

User Report

NHQ and EHQ High Voltage Supplies for biasing Micro-Channel Plate (MCP) single particle counting detectors

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Micro-Channel Plate (MCP) detectors are widely used to count and image single particles like electrons, ions or photons (VUV/X-ray). MCP are also employed for the detection of photons (visible, NUV, IR) at lowest light level conditions in photo-multiplier tubes (MCP-PMT).

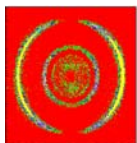
Since MCP stacks are very delicate and expensive devices it is not only important that the bias of up to 4 kV is very stable. It is also crucial that safety features like over-voltage and over-current protection and slow ramping in case of fast shut-off are part of the high voltage control.

A very important feature for all particle counting applications is low ripple over a wide frequency range from 50 Hz to GHz. Otherwise the small signals (few mV) from the MCP and read-out anodes could not be amplified and discriminated from electronic noise.

The NHQ and EHQ modules from iseg Spezialelektronik GmbH qualify for such applications in all respects. For this reason RoentDek HandelsgmbH selected a slightly modified OEM-version of these modules as an integral part of their commercial detection system *Position and Time sensitive MCP Delay-line Detector*. These detectors allow not only determining the position of single particles/photons across an up to 120 mm diameter active area but also simultaneous measuring the timing of each particle with < 1 ns precision, in coincidence with other particles or to outer parameters (e.g. trigger signals).

For such commercial systems shipped to an end-user it is important that each component, especially the High Voltage supply is of high quality in operation and finish, is reliable and robust, modular, easy-to-use and long-lasting. The controls must be well-arranged for an intuitive operation even for the novice user. The module must also have in-built safety features to prevent damage of the MCP, other delicate detector parts and sensitive electronic circuits (amplifier) in case of non-specified operation conditions or end-user mistakes. Finally, service in case of problems must be swift and uncomplicated.

The NHQ/EHQ units from iseg Spezialelektronik GmbH in combination with iseg's service management have a long record to be high quality and reliable high voltage sources for RoentDek's detector assemblies.



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Dr. Ottmar Jagutzki, Manager RoentDek GmbH