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HIGH CURRENT PULSED POWER SUPPLIES FOR ST-40 SPHERICAL TOKAMAK

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The ST-40 tokamak is a Spherical Tokamak designed and under construction by **Tokamak Energy** to reach the goal of producing clean energy by means of nuclear fusion. The tokamak machine consists of several high power magnets to confine and control the plasma inside the fusion chamber. These electro-magnetic magnets require very high currents, however the existing power infrastructure doesn't permit this and thus a pulsed power supply with ultra-capacitor energy storage is used. The ST-40 will produce the highest magnetic field ever in a spherical tokamak.

In total 3 types of pulsed power supplies have been designed and developed by **Jema Energy** for the ST-40 machine;

- Toroidal Field Power Supply (100kA 120ms flat top, upgradable up to 250kA)
- Central Solenoid Power Supply (+/-17kA 100ms flat top)
- Poloidal Field BvU Power Supply (12,5kA 50ms flat top)

The design of the power supplies is a modular concept based on IGBT. The power supplies control system will be integrated under the Tokamak Energy Control and will be current or voltage managed. The total stored energy in the power supplies is 108MJ.

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