



MAUVE CO₂ Project Status Overview

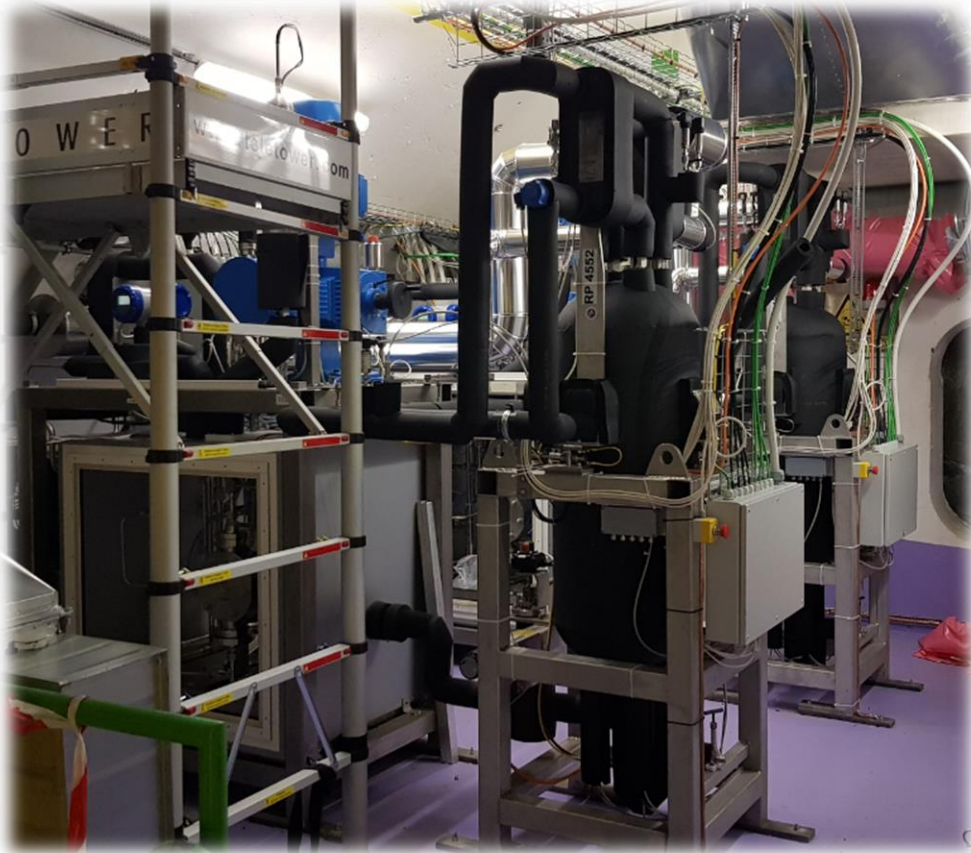
S. Galuszka on behalf of the EP-DT-FS cooling team

7 October 2019, MAUVE cooling system status

Current status

Mechanical:

- ✓ All mechanical components have been installed in the LHCb UX85A cavern



Plants and accumulators in UXA-E4



Piping and insulation



Junction Box
in experiment cavern

Current status

Electrical:

- ✓ Cabinets have been installed and connected to the equipment
- ✓ Schematics and connection documentation available on EDMS
- ✓ Grounding has been done by LHCb
- ✓ Emergency stop system implemented



