Forward Endcap EMC Mechanics

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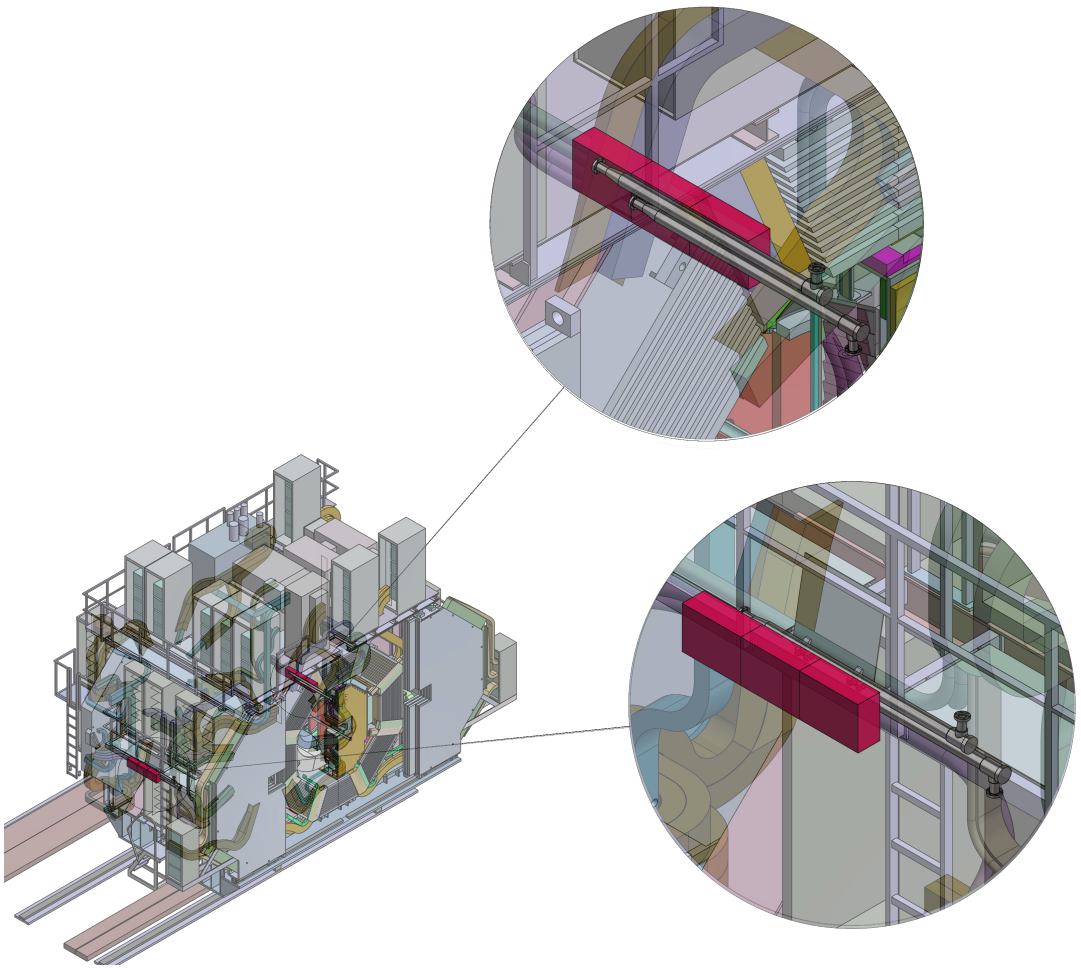
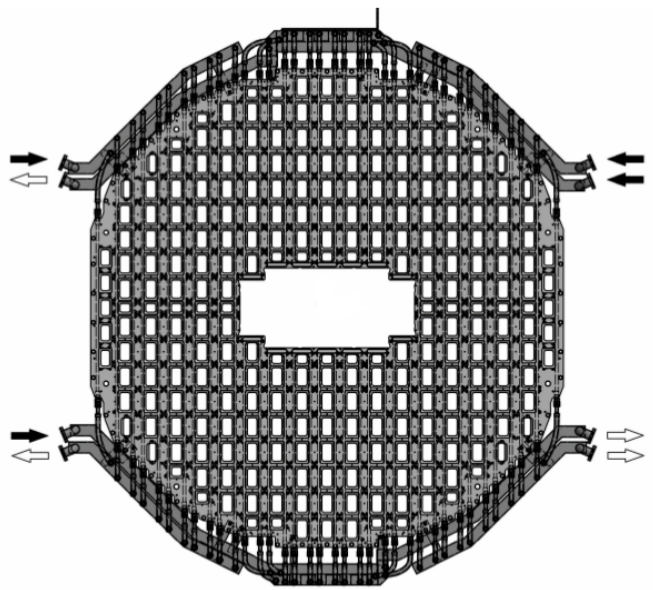
Forward Endcap Cooling: Heaters

