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Factory acceptance test results of ITER EU ECPS

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The power supply set for the EU EC Heating system (ECPS) of ITER provides up to 6 MVA electrical power to two 170GHz/1MW Gyrotrons. The required electrical power for the gyrotrons is both very high and has to comply also with highest quality requirements. These performance indicators were proven with full voltage modulation at rates up to 5kHz.

Ampegon's newly developed power supply topology is optimized to cope with these stringent requirements. Two different topologies are combined. On one hand, the PSM topology for the Main High Voltage Power Supply (MHVPS) and on the other hand the enhanced PSM topology for the two Body Power Supplies (BPS). The enhanced PSM topology demonstrates an improved accuracy and very low ripple values. Furthermore, this topology is designed to supply capacitive loads. Besides the demanding dynamic requirements and ripple performance, the power supplies must protect the Gyrotron in case of an arc. Therefore, the energy into the arc is also an important figure for the qualification of the power supply.

To test the power supply set (one MHVPS and two BPS) in its various operating modes, four different dummy loads have been designed and are part of the Ampegon scope of supply. The complete set, including the relevant control interfaces, has been installed and tested in Ampegon's test laboratory.

The test setup and the factory acceptance test results for the ECPS Heating System are presented.

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