



Magnet Power Supplies CERN, Nick Ziogas

What does it do?

The power supply can be used to power different types of magnets. It is controlled using the FGC (Function Generator Controller) Software, which allows an easy and precise control of the magnets.

How does it work?

There's two kinds of power supplies the 4-Quadrant Power Supply and the Short Pulse Power Supply. The 4-Quadrant Power Supply works in 4 modes ("Quadrants"), positive generating, positive receiving, negative generating and negative receiving. This allows to recover back magnet energy that would otherwise be lost. The Short Pulse Power Supply works by switching the power supply rapidly on and off.

Is there an analogy or metaphor you can use to help describe this simply?

It works like a super fast switch

Unique characteristics

Can be used for a wide range of magnets (superconducting magnets, conventional magnets, septum magnets, particle sources)

Limitations or constraints

4 Quadrant:

Max. Rating: 120 kW

Flexible DC Output: 1800 A, 900V

Short Pulse

Highest Pulsed Current: 3000 A for 12 ms at 1.1 Hz repetition rate

Fastest Pulsed Current: 320 A for 5 ms at 10 Hz repetition rate

Originally designed to be used for:

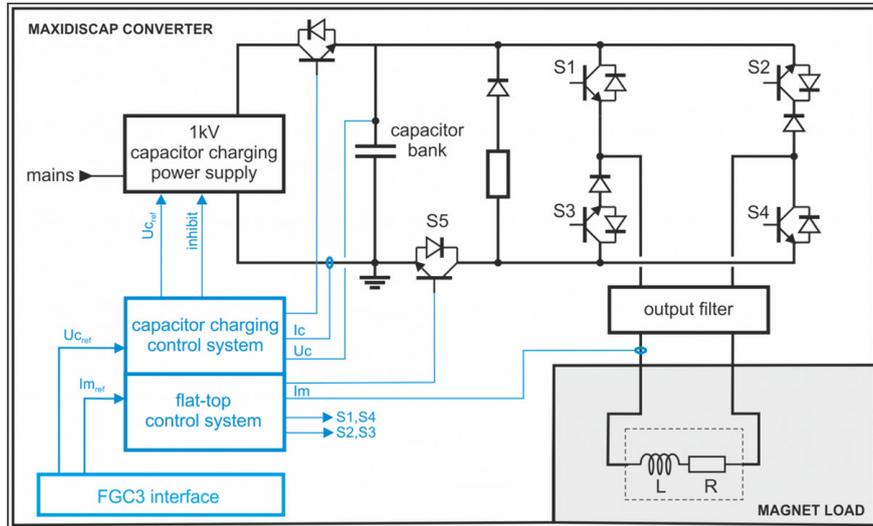
The power supplies were designed to be used on the magnets in the Large Hadron Collider at CERN

Questions related to this technology

Where are very precise magnets needed?

What else might need a 4 quadrant mode?

What else might need fast switching times with high amps?



References

<https://kt.cern/technologies/magnet-power-supplies>

<http://te-epc-fpc.web.cern.ch/content/maxidiscap>

<http://kt.cern/sites/knowledgetransfer.web.cern.ch/files/documents/technologies/cute-converter-datasheetpdf.pdf>