Back-Up cooling station for Mu2e Calorimeter

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9th June 2025

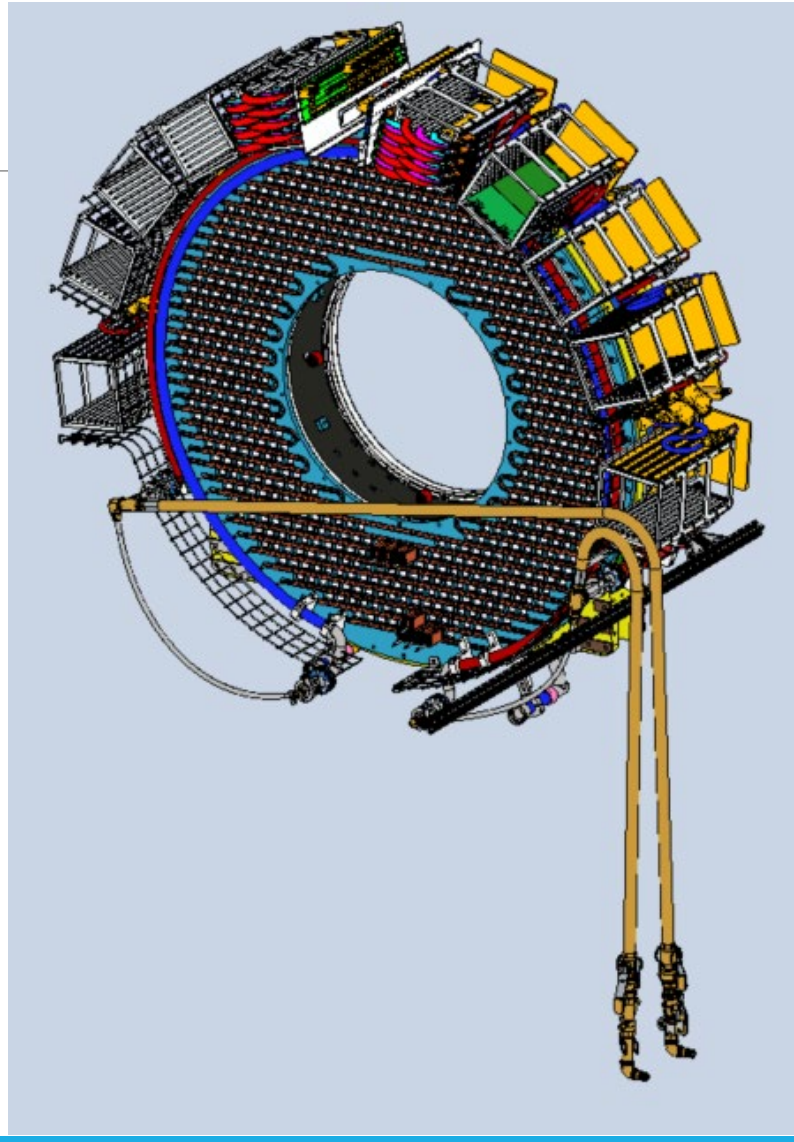
What are the requests

- Having an independent simplified cooling system to run tests on the calorimeter disks in the meanwhile of the completing of the designed cooling system
- Run preferrable 2 disks at time, but at least one in case of issues
- Being easily movable and disconnectable in case of need especially for accommodate the detector train shifts upstream and downstream
- Do not interfere with the tracker services
- Do not damage or flood the other system

