

ICSI'S VACUUM CAPABILITIES



The National Institute of Research and Development for Cryogenic and Isotopic Technologies from Ramnicu Vilcea is a scientific and technological development institute of the Education and Research Ministry, constituted with aim of verifying and improving the separation technologies and heavy water and afterwards of tritium.

The whole research and development activity of the Institute is based on the research programs, the features being the interfaces between science and technology.

Starting with a 30 years, experience of the Institute concerning the achievements of technologies and equipment and taking into account the new bases of the technological research which must meet the market requirements, the main activity of the Institute is structured on the following main directions:

- * Research in the equilibrium and separation processes of hydrogen isotopes (tritium, deuterium), realized at the scale of the industrial pilot plant;

- * Research and development of cryogenic processes, specific equipment and technologies, experimental stands;

- * Research in equilibrium and separation processes of gases, technologies for ultra-high purification and cryogenics;

- * Development of static and dynamic equipment specific to processes for isotope separation, ultra-high purification and cryogenics;

- * Research in vacuum physics, manufacturing equipment for producing high and ultra-high vacuum with adequate electronics devices and accessories;

- * The application in basic industrial production of ultra pure gases and mixtures gases, equipment sodium sulphide, analyzers, evaluation studies, consulting;

- * Technologies transfer.

ICSI Vacuum Laboratory has developed a large number of vacuum control. Thanks to our powerful material base, in our institute we can make high performances products . To execute all carefully operations we have the necessary devices. Turbo molecular pumps needs, for example, a very high level of rotational speed and for this a very good equilibration is necessary. For to do these operations we have the dedicated devices, equilibration machine Schenk and vibration analyzer Bruel & Kjaer.



Equilibration machine Schenk is used for dynamic balancing of the rotor of turbo molecular pumps. The equilibration is made in G1-G6 domain, in concordance with ISO-1940.

2125 Bruel & Kjaer Vibration Analyzer is used to measure the vibrations level of the turbo molecular pumps. If the maximal value of vibrations exceed the admissible value a new re-equilibration is made.







- **STAND VS G300**

Pumping speed

for N₂: 280L/s

for H₂: 200 L/s

- *Ultimate pressure <5*10⁻⁸ mbar*

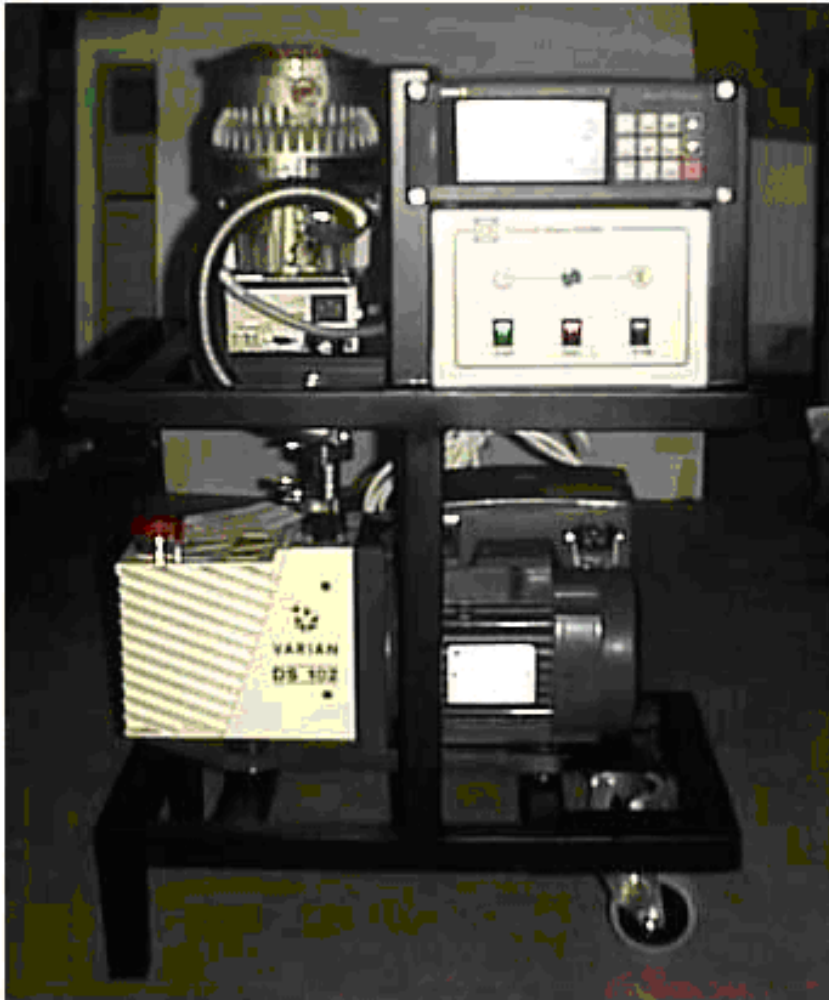
Rotational speed: 36000 rpm

- *Fore pump: mechanical 8 m³/h
Edwards*

- *Cooling requirements: water*

- *Inlet flange: ISO 100*

- *Low vacuum measure*



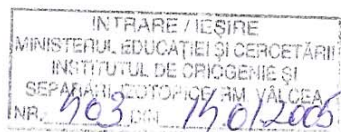
- *VACUUM STAND GS300*
Pumping speed
for N₂: 280L/s
for H₂: 250 L/s
- *Ultimate pressure* *<5*10⁻¹⁰ mbar*
Rotational speed: 56000 rpm
- *Recommended fore pump: mechanical 5 m³/h*
- *Cooling requirements: natural air convection/forced air or water optional*
- *Inlet flange: ISO 100*
- *Low and high vacuum measure*



Surface Science Analysis Chambers



Vacuum Stand GS 300



*To the General Director Dr. I.Stefanescu
National Institute for Research and Development of
the Cryogenics and Isotopics Technologies
4 Uzinei Street
240 050 Ramnicu Valcea
Romania*

Dear Dr. Stefanescu,

This year the Frank Laboratory of Neutron Physics has received two turbo-molecular pumps PTM500 manufactured in your Institute.

The testing conducted in FLNP have revealed good, stable performances of these pumps during one month of continuous operation. The measured technical specification corresponds to the certificate of technical data.

We are pleased with the quality of these pumps and we hope that, according to the contract concluded with you, the next year we will receive three more such pumps from you. They will be used in a vacuum system with large volume at the facility created in FLNP to measure cross sections of n-n scattering.

Yours faithfully,

**Director of FLNP JINR
Prof. A.V. Belushkin**

Our institute have concluded five contracts with Joint Institute for Nuclear Research (JINR) Dubna through was delivered vacuum equipments . All vacuum equipments had a very good behaviour. The pumps which was delivered to JINR have revealed high stability and performance for a long time operation. We have received a letter of gratification from our partners.