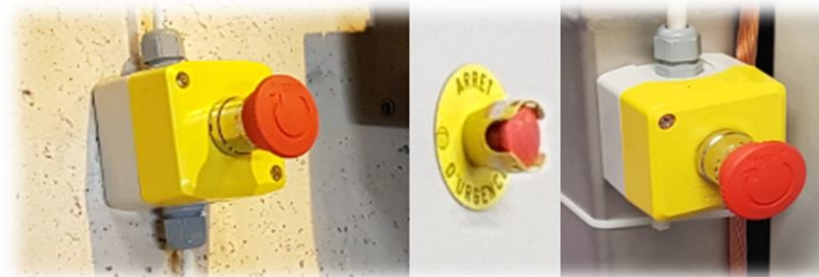
Cabinets in UXA-E3



Cabinets cabling



Grounding by LHCb



Emergency stop system

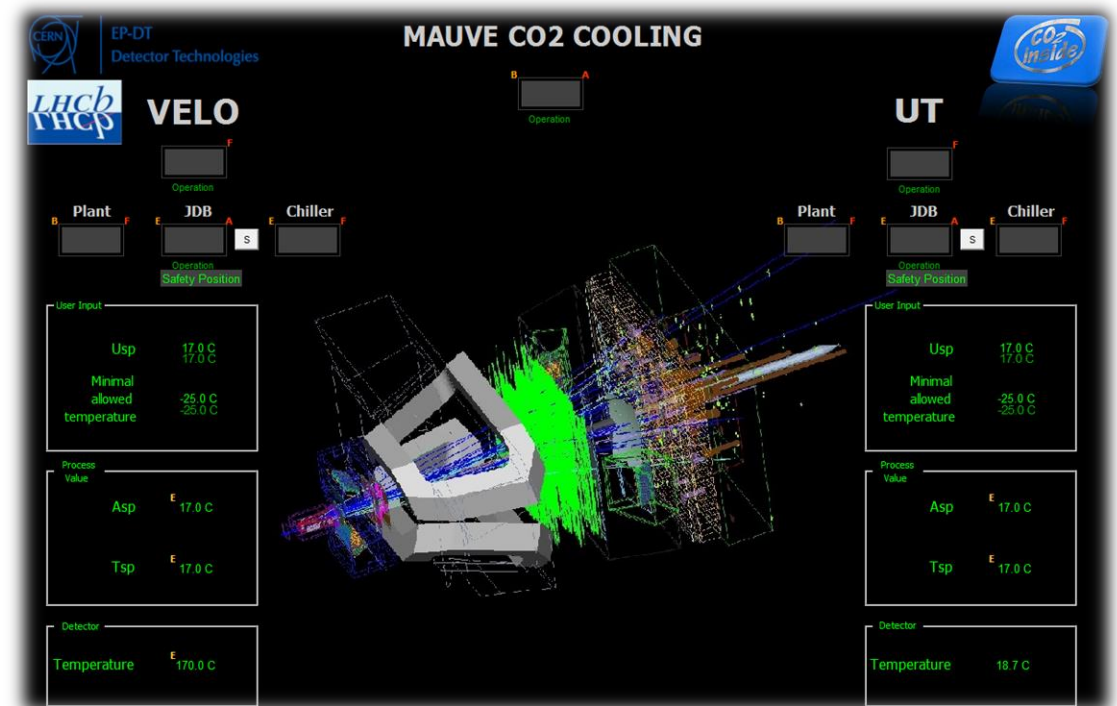
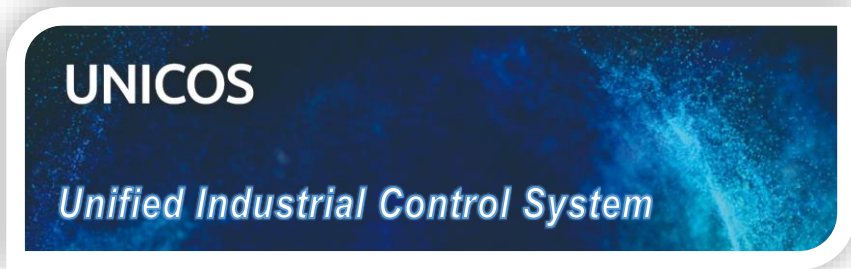


Power distribution EN-EL

Current status

Controls:

- ✓ PLC is connected to network and communication with SCADA is functional
- ✓ Valve and motor drivers are configured
- ✓ New generation of PLC code in UNICOS-CPC 1.11 (upgrade from the version in 1.10)
- ✓ Improvements in logic after testing in B.153
- ✓ Priority logic has been implemented
- ✓ New controller WNC for the distribution box warm nose
- ✓ Update of SCADA systems on the LHCb server (last WinCC OA 3.15 patch)
- ✓ Updates of SCADA database with UNICOS 1.11



Current status

Last missing elements to be installed:



Bypasses for Distribution Boxes simulation and connection to transfer lines



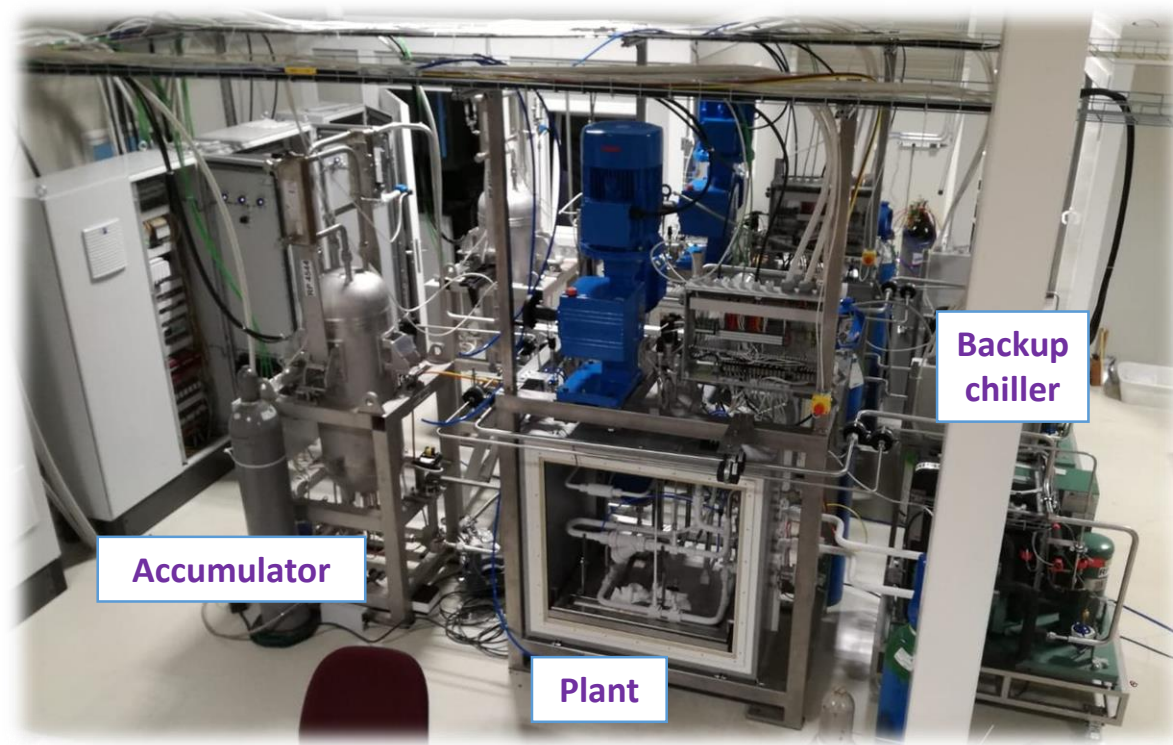
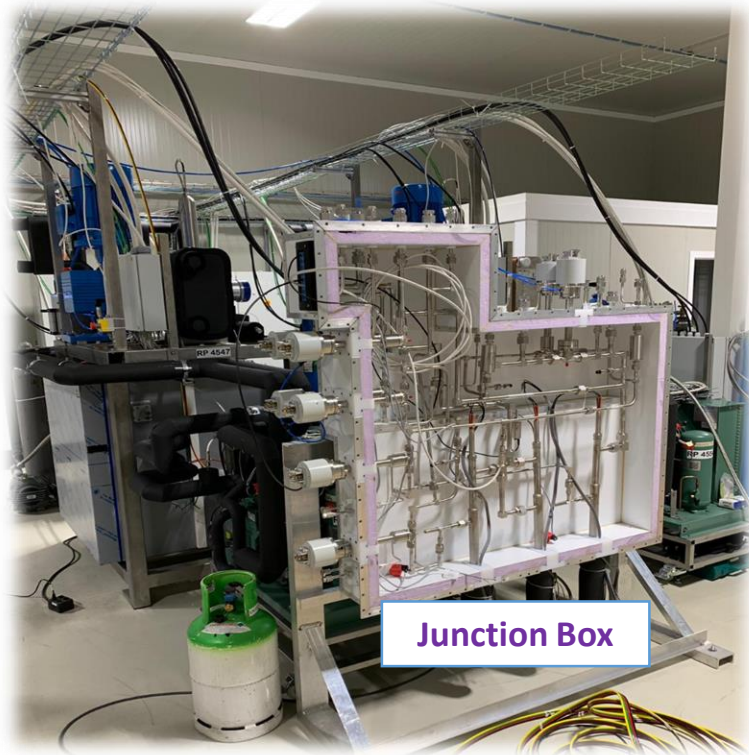
Last sensors (PT and TT) for main chiller

When can we expect final cabling for DB by LHCb?

Surface commissioning

- ✓ All interconnection piping welded and installed in B.153
- ✓ Cabling of the system
- ✓ System start-up and testing
- ✓ Controls documentation

MAUVE system being tested in lab B.153



The system has been
started successfully!



Transport in LHCb

At the end of June 2019 we started transporting the system in LHCb

- ✓ The pump drive units were replaced on the surface
- ✓ All components were moved in the alcove



Underground commissioning status

This is done:

- ✓ Emergency stop system - **checked**
- ✓ All thermal switches tested (**with IS37**)



Currently in progress:

- ✓ Input and Output check
 - ✓ Actuators control check
- Expected finish: second half of October



Underground commissioning plans

Control side:

- Calculated variables
 - 217 AIR, 89 DIC
- Alarms/Interlocks
 - 442 DA, 116 AA
- Actuators logic
 - 64 OnOff, 35 Analog, 36AnaDig, 8 AnaDO, 38 Controllers (regulation loop), 9 PCO
- Recipes update
- LHClogging to activate after commissioning
- DSS tests

Mechanical side

- Pressure test of chiller piping (40 bar)
 - 17th of October with SEICAR, EN/CV and HSE, to be confirmed
- Leak test of CO₂ piping up to JB bypasses with CO₂ at 50 bar
- Pressure test with N₂ at 186 bar with HSE
 - Date to be announced – second half of October
- Fill system with CO₂ (~60kg in total)
- Pump commissioning (after exchange), tuning, performance tests with main chiller and back-up operation

A big thanks to everyone for the hard work We keep up with the pace👍

