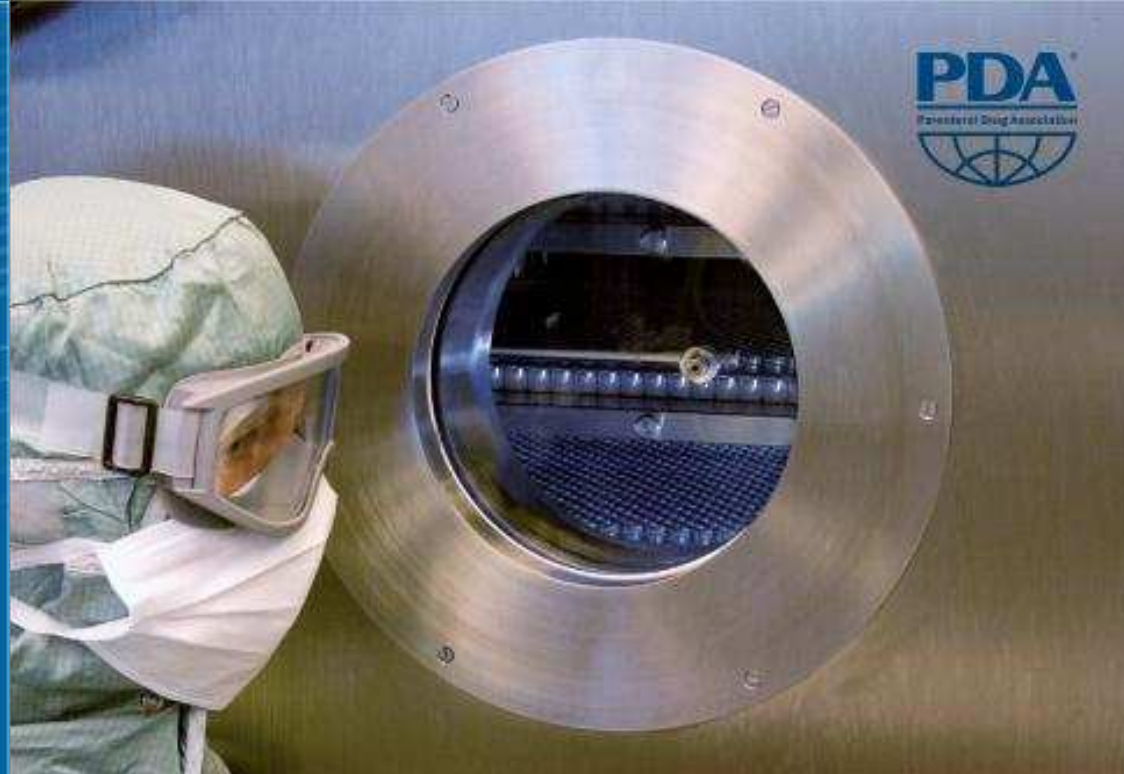




Connecting People, Science and Regulation



2018 PDA Europe
Freeze Drying in Practice

23-27 April 2018 | Training Course

23-27 April 2018

Martin Christ Gefriertrocknungsanlagen GmbH
Osterode (Harz) | Germany

www.pda.org/URL



Company portrait

Lyo Engineering is your partner in pharmaceutical industry and medical engineering in the areas of management / quality assurance / engineering with more than 10 years of experience in pharmaceutical plant engineering and construction in the fields of project handling and quality assurance.

Among other things our business activities include project management for international freeze drying projects in pharmaceutical industry, planning and monitoring of technical transfer projects of fill- / finish areas and all aspects of GMP quality assurance, for instance classification of equipment components in accordance with GMP risk analysis as qualification basis, GMP-based employee training, performance of external and internal audits, planning and monitoring of acceptance tests (FAT / SAT) and qualification phases (DQ / IQ / OQ / PQ), as well as the creation of the pharmaceutical technical documentation.

We gladly support you in the successful implementation of projects in regulated environments from the URS to the handover to the production.



Lyo Engineering
GMP is our passion!