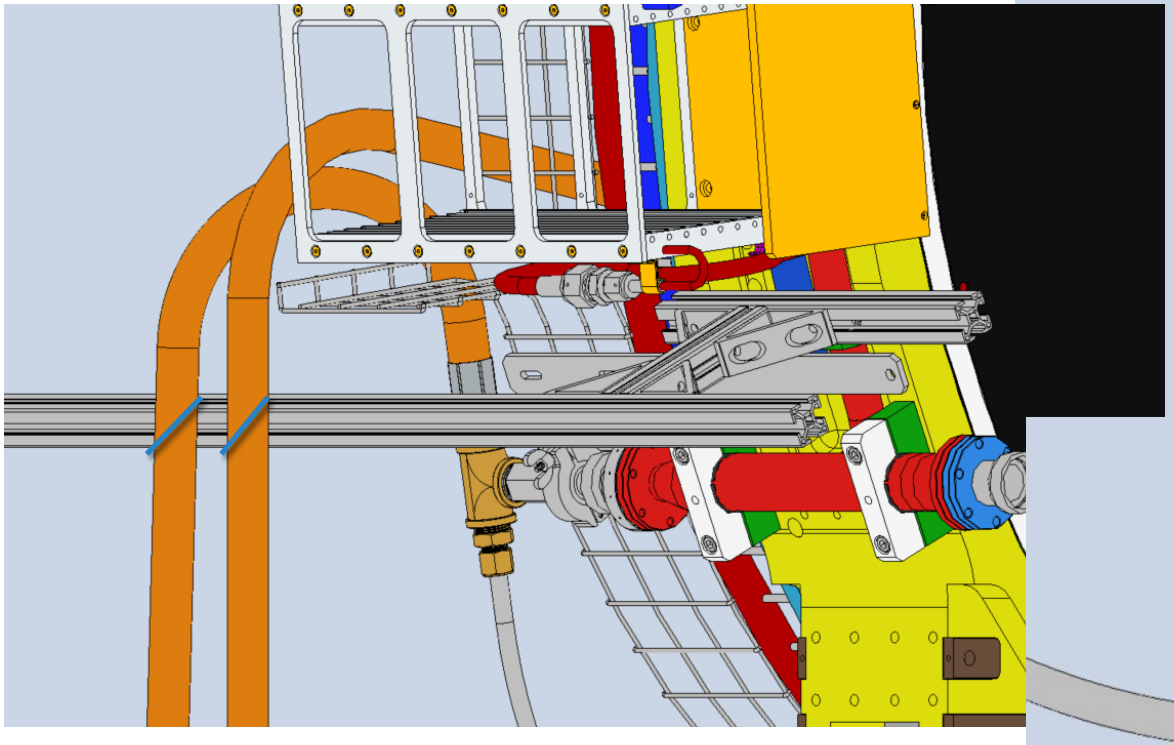
The plan

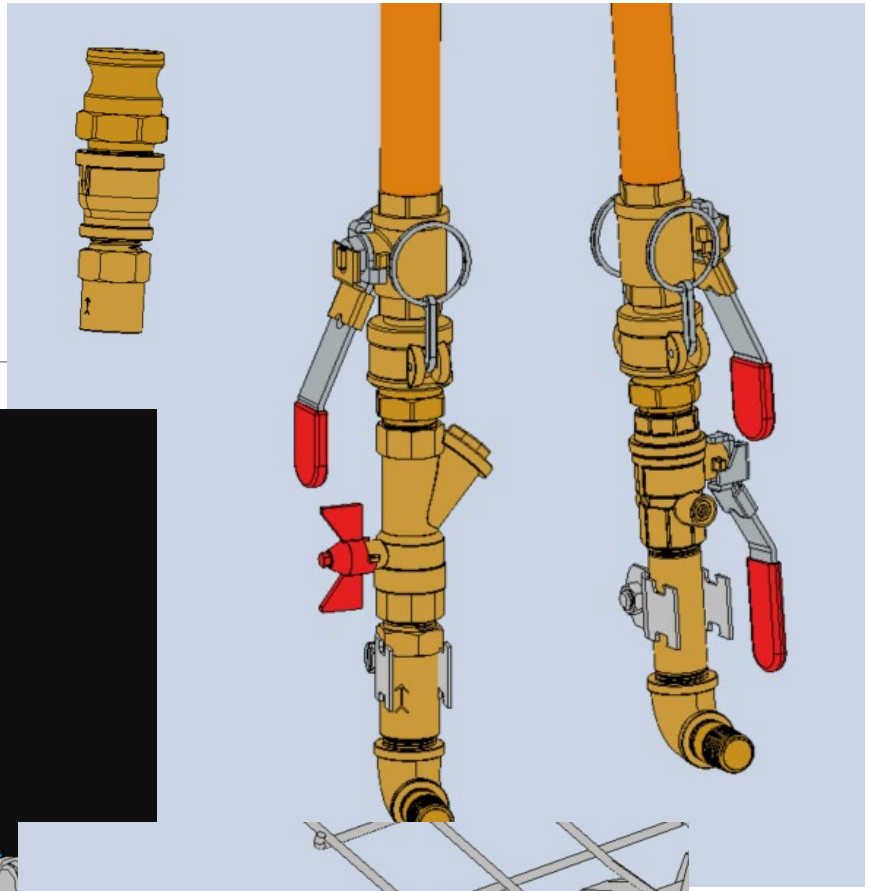
We are going to install a temporary movable chiller

