

# Ionization manometer for position-dependent UHV/XHV measurement in a recipient

Vacuum technology, cryogenics

## DESCRIPTION OF TECHNOLOGY / PRODUCT

### State of the art

In UHV/XHV chambers may appear a position-dependent pressure, varying over several orders of magnitudes, e.g. in the case of chambers with elongated geometry, complicated installations inside and multiple pumping systems. This pressure distribution cannot be measured using currently available ionization manometers, because their electron source and ion collector are packaged in close neighborhood. Therefore, only the pressure at the manometer position is measured.



Foto: Fotolia Urheber Nordroden

### Innovative solution

In the new ionization manometer, the electron source is located in the manometer housing, whereas one or more ion collectors are placed outside. These collectors are arranged in a manner that enables to measure the pressure at defined positions and the mean pressure along a linear measuring path. The pressure distribution in a spacious recipient, e.g. a vacuum coating system or a beamline of an accelerator, becomes accessible to measurement.

## AT A GLANCE ...

### TECHNOLOGY FIELD / SCOPE OF APPLICATION

- Vacuum technology
- Cryogenics

### MARKET / BRANCH

- Vacuum equipment
- Measurement technology

### USP

- Thermal separation of the electron source from the recipient and the ion collector
- Nearly free choice of the measuring path
- Pressure measurement at positions which are difficult to access

### DEVELOPMENT STATUS

- ✓ Prototype

### PATENT PORTFOLIO

German patent granted in 2014.

European patent application under examination.

REFERENCE No.: **TM 902**

## SCOPE OF APPLICATION

This innovative solution was mainly developed for the measurement of the residual gas pressure in beam pipes of circular and linear accelerators. However, it is generally applicable for any vacuum equipment with medium or "better" vacuum. It allows pressure measurements in areas of a recipient that are difficult to access.

## ADVANTAGES COMPARED TO THE STATE OF THE ART

**Thermal separation:** By means of its housing, the electron source is thermally separated from the recipient. Therefore, it may be designed as a glow cathode working at ambient temperature, whereas the recipient is under cryogenic conditions. Other electron sources, e.g. a cold cathode, may be as well applied.

**Modular design:** The new manometer allows a user-specific optimization. From a set of ion collectors the device with the most suitable dimensions is selected. If necessary, a new collector optimized for the actual application may be developed.

## DEVELOPMENT STATUS

Prototypes of the new ionization manometer have been successfully tested under cryogenic conditions in accelerator beamlines.

## OFFER

On behalf of GSI Helmholtzzentrum für Schwerionenforschung GmbH, TransMIT GmbH is looking for cooperation partners or licensees for further development in Germany, Europe, USA, and Asia. Especially, companies are sought, which are interested in the adaption of the new manometer concept to industrial applications, e.g. semiconductor processing, and its further development by user-specific design of new ion collectors and other components (electron sources and collectors, evaluation electronics).

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