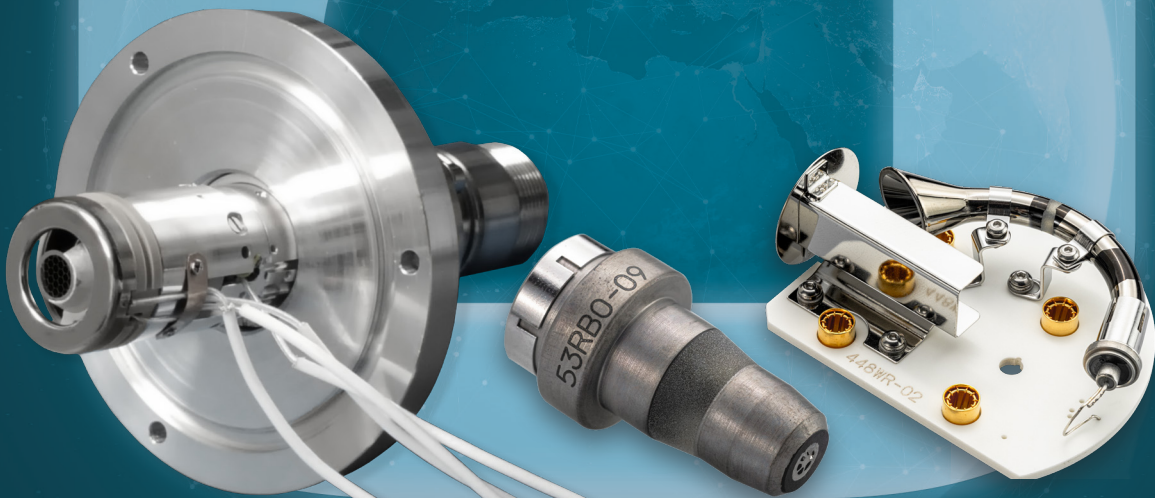


Quadrupole DETECTION TECHNOLOGY



**HIGHEST DYNAMIC RANGE TO ASSURE AN
ABSOLUTELY LINEAR RESPONSE BEYOND THE
LIMITS OF MOST ANALYTICAL INSTRUMENTS**



Whether it be environmental monitoring, developing new battery technologies, water quality assurance, ensuring the safety of our medicine or monitoring our health – accurate, sensitive, and reliable quantification is the cornerstone of modern analytical science.

Environmental scientists use Mass Spectrometry (MS) to protect and monitor our water and environment from persistent organic pollutants and polyfluoroalkyl substances (PFAS), ensuring a clean environment and safe drinking water. In the field of food safety tandem quadrupole (TQ) MS is used to protect against toxins such as mycotoxins and mold.

Pharmaceutical researchers and manufactures rely on TQ-MS to discover new treatments and ensure the medicines we take are free from toxins such as nitrosamines. Semiconductor manufacturers rely on residual gas analyzers to monitor their processes and keep their cleanrooms free of contaminants.

Critical to the success of these researchers is the performance of the detector in terms of sensitivity, dynamic range, reproducibility, and instrument uptime. These attributes allow methodologies to be rapid, cost effective, and transferable between laboratories, meeting the exact needs of trace detection while maximizing efficiency of operation.

Quadrupole MS, using either direct analysis or coupled to chromatography, has become the technology of choice

for high sensitivity analyte detection, due to its specificity, selectivity, and sensitivity. Photonis offers the detection solutions for Quadrupole Mass Spectrometer instruments with our Channeltron® and Scintitron™ technology platforms.

Channeltron® Detection technology, found in top-of-the-line mass spectrometers, is recognized for its exceptional dynamic range capabilities that surpass most analytical instrument limits. This technology by Photonis, the inventor of Channeltron® detection technology, delivers extended operational uptime, reduced background noise, and superior single ion sensitivity, ensuring top-notch performance for challenging assays.

In addition, Photonis' new Scintitron™ detection technology offers a versatile platform suitable for a variety of ion-trap, quadrupole, and hybrid mass spectrometers. With superior gain stability and dynamic range, this technology incorporates a converter-scintillator-light guide PMT chain and is ideal for both negative and positive ion mass spectrometry applications, providing a reliable solution for diverse analytical requirements.

WHAT MAKES PHOTONIS YOUR PREFERRED PARTNER

THE PHOTONIS DIFFERENCE

Our philosophy is to be a trusted technology partner in your R&D process; listening, collaborating, designing and manufacturing to the highest standard, truly outstanding, world-leading detection solutions. Whether that be for portable mass spectrometers where reliability and robustness is key, or cutting-edge laboratory instruments for your customers' most demanding application. The researchers, technology experts, and scientists at Photonis are dedicated to working with your research, product, and technology teams to create a specialized solution for your desired application.

