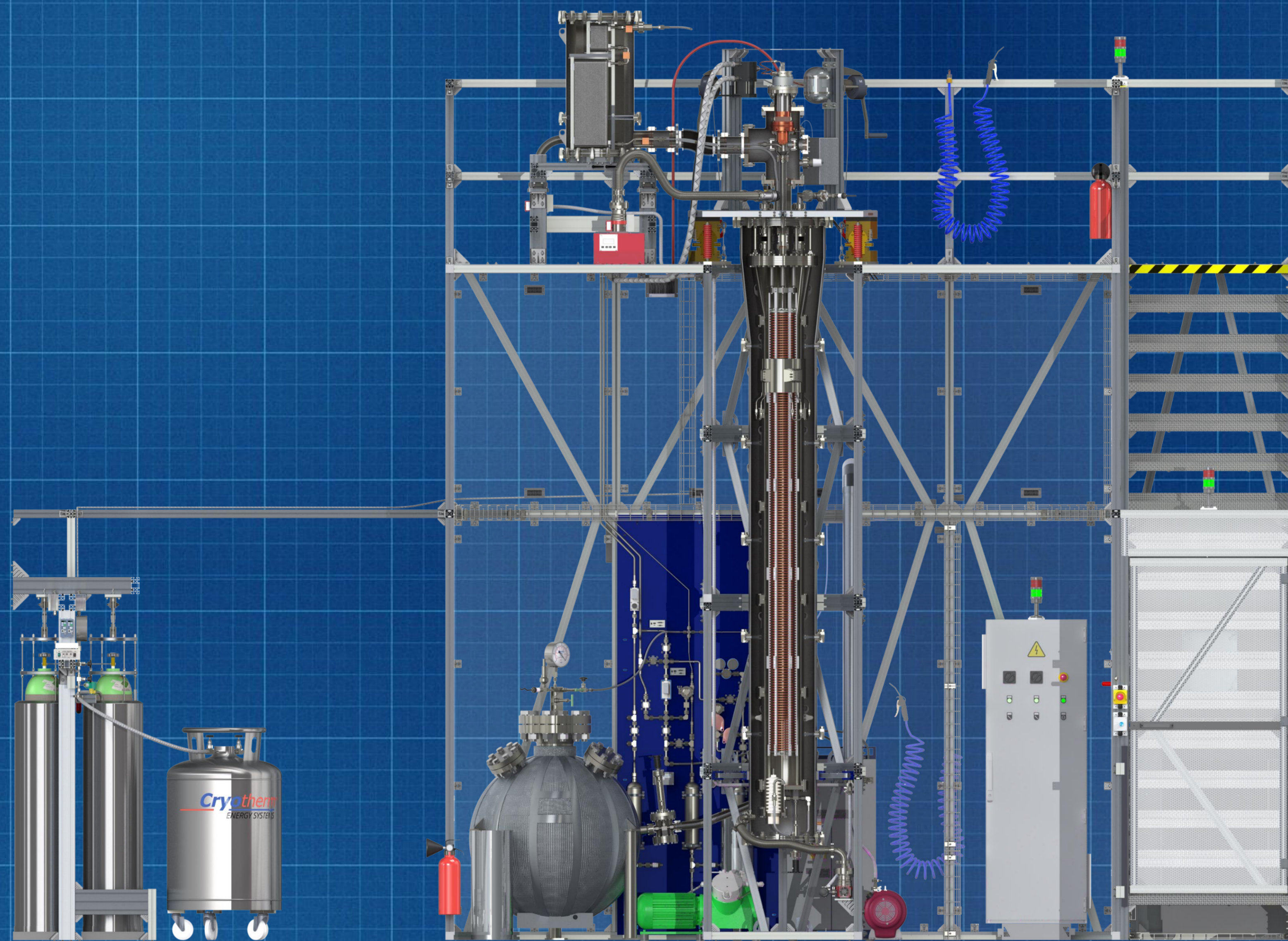
