DIAGNOSIS (Ion separation and formation)

Objectives
This module provides an efficient pumping to properly extract the NPs. The particles enter this chamber together with the gas injected in the MICS module. This chamber can separate ions and neutral nanoparticles and measure the rates with a quartz microbalance and mass spectrometer.

Environmental conditions

- Base pressure of $7 \cdot 10^{-9}$mbar. With nanoparticles: $2.1 \cdot 10^{-3}$mbar.
- Three TMP. Just at the exit of the MICS is one of 800 l/s, vertically and favoring the arrival of nanoparticles to the quadrupole, we have another 400 l/s. The third one located at the exit of the diagnosis chamber has a speed of 300 l/s.
- Vacuum measurements are performed through a full range Pirani-Penning gauge.

Technical parameters

- **EQD** (Electrostatic Quadrupole Deflector). We can separate charged particles and deflected 90º. This charges particles (ions) are focalized by a combination of Einzel lens.
- **Quadrupole of high mass.** This quadrupole works with a mass range from 0 to 10^6amu and a resolution of $\Delta M/M \sim 10$.
- **QCM.** QCM is mounted on a z-translator perpendicular to the beam that permits the monitoring of NP rates produced in the MICS module at different positions of the beam.
- **Mass spectrometer.** For measure the nanoparticles beam up to 512uma.
- **INTRO chamber.** Can be used for sample collection for ex-situ analysis (e.g.: AFM measurements).