

Feedback-Controlled Modular High Voltage DC Power Supply (FCM-HVPS)

About

This technology implements a modular high voltage switched mode DC power supply consisting of multiple DC to DC converter blocks, with high frequency voltage transformation & high voltage isolation (using high frequency transformer) incorporated within each modular block. The technology has ability to operate in grounded mode (i.e. either of the positive or negative terminal referred to ground) as well as lifted potential mode or floating mode (i.e. either of the positive or negative terminal referred to or lifted to high voltage potential up to 100kV DC); ability to withstand repetitive breakdowns (short circuits) at the output terminals; fast rise time (<1ms) and ability to restrict the dumped energy in the load during load-end breakdowns to < 10J.



Patent

Indian patent titled "High voltage DC power supply circuit" (Indian patent No. 403371) has been granted on August 11, 2022 and its German patent is pending.

Features

- ✧ Modular design
- ✧ True feedback control of the output voltage
- ✧ Fast voltage rise and fall time
- ✧ Fast output cut-off during output faults
- ✧ Ability to withstand & allow repeated breakdowns or short-circuits at output
- ✧ Low dumped-energy during breakdown in load
- ✧ Low output voltage ripple
- ✧ Ability to float at high potential
- ✧ Continuous duty and modulated operation
- ✧ Local as well as remote mode operation
- ✧ Forced air cooling

Specifications of developed product

- ✧ **Input:** 3-phase, 415V, 50Hz
- ✧ **Output voltage and current:**
0 to 35kV 15A DC
0 to 11kV 35A DC
- ✧ **Cut-off time during Fault:** < 10 μ s
- ✧ **Energy dumped during Breakdown:** < 10J
- ✧ **Voltage Regulation:** \pm 1%
- ✧ **Output Voltage Rise & fall time:** < 1ms
- ✧ **Max. output voltage ripple:** \pm 2%
- ✧ **Output voltage modulation:** \leq 5Hz
- ✧ **DC Isolation level:** Up to 100kV
- ✧ **Duty of operation:** Continuous duty

Areas of Application

- ✧ Neutral beam system
- ✧ RF systems
- ✧ Industrial applications requiring HVDC
- ✧ DC power generation



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