

Power Supply Timing for Spectrometer



Summary of Content

Precise timing and stable high-voltage pulses are critical for spectrometer performance, directly affecting mass resolution, data accuracy, and instrument reliability.

Timing Precision and Pulse Characteristics

In time-of-flight (TOF) mass spectrometry, the timing of the extraction pulse is a major factor in determining mass resolution. The extraction power supply must generate high-voltage pulses with nanosecond-level rise times and minimal timing jitter to ensure a sharp start for ion flight. Any variation in the pulse timing, known as jitter, can arise from trigger circuit delays, switch timing variability, or propagation delays in the pulse circuit, and directly contributes to the spread in ion flight times, reducing resolution. Similarly, amplitude stability is essential because fluctuations in voltage cause variations in ion energy, further affecting flight time and measurement accuracy. Advanced extraction techniques, such as delayed extraction or orthogonal acceleration, place additional demands on timing precision and pulse control, requiring the power supply to maintain consistent voltage and timing under varying conditions .

Power Supply Design Considerations

High-voltage power supplies for spectrometers must address several critical factors:

- **Voltage Ripple and Noise:** Low ripple and noise are essential to prevent fluctuations in ion acceleration. Additional filtering, such as RC low-pass filters, can reduce switching-related noise .

Article Content

Development of a high-voltage radio frequency power supply for ...

Furthermore, the radio frequency power supply is integrated into a Self-developed quadrupole mass spectrometer,

Design considerations for high voltage power supplies in mass ...

Deploying multiple power supplies in the same equipment presents extra challenges. We share how to solve the most common

Custom High Voltage Power Supply Required in Mass Spectrometry

The power supply's behavior must be repeatable and predictable under the same conditions, with focus on temperature and voltage,

AQS System for AVANCE III HD Technical Manual

These signals are the basic spectrometer auxiliary, control and timing signals for each transmit but also receive channel. They are all

Mass Spectrometry Power Supplies | Advanced Energy

High-voltage power supplies for mass spectrometry delivering high resolution, accuracy, and low noise, optimized for ionization,

Highly Stabilized Power Supply for Spectrometer

The two 4000A, 150V power supplies for the spectrometer magnet of the Bates Linac have a current regulation and

High Voltage Power Supplies for Analytical Instrumentation

Specific performance concerns, technology advances and application information are presented for the designer, specifier and user

Basic power requirements

See the sample laboratory setup in Power outlets in laboratories for the recommended number of power outlets. The following table

High Voltage for SEM and MS | Tech | Matsusada Precision

High voltage power supplies High voltage power supplies for Mass Spectrometry (MS) Mass Spectrometry uses ion

Power supply

For nominal voltages below 208 V or for areas with working voltages below 187 V due to voltage sags, you must protect your

Mass Spectrometry Power Supplies | XP Power

Mass spectrometry relies on precise ion control and measurement, where even small fluctuations in

High Voltage Solutions for Mass Spectrometry

High reliability and performance, single output fixed polarity and compact footprint make these power supplies the right choice for

Power Supply for Miniature Quadrupole Mass

A lightweight, low-power-consumption power supply has been developed to generate a

Mass Spectrometry Power Supplies | Advanced Energy

Adaptable to all mass spectrometer designs, including MALDI-ToF, Q-ToF, single/triple quadrupole, and ICP-MS formats, our power

Rise Time Optimization of Pulsed High Voltage Power Supply in ...

The extraction pulse must be fast to minimize initial energy spread. The pulse timing defines the start of the flight time measurement.

Create Complex Sequences with a DC Power Supply

Some power supplies have analog inputs that add external signals, such as a signal from a function generator, to the power output.

Verifying Power Supply Sequencing with an 8-Channel Oscilloscope

Power Supply Rise-Time Measurements In addition to the power supply sequencing, the rise-times of power supplies must be

Spellman High Voltage Mass Spectrometry Brochure

We offer a wide variety of standard and custom high voltage solutions to meet your Mass Spectrometry requirements. Precision high

Development of high-stability magnet power supply

A very stable (≤ 10 ppm) magnet power supply (MPS) is required in an accelerator to achieve acceptable beam

Design and construction of a high-stability, low-noise power supply for ...

The design and construction of a high-stability, low-noise power supply which provides potentials for the lens and

Power Supply Sequencing Simplified

The challenges in designing a multiple power supply multiply with each additional supply rail. The designer must consider the

MASS SPECTROMETRY POWER SUPPLY MODULES

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MODULAR DESIGNS, CUSTOM

Design considerations for high voltage power supplies in mass spectrometry

In mass spectrometers, many different electrical potentials may be juxtaposed, so interactions can occur between high voltage power

Set It and Forget It: Long-Term Reliable Power Supplies in Mass ...

The result is effectively a power system that ensures 24/7 reliability over long operating lifetimes, enabling operators to

Contact Us

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