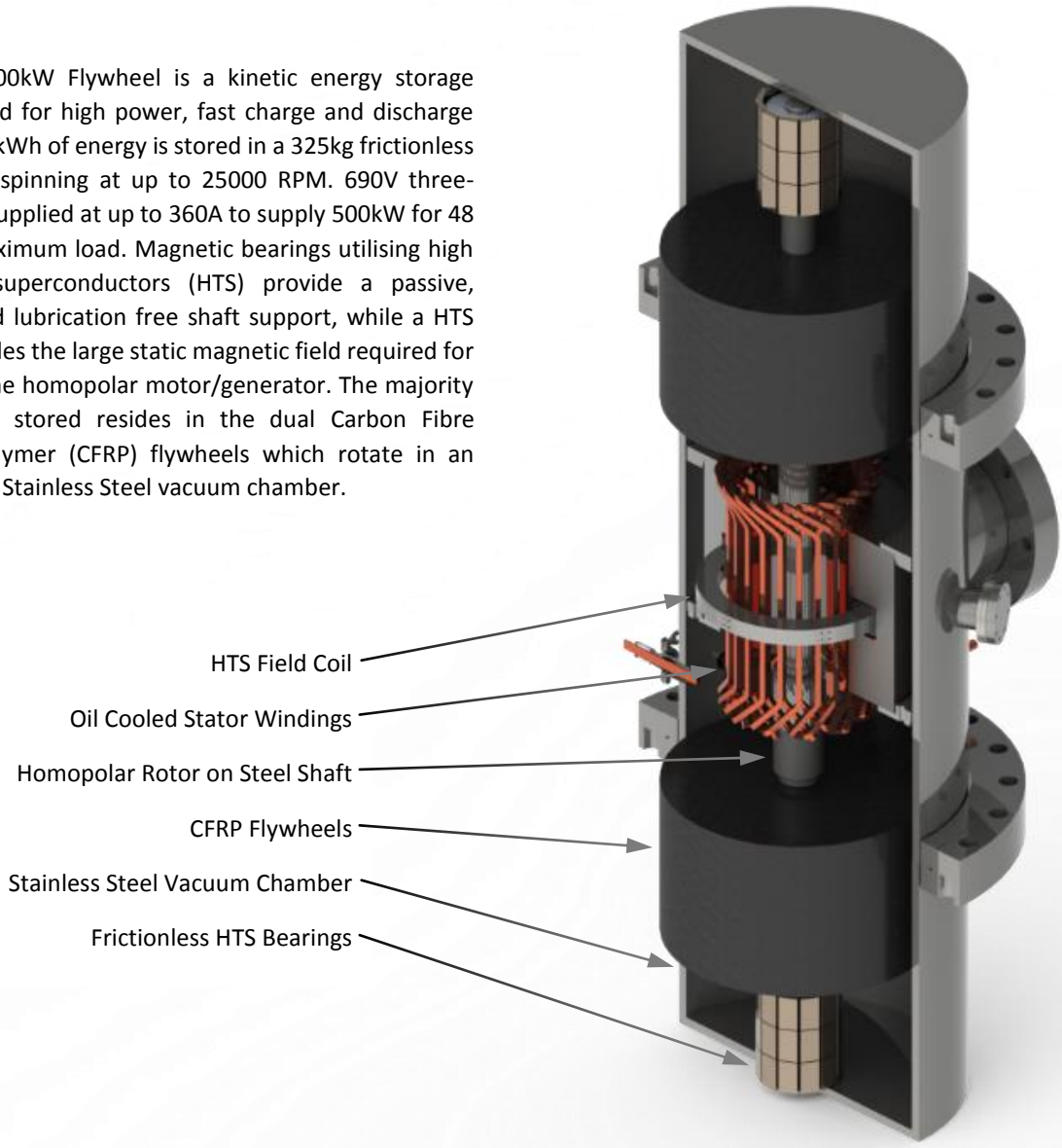
500kW Flywheel Energy Storage CFW01

Overview

The CFW01 500kW Flywheel is a kinetic energy storage device designed for high power, fast charge and discharge applications. 6kWh of energy is stored in a 325kg frictionless rotating mass spinning at up to 25000 RPM. 690V three-phase can be supplied at up to 360A to supply 500kW for 48 seconds at maximum load. Magnetic bearings utilising high temperature superconductors (HTS) provide a passive, frictionless and lubrication free shaft support, while a HTS field coil provides the large static magnetic field required for operation of the homopolar motor/generator. The majority of the energy stored resides in the dual Carbon Fibre Reinforced Polymer (CFRP) flywheels which rotate in an evacuated AISI Stainless Steel vacuum chamber.



Specifications

Capacity		
Energy Storage Capacity	6.72	kWh
Max Power	500	kVA
Run Time	48	seconds
Input Voltage	690	VAC 3-Phase
Charge/Discharge Rate	360	A
Base Impedance	1.4	Ohms

Operating characteristics		
Flywheel rotation speed	25000	RPM
Rotating Mass	325	kg
Moment of Inertia	7.06	kg.m2
Est. Storage Efficiency	1	%/min
Motor/Generator Efficiency	99.2	%
Vacuum	10^{-4}	Torr

Dimensions				
Height/Length/Width (Vacuum Chamber alone)	2250	1300	820	mm
Height/Length/Width (Including cryocooler)	2250	2000	820	mm
Weight (Vacuum chamber assembly)			2000	kg
Weight (Cryocoolers)			49	kg
Weight (Fluxpump)			10	kg