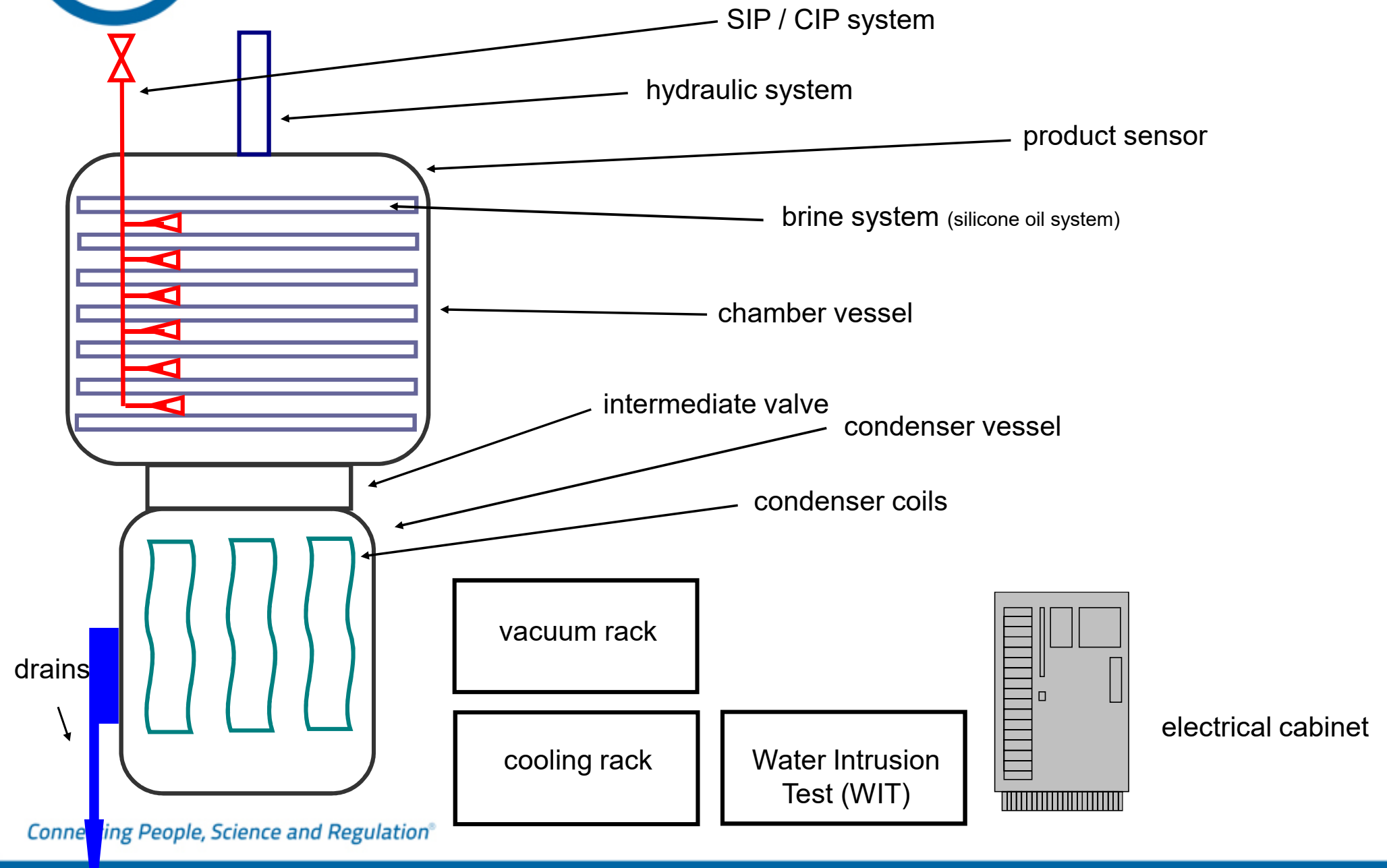
Theory 5:

