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Status and commissioning results of the helium refrigerator plant for the European XFEL

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The European XFEL project is under construction at DESY in Germany. The superconducting XFEL linac is supplied by the XFEL helium refrigerator plant. This plant consists of two existing refrigerators, which were in service for the HERA storage ring until 2007. Since the XFEL linear accelerator requires cryogenic cooling at 2K, the existing cryogenic infrastructure had to be modified.

Two of the three existing HERA helium refrigerators were required to cover the design heat load of the XFEL-linac. The refrigerator infrastructure was extended by a 2 K cooling loop, whose main component consists of a string of four cold compressors generating approximately 1.7 kW isothermal cooling capacity at 2K. The step by step commissioning and extension of the accelerator as well as the future upgrade option of the heat load demanded an extremely high turn down ability, a particular challenge for 2K cold compressor strings.

The commissioning of the helium refrigerator infrastructure is underway and should be completed soon. The current status of this project, commissioning results and particular challenges are presented.

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