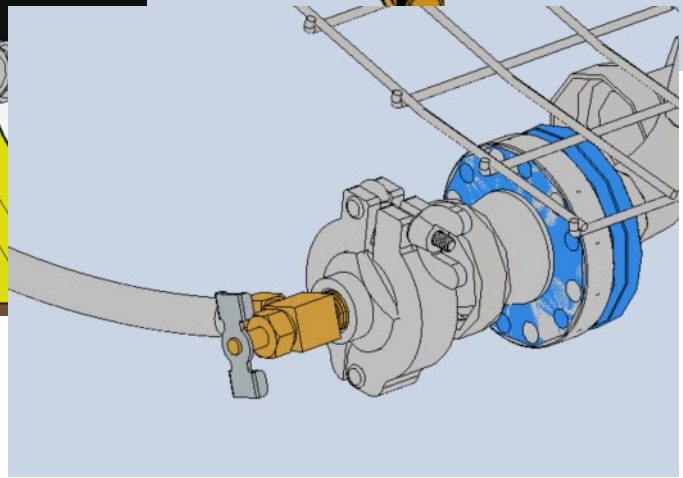
- Model Polyscience Durachill 1.5Pump air cooled chiller (the same we used in sidet)
- 1 chiller per disk (1 new and one recicled from Sidet Lab) for both crates and FEEs cooling
- Using demineralized water (with anti fungi additives)
- Using flexible lines to accommodate chiller location adjustment
- Using separation valves and quick connection to disentangle the piping if necessary



System details





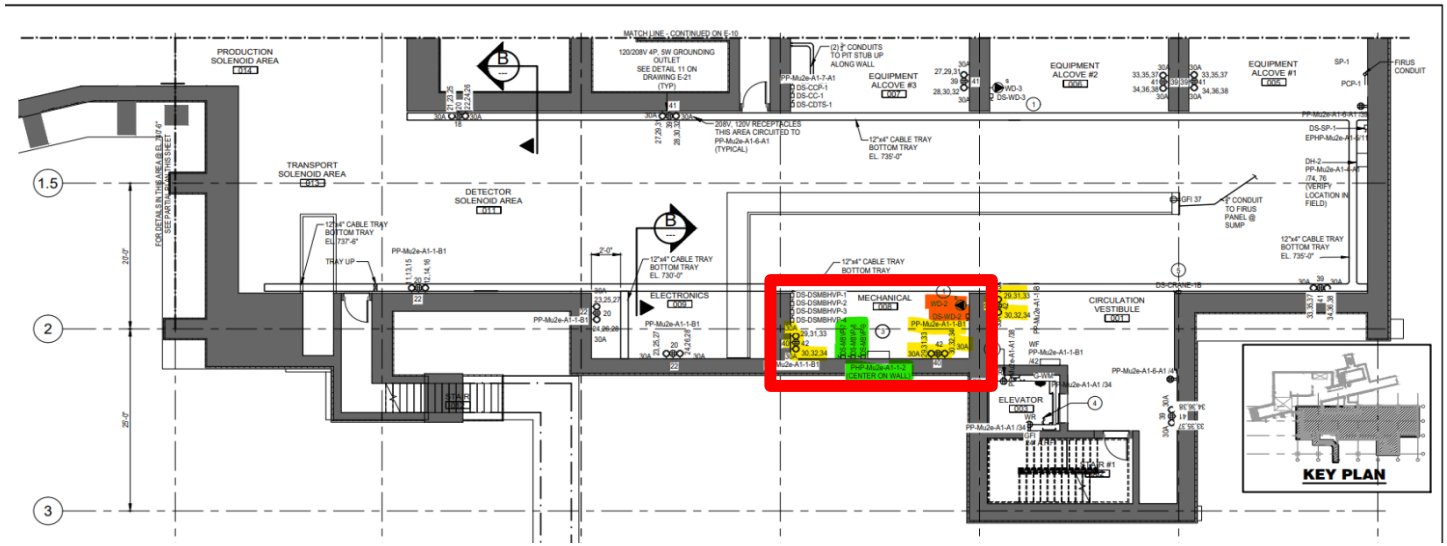


Electrical connection

The plan is to connect the chillers to the mechanical alcove (no details yet)

We need to minimize the issues with a cord running on the floor.

We are discussing with the electrical integration team and the mechanical integration team to have the best efficient solution



Emptying and filling

At the moment there is no defined procedure to emptying and filling the system

The idea is to fill gradually trough the chiller reservoir until the system is fully filled

For emptying the system instead, the idea is to disconnect the quick connection and directly empty into a dedicated barrel

Sensors

At the moment the system itself rely on the internal sensors of the cooling unit.

It has pressure, temperature and flow sensor internally and could communicate with a serial RS-232 port with the outside world

It also can be controlled through the same serial connection.

No further sensor are present at the moment with no interlock logic.