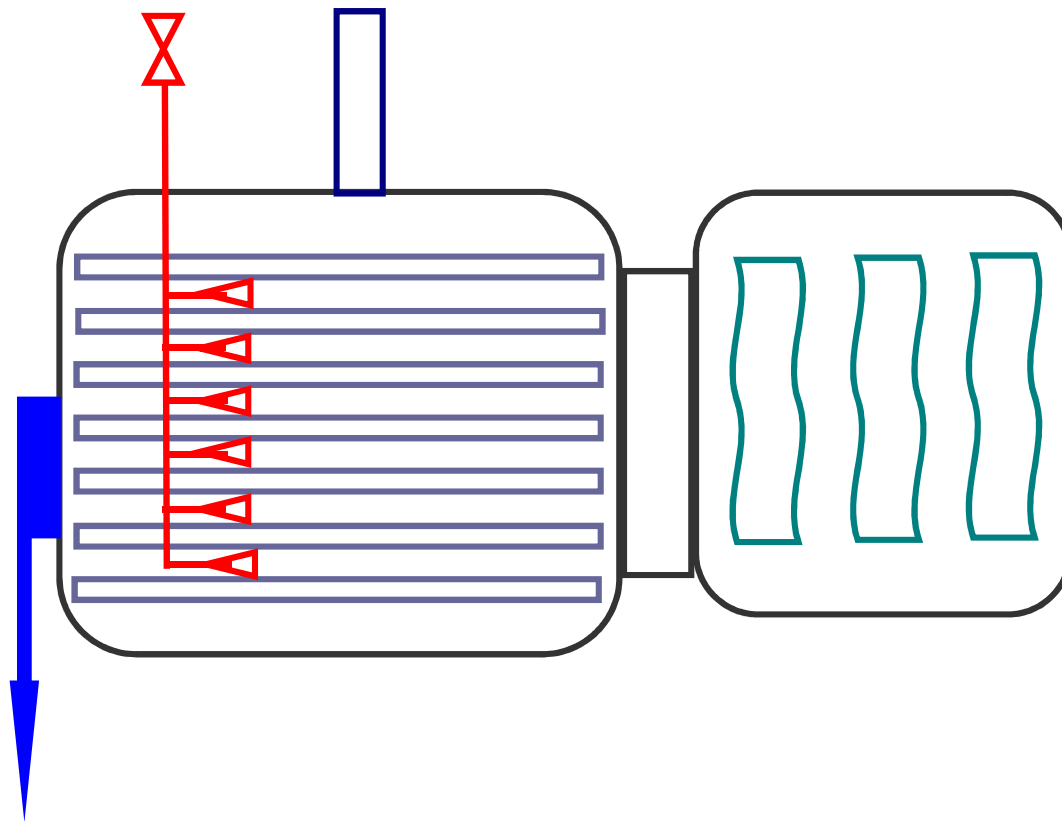
Construction of freeze dryers

- construction of freeze dryers
- systems of freeze dryers
- different types of freeze dryers
- existing lines of freeze dryers
- parameters of freeze dryers



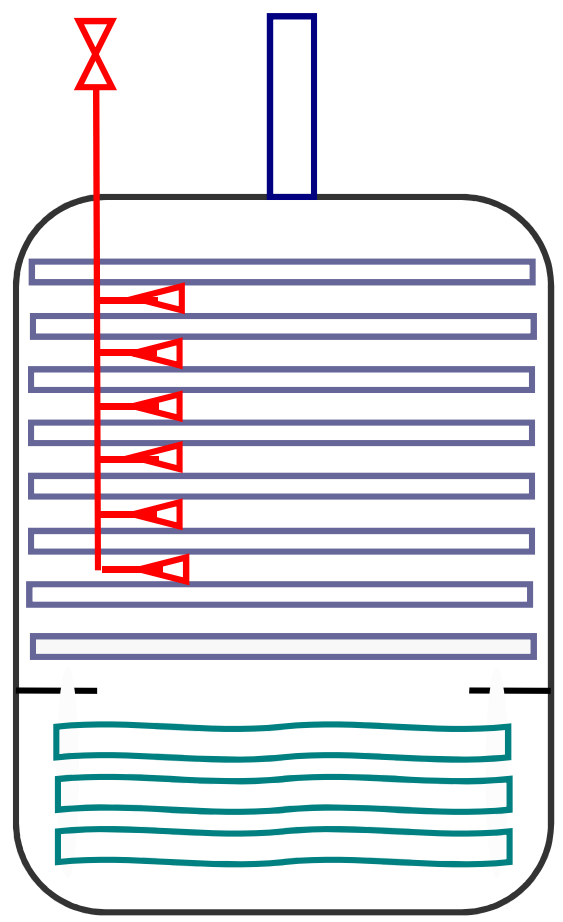
Lyophilisator





Side mounting of ice condenser:

- installation on one level
- potential disadvantage are radiative effects of the condenser to the plates (depending on recipe parameters)

