Dry capacitors for voltage source converters

DryDCap
Enhancing eco-efficiency
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Dry capacitors for voltage source converters

For consistent reliability, high capacity, increased safety and a minimal environmental footprint, a modern voltage source converter topology equipped with ABB’s DryDCap capacitors could be the answer you are looking for.

What is a DryDCap?
Traditional capacitors use oil and are susceptible to leaks. DryDCap capacitor is a non-oil, soft cell DC capacitor for modern converter topologies, where operators are looking for a voltage source converter solution with high capacity and reliability, while maintaining minimal environmental footprint.

DryDCap capacitor is constructed of small modules, each equipped with self-healing metallized film boosting the product’s reliability. This film enables the capacitor to progressively reduce its capacity and reduces the risk for short-circuiting and complete power outage in case of a failure.

Thanks to a segmented design, DryDCap capacitors provide an added level of safety to end-of-life behavior and make them especially suitable for a wide range of applications such as HVDC and SVC converters, and motor drives where high reliability is needed.

Applications
Since DryDCap contains no oil, it is a safer alternative to traditional capacitors for converters used in hazardous environments such as on oil platforms. Its high energy density capability allows for compact designs that can provide the same capacity as larger oil-based capacitors, thus enabling space saving. The compact design allows it to be installed on the same support as the IGBT valves, thus reducing inductance and consequential stress on the IGBTs, resulting in more reliable converter operation. HVDC, FACTS and motor drives all benefit from this high capacity, dry solution.

Quality, reliability and safety
ABB capacitors are produced in modern and highly automated factories and therefore have a high level of consistency. Our finely tuned quality control system constantly checks all phases of production and guarantees high and consistent quality and reliability. All capacitor elements are subject to stringent routine tests with parameters at or above the required international standards. Our ISO 9001 Quality System registration provides the strongest assurance of our product quality.

Designed for a long service-life, ABB capacitors boast an extremely low failure rate and provide our customers with an added level of safety, a better return on investment and lower maintenance costs. Power grid operators see enhanced asset utilization, lower network losses and better voltage stability for higher productivity and profits. Drive manufacturers get a compact and reliable solution allowing them to meet their customer’s increasing demands.

ABB is leading the way
Today, ABB is the leader in dry capacitor technology with extremely demanding HVDC installations being carried out in North America, Scandinavia, and Central Europe.
Technical data example

Ratings

DC Voltage (UNDC) up to 4000 V
Current (I_{rms}) up to 620 A
Capacitance up to 10 mF

Characteristics

Tangent of the loss angle tanδ \times 10^{-4}
Self-inductance (L_s) <50 \text{nH (at 1 MHz)}

Insulation

Terminal/casing 16000 VAC_{rms} 10 s

Operating temperature

Minimum temperature +5 °C
Maximum temperature +60 °C

Storage temperature

Minimum temperature -40 °C
Maximum temperature +85 °C

Technology

Dielectric Polypropylene, Metallized film
Filling material Polyurethane, Resin
Safety system Self healing technology, Fuse segmentation
Grading resistors Yes

5% Life time expectancy >260000 h (30 years)

Failure rate <100 FIT

Standard

IEC 61071 (2007)

Mechanical data

Casing material Aluminum
Mounting position Horizontal and vertical
Creepage distance 160 mm

Flash over distance (Terminal to casing)

Perpendicular cable connection 59 mm
Axial cable connection 40 mm

Typical dimensions* of DryDCap units

<table>
<thead>
<tr>
<th>Name</th>
<th>Capacitance (uF)</th>
<th>Current (A_{rms})</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>Weight (kg)</th>
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* other dimensions available on request.