INNOVATION & TECHNOLOGY TRANSFER

Dual Vacuum Chamber

Mover systems for UHV and clean environments

Reference No. P 125

BACKGROUND

Ultra-high vacuum hexapods are costly components, and achieving their operation within an ultra-high vacuum and ultra-clean environment, such as in a particle accelerator, is often extremely challenging, if not impossible. This difficulty arises due to the presence of contaminants like oil or soldering tin. Even when they can be configured to function in such pristine vacuum conditions, they frequently exhibit limitations, such as their inability to handle significant loads (>3 kg) or restricted dynamic ranges.

SOLUTION

To address this challenge, the system is divided into two distinct vacuum chambers. One vacuum chamber is ultra-high (10^{-9} mbar), ultra-clean vacuum chamber and the other is a low vacuum chamber (10^{-2} -10^{-3} mbar) containing the hexapod. The two chambers are separate vacuum systems so any oil or grease in the low vacuum chamber cannot get into the ultra-high vacuum system. The motion generated by the hexapod is passed between the two chambers through the use of vacuum bellows and a vacuum rotary feed through.

ADVANTAGES

- Positioning in 6-dimensions possible
- Applicable for ultra-high vacuum and ultra-clean environment
- Suitable for larger loads (>3 kg)

Fig. 1: Photo of a plasma cell mounted on the mover system.

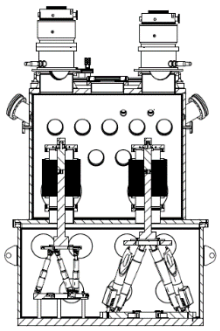

Fig. 2: Plasma tank; cross-sections of chambers in which the system is installed at DESY.

APPLICATION FIELDS

Applications in all ultra-high vacuum and ultra-clean environments such as:

- End stations for light sources
- LWFA and PWFA Systems
- Semiconductor and nano-fabrication environments
- Coating and doping processes

PROPERTY RIGHTS

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POSSIBILITIES OF COOPERATION

- Licensing
- R&D Cooperation

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