drop across the meter should be taken into consideration when calculating the applied voltage.

- Voltage should be applied to the EGA in 100 volt steps. If current is being monitored, no erratic fluctuations should appear. If fluctuations do appear, damage or contamination should be suspected and the voltage should be turned off. The assembly should then be inspected before proceeding.
- Maximum voltage that may be applied across a single EGA is:
    - L/D 40:1 or 46 :1 is 1000 volts.
    - L/D 60:1 is 1200 volts
    - L/D 80:1 is 1400 volts
- Higher potentials may result in irreversible damage.