TransMIT
Gesellschaft für
Technologietransfer mbH

Control unit for a high-frequency generator for an ion source

Ion source, coating, material processing, optics

DESCRIPTION OF TECHNOLOGY

The newly developed control unit operates high-frequency generators for ion sources much more dynamically than previous solutions.
In order to ensure the most efficient operation of high-frequency generation and coupling into the plasma, it is nessessary to continuously tune the high-frequency generator according to the changing plasma load conditions.
However, previous approaches do not offer a solution for varying the output power highly dynamically in order to influence the ion beam generated by the ion source.
This problem has now been solved.

The newly developed digital control concept of the control unit enables low-loss switching and highly dynamic plasma generation of an ion source by changing the high-frequency power output. This is a novelty in the field of supplying low-temperature plasmas.

APPLICATION FIELDS

The newly developed control system for high-frequency generators is particularly suitable for ion sources in material processing, especially for surface modifications such as coatings. This is very relevant for coatings on optical components, for example.

AT A GLANCE …

Application Fields

- Ion sources

Business

- Material processing (surface modification, coating)
- Optics

USP

- high precision
- high efficiency

Development Status

- successfully tested on several high-frequency generator prototypes

Patent Status

The Patent EP 3340746B1 for this control system was granted by the European Patent Office on 05/05/2021.

REFERENCE NO. **TM 941**

ADVANTAGES OVER THE PRIOR ART

Compared to conventional control systems, this new system enables the power of an ion source to be adjusted particularly quickly. This allows the creation of particularly small structures or particularly thin layers, which significantly increases the precision of surface modifications. It also allows the ion sources to be operated more efficiently thanks to low-loss high-frequency generation.

STATE OF THE PRODUCT DEVELOPMENT

The control concept was successfully tested on several high-frequency generator prototypes..

MARKET POTENTIAL

The global market for devices with focussed ion beams will reach a volume of 1.88 billion US dollars by 2032.

According to a research report published by Spherical Insights & Consulting, the global market for focussed ion beams is expected to grow from USD 0.94 billion in 2022 to USD 1.88 billion in 2032, representing a compound annual growth rate (CAGR) of 7.2% during the forecast period. This means that there is also a considerable market potential for the control of these ion sources.

COOPERATION OPPORTUNITIES

On behalf of its shareholder Technische Hochschule Mittelhessen, TransMIT GmbH is looking for cooperation partners or licensees for further development in Germany and Europe.

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SYSTEM PARTNER FOR INNOVATION