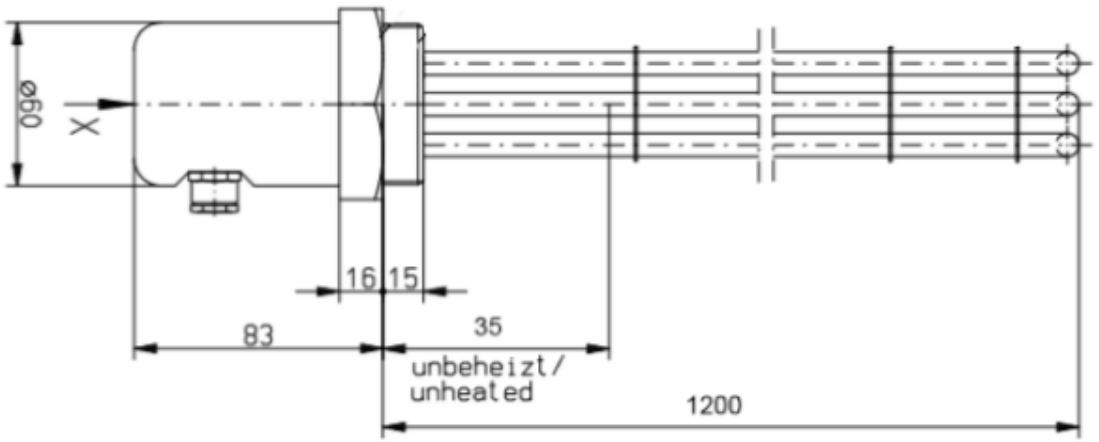
- Target calorimeter cooling scheme: Main chiller (reservoir) supplying subsystems, individual regulation by heating

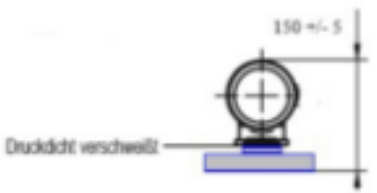




Forward Endcap Cooling: Heaters

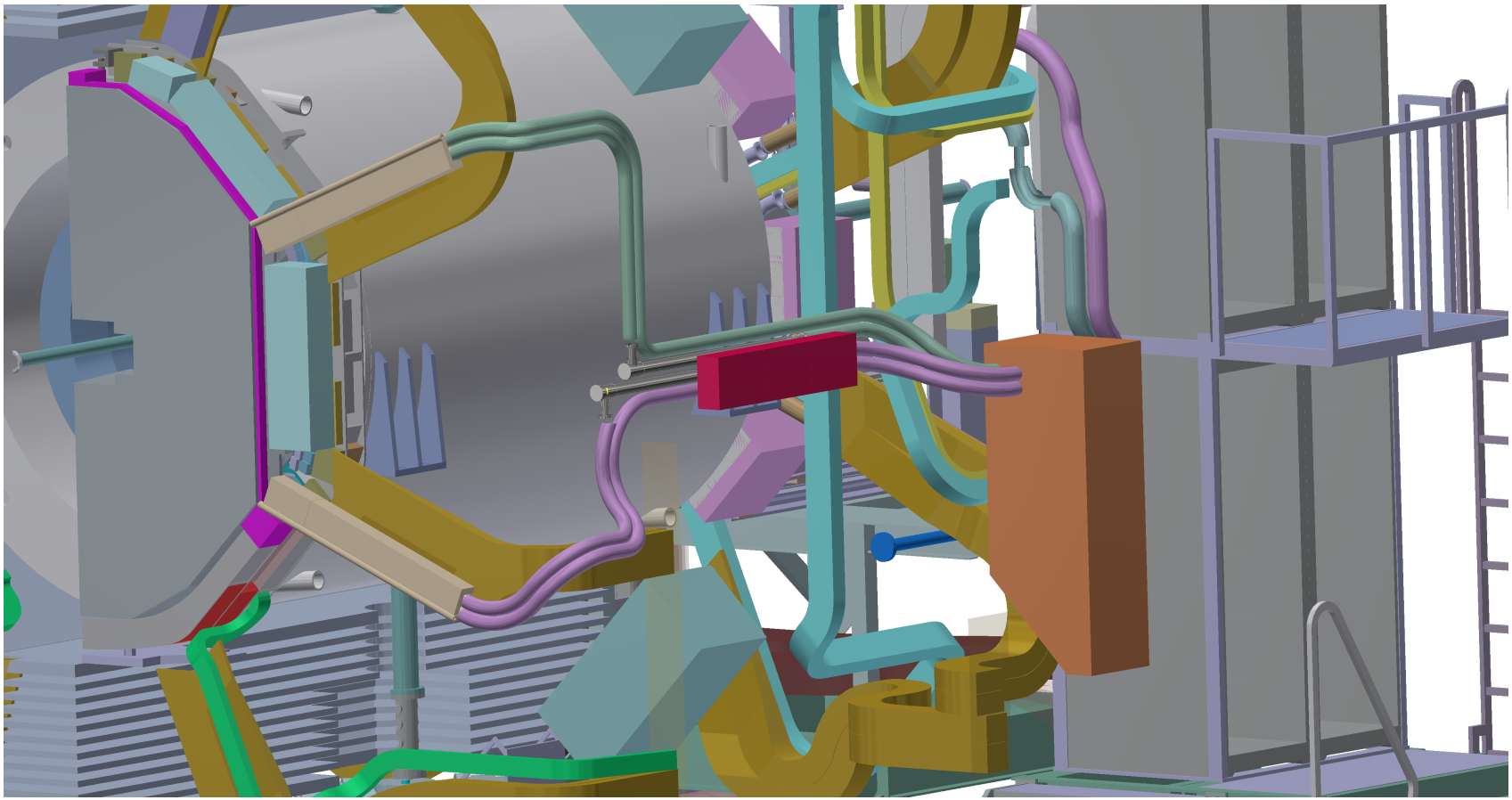
- Right angle kink dictated by manufacturer of heater device





