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Design details of the current lead test facility Karlsruhe (CuLTka)

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The new current lead test facility CuLTka was successfully commissioned in 2014 at the Karlsruhe Institute of Technology (KIT), Germany. Towards the end of the year the first pair of current leads for the Japanese fusion experimental reactor JT-60 SA was tested. These current leads have to carry currents of up to 26 kA and are cooled with helium at two different temperature levels, 4.5 K and 50 K, respectively. After commissioning and test of the first pair of the HTS-current leads another 24 current leads will be tested within the next 2.5 years. The facility consists of two valve boxes, one control box, which houses a 400 l liquid helium reservoir and two test cryostats. All cryostats are connected by cryogenic transfer lines. Two helium mass flows at 4.5 K and 20 to 70 K at overcritical pressures are provided by the 2 kW refrigerator.

This publication will describe the way of designing the facility starting from the basic demands. The overall setup is derived and particular details are explained. Some design calculations will be opposed to measured data from its real performance. In addition the design of safety aspects is discussed.

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