Manufacturing, Installation, and Commissioning of the Residual Ion Dump Power Supply for MITICA Experiment

Alberto Ferro, Loris Zanotto, Vanni Toigo, Luigi Rinaldi, Saverino Carrozza, Sandro Lazzari, Luca Sita,Alessandro Morato, Giuseppe Taddia, Daniel Gutierrez, Andrea Garbuglia, and Hans Decamps

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Abstract:

The Residual Ion Dump Power Supply (RIDPS) is devoted to feed the Electrostatic Residual Ion Dump, a device which shall collect the residual ions at the output of the gas Neutralizer in the ITER heating neutral beam injectors (HNBIs) and Megavolt ITER Injector and Concept Advancement (MITICA), the full-scale prototype located in Padua (Italy), as part of the Neutral Beam Test Facility. This power supply has to provide an average voltage of up to 25 kV, plus an ac low-frequency voltage component with a maximum amplitude of 5 kV, with sinusoidal or trapezoidal waveform. The nominal output current is 60 A, and the maximum pulse duration is 1 h. The RIDPS for both MITICA and ITER is being provided by OCEM Energy Technology s.r.l. The manufacturing of the RIDPS for MITICA has been concluded in summer 2018 and the Site Tests in Padua have been successfully completed in May 2019. In this article, the most significant issues faced during the design, integration and tests, and the solutions identified are described. The most interesting results of the Factory and Site Tests are presented, with particular emphasis on those proving the compliance of the RIDPS with the most critical requirements.