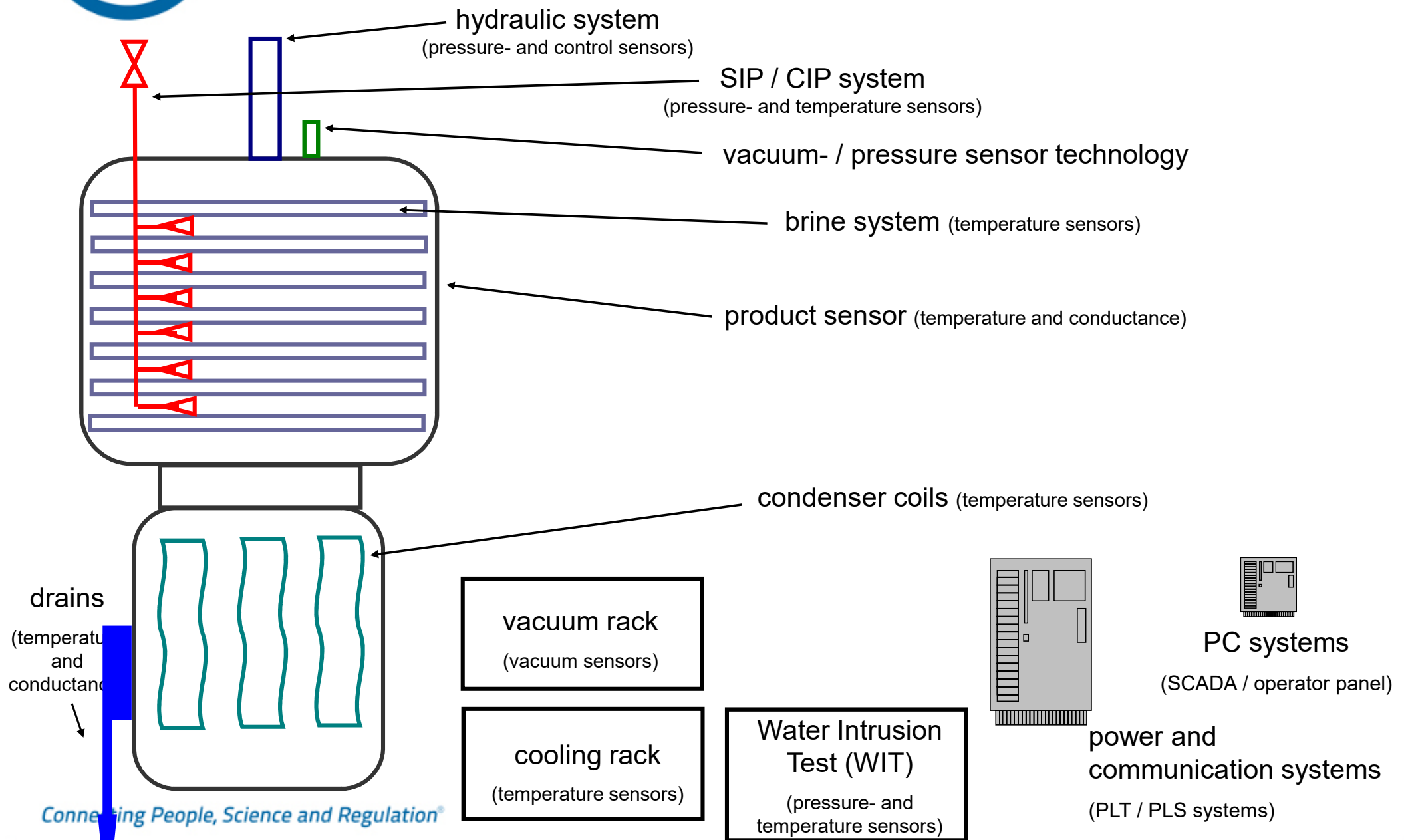


Compact design / one-chamber design:

- installation on one level
- compact design



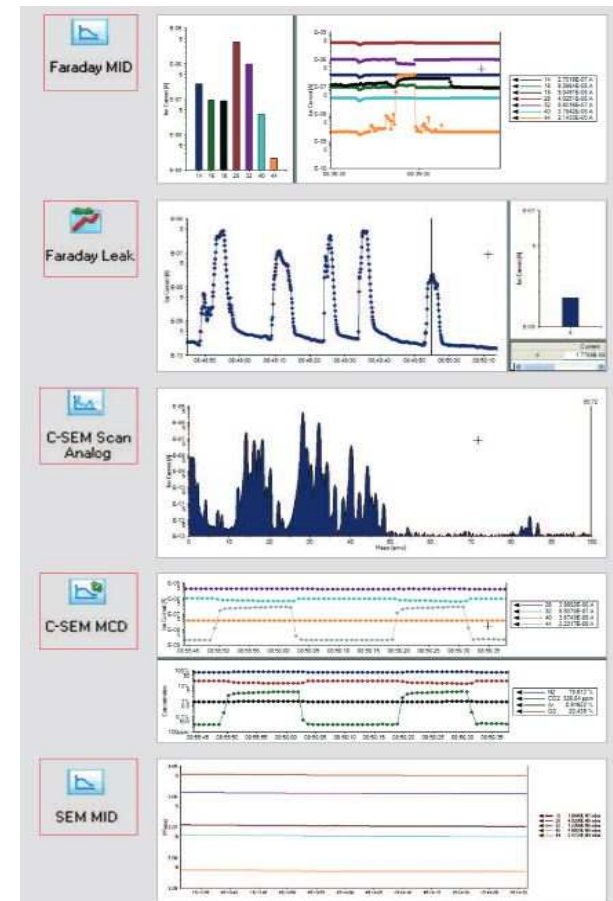
Lyophilisator





Lyophilisator

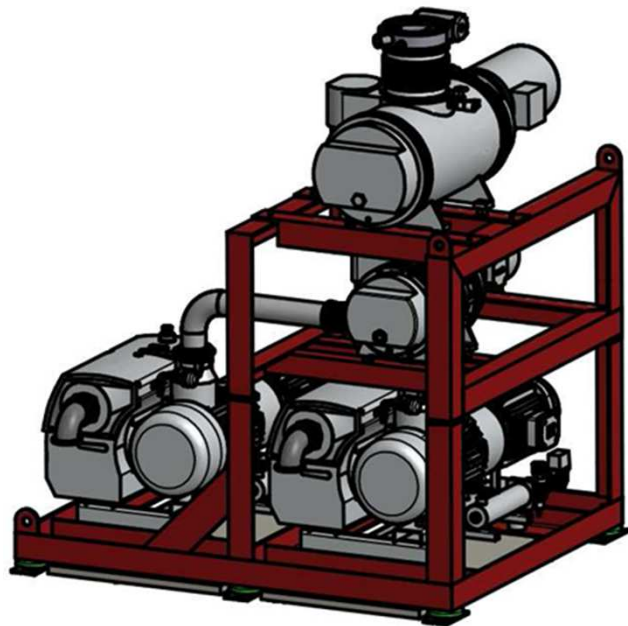
Detection with a mass spectrometer (e.g. silicone oil)





