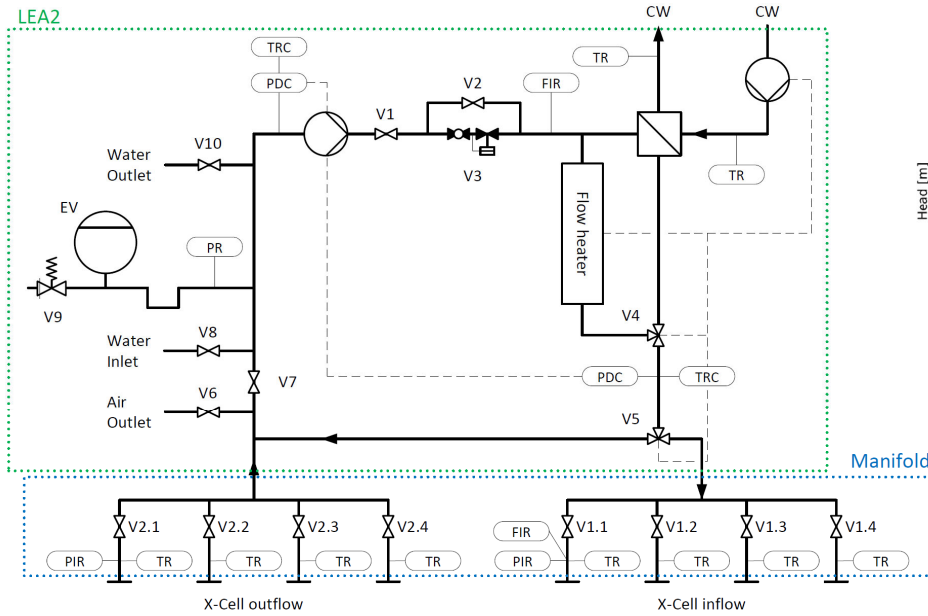
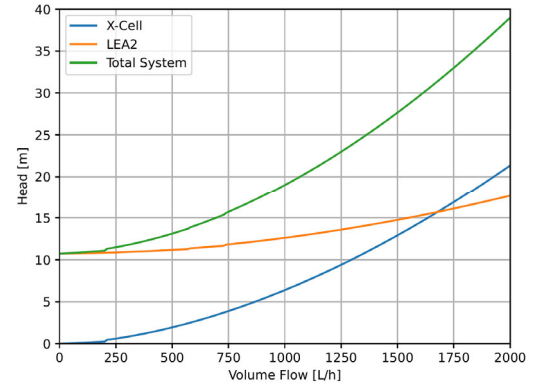


Master Thesis, Energy and Environment

Development of a Supercooled Latent Thermal Energy Storage



Hydraulic diagram of LEA2



System characteristic of LEA2 and X-Cell

Task

The energy transition towards an energy system relying mainly on renewable energies requires the development of new storage technologies. The start-up SeasonCell is developing a supercooled latent thermal energy storage system based on phase change material. Seasonal thermal energy storage can make a valuable contribution to the energy transition. During the past year the SeasonCell team has done multiple research projects.

Based on those findings this master thesis is developing, realizing, and testing a first prototype consisting out of multiple supercooled latent thermal energy storage cells. In addition, a new test bench is developed to simulate the charging and discharging of a single-family house.

Concept

A powerful thermostat has been developed as a test setup, which can simulate different user scenarios using custom-designed software. A 12 kW flow heater and a 12 kW heat exchanger have been designed for this purpose. The development of the X-Cell is crucial for the start-up of SeasonCell. For confidentiality reasons, it was not possible to present detailed developments in the master's thesis. The actual cell will be evaluated by further student research in the spring semester of 2024.

Conclusion

The predecessor test facility, LEA1, was used for various experiments last year and has now suffered oxidation damage. Various stainless steel components from the previous LEA1 facility have been used for the new LEA2 facility.

The new test facility has already been implemented as part of this Master's thesis. The results of the developed X-Cell cannot be published until further notice.

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**SEASON
CELL**