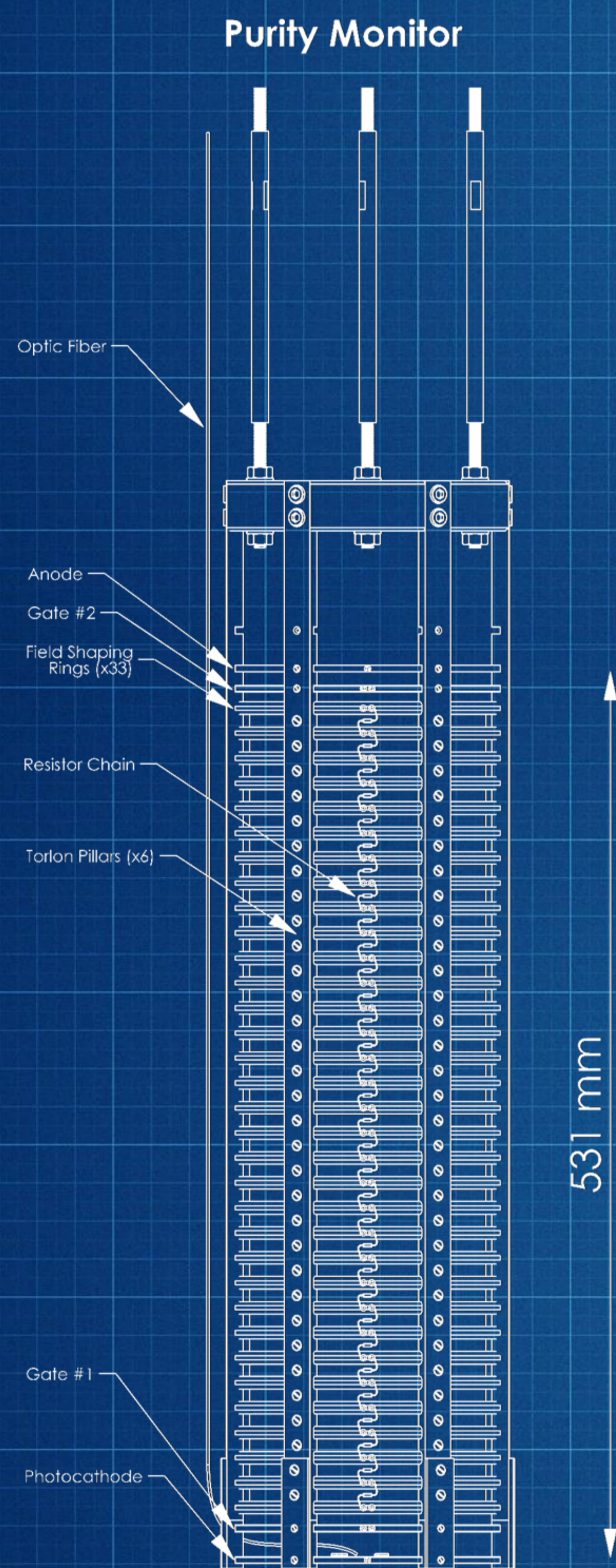
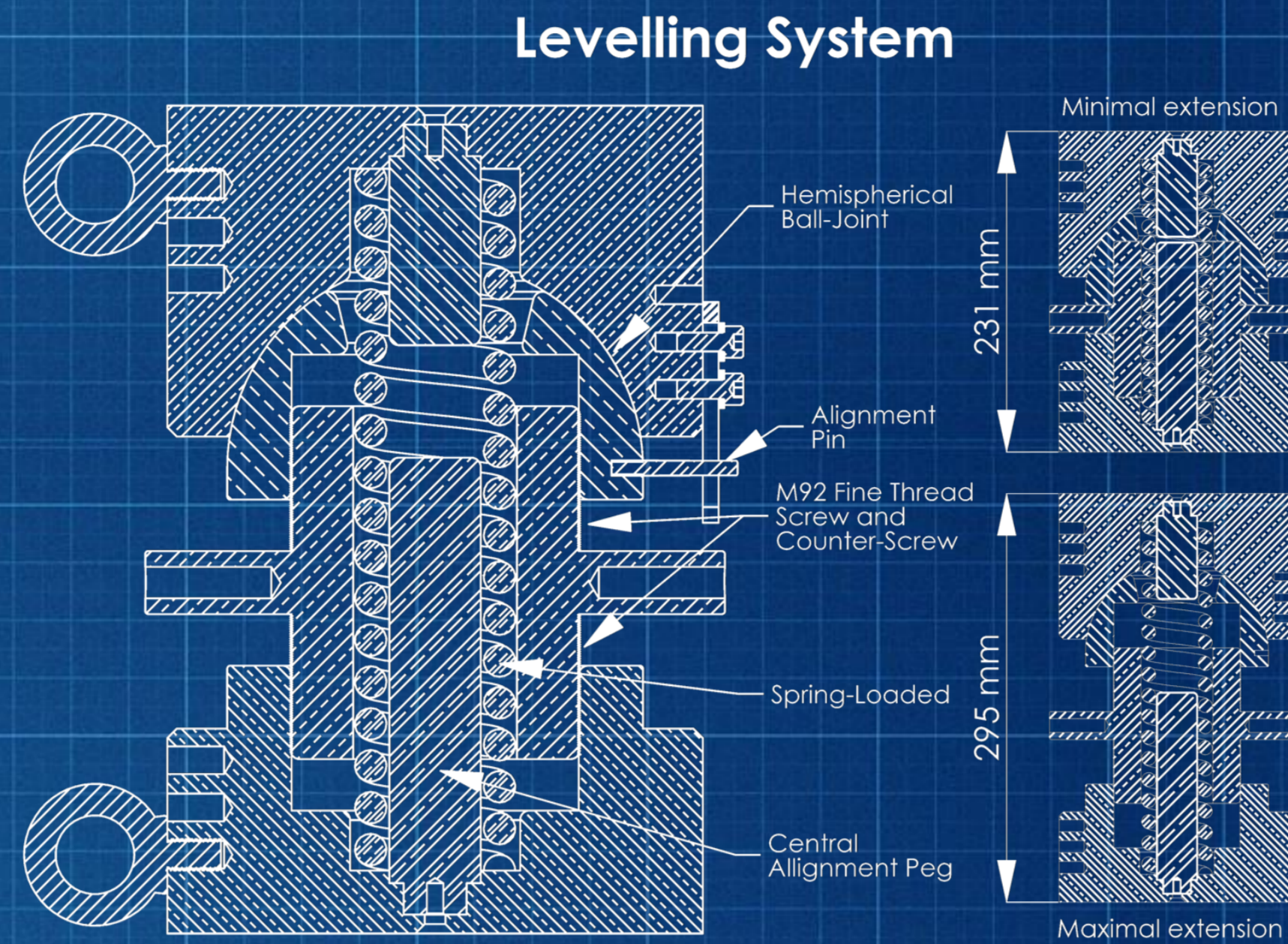