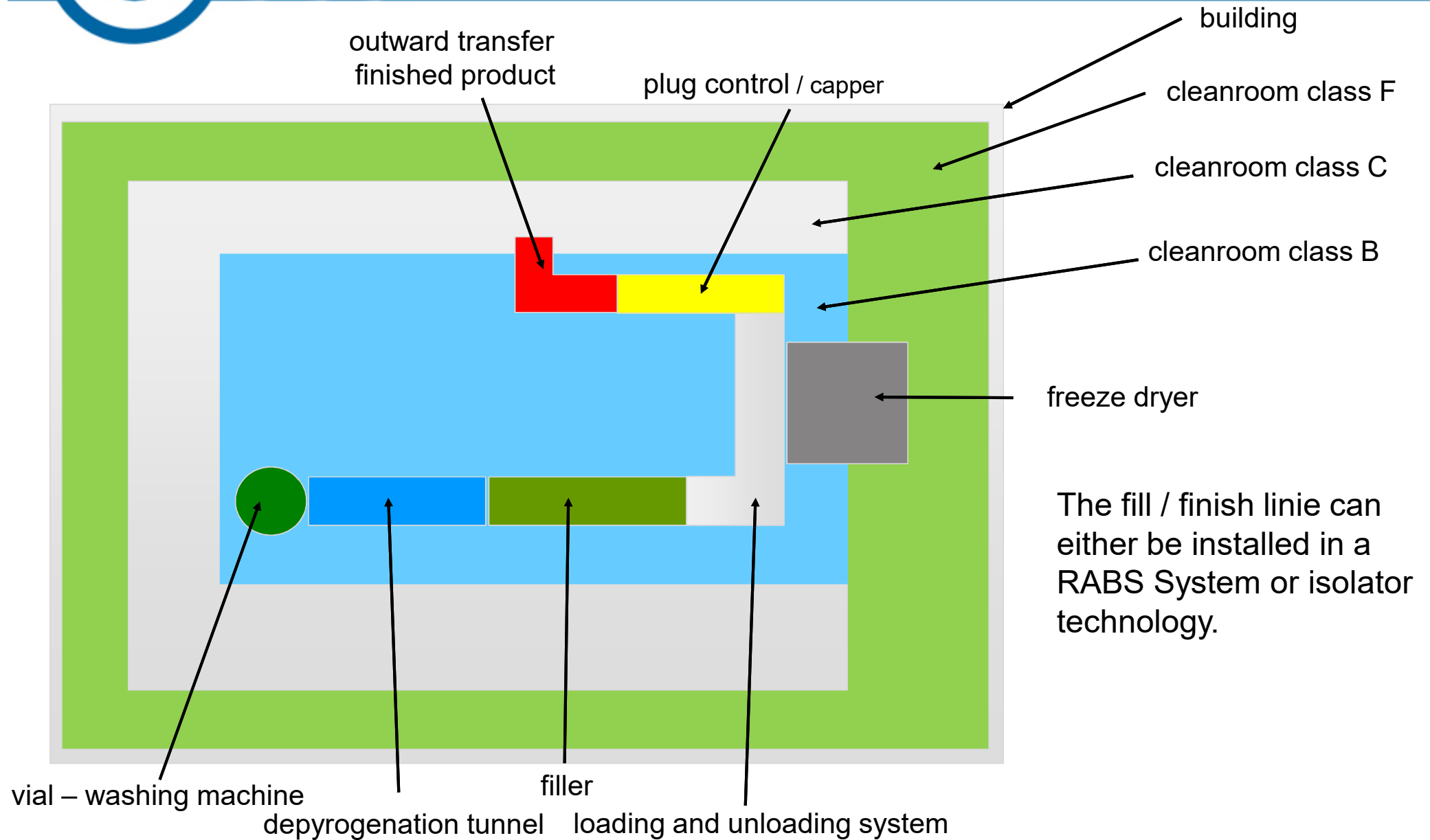
Lyophilisator

vacuum pump units





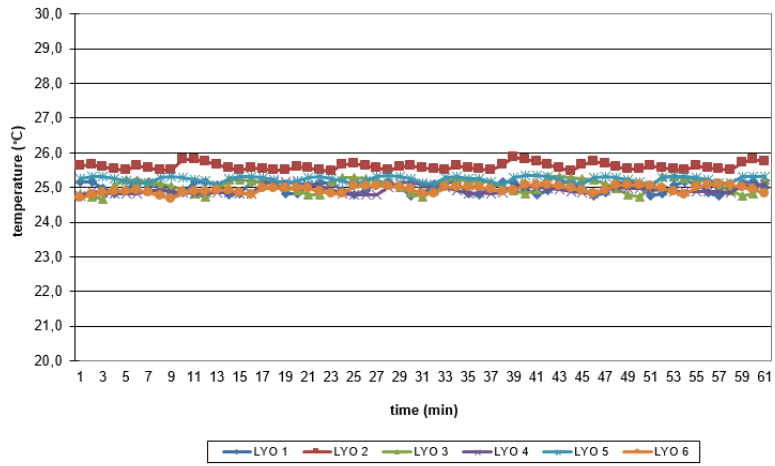
Exemplary construction of GT range



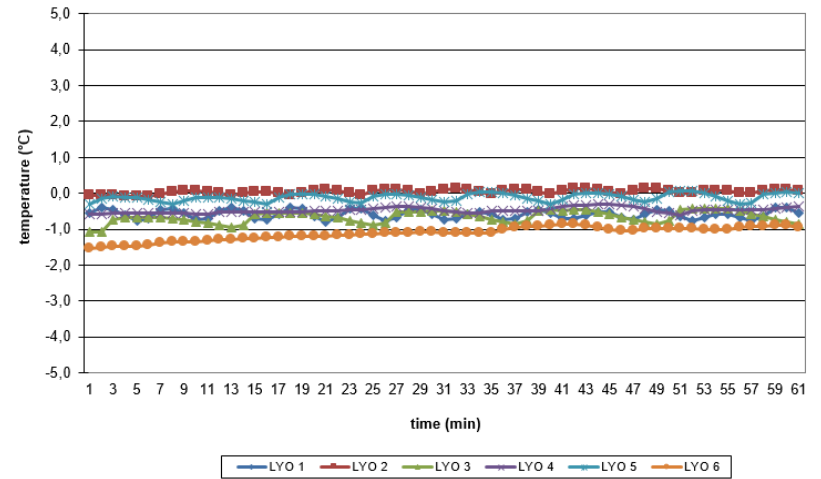


Comparison of multiple similar systems

