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# P4.024 Electrical integration of two 1MW/2s dual-frequency gyrotrons into the EC-system of the TCV tokamak

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The EC-system of the TCV tokamak was originally designed to accommodate nine gyrotrons, shared in three clusters of three gyrotrons; each cluster being supplied by one main high-voltage power supply [1]. As part of an important upgrade of TCV, this EC-system is currently renewed and extended [2]. Two MW-class dual-frequency gyrotrons (84 or 126GHz/2s/1MW) will be installed. The first one has already been delivered and will be fully commissioned on-site by the middle of 2018 [3].

This paper will describe the electrical integration of these two additional gyrotrons. The gyrotrons' cathodes will be fed by one of the main high-voltage power supplies, shared with the gyrotrons of an existing cluster. The commutation of the main power supply between the existing gyrotrons and the new ones will be performed remotely by the means of electromechanical switches. The anode power supply and the filament power supply will be integrated into a common shielded cabinet allowing the installation in a free access area. The electrical supply scheme complies with the installation principle selected for the EU gyrotrons at ITER, aiming to minimize electromagnetic interferences. The snubber used to damp the energy delivered to the gyrotron in case of an arc is implemented inside the gyrotron oil tank, as it is done in the EU gyrotron of the EC Test Facility in Lausanne [4]. The water cooling system will also be described, focusing on the electrical point of view, as well as the calorimetry measurements.

Based on long term experience of the Swiss Plasma Center with gyrotrons, giving special emphasis on electromagnetic compatibility, overall electrical design choices will ensure a reliable operation of these two gyrotrons.

[1] T. Goodmann, 19th SOFT, 1997, p. 565–568
[2] A. Fasoli, this conference
[3] S. Alberti, this conference
[4] D. Fasel, this conference

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