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Liquid nitrogen supply system for MBE

Function

Molecular Beam Epitaxy (MBE) systems are very sophisticated process installations, which operate under ultra-high vacuum conditions. Cryo panels from MBE systems require liquid nitrogen with the best possible cooling capacity to increase the vacuum pumping rate and to reach a better vacuum level inside the MBE vacuum chambers.

As one of Europe's largest cryogenic engineering and manufacturing company DeMaCo offers you a modular liquid nitrogen supply system for MBE systems.

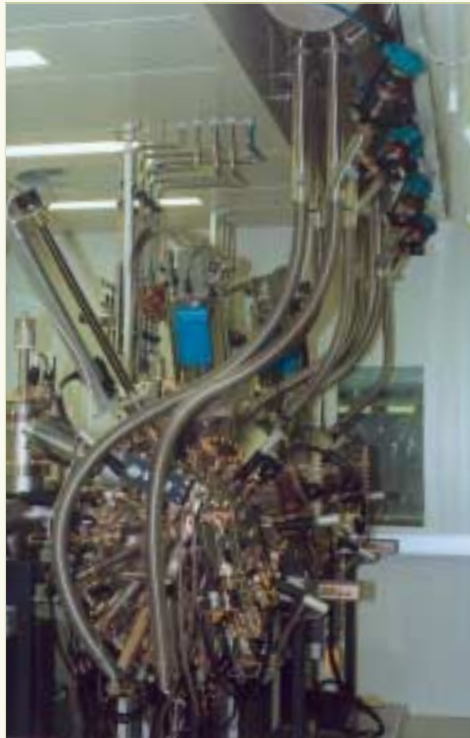
The unique design of the nitrogen supply system allows MBE users to optimise their productivity with a fully automated liquid nitrogen supply.

Characteristics

- Static vacuum system prepared for clean room conditions
- Low heat in-leak, low nitrogen losses, no ice and condensation
- Custom made
- Quick and easy installation
- Ambient pressure of liquid nitrogen
- Automatic controlled
- Safe and reliable
- No vacuum pump required

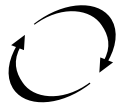
Description

A liquid nitrogen supply system consists of a Super Insulated Vacuum Line from the storage tank to the vacuum insulated phase separator. From the vacuum insulated phase separator one or more (depending on the number of cryo panels and tapping points) Flexible Super Insulated Vacuum Lines take care of ambient pressure liquid nitrogen supply to the MBE cryo panels and tapping points. The gaseous nitrogen from the cryo panels will be transported through Flexible Super Insulated Vacuum Lines back to the phase separator. From there the gas will be exhausted with a Super Insulated Vacuum Line to atmosphere.





Question



Analysis



Engineering



Cryogenics



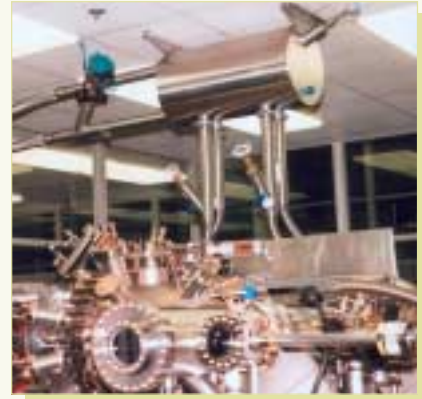
Solution

Technical specifications

- The technical specifications from all used components can be found in our product sheets.
- The Flexible Super Insulated Vacuum Lines to the MBE installation will be provided without wire braiding for more flexibility and easy cleaning.
- Phase separator
 - ▶ Inlet pressure : maximum 6 bar
 - ▶ Outlet pressure : ambient
 - ▶ Type : horizontal
- The connection to the MBE will be a vacuum insulated bayonet coupling, according to the MBE manufacturer's standard.
- Design according AD-merkblätter or TÜV

Options

- Design according to ASME, SAQ, Stoomwezen etc.
- Third party inspection
- Annual inspection and maintenance
- Dynamic vacuum system
- Vacuum insulated valves, manual or electro-pneumatic operated
- Temperature controlled valves
- Temperature controllers



Advantages

- Cryo panels will be completely filled with liquid nitrogen
- Up to 30 times more efficient in reducing heat flow than conventional insulated pipes
- Modular design with standard components
- Full stainless steel construction
- Compact flexible connections (40 mm outside diameter)
- No external insulation required
- Easy extension, re-routing, dismantling and re-using of the equipment without affecting the vacuum of the sections