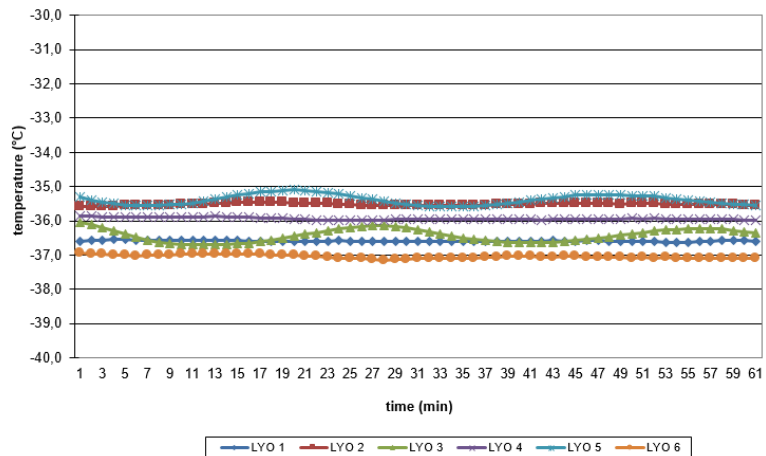
all shelves, 25°C



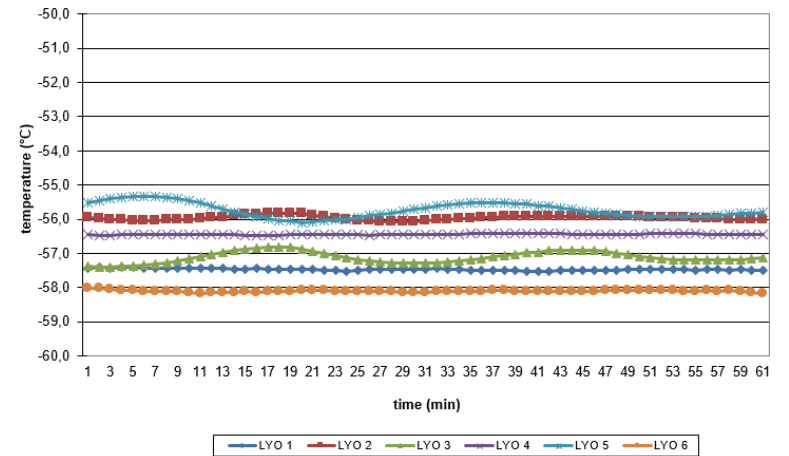
all shelves, 0°C



all shelves, -35°C



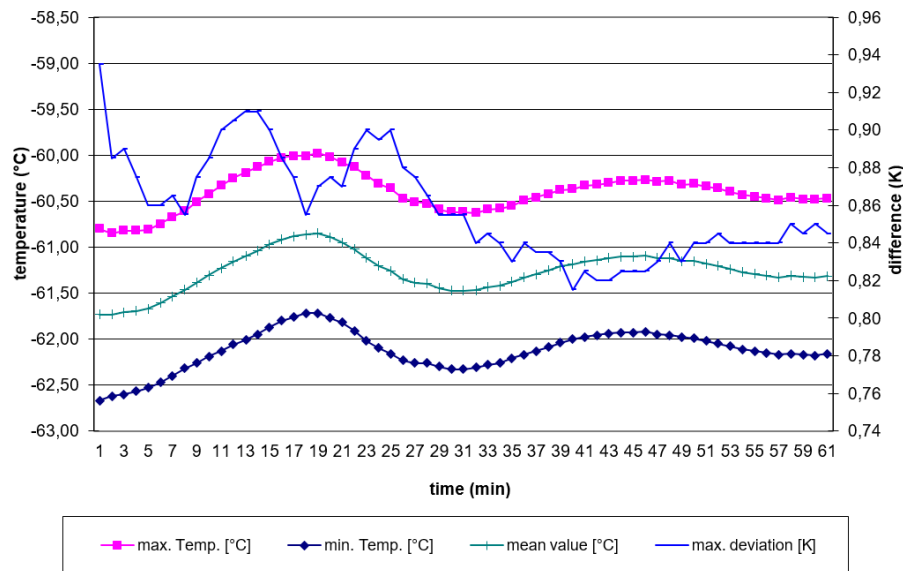
all shelves, -55°C



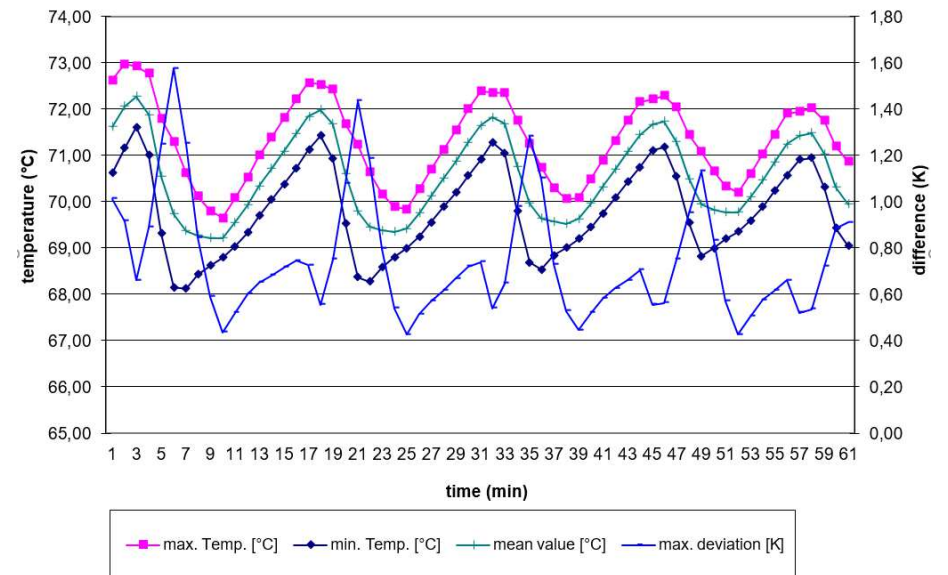