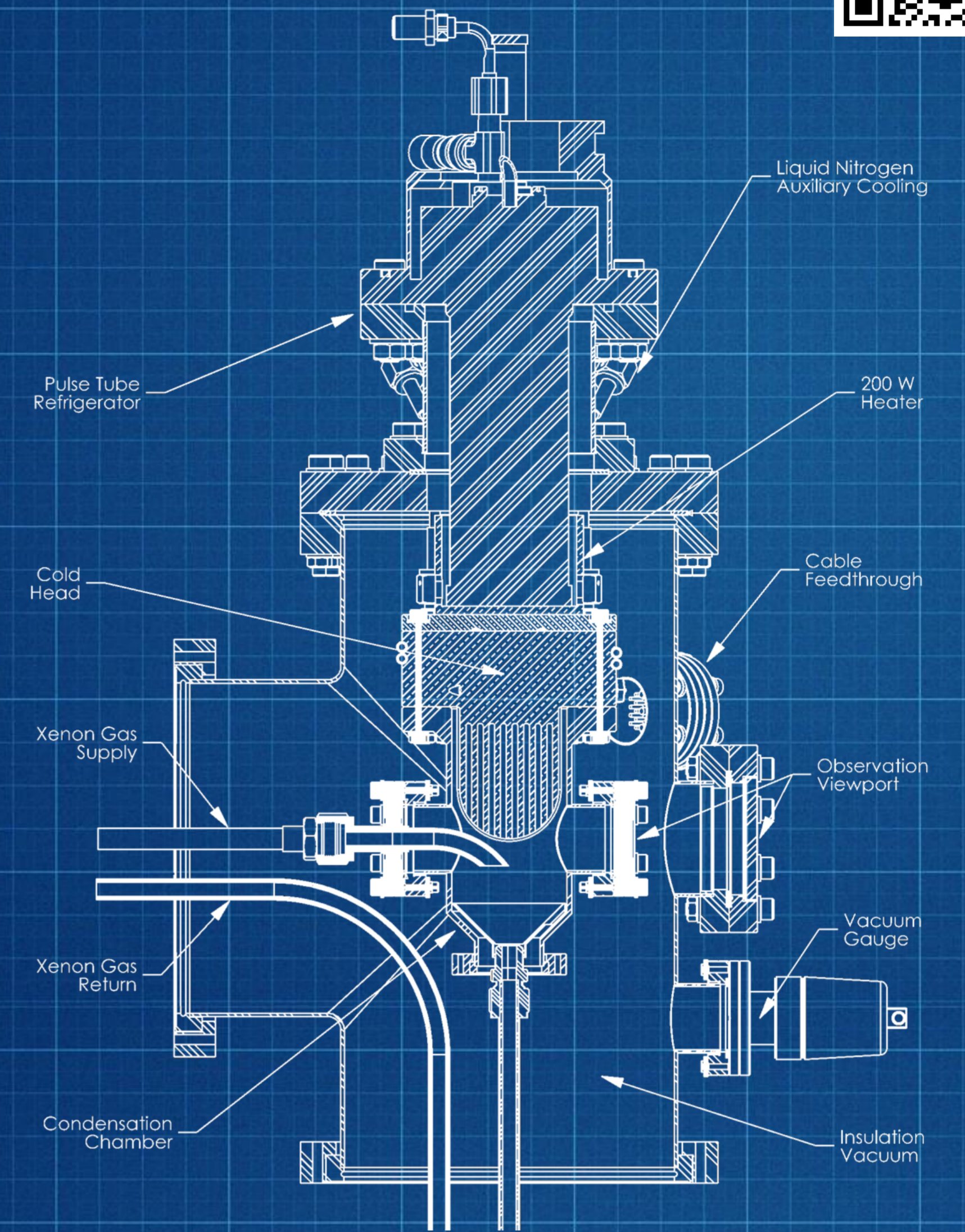
