COOPER POWER
SERIES

Power capacitor unit comparison

Eaton offers a comprehensive line of Cooper Power series power capacitor units. These units have been divided into duty ratings to align with customer applications and industry standard requirements. This document helps to provide an overview of these duty ratings to assist with selecting the product to meet your specific needs.

Capacitor unit benefits and application

Capacitor units are a simple, economical, and reliable source of reactive power on outdoor or indoor electric power systems. Benefits of capacitor incorporation in power systems include:

- Improved power factor
- System capacity release
- Reduced losses
- Improved power flow capability
- Voltage support
- Harmonic filtering
- Surge suppression Power

Power capacitors can be installed individually or in factory-assembled switched or unswitched banks including:

- Pole-mounted banks
- Open air substation banks
- Specialty applications
  - Harmonic filter banks
  - Flexible Alternating Current Transmission Systems (FACTS)
  - High–Voltage Direct Current (HVDC)
  - Transmission banks solutions

Capacitor units

Standard-duty (SD type)

Standard-duty capacitors are designed for typical utility transmission and distribution applications. These units provide an economic solution while meeting or exceeding the IEEE Std 18™-2002 revision requirements.

Heavy-duty (HD type)

Heavy-duty capacitors are designed for applications where higher reliability is desired (for example transmission capacitor banks). The heavy-duty capacitor is designed to be more resistant to the effects of higher transients, harmonics, and voltage excursions than the standard-duty capacitor.

Heavy-duty designs meet or exceed IEEE Std 18™-2012 standards.

Extreme-duty base (XDB type)

Extreme-duty base capacitors are for applications with the most extreme harmonic environments and unknown contingency needs (for example industrial applications). These units are designed to exceed the IEEE Std 18™-2012 standard. The base design is intended for ambient temperature ranges between –40 °C to + 55 °C.

Extreme-duty cold (XDC type)

Extreme-duty cold capacitors are designed to provide customers with reliably performance under excessively low ambient applications, rated to –50 °C ambient conditions.

Extreme-duty hot (XDH type)

Extreme-duty hot capacitors are designed to provide customers with reliably performance under excessively high ambient applications, rated to +75 °C ambient conditions.

For rating comparisons please review table 1.

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Table 1

Rating comparison	Standard duty (SD)	Heavy duty (HD)	Extreme duty base (XDB)	Extreme duty cold (XDC)	Extreme duty hot (XDH)
Maximum fault current	10 kA	10 kA	15 kA	15 kA	15 kA
Upper ambient	55 °C	55 °C	55 °C	40 °C	75 °C
Lower ambient	–40 °C	–40 °C	–40 °C	–50 °C	0 °C
Continuous RMS overvoltage	110% rated	125% rated	125% rated	125% rated	125% rated
Peak overvoltage	120% rated	135% rated	135% rated	135% rated	135% rated
Performance testing IEEE Std 18™ -2012	N/A	Meets @ –40 °C	Meets @ –40 °C	Meets @–50 °C	Meets @ 0 °C

Wildfire mitigation design upgrade

Wildfire mitigation is a design upgrade that can be applied to any of the unit duty classifications. This upgrade includes incremental design features that help to further limit the potential for a fire event. Wildfire mitigation is recommended for capacitor banks in remote applications, areas with maintenance limitations, or areas of elevated fire risk.

Design upgrades include:

- Increase in bushing creepage
- Increase in enclosure thickness
- Double mechanical crimps
- CapSeal epoxy bushing bonding
- Oversized terminal leads
- Increase in major insulation layers

Note: unit ratings on table 1 remain consistent, with the exception of maximum fault current, which is increased to 20 kA for all wildfire mitigation designs.

For any questions regarding application specific product recommendations, or product ratings please contact the Power Capacitor product line for additional support.

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