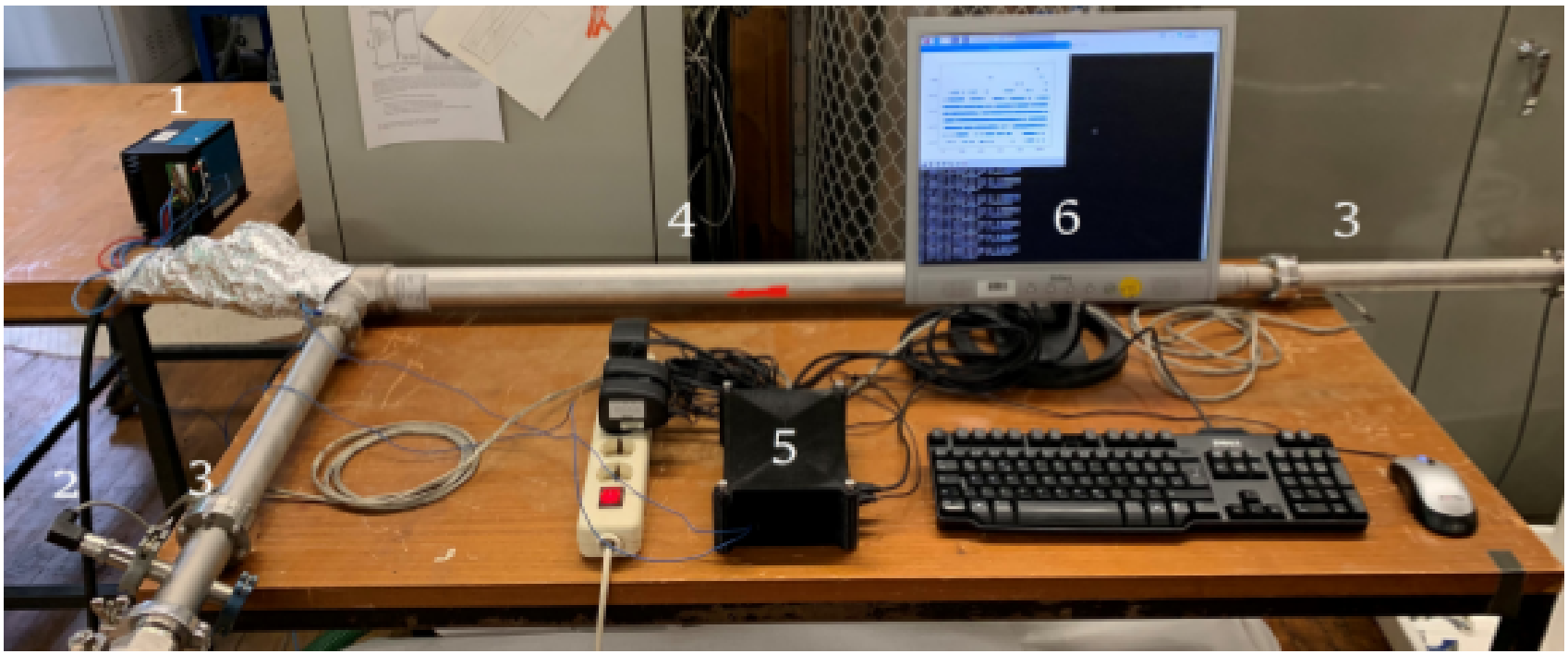
Forward Endcap Cooling: Heaters

- Pipe kink usefully integrated in run of coolant lines



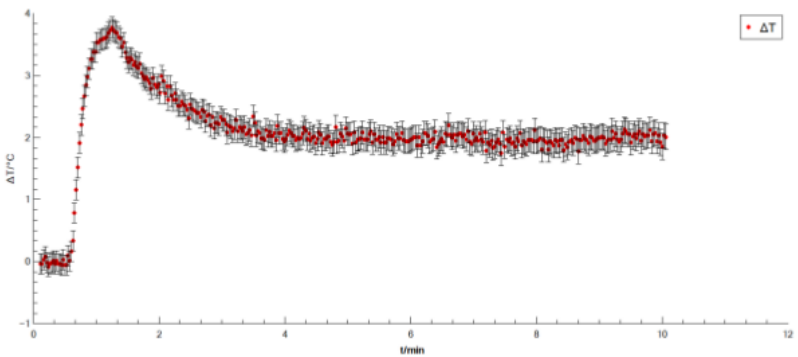
Forward Endcap Cooling: Heaters

- First working coolant heater available now
- Running different tests on pressure drop, heating performance etc. (w/ Orsay chiller only yet)
- Foreseen to have 4 such devices for the Forward Endcap main cooling (backplane)

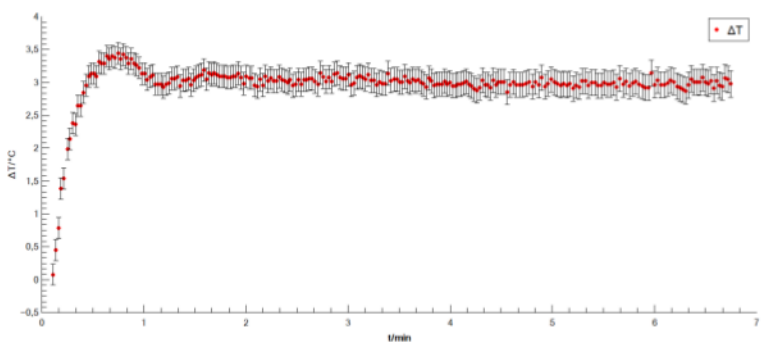


Forward Endcap Cooling: Heaters

- Heater performance:
  - Maximum heating power 12 kW
  - Power need: $\Delta T = 3$ K, 40/52 L/min $\Rightarrow$ 5.9/7.6 kW