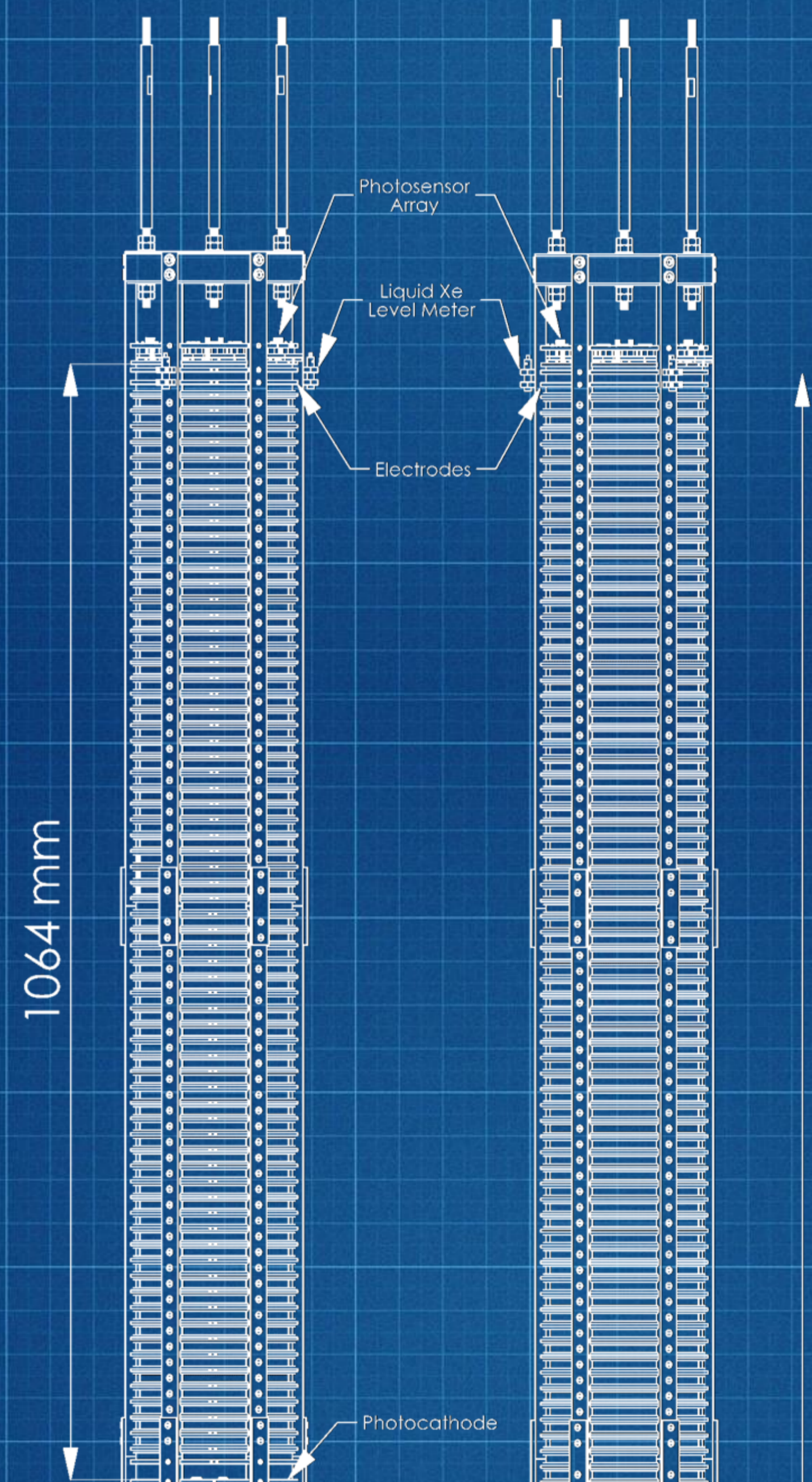