RESEARCH TO MANUFACTURING, WE CONTROL THE WHOLE PROCESS

Making the ideal detector does not end with the R&D and design process. The highest quality manufacturing is equally important to the performance of the end product. Our in-house manufacturing facility ensures the seamless transfer of your ideas, specifications, and requirements from R&D to finished product. Unique amongst the industry, we control the process from beginning to end, guaranteeing a reliable continuous supply of detectors.

WE KNOW THAT EXCELLENCE IN RESEARCH AND DEVELOPMENT NOT ONLY MEANS THE MOST SENSITIVE AND REPRODUCIBLE DETECTORS, IT ALSO ENSURES MAXIMUM LIFETIME AND RELIABILITY FOR YOUR CUSTOMERS, REDUCING SERVICING NEEDS AND ENHANCING THE REPUTATION OF YOUR PRODUCTS.



THE PHOTONIS ADVANTAGE

LEADERS

Market leaders in ion and electron detection technology for Mass Spectrometry applications

FOCUSED

Focused on being a trusted partner in your technology development

EXPERIENCED

50+ years of experience in ion detection technology

MANUFACTURING

Our Sturbridge (USA) facility controls the manufacturing process end-to-end

INDUSTRY-LEADING

We make our own special, industry-leading, proprietary glass for designing and constructing our detection technology.

QUALITY

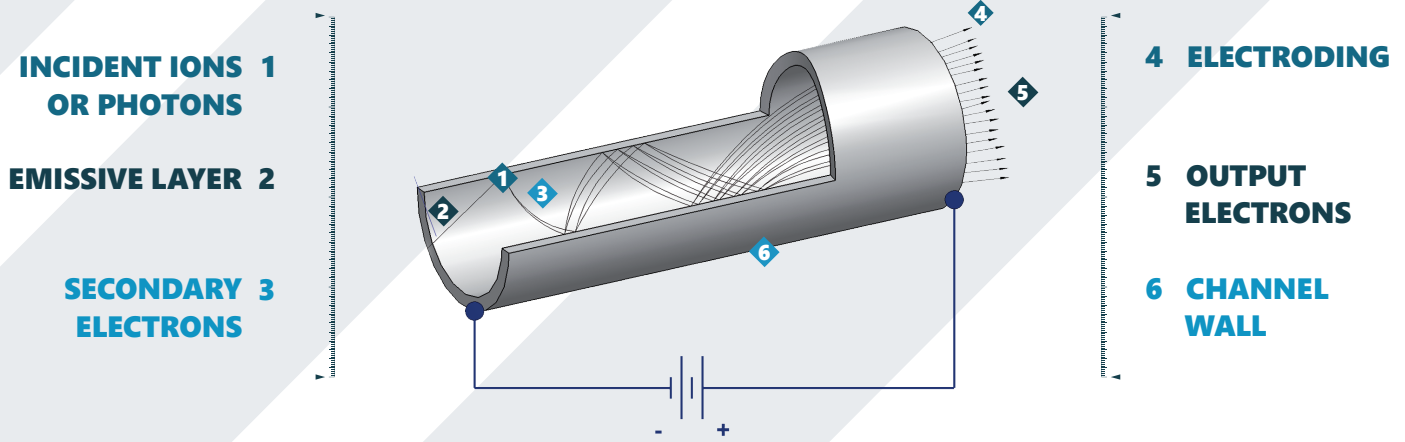
We ensure the highest quality, reproducibility and performance of our detection technology

TECHNOLOGY

End-to-end process control provides the ability to tune Quadrupole detector attributes to suit your specific technology needs.

CHANNELTRON® ELECTRON MULTIPLIERS

Photonis is the inventor of the Channeltron® electron multiplier detection technology, which is renowned for its exceptional dynamic range capabilities that surpass the limits of most analytical instruments.



WHY PHOTONIS?

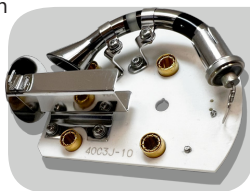
Whether the need is for a detector with superior sensitivity, a wider range of spatial or temporal resolution, or the ability to detect both positive and negative ions, Photonis is able to provide either a standard or customized offer. Photonis offers a wide range of patented ion transport solutions that can increase ion throughput up to 1000X when compared to traditional solutions. Mass Spectrometers worldwide depend on Photonis' Channeltron® detection technology for accurate analysis.



CHANNELTRON® PRODUCT PORTFOLIO

CHANNELTRON® CHANNEL ELECTRON MULTIPLIER

Photonis specializes in providing detectors which are uniquely suited to each mass spectrometer instrument manufacturer. By partnering with Photonis, you can customize just about everything from the coating, grid, type of anode, to the mount in order to ensure that the detector you receive will exceed your requirements.



MINIATURE CHANNELTRON® ELECTRON MULTIPLIER

The Miniature Channeltron® detector is designed for use in portable analog or pulse-counting applications such as leak detectors, portable mass spectrometers, and sensors for environmental and industrial use. With a gain greater than 10 million and reduced noise, these are the ideal solution to critical detection applications.