Comparison of multiple similar systems

all shelves, -60°C

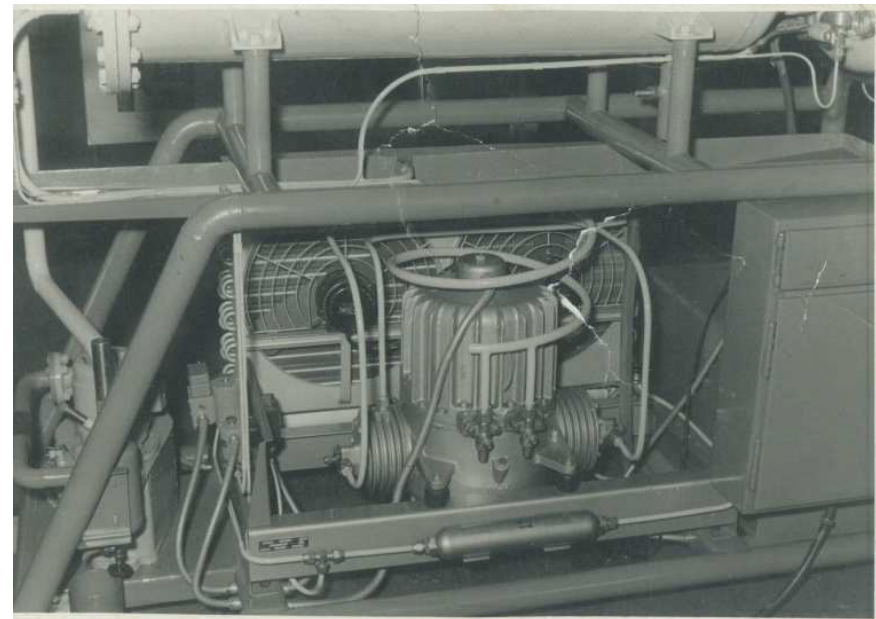
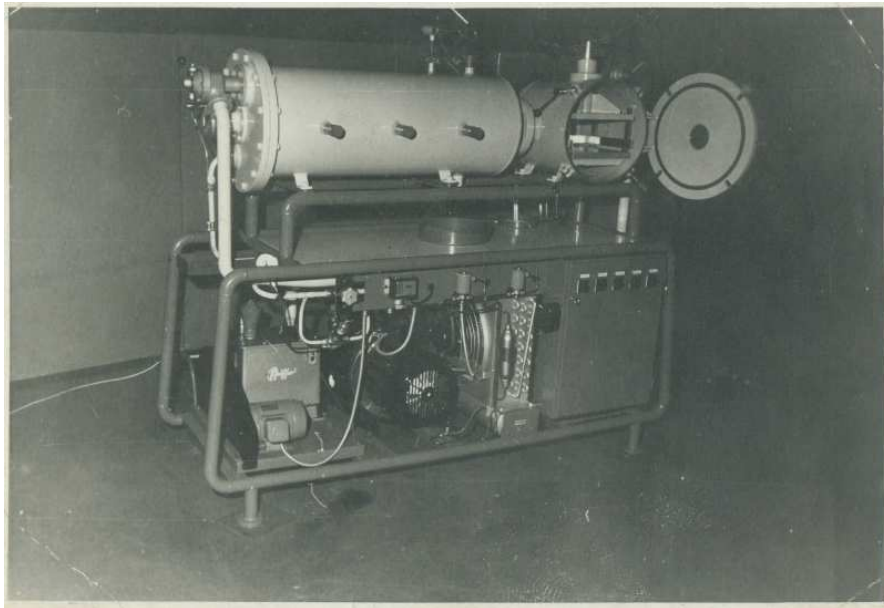


all shelves, 70°C





Old treasures





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