### Cooling Tower



### Time Projection Chamber



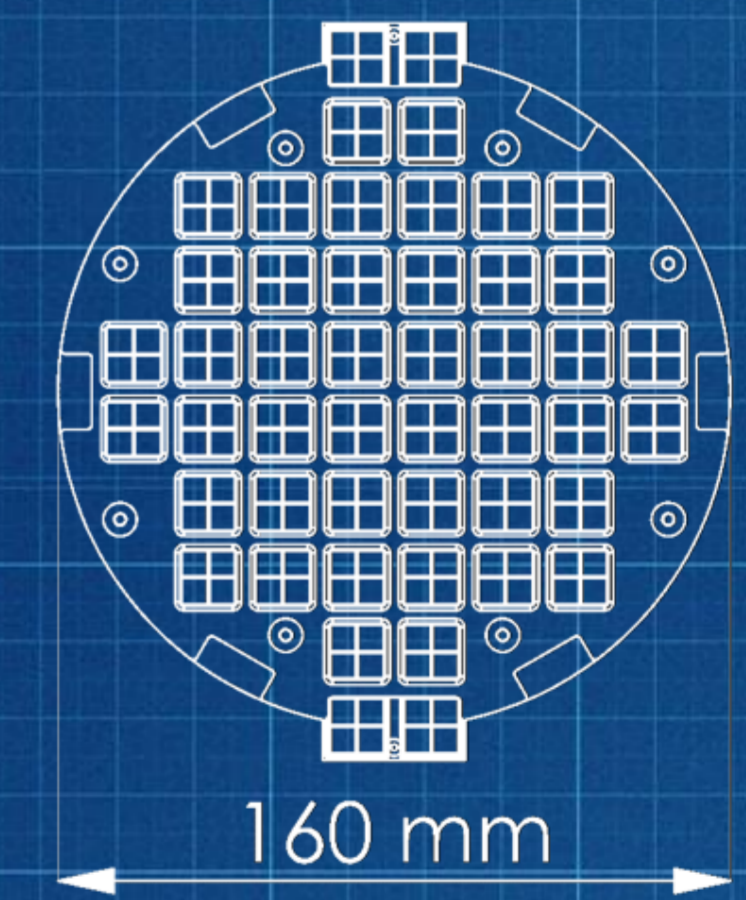
# XENOSCOPE

a full-scale vertical demonstrator for the DARWIN observatory

F. Girard, University of Zurich

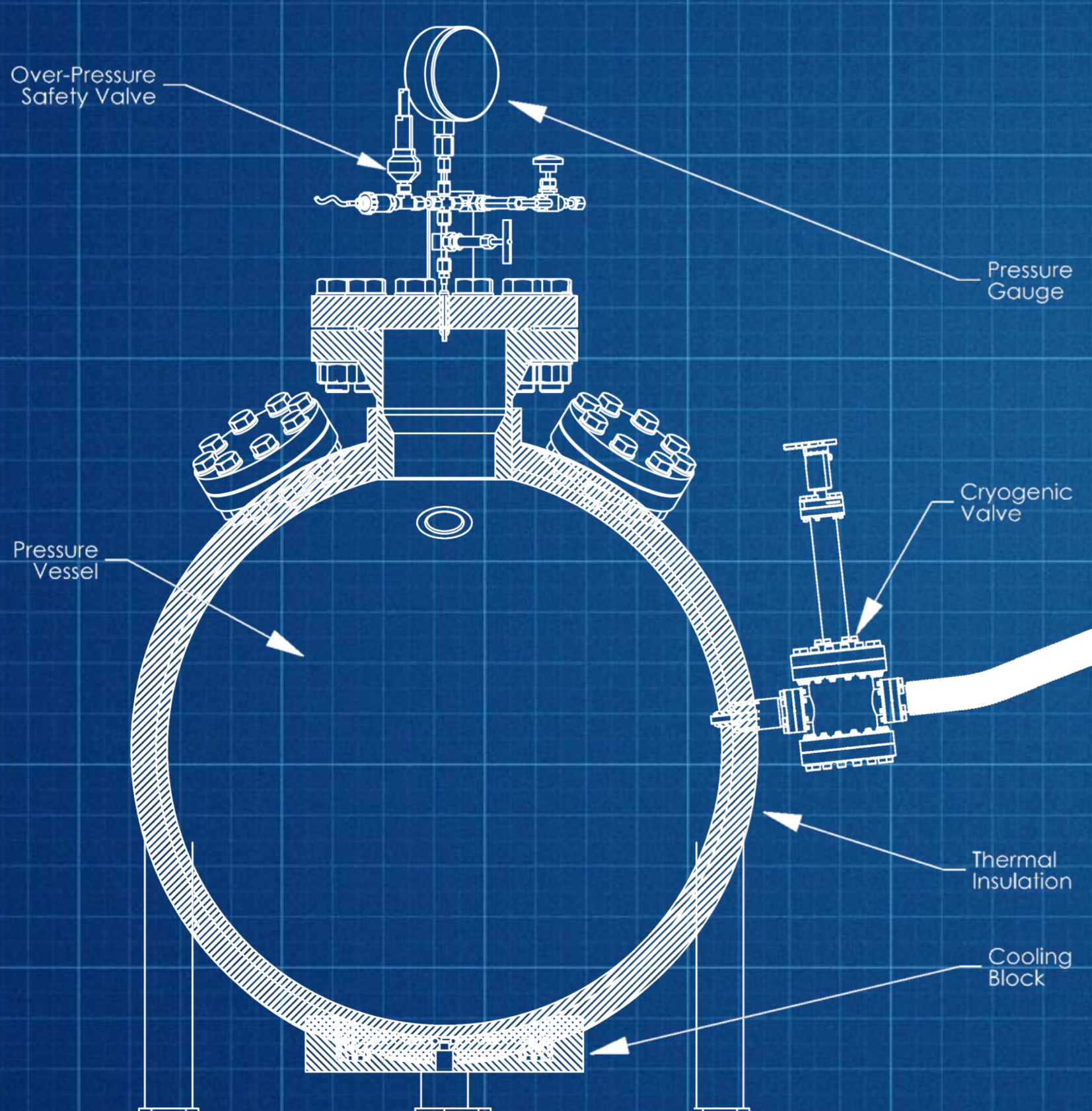
The DARWIN observatory is a proposed next-generation experiment to search for particle dark matter and other rare interactions. It will operate a 50 t liquid xenon detector, with 40 t in the time projection chamber (TPC). To inform the final detector design and technical choices, a series of technological questions must first be addressed. We built a full-scale demonstrator in the vertical dimension, Xenoscope, with the main goal of achieving electron drift over a 2.6 m distance, which is the scale of the DARWIN TPC. We have designed and constructed the facility infrastructure, including the cryostat, cryogenic and purification systems, the xenon storage and recuperation system, as well as a xenon purity monitor and the TPC. In a first commissioning run of the facility without an inner detector, we demonstrated the nominal operational reach of Xenoscope and benchmarked the components of the cryogenic and slow control systems, demonstrating reliable and continuous operation of all subsystems over 40 days. Further applications of the facility include R&D on the high voltage feedthrough for DARWIN, measurements of electron cloud diffusion, as well as measurements of optical properties of liquid xenon. In the future, Xenoscope will be available as a test platform for the DARWIN collaboration to characterise new detector technologies. (arXiv:2105.13829)