SPIRALTRON™ HIGH PRESSURE ELECTRON MULTIPLIER

Spiraltron detectors, a family of small and compact high-performance products, offer exceptional capabilities at pressures up to 10^{-2} torr. The MegaSpiraltron, a flagship member of the Spiraltron family, stands out for its ability to achieve high gain while maintaining low noise, operating at the highest pressure of any Spiraltron detector at 1×10^{-3} .



MAGNUM™ CARTRIDGE ELECTRON MULTIPLIER

The MAGNUM™ series of detectors provide high dynamic range with high gain and low noise — available in analog or pulse counting applications. Similar to other Channeltron® products, the MAGNUM™ family of electron multipliers is also based on six-channel technology, increasing secondary electron generation and increasing linear output.

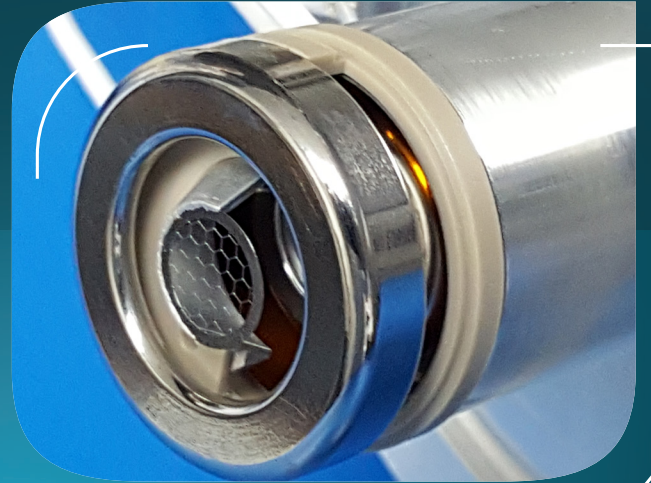


ION DETECTION TECHNOLOGY

Scintitron™ uses durable building blocks to provide a winning combination of gain stability, lifetime and dynamic range

FEATURES AND BENEFITS

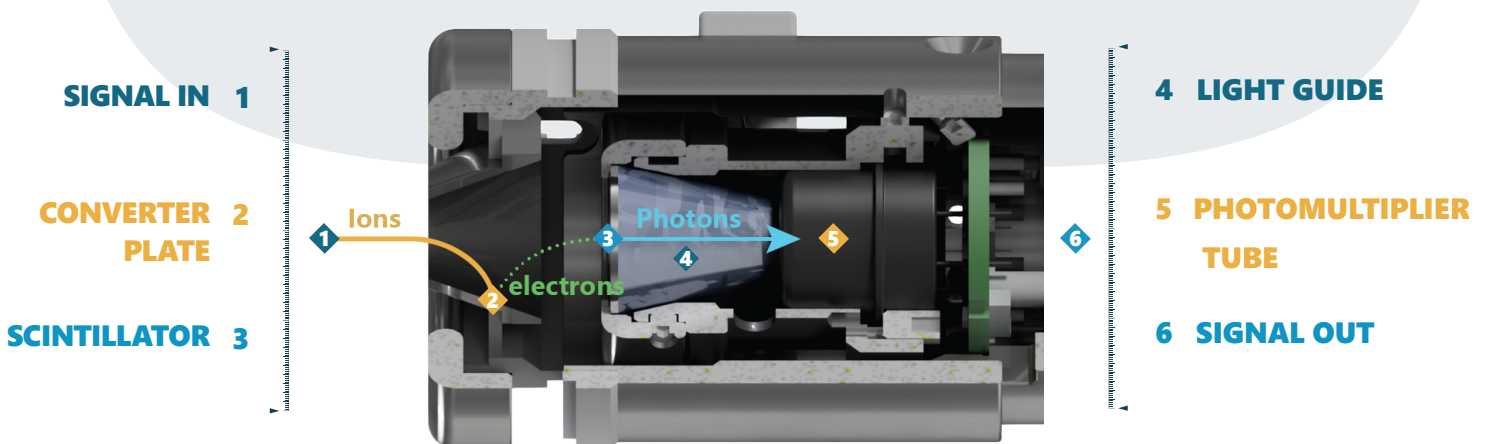
- ◆ Extremely high gain stability and long lifetime independent from instrument vacuum environment
- ◆ Dual polarity operation
- ◆ Signal output at ground potential in both polarities
- ◆ Wide dynamic range
- ◆ Low Noise
- ◆ Custom design according to instrument specifications



OPERATION PRINCIPLE

In negative ion mode, primary ions hit a dynode (not shown) and generate secondary ions. These in turn are focused on the converter and generate secondary electrons, which hit the scintillator to create photons. The photon signal is converted by a light sensor (e.g. PMT) to an analog readout signal.




In positive ion mode, primary ions hit a dynode (not shown) and the secondary electrons generated in this process are focused directly onto the scintillator.



LEADING YOU TO PEAK PERFORMANCE

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