  - Pressure drop about 15 mbar (flow 10...52 L/min) - 150 mbar tolerable (1 bar maximum system pressure drop)
  - Regulation succesfully tested in simplified circuit (w/ Orsay chiller only yet)



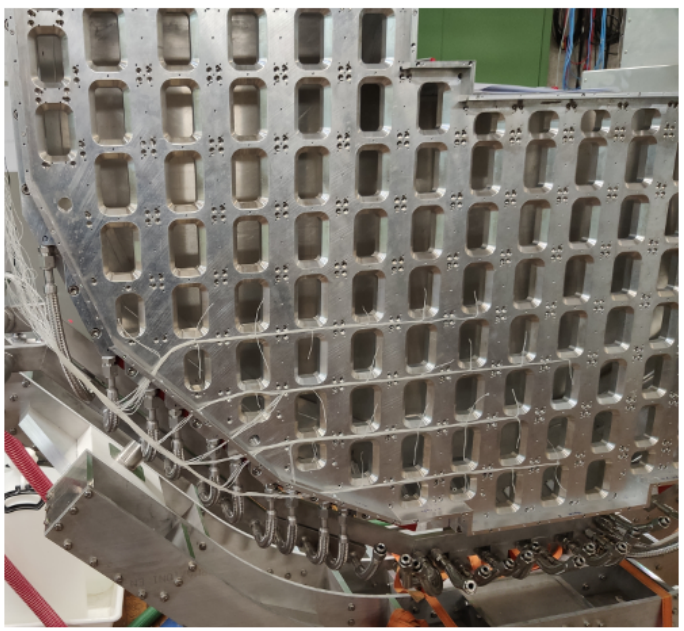
$\Delta T = 2$ K



$\Delta T = 3$ K

Forward Endcap Cooling

- Problems with leaking VCR-NPT adapter pieces that couple Swagelok hoses to cooling drills
- Consulting by Polarized Target group members (Bochum): Epoxy glueing of threads rather than PTFC tape sealing
- Checked on test pieces with vacuum pump in climate chamber



Forward Endcap Cooling: Heaters

- Electrical insulation by plastic tube sections (ECTFE, ETFE, PVDF, PSU/PES/PPSU)