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Commissioning of the helium cryogenic system for the HIE-ISOLDE accelerator upgrade at CERN

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The High Intensity and Energy ISOLDE project is a major upgrade of the existing ISOLDE and REX-ISOLDE facilities at CERN. The most significant improvement will come from replacing most of the existing REX accelerating structure by a superconducting linear accelerator (SC linac) composed ultimately of six cryo-modules installed in series, each containing superconducting RF cavities and solenoids operated at 4.5 K.
In order to provide the cooling capacity at all temperature levels between 300 K and 4.5 K for the six cryo-modules, an existing helium refrigerator, manufactured in 1986 and previously used to cool the ALEPH magnet during LEP operation from 1989 to 2000, has been refurbished, reinstalled and recommissioned in a dedicated building located next to the HIE-ISOLDE experimental hall.
This helium refrigerator has been connected to a new cryogenic distribution system, consisting of a 30-meter long vacuum insulated transfer line, a 2000-liter storage dewar and six interconnecting valve boxes, one for each cryo-module.
This paper describes the whole cryogenic system and presents the commissioning results including the preliminary operation at 4.5 K of the first cryo-module in the final experimental hall.

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