### Photosensor Array

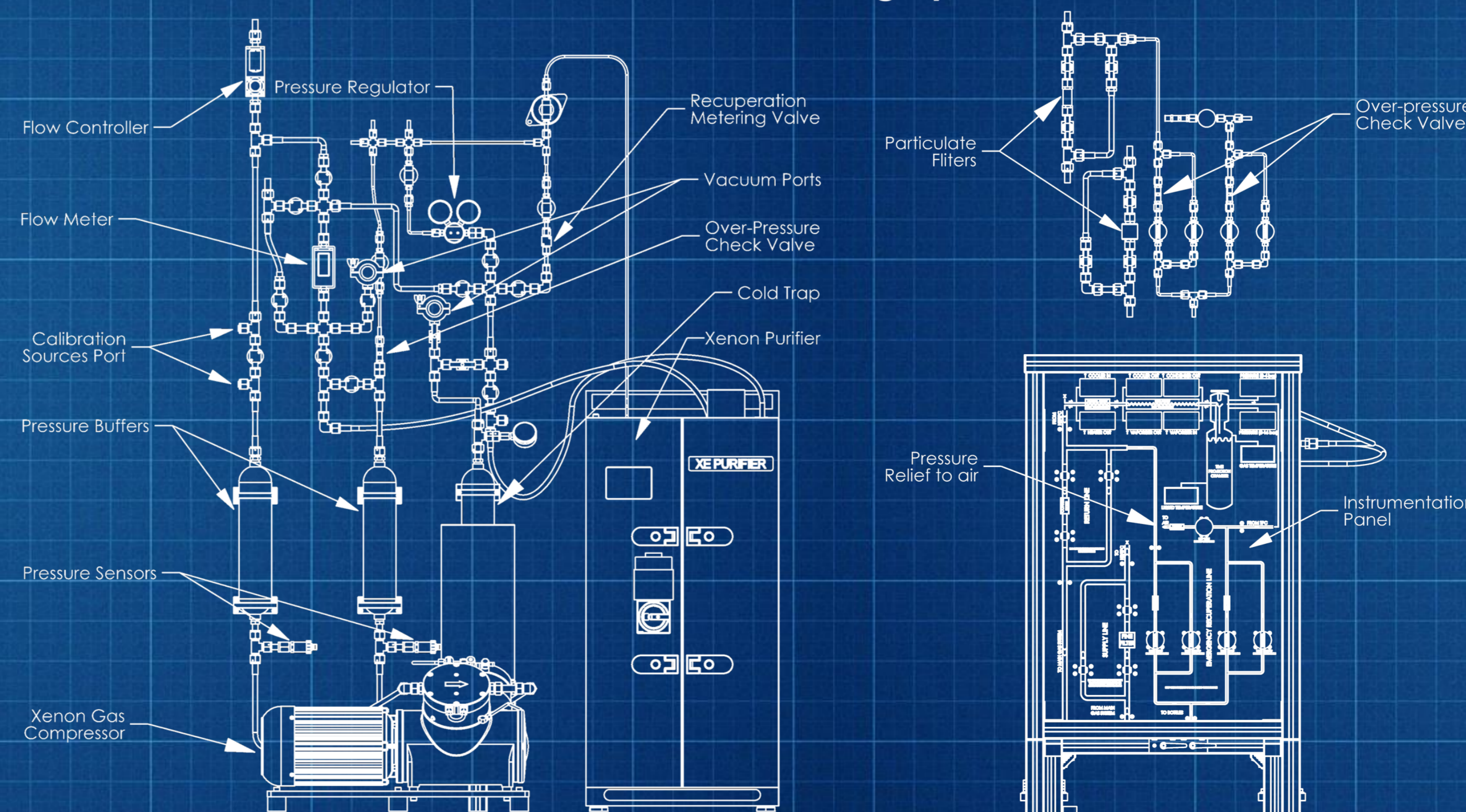


2631 mm

### BOX



### Xenon Gas Handling System



Universität Zürich UZH



erc European Research Council