Use case
Generator starting

Supercapacitors deliver reliable power for generator starting

Generators provide critical auxiliary or backup power to industrial processes when grid power is unavailable. Many industries depend on these backup power systems in the event of unexpected power outages to prevent interruptions to sensitive processes and costly downtime on operations.

Startup failure is one of the most common problems associated with generator engines. Gensets may fail to start for a variety of reasons, including high coolant temperature, low engine oil level, or even a faulty starter. However, the most frequent cause of startup failure is a discharged or dead starter battery.

Generator engines typically utilize secondary batteries to deliver a high startup current to the engine starter.

However, 12 V lead-acid and lithium-ion batteries suffer several inefficiencies, such as cold start issues due to low startup current, battery leaks due to overcharging, and rapid internal degradation with harsh temperature conditions.

Additionally, batteries add extra bulk and weight to the engine compartment of the generator – which may limit some manufacturers' ability to design compact systems.

Eaton supercapacitors provide a robust solution for reliable starting of generator engines with significant benefits over batteries.

Eaton's XLR-LV supercapacitor modules are high-reliability, compact, and ultra-high capacitance energy storage devices that deliver high starting power with very low equivalent series resistance (ESR).

The XLR-LV module is a high power density storage system which can cycle millions of charge/discharge cycles.

Depending upon the model, it can deliver a maximum voltage of 18 V and peak power of 47.6 kW over an operating life up to 20 years* with virtually maintenance-free operation.

Each module comprises six XL60 3000 F cells, offering 500 F in total. Unlike batteries (which utilize a chemical process to store charges), the XLR-LV module stores energy electrostatically within its electric double layer construction (EDLC). Charging times are typically in the one-minute range.

The XLR-LV supercapacitor module offers high-temperature resilience due to its rugged construction. Operating temperature range is from -40 °C (suitable for cold starting) up to +65 °C (suitable for starting hot engines) at over 98% efficiency. These modules are ideal for genset starting in outdoor applications (e.g., emergency systems, military, and microgrids).

The XLR-LV module is a cost-effective alternative to starting batteries, giving users best total cost of ownership with reduced replacement and maintenance costs. The compact size of these modules provides greater design flexibility for generator starting applications, allowing manufacturers to reduce size and weight in the engine compartment. The supercapacitor materials used are eco-friendly and RoHS-compliant.

*Supercapacitor lifetimes vary based on charge voltage and temperature. See Eaton's application guidelines or contact your local Eaton sales representative for more information on lifetime estimates

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

www.eaton.com/supercapacitors

Powering Business Worldwide

Printed in USA
Publication No. 10946 BU-MC19076
February 2023

Follow us on social media to get the latest product and support information.